INTERNATIONAL CONNECTEDNESS, GOVERNMENTAL INTERVENTIONS, AND FIRMS' ADAPTATION TO EXOGENOUS SHOCKS: EVIDENCE FROM THE COVID-19 PANDEMIC

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Abstract

Purpose – Our understanding of how firms adapt to exogenous shocks remains rather limited. We examine whether internationally connected firms (i.e., firms that rely on exporting, global value chains and foreign ownership) are less likely to adjust their production in response to a major exogenous shock. Moreover, we investigate if governmental policy interventions affect more internationally connected firms than domestically focused counterparts.

Design/methodology/approach – We employ a dataset of more than 13,000 firms from 41 countries worldwide from the World Bank's Enterprise Surveys, taking advantage of the recent COVID-19 pandemic as a quasi-experimental setting for this research.

Findings – Our results show that export-intensive and foreign-owned firms are less likely to adjust their production in response to the pandemic. Moreover, governmental policies (in the form of confinement stringency and economic stimuli) seem to affect equally all firms' ability to adapt to the pandemic. Finally, the economic magnitude of these national policies dwarfs those of firms' international strategies, confirming the paramount role played by governments worldwide in response to major exogenous shocks.

Originality/value – We examine empirically whether internationally connected firms are more or less affected by a major global crisis (in this case the COVID-19 pandemic) and whether national policies in response to the crisis favour or not domestic firms.

Keywords Organizational adaptation; COVID-19; Exports; MNEs; Global Value Chains; Governmental policies.

1. INTRODUCTION

The internationalization process remains paramount for conducting business around the world (Dunning & Lundan, 2008; Krammer, Strange & Lashitew, 2018). The technological, socio-political and institutional changes that have taken place over the last half a century have created a global market that is accessible to all firms (Turkina & Van Assche, 2018; Ahlstrom et al., 2020; Mukherjee et al., 2023a). However, major disruptive events such as 9/11, the global financial crisis of 2008, SARS and Ebola outbreaks, the Fukushima nuclear disaster, and the COVID-19 pandemic have had significant cross-border consequences, forcing firms to develop appropriate strategic responses to stay afloat (Gao & Sarraf, 2009; Van Assche & Lundan, 2020; Hitt, Holmes & Arregle, 2021).

Prior research suggests that different types of firms cope very differently with major crises and exogenous shocks (Oh et al., 2020; Wenzel, Stanske & Lieberman, 2020; Gomez et al., 2024). Such events involve unpredictable contingencies and heightened uncertainty related to the supply of raw materials, fluctuating demand, and changing consumer preferences (Gereffi, Lim, & Lee, 2021; Mukherjee & Mukherjee, 2021). To alleviate such problems, firms need to adjust their production and service offerings and how they conduct their business (Arslan et al., 2020; Chakrabarti, 2015; Chakrabarti, Vidal & Mitchell, 2011; Mukherjee & Krammer, 2024). Given this context, the extent, type, and success of these adjustments require closer scholarly attention (Oh & Oetzel, 2022; Orlando et al., 2022). Consequently, two important deficits stand out in this literature.

First, while prior work has documented firm-level strategic responses to environmental disasters (Gao & Sarraf, 2009; Li & Tallman, 2011), there is a paucity of understanding on how the characteristics of internationalization affect firms' adaptation to severe exogenous shocks (Peng & Kathuria, 2021). On one hand, we know that international connectedness provides significant benefits to firms; on the other, it also makes them more vulnerable to

internal and external exigencies (Bahl, Lahiri & Mukherjee, 2021; Hsu, Chen & Cheng, 2013), as exposed by the recent COVID-19 pandemic (Arslan et al., 2020; Krammer, 2021a; Oh, Shin & Oetzel, 2021; Orlando et al., 2022). Given the unique nature of this crisis and its profound global effects, examining how COVID-19 has impacted internationally connected firms is a theoretically and practically compelling research question that can help business scholars better understand the strategic responses developed by firms in response to such unique threats (Meyer & Li, 2022; Gomez et al., 2024).

The second gap in the literature relates to a better understanding of the role of government policy in shaping firm-level strategic responses to exogenous shocks (Gereffi et al., 2021; Stiglitz, 2021). Government policies were essential during the pandemic, focusing on minimizing both the negative healthcare and economic consequences of this crisis (Borio, 2020). Yet, their overall efficiency and ability to deliver tangible benefits for firms remains an open question (Adams-Prassl et al., 2020; Bartik et al., 2020; Klöckner et al., 2023). Thus, examining the relative success of such interventions across different types of firms (i.e., internationally versus domestically oriented) is critical for drafting comprehensive policy responses to future external shocks (Van Assche & Lundan, 2020; Beamish & Hasse, 2022).

We draw on theoretical insights from organizational ecology (Dobrev, Ozdemir & Teo, 2006; Le Mens, Hannan & Pólos, 2011) to argue that international connections – in the form of exporting, foreign ownership, and global value chain (GVC) participation – make firms more organizationally inert, thus less likely to adjust their service and production activities in the wake of a major exogenous shock like the COVID-19 pandemic. Moreover, building on the firm–government interaction literature (Boddewyn & Brewer, 1994; Gaur, Ma & Ding, 2018; Dang, Jasovska & Rammal, 2020), we theorize that government interventions associated with pandemic policies may act as boundary conditions for firm adaptive responses, benefitting more domestic-focused firms rather than internationally connected ones. We test these

predictions using a sample of more than 13,000 firms across 41 countries from Enterprise Surveys (ES) and COVID-19 Follow-up Surveys developed and administered by the World Bank before and during the pandemic.

We advance several contributions. First, answering recent calls in the literature (Oh & Oetzel, 2022), we develop and test a theoretical framework that explicates how global exogenous shocks can affect firms that conduct international activities. While prior studies in this domain have focused on narrower phenomena in terms of scope and impact, such as terrorism, financial crises, armed conflicts, or natural disasters (Dai, Eden & Beamish, 2017; Oh & Oetzel, 2011, 2017; Darendeli & Hill, 2016), we focus on the COVID-19 pandemic, a unique event that has brought novel, broad challenges to companies that rely on international connectivity to operate and thrive (Verbeke & Yuan, 2021; Beamish & Hasse, 2022; Meyer & Li, 2022).

Second, we contribute to the ongoing debate on the benefits and risks of engagement in firms' international business (IB) activities. This is particularly salient for the current global environment, one that is characterized by increased protectionism, greater uncertainty, global shocks, and pressing grand societal challenges that mandate organizational responses (Buckley, Doh & Benischke, 2017; Vahlne et al., 2018; Witt, 2019; Krammer et al., 2023; Krammer, 2024). While internationalization was historically heralded as the best route for securing economic development, major exogenous shocks have affected more multinational enterprises (MNEs) than domestic firms (Guedhami et al., 2022). Focusing on the COVID-19 pandemic, we find that internationally connected firms are less likely to reconfigure their production activities in response to the crisis. Our empirical results – based on a large, heterogeneous, multi-country context – complement prior conceptual or qualitative insights in the literature (Contractor, 2022; Gereffi, 2020) on the effects of exogenous shocks on internationally oriented firms.

Finally, we fill in a void in the IB literature by showcasing the decisive role played by governmental policies worldwide in supporting business adaptation in the wake of a major global crisis or shock (Evenett, 2020; Van Assche & Lundan, 2020; Verbeke & Yuan, 2021; Rašković, 2022). Our findings complement the scant evidence on the role of governments vis-à-vis firms' internationalization (Williams & Martinez, 2012; Zhang et al., 2022) and investment (Deng et al., 2020) by showing that economic stimulus measures help firms to adapt, while stringent containment policies inhibit their adaptation. We also find some support–albeit much weaker and only for firms relying on GVCs –for our theory that these governmental interventions will disproportionately affect internationally connected firms.

2. THEORETICAL BACKGROUND

2.1 COVID-19 pandemic as exogenous shock and firms' strategic responses

Exogenous shocks pose significant challenges for businesses and policymakers alike. Before the COVID-19 pandemic, IB scholars have examined how natural disasters (Mithani, 2017; Oh & Oetzel, 2011; Oh et al., 2020), terrorism and violent conflicts (Czinkota et al., 2010; Dai et al., 2013; Oh & Oetzel, 2017; Oetzel & Getz, 2012; Oetzel & Miklian, 2017) or financial crises (Gao & Sarraf, 2009; Chakrabarti et al., 2011; Chakrabarti, 2015) impact MNE activities.

However, the COVID-19 pandemic is different from those other types of exogenous shocks, as it has had far-reaching effects on the global economy. In terms of the scope of impact, the COVID-19 pandemic has had a widespread impact on businesses across multiple sectors and geographies (Kobrin, 2020). It has affected not only specific industries like travel, hospitality, and retail, but also supply chains, manufacturing, and service sectors[1]. Furthermore, the COVID-19 pandemic has caused disruptions in multiple dimensions, such as supply chain

[1] In contrast, financial crises typically impact the financial sector and later have repercussions that spread to other sectors, whereas natural disasters, terrorism, and conflicts have a relatively low geographic scope.

disruptions (Gereffi, 2020; Narula, 2020), cross-sectoral international collaboration (Arslan et al., 2020), reduced consumer demand (Mukherjee & Mukherjee, 2021), government-imposed restrictions on business operations (Guedhami et al., 2022), and availability of labor (Albanesi & Kim, 2021). Lastly, the response to the COVID-19 pandemic has involved a combination of fiscal, monetary, and public health measures by governments worldwide (Cronert, 2022; Guedhami et al., 2023; Van Assche & Lundan, 2020). These policies addressed the health crisis and the economic impact, leading to unique interactions between economic authorities, public health authorities, and businesses.

