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[1]   Previously: *The CTC Reporter*. In the past, the Programme on Transnational Corporations was carried out by the United Nations Centre on Transnational Corporations (1975–1992) and by the Transnational Corporations and Management Division of the United Nations Department of Economic and Social Development (1992–1993).

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For further information on the journal, including ethics statement and review policy, visit https://unctad.org/Topic/Investment/Transnational-Corporations-Journal.

CONTENTS

Are emerging market MNEs more attracted towards better patent enforcement regimes when undertaking greenfield R&D-focused FDI?*

Ludan Wu,[a] Dylan Sutherland[b] and John R. Anderson[c]

Abstract

Multinational enterprises in emerging markets (EMNEs), owing to weak enforcement of intellectual property rights (IPR), face challenges when undertaking domestic innovation. As a result, they may search for superior IPR environments in which to create greenfield projects focused on research and development (R&D) and innovation. We hypothesize that the likelihood that an EMNE chooses to invest in an R&D-focused greenfield project over other FDI projects is positively associated with increased levels of host-country patent enforcement protection relative to its home market. In addition, we hypothesize that EMNEs, many in the process of catching up through "springboard" FDI with developed-market MNEs (DMNEs), are more sensitive to IPR protection than DMNEs. Results of logistic regression modelling of 112,908 greenfield projects largely support our hypotheses. We discuss implications for understanding EMNE theorizing and policy, which has to date focused more on regulating technology-seeking mergers and acquisitions (M&As), overlooking the growing importance of R&D-related greenfield FDI as an effective firm-level catch-up strategy for EMNEs.

Keywords: greenfield FDI; firm-level catch-up; springboard theory; institutional arbitrage; intellectual property rights; strategic asset seeking

JEL classification codes: F21, F23, F68, O32, O34

1. Introduction

The strategic asset-seeking (hereafter SAS) orientation of MNEs from emerging markets (EMNEs) has become a hallmark feature of their motivation for outward foreign direct investment (FDI) (Meyer, 2015; Sutherland et al., 2020). This has driven a large and growing academic literature on the subject and spurred calls for extension of international business theories (Buckley et al., 2023; Paul and Feliciano-Cestero, 2021). In large-sample studies, EMNEs have been found to engage in higher levels of SAS FDI than developed-market MNEs (DMNEs) – both currently and adjusted for their stage of maturity (Jindra et al., 2016; Sutherland et al., 2020). Indeed, EMNEs "are considered highly active in acquiring foreign know-how, technologies and brands, with a view to catching up with developed market MNEs" (Wu et al., 2022, p.535).[1] Many of the places where EMNEs tend to locate their SAS-related FDI projects, moreover, are in favourable institutional environments, potentially compensating for their own domestic institutional voids – so-called "institutional arbitrage"-related FDI (Witt and Lewin, 2007). In addition to providing access to better institutional environments, such locations may also facilitate access to capabilities in the form of outstanding human resources, knowledge networks and supporting infrastructure, enabling them to develop the capabilities to engage in cutting-edge innovation (Lorenzen et al., 2020).

One of the primary theoretical lenses with which to view EMNEs' SAS FDI behaviour is the "general theory of springboard MNEs" (Luo and Tung, 2018; Paul and Feliciano-Cestero, 2021). A central tenet of springboard theory is its emphasis on rapid firm-level catch-up through SAS-related mergers and acquisitions (M&As) as a key means of building capability in EMNEs. Nonetheless, there is now growing recognition of the role of greenfield FDI projects related to research and development (R&D) as a mechanism to spur firm level catch-up (Wu et al., 2022). Indeed, Luo and Tung (2018) recently concluded that "thus far, most research has looked at [springboard] MNEs through the lens of M&As, while little attention has been paid to other important investment modes such as … greenfield investments" (Luo and Tung, 2018, p. 147). Anecdotally, however, there appear to be many notable examples of EMNEs that have successfully used R&D-related greenfield FDI in their catch-up strategies. This includes many well-known, high-profile cases such as Huawei and ZTE from China, as well as numerous other less talked about but equally successful cases (i.e. Infosys, Neuberg Diagnostics, Tata and Mahindra Groups (India), Mercado Libre (Argentina), Softtek (Mexico), Naspers (South Africa), Comcraft (Kenya) and Stefanini IT Solutions (Brazil)).

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[1] The term "strategic assets" refers to critical resources or capabilities, including, for example, R&D capacity, proprietary technology, design facilities, brands and reputation, and distribution and production networks that give firms competitive advantages over others (Teece et al., 1997).

This raises several questions. Springboard theory suggests that EMNEs are considered to have a stronger SAS orientation than DMNEs, as they look to engage in rapid firm-level catch-up by building innovation (and other) capabilities through "aggressive" cross-border M&As (Luo and Tung, 2018). Do we therefore witness similar differences between EMNEs and DMNEs when it comes to SAS greenfield projects (i.e. related to R&D and to design, development and testing)? Moreover, if – as springboard theory suggests – EMNEs also engage in institutional arbitrage, do relatively superior institutional environments more strongly attract greenfield innovation offshoring by EMNEs than by DMNEs? If so, what types of superior institutions might differentially attract EMNEs (versus DMNEs)?

Here we focus primarily on protection of intellectual property rights (IPR). This is because IPR would appear a likely candidate to be associated with EMNEs' R&D-related greenfield FDI, given the ultimate purposes of such investment – namely to build a strong IPR portfolio in a well-guarded environment. We therefore conceptually and empirically explore the extent to which EMNEs' SAS-related greenfield FDI may be stronger than that of DMNEs; and whether superior home- or host-country IPR enforcement acts more strongly as a driver for EMNEs' choice of R&D FDI than for DMNEs' choice. We do so by employing logistic regression analysis of the FDI choices of 112,908 greenfield projects worldwide, comparing EMNEs with DMNEs. Our results show that better IPR enforcement does indeed more strongly attract greenfield R&D by EMNEs. We discuss how our findings contribute to the debate on EMNE catch-up within international business theory (including springboard theory). From a policy perspective, we argue that the recent focus has mainly been on controlling technology-seeking springboard-type M&As from emerging markets to developed ones. Greenfield FDI related to R&D has been largely overlooked by policymakers from developed markets, despite its rapid expansion and growing importance to EMNEs as a means of facilitating firm-level catch-up.

2. Theory and hypothesis development

EMNEs, some argue, do not possess traditional types of "ownership advantages" that can be meaningfully exploited in developed markets (Cuervo-Cazurra, 2012). This being so, their outward FDI strategies are considered poorly explained by existing theory, prompting calls for new or revised theoretical contributions to explain their FDI strategies (Luo and Tung, 2018). EMNE SAS strategies, in particular, are thought to be driven by the comparatively low levels of strategic assets they possess when compared with their DMNE competitors (Luo and Tung, 2007; Rui and Yip, 2008), as they look to rapidly catch up with DMNEs (Rui and Yip, 2008), aided at times by State support (Wang et al., 2012) and a number of additional favourable conditions in their domestic home markets. These include

access to "complementary local resources", allowing them to fully exploit their home market (Hennart, 2012); asymmetries in liabilities of foreignness, hindering foreign businesses looking to compete in emerging markets but not impeding EMNEs from going out (Petersen and Seifert, 2014); business group affiliation, aiding EMNE groups in exploiting their home market more effectively (i.e. internal product, labour and finance markets) (Yiu et al., 2007); and the imperative to catch up and learn from foreign rivals (Child and Rodrigues, 2005; Mathews, 2006). State-led institutional supports (at various levels) may therefore encourage their international SAS expansion, through – among other things – support for domestic financial markets (Wang et al., 2012). This includes active industrial policies to encourage nascent EMNEs to engage in cross-border SAS, particularly in the case of Chinese MNEs (Cui and Jiang, 2012; Deng, 2009; Luo et al., 2010; Wang et al., 2012). EMNEs, moreover, have been considered especially capable of competing in the "middle of the pyramid" income groups in both their home and other emerging markets, offering outstanding performance-to-cost ratios in the "fight for the middle" (Brandt and Thun, 2010). They also have developed "compositional capabilities" and exploit the advantages of ambidexterity, which allow them to more effectively transfer and exploit relevant knowledge in these markets than DMNEs (Yamin, 2023; Yamin and Sinkovics, 2015). In short, the internationalization strategies of EMNEs have led, in some instances, to significant improvements in their performance and competitiveness.

2.1 Greenfield FDI and R&D innovation offshoring (SAS) orientation: EMNEs versus DMNEs

While the SAS orientation of EMNEs has risen to theoretical prominence among international business scholars (Luo and Tung, 2018; Mathews, 2017; Sutherland et al., 2020), it is of interest to note that the role of the greenfield establishment mode has generally been downplayed and under-researched in that literature (Schaefer, 2020). This is probably because SAS greenfield approaches are considered less "aggressive", less high profile and generally more incremental in their nature. A greenfield FDI project, for example, typically involves a single site in a specific location, such as Huawei establishing an R&D subsidiary in Stockholm, initially with only a small number of employees. Unsurprisingly, such greenfield FDI is often less widely covered in worldwide media reporting, as it is politically less consequential than a billion-dollar-plus mega-merger involving a target firm with multiple subsidiaries. Greenfield data sets, moreover, have been less easily accessible through mainstream academic research institutions, whereas M&A data is commonly available. However, the underlying logic and rationale applied to the motivating role of firm-level catch-up, as popularized in the springboard and "LLL" perspectives (Mathews, 2006; Luo and Tung, 2007), would appear to be

equally relevant to the case of SAS-related greenfield FDI. If EMNEs are in a rush to engage in firm-level catch-up and accelerated internationalization – as exemplified by "aggressive" acquisitions to developed markets – would they not also look to engage in greenfield R&D more enthusiastically than DMNEs?

Can EMNEs benefit from SAS R&D-related greenfield FDI to engage in "innovation offshoring"? Innovation offshoring – "the foreign sourcing of knowledge-intensive activities as inputs to the innovation process" – has indeed been found to be of particular benefit to innovation performance in EMNEs (Rosenbusch et al., 2019, p. 203). Recent research shows how such FDI strategies have looked to (i) tap into local R&D infrastructure (Schaefer, 2020; Zhang et al., 2017); (ii) engage in "technological scanning" to track the latest technological developments in developed markets, helping plan future investments (Zhang et al., 2017); (iii) establish new technology partnerships and networks, to make use of "external technological assistance by building or strengthening new or existing local cooperative relationships" (with both well-known large businesses as well as lesser known smaller ones) (Zhang et al., 2017) and universities and research centres (Liefner et al., 2019); (iv) interact with the aforementioned technology leaders; (v) recruit highly trained foreign research personnel and integrate them into the EMNEs' organizational structure and fabric – creating deep networks and linkages with key human resources related to R&D (Schaefer, 2020; Schaefer and Liefner, 2017); and (vi) develop mechanisms for managing foreign R&D personnel, often involving frequent meetings and exchanges (Schaefer, 2020). Indeed, recruitment of highly trained personnel is perhaps unsurprisingly "among the most important technology-driven motives for setting up overseas R&D units" (Zhang et al., 2017).

This is supported by Schaefer et al.'s detailed case study of Huawei, which "turned abroad to access state-of-the-art knowledge" because it "had little left to learn in its home country" (Schaefer, 2020, p. 1501). Huawei's success is now in large part seen as related to "hiring non-locals who are culturally and professionally embedded in the international industry networks" (Schaefer, 2020, p. 1510). The Chinese MNEs Huawei and ZTE stand out as significant cases in point. They rely extensively upon foreign hires in international R&D centres in institutionally advanced developed markets (Schaefer and Liefner, 2017). By 2018, Huawei (with 116 R&D centres) and ZTE (with 28) – China's largest MNE investors in greenfield R&D by some distance – had established more than 144 SAS greenfield R&D centres. Most of Huawei's most-cited patents, moreover, do not originate from China, but rather from its dozens of foreign R&D outposts (Schaefer, 2020), pointing towards the great strategic importance of these offshore R&D hubs for successful EMNEs. Other case study evidence supports the view that EMNEs can successfully engage in overseas greenfield FDI, facilitating capability-building and firm-level catch-up. This includes Tata Group (Becker-Ritterspach and Bruche, 2012), Infosys (Kimble, 2013), Naspers (Teer-Tomaselli et al., 2019) and Mahindra (Ramaswamy and Chopra, 2014).

To date, there has been huge academic and policy interest in the "aggressive" springboard-type M&As used as a vehicle for EMNEs to catch up with DMNEs (Luo and Tung, 2018). Yet there is also a strong rationale for EMNEs to engage in R&D-related greenfield FDI, as it allows them to tap into key resources and institutional environments required to support innovation. This raises the question of whether EMNEs are more inclined to undertake R&D-related greenfield FDI than DMNEs, which leads to our first hypothesis.

> *Hypothesis 1* (H1): When undertaking greenfield FDI projects, EMNEs are more predisposed to establish R&D-related projects than are DMNEs.

2.2 EMNEs and DMNEs, institutional arbitrage and IPR enforcement

Springboard theory highlights the role of institutional arbitrage as a key driver of EMNEs' springboard outward FDI; however, the theory is surprisingly silent on the specific *types* of institutions that EMNEs seek. It may potentially be refined by considering this question. We argue that SAS motives typically involve efforts to build up rare and valuable firm-level capabilities (for example, sourcing knowledge by attracting the best human resources or scientific talent) that allow an MNE to become innovative and, eventually, internationally competitive (Awate et al., 2015). Such capability-building activities typically involve high levels of investment in the newly created foreign subsidiaries (Hansen et al., 2016; He et al., 2018). If this is so, availing of IPR-related institutions that are favourable to guarding innovation-related investments may be of considerable value for springboard EMNEs. Indeed, recent research shows that IPR-related institutional arbitrage has a significant impact on innovation performance for EMNEs (Rosenbusch et al., 2019).

Moreover, firms also take great interest not only in "book laws" on patent protection, but also in enforcement of these laws (Papageorgiadis and Sofka, 2020). The extent to which such laws are implemented (as opposed to just enacted) determines the effectiveness of IPR protection. Contract enforcement is therefore also considered crucial for innovation activities to take place (Papageorgiadis and Sofka, 2020). It facilitates firms investing in R&D activities by allowing them to earn rents from the IPR investments they make and guarding against illegal appropriation by others (i.e. by former employees or competitors). IPR enforcement, in short, greatly affects the ability of a firm to appropriate market rents associated with innovation (Bruno et al., 2021; Rosenbusch et al., 2019).

Case study evidence suggests that innovation offshoring involves a long-term commitment to employment of highly trained foreign personnel, access to scientific infrastructure and educational resources, related networks and more generally location-bounded knowledge clusters and global centres of excellence

in settings where enforcement of IPR is strong (Schaefer, 2020; Wu et al., 2022). All MNEs increasingly seek to expose themselves to such locations through innovation offshoring (Cano-Kollmann et al., 2016). By comparison with mature DMNEs, however, which typically already have significant exposure to locations with strong IPR enforcement (through their portfolio of R&D-intensive subsidiaries, including domestic ones), "infant" EMNEs do not. When engaging in rapid firm-level catch-up (Cuervo-Cazurra, 2012), they may therefore attempt to become more like their DMNE counterparts, specifically by increasing their exposure to environments with strong IPR enforcement. A strong IPR enforcement environment thus becomes of greater importance to EMNEs (versus DMNEs) owing to (i) their current underexposure to such environments, which can protect their investment in innovation capability-building and (ii) their stronger (versus DMNEs) need to invest heavily in building firm-level capabilities related to catch-up (where such investments are best guarded in IPR environments with strong enforcement). We therefore posit that IPR-related institutional arbitrage motives (i.e. the difference in institutional quality between home and host) are likely to be a stronger, not weaker, driver of the choice to establish R&D-related greenfield subsidiaries for EMNEs than for DMNEs.

> *Hypothesis 2* (H2): Superior patent enforcement measures between home and host country will more positively influence the choice to set up an R&D-related greenfield subsidiary for EMNEs than for DMNEs.

3. Methods

3.1 Data and sample

The fDi Intelligence's fDi Markets project database draws on press releases, newspaper reports and information from local and national investment agencies, as well as investing firms, to record details on 200,000-plus greenfield investments made worldwide between 2003 and 2021. The database is commonly used to track greenfield FDI around the globe in empirical studies exploring such FDI (De Beule and Somers, 2017; Yang and Bathelt, 2021). Information reported includes the investing firm or parent company, the sector, the country of origin and of destination, the volume of FDI and number of employees, as well as the type of activity for each investment (e.g. R&D, design and testing; education and training; logistics, distribution and transportation).

A logistic regression analysis is employed to estimate the relative likelihood of an MNE engaging in a SAS-type FDI project (in this case, designated as R&D or design, development and testing (DDT)) relative to all other FDI types. By including a dummy variable for EMNEs, we investigate whether EMNEs are more likely to engage in SAS-type greenfield FDI projects than their DMNE counterparts (H1).

Including a continuous variable for the Patent Enforcement Index (PEI) home–host difference (PEIDiff) allows us to ascertain the impact of PEI differences between home and host through the interaction of this continuous variable with the EMNE dummy variable (H2).

3.2 Dependent variable

As noted, we assign a value of one to our binary dependent variable when the FDI project is classified as "R&D" or "design, development and testing", and a value of zero for other types of projects. Our approach follows some earlier studies that also have used the fDi Markets database (Castellani and Lavoratori, 2020; Guimón et al., 2018). Castellani and Lavoratori (2020) argue that both types of activities are viewed as competence- or capability-creating activities associated with innovation activities. Both R&D and design, development and testing subsidiaries combined have been used to capture strategic asset-related activity (De Beule and Somers, 2017), and both have been considered as an appropriate proxy for subsidiaries involved in innovation activities (Castellani and Lavoratori, 2020).

3.3 Independent variables

Various indices have been employed to compare the strength and quality of patent systems across countries in international business research. To date, however, nearly all approaches have relied upon the use of "book laws" as an indicator of IPR quality in a national jurisdiction. Looking only at book law is problematic, however, as "most variance across countries emerges during the actual processes of enforcement" (Papanastassiou et al., 2020, p. 1). The Patent Enforcement Index (PEI) captures the differences in actual patent enforcement for 51 countries. It relies upon relatively comprehensive firm-level enforcement data (Papanastassiou et al., 2020). The PEI itself is subdivided into three sub-indices for more granularity: the ease of patent administration, the efficiency of courts and law enforcement for effectively punishing infringement and the availability of data for identifying infringement (Papanastassiou et al., 2020). Here we use the average of these three subcomponents, calculated for both host and home countries, so as to estimate the PEI difference (i.e. subtracting the PEI of the home from the host or destination). Thus, an EMNE investing in a developed market with a better patent enforcement regime would constitute a positive PEI difference.

A dummy variable (EMNE, table 1) captures whether the FDI project is of emerging-market origin (EMNE FDI project = 1; DMNE FDI project = 0). Our classification of emerging- and developed-market economies corresponds to that used by the International Monetary Fund (IMF). The IMF *World Economic Outlook* classifies 39 economies as "advanced" (based on such factors as high per capita income,

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exports of diversified goods and services, and international integration within a
particular region or country) and all remaining countries as "emerging-market and
developing" economies. Among these, 40 are in addition considered "emerging-
market and middle-income" economies by the *IMF Fiscal Monitor*. Here we consider
all economies listed as advanced by the *IMF World Economic Outlook Database* as
homes to DMNEs. All others, including those falling under the emerging-market and
middle-income category, we consider as homes of EMNEs.[2] DMNEs thus originate
from Australia, Austria, Belgium, Canada, Czechia, Denmark, Estonia, Finland,
France, Germany, Greece, Hong Kong (China), Iceland, Ireland, Israel, Italy, Japan,
the Kingdom of the Netherlands, New Zealand, Norway, Portugal, the Republic
of Korea, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan
Province of China, the United Kingdom and the United States. EMNEs include
the following countries: Argentina, the Bolivarian Republic of Venezuela, Brazil,
Chile, China, Colombia, Hungary, India, Indonesia, Jordan, Malaysia, Mexico, the
Philippines, Poland, the Russian Federation, South Africa, Romania, Thailand,
Türkiye and Ukraine. Note that data availability restricts our sample size for both
EMNEs and DMNEs, which is therefore not exhaustive. A detailed breakdown of
the destination countries and distribution by parent investors is provided in table 2.

Table 1. Description of variables and data source

Abbreviation	Name	Measurement	Data source
R&D/DDT	R&D/DDT investment	1 = DDT and R&D investments; 0 = other investments.	fDi Intelligence, fDi Markets project database, 2003–2021.
EMNE	EMNE dummy variable	1 = if the parent firm is from an emerging market economy; 0 = if the parent firm is from an developed market economy.	International Monetary Fund, World Economic Outlook Database, April 2023, www.Imf.org.
PEIDiff	PEI difference	Patent Enforcement Index (PEI) difference, host minus home PEI measure.	Papageorgiadis and Sofka (2020).
HmPEI	PEI, home country	Sourcing countries' PEI.	Papageorgiadis and Sofka (2020).
GlbCity	Global city	1 = if the host city is a "global city"; 0 = all other cities.	Loughborough University, "Globalization and World Cities (GaWC)", www.lboro.ac.uk/microsites/ geography/gawc/data.html (accessed on 11 January 2022).
TechClus	Technological cluster	1 = top-ranked technological cluster at city level; 0 = all other cities.	Cornell University, INSEAD and the WIPO, Global Innovation Index 2021, www.globalinnovationindex.org.

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Table 1. Description of variables and data source (Concluded)

Abbreviation	Name	Measurement	Data source
CapInv	Capital investment	Capital invested in the foreign subsidiary, value in millions of United States dollars.	fDi Intelligence, fDi Markets project database, 2003–2021.
JobsCrt	Jobs created	Number of jobs created in the foreign subsidiary.	fDi Intelligence, fDi Markets project database, 2003–2021.
FrmExp	Firm's prior experience	Parent company's prior experience in the host country.	fDi Intelligence, fDi Markets project database, 2003–2021.
CapCity	Capital city	1 = if the host city is the national capital city; 0 = all other cities.	WorldData.info, "All capitals in the world", www.worlddata.info (accessed on 24 January 2022).
InstHost	Institutions, host country	Destination country's institutional quality.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
LogGDP	Logarithm of GDP	Logarithm of gross domestic product (GDP).	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
InnoHost	Innovation, host country	Global Innovation Index rank of the destination country.	Cornell University, INSEAD and WIPO, "Global Innovation Index 2021", www.globalinnovationindex.org.
LawHost	Rule of law, host country	Average rule of law quality.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
GRHost	Growth rate, host country	Speed of growth in destination country.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
BusEase	Ease of starting a business	Index/survey based on World Bank questionnaire.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
ValInt	Value of intangibles	Total value, constant United States dollars.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
InstQ	Institutional quality	Average institutional quality measure based on World Bank data.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
TradeSc	Scale of trade	Scale of trade, real values.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
R&DExp	R&D expenditure	Measure of R&D expenditures in destination country.	World Bank, WDI Database, www.worldbank.org (accessed on 5 December 2022).
Ind	Industry	Dummy variables.	fDi Intelligence, fDi Markets project database, 2003–2021.
Yr	Year	Dummy variables.	fDi Intelligence, fDi Markets project database, 2003–2021.

Source: Authors' compilation.

Table 2. Distribution by EMNE/DMNE home and destination countries

Destination country	EMNE greenfield FDI projects	EMNE sub-samples					DMNE greenfield FDI projects	DMNE sub-samples		
		China	Russian Federation	India	Brazil	Other EMNEs		United States	United Kingdom	Other DMNEs
Argentina	136	6	4	4	67	55	604	238	25	341
Australia	212	80	4	69	2	57	2 871	1 233	420	1 218
Austria	49	16	10	2	2	19	780	108	26	646
Belgium	152	58	9	39	6	40	1 712	482	132	1 098
Brazil	276	84	15	54	-	123	2 652	903	162	1 587
Canada	167	52	9	53	16	37	2 969	1 599	231	1 139
Chile	73	12	-	4	14	43	450	129	28	293
China	438	-	58	121	40	219	12 339	3 653	571	8 115
Colombia	158	15	-	13	23	107	632	237	33	362
Czechia	77	24	14	14	-	25	1283	243	87	953
Denmark	69	33	1	17	-	18	838	200	77	561
Estonia	12	1	7	2	-	2	224	27	13	184
Finland	91	25	36	21	-	9	940	173	56	711
France	330	145	21	53	16	95	5 059	1 504	429	3 126
Germany	1 595	720	123	186	18	548	7 677	2 138	626	4 913
Greece	15	9	1	2	-	3	199	42	35	122
Hungary	95	34	1	24	2	34	1 551	284	80	1 187
Iceland	1	-	-	-	-	1	17	9	3	5
India	345	181	27	-	13	124	7 360	3 155	597	3 608
Indonesia	143	53	2	23	-	65	791	122	26	643
Ireland	59	27	2	15	1	14	1 910	1 170	277	463
Israel	24	9	5	4	1	5	379	257	15	107
Italy	92	44	5	14	1	28	1 296	349	117	830
Japan	167	80	17	28	4	38	1 725	813	123	789

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Table 2. Distribution by EMNE/DMNE home and destination countries (Concluded)

Destination country	EMNE sub-samples						DMNE sub-samples			
	EMNE greenfield FDI projects	China	Russian Federation	India	Brazil	Other EMNEs	DMNE greenfield FDI projects	United States	United Kingdom	Other DMNEs
Jordan	15	7	1	3	1	3	82	30	5	47
Malaysia	118	55	7	29	-	27	1 263	308	132	823
Mexico	239	93	3	45	37	61	3 585	1 479	121	1 985
Netherlands, Kingdom of the	245	84	16	65	6	74	2 102	903	214	985
New Zealand	24	11	-	8	-	5	317	96	42	179
Norway	11	4	1	2	1	3	278	61	54	163
Philippines	83	21	1	16	-	45	646	226	45	375
Poland	127	38	16	25	1	47	3 022	579	222	2 221
Portugal	46	4	-	4	29	9	576	78	46	452
Republic of Korea	56	35	9	5	2	5	1 074	425	49	600
Romania	141	22	20	11	8	80	1 521	263	109	1 149
Russian Federation	313	92	-	37	6	178	2 613	515	122	1 976
Slovakia	36	8	3	4	1	20	691	102	28	561
Slovenia	17	6	3	1	-	7	131	10	5	116
South Africa	121	49	10	50	3	9	900	278	140	482
Spain	274	61	17	30	26	140	3 807	809	372	2 626
Sweden	56	26	7	14	1	8	799	226	67	506
Switzerland	84	24	16	27	7	10	981	380	46	555
Thailand	133	53	1	30	-	49	1 574	259	57	1 258
Türkiye	105	30	18	22	11	24	1 512	272	94	1 146
Ukraine	122	7	59	3	1	52	449	91	32	326
United Kingdom	574	158	27	170	23	196	4 979	2 118	-	2 861
United States	1 575	558	52	392	163	410	14 380	-	2 159	12 221
Venezuela, Bolivarian Republic of	19	3	5	2	3	6	58	21	2	35
Total	9 310	3 157	663	1 757	556	3 177	103 598	28 597	8 352	66 649

Source: Authors' caculations, based on fDi Markets project database.