Prior studies in this vein have argued that exogenous shocks may present not only threats but also opportunities to firms. While disruptions often limit access to customers and suppliers, new opportunities can stem from opening markets that were unavailable before the crisis (Angelidou et al., 2022; Pangarkar & Lie, 2004; Wan & Yiu, 2009). Moreover, in response to such shocks, firms commonly have to adjust their products and operations (Tan & See, 2004; Tybout & Bark, 1988; Wan & Yiu, 2009). Such production adjustments can bear both positive (Pangarkar & Lie, 2004; Singh, Mahmood & Zu, 2011; Wan & Yiu, 2009) and negative consequences for firms (Chakrabarti et al., 2011; Chakrabarti, 2015).

Thus, on one side, production adjustments prevent obsolescence, allowing firms to renew and enlarge their customer base (Rosenkopf & Nerkar, 2001; Vermeulen & Barkema, 2001). Furthermore, they enable organizations to capitalize on consumer or market changes by redeploying resources and expertise in areas where these opportunities present themselves (Angelisou et al., 2022; Pangarkar & Lie, 2004; Singh, Mahmood & Zu, 2011; Wan & Yiu, 2009). Finally, adjustments in production can enable firms to minimize the contingent economic pressures following a crisis by narrowing and focusing their attention on the areas where they still have a competitive advantage (Lewin & Volberda, 1999; Spisak et al., 2015).

In turn, production or service adjustments can have also negative effects on a firm's performance, given the significant internal commitments needed during a crisis (March, 1981). For example, the product or service adjustment may require a firm to retrain its workforce or replace a production plant; subsequently, firms that change their production/services are more likely to suffer from performance disruptions and face a higher risk of failure (Chakrabarti et al., 2011). Production adjustments can also affect long-term performance. A case in point for this is the study by Li & Tallman (2011) on the changes multinational companies made after the 9/11 terrorist attack. They observed that, although geographic diversification exposed firms to greater risk in the short term, multinational firms are often reluctant to engage in production adjustment because such adjustments may reduce the benefits associated with international diversification in the long term. In the next section, we discuss production adjustments as a form of organizational adaptation from the perspective of organizational ecology.

2.1 Organizational ecology

Organizational ecology, as outlined by Hannan & Freeman (1984), focuses on how populations of organizations change over time due to environmental forces. One of its central tenets is that changes in the diversity of organizational forms within a population in the long term happen primarily through a selection process rather than adaptation at the individual firm-level. This view stems from the concept of organizational inertia —which refers to the resistance to change that organizations often experience. Because organizations develop specific routines, structures, and strategies in response to a particular environment, over time they often become rigid, which makes them slower or unable to adapt to rapid environmental changes. As a result, rather than individual organizations adapting, the population evolves as less-fit organizations fail, and new, more appropriate organizational forms emerge to replace them.

Initially, organizational ecology emphasized population-level dynamics and minimized the role of individual organizational agency in determining survival outcomes (Sarta, Durand

& Vergne, 2021). Early theorists argued that due to strong inertia, organizations generally could not adapt fast enough to survive in rapidly changing environments. Thus, failure and replacement, rather than internal adaptation, were seen as the key drivers of population-level organizational changes.

However, subsequent research has introduced a more nuanced view, recognizing that under certain conditions, organizations can adapt (Dobrev, Ozdemir & Teo, 2006; Le Mens, Hannan & Pólos, 2011). While inertia remains a central constraint, there are instances where organizations, realizing that their survival is at stake, can engage in strategic adaptation. For example, firms facing existential threats may reorganize, restructure, or innovate in order to remain competitive (Zhang, Yang & Xia, 2023; Sarta et al, 2020). This suggests that while inertia limits adaptation in stable environments, organizations may exhibit flexibility when faced with extreme conditions or prolonged environmental pressures.

Prior work in this area has advanced several insights into why and how firms adapt to sudden and significant changes in their external environments. For instance, in his study of South-East Asian firms following the 1997 financial crisis, Chakarabarti (2011) found that better-performing firms, at the time of a crisis, are less likely to engage in asset reconfigurations than struggling firms because the former faced fewer pressures to use resources in a more efficient way. However, adjustments made by struggling firms improve their productivity, therefore helping them recover and better cope with the crisis (Ketchen & Palmer, 1999; Robbins & Pearce, 1992). Similarly, Kraatz & Zajac (2001) argued that the likelihood of organizations engaging in strategic change (including product and service adjustments) during an exogenous shock depends on the level of resources they have. Specifically, firms with abundant resources are less likely to engage in strategic change, as resources can provide a buffer against a decline in performance.

Building on these insights, we will now unpack some potential mechanisms through which internationally connected firms' inertia can build up significantly in the wake of a crisis.

3. HYPOTHESIS DEVELOPMENT

3.1 Exporting and firms' adaptation to COVID-19

A consensus in the business literature is that exporters possess superior resources and capabilities compared to purely domestic enterprises. Exporting allows firms to access various international markets and quickly diversify their production portfolios (Bahl et al., 2021; Nuruzzaman et al., 2020). In addition, exporters are more efficient and productive than domestic-oriented firms (Clerides, Lach & Tybout, 1998; Melitz, 2003), and this relative advantage appears to increase over time (De Loecker, 2007). Finally, export performance, measured by export intensity, is positively associated with workforce skill level, access to external technologies, and managerial know-how (Krammer et al., 2018). Subsequently, we believe that this advantage will paradoxically contribute to their inertia in terms of changing or adjusting their production patterns in the wake of a major shock. This is supported by several rationales.

First, drawing on the organizational ecology perspective, we argue that exporters are less likely to adapt to exogenous shocks due to their inherent inertia and resources advantages. Exporters, benefitting from superior productivity (De Loecker, 2007) and significant resource advantages (Krammer et al., 2018), as well as more optimistic perceptions about future uncertainties (De Loecker, 2007), can better endure demand reductions without the need for immediate adaptation. Their substantial organizational, social, and financial capital act as a buffer against crises, allowing them to maintain operations and survive external shocks without altering their core products or business models. This resilience reflects the idea that firms with

stronger resource bases are less likely to experience selection pressures that require immediate changes, allowing them to weather economic downturns more effectively.

Second, exporters' reduced dependence on any single market enables them to mitigate crisis risks without needing to adapt rapidly. From an organizational ecology viewpoint, market diversification acts as a form of environmental buffering, reducing the direct pressure for adaptation. Exporters can engage in institutional arbitrage (Fathallah, Branzei & Schaan, 2018) or escape unfavourable home-country environments by leveraging their presence in multiple international markets (Krammer & Kafourous, 2022). Even in global disruptions like a pandemic, variations in recovery speeds across countries can allow export-intensive firms to survive longer without altering their strategies. This reflects the ecological principle that organizations survive environmental shocks based on fit with the environment rather than quick adaptation. Exporters, with their diversified market exposure, may thus be selected to survive while non-exporters face more direct pressures to adapt. In the context of a shock, this ability can help them ride out a decline in domestic demand.

Finally, exporting firms are less likely to engage in production adaptation following a shock because such changes threaten their long-term competitiveness and reflect the high inertia associated with their established routines. Organizational ecology suggests that once firms have developed tailored products and business models for diverse markets (Rodriguez & Rodriguez, 2005; Zhang, Yang & Xia, 2023), they are reluctant to disrupt these entrenched processes. Adapting production post-shock would require substantial investments, such as retraining the workforce or reinvesting in new technologies, which could undermine the firm's competitive advantage. The uncertainty surrounding the duration and nature of the shock further reinforces inertia, making adaptation less appealing strategically and operationally (Brussevich, Papageorgiou, & Wibaux, 2022; Eschachasthi, 2022). Thus, from an ecological

standpoint, exporters are more likely to persist without adaptation, relying on their established strengths to outlast the crisis.

In sum, having greater resource advantages causes export-intensive firms to have less urgency when facing an exogenous shock, and be more reluctant to engage in production adjustment, because such adjustments can threaten their long-term competitiveness in these markets. We state this formally as:

> *Hypothesis 1. There will be a negative relationship between a firm's reliance on exports and the likelihood that it will adjust its products or services in response to a major exogenous shock.*

3.2 Foreign ownership and firms' adaptation to COVID-19

Foreign firms commonly compensate for liabilities of foreignness (Zaheer, 1995), by relying on firm-specific advantages that stem from unique resources and capabilities transferred from the headquarters (or other subsidiaries) as well as resources and capabilities that are acquired in the host countries (Rugman, 1981; Rugman & Verbeke, 2007). This combination allows a foreign owned enterprises to have a greater resource base than its domestic counterparts, as well as enjoying other benefits such as internal equity financing (Nguyen & Rugman, 2015)[2], subsidies or technology access from their parent companies (Un, 2011; Un, 2016), all of which are likely to improve their performance further vis-à-vis domestic firms.

From an organizational ecology perspective, we contend that foreign-owned firms are more likely to resist adapting their products or services in response to an exogenous shock than their domestic counterparts. This is because foreign-owned firms possess inherent advantages that allow them to survive shocks without significant changes. Organizational ecology

[2] Nguyen & Rugman (2015) found that 90% of financing in British subsidiaries comes from internal equity financing.

highlights the concept of structural inertia, which suggests that larger, well-established organizations are slow to adapt due to entrenched processes and resource bases. Foreign-owned firms benefit from global economies of scale (Chandler, Hikino & Chandler, 2009; Cantwell, 2015) and amortisation of costs across their international operations (Contractor, 2022). Their ability to spread costs, including administrative and R&D expenses, across multiple regions reduces their vulnerability to demand shocks like COVID-19. This cost efficiency helps absorb the negative sales impacts, allowing them to maintain stability without needing to alter their production processes—reflecting their capacity to survive shocks through resource advantage rather than adaptation.

Furthermore, the internationalization of foreign-owned firms equips them with capabilities for managing risk and uncertainty (Meyer, Li & Schotter, 2020), reducing their reliance on reactive adaptation. As these firms operate across diverse markets, they accumulate resources and expertise that enhance their ability to cope with environmental fluctuations (Cuervo-Cazurra et al., 2018; Oetzel & Miklian, 2017). For example, foreign-owned firms often share risk management insights within their global networks, enhancing resilience across their subsidiaries (Dang, Jasovska & Rammal, 2020). In line with organizational ecology's emphasis on environmental selection, these accumulated capabilities allow foreign-owned firms to persist without needing immediate adaptation, as they have already built a fit with diverse and unpredictable environments.

Lastly, the high costs of adaptation and the limited autonomy of foreign-owned firms further discourage them from adapting to shocks. Production adjustments can require substantial reinvestment in new technologies and processes, eroding the very global economies of scale that make these firms competitive (Bourmault & Siegel, 2022). Moreover, multinational headquarters often centralize decision-making, limiting the autonomy of foreign subsidiaries and restricting their capacity to engage in local adaptations (Bartlett & Ghoshal,

1986; Cantwell & Mudambi, 2005). This centralized control reinforces organizational inertia, as foreign-owned firms are bound by pre-defined roles and functions set by headquarters, reducing the likelihood of operational change in response to exogenous shocks. Organizational ecology suggests that firms with higher inertia are more likely to survive by maintaining stability rather than adapting, particularly in uncertain environments where the duration and impact of shocks remain unclear (Krammer, 2021a). Thus, foreign-owned firms are more reluctant to adapt during crises, relying instead on their established global resources and structures to endure. Subsequently, we posit that:

> *Hypothesis 2. There will be a negative relationship between foreign ownership and the likelihood that a firm will adjust its products or services in response to a major exogenous shock.*

3.3 Reliance on GVCs and firms' adaptation to COVID-19

Firms worldwide rely heavily on goods imported from foreign countries, with trade in intermediate goods linked through GVCs reaching nearly US$ 8 trillion (UNCTAD, 2020). Participation in GVCs provides significant benefits during stable periods, including cost savings from differences in factor prices and access to unique resources (Mukherjee et al., 2023b; Narula, 2020), enhanced choice in the quality and characteristics of intermediate goods (Cano-Kollmann et al., 2016; Mukherjee et al., 2019), and access to foreign intangible assets such as organizational or firm-specific human capital that can increase the firm's value (Cano-Kollmann, Hannigan & Mudambi, 2018). These advantages reflect a strong fit with the global environment during 'normal times,' supporting organizational ecology's principle that firms thrive based on their fit with stable environmental conditions.

However, firms with highly diversified global sourcing networks are often less adaptable when confronted with major shocks, due to the complexity of addressing disruptions across multiple markets (Kedia & Mukherjee, 2009; Mukherjee & Mukherjee, 2021; Orlando

et al., 2022). According to organizational ecology, these firms experience structural inertia, making them less responsive to rapid changes. While domestic firms might be more vulnerable to local shocks, they can benefit from government support or quickly source substitute products abroad (Kolko & Neumark, 2020). In contrast, firms reliant on GVCs face the compounded risk of disruptions in numerous countries, making adaptation more difficult and costly. Even though GVCs allow for diversification and economies of scale (Choi et al., 2018), firms embedded in these networks face significant supply chain risks, which increase their inertia and reduce their ability to respond flexibly to crises (Meier & Pinto, 2020).

Despite the resilience GVC-participating firms gain from cost savings, their reliance on intricate global supply chains imposes substantial sunk costs that make adaptation in response to crises unlikely (McWilliam et al., 2020; Contractor, 2022). Organizational ecology posits that firms tend to resist change due to the high costs associated with altering established processes. In the case of global sourcing firms, adjusting their production would involve significant restructuring of supply chains or changing the specifications of goods, leading to further production disruptions (Fuchs, 2022). This structural complexity, combined with the fear of losing access to critical goods or resources, limits their ability to adapt to exogenous shocks. Instead, these firms rely on their existing fit with the global environment to survive, reflecting the selection processes emphasized in organizational ecology. Firms with the resources to endure shocks will persist, while those unable to maintain their global networks will be more likely to fail, rather than adapt.

In line with the inertia principle, firms embedded in GVCs are less likely to engage in rapid production adjustments because such changes may harm their long-term survival. The entrenched structure of their supply chains and the associated sunk costs make them resistant to significant alterations, even in the face of external crises. Thus, rather than adapting their operations, firms with global sourcing strategies tend to ride out shocks by relying on their

established networks and resources, underscoring the ecological perspective that survival is more about environmental fit and resilience than about organizational agility or quick adaptation. Hence, we posit that:

> *Hypothesis 3. There will be a negative relationship between a firm's reliance on GVCs and the likelihood that it will adjust its products or services in response to a major exogenous shock.*

3.4 Boundary conditions: The impact of governmental policies

During the pandemic, governments worldwide had to devise measures to alleviate the crisis's economic consequences and limit its societal and health consequences (Hale et al., 2021). They did this by introducing *lockdown policies* (i.e., to contain the spread of the virus and bring down the number of cases, hospitalizations, and deaths), as well as *economic policies* (i.e., to protect certain sectors and businesses that were perceived to have a higher risk of bankruptcy due to the pandemic). In this section, we will explore the indirect or moderating effects of these policies on the relationship between firms' internationalization and their ability to adapt successfully.

In the aftermath of COVID-19 becoming a global pandemic, policymakers around the world were called upon to support certain firms, industries, and workers to ensure that they will be able to cope and survive this crisis. While virtually all governments have responded to this challenge in some shape or form, the extent and type of economic stimuli has differed significantly across countries (International Monetary Fund, 2020). Mirroring prior insights into the importance of examining the underexplored implications of these important variations, particularly in the case of emerging economies (Estrin et al., 2019). In practice, these stimuli have taken various forms, from soft loans and equity injections to debt relief packages. Such assistance, especially soft loans, provided firms with extra resources so they could adjust their production to meet new demands in the market (Narula, 2020). Similarly, economic stimuli in

the form of debt relief helped firms' cash flows and provided means to finance any adjustments to production in response to changes caused by the pandemic.

We posit that the extent of economic support through governmental policies will be more effective or helpful to domestic firms rather than those with an international orientation. One potent argument is the fact that these policies are crafted at the national level and are meant to protect both domestic firms and domestic employment (Hale et al., 2021). Consequently, they will likely maintain or amplify existing inertia in internationally oriented firms (Le Mens et al., 2011). Thus, taking into account that foreign-owned, exporting, and GVC-embedded firms face less risk by catering to a global market (Beamish & Hasse, 2022), having a certain degree of independence from their home countries and their idiosyncratic features (Oh et al., 2021), benefit from higher levels of resources and capabilities (Krammer et al., 2018; Hitt et al., 2021), as well as stronger innovation bases (Melitz, 2003) as a prerequisite for successful adaptation (Paunov, 2012; Krammer, 2021a), it is difficult to prioritize them in terms of governmental support. As such, we would expect that most of this governmental support would target domestic firms that are deficient in these domains and need help to stay afloat following the crisis.

Moreover, governmental support can trigger different strategies in domestic versus internationally oriented firms (Dang et al., 2020; Nuruzzaman et al., 2020). While domestic firms would be in a position to use this financial assistance to upgrade their portfolio of products and services and/or engage in radical innovation to improve their competitive position, prior evidence suggest that they will be cautious and focus instead on cost reduction and efficiency improvement measures (Varum & Rocha, 2011). This is very much consistent with the pragmatic and shorter-term view that managers of these organizations need to tackle tangible and critical issues to maximize their survival chances (Bridges & Guariglia, 2008).

In conclusion, although economic stimuli can encourage firms, especially domestic ones, to adjust their production following a global exogenous shock, the short-term nature and lesser need for support in the case of internationally connected firms suggest that they will only exacerbate their inertia. Subsequently:

> *Hypothesis 4a: The extent of economic stimuli provided by the government will help firms to adjust their products or services during the COVID-19 pandemic, but this effect will be weaker for firms that are foreign-owned and firms that rely more heavily on exports and GVCs.*

Besides economic measures, governments around the world adopted various containment policies as early as the first quarter of 2020 to slow the spread of the COVID-19 virus. In early 2020, these containment policies included restrictions on movement, and quarantine policies (Van Assche & Lundan, 2020). The extent of restrictions on movement varied from school closures and restrictions on public gatherings to workplace closures and restrictions on international travel. Although these restrictions were effective at slowing the spread of COVID-19, they limited human interaction and prevented firms from adjusting production processes or services, such as workforce training or installing new machinery in factories. As a result, we posit that these movement restrictions will be negatively associated with a firm's likelihood of engaging in product or service adjustments, and that these effects will be more pronounced for internationally oriented firms than domestic ones. Several arguments support our reasoning.

First, these movement restrictions have exacerbated the inertia of internationally connected firms, as they rely on frequent personal interactions to sustain critical business operations, including their production adjustments. MNE subsidiaries, for example, need substantial support from their headquarters or sister subsidiaries to adjust their products or services (Hitt, Holmes & Arregle, 2021). With restrictions in place on international movement,

interaction between staff in the multinational subsidiaries and those at the firm's headquarters are more likely to be limited, which may prevent subsidiaries from receiving full support to reconfigure their assets, products, or services (Purdie et al., 2021). Movement restrictions also limit the extent of production adjustments in export-intensive firms or in firms that participate in GVCs. Exporting and importing firms often depend on consumers or suppliers when adopting new technologies in the process of product or service adjustments (Krammer et al., 2018) both of which require personal interactions (Contractor & Mudambi, 2008; Van Assche & Lundan, 2020).