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3.4 Control variables

We controlled for factors that may influence the choice of R&D greenfield FDI, including those linked to the firm (industry, size, year etc.) and the host-country destination (i.e. technology levels, presence of innovative clusters, ease of business or general institutional development, and so on) and home- and host-country differences (i.e. patent enforcement index superiority in host versus home). First, however, of considerable importance is the overall level of innovativeness of the host economy where an FDI project takes place. R&D FDI projects will be attracted to more innovative economies. Those economies that are innovative, however, may also have better patent enforcement protection. To attempt to tease out the impacts of patent enforcement regimes, we therefore introduce a number of variables to control for the overall innovativeness of the host economy. As in similar studies, we employ the widely used Global Innovation Index (GII) (Yoo and Reimann, 2017). This captures the strength of the national innovation ecosystem, measuring innovation activity in terms of both World Intellectual Property Organization (WIPO) patents and educational attainment. Specifically, innovation capability is measured according to fractional counting, based on both the number of patents issued by inventors and the scientific articles published by authors. The WIPO's GII ranking thus includes education, infrastructure and knowledge creation (Kerr and Robert-Nicoud, 2020; Rehman et al., 2020; Yu, 2021).

In addition, we introduce the value of the host economy's intangible assets and national R&D expenditures (World Bank, WDI database), which may attract greenfield R&D investment. Knowledge and innovation capabilities, moreover, are often concentrated in clusters (agglomerations) of activity, such as in global cities and high-tech clusters. Subnational factors also, therefore, play a part in attracting greenfield R&D FDI (Chakravarty et al., 2021). To control for local agglomeration impacts, we include subnational city-level controls (which data in the fDi Markets database allows us to do). FDI scale is measured by host-country subsidiaries' employees as a scale control (Hu et al., 2021). General overall institutional quality (rule of law, political stability, etc.) in the host country affects its attractiveness to foreign investors undertaking greenfield FDI (Nielsen et al., 2017; Yang, 2018). Investment may be affected by risks and additional costs in a weak institutional environment (Nielsen et al., 2017; Yang, 2018). To control for the institutions of the host country, we followed the methodology of Marano et al. (2017) and employed principal component analysis to create a composite measure of the six worldwide governance indicators: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and absence of corruption (Marano et al., 2017). In addition, we controlled for the amount of capital invested, which may affect decisions regarding R&D investment (Lai et al., 2015). The host country's international experience can potentially affect the FDI strategy, which is assessed by the cumulative investments made by a firm in destination

countries between 2003 and 2021. Furthermore, we accounted for economic influences: a natural logarithm of the gross domestic product (GDP) was used to control for the size of the local market (Banalieva et al., 2018; Hutzschenreuter and Harhoff, 2020). Finally, we incorporate the PEI of the source country, as that country's institutional environment could influence SAS activities, through institutional evasion, flight or arbitrage.

3.5 Model

Given our focus on estimating the likelihood of an MNE's choice of SAS FDI (over other types of FDI), for our analysis we employ binary logistic modelling with robust standard errors, clustered by year and industry. This methodology is widely used in international business studies (Belderbos et al., 2020) and utilizes the maximum likelihood estimation technique (Fischer, 1973).

$$Probability(R\&D_i/DDT_i = 1; Others_i = 0)$$
$$= f(HmPEI_i, JobsCrt_i, InnoHost_i, LawHost_i, GRHost_i, BusEase_i, CapInv_i,$$
$$ValInt_i, InstQ_i, TradeSc_i, R\&DExp_i, GlbCity_i, TechClus_i, CapCity_i, InstHost_i,$$
$$FrmExp_i, LogGDP_i, PEIDiff_i, EMNE_i, EMNE_i *PEIDiff_i, Industry_i, Year_i)$$

As indicated in the model, *i* represents companies. We hypothesize that the propensity of a firm *i* to engage in R&D investment is significantly influenced by the country of its origin. Moreover, we examine interaction variables, with a special emphasis on the difference in the PEI between the destination and source countries.

4. Results

Table 3 provides a correlation matrix and descriptive statistics. To minimize large correlations, we use a mean-centred approach when including interaction terms. For all models the mean variance inflation factor (VIF) was less than 10, indicating that collinearity did not present serious issues for inferring statistical significance (Cohen et al., 2013; Hair et al., 2010). We adopt reporting of odds ratios (table 4b) as well as coefficients (table 4a), as per Bowen and Wiersema (2004). Coefficients in non-linear models can only indicate directions and odds ratios are typically used to interpret logit models (an odds ratio of greater than 1 suggests an increase in likelihood associated with that variable, if it is significant). Based on statistical analysis of model fit data, models B and C also show lower log pseudo-likelihood and Akaike Information Criterion (AIC) values than model A (not including the PEIDiff variable and interactions). This implies an increased effectiveness in these models (Wulff, 2015).

Table 3. Descriptive statistics and pairwise correlations

Variable	Observation	Mean	Standard deviation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
R&D/DDT	112908	0.103	0.304	1																				
EMNE	112908	0.082	0.275	-0.008***	1																			
PEDiff	112908	-1.452	2.605	-0.034***	0.456***	1																		
HmPEI	112908	7.576	1.469	0.038***	-0.748***	-0.554***	1																	
JobsCrt	112908	125.926	320.309	-0.006*	-0.013***	-0.150***	-0.024***	1																
InnoHost	112908	49.863	9.689	-0.027***	0.025***	0.714***	0.006*	-0.167***	1															
LawHost	112908	68.282	24.509	-0.023***	0.042***	0.790***	0.006*	-0.214***	0.813***	1													
GRHost	112908	61.147	12.719	0.075***	-0.074***	-0.441***	0.046***	0.181***	-0.271***	-0.602***	1												
BusEase	112908	86.397	7.461	-0.054***	0.002	0.439***	0.020***	-0.147***	0.581***	0.610***	-0.436***	1											
CapInv	112908	58.771	274.664	-0.016***	0.007**	-0.037***	-0.020***	0.325***	-0.053***	-0.066***	0.051***	-0.037***	1										
ValInt	112908	49.63	8.694	-0.016***	-0.002	0.308***	0.008**	-0.063***	0.622***	0.291***	0.214***	0.170***	-0.022***	1									
InstQ	112908	74.23	14.158	-0.040***	0.038***	0.761***	0.007**	-0.212***	0.817***	0.969***	-0.645***	0.723***	-0.064***	0.249***	1								
TradeSc	112908	80.195	8.057	-0.018***	0.009***	0.306***	-0.019***	-0.025***	0.550***	0.214***	0.175***	0.064***	-0.004	0.374***	0.201***	1							
R&DExp	112908	3745.41	3972.892	-0.033***	0.058***	0.499***	-0.049***	-0.089***	0.705***	0.465***	-0.112	0.130***	-0.032***	0.362***	0.434***	0.818***	1						
GloCity	112908	0.403	0.491	0.037***	-0.008***	-0.056***	0.014***	-0.067***	-0.035***	-0.097***	0.195***	-0.080***	-0.053***	0.160***	-0.107***	-0.025***	-0.116***	1					
TechClus	112908	0.309	0.462	0.009***	-0.015***	0.073***	0.019***	-0.065***	0.206***	0.037***	0.170***	-0.003	-0.044***	0.292***	0.030***	0.233***	0.141***	0.604***	1				
CapCity	112908	0.19	0.392	-0.018***	0.013***	-0.012***	-0.005*	-0.088***	-0.016***	0.030***	-0.055***	0.101***	-0.048***	0.019***	0.044***	-0.209***	-0.174***	0.548***	0.215***	1			
InstHost	112908	0.752	0.827	-0.028***	0.041***	0.757***	0.007**	-0.214***	0.745***	0.979***	-0.670***	0.603***	-0.066***	0.236***	0.962***	0.111***	0.382***	-0.101***	0.001	0.046***	1		
LogGDP	112908	8.071	1.42	0.023***	-0.011***	-0.007*	-0.012***	0.072***	0.172***	-0.196***	0.447***	-0.323***	0.023***	0.186***	-0.233***	0.867***	0.629***	0.028***	0.221***	-0.245***	-0.298***	1	
FrmExp	112908	0.754	2.407	0.076***	-0.052***	-0.097***	0.051***	0.075***	-0.060***	-0.081***	0.088***	-0.042***	0.063***	-0.016***	-0.079***	-0.020***	-0.045***	0.003	-0.020***	-0.027***	-0.077***	0.014***	1
Yr	112908	2012.89	5.372	0.013***	0.066***	0.179***	-0.035***	-0.145***	0.133***	0.194***	-0.195***	0.118***	0.042***	0.026***	0.189***	0.035***	0.069***	-0.021***	-0.002	0.030***	0.185***	-0.053***	0.141***	1

Source: Authors' estimations.
Note: Pairwise correlations are statistically significant at *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table 4a. Logistic regression for SAS greenfield investments (coefficients), 2003–2021

R&D/DDT investment	Model A	Model B	Model C
HmPEI	-0.121*** (0.024)	-0.037 (0.026)	-0.033 (0.026)
JobsCrt	0.000*** (0.000)	0.000* (0.000)	0.000* (0.000)
InnoHost	0.050*** (0.005)	0.051*** (0.005)	0.051*** (0.005)
LawHost	0.019*** (0.004)	0.019*** (0.004)	0.019*** (0.004)
GRHost	0.020*** (0.001)	0.020*** (0.001)	0.020*** (0.001)
BusEase	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.003)
CapInv	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
ValInt	-0.018*** (0.003)	-0.018*** (0.003)	-0.018*** (0.003)
InstQ	-0.028*** (0.006)	-0.028*** (0.006)	-0.029*** (0.006)
TradeSc	-0.067*** (0.006)	-0.067*** (0.006)	-0.067*** (0.006)
R&DExp	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
GlbCity	0.145*** (0.032)	0.145*** (0.032)	0.144*** (0.032)
TechClus	-0.297*** (0.030)	-0.295*** (0.030)	-0.295*** (0.030)
CapCity	-0.497*** (0.034)	-0.498*** (0.035)	-0.494*** (0.034)
InstHost	0.378*** (0.088)	0.392*** (0.088)	0.385*** (0.088)
FrmExp	0.078*** (0.004)	0.079*** (0.004)	0.078*** (0.004)
LogGDP	0.442*** (0.036)	0.449*** (0.036)	0.447*** (0.036)
PEIDiff	-0.156*** (0.023)	-0.164*** (0.023)	-0.173*** (0.023)
EMNE		0.622*** (0.062)	0.325*** (0.074)
EMNE*PEIDiff			0.134*** (0.016)
_cons	-1.565*** (0.279)	-2.375*** (0.292)	-2.384*** (0.293)
Observations	112 908	112 908	112 908
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Wald Chi-square	6 475.72	6 524.87	6 564.88
Log pseudolikelihood	-32 548.23	-32 500.20	-32 468.75
Akaike's information criterion	65 242.46	65 148.39	65 087.49
Pseudo R-square	0.129	0.130	0.131
Mean variance inflation factor	6.14	6.10	6.06

Source: Authors' estimations.

Note: Robust standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

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Table 4b. Logistic regression for SAS greenfield investments (odds ratio), 2003–2021

R&D/DDT investment	Model A	Model B	Model C
HmPEI	0.886*** (0.021)	0.964 (0.025)	0.968 (0.025)
JobsCrt	1.000** (0.000)	1.000* (0.000)	1.000* (0.000)
InnoHost	1.051*** (0.006)	1.052*** (0.006)	1.052*** (0.006)
LawHost	1.019*** (0.004)	1.019*** (0.004)	1.019*** (0.004)
GRHost	1.020*** (0.001)	1.021*** (0.001)	1.020*** (0.001)
BusEase	0.998 (0.003)	0.998 (0.003)	0.998 (0.003)
CapInv	0.999*** (0.000)	0.999*** (0.000)	0.999*** (0.000)
ValInt	0.982*** (0.003)	0.982*** (0.003)	0.982*** (0.003)
InstQ	0.972*** (0.006)	0.972*** (0.006)	0.971*** (0.006)
TradeSc	0.935*** (0.005)	0.935*** (0.005)	0.935*** (0.005)
R&DExp	1.000*** (0.000)	1.000*** (0.000)	1.000*** (0.000)
GlbCity	1.156*** (0.037)	1.156*** (0.037)	1.155*** (0.037)
TechClus	0.743*** (0.022)	0.745*** (0.022)	0.744*** (0.022)
CapCity	0.608*** (0.021)	0.608*** (0.021)	0.610*** (0.021)
InstHost	1.459*** (0.129)	1.481*** (0.131)	1.469*** (0.130)
FrmExp	1.081*** (0.004)	1.082*** (0.004)	1.081*** (0.004)
LogGDP	1.555*** (0.055)	1.566*** (0.056)	1.563*** (0.056)
PEIDiff	0.856*** (0.020)	0.849*** (0.020)	0.841*** (0.020)
EMNE		1.863*** (0.116)	1.383*** (0.102)
EMNE*PEIDiff			1.143*** (0.019)
_cons	0.209*** (0.058)	0.093*** (0.027)	0.092*** (0.027)
Observations	112 908	112 908	112 908
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Wald Chi-square	6 475.72	6 524.87	6 564.88
Log pseudolikelihood	-32 548.23	-32 500.20	-32 468.75
Akaike's information criterion	65 242.46	65 148.39	65 087.49
Pseudo R-square	0.129	0.130	0.131
Mean variance inflation factor	6.14	6.10	6.06

Source: Authors' estimations.

Note: Robust standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

In tables 4a and 4b (reporting coefficients and odds ratios respectively), the logistic estimates for hypotheses 1 and 2 are presented. Model A shows that most of the control variables have the expected sign and are significant. SAS greenfield FDI continued to be attracted to a country by prior experience (FrmExp) and advanced institutional environments (InstHost) as indicated by positive odds ratios (oRs) of 1.081 and 1.459, respectively. These results indicate that investors have been attracted to SAS greenfield FDI because of experience and an advanced institutional environment. In addition, the odds ratio of a global city (GlbCity) is greater than 1 and significant at the 0.1 per cent level, indicating that cities with a high concentration of knowledge-intensive research are likely to be the most attractive locations for SAS greenfield projects.

Table 5. Average marginal effects

Term	Hypothesis	SAS_dy/dx
EMNE	H1	0.027***(0.000)
EMNE* PEIDiff	H2	0.011***(0.000)

Source: Authors' estimations.
Note: Robust standard errors are in parentheses. *** $p < 0.001$.

Table 4a shows that the coefficient ratio of the EMNE dummy variable was significant and positive ($\beta = 0.622$, $p < 0.001$ in model B, $\beta = 0.325$, $p < 0.001$ in model C). Its odds ratios are greater than one across the models in table 4b (model B: OR = 1.863, $p < 0.001$; model C: OR = 1.383, $p < 0.001$), which indicates that EMNEs are more likely than DMNEs to choose SAS-related greenfield FDI projects. Furthermore, the average marginal effect for model B in table 5 shows that the probability of choosing a greenfield R&D project is 0.027 higher ($p = 0.000$, $p < 0.001$), suggesting that the likelihood of an EMNE parent firm undertaking SAS greenfield investment increased by 2.7 per cent (at the 0.1 per cent significant level). Thus, hypothesis 1 is supported.

We also include an interaction term between PEIDiff and the EMNE dummy variable, which is significant and positive in model C (table 4a). The log odds ratio for the interaction term EMNE * PEIDiff (OR = 1.143, $p < 0.001$) in table 4b is larger than 1, which implies that the probability of EMNEs undertaking SAS greenfield FDI is higher when there is superior patent enforcement protection between an MNE's home and target countries. Importantly, the average marginal effects for model C in table 5 also show the probability of having a SAS orientation by EMNEs in high PEI difference countries is 1.1 per cent ($p = 0.000$, $p < 0.001$) higher. PEIDiff, therefore, positively moderates EMNEs' choices of greenfield R&D FDI (figure 1). Hypothesis 2 is thus supported.

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Figure 1. Interaction between EMNE dummy and PEI difference variable

Linear prediction of R&D/DDT investment

Adjusted predictions with 95 per cent confidence intervals

Kdensity PEIDiff

PEIDiff

—— EMNE —— DMNE
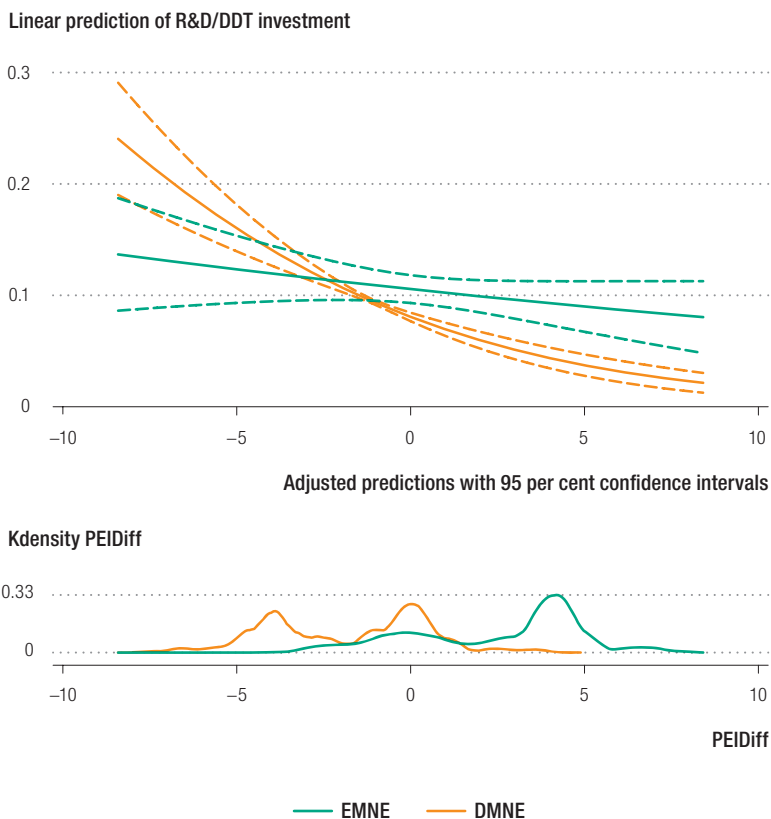
Source: Authors' estimations.

It is possible that geopolitical conditions differentially restricted EMNE M&As in more recent periods, forcing EMNEs into SAS activities through greenfield FDI. If this were the case, we could not attribute EMNEs' greater propensity for R&D-related greenfield FDI only to firm-level catch-up motives, as hypothesized. This is because there would be additional geopolitical factors in play that limit EMNEs' freedom of choice. As we cannot meaningfully control for such policy and geopolitical changes and their differential impacts on EMNEs versus DMNEs, we opted to run our model for an earlier-period sub-sample. Specifically, we performed logistic regression analyses for the years prior to 2017 and the rise of the Trump administration in the United States, which marked a significant inward turn in geopolitical relations regarding openness of international trade and investment relations.

Table 6a shows that the coefficient of the EMNE dummy variable was significant and positive ($\beta = 0.629$, $p < 0.001$ in model 2; $\beta = 0.395$, $p < 0.001$ in model 3). Its odds ratios are greater than 1 across the models in table 6b (model 2: OR = 1.876, $p < 0.001$; model 3: OR = 1.484, $p < 0.001$), which indicates that EMNEs are more likely than DMNEs to choose SAS-related greenfield FDI projects. Furthermore, the average marginal effect for EMNEs in table 7 shows that the probability of choosing SAS investment is 0.031 higher ($p < 0.001$), suggesting that the likelihood of an EMNE parent firm undertaking SAS greenfield investment increased by 3.1 per cent (at the 0.1 per cent significance level). Thus, hypothesis 1 is further supported.

We also include the interaction term (EMNE * PEIDiff), which is significant and positive in model 3 (table 6a). The log odds ratio is 1.12 ($p < 0.001$) (table 6b), which implies that the probability of EMNE investors undertaking SAS greenfield FDI increases when there is superior patent enforcement protection between an MNE's home and target countries. Importantly, the average marginal effects for this interaction term (table 7) also show that the probability of EMNEs in high PEI difference countries having a SAS orientation is 0.9 per cent ($p < 0.001$) higher. PEIDiff, therefore, positively moderates EMNEs' choices for greenfield R&D FDI. Hypothesis 2 is thus supported.[3]

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[3] By way of additional robustness checks, we incorporated a number of additional control variables (including target PEI index) as well as similar base models but for different time periods. Our results remained consistent across a broad spectrum of different models. Results available from authors by request.

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Table 6a. Logistic regression for SAS greenfield investments (coefficients), 2003–2016

R&D/DDT investment	Model A	Model B	Model C
HmPEI	-0.074* (0.031)	0.006 (0.033)	0.011 (0.033)
JobsCrt	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
InnoHost	0.037*** (0.007)	0.039*** (0.007)	0.039*** (0.007)
LawHost	0.013** (0.005)	0.013** (0.005)	0.013** (0.005)
GRHost	0.024*** (0.002)	0.024*** (0.002)	0.024*** (0.002)
BusEase	-0.003 (0.004)	-0.003 (0.004)	-0.003 (0.004)
CapInv	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
ValInt	-0.011** (0.004)	-0.011** (0.004)	-0.011** (0.004)
InstQ	-0.016+ (0.008)	-0.015+ (0.008)	-0.016* (0.008)
TradeSc	-0.087*** (0.007)	-0.088*** (0.007)	-0.088*** (0.007)
R&DExp	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
GlbCity	0.132** (0.039)	0.132** (0.039)	0.131** (0.039)
TechClus	-0.347*** (0.037)	-0.345*** (0.037)	-0.346*** (0.037)
CapCity	-0.384*** (0.043)	-0.384*** (0.043)	-0.380*** (0.043)
InstHost	0.518*** (0.127)	0.543*** (0.128)	0.537*** (0.127)
FrmExp	0.115*** (0.006)	0.116*** (0.006)	0.116*** (0.006)
LogGDP	0.604*** (0.046)	0.617*** (0.046)	0.612*** (0.047)
PEIDiff	-0.115*** (0.030)	-0.124*** (0.030)	-0.130*** (0.030)
EMNE		0.629*** (0.080)	0.395*** (0.092)
EMNE*PEIDiff			0.113*** (0.021)
Observations	76 353	76 353	76 353
_cons	-2.047*** (0.346)	-2.820*** (0.362)	-2.840*** (0.363)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Wald Chi-square	4 702.17	4 722.60	4 745.16
Log pseudolikelihood	-21 216.80	-21 186.89	-21 173.37
Akaike's information criterion	42 567.60	42 509.78	42 484.75
Pseudo R-square	0.138	0.139	0.140
Mean variance inflation factor	6.10	6.06	6.02

Source: Authors' estimations.

Note: Robust standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.

Table 6b. Logistic regression for SS greenfield investments (odds ratio), 2003–2016

R&D/DDT investment	Model A	Model B	Model C
HmPEI	0.928* (0.029)	1.006 (0.033)	1.011 (0.033)
JobsCrt	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)
InnoHost	1.038*** (0.008)	1.039*** (0.008)	1.040*** (0.008)
LawHost	1.013** (0.005)	1.013** (0.005)	1.013** (0.005)
GRHost	1.024*** (0.002)	1.024*** (0.002)	1.024*** (0.002)
BusEase	0.997 (0.004)	0.997 (0.004)	0.997 (0.004)
CapInv	0.998*** (0.000)	0.998*** (0.000)	0.998*** (0.000)
ValInt	0.989** (0.004)	0.989** (0.004)	0.989** (0.004)
InstQ	0.985[+] (0.008)	0.985[+] (0.008)	0.984* (0.008)
TradeSc	0.916*** (0.007)	0.916*** (0.007)	0.916*** (0.007)
R&DExp	1.000*** (0.000)	1.000*** (0.000)	1.000*** (0.000)
GlbCity	1.141** (0.045)	1.141** (0.045)	1.140** (0.044)
TechClus	0.707*** (0.026)	0.708*** (0.026)	0.707*** (0.026)
CapCity	0.681*** (0.029)	0.681*** (0.029)	0.684*** (0.029)
InstHost	1.678*** (0.214)	1.721*** (0.220)	1.710*** (0.218)
FrmExp	1.122*** (0.006)	1.123*** (0.006)	1.123*** (0.006)
LogGDP	1.829*** (0.085)	1.853*** (0.086)	1.844*** (0.086)
PEIDiff	0.891*** (0.026)	0.884*** (0.026)	0.878*** (0.026)
EMNE		1.876*** (0.150)	1.484*** (0.137)
EMNE*PEIDiff			1.120*** (0.023)
Observations	0.129*** (0.045)	0.060*** (0.022)	0.058*** (0.021)
_cons	76 353	76 353	76 353
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Wald Chi-square	4 702.17	4 722.60	4 745.16
Log pseudolikelihood	-21 216.80	-21 186.89	-21 173.37
Akaike's information criterion	42 567.60	42 509.78	42 484.75
Pseudo R-square	0.138	0.139	0.140
Mean variance inflation factor	6.10	6.06	6.02

Source: Authors' estimations.