Furthermore, these compulsory quarantine requirements have also had disproportionate effects (in terms of costs and hassle) on international travelers as opposed to domestic (within-country) ones (Hale et al., 2021). In the UK, for example, the cost of quarantine for international travelers from high-risk countries was GBP £2,285 for an adult, which was high enough to make traveling to the UK difficult, or even impossible, for some people (Jolkina, 2021). In addition, time spent in quarantine was seen as lost time. The direct and opportunity costs of quarantine disincentivize international travel, further reducing the chance that internationally connected firms would make changes to their production processes, as such adjustments might require interactions with headquarters or with foreign consumers and suppliers. Subsequently, these restrictions are more likely to impede the activities of internationally oriented firms than domestic ones.

In conclusion, containment policies have affected personal interactions critical for the operations of large organizations (such as MNEs or large exporting firms, or firms that are engaged deeply in complex GVCs). Furthermore, they have disproportionally affected/restricted international travel (throughout the pandemic), therefore limiting any interactions between exporting and importing firms and their foreign consumers or suppliers.

All these reasons suggest that these policies have further exacerbated the inertia of internationally connected firms. Hence, we propose:

> *Hypothesis 4b: The severity of containment policies will reduce firms' ability to adjust their products or services during the COVID-19 pandemic, and these effects will be stronger for firms that are foreign-owned and those that rely more heavily on exports and GVCs.*

Our conceptual model and hypotheses are summarised in **Figure 1**.

--- Insert Figure 1 here ---

4. METHODS

4.1 Data sources and sample

We test our hypotheses using firm-level data across 41 countries from the Enterprise Surveys (ES) and the COVID-19 Follow-Up Survey (FUS), both administered by the World Bank. The first data source has been collected via interviews and surveys of managers in the period 2018-2019, while the COVID follow-up surveys have been carried-out between May 2020 and March 2021 with an explicit objective of assessing the impact of the pandemic on businesses worldwide. We use an existing unique firm identifier (*idstd*) present in both surveys to match firm-level data. The actual date of the surveys differs by country; however, all firms have been surveyed both pre-pandemic and post-pandemic (more details are available at https://www.enterprisesurveys.org/en/covid-19).

The main benefit of using ES and FUS is the fact that these are stratified firm level surveys which are especially designed to maintain representativeness of firms across regions and sectors for these countries. In addition, they also include questions on both the extent of firms' involvement in international activities (e.g., exports, foreign ownership, and GVCs) and their reactions to the pandemic, which makes it an extremely useful dataset for our research.

Importantly, its international representation (41 countries) remains unmatched by any other source, in particular those examining various organizational reactions to the COVID-19 crisis (e.g., Krammer, 2022; Lashitew, 2023; Gomez et al., 2024; Lefebvre & Osei-Tutu, 2024). After removing all missing observations for our variables of interest we are left with a sample of roughly 13,466 firms across 41 countries and 32 sectors covering both manufacturing and services. **Table 1** presents a short description of the variables and their descriptive statistics, while **Table A1** (Appendix) presents the pairwise correlations. Moreover, a breakdown of the dataset by country and industry is presented in **Tables A2** and **A3** (Appendix).

--- Insert Table 1 about here ---

Dependent variable. To capture firm adaptability, we examine its response in terms of production, as the one of the major changes we can observe at the firm level, and moreover one that is the result of organizational learning in the face of external shocks (Levy, 1965). We measure firm adaptability to COVID-19 (*cov19adapt*) as a binary variable using the following question:" *Has this establishment adjusted or converted, partially or fully, its production or the services it offers in response to the COVID-19 outbreak?* Moreover, in the robustness checks section of the paper we also consider a couple of alternative proxies for adaptability.

Independent variables.

We measure reliance on exports (*exportintensity*) as the percentage of sales coming from direct and indirect exports (Krammer et al., 2018). The higher the percentage of sales from exports it signals greater reliance on exports for a particular firm. We capture foreign (MNE) participation in both public and privately owned enterprises by focusing only on majority ownership (Girma, Gong, & Görg 2009), and capturing it using a dummy variable (*foreignown*) that takes a value of 1 a firm has a majority foreign ownership (greater than 50 percent), and 0 otherwise. Finally, a firm's reliance on global value chains (*GVCreliance*) is measured by

looking at the percentage of inputs and supplies of foreign nature of the total inputs and supplies used in the production (Verbeke, 2020).

Moderating variables

Information on governments' response to COVID-19 pandemic both in terms of stringency of lockdowns and stimulus (i.e., economic measures put in place to deal with the negative effects on businesses and individuals) come from the Oxford COVID-19 Government Response Tracker developed by Hale et al. (2021). This database provides a systemic and comparative way to track these responses across countries. The containment index combines 'lockdown' restrictions and closures, testing policies and contact tracing, short term investment in healthcare, and investments in vaccines. The economic stimulus index incorporates measures of the degree of government policies to provide economic stimulus to businesses and households. Both indexes are calculated using all ordinal policies indicators specified in Hall et al. (2021) and have a range between 0 and 1. Daily frequency data of the indexes and their components is available at: https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker (Accessed May 2021). We aggregate these indicators up to the specific month in 2020 or 2021 when the COVID-19 follow-up data is collected by the World Bank. The resulting average economic support index (*Econsupport*) and containment index (*Containment*) that we will use in our analysis.

Controls

To account for any systematic differences between different countries and industries in terms of their natural propensity to be affected (and hence adapt to COVID-19 challenges), we employ industry and country fixed-effects throughout the estimations. Moreover, we include a wide range of firm-level controls to ensure that firms' ability to adapt is correctly identified in relation to firm involvement in international activities.

First, we control *firm size* as larger firms benefit from superior resources and capabilities which can be used more easily when it comes to dealing with the crisis. We measure firm size as the total number of employees at the end of the year before the survey (log-transformed). Second, we also capture firm experience by including *firm age* namely the number of years of activity (since establishment) under the idea that more experienced firms might possess more resilience and resources to deal with a crisis. Along the same lines, we also include the experience of the top managers (*mgmexp*) which has previously been linked with firm performance (Bloom & Van Reenen 2010). Next, access to finances either through bank loans or lines of credit is both a driver of firm growth but also of survival, particularly in harsh market conditions (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2011). *Finance* is a dummy variable that has a value of 1 for firms that have a credit line from a private bank and 0 otherwise. Finally, while we examine the effects of exporting at the intensive margin (i.e., how much export-intensive is a firm) in our hypotheses, there is a clear selection effect in terms of exporting, and only the most productive and innovative domestic companies being able to export (Krammer et al., 2018). Thus, it is important to control for any potential self-selection effects by including a dummy for exporting versus non-exporting firms (*exportdum*). We also include a measure of performance as a control (*logfirmperformance*) calculated as the difference between firm sales and firm labor costs, and which essentially proxies for a firms' productivity (Krammer & Kafouros, 2022) under the expectation that firms that are more productive will also tend to be more adaptable to changing environmental conditions.

Finally, we also included different controls that have been proposed by prior literature to have a clear and longstanding association with firms' adaptation capabilities (Baishya et al., 2025; Fainshmidt, Nair, & Mallon 2017). Specifically, we have captured firms' innovative capabilities through several proxies that cover both *innovation inputs* (such as R&D investment) but also *innovation outputs* (e.g., new products and new processes developed by a

firm) as available in the ES data. To capture R&D investment we code firm's responses to the question ("*During the last fiscal year did this establishment spend on research and development activities*") into a binary variable (*R&D*). Similarly we use questions from the surveys on product and process innovations (e.g., *"During the last three years, did your establishment: introduce into the market any new or significantly improved products (goods or services)? and respectively* "*… any new or significantly improved production processes including methods of supplying services and ways of delivering products?*") to derive two binary variables (*new product* and *new process*), which take the value of 1 for positive ("yes") answers, and 0 otherwise.

4.2 Estimation strategy and econometric issues

To estimate the impact of export intensity, foreign ownership and GVC reliance on firm adaptability to COVID-19 we use a probit model given the binary nature of the dependent variable (*cov19adapt*). Thus, we estimate the following regression equation:

$$cov19adapt_{fcs} = \Phi\{\alpha_0 + \beta_1 Exportintensity_{fs} + \beta_1 Foreignown_{fs} + \beta_1 GVCreliance_{fs} + controls_f + \lambda_{sc} + error\}$$

where *adapt_covid19* is a dummy variable which equals 1 if the firm has adapted its production to COVID-19 or not; Φ denotes the cumulative standard normal distribution; *f, c, s* are indexes for firms, countries, and industries; *controls* include all the firm specifics detailed in the previous section; λ_{sc} are the industry (sector) and country fixed effects.

By design, endogeneity in the form of reverse causality is reduced significantly in this setting. All our explanatory variables come from a survey carried out either in 2019 or 2018 (pending on the country). In turn, our DV (i.e., firm's ability to adapt to covid-19) comes from surveys predominantly carried out in 2020 (May-September) and a couple (Serbia and Bosnia) carried out in 2021, so reverse causality is highly implausible.

Lastly, a common drawback of survey data is potential for common-method bias (CMB). Fortunately, our source of data (the ES) has embedded in it a few procedural remedies to tackle CMB, namely: 1. All respondents and firms are anonymous 2. The questions about COVID-19 adaptation and the firm-specific variables are coming from two different surveys which are separated by 1-2 years, thus unlikely that answers will be strategically provided to serve a particular objective. In addition, we have also performed the usual empirical diagnostics for identifying CMB namely Harman's one factor test and the common latent analysis recommended by Podsakoff et al. (2003). The results of these tests indicate that there is no single factor that explains the variance behind these variables/responses. Therefore, we concluded that CMB is not an issue in this instance.

5. RESULTS

5.1 Main results

Our empirical results are presented in **Table 2**. We start with Model 1 where we introduce all controls and industry and country fixed effects to tease out any unobserved heterogeneity among industries and nations in terms of systematically adapting to COVID-19. In line with our expectations, larger firms appear to be better equipped to adapt their production to these new challenges. We find robust negative effects for firms' age which suggest that younger firms are more successful in adapting to the pandemic. This finding (coupled with the effects of managerial experience) suggests that prior industry or business experience is not particularly useful when dealing with a novel and radical disruption such as COVID-19. Similar negative effects of firm age and experience in adapting to new environments have been consistently found in other contexts such as product adaptation, new industry emergence (Furr, 2019) and strategic agility (Pereira et al., 2021). In addition, they are consistent with recent studies in the literature that find start-ups to be better equipped to deal with COVID-19 disruptions compared

to mature, well-established firms (Ebersberger & Kuckerts, 2021; Krammer, 2021a). Finally, in line with the selection hypotheses (i.e., exporters tend to have higher productivity and superior capabilities compared to non-exporters) we find a positive and significant effect of exporting status on adaptability of firms.

--- Insert Table 2 about here ---

In Model 2 we test our first hypothesis, namely that export intensity of a firm will negatively impact the probability it will adapt to the pandemic. The coefficient of *export intensity* is negative and significant confirming our conjecture. Next, in Model 3 we introduce *foreign ownership* and again the coefficient is negative and significant at 5% providing support for our second hypothesis. In Model 4, we test the effects of reliance on global value chains (i.e., our Hypothesis 3). The coefficient of *GVCreliance* is positive but insignificant suggesting that reliance on GVCs does not appear to influence firms' adaptability to COVID in a statistically meaningful way. In Model 5 we test all three hypotheses together and the coefficients, signs and significance are similar, proving that the results are quite robust.

To get a better feel for the economic magnitude of these effects regarding adaptation we also compute the marginal effects.Consistent with the relative size of the coefficients and considering that we control for a large number of co-variates in all these models, we show that an increase in terms of a firm's export intensity from 33 to 100 percent (i.e., relying exclusively on exports for its business) results in a 6 percent decrease in terms of its chances to adapt to COVID-19. Likewise, domestic-owned firms have on average 4 percent higher chances of adapting to COVID-19 pandemic compared to foreign-owned ones.

In Models 6, 7 and 8 we test the moderating effect of economic support provided by the government in these countries in the form of economic stimulus via tax breaks or grants. The direct effect of governmental support is, as expected, positive and highly significant throughout these models, thus confirming our prior predictions. In turn, the interaction terms

between economic stimulus and export intensity, foreign ownership, and reliance on GVCs are all negative but only the last term (reliance on GVC) retains statistical significance. This suggests that the economic stimulus will be less beneficial for firms that rely heavily on GVCs than for those relying more on domestic providers and intermediate products. In a similar fashion, the degree of containment as proxied by restrictions to movement, testing and lockdown stringency have a negative and robust effect on overall adaptation of firms to COVID-19. We also get confirmation that firms that rely more heavily on GVCs for intermediate inputs, supplies and resources will be less affected by stronger containment policies, contradicting our Hypothesis 4b.

5.2 Robustness analyses

To further check the validity of our findings we have performed several additional analyses, which include exploration of additional proxies for firm adaptation, additional controls, and alternative proxies for some of our existing controls. These results are not reported here due to space constraints but are available upon request.

Different adaptation proxies

The COVID Follow-up survey administered by the World Bank presents several such options by examining whether the firms have shifted their sales online, adopted or increased their online delivery, and allowed their employees to work remotely to meet the lockdown criteria. Specifically, the question in the surveys asks: "*Did this establishment experience any of the following changes in response to the COVID-19 outbreak?:*" a. *Started or increased business activity online?*" b. "*Started or increased delivery or carry-out of goods or services?*" or c. "*Started or increased remote work arrangement for its workforce?").* The answers (yes/no) to these questions have been converted into binary variables which capture these adaptation responses.

To explore the idea of using these variables as alternatives for our main DV, namely production adaptation in response to COVID-19, we have examined in more detail the relationship between these variables to determine whether they are complements or (weak) substitutes to each other. Our principal component analysis using orthogonal varimax rotation (**Table A4,** Appendix) yields only one component with an eigen value greater than one (1.73)- however, the variables do not load up imperfectly on this factor with production adaptation (0.36), remote (0.42) less well, compared to online sales (0.60) and online delivery (0.57). Essentially, the results of the PCA indicate that these variables likely capture different dimensions of adaptation to COVID-19, and as such cannot be used as substitutes/alternatives for our main adaptation variable which evolves both theoretically and empirically around changes implemented in the production process because of COVID crisis. Nevertheless, given the availability of this data we have performed additional ex-post analyses using these additional dimensions of adaptation and their relationship with international orientation of firms. We trust these preliminary findings will generate more interest in these areas from follow-up research that can both theorize and test how firms have adapted via online/virtual work and/or commercial activities.

Different performance proxy

We have used as our main firm performance measure a proxy a measure of productivity. In subsequent robustness tests we have replaced this variable with a more straightforward one, namely the (past) sales of the firm (Cole et al., 2018). The coverage of this variable is relatively good, albeit it results in a slight decrease in terms of sample size (to roughly 11,000 firms). The coefficient of *pastsales* is very small (given the scale difference for this variable) but importantly, it does not appear to affect significantly firm adaptation (like the productivity measure used in our main analyses). This provides us with confidence that our models are well-specified in terms of controls. Moreover, results are very similar in terms of our hypothesized

effects, the only changes occurring being some minor changes in terms of magnitude of the coefficients. These results are again, available upon request.

Additional controls

Superior management practices have been heralded as one of the keys for success (Bloom & van Reenen, 2010) and innovativeness (Krammer, 2021b) of organizations. As managerial skills facilitate firms' ability to adjust and reconfigure its assets and resources (Eggers & Kaplan, 2009), they can be viewed as an important pillar of dynamic capabilities which are mandated to survive, adapt, and thrive following drastic changes in the environment (Pisano & Shuen, 1997). To capture the extent of different management practices we follow Krammer (2021a) and include several dimensions of management practices that include *monitoring, strategic agility*, *performance targeting* and *promotion opportunities*. We then include these dimensions as additional controls in our regressions. Overall, the coverage of these variables is not very extensive, and our sample size decreases to around 4,000 firms. Interestingly, except for the promotion practices (which appears to correlate negatively and significantly to adaptation) the rest of the management practices variables do not appear to correlate significantly, indicating again, that our batch of extensive controls is probably capturing a lot of the variation in our DV.

Potential endogeneity

We have also carried out additional tests regarding potential endogeneity of our main explanatory variables (i.e., export intensity, foreign ownership and reliance on GVCs) -**Table A5** in the Appendix. To check and correct for this endogeneity bias, we followed the literature (Fisman & Svensson, 2007; Krammer, 2019) and instrumented these firm-level variables with their respective region (defined as subnational political-administrative units in a country) and industry unit and excluding the focal firm. The identifying assumptions, confirmed by the data, are that sector-region average rates of these variables will be highly correlated with individual

firm responses in these domains (all first stage coefficients are significant at 1 percent) but uncorrelated with firm adaptation to COVID-19. However, in all these cases the Wald exogeneity tests are not statistically significant (at 5 percent) suggesting that endogeneity is not an issue in the case of our main IDVs and sample. Technically, this implies that the error terms in the structural equation and the reduced-form equation for the potentially endogenous variable are not correlated, and therefore we should trust the results of our simple probit instead (Wooldridge, 2002; pp. 472-477). To further attest these findings, we have also performed Smith-Blundell (1986) tests of exogeneity with qualitatively similar insights (i.e., failing to reject exogeneity), also reported in Table A5. Together these additional results suggest that the theorized IB factors (i.e., export intensity, foreign ownership, and reliance on GVCs) have a distinct effect on firms' ability to adapt to COVID-19 and more generally, to crises and other exogenous shocks.

5.3 Ex-post analyses

The results of our PCA analysis regarding the different adaptation strategies employed by firms in response to COVID-19 suggest that *production adaptation*, *online sales and delivery* and *remote work* are rather independent, and thus capturing different facets of organizational adaptation in response to crises. Following these insights, we have run our models again using these adaptation variables as DVs to provide additional findings in this regard and discuss further ways in which future research might tap into these possibilities (**Table A6,** Appendix). Regarding the direct effects of international focus of firms, in the case of *online sales* (Panel A) we find that export-intensive firms appear to have a distinct disadvantage (lower probability to shift to online sales) while those engaged in GVCs have a higher chance to do so. Furthermore, government interventions (either in the form of support or containment policies) have not affected online sale adaptation but appear to have helped marginally those engaged in GVCs to further pursue them. The results of our tests using *online delivery* as the DV reveal

very similar insights (Panel B) but with a lower statistical significance on average. Regarding adaptation by adopting *remote work* (as opposed to physical presence), exporters appear again to be less inclined to switch to remote work, while foreign-owned firms and GVC-reliant firms are much more likely to do so, likely due to their prior knowledge and use of these alternate business practices. Nevertheless, the degree of governmental interventions (both as economic support and as containment measures) has pushed heavy exporters into adopting remote working conditions in response to the COVID-19 pandemic.

Overall, these additional results suggest some interesting avenues for research in this area which can explore changes in terms of labor markets occurring because of this crisis and the heterogenous responses developed by internationally oriented firms (e.g., foreign MNE subsidiaries and export-intensive firms) due to complex interactions between their objectives and constraints. Such further endeavours may provide valuable insights for IB scholars seeking to disentangle the national and international factors affecting firm adaptability and resilience in the face of a crisis.