Note: Robust standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, [+] $p < 0.1$.

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Table 7. Average marginal effects, 2003–2016

Term	Hypothesis	SAS_dy/dx
EMNE	H1	0.031***(0.000)
EMNE* PEIDiff	H2	0.009***(0.000)

Source: Authors' estimations.
Note: Robust standard errors are in parentheses. *** p < 0.001.

Figure 2. Interaction between EMNE dummy and PEI difference variable, 2003–2016

Linear prediction of R&D/DDT investment

Adjusted predictions with 95 per cent confidence intervals

Kdensity PEIDiff

PEIDiff

EMNE —— DMNE ——
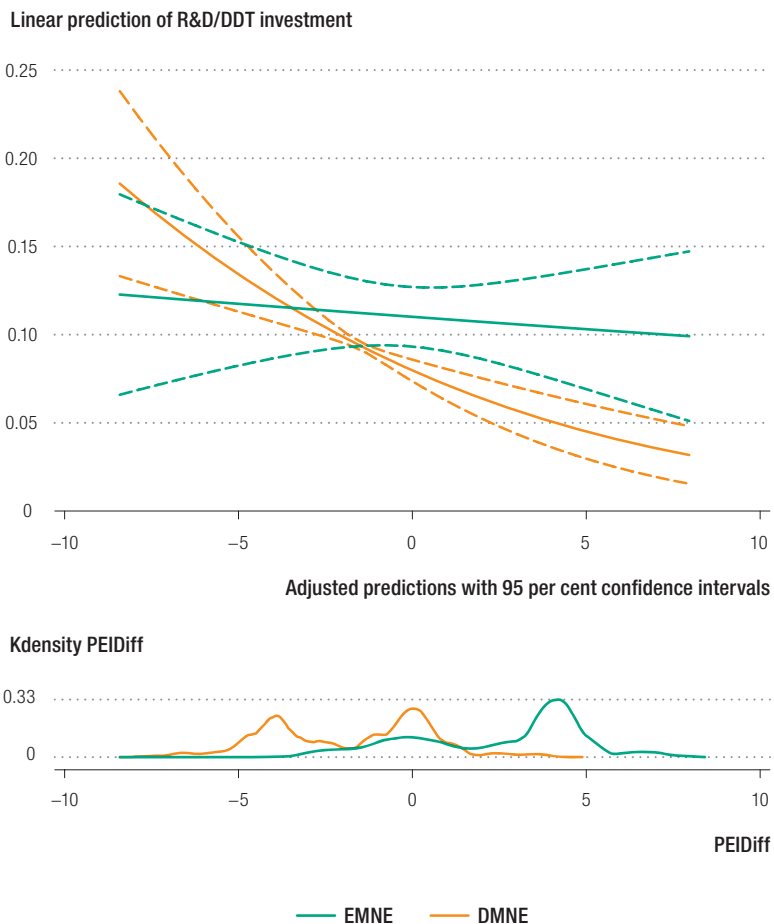
Source: Authors' estimations.

5. Discussion

Our findings show (i) that EMNEs are more likely than DMNEs to undertake greenfield R&D FDI than other types of FDI projects; and (ii) that patent enforcement protection affects the innovation offshoring location choice more strongly for EMNEs than for DMNEs. We first discuss the implications of incorporating SAS greenfield FDI for the EMNE catch-up literature before considering implications for EMNE-related theory, including the springboard theory (Luo and Tung, 2018). This is followed by discussion of policy implications.

5.1 Greenfield capability-building/knowledge-seeking SAS-related FDI: EMNEs versus DMNEs

International business scholars have become interested in whether EMNEs are different than DMNEs and thus if novel theory is required to analyse EMNEs' outward FDI. The increased tendency towards SAS has been strongly highlighted in EMNE theorizing in this regard (Hernandez and Guillén, 2018; Kumar et al., 2020; Liu and Giroud, 2016; Luo and Tung, 2018). The international business literature on firm-level catch-up through SAS, however, has mainly considered international M&As. SAS-related greenfield FDI has been overlooked (Schaefer, 2020; Schaefer and Liefner, 2017). This may be because perspectives such as the springboard theory, which emphasizes catch-up speed and thus acquisitions as the preferred establishment mode for SAS, have been highly influential in this debate (Luo and Tung, 2018).[4] As Luo and Tung (2018, p. 147) candidly acknowledge, "most research has looked at SMNEs [springboard MNEs] through the lens of M&As, while little attention has been paid to other important investment modes".

SAS-related greenfield FDI has arguably become a far more important approach to firm-level technological catch-up taken by EMNEs. Indeed, during the 2003–2021 period, 16,753 greenfield R&D foreign investments were made in total; of these, 1,596 (9.5 per cent) originated from 741 EMNE parent firms.[5] However, over the period in question the EMNE share of greenfield R&D-related FDI increased from 3.5 per cent of total annual capital investment in 2006 to a high of 17.3 per cent in 2017. In the same period, annual employee share rose from 5.2 per cent to 16.2 per cent and number of total investments from 5.5 per cent to 13 per cent (fDi Markets database). EMNEs, therefore, have become much more important contributors to

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[4] The word "acquisition(s)" is mentioned 31 times, "rapid" 7 times, "accelerate(d)" 6 times, and "speed" and "fast(er)" 5 times each. By contrast, "greenfield" is mentioned only 1 time, on the penultimate page in the "future research and suggested agenda" section (Luo and Tung, 2018, p. 147).

[5] Each parent had on average 2.15 subsidiaries, US$100 million of total investment and 257 employees (fDi Markets project database).

international R&D innovation offshoring. These large EMNEs have created complex international innovation networks with hundreds of foreign R&D subsidiaries, tapping into key location-bounded assets around the world, often benefitting from excellent institutional environments. Case study evidence, moreover, showed that many of these EMNEs had successfully engaged in overseas innovation activities that facilitated capability-building and firm-level catch-up. For example: Tata (Becker-Ritterspach and Bruche, 2012), Infosys (Kimble, 2013), Naspers (Teer-Tomaselli et al., 2019), Mahindra (Ramaswamy and Chopra, 2014), and Huawei (Schaefer, 2020).[6]

Owing to the changing geopolitical environment and a push towards international decoupling, leading to greater scrutiny of some M&A deals, greenfield SAS strategies have now become more realistic options for some EMNEs. In the United States, for example, the Committee for Foreign Investment in the United States (CFIUS) heavily scrutinizes deals from strategic rivals (such as China and the Russian Federation) (Godsell et al., 2023). In the European Union, moreover, there is now increasing awareness of the need for greater cross-market regulation, with significant review of individual national policies taking place (European Commission, 2022).[7] However, it is important to note that our results suggest that it is not only increased regulation that drives the greater proclivity towards greenfield R&D FDI projects. Decomposing our sample to a time period before 2017 when the geopolitical environment was not as hostile (2003–2016), we also find that EMNEs had a stronger preference for greenfield SAS-related projects.

The idea that accelerated internationalization is embodied by aggressive acquisitions, as characterized by Luo and Tung's (2018) springboard theory, tells only part of the story about EMNE catch-up strategies. And though the associated literature has emphasized the explosive, aggressive and rapid nature of springboard FDI activity, a rebalancing towards a greater emphasis on greenfield FDI may lead to a more realistic evaluation of EMNEs' internationalization trajectories. Building up

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[6] After Huawei Technologies (China), which is the largest outward FDI investor in R&D by some distance (it has invested US$7.9 billion, employing 22,335 people in 142 foreign R&D subsidiaries), some of the other largest EMNE investors in greenfield R&D include Infosys Technologies (India, software and information technology (IT) services, US$3.2 billion in greenfield R&D FDI, 10,875 overseas R&D employees, 31 R&D subsidiaries); Tata Group (India, diversified, US$3.1 billion, 8,516 employees, 52 subsidiaries); Mahindra Group (US$1.9 billion, 5,539 employees, 55 R&D subsidiaries); Mercado Libre (Argentina, e-commerce, US$1.2 billion, 351 employees, 8 subsidiaries); Softtek (Mexico, software and IT services, US$1.1 billion, 610 employees, 6 subsidiaries); Naspers (South Africa, technology, media and internet, US$768 million, 1,027 employees, 11 subsidiaries); Tune Group (Malaysia, leisure and entertainment, US$592 million, 331 employees, 3 subsidiaries); Comcraft Group (Kenya, diversified, US$430 million, 2,947 employees, 7 subsidiaries); Stefanini IT Solutions (Brazil, IT, US$390 million, 264 employees, 4 subsidiaries); Neuberg Diagnostics (health care, US$415 million, 52 employees, 6 subsidiaries).

[7] The acquisition of high-tech German robotics maker Kuka by Midea (China) in 2016 marked a watershed moment in Europe, leading to considerable debate about greater control of technology-seeking M&As, particularly of those from China.

R&D capabilities through greenfield FDI can take time, but as shown by some of the most successful EMNEs (in terms of innovation capabilities, i.e. Huawei, Infosys, Tata, Mahindra, Comcraft, Mercado Libre), it can be a highly effective approach. Case study evidence increasingly demonstrates that EMNEs invest heavily in their overseas R&D subsidiaries and draw strongly from them in their push to catch up with the most innovative DMNEs (Schaefer, 2020). Larger-scale empirical studies also show that EMNEs significantly benefit from offshore innovation in advanced institutional environments (Bruno et al., 2021; Rosenbusch et al., 2019). This points towards a future in which EMNEs extend their innovation capabilities beyond those related to composition and bricolage aimed at the "middle of the pyramid" (Amin, 2023; Brandt and Thun, 2016) towards one in which they compete at the very leading edge of technological development in high-income markets.

5.2 Institutional arbitrage: EMNEs versus DMNEs

At a conceptual level, the international business debate focuses on whether mainstream theory is applicable and useful for understanding EMNEs. In this regard, institutional arbitrage-related FDI has been frequently highlighted as a salient characteristic of EMNEs (Boisot and Meyer, 2008; Golikova et al., 2014). Again, however, to our knowledge there have been only a few attempts to empirically explore (using relatively large data sets and going beyond case studies) whether this is true or not (Bruno et al., 2021; Rosenbusch et al., 2019). If true, for what types of institutions and in what types of investment scenarios does theory suggest that institutional arbitrage by EMNEs might act as a driver for outward FDI, differentiating EMNEs from DMNEs?

Springboard theory is rather vague regarding the types of institutional arbitrage EMNEs seek to benefit from. According to Luo and Tung (2018, p. 130), "International springboard is a global strategy to improve a firm's global competitiveness and catch up with established and powerful rivals in a relatively rapid fashion through aggressive strategic asset- and opportunity-seeking, *and by benefitting from favorable institutions in foreign countries*" [emphasis added]. Springboard theory also talks of reducing "vulnerability to home institutions" and undertaking FDI to "alleviate institutional and market constraints at home" (Luo and Tung, 2018, p. 131). Springboard theory does not explore in any detail the specific institutional needs of EMNEs and, importantly, how or whether these differ from those of DMNEs (Hertenstein and Alon, 2022).

We hypothesized that the role of IPR-related institutions would likely become of crucial importance when knowledge-seeking (i.e. R&D-focused activity) motivates the greenfield FDI. We then argued that EMNEs, which invest heavily in offshore R&D centres to "impel" capability upgrading (He et al., 2018, p.248), necessarily require strong IPR enforcement. Environments with strong IPR enforcement are found

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mainly in developed markets, where DMNEs originate (and typically already have R&D subsidiaries). As such, it may not be hard to understand why IPR institutional quality is a weaker driver of R&D innovation-related investment for DMNEs. DMNEs, unlike EMNEs, already have sufficient exposure to sound IPR environments. They are not compelled, moreover, to invest as large a share of their resource base in their R&D activities, owing to their technological leadership positions (i.e. they do not have to engage in firm-level catch-up). By contrast, EMNEs that are looking to catch up must invest comparatively heavily in such subsidiaries. This may explain why stronger IPR protection more strongly drives their choice of FDI.[8]

Is this surprising? Interestingly, a growing body of empirical evidence supports positive innovation performance outcomes for EMNEs relative to DMNEs when entering markets with better institutions. This may also help explain our results concerning FDI preferences or the rationale for why EMNEs are attracted by better patent enforcement regimes. Bruno et al. (2021), for example, recently showed that EMNEs had better innovation performance than DMNEs when their R&D subsidiaries were located in jurisdictions with strong IPR protection. Rosenbusch et al. (2019) conducted a comprehensive meta-analysis (based on 48 samples taken from existing studies) of the impacts of innovation offshoring. They too found a positive significant relationship that was "contingent upon the home institutional environment": when home institutions were weak it facilitated "institutional arbitrage outcomes" (Rosenbusch et al., 2019, p. 203). Why do we see such outcomes? One possibility is, as we have suggested, that EMNEs commit strongly to their overseas R&D subsidiaries to impel the upgrading of their own capability and technology.

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[8] This is reflected in aggregate greenfield R&D FDI. Although EMNEs in the sample have invested in R&D subsidiaries in at least 107 developing- and developed-target countries, the top 10 developed markets with high PEI enforcement (including Canada, Germany, Hong Kong (China), Italy, Japan, Singapore, Sweden, the United Kingdom and the United States) attracted about 42 per cent of all R&D FDI by EMNEs (and provided 33 per cent of employees). The United States was the single most popular destination for EMNEs, receiving 14 per cent of total FDI and 16 per cent of employees.

By contrast, in the same period (2003 to 2021), the two most attractive destinations for DMNEs' greenfield R&D subsidiaries were India and China, together accounting for 32 per cent of total capital invested and 46 per cent of all R&D employees that DMNEs hired globally. Developed markets were nonetheless still important for DMNEs when doing R&D-related FDI, albeit not nearly as important as they were for EMNEs. Thus, for DMNEs, all developed markets combined attracted 46 per cent of their FDI capital and 32 per cent of jobs. For EMNES these figures stood at 52 per cent and 42 per cent respectively. Despite large geographic and high physical distances, encompassing additional "liabilities of foreignness", EMNEs were keen to exploit developed-market environments for the purposes of R&D-related FDI.

5.3 Policy implications

For developed-market economies, the rise of EMNEs through aggressive cross-border M&As has raised considerable concerns regarding whether there is a level playing field. MNEs from China, for example, have been accused of playing by a different rulebook, relying upon a relatively protected domestic market and State-supported selective industrial policies to support its MNEs in acquiring high-tech developed-market businesses as part of a sophisticated techno-nationalist industrial strategy (i.e. Chemchina's acquisition of Syngenta or Midea's acquisition of Kuka). The CFIUS, for example, has become active in blocking M&As, particularly in strategically important industries. In the European Union, as in the United States, sentiment among policymakers has recently started to swing more towards regulation of inward M&As – although the picture is more complex owing to the many different interests of member States and different national screening regimes (European Commission, 2022). What is important to note here is that to date policy debate has focused overwhelmingly on M&As. Greenfield R&D-related FDI from EMNEs appears to have been largely overlooked.

This is likely for several reasons. First, greenfield R&D FDI may involve reinvestment from existing foreign subsidiaries, either from previously acquired subsidiaries of EMNEs or greenfield FDI projects. The former approach is common (He et al., 2018). These investments may qualify as FDI only if one uses an "ultimate owner" definition of FDI, but many domestic reinvestments are hard to monitor and may simply be overlooked. Such FDI may be on a far more modest scale, at least initially, and thus harder to identify than most typical M&A deals. Commercial data collection agencies (i.e. fDi Markets) may not even collect information on smaller greenfield investments. Second, as greenfield FDI does not have the potential to destroy jobs (unlike M&As, where post-acquisition layoffs may occur), it receives less political attention. Rather, such FDI is politically beneficial to host regions, as it creates high-paying job opportunities. Third, greenfield FDI does not, in the first instance, generally involve taking possession of any strategic assets. There is, therefore, nothing to initially screen or block (say on national security grounds), unlike in the case of M&As. These factors make greenfield R&D-related FDI difficult to regulate for developed-market economies, but at the same a useful strategic option for EMNEs to adopt (and their governments to support). Thus, developed-market policymakers are encouraged to develop greater awareness of the potential threat to domestic technological leakage from greenfield R&D-related FDI by EMNEs. Greater restrictions on one form of establishment mode (i.e. M&As) necessarily requires greater consideration of alternatives (i.e. greenfield FDI) if original policy goals are to be achieved (namely restriction of knowledge acquisition by EMNE competitors in key strategic industries).

Conversely, there may still be opportunities for home and host countries to find common ground on the perceived benefits of greenfield FDI flowing from emerging markets to developed markets. As mentioned earlier, the promise of creating high-

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paying jobs and all the related benefits (such as stimulation of local economic activity and the start-up of complementary business by local entrepreneurs) are highly desirable outcomes for the host market. Promoting meaningful engagement in greenfield R&D FDI could be a political win for both home and host country governments in some instances – particularly those where the developed host market has limited interest in developing its own industries and in "decoupling" from or becoming less dependent on emerging markets. A potential actionable avenue is the creation of investment promotion agencies with a focus on greenfield investment from EMNEs.

From the EMNE perspective, the evolution of SAS towards greenfield investment appears logical, given the increasing constraints on other forms of FDI. EMNEs such as Huawei, Tata, Infosys and others have shown that these strategies can be tremendously effective. They avoid the political fallout associated with high-profile M&As. They also circumvent the added restrictions such deals are increasingly facing. Neither do greenfield approaches face the same types of integration challenges, which for large international M&As require high levels of absorptive capacity and the capability to deal with large cultural differences (sometimes exacerbated by State ownership of the acquirer).

The policy challenge for developing countries will be to facilitate continued investment by their MNEs in greenfield R&D without exacerbating current geopolitical tensions during an era of growing techno-nationalist frictions. Missteps could lead to further restrictions on greenfield R&D-related FDI, although developed-market governments face the aforementioned regulatory challenges. A growing body of empirical evidence suggests EMNEs can and do benefit from greenfield R&D-related FDI and, more generally, are creative in their approaches to innovation and catching up (Yamin, 2023). This suggests policymakers in emerging markets should think carefully about how such outward FDI can be encouraged and linked with existing initiatives. Emerging-market policymakers will need to balance and manage their relationships with developed economies, given the greater wariness of developed-market governments towards the approaches that some EMNEs have used to seek knowledge through FDI.

6. Conclusions

EMNE-related research analysing SAS types of capability-building FDI has for the most part looked at cross-border M&As. An assumption in mainstream international business theorizing (i.e. springboard theory) is that it is only through M&As that sufficient high-quality strategic assets can be acquired to facilitate accelerated catch-up (Kumar et al., 2020; Luo and Tung, 2018). Yet one outcome of this M&A focus has been the neglect of research on greenfield FDI as a strategic firm-level

catch-up response by EMNEs. We have argued that EMNEs have a greater proclivity to create greenfield R&D subsidiaries over other types of foreign subsidiaries when compared with DMNEs. Although such FDI may not appear, at face value, to create opportunities for rapid and accelerated catch-up, it has arguably become a very successful approach for many EMNEs (e.g. Huawei, Infosys, Mahindra, Tata, Comcraft, Mercado Libre and Softtek). In the face of greater geopolitical pressures and international decoupling, moreover, it is becoming a more realistic option for many EMNEs.

At a conceptual level, springboard theory and associated EMNE theorizing has been relatively silent on the exact types of institutional arbitrage that EMNEs may engage in and how they vary between EMNEs and DMNEs. We show that home- or host-country superiority in IPR enforcement is a stronger driver for EMNEs when deciding to undertake greenfield R&D-related FDI in innovation offshoring. This, we argue, is because EMNEs make significant commitments to their offshore R&D hubs, which they look to develop and use as their key centres for innovation and firm-level catch-up. They do this so as to catalyse firm-level catch-up with DMNEs. EMNEs, moreover, are typically underexposed to high-quality IPR enforcement regimes, which they lack at home. Combined, this makes EMNEs more attracted towards this type of IPR-related institutional arbitrage when undertaking innovation offshoring.

From a policy perspective, better understanding of greenfield knowledge-seeking FDI is becoming of ever greater importance. This is because EMNEs face higher political hurdles in undertaking cross-border M&As during an era in which techno-nationalist industrial policies are on the rise. Greenfield FDI presents far fewer regulatory challenges for EMNEs. For policymakers from emerging economies, therefore, promoting an environment favourable to outbound greenfield FDI, particularly to countries with strong IPR protection, may be advisable and may enhance their innovation capacity in the longer term. By contrast, for policymakers in developed countries that are looking to adopt techno-nationalist strategies that domestically promote some of the key industries of the future (e.g. electric vehicles, renewables, artificial intelligence and so on), greater consideration of how to regulate knowledge-seeking EMNE greenfield FDI may be required. For these advanced economies, loss of key IPR may be a concern. A greater EMNE presence brings with it more competition for key knowledge resources, which may undermine their own industrial policies.

We still do not know enough about how EMNEs can exploit greenfield R&D-related FDI, or what the specific outcomes of such investments are in both the host and home countries. More detailed case study analysis is required of how EMNEs develop foreign R&D subsidiaries (e.g. strategies for attracting the best talent and retaining it, how they cooperate with foreign universities and other research centres or hubs) and subsequently transfer knowledge from greenfield subsidiaries

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in foreign markets to their home base (Schaeffer, 2020). Future research may also explore the way in which EMNEs look to exploit superior IPR environments in foreign markets and why they do so. Institutional arbitrage in EMNEs remains a relatively under-researched area in the field of international business. Our research suggests that it is important. Future research could also explore what other types of institutions attract EMNEs. Incorporating additional analysis of IPR protection is one potentially fruitful avenue for further research, again, possibly at the firm level by exploring specific cases and/or industries in greater depth. Such analysis will contribute to a better understanding of springboard theory and the associated literature on firm-level catch-up of EMNEs.

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Reshoring, nearshoring and development. Readiness and implications for Latin America and the Caribbean*

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Abstract

This paper discusses the concepts of reshoring and nearshoring, which are gaining increasing popularity. We contribute to the literature in three main ways. First, building on previous theories we define a conceptual framework and consider how recent developments – the COVID-19 pandemic and Industry 4.0 technologies – may affect these patterns. Second, we process some preliminary evidence to test whether Latin American and Caribbean economies are indeed participating in this reshoring trend. Third, we propose a measure of "reshoring readiness", to assess whether these countries appear to be ready to host relocations and benefit from them. Overall, we find limited evidence of nearshoring to the region so far, except in Mexico, and we highlight strengths and weaknesses of the region for attracting and benefitting from future relocations.

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1. Introduction

The last decades of the twentieth century were characterized by a fast globalization process. Trade and industrial production were drastically restructured, reflecting the strategic decisions of many companies to offshore stages of production to exploit cheaper resources, access markets and technologies, and take advantage of geographically dispersed production networks. Global value chains (GVCs) were the name of the game (Baldwin, 2016; Ponte et al., 2019; Timmer et al., 2014), increasingly encompassing more sectors, including services, and incorporating emerging markets (UNCTAD, 2020).

However, after three decades of accelerating globalization, since 2010 international production has slowed down, with sluggish growth of trade and FDI. This may be explained by the changes in the international context, with rising labour costs in once cheap locations, rising uncertainty and protectionism (UNCTAD, 2020). Within this framework, the once common offshoring practices were challenged, and some companies started to reconsider their international location decisions to eventually "reshore" (or "backshore") – bring production back into the country, or in its proximity – or at least some slices of the value chain.

From the standpoint of developing countries, for which foreign investment remains a crucial source of capital, nearshoring practices could represent an opportunity. However, the conditions to attract nearshoring and benefit from it are complex and hard to achieve for many countries. Moreover, despite some recent contributions discussing the effects of current GVC reconfigurations on developing countries (Bertoni and Perez Almansi, 2022; Brenton et al., 2022; Maloney et al., 2023), thus far the literature on nearshoring has mainly taken the perspective of firms in advanced economies and the likely impact on the latter. Given the firm-level nature of the phenomenon, often secretly implemented, the available evidence is still largely impressionistic.

To address these gaps, in this paper we contribute to the literature in three main ways. First, we structure the terms of the debate on reshoring and nearshoring by proposing a conceptual framework of analysis considering existing theories. Second, we suggest an original measurement of the phenomenon at the macro and trade levels, and we remedy the scant evidence on reshoring. Third, we investigate nearshoring from the perspective of developing countries and measure the nearshoring readiness of Latin American and Caribbean countries, i.e. whether those countries appear to be ready to host relocations and benefit from them.