6. DISCUSSION AND CONCLUSIONS

Exogenous shocks present significant challenges for firms conducting international activities. Prior studies in this area have focused on the effects of such shocks (such as the 2008 global financial crisis), natural or human-made disasters, terrorism, and war, examining whether and how MNEs cope with these challenges. In turn, in this study we investigate the impact of the COVID-19 pandemic on businesses worldwide. We propose that firms that are more involved in international activities (through higher exports, greater foreign ownership, and more reliance on GVCs) will find it more difficult to adjust and adapt their production and goods and services than their more domestic counterparts. In addition, we argue that the extent of government

interventions in two key areas (i.e., containment/stringency of lockdowns and economic support) will have differential effects on international versus domestic-oriented firms.

Our results provide ample support for the first two factors (i.e., exporting and foreign ownership), suggesting that firms that rely on international resources, expertise and markets have a lower chance of succeeding in terms of adaptation. Furthermore, we find that there are no differences in firm responses to government policy, except minor ones and only in the case of firms relying on GVC. In addition, we do not find robust evidence for penalties in terms of adaptation when it comes to firms engaged in GVCs (i.e., those that rely heavily on goods sourced from abroad in their production), suggesting that organizational inertia associated with international connections does not apply uniformly across all firms.

We postulate that GVC-reliant firms are not less likely to engage in adaptation because exogenous shocks like the COVID-19 pandemic and the movement restrictions policy that followed afterwards directly influence the availability of their foreign-sourcing inputs, and subsequently, also their production capacity. For this reason, GVC-reliant firms are not severely constrained by organizational inertia because adaptation in the form of production adjustment is necessary for them to cope with the sudden shocks in imported supplies. Our GVC reliance variable is only significant when controlling for governmental interventions, suggesting that these policies (economic and public containment measures) have different effects on GVC-reliant and domestic-reliant firms in terms of the resources and intermediate goods they need for their production processes. For similar reasons, GVC-reliant firms are more sensitive to the shock caused by the COVID-19 pandemic as it can directly affect their access to foreign-sourced inputs and therefore their production capacity. The government economic stimulus, therefore, can provide a financial buffer for GVC-reliant firms and therefore reduce their incentives to adjust production.

6.1 Theoretical contributions

We offer several contributions to the literature. First, we develop theoretical arguments on the role of international strategies (exporting, foreign ownership and GVC reliance) in relation to adapting to global exogenous shocks. Our work augments prior work in this area, which has focused on different types of shocks, such as terrorism, armed conflicts, financial crises, and natural disasters (Dai, Eden & Beamish, 2017; Oh & Oetzel, 2011, 2017; Darendeli & Hill, 2016; Mukherjee & Krammer, 2024). The response to COVID-19 has required significant shifts in terms of business models, delivery, and sales across countries and industries, and our study has been able to examine firms' responses and adaptations to these radical changes, and at the same time answer calls in the IB literature to investigate how internationally-connected firms have been affected by this unprecedented crisis, which has dramatically altered the connectivity, openness, and daily operation of the global economy (Verbeke & Yuan, 2021). Moreover, with this work we are advancing the organizational ecology theory by theorizing the effect of unexpected global situations like the COVID-19 pandemic on the nature and pace of organizational change as called by recent reviews of this literature (Öztürk & Dil, 2022).

Second, our study contributes to the ongoing debate on the benefits and disadvantages of internationalization. While a strategy of internationalization has been heralded as the way forward for growth and development, our findings suggest that firms relying heavily on IB activities after this global crisis suffered significant negative effects. Combined with the recent protectionist and nationalistic trends, our findings suggest that in this 'new normal' internationalization might be a riskier, more difficult strategy, particularly for firms that lack flexibility, slack, and dynamic capabilities (Krammer, 2021a) to respond to these increased challenges. Future studies in this area may wish to investigate qualitatively and quantitatively how GVC-reliant firms have coped with COVID-19, or whether – and why – its effects varied so significantly across countries, regions, and industries worldwide.

Finally, the issue of whether exporters, foreign-owned enterprises, and firms that rely on GVCs are more resilient and adaptable in the face of major exogenous shocks should be at the top of the IB scholarship agenda. While most of the benefits of internationalization have been heavily documented in the literature, the scale and nature of crises such as the COVID-19 pandemic allows us to document and investigate some of the disadvantages of internationalization in the face of such a large shock (Guedhami et al., 2022).

6.2 Policy and managerial implications

The pandemic forced the governments worldwide to intervene, which, in turn, affected firm activities. The question of whether governmental interventions in both the public and economic space (i.e., to contain the spread of the virus, stimulate economic activity) had tangible, long-term benefits for firms is still open to debate (Hoshi, Kawaguchi & Ueda, 2022; Kozeniauskas, Moreira & Santos, 2022).

Focusing on these issues, we examine whether these policies have nation-centric benefits as well, specifically by favouring domestically oriented firms over internationally oriented firms in a given country or jurisdiction. Our results (except for GVC-reliant firms, and only to a minor extent) appear to suggest a universal effect (positive for economic stimulus and negative for containment stringency) across both types. This finding regarding engagement in GVCs suggests that future endeavours in this area might venture into linking firms' adaptation rates to their survival rates by examining their reliance on GVCs as a double-edged sword: on one hand, GVCs provide firms with access to global expertise and know-how; on the other hand, they make firms more susceptible to global shocks and less protected by their government's policies (Verbeke, 2020).

Moreover, this work engages with the ongoing debate about the merits and demerits of globalization, a central question to the field of IB (Cui et al., 2023; Lundan, 2018). Thus, not surprisingly our findings have implications for managers and policymakers worldwide. From

a managerial standpoint, our findings imply that top decision makers in export-oriented firms or foreign-owned companies may remain reluctant to alter production activities even in the wake of major exogenous shocks. This probably happens as international exposure creates a comfort space and a position of resource slack that prevent them from adjusting to the new reality. Thus, managers of such firms need to be made more cognizant about the risks associated with not adjusting their production or service activities. Special training programs can be created for such companies, where scenario studies would explain the pros and cons of non-adjustment.

Furthermore, the export-intensive firms and foreign-owned firms need to build resilience and slack to help them deal with the aftermath of crises. One way to do this is to invest in building dynamic capabilities (i.e., R&D activities, recruiting skilled personnel, implementing good management practices) that can be harnessed towards innovation and competitiveness in 'normal' periods, then adapted to cope with crises when necessary (Krammer, 2021a). Finally, another option is to diversify and balance a portfolio of activities across multiple markets, to allow a better absorption of these shocks (Bebczuk & Galindo, 2008).

From the policy-making vantage point, the emergence of such major crises highlights the importance of a well thought out, impartial policy response. Notably, our results indicate that governmental policies have a much larger, indiscriminatory and significant effect on firm adaptation compared to their business orientation (domestic or international). This is somewhat surprising given the significant support devoted during the pandemic to the local economy and small businesses (furlough schemes, tax breaks, etc.), while ignoring businesses that rely heavily on IB activities. For instance, government of Slovenia (one of the countries in our sample), in order to support to corporate liquidity provided through grants, government guarantees and other monetary benefits to small domestic businesses (IMF, 2023).

6.3 Limitations and future research

This work is also subject to several limitations that provide viable avenues for future research in this area. First, we focus on theoretical and empirical lenses on one aspect (in our opinion, the most salient one) of firm adaptation, namely the reconfiguration of production and services to meet the demands of a post-COVID-19 world. Nevertheless, we fully acknowledge that there might be other ways in which firms can adapt (including ceasing activity or shifting to other business domains or business practices). As far as our dataset allowed, we have investigated these options (e.g., a shift to online sales, remote working, etc.) in our study. Future work in this area could explore such alternatives, particularly from a qualitative angle, which will allow richer and novel theories to be built around strategic responses to crises.

Second, we also consider adaptation in this context to be a positive development (i.e., firms face an exogenous crisis, and they respond to it by adapting their production). Nevertheless, it is possible that some firms do not need to adapt their production because they were already moving in the direction of post-COVID-19 market trends before the crisis. While this scenario is unlikely due to the unexpected nature of the crisis (and our extensive empirical analysis presents *average effects* across thousands of firms), we are aware that some firms can be omitted from our analysis, based on these grounds. Similarly, we control for industry-specific propensity to adapt to COVID-19 (e.g., a firm that deals in metals or a firm in a different resource-intensive industry might not need to adapt at all) by having *fixed effects* specifications to tease out any such differences. Yet, our study remains subject to a couple of ubiquitous problems that affect all empirical research, namely potential omitted variable bias and measurement errors. Here again we are bounded in terms of what and how we measure variables by the availability and methodology of the ES.

Third, like other recent studies, which employ various iterations and subsets of the ES data (Krammer, 2019; Nuruzzaman et al., 2022; Krammer et al., 2023), we need to embrace

the trade-offs that come with it. On the positive side, the ES data benefits from excellent international dimensions (multiple countries, sectors, and types of firms) with a standardized questionnaire and a stratified sample of respondents/firms that are representative of each economy or country included. However, some of its questions are poor quality (many have yes/no answers rather than open answers), longitudinal coverage (small panels overall, especially when looking at multiple waves of surveys and across multiple countries), and a lack of options in terms of augmenting the survey with additional firm-level details from other databases (e.g., financial, strategic), due to anonymisation. While we employed other measures of adaptation as well as production, all these measures by design (i.e., the survey instrument developed by the World Bank) are binary, and therefore lack depth and finesse in terms of measurement.