The conceptual framework, based on the literature, is presented in section 2. We then consider how recent developments such as the emergence of new technologies and the COVID-19 pandemic may affect nearshoring (section 3). In section 4 we use macro and trade data to measure reshoring activities to Latin American and

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Caribbean countries. In sections 5 and 6, we discuss and measure the reshoring readiness of these countries and conclude with some policy implications.

Overall, we observe limited evidence for nearshoring from United States multinational enterprises (MNEs) to these countries. Mexico is an exception and seems to be playing an increasingly relevant role; however, our analysis shows that it is far from displacing China. The region proves to have strengths and weaknesses in attracting potential nearshoring: the relatively high human capital may attract higher value-added stages of value chains, but the region still has a long way to go to improve its logistics and strengthen its digital infrastructure to respond to the growing concerns of buyers and investors.

2. The economics of reshoring: key concepts, rationales and impacts

The concepts of reshoring and backshoring first, and that of nearshoring later, became a topic of discussion among policymakers and the press before grabbing the attention of academic research. Despite this growing attention, there is not yet a unified framework of analysis, and multiple perspectives overlap, with ensuing variations in terminology. In line with most of the literature, we use the term reshoring to refer to a generic relocation of production activities in the opposite direction from offshoring. Backshoring and nearshoring then describe different types of reshoring, respectively all the way back to the home country or to its proximity. For example, if a United States firm were moving part of its offshored production from China back to the United States, this firm would be backshoring, while if the same production were relocated to Mexico, it would be nearshoring.

In the academic literature, these phenomena have mainly been studied by international business scholars stressing the standpoint of the firm.[1] In this sense, reshoring practices have been considered as part of a firm's dynamic location strategy within which, given an earlier decision to offshore, this is revised and reversed, sometimes "correcting previous strategies" (Fratocchi et al., 2014; Kinkel, 2014).

However, corporations' location and relocation decisions do not only impact firms' efficiency and profitability, but also have remarkable effects on the wider economy, entailing a transformation in the international division of labour and a reconfiguration of global production. Although this aspect remains less explored, some efforts have been made in this direction (Casson, 2013; OECD, 2016; UNCTAD, 2020; UNIDO, 2019).

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[1] Although most of this literature has focused on large manufacturing firms, sometimes SMEs are also analysed (Gray et al., 2013; Stentoft et al., 2016).

2.1 Firms' internationalization decisions

Corporate internationalization strategies involve both the choice of *where* to carry out production (i.e. the shoring decision) and of *how to organize* production *and source* production factors (i.e. the corporate boundary, or sourcing, choice).

The motivations for internationalization and the mode chosen to enter international markets have been extensively analysed in a large body of literature, ranging from international business to economics and industrial organization (Buckley and Casson, 1976; Hymer, 1976; Dunning, 1980, 1988 and 2000; Dunning and Rugman, 1985).

These motivations depend on the firm's and industry's characteristics, the (home and host) country contingencies and, crucially, developments in the global economy. Therefore, although many of the motivations for offshoring highlighted in the past remain relevant,[2] a number of push and pull factors related to the context can be fostering reshoring practices.

In terms of push factors from host countries, these mainly relate to labour markets (Piatanesi and Arauzo, 2019). The erosion of wage differentials between developed and developing countries has reduced the scope for arbitrage on labour costs and has operated as a push effect from offshore locations to home countries. In some cases, this is compounded by low labour productivity and reduced availability of skilled workers, further motivating reshoring (Gray et al., 2013; Kinkel and Maloca, 2009; Lampon et al., 2015; Tate et al., 2014; Vanchan et al., 2018).

On the other hand, some pull effects operate when incentives and government policies drive the relocation to more advantageous sites (Gray et al., 2013; Lee and Park, 2021; Vanchan et al., 2018).

Finally, several drawbacks related to the distance between home and host countries have also been highlighted by the literature, suggesting that reshoring would reflect a correction of misjudged preceding decisions, and the underestimated costs of distance. Therefore, the changing context, together with wrong past decisions, would force substantial strategy "corrections".

In this respect the literature has emphasized the importance of several factors:

- The actual transport and communication costs, far higher than what was expected

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[2] In Dunning's eclectic theory of international production, a firm's offshoring decisions could be explained with four possible rationales, depending on why the firm was internationalizing: to seek natural resources, larger markets, increased efficiency, or strategic assets and capabilities (Dunning, 1980 and 1988).

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- The adverse effects related to reduced flexibility in highly complex production networks (Fratocchi et al., 2014; Gylling et al., 2015; Kinkel and Maloca, 2009)

- The existence of supplier-consumer mismatches (Piatanesi and Arauzo, 2019), which are hard to settle when production is far from the final market

- The negative impact of far-away offshored production on innovation opportunities: user-producer interactions may be very important for learning and innovation in production (Chang and Andreoni, 2020; Fratocchi et al., 2016; Gray et al., 2013; Pietrobelli and Rabellotti, 2011)

- Discrepancies in institutional structures in relation to intellectual property rights (IPRs) (Gray et al., 2013; Tate, 2014), quality standards (Ancarani et al., 2015; Fratocchi et al., 2014; Stentoft et al., 2016), environmental and social conditions (Ashby, 2016; Gray et al., 2013; Tate, 2014) and other regulations

Against this backdrop, it is clear that firm-level decisions change over time, adjusting to incentives and context.

In table 1 we present a simple layout of the possible options obtained by combining the various strategic decisions by firms on where and how to carry out production. On the vertical axis we classify possible corporate boundary decisions, and on the horizontal axis the possible location decisions. Using this table, we can analyse the implications for trade, FDI flows and GVC configurations of offshoring, backshoring and nearshoring.

During the years of the globalization expansion, companies increasingly offshored their production activities using different organization and sourcing modes. Thus, they chose to either establish foreign affiliates, enter into strategic partnerships with other firms or outsource to foreign suppliers. The former case resulted in growing FDI flows, initially between Europe and the United States and, after 2000, in Asian markets (UNCTAD, 2018). The partnerships and the non-equity modes of internationalization have also been widely used, as they allowed MNEs to concentrate in higher value added segments of the value chain and outsource non-core activities.[3]

Offshoring location decisions, whatever the source mode chosen by the MNE, involve an expansion of global production networks. Conversely, nearshoring can be intended as a shift to a smaller geographical scope, with a movement from the last right-hand column to the central one; that is, relocating activities from a distant

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[3] However, although outsourcing practices have first been related to low value added activities, they have also expanded to some higher value added segments in the upstream (e.g. R&D activities) and downstream (e.g. customer services) stages of the value chain (Pietrobelli et al., 2011; UNCTAD, 2020).

country to one in the same region of the company's headquarters. Therefore, in the case of nearshoring, FDI and international trade flows would still be observed, but with a reconfiguration of their geographical composition, implying a regionalization of value chains. If, instead, production segments are repatriated to the home country (backshoring), a reduction of international exchanges of inputs and products would appear, with more production carried out domestically by the company's domestic divisions or by domestic partners and suppliers in the same value chain.

Looking from a different perspective, nearshoring could be visualized as an expansion from home production to offshoring in the same region, in the proximity of the home country. This would imply an expansion abroad, even if limited to nearby countries, by establishing affiliates in neighbouring countries or regional value chains, or by sourcing from nearby but foreign suppliers, thereby expanding the global production network.

Table 1. Shoring and sourcing: possible corporate decisions

			Location (shoring) decision		
			Inshore	**Nearshore**	**Offshore**
			Same country	*Same region*	*Distant country*
Corporate boundary (sourcing) decision	**Insource**	*Make*	Domestic divisions and affiliates (domestic trade)	Establishing affiliates in a foreign nearby country (FDI and regional trade)	Establishing foreign affiliates (FDI and international trade)
	Partnership (e.g. value chains)	*Hybrid*	Domestic Partnership	Regional Partnership	Foreign Partnership
	Outsource	*Buy*	Source from domestic suppliers (domestic trade)	Source from foreign nearby supplier (regional trade)	Source from foreign supplier (international trade)

Source: Authors' adaptation from Foerstl et al. (2016).
Note: Partnerships can take various forms; for example, joint ventures, strategic partnerships, long-term contracts, captive suppliers. They can be equity- or transaction-based.

In addition, it is necessary to remark that in the context of fragmented international production often organized along GVCs, the location decision does not necessarily involve the whole value chain, but frequently only some specific segments. As a result, the backshoring and nearshoring decisions also have important implications for the reconfiguration of GVCs.

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In sum, the table shows how shoring (location) and sourcing (boundary) choices reflect two different strategic decisions, and how it is the intersection between the two that outlines the emergence of different forms of internationalization of production. Both decision domains are very relevant as they shape GVCs and affect value added creation, capture and distribution across countries.

3. Possible forms of GVC reconfiguration. The role of technological changes and of the international environment

Geopolitical conflicts and external shocks, such as the COVID-19 pandemic, are likely to have disruptive effects on the international fragmentation of production. Indeed, while trade wars and political tensions were already inducing a tendency towards regionalization and protectionism (Enderwick and Buckley, 2020), these tendencies might accelerate as a result of the uncertainty brought about by the COVID-19 crisis and the war in Ukraine combined with the vulnerability of many complex and geographically widespread production networks. Moreover, these elements interact with the proliferation of new technologies related to Industry 4.0, leading to potentially disruptive effects on GVC reconfiguration (UNCTAD, 2020).

3.1 New technologies, Industry 4.0 and GVCs

In the traditional international business view, technological advancements and innovations in information and communication technology were believed to encourage the internationalization of production by reducing the costs of transaction, coordination and communication (Alcácer et al., 2016; Chen and Kamal, 2016). The emergence of the so-called fourth industrial revolution is further strengthening these trends. The technological changes related to Industry 4.0, often called New Industrial Revolution technologies, include artificial intelligence, Big Data, clouds, the Internet of Things, automation and 3D printing. So far, these technologies have affected production networks only marginally, and mainly in advanced countries (UNCTAD, 2021).

While digitalization is already affecting many value chains, leading to larger "servicification" of manufacturing and greater importance of intangibles in GVCs, additional changes may be on the horizon (UNCTAD, 2020). Some studies argue that adoption of Industry 4.0 technologies could trigger reshoring activities (e.g. Brennan et al. (2015), on the Internet of Things and additive manufacturing, and De Backer et al. (2018), on robotics).[4] Clearly, the effects of the diffusion of these

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[4] Similarly, Dachs et al. (2019) find a positive correlation between relocation decisions and adoption of New Industrial Revolution technologies by companies but conclude that actual backshoring is occurring in only 4 per cent of the 1,700 European manufacturing firms analysed.

technological changes will differ depending on the type of technology and industry. The first structured study of the potential impacts of different categories of New Industrial Revolution technologies on international production was offered by UNCTAD in the *World Investment Report 2020* (UNCTAD, 2020).

In relation to automation, the increasing availability and affordability of robotics and artificial intelligence solutions is likely to affect manufacturing value chains and raise the incentives to reshore. This tendency would be reinforced by the increasing wages in offshore locations, reducing the role of labour cost arbitrage in location decisions. However, investments in robots are highly capital-intensive, enjoy economies of scale and are likely to be feasible only for larger firms in advanced countries, possibly limiting the scope of reshoring to these countries. Moreover, the increased relevance of IPR protection is likely to foster a shift towards internalization and more hierarchical and tightly controlled forms of GVC governance. The replacement of low-skilled labour with robots is predicted to spread the value added distribution along the chain across many chain segments, and to lift total value added (i.e. shifting the whole "smile" curve upwards) due to productivity gains (UNCTAD, 2020). However, although automation represents a challenge for developing countries that rely on their lower cost of labour to attract foreign investment, some of them are responding to the threat by investing in automation themselves. This has occurred, for example, in Czechia, Slovakia and Slovenia, and has allowed them to retain many foreign productions.[5]

The diffusion of digitalization, that is its spread to affect all sectors of activity, is likely to reduce coordination and transaction costs. The Internet of Things, the cloud, digital platforms, artificial intelligence and Big Data make it both possible and easier to manage, monitor and control complex activities from distant locations as well as to reach remote markets without a physical presence. Digital technologies may favour more effective and safer remote communication, coordination and control, reducing the risks involved in offshoring. As a result, fragmentation may be further enhanced. Small and medium-sized enterprises, including those from developing countries, might benefit from enhanced access to GVCs, but that benefit will probably be more concentrated in low value added activities. In fact, the highly knowledge- and data-intensive segments of production are likely to be internalized by MNEs, which can also count on greater capabilities to deal with and benefit from the related technologies. However, GVC integration may in turn foster the development of firm-level capabilities in Industry 4.0–related technologies, which still have limited diffusion in developing-country firms (Delera et al., 2022).

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[5]   Dalia Marin, "How COVID-19 is transforming manufacturing", *Project Syndicate*, 3 April 2020.

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Finally, 3D printing is also beginning to change the configuration of production of some industries, but its effects are likely to remain confined to niche industries, with relatively limited implications for most developing countries. However, for the affected sectors, 3D printing could generate a configuration of international production characterized by small-scale and localized production. It could in principle produce a paradigmatic change in international production, through the simultaneous effects of rebundling and offshoring, with shorter value chains but geographically dispersed and very proximate to final consumers. In selected sectors, mass customization is likely to prevail, with larger shares of value added derived from the design phase and from customer-related activities, at the opposite extremes of the value added curve.

Overall, the magnitude of the shifts to come will depend on the specific industries considered and on the country contexts. Some technological elements will push for increased complexity and dispersion of value chains; others may make regional and local value chains more likely, opening opportunities for nearshoring. However, the increased capital and knowledge intensity implied by new technologies is likely to exacerbate the concentration of value creation along these chains, with access limited to fewer countries, often relatively more advanced.

3.2 COVID-19 crisis and the increasing uncertainty

The disruptive effects of the COVID-19 pandemic on the global economy are multidimensional. The new crucial element is the growing uncertainty, leading some authors to foresee dramatic changes to the GVC model (e.g. Barbieri et al., 2020; Javorcik, 2020; Ling and Lanng, 2020), and an overall reduction of global supply chain activity.[6]

A new push towards reshoring activities could come both from managerial strategies at the firm level and from governmental actions (Elia et al., 2021). The pandemic has highlighted the vulnerability of supply chains to disruptions arising from large reliance of companies on offshore producers, and the resulting lack of self-sufficiency in countries (e.g. in medical supplies and components of key industrial supply chains; Barbieri et al., 2020). Therefore, we may expect that the search for GVC robustness and minimization of disruptions could lead to some backshoring, or to regional cooperation and nearshoring if the full relocation of the supply chain were too costly (Barbieri et al., 2020), helping to achieve a better balance between efficiency and resilience (Golgeci et al., 2020). Other firms, however, may not be able to take any of these steps, given the scale and nature of the upstream activities they have outsourced over the years, or the "massive modularity" that continues to prevail in some sectors (Thun et al., 2022).[7]

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[6] Dalia Marin, "How COVID-19 is transforming manufacturing", *Project Syndicate*, 3 April 2020.
[7] Diane Coyle, "Rethinking supply chains", *Project Syndicate*, 10 June 2022, www.project-syndicate.org.

By contrast, some observers have claimed that the crisis has made clear the positive role of GVCs in handling disruptions in some key sectors. For example, analysing the medical devices GVC, Bamber et al. (2020) observe that particularly in the first stages of the virus diffusion, GVCs helped alleviate shortages in the countries more heavily affected by the pandemic. Internationally integrated buyers have been able to differentiate their sources for supply of essential goods that suddenly become strategic. For example, imports of gloves from non-traditional exporters of gloves such as Sri Lanka and Thailand spiked, as did imports of hospital gowns from the Dominican Republic, Honduras and Viet Nam. In sum, international production networks would have contributed to improving resilience and response to shocks whereas back- or nearshoring, which reduce the range of options, would increase risk (Bamber et al., 2020).

In this regard, a recent paper by Miroudot (2020) discusses the fine differences between *robustness* and *resilience* in GVCs, and what they imply for business strategies. Whereas robustness – i.e. avoiding disruptions altogether – might be preferable and necessary in the supply chains of essential products, in most other cases resilience may be preferred. That is, due to cost considerations, companies in non-essential production (e.g. non-medical suppliers) may accept undergoing occasional disruptions while improving their ability to resume normal operations as swiftly as possible.

In any case, value chain design and the selection of most reliable suppliers and sites are expected to be important in companies' future strategies to build both resilience and robustness (ECLAC, 2020). With companies looking for more secure sources of supply, countries that aspire to attract new segments of international production must provide reliability. In this regard, the precarious attitude of some Latin American and Caribbean countries may have not produced an increase in their dependability. For example, the unplanned management of the crisis by the Government of Mexico generated high uncertainty for firms in the automotive sector, undermining the trustworthiness of the country as a supplier.[8]

4. Recent trends in the international productive integration of Latin America and the Caribbean

Despite the growing attention to firms' reshoring decisions, solid empirical evidence is still scarce. Data on the location of companies and lead-firm suppliers are not openly disclosed, and this has made it difficult to obtain consistent evidence beyond many anecdotal stories and some isolated surveys.

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[8] *The Economist*, "Covid-19's blow to world trade is a heavy one", 14 May 2020.

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However, although preliminary and imperfect, traditional trade statistics and input-output tables can provide important information about countries' integration in international production. Thus, the aggregate of firm-level decisions, notwithstanding some expected heterogeneity, should be reflected and visible in macro-level outcomes.

As discussed above, firms take shoring decisions on the basis of several factors, much of which are industry- or context-specific. Moreover, disruptive events and technological changes, while affecting the whole economy, do not affect all sectors and firms in the same way. That is, at the micro level substantial heterogeneities exist, and therefore we cannot consider the macro dimension as being the mere sum of micro behaviours. However, if micro practices become widespread and substantial, they should be visible in trade patterns. On the basis of similar assumptions, a large literature has relied on trade (particularly of intermediates) and statistics based on input-output tables to discuss offshoring practices (e.g. Antràs and Staiger, 2012; Feenstra, 2017).

We are here interested in observing whether there is any evidence suggesting that reshoring practices are consistently occurring in the region, and if they emerge from trade statistics. Indeed, in line with the current literature (Maloney et al., 2023), we expect that the eventuality of nearshoring to Latin America and the Caribbean would largely consist of MNEs from the United States shifting activities to the region. This could happen either as a shift from other previous offshore locations or as an expansion of MNEs seeking to diversify their supply chain to new sites. Either way, if nearshoring to the region is occurring, the relative share of United States imports from Latin American and Caribbean countries should increase.

For this reason, we first look at the role of these countries in United States imports and how they perform relative to other regions, which countries are leading and if recent developments in these trends may suggest any underlying reshoring practices. Second, we follow De Becker et al. (2016) and proxy reshoring through the share of domestic demand served by imports from different countries to explore possible evidence of reshoring by United States MNEs. Finally, we look at trade in value added to gain deeper insights into the actual value embodied in trade between countries in Latin America and the Caribbean and other regions and its evolution over time.

This empirical exercise serves the purpose of offering macroeconomic evidence that may suggest the possible existence of underlying corporate relocations, without claiming that we provide direct reshoring proxies. We expect that the changing patterns at the macro level over time will reveal the ultimate effects of companies' relocation decisions and may usefully inform the discussion on nearshoring.

4.1 The relevance of Latin American and Caribbean countries in United States imports and shifting patterns

As a first step in our effort to gain insights on the occurrence and extent of nearshoring, we analyse bilateral data of United States imports to explore whether the macro-level evidence supports the hypothesis of nearshoring of United States firms to Latin American and Caribbean countries. The region is the second most important in terms of imports for the United States after China, followed by the European Union[9] and Canada. While imports from China fell after 2018, those from Latin America and the Caribbean stagnated between 2018 and 2019. When looking at individual countries in the region, the role of Mexico is clear, with Mexican imports accounting for almost 60 per cent of total United States imports from the region in 2005 and increasing to 76 per cent in 2019 (figure 1).

Figure 1. United States gross imports from main exporter countries in Latin America and the Caribbean, 2005–2019 (Billions of United States dollars)
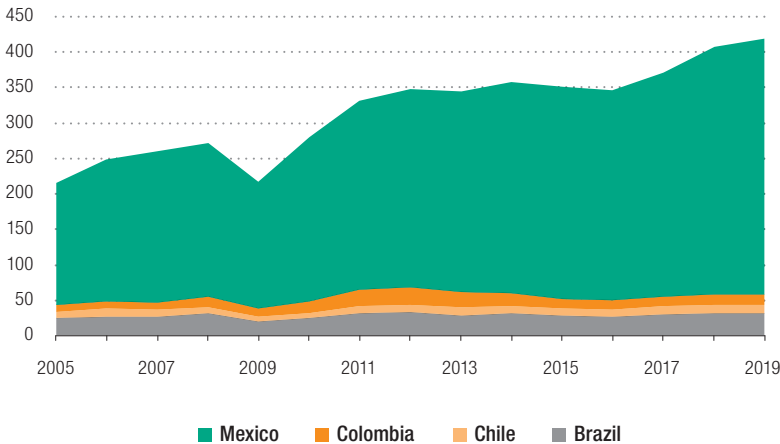
Source: Authors' elaboration based on OECD.Stat, BTDIxE, ISIC Rev. 4.

However, in a world dominated by internationally fragmented production processes, considering only gross imports would be misleading. International trade often consists of intermediate products that are further processed in the importing country and then eventually re-exported in a GVC. United States imports

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9   The European Union refers to the aggregate of the 27 member countries as of 2023.

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of intermediates from Latin America and the Caribbean countries exceeded those
from European Union countries, China and Canada for most of the last 15 years
(figure 2). However, they have been decreasing since 2012, differently from imports
from the European Union. For China, the moderate values relative to those of gross
imports might reflect the prevalence of assembled goods for final consumption.

Figure 2. United States intermediate goods imports from selected countries and regions, 2005–2019 (Billions of United States dollars)
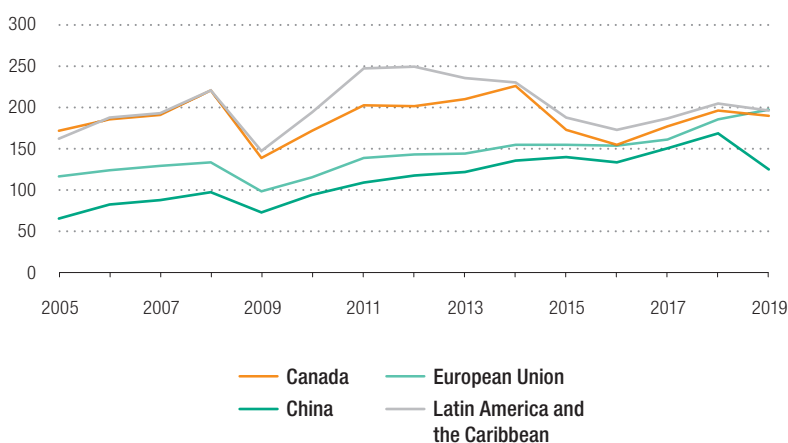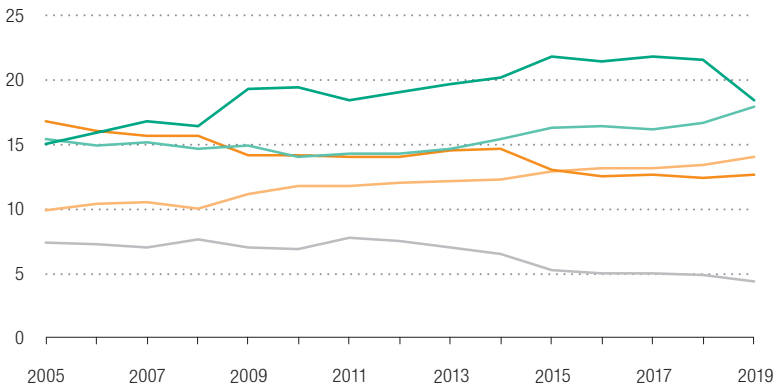

Source: Authors' elaboration based on OECD.Stat, BTDIxE, ISIC Rev. 4.
Note: European Union refers to the 27 member states of the European Union as of 2023.

With respect to the relative participation of individual countries from the region,
the figure mirrors that of gross imports (see figure 1). Mexico leads, followed
by Brazil, whose relative importance is rising. Looking at United States imports
from different regions as a share of total United States imports (figure 3), we can
observe that the contribution of Latin American and Caribbean countries has been
decreasing, especially after 2012, in terms of both gross final and intermediate
imports. That is, in 2019 these countries exported more value to the United States
than in 2005 (see figure 2), but they have not displaced other countries as United
States trading partners during this period. This figure appears to suggest that the
relocation of United States MNEs' activities to Latin America and the Caribbean,
i.e. nearshoring, has been limited, except for Mexico, whose share of United States
total gross imports rose from 10 to more than 14 per cent between 2005 and
2019, which could indicate some degree of backshoring. China was a growing
offshore destination until 2018, with a rapid fall since then (figure 3).

Figure 3. Shares of United States gross imports of final and intermediate goods from selected countries and regions, 2005–2019
(Percentage)

a. Gross imports

b. Intermediate imports

Legend:
- Canada
- China
- European Union
- Mexico
- Rest of Latin America and the Caribbean

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4.2 The share of United States domestic demand served by imports as a proxy for reshoring

Another way to explore possible evidence of reshoring by United States MNEs is to consider the evolution of the share of United States domestic demand served by imports.[10] Indeed, that share gives information on the relative relevance of other countries' production in satisfying final demand from the United States. For the hypothesis of greater backshoring to the United States to be supported, we should observe a reduction in overall imports over domestic demand, meaning that internal consumption is increasingly satisfied by domestic production (displacing foreign production carried out by either United States subsidiaries or foreign firms supplying United States MNEs). Alternatively, shifts in the shares of production carried out in different countries to serve United States demand would be a proxy for the relocation of MNE activities, and possibly for nearshoring.

Looking at the evidence, we observe that the share of United States domestic demand served by Canada (both gross and intermediate imports) declined substantially during 2005–2019, while the share served by the European Union remained stable (figure 4). Moreover, the share of United States domestic demand satisfied by foreign production does not show a substantial decline, at least in terms of gross imports, thereby not supporting the hypothesis of overall backshoring by United States MNEs. Particularly striking is the evolution of imports from China. The share of United States demand served by gross imports from China increased 40 per cent from the baseline year, and the share served by intermediate goods imports increased even more. Thus, China not only remains an important location for foreign activities of United States MNEs, but it is also possibly changing the quality of its contribution, moving from production based mainly on assembly of products to export of intermediate products to be further processed in the United States.

Conversely, the share of United States final demand served by gross final imports from Mexico rose about 30 per cent over the period but the share served by intermediate imports remained stable overall (see figure 4). This pattern, while providing some evidence to support the hypothesis of nearshoring to Mexico, also suggests that Mexico has become an increasingly important source of finished products to fulfil United States demand. This lends itself to different interpretations. On the one hand, it could hide an exacerbation of the negative aspects of the *maquila*, with rising exports from Mexico of final assembled products and possibly lower value added. On the other hand, the larger increase in gross exports relative to that of intermediate products might indicate an increase in the level of processing

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[10] In this exercise, we follow De Becker et al. (2016).

of Mexican products that serve the United States market and thus imply the opposite, with Mexico crafting more exported products, entering new stages of the value chain and adding more value. A definite answer would require more detailed data on trade in value added and GVC statistics.

In contrast to the trend in Mexico, United States gross and intermediate imports from all other Latin American and Caribbean countries fell about 40 per cent over the period, suggesting no evidence of relocation of activities of United States MNEs to those countries during 2005–2019.

Figure 4. Evolution in the share of United States imports as a percentage of domestic demand, 2005–2018 (Percentage, 2005 = 100)

a. Gross imports
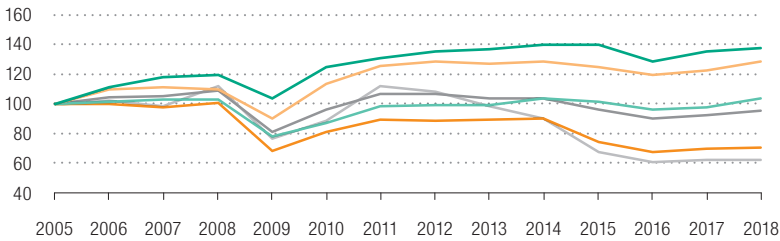
b. Intermediate imports
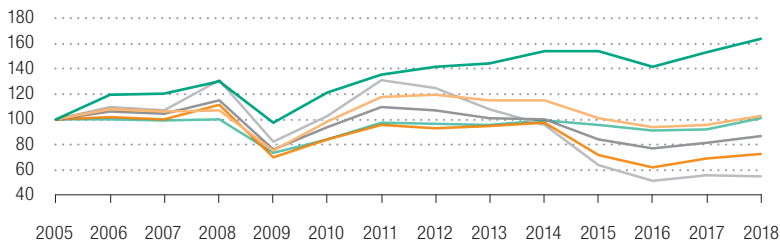
Legend:
- Canada
- Mexico
- China
- Rest of Latin America and the Caribbean
- European Union
- World

Note: European Union refers to the 27 member states of the European Union as of 2023.

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4.3 Fragmentation of production and trade in value added

In a world of fragmented international trade and GVCs, it is necessary to look at trade in value added (Baldwin and Lopez-Gonzalez, 2015), which we do in this section. First, we observe that, excluding intraregional trade, China, the United States, and the European Union are major destination countries of value added produced in Latin American and Caribbean countries. When comparing 2010 and 2019, we observe that while China doubled its share in the absorption of value added produced in the region, the United States did not lose its prominent position, and even expanded its role. This can reinforce the expectation that, despite the growing role of China, if nearshoring to the region is to occur, it is probable that it would involve United States companies. Moreover, we notice that although most of the value added produced in Latin America and the Caribbean is consumed in the region, the internationalization of these countries has been increasing during these years, with total value added consumed abroad increasing between 12 and 14 percentage points in all countries (figure 5).

Figure 5. Destination countries of value added produced in selected Latin America and Caribbean countries, 2010 and 2019

(Percentage of value added produced)
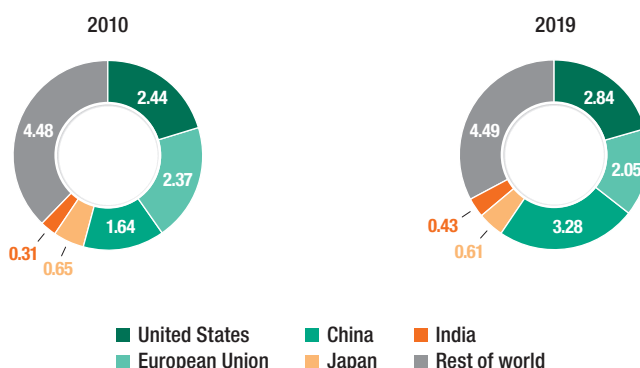
Source: Authors' elaboration based on OECD TiVA database, 2022 preliminary version.
Note: European Union refers to the 27 member states of the European Union as of 2023. Owing to data availability, the regional countries considered here are Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico and Peru.

When taking a closer look at different countries in Latin America, we find significant differences (figure 6). From Mexico and Costa Rica, the United States imports a significantly higher-than-average share of value added (over 17 and 9 per cent,

Figure 6. Foreign destination countries of value added produced in selected Latin America and Caribbean countries in 2019

(Percentage of value added produced)
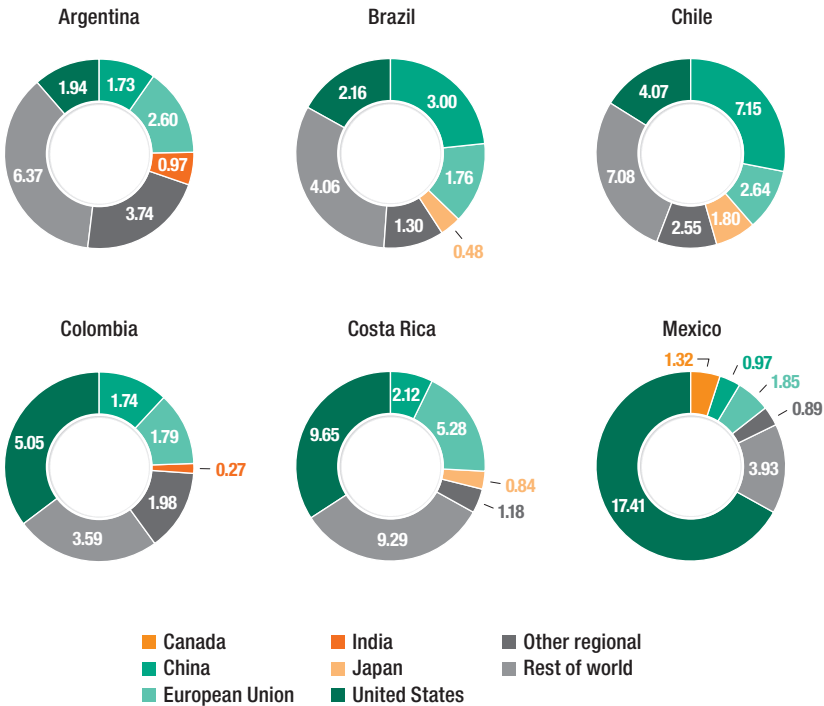
Source: Authors' elaboration based on OECD TiVA database, 2022 preliminary version.
Note: European Union refers to the 27 member states of the European Union as of 2023. Owing to data availability, the regional countries considered here are Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico and Peru.

respectively), whereas for countries in South America imports from other Latin American economies are particularly relevant. This finding is in line with the observation that in Latin America as a whole value chains are more global than regional, and that regional linkages are significantly more important in South America than in Central America (Cadestin et al., 2016; World Bank, 2020).

When taking the perspective of the United States – that is, when observing the source of foreign value added used to satisfy United States demand (figure 7) – we observe similar results as in the analysis of United States imports (see figure 4). The European Union, China and Canada, in that order, are the main foreign contributors to value added absorbed by the United States during the

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period observed. The increase in the consumption of Chinese-produced value added is astonishing, especially until 2015, when it plateaued and then declined, suggesting if not a tendency towards reshoring, at least a deceleration of offshoring practices. However, Latin American and Caribbean countries do not seem to have reaped the benefits of potential underlying relocations. Over the period, the main countries in the region have contributed only marginally, and the trend overall has been negative. Mexico has been a major player, but its share of value added in United States domestic demand has remained stable overall, suggesting that the increase in Mexican exports to the United States was not accompanied by an upgrade in Mexican production and providing little support to nearshoring hypotheses for the country so far.

Figure 7. Source of foreign value added serving United States domestic demand, 2005–2020 (Percentage)
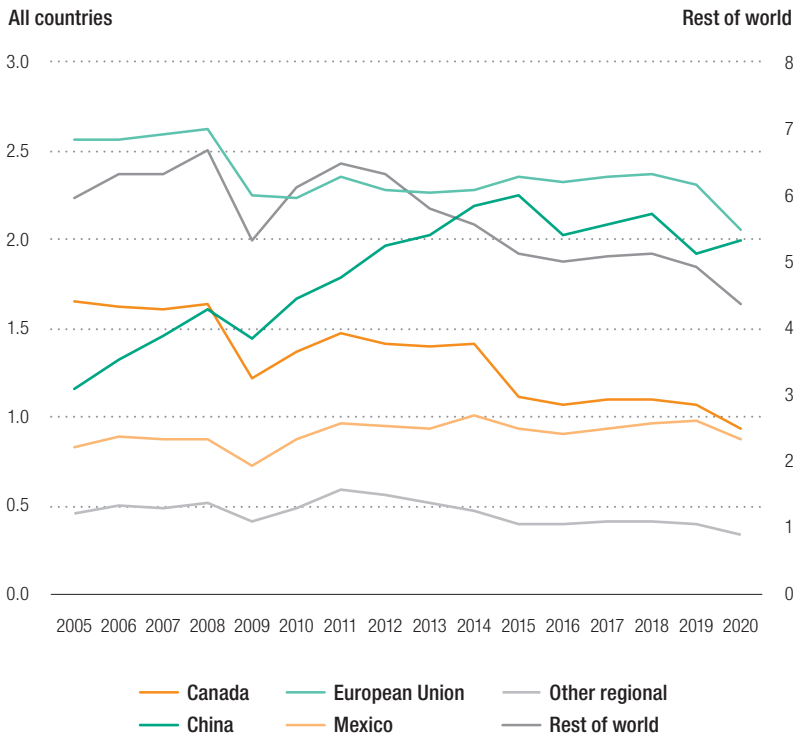
Source: Authors' elaboration based on OECD TiVA database, 2022 preliminary version.
Note: Owing to data availability, "Other regional" here refers to the six countries included in the TiVA data set (Argentina, Brazil, Chile, Colombia, Costa Rica and Peru); Mexico is shown separately.

5. How can developments in reshoring and nearshoring play out in Latin American and Caribbean countries? Reshoring readiness in the region

We have observed that reshoring and nearshoring practices are still rather limited in countries of the region. Can we expect that this trend may reverse soon? Are regional economies prepared for this event to occur?

As discussed in section 2, many factors contribute to determining MNEs' and lead firms' decisions about location and relocation. While some traditional determinants (e.g. costs) remain crucial, others are gaining importance due to technological changes and to new policies and contexts (Elia et al. 2021; Conley, 2022). Importantly, firm-level location decisions depend heavily on the macroeconomic and regulatory context and assets prevailing in each country, which determine the "reshoring readiness" of a country. In addition, these factors of attractiveness for reshoring are intertwined with the capacity of countries to maximize the possible benefits from nearshoring. In table 2 we analyse Latin American and Caribbean countries' reshoring readiness and compare it with the readiness of China and of the United States (appendix table).

Digitalization

One crucial element of the new scenario is digitalization. Indeed, the digitalization of production processes offers the potential to reduce the importance of costs in location decisions and changes the determinants of location attractiveness. According to the Digital Adoption Index, a composite measure of the digital technologies spread across the key agents in an economy – people, business and governments – the overall adoption of digital technologies in Latin American and Caribbean countries is 30 per cent lower than in the United States. Substantial differences are observed within the region, with some countries showing digital adoption at a level similar to or even higher than (i.e. Chile) that of the United States and other countries, particularly across Central America and the Caribbean, lagging behind (table 2). When decomposing the index across different user groups, it becomes evident that the business sector is the largest user of digital technologies and that such technologies are less widely adopted by governments and individuals. However, almost 65 per cent of the regional population regularly used the Internet in 2019, a proxy for the level of human capital in digitalization. Again, high heterogeneity prevails in the region. Central American countries and some South American ones, such as the Plurinational State of Bolivia, Guyana and Suriname, suffer from remarkable lags in the spread of digital technologies.

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Table 2. Indicators of reshoring readiness in South America, Central America and the Caribbean, China and the United States by domain

Country by region	Digitalization — Digital Adoption Index (0–1)	Human capital/digitalization — Individuals using the Internet (% of population)	Logistics — Logistics Performance Index (1–5)	Human capital — Human Capital Index (0–1)	Human capital — Upper secondary educational attainment (% of adult population)	Science, technology and innovation — R&D expenditure (% of GDP)	Science, technology and innovation — Researchers per million inhabitants (Number)	IPR protection — Intellectual property rights (0–10)	Risk — Resilience Index (0–100)	Proximity to markets — Remoteness Index (0–1)
South America										
Argentina	0.69	74.29	2.89	0.60	37.20	0.54[b]	1 192.23[b]	5.40	52.79	0.55
Bolivia (Plurinational State of)	0.48	43.83	2.36	..	18.60[d]	..	..	4.20	26.27	0.56
Brazil	0.68	67.47	2.99	0.55	30.90	1.26[a]	887.68[a]	6.16	52.21	0.51
Chile	0.76	82.33	3.32	0.65	37.10[b]	0.36[b]	493.29[a]	6.50	60.66	0.55
Colombia	0.64	65.01	2.94	0.60	28.50	0.24	88.02[b]	6.25	49.54	0.53
Ecuador	0.57	57.27	2.88	0.59	29.60[b]	0.44	399.49[a]	5.33	35.78	0.54
Guyana	0.36	37.33	2.36	0.50	..					0.48
Paraguay	0.54	68.52	2.78	0.53	24.10	0.15[b]	135.14[b]	3.83	41.54	0.57
Peru	0.55	59.95	2.69	0.61	36.10	0.13	..	4.92	44.02	0.56
Suriname	0.49	48.95			13.80[b]					0.48
Uruguay	0.76	76.95	2.69	0.60	17.10	0.48	696.38	4.91	63.50	0.53
Venezuela (Bolivarian Republic of)	0.49	72.00	2.23	..	26.50[c]	0.34[e]	300.26[c]	2.48	8.86	0.53
Central America and the Caribbean										
Antigua and Barbuda	0.48	76.00	..	0.60	50.00[f]					
Bahamas (the)	0.53	85.00	2.53	..	..				..	..
Barbados	0.65	81.76	..	..	..					0.43
Belize	0.40	47.08	..	..	19.40[f]					
Costa Rica	0.66	81.20	2.79	0.63	17.40	0.42[b]	380.41[b]	6.35	52.18	0.53
Cuba	0.24	61.84	2.20	..	26.70[b]					
Dominica	0.50	69.62	..	0.54	..					
Dominican Republic	0.50	74.82	2.66	0.50	26.10[c]		..	4.71	41.42	0.49
El Salvador	0.50	33.82	2.58	0.55	21.70[b]	0.18[b]	63.71[b]	4.36	28.44	0.53
Grenada	0.53	59.07	..	0.57	..					
Guatemala	0.52	65.00	2.41	0.46	16.30[e]	0.03[b]	14.01[b]	4.51	24.83	0.54

Table 2. Indicators of reshoring readiness in South America, Central America and the Caribbean, China and the United States by domain (Concluded)

Country by region	Digitalization: Digital Adoption Index (0–1)	Human capital/ digitalization: Individuals using the Internet (% of population)	Logistics: Logistics Performance Index (1–5)	Human capital: Human Capital Index (0–1)	Human capital: Upper secondary educational attainment (% of adult population)	Science, technology and innovation: R&D expenditure (% of GDP)	Science, technology and innovation: Researchers per million inhabitants (Number)	IPR protection: Intellectual property rights (0–10)	Risk: Resilience Index (0–100)	Proximity to markets: Remoteness Index (0–1)
Haiti	0.25	32.47	2.11	0.45	..	..	..	4.05	0.00	..
Honduras	0.43	31.70	2.60	0.48	13.20	0.04[b]	..	4.48	25.08	0.54
Jamaica	0.50	55.07	2.52	0.53	..	..	..	6.09	..	0.50
Mexico	0.60	70.07	3.05	0.61	19.20	0.31	315.26[c]	5.95	48.82	0.54
Nicaragua	0.46	27.86	..	0.51	..	0.11[d]	..	3.94	24.08	0.55
Panama	0.57	63.63	3.28	0.50	20.10[i]	0.15[b]	39.11[i]	5.38	49.18	0.50
St. Kitts and Nevis	0.53	80.71	..	0.59	..	..	..	..	..	..
St. Lucia	0.40	50.82	..	0.60	24.60[i]	..	..	..	..	..
St. Vincent and the Grenadines	0.50	22.39	..	0.53	32.80[b]	..	..	..	..	..
Trinidad and Tobago	0.59	77.33	2.42	0.60	43.60[h]	..	..	6.00	40.6	0.46
Averages, Latin America and the Caribbean, China and the United States										
Latin America and the Caribbean	0.52	64.29[a]	2.66	0.56	24.86	0.67	515.40[b]	5.04	38.49	0.52
China	0.59	54.30	3.61	0.65	13.50[i]	2.19	1 307.12	6.02	47.93	0.48
United States	0.75	87.27	3.89	0.70	44.60	2.84	4 412.40	8.69	90.30	0.41

Source: Authors' elaboration. See appendix table for the source and description of each indicator.

Note: Except as otherwise indicated, all data refer to the most recent available year of each data set. Data for Latin America and the Caribbean are drawn from the original source or calculated as the simple average of all countries in the region for which data are available.

a Data from 2018.
b Data from 2017.
c Data from 2016.
d Data from 2015.
e Data from 2014.
f Data from 2013.
g Data from 2012.
h Data from 2011.
i Data from 2010.

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Logistics and production costs

Initial miscalculation of the total costs of offshoring has been highlighted in the literature as a possible driver of the early processes of offshoring. The costs of management, logistical and operational problems related to offshoring started to be assessed more carefully recently. We use the Logistic Performance Index, a composite indicator ranging between 1 and 5, to assess the comparative logistic performance of Latin American and Caribbean countries based on six dimensions: the efficiency of the customs clearance process, the quality of trade- and transport-related infrastructure, the ease of arranging competitively priced shipments, the quality of logistics services, the ability to track and trace consignments, and the frequency with which shipments reach the consignee within the scheduled time. The overall indicator places these countries in a mid-table, unfavourable position. Only Chile and Panama, and to a lesser extent Mexico and Brazil – in this order – have logistic performances competitive with those of China and the United States. As supply-chain-related operational factors gain more relevance in location decisions, improving the quality of infrastructure and logistic services as well as transport efficiency in the region will become increasingly important for maintaining competitiveness in international production networks.

Human capital and science, technology and innovation systems

The co-location of research and productive activities has been considered an important factor to enable virtuous user-producer relations and beneficial feedbacks for innovation (Pisano and Shih, 2009). The literature on reshoring studies such co-location as a possible determinant of backshoring practices, as advanced countries' MNEs might want to reunite the research and development (R&D) and production stages of the value chain at home (De Backer et al., 2016). The need for advanced capabilities to employ in this knowledge-intensive stage of the value chain, together with the fear of losing the exclusiveness of specific expertise – particularly in countries with low levels of IPR protection – has motivated the belief that these circumstances would favour backshoring rather than nearshoring practices. However, as some few successful experiences demonstrate (e.g. Intel in Costa Rica), countries that can offer a substantial supply of highly skilled and cheaper human capital are in a better position to compete for the attraction of high-value, knowledge-intensive activities.

The Human Capital Index, calculated by the World Bank to measure the productivity of a future worker based on his or her health and education, is lower in Latin American and Caribbean countries than in other advanced countries, but at a level comparable with that of China. In some countries in South America, particularly Argentina, Chile and Peru, and to a lesser extent Brazil, a significant share of the adult population has completed upper secondary education. Thus, some countries in the region offer reasonable numbers of skilled and specialized workers.

Not only might countries supply trained and educated workers to be employed in foreign-owned R&D activities, but they can themselves also be home to scientific research that could attract higher-value segments of production. However, when analysing data on R&D expenditure as a percentage of gross domestic product, we find that in Latin American and Caribbean countries this share is only 30 per cent of that of China, and 23 per cent of that of the United States. In the region, Brazil is the only significant exception, with a share of 1.26 per cent in 2017.

Data on researchers per million inhabitants confirm this perception, as in Latin American and Caribbean countries the number is about one tenth that in the United States and less than half that in China. Relevant exceptions are Argentina, Brazil and Uruguay. Central American countries and even Mexico lag substantially behind. If the region wants to become competitive in higher-value segments of production and leverage the increasingly recognized importance of rebundling research with production activities, future policies should focus on strengthening science, technology and innovation systems in the region.

Intellectual property rights

Another factor of concern that can limit the attraction of knowledge-intensive segments of production is the weakness of IPR. This factor is highly controversial. If on the one hand IPR security can be a stimulus to private business research, on the other it can also limit the diffusion and spillover of innovation to the wider economy. In an index ranging from 0 to 10, IPR protection is given an average score of 5 in the region. Brazil, Chile and Colombia, followed by Jamaica, Costa Rica and Trinidad and Tobago, rank the highest. Yet most countries in the region are considered to insufficiently enforce IPR protection, and this may discourage MNEs from the United States and the European Union from relocating some activities to the region. Argentina, Brazil and Ecuador are included in the third group of countries of the European Union's special attention list ("priority watch") but considered more reliable than China and India, which are in the priority 1 and priority 2 lists respectively (European Commission, 2020). Conversely, the United States considers Argentina, the Bolivarian Republic of Venezuela and Chile to be as dangerous as the two Asian countries and includes them in the priority watch list; 10 other Latin American and Caribbean countries are also on their watch list (Office of the United States Trade Representative, 2020). Ultimately, while some IPR protection should be guaranteed to earn the trust of MNEs, if a country offers other elements of attractiveness, a moderate level of IPR protection might not hinder relocations. Indeed, the low level of IPR protection in China and India, as in other Asian countries, has not prevented offshoring to these countries, where other substantial advantages prevail.

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Risk and resilience

Resilience became a much used and eventually abused term during the recent pandemic. What is certainly true is that reducing the risk related to disruptions and improving the capacity to speed up the resumption of operations after shocks have both gained priority in international business planning. As firms look for increasingly reliable locations for their foreign production, a resilience index that provides an indication of the ability of a country's enterprises to recover after disruptive events gives a good measure of the attractiveness of that country. The resilience index calculated by FM Global (see table 2) is based on 12 core drivers pertaining to economic, risk quality and supply chain factors. On its scale of 0–100, Latin American and Caribbean countries score 38.5 on average. This score is substantially lower than that of the United States (90.3) and also of China (47.9). However, many individual countries perform significantly better, notably Uruguay, Chile, Argentina, Brazil, Costa Rica, Colombia and Panama , in that order.

The main weakness of the region appears to be related to the risk quality score. The inherent degree of countries' exposure to natural hazards makes Latin America and the Caribbean more vulnerable than other regions. Yet, better quality and enforcement of building codes and standards may reduce vulnerability. Finally, on supply-chain-related factors, while not the main cause of weakness, countries in the region score substantially below China. As noted earlier, improving the efficiency of logistics may usefully interact with risk and resilience considerations to enhance a country's attractiveness to foreign investors.

Flexibility and proximity to markets

The level of flexibility and proximity to the market offered by alternative locations has become an increasingly relevant factor in shoring decisions. To improve flexibility and reduce the lead times of products to final consumers, several European firms have already nearshored from China to Eastern Europe or directly backshored at home.[11] As most Latin American and Caribbean countries are not geographically close to many other countries, the majority of the region would in principle lack this attractiveness factor. Yet, in the highly globalized world where new technologies connect people and countries regardless of geographical distance, the concept of proximity to markets becomes more nuanced. While geographical distance surely matters in influencing lead times and agility of transport, digitalization adoption and logistic capabilities can substantially affect the perceived flexibility of operations and proximity to markets (Sturgeon et al., 2017).

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[11] Eurofound (European Foundation for the Improvement of Living and Working Conditions), "European Reshoring Monitor", https://reshoring.eurofound.europa.eu (accessed on 20 December 2022).

The remoteness index in table 2 measures this expanded concept of distance and includes – other than geographical proximity – broadband capacity, logistics capabilities and time required for trading across borders. According to the index, the proximity of Latin American and Caribbean countries to other markets is lower than that of the United States but, overall, close to that of China. Ultimately, while geographical distance might hinder relocations, particularly in those sectors where distance acquires particular importance, the distance of countries in the region from other markets does not seem to be insurmountable. Investments to improve logistics, infrastructure and adoption of new technology could certainly help.