6.4 Concluding remarks

COVID-19 has impacted individuals, firms, and society overall in ways that will be assessed for years to come. We found that export-intensive and foreign-owned firms have indeed been more sluggish in terms of adapting to the pandemic. Overall, our results indicate no differences in the way firms responding to government interventions at the time of COVID-19 pandemic, except for firms that rely heavily on GVCs. Importantly, the magnitude of the governmental policies appears trumps dominantly the effects of firm-level internationalization proxies when it comes to firm adaptability to exogenous shocks.

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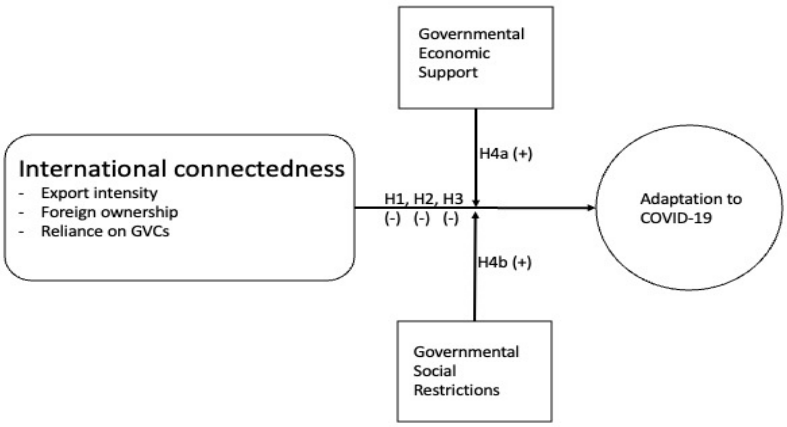
Table 1. Descriptive statistics

Variable	Details	Source	Obs.	Mean	Std. Dev.	Min	Max
Dependent variable							
cov19adapt	Have firms adapted production to covid-19?	i	13,466	0.34	0.48	0.00	1.00
Independent variables							
exportintensity	The percentage of sales coming from exports	i	13,466	10.99	25.47	0.00	100.00
foreignown	Majority foreign owned (>50%) firm	i	13,466	0.08	0.27	0.00	1.00
GVCreliance	The percentage of inputs and supplies of foreign origin	i	13,466	35.05	37.34	0.00	100.00
Moderating variables							
Econsupport	The extent of economic support available	ii	13,466	0.16	0.08	0.00	0.35
Containment	The extent of restrictions and lockdown	ii	13,466	0.22	0.04	0.06	0.29
Controls							
lnsize	Log firm size (number full time employees)	i	13,466	3.33	1.28	0.69	10.31
lnage	Log firm age (2020-year establish)	i	13,466	2.90	0.68	0.69	5.31
mgmexp	Manager's experience in the industry	i	13,466	21.08	11.71	1.00	70.00
finance	Has access to a loan or credit line?	i	13,466	0.40	0.49	0.00	1.00
exporter	Is the firm exporting any of its products?	i	13,466	0.26	0.44	0.00	1.00
new_products	Has the firm introduced any new products?	i	13,466	0.30	0.46	0.00	1.00
new_processes	Has the firm introduced any new processes?	i	13,466	0.18	0.38	0.00	1.00
R&D investment	Has the firm invested in R&D activities?	i	13,466	0.17	0.38	0.00	1.00
logperformance	Firm sales minus labor costs (logs)	i	13,466	14.51	4.94	0.00	28.49

Sources: i. Enterprise Surveys (World Bank)
ii. Oxford COVID-19 Government Response Tracker (Hale et al., 2021)

Figure 1. Conceptual Model



Source: Authors own work

Table 2. Main results

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 11	Model 8	Model 9	Model 10
lnsize	0.033***	0.039***	0.039***	0.031***	0.041***	0.039***	0.039***	0.031***	0.039***	0.039***	0.032***
	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]
lnage	-0.031	-0.035+	-0.035+	-0.037+	-0.043**	-0.035+	-0.034+	-0.036+	-0.035+	-0.035+	-0.036+
	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]
mgmexp	-0.003**	-0.003**	-0.003**	-0.003**	-0.003**	-0.003**	-0.003***	-0.003**	-0.003**	-0.003**	-0.003**
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
finance	0.029	0.025	0.022	0.031	0.022	0.025	0.021	0.029	0.025	0.022	0.03
	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]
logperformance	-0.001	0.000	0.000	-0.002	-0.001	0.000	0.000	-0.002	0.000	0.000	-0.002
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
new_products	0.129***	0.124***	0.129***	0.125***	0.120***	0.124***	0.130***	0.124***	0.124***	0.129***	0.124***
	[0.028]	[0.028]	[0.028]	[0.029]	[0.029]	[0.028]	[0.028]	[0.029]	[0.028]	[0.028]	[0.029]
new_processes	0.104***	0.100***	0.105***	0.112***	0.108***	0.101***	0.105***	0.112***	0.100***	0.105***	0.112***
	[0.033]	[0.033]	[0.033]	[0.034]	[0.034]	[0.034]	[0.033]	[0.034]	[0.033]	[0.033]	[0.034]
R&D investment	0.016	0.018	0.017	0.014	0.016	0.019	0.017	0.015	0.018	0.017	0.014
	[0.035]	[0.035]	[0.035]	[0.036]	[0.036]	[0.035]	[0.035]	[0.036]	[0.035]	[0.035]	[0.036]
exporter	0.038	0.138***	0.045	0.044	0.143***	0.136***	0.046	0.048	0.138***	0.045	0.044
	[0.031]	[0.041]	[0.032]	[0.032]	[0.042]	[0.041]	[0.032]	[0.032]	[0.041]	[0.032]	[0.032]
H1: exportintensity		**-0.003*** **			**-0.003*** **	-0.002			-0.003		
		[0.001]			**[0.001]**	[0.001]			[0.003]		
H2: foreignown			**-0.146** **		**-0.105** **		-0.009			-0.009	
			[0.046]		**[0.048]**		[0.094]			[0.208]	
H3: GVCreliance				**0.000**	**0.001**			0.002***			0.003**
				[0.000]	**[0.000]**			[0.001]			[0.002]
Econsupport						55.040***	54.579***	54.078***			
						[5.339]	[5.336]	[5.432]			

H4: Econsupport * exportintensity						**-0.004**					
						[0.006]					
H4: Econsupport * foreignown							**-0.685**				
							[0.534]				
H4: Econsupport * GVCreliance								**-0.009****			
								[0.004]			
Containment									-32.570***	-32.278***	-31.725***
									[3.162]	[3.160]	[3.210]
H5: Containment * exportintensity									**-0.001**		
									[0.011]		
H5: Containment * foreignown										**-0.515**	
										[0.993]	
H5: Containment * GVCreliance											**-0.014+**
											[0.008]
constant	0.329**	0.343**	0.335**	0.323**	0.328**	-10.786***	-10.699***	-10.590***	8.598***	8.520***	8.398***
	[0.143]	[0.143]	[0.143]	[0.148]	[0.148]	[1.017]	[1.016]	[1.032]	[0.881]	[0.880]	[0.897]
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	13,831	13,769	13,831	13,486	13,426	13,769	13,831	13,486	13,769	13,831	13,486
Log Likelihood	-7731.60	-7703.79	-7728.54	-7538.24	-7508.02	-7703.59	-7727.71	-7535.78	-7703.76	-7728.40	-7536.54
LR Chi Square	2322.27	2316.66	2328.40	2270.94	2271.79	2317.04	2330.05	2275.86	2316.71	2328.67	2274.34
AIC	16183.05	16100.14	16179.46	15774.73	15688.62	15573.19	15623.42	15239.57	15573.52	15624.80	15241.09
BIC	16773.58	16690.12	16777.56	16370.82	16291.68	16198.19	16256.33	15870.36	16198.52	16257.72	15871.88

Notes: The dependent variable is firm's adaptation of production due to COVID-19; These are probit estimations with country and industry fixed effects. Robust standard errors in parentheses, corrected for clustering within country groups. + p < 0.10, ** p < 0.05, *** p < 0.01. All significance tests are based on two-tailed tests. Source: Author's own work.

ONLINE APPENDIX . ADDITIONAL RESULTS

Table A1. Pairwise correlations

No.	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	cov19adapt	1														
2	exportintensity	-0.0166*	1													
3	foreignown	0.0062	0.2471*	1												
4	GVCreliance	0.0231*	0.2205*	0.1809*	1											
5	Econsupport	-0.0538*	0.0911*	-0.0230*	-0.0095	1										
6	Containment	-0.0121	-0.0059	-0.0812*	-0.0457*	0.4032*	1									
7	lnsize	0.0486*	0.3275*	0.2266*	0.0906*	0.0347*	-0.0041	1								
8	lnage	-0.0491*	0.0773*	-0.0264*	0.0199*	0.0947*	0.0374*	0.2340*	1							
9	mgmexp	-0.0534*	0.0717*	-0.0652*	0.0467*	0.1597*	0.1070*	0.0883*	0.4724*	1						
10	finance	-0.0111	0.0924*	-0.0473*	0.0684*	0.1244*	0.0133	0.1803*	0.1014*	0.0764*	1					
11	exporter	-0.0119	0.7420*	0.1734*	0.2136*	0.0878*	-0.0037	0.3094*	0.1220*	0.0936*	0.1492*	1				
12	new_products	0.0758*	0.0924*	0.0737*	0.1768*	-0.0374*	-0.0832*	0.1271*	0.0634*	0.0439*	0.1411*	0.1424*	1			
13	new_processes	0.0592*	0.1005*	0.0708*	0.1161*	0.0024	-0.0617*	0.1577*	0.0508*	0.0350*	0.1478*	0.1349*	0.3499*	1		
14	R&D investment	0.0067	0.1805*	0.0534*	0.0911*	0.0816*	0.0267*	0.2147*	0.0468*	0.0366*	0.1596*	0.2219*	0.2289*	0.2102*	1	
15	logperformance	0.0178*	0.1135*	0.0955*	0.0606*	0.0397*	0.0225*	0.2907*	0.1023*	0.0938*	0.0967*	0.1448*	0.0520*	0.0796*	0.1240*	1

Note: * Significant at 5 percent or better; Source: Author's own work.