In sum, our preliminary analysis suggests that the reshoring readiness of Latin America and the Caribbean is still limited. Many areas of weakness remain, from the diffusion of digital technologies to the quality of logistics infrastructure and of innovation systems.

6. Conclusions. What possible framework for public policies?

In this paper we discussed the emerging trend of reshoring of international production, focusing on the current and likely dynamics of nearshoring to Latin American and Caribbean countries. We reviewed the different approaches of the literature to these phenomena, the driving forces and the implications for GVC reconfigurations. We analysed trade and value added to conclude that nearshoring to the region is still occurring to a limited extent. Finally, we proposed a measure of the reshoring readiness of the region, to highlight the areas of major strength and weakness in attracting and benefitting from relocations.

Our study reveals that very limited nearshoring of United States firms to Latin American and Caribbean countries has occurred so far. Although the region is not displacing others in this regard, Mexico is a relevant exception. Yet even though Mexico is gaining importance in terms of gross and intermediate imports to the United States, the analysis of trade in value added reveals that no major upgrading in Mexican production appears to be occurring. Moreover, given that the region, and particularly South America, is not near other, more advanced regions, nearshoring by MNEs from the United States or from other developed countries still appears to have limited potential.

In terms of reshoring readiness, Latin America and the Caribbean still suffers from substantial areas of weakness, from the diffusion of digital technologies to the quality of logistics infrastructure and innovation systems. The results of this analysis point to policy areas that clearly deserve attention. Logistics infrastructure needs to be improved in many countries, including digital infrastructure and the skills to access and adopt such technologies. In most countries, the science and technology systems also need to be strengthened to increase the attractiveness

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of the region as potential backshoring destinations. However, the policy reach should extend beyond the level of individual countries. In this sense, the deeper regional integration in South America could be leveraged. Strengthening of regional value chains could be a viable alternative to increase international production ties and stimulate the internationalization of local suppliers. In this regard, international policy coordination would certainly be desirable, for better harmonized standards and regulations.

This study inevitably suffers from some limitations due to the paucity of firm-level and industry-level data available on the shoring phenomenon, as well as to the boundaries of the shoring phenomenon, which is in a continuous process of being redefined and changed. Future research will need to build new empirical evidence on firm-level sourcing and shoring decisions, explore the implications that current geopolitical developments and technological changes could have on shoring processes, and explore the different levels of policymaking available.

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Appendix

Appendix table: Attractiveness indicators description and data sources				
Variable	**Domain**	**Description**	**Source**	**Year**
Digital Adoption Index	Digitalization	A composite index that measures the extent of spread of digital technologies. It is based on three sectoral sub-indices to measure digital technology adoption by the key agents in an economy: people, businesses (firms) and governments.	World Bank, https://data.worldbank.org	2016
Individuals using the Internet	Human capital/ digitalization	Individuals who have used the Internet (from any location) in the preceding three months. The Internet can be used through a computer, mobile phone, personal digital assistant, games machine, digital TV or other device.	International Telecommunication Union (ITU), www.itu.int/en/ITUD/Statistics	2019
Logistics Performance Index	Logistics	Reflects perceptions of a country's logistics on the basis of six dimensions: efficiency of customs clearance process, quality of trade- and transport-related infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track and trace consignments, and frequency with which shipments reach the consignee within the scheduled time.	World Bank and Turku School of Economics, Logistic Performance Index Surveys	2018
Human Capital Index (HCI)	Human capital	Calculates the contributions of health and education to worker productivity. The score measures the productivity of a future worker or child born today relative to the benchmark of full health and complete education.	World Bank, https://data.worldbank.org	2020
Upper secondary educational attainment	Human capital	Refers to the highest level of education that an individual has completed. The percentage of the adult (25 years or older) population that completed upper secondary education is the percentage of adults who completed higher-level education to prepare for tertiary education or obtain specialized skills relevant to employment.	UNESCO (UIS), http://data.uis.unesco.org	2018
Research and development expenditure	Science, technology and innovation	The total intramural expenditure on gross domestic product in the national territory during a specific reference period expressed as a percentage of the gross domestic product of the national territory.	UNESCO (UIS), http://data.uis.unesco.org	2018

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Appendix table: Attractiveness indicators description and data sources (Concluded)

Variable	Domain	Description	Source	Year
Researchers per million inhabitants	Science, technology and innovation	Number of professionals engaged in the conception or creation of new knowledge (who conduct research and improve or develop concepts, theories, models, techniques instrumentation, software or operational methods) during a given year expressed as a proportion of a population of one million.	UNESCO (UIS), http://data.uis.unesco.org	2018
Intellectual Property Rights	IPR protection	Calculated from three components: intellectual property rights protection, patent protection and copyright piracy. Data related to intellectual property rights protection are drawn from the WEF Executive Opinion Survey. Data related to patent protection are drawn from the Patent Rights Index, and information about copyright piracy is derived from the BSA Global Software Survey.	Property Rights Alliance, www.propertyrightsalliance.org	2020
Resilience Index	Risk	Summary measure of resilience that provides an indication of countries' relative firm resilience to disruptive events. The overall index is a composite measure including three major kinds of factors: economic (productivity, political risk, oil intensity and urbanization rate), risk quality (exposure to natural hazards, natural hazards risk quality, fire risk quality, cyber risk) and supply chain (control of corruption, quality of infrastructure, corporate governance and supply chain visibility).	FM Global, www.fmglobal.com	2020
Remoteness Index (RI)	Proximity to markets	Measure of remoteness incorporating both geographical distance and an expanded measure of distance that includes broadband capacity, logistic capabilities and time required in trading across borders.	Sturgeon et al. (2017)	2015

Source: Authors' compilation.

The United Kingdom Modern Slavery Act: Are we making progress? A look at organizational commitment to eradicating modern slavery*

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Abstract

This study examines the effect of regulatory outreach actions on modern slavery statements by the United Kingdom. More than 30,000 policy entries in the United Kingdom Modern Slavery Compliance Registry from 2020 to 2022 were reviewed using analysis of variance and multiple regression to determine predictors of policy statement robustness. The results reveal that policies have become more robust following regulatory efforts. Private conglomerate groups, which can include multinational corporations, are the largest publishers to the registry. However, the role of the chief executive officer as the authority approving the statements has diminished in impact, while company turnover has emerged as a more reliable predictor of impact. Furthermore, the presence of International Labour Organization indicators in the policy statement shows that concern for child-related issues can vary depending on the geographical focus of risk, but that it does not predict a focus on women. The steady improvement in the robustness of modern slavery policies signals some progress following regulator outreach.

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1. Introduction

The International Labour Organization (ILO) estimated that 27.6 million people were living in modern slavery in 2021, despite criminalization of the practice under international law and universal condemnation of it as unethical (Crane, 2013). There is no formal legal definition of modern slavery, but the term generally refers to "situations of exploitation that a person cannot refuse or leave" (ILO et al., 2022, p. 2). This encompasses various exploitative practices such as forced labour, debt bondage, chattel slavery, serfdom, trafficking of children and adults, forced marriage, child soldiers, and domestic servitude (Oxfam and Kalayaan, 2008). The 2012 Bellagio-Harvard Guidelines on the Legal Parameters of Slavery extended the definition of slavery in Article 1(1) of the 1926 Slavery Convention: "the status or condition of a person over whom any or all the powers attaching to the right of ownership are exercised." The guidelines further elaborate this definition by considering the exercise of powers attaching to the right of ownership as "constituting control over a person in such a way as to significantly deprive that person of his or her individual liberty, with the intent of exploitation through the use, management, profit, transfer, or disposal of that person. Usually, this exercise will be supported by and obtained through means such as violent force, deception and/or coercion" (Mende, 2019, p. 232). The global community, under the umbrella of the United Nations Sustainable Development Goals (SDGs), has committed to eradicate modern slavery by 2025 for children and by 2030 universally. The pledge includes taking "immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour" (SDG Target 8.7).

Despite these pledges and public focus, multinational corporations (MNCs) still report limited understanding of modern slavery and their role in its eradication (Robb and Michailova, 2023). This understanding differs significantly based on the firm's context such as the jurisdiction, the industry and the complexity of a company's supply chain (Robb and Michailova, 2023).

Within management research, discussions about modern slavery are often found in the context of the supply chain, where slavery is used to underprice labour through illegitimate means (Crane, 2013). In 2015, the United Kingdom took the lead in fighting modern slavery by introducing the United Kingdom Modern Slavery Act, the first law of its kind (Flynn and Walker, 2020). A key provision of the law is the Transparency in Supply Chain (TISC) clause, designed to expose supply chain practices to public scrutiny and thereby pressure firms to take proactive measures against modern slavery risks (Birkey et al., 2018). This provision is the only part of the law to address private companies (Cousins et al., 2020). Specifically, the law requires that all businesses that do business in the United Kingdom that have a total annual turnover of £36 million or more prepare and make public a statement

outlining the measures they have taken to ensure that slavery and human trafficking are not occurring within their supply chain (Flynn and Walker, 2020). The statement must describe "the steps the organization has taken during the financial year to ensure that slavery and human trafficking is not taking place in any of its supply chains, and in any part of its own business" (United Kingdom Modern Slavery Act, Part 6.4). Notably, while the act requires organizations to publish a statement with the steps, if any, they have taken to prevent modern slavery within their business, it does not require organizations to enact an anti-modern slavery strategy.

In December 2017, the National Audit Office issued a report critically assessing the response of the United Kingdom to modern slavery, specifically criticizing it for lack of accountability, insufficient oversight and scarce prosecutions (Mantouvalou, 2018). Despite these criticisms, the TISC clause promulgated by the United Kingdom in the act provides an excellent framework for studying modern slavery reporting in the organizational context. As Pinnington et al. (2023) point out, the United Kingdom has established a unique combination of mandatory annual reporting, comprehensive reporting guidance, inclusivity of all businesses (including non-governmental organizations, as well as business-to-business, business-to-consumer and business-to-government entities), and several years of compulsory reporting, enabling firms to develop best practices through multiple reporting cycles.

Prior research by Flynn and Walker (2020) reviewed modern slavery statements of United Kingdom firms in 2016, one year after the implementation of the 2015 act. Their model focused on coercive, mimetic and normative influences and provided strong evidence that institutional theory accounts for organizational responses to TISC. However, their study did not attempt to assess the *level of commitment* or utilize TISC statements to predict which actions are most likely in specific types of firms (i.e. firm size, CEO's role). We introduce upper echelons theory to further understand organizational commitment to eliminating modern slavery. Specifically, we examine how the CEO's direct involvement influences organizational commitment to achieving SDG 8 targets and the robustness of the firms' policy statements. We determine robustness based on the comprehensiveness of the modern slavery policy, specifically the number of suggested and optional policy areas addressed in the registry submission.

Our research examines over 30,000 statements submitted to the United Kingdom Modern Slavery Compliance Registry from 2020 through 2022 to determine the progress that organizations based in the country are making in improving policies aimed at eradicating modern slavery and achieving the SDG targets related to forced labour. In addition, we investigate the role of the CEO as the approving authority. We seek to answer the following question: what effect have regulatory actions had on compliance with policy development and robustness, particularly with a focus on vulnerable populations? The remainder of the paper proceeds as follows.

The next section reviews the literature on modern slavery in the context of strategic management and institutional theory and develops our hypotheses. Then, we describe our methods and explain our data sources and analytical details. Finally, we discuss our findings and their implications.

2. Background and hypothesis development

Unlike the slave trade of the past, modern slavery is less about owning people and more about using individuals as tools for generating profit. It is estimated that slavery generates $150 billion in profits annually (Themis International Services, 2021). In the United Kingdom alone, an estimated 136,000 individuals are living in conditions of modern slavery (Themis International Services, 2021).

Studies on supply chain management have closely examined the subject of modern slavery, yet this lens has focused on deficiencies in labour markets and is constrained by its reliance on measurable and observable data about transparent supply chain actions. Consequently, it may overlook unseen or unreported factors (Caruana et al., 2021; Crane, 2013; Geng et al., 2022). Strategic management theory can provide more potential forms of explaining management behaviour and the potential influence of the top management team on developing policies (Caruana et al., 2021).

The strategic management literature has examined modern slavery through the lens of institutional theory. It posits that the behaviour and development of an organization are significantly influenced by the norms, values and rules of the environment in which it operates (DiMaggio and Powell, 1983; Scott, 2001). This process is characterized by three primary mechanisms: coercive (regulatory), mimetic (cultural-cognitive and isomorphic) and normative pressures (DiMaggio and Powell, 1983; Scott, 2001). These pressures influence firms to focus on CSR initiatives and signal their work through their policies (Flynn and Walker, 2020). Economic-based arguments framed in institutional theory focus on formal control systems and coercive pressures, which arise from legal and regulatory requirements as varied as punitive sanctions and use of force, or positive incentives. The Modern Slavery Act, which mandates companies to publish an annual statement detailing their efforts to combat modern slavery in their supply chains, is an illustration of coercive influences by government regulators.

Organizational isomorphism, or similarity of behaviour, also facilitates regulatory endorsements of the firm and its legitimacy (Deephouse, 1996). Mimetic pressures result from market ambiguity and environmental uncertainties, leading organizations to mimic the practices of successful or legitimate firms in the field (Deephouse, 1996). Normative pressures are associated with societal expectations and cultural norms, which could drive companies to take voluntary actions to combat modern slavery beyond merely obeying the law.

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Prior research has used the institutional theory framework to examine regulatory effects related to modern slavery (Birkey et al., 2018; Flynn and Walker, 2020; Islam and Van Staden, 2021; Stevenson and Cole, 2018). In their review of modern slavery disclosure statements, Flynn and Walker (2020) discovered that of firms listed on the Financial Times Stock Exchange, the top 100 are more likely to make changes in most aspects of structure, policy and practice than the next 250 firms in response to these pressures. They also found correlations between adherence to international human rights accords and the presence of human rights policies. Furthermore, participation in a multi-stakeholder initiative is associated with the establishment of a modern slavery working or steering group. Flynn and Walker (2020) suggest that structural, policy and practice responses contained in these statements signal compliance with these institutional pressures. Previous research has also confirmed that firm size, high supply chain risk and prior reporting are correlated with disclosure statements (Birkey et al., 2018).

Despite the various institutional pressures, there is evidence to suggest that organizations may not always respond effectively to regulatory action. This was highlighted in 2022 when the Financial Reporting Council reported that one in ten United Kingdom organizations failed to comply with the Modern Slavery Act's requirement to publish an annual slavery statement.[1] Furthermore, one in three organizations that did publish a statement provided one of poor quality, suggesting potential gaps in effectively translating coercive and mimetic pressures into meaningful organizational actions. This could be mitigated by more active intervention from the regulatory bodies. An increased level of compliance activity from regulators may serve to amplify the coercive pressures on organizations, thereby improving compliance rates with the Modern Slavery Act and improving robustness of policies to combat modern slavery.

Hypothesis 1 – Active outreach by the regulator will result in greater submission compliance and more robust policies.

Although institutional theory provides a framework for understanding how firms adapt to gain legitimacy, it overlooks the significance of individual agency in shaping action. Therefore, intra-organizational dynamics deserve consideration (Greenwood and Hinings, 1996). We propose that upper-echelon theory, a relatively unexplored factor in this context, is crucial for understanding how institutional pressures shape modern slavery disclosure statements. Upper-echelon theory posits that the personalities, values and experiences of executives play a pivotal role in shaping

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[1] Alice Lepeuple, "New anti-modern slavery bill unlikely to accomplish goals", WilmerHale W.I.R.E. (White Collar, Investigations and Regulatory Enforcement) UK, 10 June 2022, www.wilmerhale.com/en/insights/blogs/WilmerHale-W-I-R-E-UK/20220610-new-anti-modern-slavery-bill-unlikely-to-accomplish-goals.

their interpretation of situations, subsequently influencing their decisions (Hambrick, 2007; Hambrick and Mason, 1984). It is often the top management team and other members of the dominant coalition who have the most power and influence over an organization's decisions (Cyert and March, 1963).

The CEO in particular may provide guidance that improves sense-making and decision-making processes, aligning them with the empathy and emotions connected to social causes (König et al., 2018). Bendoly et al. (2021) suggest that leadership involvement in sustainability initiatives may stem from competency in stewardship. Furthermore, Everaert et al. (2019) demonstrated that a CEO's ethical ideology influences their stakeholder-centered logic, which could restrict disclosure related to corporate social responsibility (CSR) activities. When a CEO's managerial discretion is high, their values can greatly influence CSR disclosures (Everaert et al., 2019).

The Modern Slavery Act provides a unique perspective for examining leader accountability in policy decisions. Under the law, these statements must be approved by the board of directors and signed by at least one director. In June 2021, an amendment to the law was proposed that includes criminal penalties for individual signatories who approved false or incomplete information, and for those continuing to source from supplies lacking transparency. These potential penalties include up to two years of prison time and up to £20 million in fines.[2] The personal signature requirement presents a unique opportunity to investigate the role of CEOs in modern slavery statements. Considering the threat of personal criminal and financial liability, CEOs who are willing to be personally accountable for the firm's account will have greater confidence in the accuracy of their policy statements and the firm's ability to adhere to proposed commitments. As such, these CEOs could be more inclined to ensure rigorous internal practices and supply chain transparency.

> *Hypothesis 2 – Firms with CEO accountability for the modern slavery statement will exhibit a more comprehensive modern slavery policy.*

Birkey et al. (2018) found that while numerous stakeholder groups desire enhanced transparency to ensure an ethical supply chain, many investors are wary of potential costs. These conflicting pressures have curtailed transparency in modern slavery statements, resulting in disclosures that are more "symbolic than substantive" (p. 24). Birkey et al. (2018) proposed that managerial apprehension about the disclosure of substantial risks may alarm investors. They found that

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[2] Kwame Taylor, "Strengthening corporate accountability through the Modern Slavery Act", 1 September 2021, https://sancroft.com/2021/09/01/strengthening-corporate-accountability-through-the-modern-slavery-act; Shoosmiths, "Corporate liability is on the horizon for breach of the Modern Slavery Act", www.shoosmiths.com (accessed 31 January 2023).

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investor reactions to legislative events requiring supply chain transparency have been negative, particularly for firms facing significant threats to their legitimacy from social and political exposure. However, this analysis focused largely on public companies.

More recent analysis indicates a possible shift in attitudes toward risk disclosure. A qualitative analysis of modern slavery statements of several United Kingdom hotel companies revealed significant efforts to increase awareness of training programs and due diligence processes (Jones and Comfort, 2021). In examining more than eight public events leading up to the adoption of the Modern Slavery Act, Cousins et al. (2020) found no evidence of significant abnormal impacts on stock prices. Furthermore, they found that the TISC provisions of the Modern Slavery Act may provide a competitive advantage to firms that have a demonstrated track record of addressing slavery risk, as those firms with a history of recent social incidents had more incidents of negative stock price reactions. Favourable reaction to good track records of compliance with the act may be an incentive for firms to comply with disclosure and reporting requirements (Cousins et al., 2020). Disclosures may lead to additional costs that could present a large burden for firms with lower turnover. Disclosure costs could take the form of proprietary costs, political costs and direct costs associated with drafting the compliance statements themselves (Cousins et al., 2020).

At present, most firms submitting statements to the registry are private companies. This situation provides an opportunity to examine whether drivers of behaviour that are not influenced by investor market demands and regulatory cost exposure also result in the same level of risk aversion and less comprehensive policies. Furthermore, the role of company size, determined by turnover, in shaping compliance behaviours could also be critical. Firms with larger turnover might have more resources at their disposal to absorb increased costs (Dias et al., 2017), allowing them to invest more in compliance efforts and to develop more robust policies to combat modern slavery.

> *Hypothesis 3 – Firms with larger turnover will have more robust levels of modern slavery policy compliance.*

In addition to the role of the CEO, the robustness of the organization's response to modern slavery issues may serve as an indicator of whether more comprehensive policies are addressing the complex issues associated with the supply chain and modern slavery. The United Kingdom Modern Slavery Compliance Registry, for example, encourages organizations to submit additional areas of identified risk, including affected groups and whether their statements have taken the extra step to identify and address indicators of forced labour. Deeply ingrained issues involving migrant workers characterize the labour force in several industries. The 2000 United Nations Convention Against Transnational Organized Crime's

Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, was a significant policy change that recognized the movement or trafficking of individuals as inherently connected to the modern conceptualization of slavery (Broad and Turnbull, 2019). Subsequent policies, such as the Asylum and Immigration Act of 2004 and the Council of Europe Convention on Action against Trafficking in Human Beings of 2008, have focused on issues of trafficking and forced labour, showing a heightened awareness of these issues in the legal and institutional environments. A 2017 report by the United Kingdom Home Office indicates a progressive increase in cases of modern slavery in the country since 2009; 2016 data shows more than 3,800 victims, of which one third were children (Cooper et al., 2017). Only 25 per cent of the reported cases came from nationals – however, of that group, the majority were children (75 per cent) – and 75 per cent of the total cases were reported from countries outside the European Economic Area, with the most common form of exploitation of adults being exploitive labour (Cooper et al., 2017).

"Slavery – antebellum and modern – was and is still driven by demand for cheap [labour] in supply chains, where a constant search for progressively lower costs and new sources of revenue has all too often led to forced [labour], debt bondage, unethical [labour] brokering, and other forms of [labour] exploitation," according to Baderschneider and Friedman (2021, p. 102). Global consumer demand and market competition have intricately woven dependencies in global supply chains and sources of labour from those who can be exploited. Therefore, issues of forced and slave labour within the United Kingdom extend far beyond the country's borders. For example, over 80 per cent of cotton in United Kingdom originates in the Xinjiang region of China, a region fraught with allegations of human rights abuses of the Uyghur Muslim population.[3] Even looking domestically, "...the [United Kingdom] is primarily a destination country for victims of human trafficking," according to Cooper et al. (2017, p.12), with recruitment occurring outside of the United Kingdom and victims who are looking for job opportunities. In this context, the geographical location of risk becomes crucial in shaping an organization's modern slavery policies and responses.

Against this backdrop, the Government of the United Kingdom attempted additional coercive actions and announced new financial penalties in 2021 for organizations found to be in violation of the Modern Slavery Act and complicit in perpetuating abuses within their supply chains.[4] Despite the country's exit from the European Union, it is still part of the broader context of trans-European trade focused on addressing human rights issues in industries such as forestry, ecosystem risk commodities

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[3] Thomas Reuters Foundation, "Uyghur group sues UK government over 'slave labour' cotton", 28 October 2022, www.eco-business.com.
[4] United Kingdom Government, "UK government announces business measures of Xinjian human rights abuses", Press release, 12 January 2021, www.gov.uk/government/news.

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and garments, and in mandating due diligence (European Parliament, 2021). The European Union has also proposed a ban on importing any products made with forced labour.[5]

These regulatory actions signal that United Kingdom organizations must take actions and demonstrate transparency in how they are designing policies and implementing procedures to address labour conditions. SDG Target 8.7 sets an ambitious goal of eradicating forced child labour by 2025 and in other vulnerable populations by 2030, while SDG 8.8 aims to protect the labour rights of migrants and women. However, supply chains are complex, with risks of forced labour being present many tiers down or distanced by third-party contractors (Baderschneider and Friedman, 2021).

The United Kingdom Modern Slavery Compliance Registry also allows organizations to indicate whether their policy aligns with ILO statements, identify risk locations – countries within the firm's supply chain where human rights are limited or where the firm has other indications that a threat of modern slavery exists – and specify which vulnerable populations are at risk. This creates a unique opportunity to examine the relationship between the organization's commitment to ILO standards and the vulnerable groups that their supply chains affect.

> *Hypothesis 4a - The presence of ILO statements in a firm's policies will predict its focus on risks to women and children as vulnerable populations.*

An organization's response to regulation can vary by the countries in which they do business and those countries' differences from their home environment. The literature has provided mixed evidence as to whether a host country regulatory environment that differs drastically from the home environment creates more uncertainty and, therefore, less foreign investment in those locations (Dias et al., 2017). Formal governmental regulatory actions, and especially imperfections in regulatory processes, can be a larger source of hazards for multinational organizations than societal and cultural factors changing their levels of foreign direct investment (Slangen and Beugelsdijk, 2010). But the organization's focus of attention on policy matters can also vary by the prevalence of public scrutiny and media coverage in the country in which they are doing business (Geng et al., 2022). As such, the locations in which the firm focuses on labour standards may influence their orientation to these vulnerable groups, where some may be of more concern in the host country.

> *Hypothesis 4b – Risk location will moderate the relationship between ILO statements and focus on vulnerable populations.*

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[5] Philip Blenkinsop, "EU proposes banning products made with forced labor", 14 September 2022, www.reuters.com.

3. Method

3.1 Data sample

The Government of the United Kingdom's Modern Slavery Compliance Registry publicly lists modern slavery statements that have been voluntarily submitted for regulatory monitoring. Although submissions are optional, the law mandates every company to publicly publish a modern slavery statement on its website. Organizations typically report for a 12-month period from April to March, with a deadline of September 30 to publish their statements.[6]

Our study analyzes the policy statements submitted from United Kingdom companies for the years from 2020 through 2022. As reported by Cordery, a United Kingdom law firm, the Government requested 15,824 organizations to submit their modern slavery statements to the registry in 2021. This figure stands against the backdrop of more than 4 million companies registered.[7] This governmental request seems to have catalysed a notable surge in registered statements. Interestingly, the number of submitted statements declined considerably after this legislative push, an observation that aligns with the propositions of institutional theory on regulatory forces.