Table A2. Distribution of data by country

Country Code	Obs.	Percent
Albania	684	5.08
Belarus	490	3.64
Bulgaria	477	3.54
Chad	94	0.70
Croatia	335	2.49
Cyprus	153	1.14
Czech Republic	385	2.86
Estonia	256	1.90
Georgia	467	3.47
Greece	517	3.84
Guatemala	184	1.37
Guinea	85	0.63
Honduras	150	1.11
Hungary	607	4.51
Italy	397	2.95
Jordan	364	2.70
Latvia	210	1.56
Lebanon	355	2.64
Lithuania	202	1.50
Macedonia, FYR	254	1.89
Malta	175	1.30
Moldova	255	1.89
Mongolia	282	2.09
Montenegro	131	0.97
Morocco	550	4.08
Mozambique	215	1.60
Nicaragua	171	1.27
Niger	48	0.36
Poland	756	5.61
Portugal	698	5.18
Romania	490	3.64
Russian Federation	971	7.21
Serbia	308	2.29
Slovak Republic	316	2.35
Slovenia	218	1.62
South Africa	164	1.22
Togo	48	0.36
Zambia	496	3.68
Zimbabwe	508	3.77
Total	*13,466*	*100.00*

Source: Author's own work

Table A3. Distribution of data by industry

Industry	Obs.	Percent
Food	1,804	0.13
Tobacco	10	0.00
Textiles	231	0.02
Garments	724	0.05
Leather	102	0.01
Wood	260	0.02
Paper	104	0.01
Publishing, printing, and media	255	0.02
Refined petroleum product	13	0.00
Chemicals	209	0.02
Plastics & rubber	322	0.02
Non-metallic mineral products	359	0.03
Basic metals	105	0.01
Fabricated metal products	940	0.07
Machinery and equipment (29-30)	738	0.05
Electronics (31-32)	148	0.01
Precision instruments	60	0.00
Transport machines (34-35)	97	0.01
Furniture	379	0.03
Recycling	32	0.00
Construction Section F:	1,031	0.08
Services of motor vehicles	462	0.03
Wholesale	1,084	0.08
Retail	2,482	0.18
Hotel and restaurants: section H	791	0.06
Transport: Sections I-V	502	0.04
IT	222	0.02
Total	*13,466*	*100*

Source: Author's own work.

Table A4. Different dimensions of adaptation to COVID-19: Principal component analysis

Variable	Factor 1	Factor 2	Factor 3	Factor 4
cov19adapt	0.3657	0.8067	0.4613	-0.0512
online sales	0.5989	-0.1508	-0.2921	-0.7302
online delivery	0.5736	0.0616	-0.4898	0.6537
remote work	0.4225	-0.568	0.6797	0.192

Source: Author's own work.

Table A5. IV (Instrumental variable) estimations

Variables	Model 11	Model 12	Model 13
Lnsize	0.046***	0.039***	0.031***
	[0.016]	[0.014]	[0.011]
Lnage	-0.039+	-0.035	-0.037+
	[0.022]	[0.021]	[0.021]
Mgmexp	-0.003**	-0.003**	-0.003**
	[0.001]	[0.001]	[0.001]
Finance	0.019	0.022	0.031
	[0.028]	[0.028]	[0.026]
firm performance	-0.001	0.000	-0.002
	[0.003]	[0.003]	[0.003]
new_products	0.121***	0.129***	0.127***
	[0.029]	[0.028]	[0.030]
new_processes	0.098***	0.105***	0.112***
	[0.034]	[0.033]	[0.034]
R&D investment	0.02	0.017	0.014
	[0.035]	[0.035]	[0.036]
Exporter	0.275	0.046	0.047
	[0.212]	[0.034]	[0.035]
H1: exportintensity	**-0.006**		
	[0.005]		
H2: foreignown		**-0.127**	
		[0.180]	
H3: GVCreliance			**0.000**
			[0.001]
Constant	0.362**	0.336**	0.337**
	[0.146]	[0.143]	[0.157]
Industry FE	Yes	Yes	Yes

Country FE	Yes	Yes	Yes
	exportintensity	foreignown	GVCreliance
export_reg_sect_avg	17.374***		
	[1.131]		
foreign_reg_sect_avg		0.839***	
		[0.026]	
GVC_reg_sect_avg			0.981***
			[0.025]
Lnsize	2.076***	0.040***	1.111***
	[0.132]	[0.002]	[0.248]
Lnage	-1.126***	-0.024***	-0.116
	[0.251]	[0.004]	[0.470]
Mgmexp	0.007	-0.001***	0.031
	[0.014]	[0.000]	[0.027]
Finance	-1.737***	-0.048***	-0.059
	[0.311]	[0.005]	[0.584]
firm performance	-0.057	0.003***	0.342***
	[0.037]	[0.001]	[0.070]
new_products	-0.949***	0.006	5.780***
	[0.346]	[0.005]	[0.648]
new_processes	-0.568	0.001	1.703**
	[0.409]	[0.006]	[0.767]
R&D investment	0.327	0.006	2.593***
	[0.423]	[0.006]	[0.797]
Exporter	36.961***	0.053***	10.329***
	[0.400]	[0.006]	[0.717]
Constant	2.461	-0.004	-12.610***
	[1.810]	[0.026]	[3.773]
Wald Chi Square	0.22	3.08+	1.57
Smith-Blundell Chi Square	0.43	0.01	0.07
N	13,769	13,831	13,486
Log Likelihood	-65822.12	-7631.68	-72797.54
LR Chi Square	1912.42	1910.96	1849.54
AIC	131976.24	15599.35	145931.08
BIC	133226.25	16865.18	147192.66

Notes: We have used region-industry averages to instrument export intensity (Model 11), foreign ownership (Model 12) and reliance on GVCs (Model 13). + $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All significance tests are based on two-tailed tests. Source: Author's own work.

Table A6. Ex-post analysis: International connectedness and other dimensions of adaptability in the wake of crises*

Variables	Panel A: Online Sales								
exportintensity	-0.005***			-0.004**			-0.007**		
	[0.001]			[0.002]			[0.003]		
foreignown		-0.041			-0.055			0.046	
		[0.052]			[0.100]			[0.219]	
GVCreliance			0.001***			0.002**			0.004**
			[0.000]			[0.001]			[0.002]
Econ support (ES)				-0.205	-1.432	-2.569			
				[5.759]	[5.745]	[5.852]			
ES *exportintensity				-0.005					
				[0.007]					
ES *foreignown					0.005				
					[0.104]				
ES *GVCreliance						0.002**			
						[0.001]			
Containment (C)							0.056	0.873	1.481
							[3.413]	[3.402]	[3.455]
C *exportintensity							0.009		
							[0.013]		
C *foreignown								-0.143	
								[1.055]	
C *GVCreliance									-0.008
									[0.008]
N	11,525	11,600	11,368	11,693	11,769	11,543	11,693	11,769	11,543
Log Likelihood	-5599.35	-5661.37	-5547.25	-6603.94	-6631.74	-6505.53	-6603.98	-6631.81	-6505.73

Variables	Panel B: Online Delivery								
exportintensity	-0.005***			-0.004**					
	[0.001]			[0.002]					
foreignown		-0.026			-0.055				
		[0.054]			[0.100]				
GVCreliance			0.000			0.002**			
			[0.000]			[0.001]			
Econ support (ES)				-0.205	-1.432	-2.569			
				[5.759]	[5.745]	[5.852]			
ES *exportintensity				-0.006					
				[0.008]					
ES *foreignown					-0.68				
					[0.628]				
ES *GVCreliance						-0.005			
						[0.005]			
Containment (C)							-0.989	-0.618	-1.203
							[3.815]	[3.806]	[3.850]
C *exportintensity							-0.011		
							[0.014]		
C *foreignown								-1.848+	
								[1.096]	
C *GVCreliance									0.007
									[0.008]
N	11,600	11,368	11,525	11,846	11,920	11,690	11,846	11,920	11,690
Log Likelihood	-5661.25	-5547.14	-5599.10	-5452.15	-5512.98	-5400.77	-5452.15	-5512.14	-5400.90

Variables	Panel C: Remote Work

exportintensity	-0.002***			-0.005***			-0.008***		
	[0.001]			[0.001]			[0.003]		
foreignown		0.370***			0.261***			-0.215	
		[0.048]			[0.099]			[0.215]	
GVCreliance			0.003***			0.003***			0.003+
			[0.000]			[0.001]			[0.002]
Econ support (ES)				0.399	-1.219	-4.498			
				[5.299]	[5.303]	[5.429]			
ES *exportintensity				0.016**					
				[0.006]					
ES *foreignown					0.682				
					[0.541]				
ES *GVCreliance						-0.004			
						[0.004]			
Containment (C)							-0.667	0.804	2.861
							[3.147]	[3.145]	[3.207]
C *exportintensity							0.028**		
							[0.012]		
C *foreignown								2.869***	
								[1.029]	
C *GVCreliance									-0.002
									[0.008]
N	11,525	11,600	11,368	11,693	11,769	11,543	11,693	11,769	11,543
Log Likelihood	-5599.35	-5661.37	-5547.25	-6603.94	-6631.74	-6505.53	-6603.98	-6631.81	-6505.73

Note: * All models include the full batch of controls and fixed effects as in our main estimations. These are not reported here due to space constraints. Source: Author's own work.