Over the three years, 30,849 observations were recorded, representing a mix of submissions from individual firms as well as conglomerate groups (here referred to as group submissions) (table 1). Conglomerate submissions, denoting each submission from subordinate firms within the group, were logged individually, marking whether the observations belonged to a group. We accessed the data in January 2023 and categorized the data on the basis of features of the statement, as well as by additional explanatory text. In the collected data set, the registry submissions for 2021 statements ($n = 14,989$, 48.6 per cent) significantly outnumbered the submissions for 2020 ($n = 8,260$, 26.8 per cent) and 2022 ($n = 7600$, 24.6 per cent). Private companies submitted the majority of statements, with public companies representing only a minor share (1.38 per cent). However, conglomerate groups were the most frequent submitters, accounting for 83 per cent of total submissions on behalf of their subsidiaries.

Every statement included information regarding the person who approved it, with 13,588 (44 per cent) being signed by the company's CEO. Each statement also contained data on the firm's level of turnover. Of these, 5.9 per cent reported a

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[6] Kwame Taylor, "Strengthening corporate accountability through the Modern Slavery Act", 1 September 2021, https://sancroft.com/2021/09/01/strengthening-corporate-accountability-through-the-modern-slavery-act.

[7] Cordery, "15,824 Organizations in the UK sent Modern Slavery Compliance Registry Letter", 28 April 2021, www.corderycompliance.com.

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turnover under £36 million, 14.7 per cent a turnover of £36–60 million, 14.5 per cent a turnover of £60–100 million, 31.4 per cent a turnover of £100–500 million, and the remaining 33.5 per cent a turnover exceeding £500 million.

Table 1. Sample population summary						
					Mean (standard deviation)	**Mean (standard deviation)**
Statement year	**N**	**Percentage of total N**	**Group submission**	**Public company**	**Recommended policy**	**Additional policies**
2020	8 260	26.8%	6 912	68	5.504 (0.807)	1.280 (1.942)
2021	14 989	48.6%	12 350	205	5.533 (0.807)	1.384 (2.009)
2022	7 600	24.6%	6 353	155	5.662 (0.690)	1.439 (2.055)
Total	**30 849**		**25 615**	**428**		

Source: Authors' calculations based on data submissions to the United Kingdom Modern Slavery Registry for 2020, 2021 and 2022 as of January 2023.

3.2 Data transformation and variables

The registry's data files are mainly composed of text data. To facilitate analysis, these textual data were converted into numeric form using a series of data transformations performed in RStudio.

These files contain information spanning the six policy areas recommended by the registry guidance documentation: (1) organizational structure, (2) policies,[8] (3) risk assessment, (4) due diligence, (5) training and (6) goals. Upon making a submission to the registry, organizations can indicate their alignment with these six recommended areas by selecting "Yes" or "No" on the submission portal. For example, if a firm has implemented a risk assessment policy that lacks a due diligence policy, it would indicate Yes for risk assessment and No for due diligence (table 2).

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[8] This includes a series of provisions related to a firm's domestic and international supply chains, as well as its own operations, including freedom of workers to terminate employment; freedom of movement; freedom of association; prohibition of any threat of violence, harassment or intimidation; prohibition of the use of worker-paid recruitment fees; prohibition of compulsory overtime; prohibition of child labour; prohibition of discrimination; prohibition of confiscation of workers' original identification documents; provision of access to remedy; compensation and justice for victims of slavery; and other provisions which may indicate any additional policy areas covered.

Table 2. Variables used

Variable name	Measurement and description
Additional policies	Numeric. This is a calculated field from our analysis, totaling the number of policies outside of those recommended by the United Kingdom Government that are included in the organization's response. The formula is as follows: Additional policies = (Additional) Policies + (Additional) Training + Working conditions engagement + Social audits + Grievance procedures
(Additional) Policies*	Binary: 1 if additional policy items are present, 0 if not. This item is included in the Additional policies calculated score.
(Additional) Training*	Binary: 1 if additional training items are present, 0 if not. This item is included in the Additional policies calculated score.
Approving person	Binary: 1 if CEO is listed as the person approving the statement, 0 otherwise.
Children	Numerical (0, 1, 2 or 3). Counts how many times "Children" appears in the three risk groups. The groups available for organizations to select were Children, Migrants, Women, Refugees and other vulnerable populations.
Grievance mechanisms	Binary: 1 if grievance mechanisms are present, 0 if not. This item is included in the Additional policies calculated score.
Group submission	Binary: 1 if the statement is a group submission, 0 if not.
ILO indicators in statement	Binary: 1 if ILO indicators are present in the statement, 0 if not.
Migrants	Numerical (0, 1, 2 or 3). Counts how many times "Migrants" appears in the three risk groups. The groups available for organizations to select were Children, Migrants, Women, Refugees and Other vulnerable populations.
Other vulnerable groups	Numerical (0, 1, 2 or 3). Counts how many times "Other vulnerable groups" appears in the three risk groups. The groups available for organizations to select were Children, Migrants, Women, Refugees and Other vulnerable populations.
Recommended policy	"Numeric. This is a calculated field from our analysis totaling the number of policies recommended by the United Kingdom Government that are included in the organization's response. The formula is as follows: Recommended policies = Statement includes org structure + Statement includes policies + Statement includes risk assessment + Statement includes due diligence + Statement includes training + Statement includes goals
Refugees	Numerical (0, 1, 2 or 3). Counts how many times "Refugees" appears in the three risk groups. The groups available for organizations to select were Children, Migrants, Women, Refugees and Other vulnerable populations.
Risk location	Categorical: 1 for China, and 2 for the United Kingdom, 0 for other locations.
Sector type	Binary: 1 if the sector type is public, 0 if not.
Social audits	Binary: 1 if social audits are present, 0 if not. This item is included in the Additional policies calculated score.
Statement includes due diligence	Binary: 1 if the statement includes due diligence, 0 if not. This item is included in the Recommended policies calculated score.

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Table 2. Variables used

Variable name	Measurement and description
Statement includes goals	Binary: 1 if the statement includes goals, 0 if not. This item included in the Recommended policies calculated score.
Statement includes org structure	Binary: 1 if the statement includes organizational structure, 0 if not. This item is included in the Recommended policies calculated score.
Statement includes policies	Binary: 1 if the statement includes policies, 0 if not. This item is included in the Recommended policies calculated score.
Statement includes risks assessment	Binary: 1 if the statement includes risks assessment, 0 if not. This item is included in the Recommended policies calculated score.
Statement includes training	Binary: 1 if the statement includes training, 0 if not. This item is included in the Recommended policies calculated score.
Statement year	Continuous: The year the policy statement was made. Statement years in this data set were 2020, 2021 and 2022.
Turnover	Categorical: 1 = <£36 million; 2 = £36–60 million; 3 = £60–100 million; 4 = £100–500 millon; 5 = >£500 million.
Women	Numerical (0, 1, 2 or 3). Counts how many times "Women" appears in the three risk groups. The groups available for organizations to select were Children, Migrants, Women, Refugees and Other vulnerable populations.
Working conditions engagement	Binary: 1 if there is engagement with working conditions, 0 if not. This item is included in the Additional policies calculated score.
Years producing statements	Ordered categorical variable: 0 for first-time producing statement 1 for one to five years, and 2 for more than five years.

Source: Authors' compilation of variables used from the United Kingdom Modern Slavery Registry and calculated measures.
* The registry provided an extra category titled "Policies (optional)" and "Training (optional)" in additional to several other variables that are included in the computation of the "Additional policies" variable. This study labels "Policies (optional)" as "(Additional) Policies" and "Training (optional)" as "(Additional) Training".

Moreover, firms can use multiple-selection fields to showcase further details about their operational areas. For this study, we focused on fields that provide specific information about (1) the level of training offered throughout the organization, from frontline to executive-level staff, and extending into the supply chain; (2) additional policies related to worker freedoms; (3) types of organizations the firm collaborates with to monitor working conditions, ranging from trade unions to law enforcement; (4) kinds of audits which are conducted either within or outside the organization; and (5) grievance mechanisms in place and which groups the firm identifies as being most at risk for forced labour.

Later sections of the registry allow organizations to indicate whether the statement refers to any ILO indicators of forced labour, areas of risk and impacts on vulnerable populations. Control variables used in the analysis include the statement

year (2020, 2021, 2022), whether the statement was submitted on behalf of a conglomerate group and the number of years that the organization has been producing statements.

Several data transformations were conducted to convert text data into numeric data to facilitate our analysis. First, the "Approving person" field was searched for evidence of the CEO serving as the signatory to the statement. Terms such as "CEO", "Chief executive" or "Chief executive officer" were converted to a binary variable of 1; all other entries were marked as 0. A similar procedure was implemented to determine whether the firm's statement addressed any of the six core areas: organizational structure, policies, risk assessment, due diligence, training and goals. Organizations can also indicate their alignment with these six recommended areas.

The registry also provides several optional areas for inclusion. For example, a firm can specify whether it had instituted additional policies related to worker freedoms, ranging from the freedom to terminate employment and freedom of movement to prohibitions against violence, harassment, intimidation, worker-paid recruitment fees, compulsory overtime, child labour, discrimination and confiscation of workers' original identification documents. Moreover, firms can state whether they provide access to remedy, compensation and justice for victims of modern slavery. The presence of any of these variables was designated as a 1 for that field. Additional fields were allotted for levels of training in the organization, monitoring of working conditions, social audits and grievance procedures. Once again, the presence of any entry in each of these fields was denoted as a 1, while the absence of an entry was marked as 0. Although fields related to ILO indicators are recorded, the registry combines them with risk areas and vulnerable populations; however, only 1,776 entries (5.8 per cent of the sample) contained data in these fields. Consequently, ILO indicators were not incorporated in our overall policy analysis but were analyzed separately in relation to vulnerable populations.

3.3 Analysis

All of the recommended policy areas correlated positively and significantly with one another, as did the additional policy areas. However, when combined, several of the additional policy areas correlate negatively with the recommended areas, particularly organizational structure and risk assessments. The presence of these negative correlations suggests that computing a single combined policy-level score for all areas would not be feasible.

As a result, policy-related variables were segregated into two distinct policy-level rating scores. One score included the measures recommended by the Government, while the other comprised the additional policy areas. The scores were computed as follows:

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> ***Recommended policies*** *= Statement includes org structure + Statement includes policies + Statement includes risk assessment + Statement includes due diligence + Statement includes training + Statement includes goals*
>
> ***Additional policies*** *=* (Additional) Policies + (Additional) Training + Working conditions engagement + Social audits + Grievance mechanisms

As expected, most respondents included information in their statements pertaining to the main areas of organizational structure. However, fewer incorporated details about the optional areas of additional policies (table 3). These areas also exhibited a higher standard deviation than the recommended areas, indicating more variation across the statements.

The registry opened for submissions in March 2021,[9] allowing organizations to submit their policy statements for both 2020 and 2021 immediately. Furthermore, the Government engaged in dedicated outreach to more than 15,000 firms. The overall data set shows that 2021 submissions comprise nearly half of all entries (n = 14,989, 48.6 per cent). To the best of our knowledge, the Government did not conduct additional outreach efforts of the same magnitude in 2022, which witnessed a lower submission rate than in 2020 and nearly half that of 2021. A one-way analysis of variance (ANOVA) was performed to test our hypothesis that regulatory action would prompt more firms to comply with submission and adopt more robust policies by examining the impact of the year (2021 was the year of regulator intervention). The results indicate a significant difference in the level of Recommended policy by statement year (table 4). In addition, when testing control variables, the number of years that the organization has been producing statements was positively and statistically significant in predicting the level of Recommended policy.

Hypothesis 1 anticipated that regulatory intervention would lead to more robust policies. Figure 1 displays a plot of the relationship between the level of recommended and additional policy by statement year. It is important to remember that organizations can comply with the submission requirements by also stating that they do not have policies in place. The 2020 data reveal an interesting dynamic, in that more statements included at least one of the additional policy areas. However, the slope of the linear relationship between having recommended policies and having additional policies is steeper in 2021 and 2022, demonstrating greater polarization in the sample after regulatory action. Firms either had entries with minimal content in both policy areas, or they had high recommended policy scores (including all six

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[9] Government of the United Kingdom, "Government launches modern slavery statement registry," 11 March, 2021, www.gov.uk/government/news.

Table 3. Correlation of reported policy areas

Means, standard deviations, and correlations with confidence intervals

Variable	Mean	Standard deviation	1	2	3	4	5	6	7	8	9	10
1. Statement includes org structure	0.99	0.08										
2. Statement includes policies	0.99	0.08	0.25**									
3. Statement includes risk assessment	0.96	0.21	0.16**	0.15**								
4. Statement includes due diligence	0.98	0.15	0.13**	0.19**	0.52**							
5. Statement includes training	0.93	0.25	0.09**	0.14**	0.22**	0.25**						
6. Statement includes goals	0.71	0.46	0.10**	0.10**	0.24**	0.22**	0.29**					
7. Training	0.29	0.45	0.01*	0.03**	0.00	0.01	0.13**	0.09**				
8. Policies	0.30	0.46	0.00	0.03**	-0.01*	0.03**	0.02**	0.07**	0.83**			
9. Working conditions engagement	0.30	0.46	0.01*	0.02**	0.00	0.02**	0.03**	0.08**	0.85**	0.90**		
10. Social audits	0.16	0.36	0.00	0.02**	0.03**	0.05**	0.06**	0.14**	0.61**	0.62**	0.65**	
11. Grievance mechanisms	0.32	0.47	0.01	0.03**	-0.03**	0.00	0.02**	0.07**	0.85**	0.89**	0.89**	0.61**

Source: Authors' estimations.

Note: N = 30,849. Values in square brackets indicate the 95 per cent confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * p < 0.05, ** p < 0.01. Variables 1 through 6 are the recommended policy areas that the registry encourages organizations to include. Variables 7 through 11 are the additional policy areas that organizations may report on in their registry filing.

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Table 4. ANOVA comparing statement year

Fixed-effects ANOVA results using Recommended policy as the criterion

| Predictor	Sum of squares	df	Mean square	F	p	partial η^2	partial η^2 95% CI [LL, UL]
Statement year	97.46	1	97.46	160.1	0	0.01	[0.00, 0.01]
Error	18 777.98	30 847	0.61				[NA, NA]

Source: Authors' estimations.
Note: N = 30,849. *LL* and *UL* represent the lower limit and upper limit of the partial η^2 confidence interval, respectively.

areas), or they also addressed more than one additional policy area. Both the ANOVA results, which indicated a significant difference between statement year (see table 4), and the differences in slope lend support for hypothesis 1, as overall robustness of policies increased after the regulatory outreach. While one might argue that other factors such as the COVID-19 pandemic had an impact during this time frame, the virus was mentioned only 421 times in 2021 and 73 times in 2022 in relation to the organization's risk mitigation strategies. In addition, Ukraine was mentioned merely 15 times as a location of risk in the 2022 data set.

Figure 1. Relationship of policy levels by Statement year
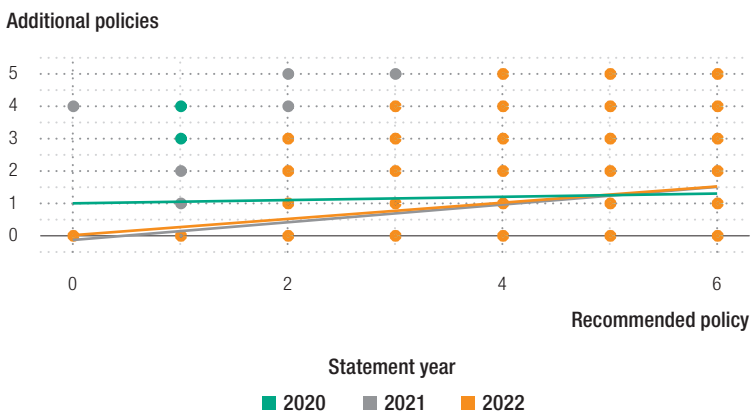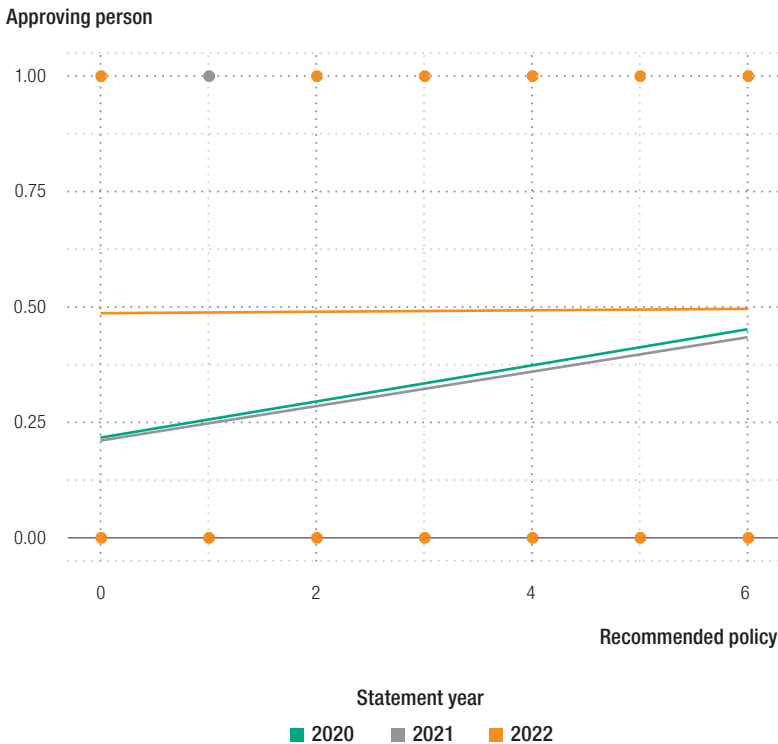

Source: Authors' estimations.
Note: N = 30,849. The policy areas recommended by the Government include Org structure + Policies + Risk assessment + Due diligence + Training + Goals. The Additional policies recommended indicate whether the firm has Additional policies + Additional training + Working conditions engagement + Social audits + Grievance procedures. Per our analysis procedures these were computed as composite scores.

Variations are evident in the data set regarding the prevalence of the CEO as the approving authority. Figure 2 depicts the relationship between the CEO as the approving person and the recommended policy areas, while figure 3 shows the same relationship but with additional policy areas. These figures reveal that the 2020 and 2021 statements follow similar patterns of relationships between policy areas and the CEO as the approving person, whereas the pattern in 2022 looks noticeably different. In 2020 and 2021, there is a positive relationship between the CEO's role and the development of more robust policy decisions. By 2022, the CEO's role seems to have diminished across the data set, accounting for roughly half of the data and distributed evenly across all policy levels.

Figure 2. Relationship between Recommended policy and Approving person by Statement year

Approving person

Statement year

■ 2020   ■ 2021   ■ 2022

Source: Authors' estimations.

Note: N = 30,849. Approving person indicates whether the CEO was the signatory on the policy statement. Per our coding procedures, a text analysis of the name and title field was done to translate the submission into a dummy variable (1 = CEO, 0 = Another person).

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Figure 3. Relationship between Recommended policy and Approving person by Statement year
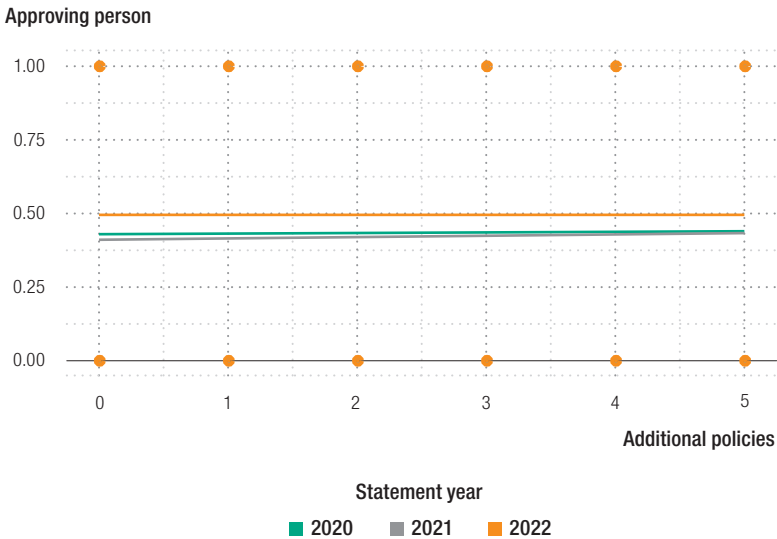
Approving person

Statement year
■ 2020 ■ 2021 ■ 2022

Source: Authors' estimations.
Note: N = 30,849. Approving person indicates whether the CEO was the signatory on the policy statement. Per our coding procedures, a text analysis of the name and title field was done to translate the submission into a dummy variable (1 = CEO, 0 = Another person).

As indicated in table 3, the individual items measuring recommended and additional policy areas are highly correlated with one another and, in some cases, have opposing relationships, such as the negative relationship between organizational structure and social audits, and between risk assessments and grievance mechanisms. This makes it problematic to include the combination of both recommended and additional policy factors in a central analysis to determine whether the CEO, as the approving person, was predictive. Nevertheless, we also checked the variance inflation factor associated with a potential predictive model combining all the factors and found high multicollinearity. Consequently, to examine the CEO's role in the robustness of the policy, we restricted our regression model solely to the recommended policy components. A variance inflation factor scores for the individual recommended policy items, examined separately, were within the expected range of < 2. In addition, owing to the previous presence of multicollinearity across the broader data test, we tested the model focused on the recommended policy areas for Gauss-Markov conditions to confirm the reliability of the data (Kalnins, 2022). We used White's test, which looks

to confirm the presence of heteroskedasticity and has been shown to work well in large samples (Jeong and Lee, 1999). Our analysis did not reveal the presence of heteroskedasticity (7.783, p = 0.254).

Upon closely examining the individual components of the composite score, the CEO as the approving person was found to significantly predict the presence of the recommended areas of the modern slavery statement. The most significant relationships were with inclusion of risk assessments, training and goals (table 5). However, the low R^2 value indicates that this explains only a small part of the policy variance (table 5). This finding provides partial support for hypothesis 2.

Table 5. Relationship between CEO as approving person and policy area

Fixed-effects ANOVA results using Recommended policy as the criterion

Predictor	B	b 95% CI [LL, UL]	beta	beta 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	r
(Intercept)	0.27**	[0.18, 0.36]					
Statement includes org structure	0.05	[-0.02, 0.12]	0.01	[-0.00, 0.02]	0.00	[-0.00, 0.00]	0.02**
Statement includes policies	0.00	[-0.07, 0.08]	0.00	[-0.01, 0.01]	0.00	[-0.00, 0.00]	0.01*
Statement includes risks assessment	0.09**	[0.06, 0.12]	0.04	[0.02, 0.05]	0.00	[0.00, 0.00]	0.04**
Statement includes due dilligence	-0.03	[-0.07, 0.02]	-0.01	[-0.02, 0.00]	0.00	[-0.00, 0.00]	0.02**
Statement includes training	0.04**	[0.02, 0.07]	0.02	[0.01, 0.03]	0.00	[-0.00, 0.00]	0.04**
Statement includes goals	0.03**	[0.01, 0.04]	0.02	[0.01, 0.04]	0.00	[0.00, 0.00]	0.04**
					Fit:	$R^2 = 0.003$**	95% CI [0.00, 0.00]

Source: Authors' estimations.

Note: N = 30,849. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant; *b* represents unstandardized regression weights; *beta* indicates the standardized regression weights; sr^2 represents the semi-partial correlation squared; *r* represents the zero-order correlation; *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * $p < 0.05$, ** $p < 0.01$.

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With the advent of additional requirements to submit statements to the registry, as a mandate, we expected that larger firms (as measured by turnover) would possess a more robust policy containing more of the recommended areas, given both the increased risk of maintaining the legitimacy of operations and ability to afford additional costs associated with taking remediating or monitoring actions. Using multiple hierarchical linear regression, turnover was found to be a better predictor of the recommended policy level than CEO's role (table 6). Group submission was negatively related to overall policy robustness (see table 6). In contrast, turnover specifically predicted all individual components of the recommended policies, except organizational structure (table 7).

Table 6. Effects of key variables on Recommended policy

Regression results using Recommended policy as the criterion

| | | b | | | $beta$ | | | sr^2 | |
| | | 95% CI | | | 95% CI | | | 95% CI | |
Predictor	b	[LL, UL]	$beta$	$beta$	[LL, UL]	sr^2	sr^2	[LL, UL]	r
(Intercept)	5.20**	[5.17, 5.24]							
Turnover	0.06**	[0.05, 0.07]	0.10		[0.09, 0.11]	0.01		[0.01, 0.01]	0.11**
Approving person	0.05**	[0.03, 0.07]	0.03		[0.02, 0.04]	0.00		[0.00, 0.00]	0.05**
Group submission	-0.05**	[-0.08, -0.03]	-0.03		[-0.04, -0.01]	0.00		[0.00, 0.00]	0.01
Years producing statements	0.13**	[0.11, 0.15]	0.08		[0.07, 0.09]	0.01		[0.00, 0.01]	0.10**
						Fit:	$R^2 = 0.020$**		95% CI [0.02, 0.02]

Source: Authors' estimations.

Note: N = 30,849. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant; *b* represents unstandardized regression weights; *beta* indicates the standardized regression weights; sr^2 represents the semi-partial correlation squared; *r* represents the zero-order correlation; *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. ** p < 0.01.

Table 7. Regression of Turnover on Recommended policy areas
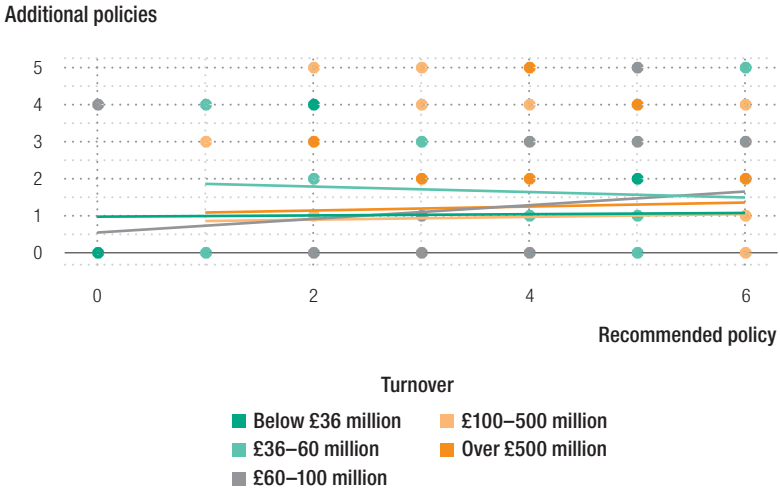
Regression results using Turnover as the criterion

Predictor	b	b 95% CI [LL, UL]	Beta	beta 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	r
(Intercept)	2.66**	[2.44, 2.88]					
Statement includes org structure	0.13	[-0.04, 0.30]	0.01	[-0.00, 0.02]	0.00	[-0.00, 0.00]	0.03**
Statement includes policies	0.38**	[0.19, 0.56]	0.02	[0.01, 0.03]	0.00	[-0.00, 0.00]	0.04**
Statement includes risks assessment	0.38**	[0.30, 0.46]	0.06	[0.05, 0.08]	0.00	[0.00, 0.00]	0.08**
Statement includes due diligence	-0.20**	[-0.31, -0.09]	-0.02	[-0.04, -0.01]	0.00	[-0.00, 0.00]	0.04**
Statement includes training	0.32**	[0.26, 0.38]	0.07	[0.05, 0.08]	0.00	[0.00, 0.01]	0.09**
Statement includes goals	0.13**	[0.10, 0.16]	0.05	[0.04, 0.06]	0.00	[0.00, 0.00]	0.08**
					Fit:	$R^2 = 0.015$**	95% CI [0.01, 0.02]

Source: Authors' estimations.

Note: N = 30,849. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant; *b* represents unstandardized regression weights; *beta* indicates the standardized regression weights; *sr²* represents the semi-partial correlation squared; *r* represents the zero-order correlation; *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. ** $p < 0.01$.

Figures 4–6 illustrate the changes in both recommended and additional policy levels among firms of differing turnover. In 2020, the relationship is more pronounced in mid-range firms with turnover in the range of £60–100 million, while in 2021 firms with turnover in the range of £36–60 million experienced the sharpest increase in policy level. Between 2021 and 2022, there is a stronger relationship for higher-turnover firms, those with £100 million or more. As a result, hypothesis 3, which proposed that larger firms will have more robust modern slavery policy, is partially supported.

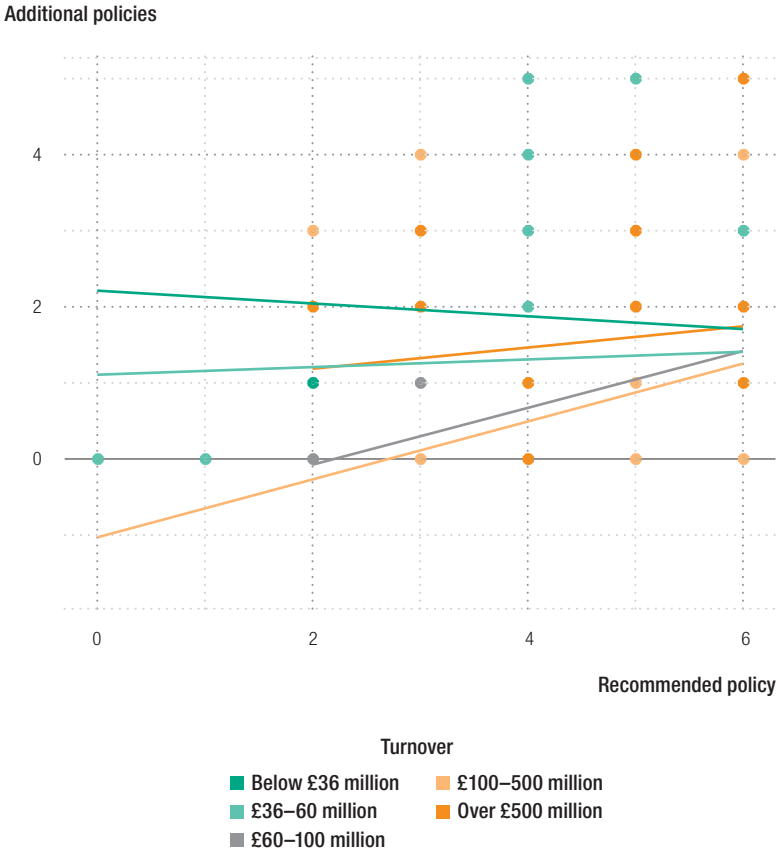The United Kingdom Modern Slavery Act: Are we making progress?
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Figure 4. Turnover, 2020

Additional policies

Source: Authors' estimations.
Note: N = 30,849.

Figure 5. Turnover, 2021

Additional policies
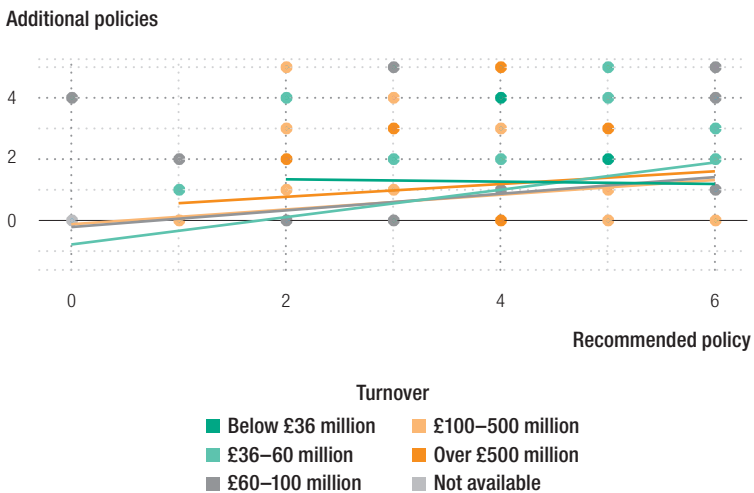
Source: Authors' estimations.
Note: N = 30,849.

Figure 6. Turnover, 2022

Additional policies

Source: Authors' estimations.
Note: N = 30,849.

The broader commitments of firms to eradicate forced labour align with the additional areas indicated in the registry statements. A significantly smaller percentage of the overall sample included references to the ILO indicators of forced labour, as well as information on the locations of risk in their supply chains, and the specific vulnerable populations at risk. The registry allows firms to identify up to three risk areas and locations where the firm can report concerns related to women, migrants, children and refugees. Similar to earlier coding procedures, a text analysis was performed to compute a summary variable of mentions for each vulnerable population category. A text string mapping was done to translate each

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text entry into a binary variable (1 if present, 0 if not present) to count each time women, children, migrants, refugees or other vulnerable populations were reported as a focus. These were then totaled into a composite score per population group.

The registry data permit multiple countries to be mentioned in each of the three risk locations that could be reported, thus offering three fields that might mention countries of focus and complicating empirical analysis. To establish a coding procedure, the 2022 data set was reviewed for the first reported risk location. This field contained 2,290 discrete mentions of countries, which were then manually assessed. Most organizations mentioned the United Kingdom ($n = 427$, 18.65 per cent) and China ($n = 217$, 9.48 per cent), with no other country being mentioned more than 5 per cent of the time,[10] and the majority representing 2 per cent or less.

We used this distribution to determine a strategy to approach our geographic analysis across the entire registry data set, limiting the coding procedure to focus on the United Kingdom and China. The final result was coding the location fields as dummy variables for the United Kingdom (2), China (1) or Other (0). This ordering method also ensures that a positive relationship would be oriented towards the home country (the United Kingdom) rather than the external environment. This orientation logically orders the coded variables in alignment with the policy issues facing United Kingdom organizations at home, in China and elsewhere. Incomplete entries were excluded, leaving only 1,699 firms in our sample. The distribution of location was consistent in the data across all reported locations, with the majority focusing on the United Kingdom, then China, then other.

For simplicity of analysis, we used the first risk location measure in our regression model to test the relationship between ILO statements in the policy and focus on specific vulnerable groups. The results of our multiple regression analysis indicate that the presence of ILO statements predicts a focus on all of the vulnerable groups, except for women (table 8). When policies contain ILO statements, there is less emphasis on unspecified vulnerable groups, or the "Other" category. This indicates a more targeted focus on the specific vulnerable groups that are mentioned in the policies, except women. Refugees had the strongest positive relationship with ILO statements. As such, hypothesis 4a, which posited that the presence of ILO statements in a firm's policy would predict a focus on specific vulnerable groups, receives partial support from our analysis. Hypothesis 4b, which suggests that geographic risk location would influence a firm's policy focus on specific vulnerable groups is confirmed.

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[10] In 2022, Ukraine was mentioned only 15 times in 2,290 entries that discussed risk locations.

Table 8. Moderation effect of risk location on ILO indicators among vulnerable groups

Regression results using ILO indicators in statement as the criterion

Predictor	B	b 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]
(Intercept)	0.38**	[0.32, 0.45]		
Women	-0.04	[-0.10, 0.01]	0.00	[-0.00, 0.00]
Children	0.23**	[0.15, 0.31]	0.02	[0.00, 0.03]
Migrants	0.07**	[0.03, 0.10]	0.01	[-0.00, 0.02]
Refugees	0.39**	[0.13, 0.65]	0.00	[-0.00, 0.01]
Other vulnerable groups	-0.14**	[-0.19, -0.09]	0.01	[0.00, 0.03]
Risk location	-0.03	[-0.08, 0.01]	0.00	[-0.00, 0.00]
Women*Risk location	0.05	[-0.01, 0.11]	0.00	[-0.00, 0.00]
Children*Risk location	-0.19**	[-0.27, -0.12]	0.01	[0.00, 0.03]
Migrants*Risk location	0.01	[-0.01, 0.04]	0.00	[-0.00, 0.00]
Refugees*Risk location	-0.44	[-0.92, 0.03]	0.00	[-0.00, 0.01]
Other vulnerable groups*Risk location	0.07**	[0.04, 0.10]	0.01	[0.00, 0.02]
		Fit:	$R^2 = 0.082$**	95% CI [0.05, 0.10]

Source: Authors' estimations.

Note: The number of respondents that included information about ILO indicators, as well as risk location and vulnerable population data was significantly less, N = 1,699. A significant *b*-weight indicates the semi-partial correlation is also significant; *b* represents unstandardized regression weights; sr^2 represents the semi-partial correlation squared; *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. ** p < 0.01.

Our findings show a significant moderation effect in the relationship among ILO policy statements and a focus on children in "Other" vulnerable groups. Given the location-variable coding of positive values inclining toward the home market of the United Kingdom, the negative moderation relationship between risk location and children would indicate that a focus on children happens when the organization's focus is away from the United Kingdom market, whereas the positive relationship with the "Other" vulnerable group category would indicate that such a focus is

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more significant in the market. Given that women, migrants, and refugees are treated as separate groups, firms see "Other" groups besides these classifications as vulnerable when considering the United Kingdom labour market. These findings highlight the complexity and specificity of relationships between policy focus, geographical risk and the attention to vulnerable populations in the context of modern slavery prevention.

4. Discussion

Our findings suggest that the Government's active intervention had an impact on both the number and the robustness of policies submitted to the registry. However, these effects varied by revenue turnover and over time. Even though the regulator's outreach did not yield a higher number of registry submissions in 2022, it is important to note that the reporting window for the previous calendar year extends well into 2023, potentially allowing for increases in these numbers.

Interesting changes were evident through the ANOVA model, which clearly demonstrated differences by statement year, showing that statements in 2021 and 2020 addressed more policy areas. However, the total number of submissions was less in 2022, a year in which less regulatory outreach was done. These changes occurred against the backdrop of proposed modifications to the Modern Slavery law. On 10 May 2022, a new Modern Slavery Bill was introduced in the Queen's speech. It proposed sterner penalties for non-compliance, including potential criminal charges for the approving authority.[11] Considering these proposed changes, firms might delay future submissions to the registry until the final updates are enacted, as registry submissions currently remain voluntary.

Statement robustness was also influenced by turnover. For instance, mid-tier firms outpaced larger firms in the breadth of policy areas addressed in their initial policies, published after being prompted by the regulator in 2020, but by 2022 larger-turnover firms (indicated as level 5) and lowest-turnover firms (level 1) appeared very similar (figures 4–6). This trend deviates from research on public firms, which often show managerial hesitancy to disclose risks owing to fear of investor reaction (Birkey et al., 2018). Our study of primarily private firms indicates that over this period of active regulator outreach, policy robustness that discloses risks increased. Explanations may be found in organizations realizing the positive benefits of having strong statements (Cousins et al., 2020) or mimetic

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[11] Alice Lepeuple, "New anti-modern slavery bill unlikely to accomplish goals", WilmerHale W.I.R.E. (White Collar, Investigations and Regulatory Enforcement) UK, 10 June 2022, www.wilmerhale.com/en/insights/blogs/WilmerHale-W-I-R-E-UK/20220610-new-anti-modern-slavery-bill-unlikely-to-accomplish-goals.

forces where larger-turnover firms emulated smaller firms when they were able to compare policy commitments, echoing the implication of institutional theory. Moreover, in the first two years of statements, having the CEO as signatory more strongly predicted policy levels. This observation aligns with the principle of upper-echelons theory, which underscores the influence of top executives on organizational outcomes. The predictive relationship of the CEO to more robust policies diminished in 2022. However, this also indicates the presence of mimetic forces occurring, as organizations were able to see that other CEOs were committing to more robust policies. In 2022, the CEO as the approving authority now appears in about half of the population of submissions.

Our study also revealed intriguing findings related to the geographic focus of organizations' labour policies and their attention to vulnerable populations (table 8). Although we found no significant relationship between the presence of ILO standards and a focus on women, ILO labour policy statements did significantly predict a focus on children, influenced by location. Specifically, the focus on children was more pronounced outside the home market. These findings provide evidence of the impact that public outreach efforts have had on highlighting the issues of child and forced labour in the supply chains of MNCs. Moreover, the presence of ILO labour policy statements was also predictive of a focus on other vulnerable populations, though this relationship was also affected by location. The effect of location, however, was less pronounced for the United Kingdom and China markets, compared with other locations. This suggests a modest but measurable shift in focus towards the United Kingdom market when considering attention to these other vulnerable populations. These findings provide strong evidence of the impact that public outreach has had on highlighting the issues of child and forced labour in the supply chains of MNCs.

While regulatory actions appear to have had an effect, the lack of significant advancement in additional, optional policy areas and the decrease in statement submissions for 2022 indicate that regulatory outreach needs to be either consistent or mandatory to sustain improvements. However, there is still significant work to be done in enhancing policy robustness, with few firms including the optional, additional policy areas such as working condition engagements, social audits and grievance procedures, and very few incorporating ILO standards.

Despite these challenges, the strong association between ILO policy statements and firm focus on children as a vulnerable population is promising and could be indicative of progress towards the United Nations' 2025 goals on child labour. However, the lack of association between women and ILO standards remains a concern, given the global issue of sex trafficking, which transcends geographic boundaries as a by-product of digitalization that allows for exploitation over the Internet.

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5. Conclusion and policy recommendations

This study examined statements submitted to the United Kingdom Modern Slavery Compliance Registry from 2020 to 2022, evaluating the impact of regulatory outreach on firm policies towards eradicating forced labour. We observed an increase in policy robustness over time, with significant correlation between statement year and policy strength. The most significant gain was recorded in 2021, after regulator outreach regarding the registry; a decline in submissions occurred in 2022, suggesting that regular or mandatory outreach may enhance compliance.

While the first two years of registry statements suggest an influence by the CEO in predicting policy robustness, the effect declined in 2022, with revenue turnover emerging as a better predictor. The study is largely representative of private firms. Contradicting previous studies focused on public firms, it indicates that private firms do not shy away from disclosing supply chain risks.

A notable observation was the minimal inclusion of ILO forced labour indicators in firm statements, indicating that more regulator outreach about these policy areas is required. The inclusion of ILO statements predicts the organization's focus on labour risks for all vulnerable groups, except for women. Given global threats from human trafficking, firms' lack of focus on women is concerning and difficult to disentangle from other political and legislative issues. A requirement to include ILO labour standards as part of modern slavery policies and specific requirements regarding vulnerable populations could serve to direct organizational focus in these areas.

In addition, we found that location played a role in influencing the focus of United Kingdom firms on labour risks for vulnerable groups, specifically children and a general classification of "Other" vulnerable groups, as opposed to women, refugees or migrants specifically. Multinational corporations face regulators with different priorities and social pressures in each country where they do business, resulting in difficulty satisfying policy requirements across a global supply chain. To focus on the achievement of SDG 8.7 and specifically address the end of child labour by 2025, regulators might focus their outreach on children as a vulnerable population in order to see policy improvements across more organizations.

This study focused specifically on United Kingdom firms that have voluntarily submitted modern slavery statements to an online government registry. Although this public data enables online searches and data extraction of statement components, it has inherent limitations, including multiple-selection textual data combined into single cells, requiring data transformation expertise for analysis, and self-reported data without third-party validation. The time limit of only three years of data presents a challenge to assessing impacts of regulator action; these have been addressed by the methods, measurements and data analysis techniques employed in this study.

Our sample predominately consisted of United Kingdom conglomerate groups that were private firms, adding to the literature through its unique and detailed review of largely private conglomerate companies, contrasting with prior research which has focused primarily on publicly traded firms. Reviewing this analysis again when statement submission is mandatory and includes more public companies will help to isolate and confirm critical differences.

Future research could build on a longer time frame, qualitatively examining registry submissions and assessing the influence of future regulator mandates. Whereas previous studies have qualitatively reviewed modern slavery statements (Birkey et al., 2018; Flynn and Walker, 2020; Jones and Comfort, 2021), none utilized the registry's structured categories (recommended and additional policies, ILO indicators, risk locations and focus on vulnerable groups) to provide a specific and repeatable common structure. A persistent challenge will be harmonizing this data with international data, given varying regulatory requirements and subsequent difficulties in unifying content analysis across data sets. The United Kingdom registry represents an initial online data framework, paving the way for future analysis in this field.

In conclusion, our findings suggest incremental progress in organizational modern slavery policies in response to regulator outreach for compliance with policy submissions to a common registry, but also emphasize the need for more work. Policy robustness could be maintained and enhanced with mandatory regulatory intervention, especially with respect to ILO indicators of forced labour and vulnerable groups. These results highlight the dynamic nature of interactions between regulatory action, executive decision-making and policy development regarding the societal imperative to eradicate forced labour. Moreover, our study highlights that further improvement in regulator actions is necessary.

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Globalized production processes and foreign governmental lobbies: Analysing the United States Foreign Agents Registration Act reports*

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Abstract

This study examines two potentially opposing effects that the current state of trade globalization can have on foreign governmental lobbies in the United States. On one hand, economic globalization and increased flows of goods may lead to more and more contentious issues between trading partners. On the other hand, the growing networks of global value chains (GVCs) may mobilize interest groups in foreign lobbies' target countries (the United States in this study), whose activities might substitute for those of foreign governmental lobbies. With such linkages, an increase in lobbying activities by domestic producers may reduce the need for direct foreign lobbying on contentious issues. The study reveals different effects of forward and backward GVC linkages, and the results have two main policy implications: first, policymakers should be aware of the growing intricate nature of foreign influence; second, more attention must be paid to political consequences of GVCs' distributive effects, particularly those from backward linkages.

Keywords: global value chains, interest groups, international political economy, lobbying

JEL classification codes: D72, F5, F6, F13, F50, O24

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1. Introduction

In the late 1970s Robert Keohane and Joseph Nye presented "complex interdependence" as an alternative to the then-dominant State-centred approach to international relations (Keohane and Nye, 2001). They demonstrated the utility of a model in which the State is not monolithic and multiple channels of contact exist between societies. As globalization continues, their analysis has become increasingly influential.

One aspect of this complex interdependence is the attempt by foreign government agencies and private actors to lobby democratic governments. On one hand, such attempts are often regarded as a threat to legitimate procedures of democracy (Newhouse, 2009). On the other, theorists such as G. John Ikenberry (2001) consider that multiple channels of communication among democracies secure predictability in foreign policy and stabilize the so-called liberal international order. Whether one evaluates such debates positively or negatively, their presence suggests the political significance of foreign lobbies, and understanding their nature is of relevance to policymakers in any democratic country.

The present study explores how the globalization of production, resulting in the expansion of global value chains (GVCs), affects the lobbying activities of foreign government entities in the United States, a democracy that allows extensive lobbying activities by foreign agents and records them. It is based on analyses of Department of Justice reports, semi-annually submitted to Congress, under the Foreign Agents Registration Act (FARA). How foreign actors influence the democratic process is an important issue as flows of goods, services and money across borders increase globally. The findings of this study reveal the evolving nature of foreign lobbying, particularly through linkages with domestic actors, as well as how it reflects the distributive consequences of globalization and thus bears implications for policymakers as well as researchers.

This study contrasts and quantitatively tests two potentially opposing effects that current trade globalization can have on foreign governmental lobbies in the United States. On one hand, the deepening economic ties might cause more friction internationally, thereby offering governments overseas more reasons for lobbying. Economic globalization and greater flows of goods may spur greater contention on more issues between trading partners, issues on which the foreign counterpart will end up lobbying (de Vries, 1990; Lee, 2020). On the other hand, such an increase in economic interdependence might also open multiple channels of communications across borders, lessening the need for lobbying. Today GVC networks have grown, owing to innovation in information technology and foreign direct investment. They may mobilize interest groups in foreign lobbies' target countries (the United States in this study), whose activities might substitute for those of foreign lobbies, as those processes link suppliers and buyers who share interests across borders.

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With such linkages, greater lobbying activities by producers in the target country may reduce the need for direct foreign lobbying over contentious issues. This paper focuses on foreign government entities, rather than private actors, as lobbying agents, in part owing to data limitations (i.e. by using FARA reports as data sources); the focus can be justified in light of the roles that foreign government establishments such as embassies play in responding to economic issues, including trade frictions. Still, the scope of this study is limited by this choice; in fact, foreign private actors, especially multinational corporations, today have a variety of ways to influence democratic processes, such as through subsidiaries (Lee, 2022), and so research must give attention to recent work on the role of these actors.

2. Economic interdependence, global value chains and foreign lobbying

The effects of economic interdependence and globalization on international disputes have long been discussed (Barbieri and Schneider, 1999; Mansfield and Pollins, 2001), and the debate regarding the nature of the relationship between globalization and conflict continues (Barbieri, 1996; Li and Reuveny, 2011). Of relevance, prior studies agree that globalization leads to more intensive (both cooperative and conflictual) interactions between States (de Vries, 1990; Peterson and Zeng, 2021). The present study investigates one of various means by which States try to influence other States in this context: foreign governmental lobbying.

Scholars of United States politics have studied the influence of organized interest groups, which have varying degrees of financial resources and mobilizing capacity, and the nature and variety of their lobbying activities (De Figueiredo and Richter, 2014). Lobbying is distinct from making campaign contributions to politicians: it involves spending money on conveying information and messages to people in office rather than directly transferring funds to politicians (De Figueiredo and Richter, 2014).

Lobbying is equally important to foreign government agents who intend to influence policymaking processes in the United States, which are characterized by separation of executive and legislative powers (Tidwell, 2016). Some scholars emphasize that these multiple access points have made the United States–centred international order more benign and "open" (Ikenberry, 2001, p. 205). To realists in the United States, however, such "domestic political penetration" may hinder the pursuit of national interests (Walt, 2005, p. 194).

Contrary to common presumption, lobbying activities by foreign agents typically involve exchanging information and building confidence, rather than seeking immediate policy changes in a particular direction, except under special circumstances. In general, foreign agents are perhaps even more defensive than

their domestic counterparts. They lack the electoral leverage enjoyed by domestic interest groups unless they can find connections to powerful groups organized by others of their heritage, as in the case of Israel (James, 2021).

Most foreign lobbying activities, therefore, are conducted in accordance with "the self-perceived political vulnerabilities of these countries" (Calder, 2014, p. 133). Successful lobbying usually stems from making personal and organizational connections, thereby gaining credibility as a provider of information relevant to policymaking and/or building coalitions with politicians and businesses in the country where influence is sought, rather than aggressively seeking to buy influence (Shinoda, 1989).

Scholars have also examined how effective foreign lobbying activities are at achieving specific goals (Pevehouse and Vabulas, 2019). Gawande et al. (2006, p. 563) find that foreign lobbies targeting a specific industrial sector in the United States are effective at reducing tariffs, and thus, not only do those lobbying groups benefit, but also "U.S. consumers gain unambiguously from the presence of foreign political activity." The causes of these activities and how deepening globalization affects them are still underexplored.

Particularly lacking in the literature is research on the effects of GVCs, despite the increased interest they have drawn from scholars and practitioners in recent decades. The growing attention to this particular aspect of globalization is due to the distributive effects of GVCs, how they alter preferences of domestic and transnational actors, and how they result in the formation of coalitions (Dallas et al., 2019).

Baldwin (2012, p. 4) characterizes the deepening globalization of production in recent decades as the "second unbundling", enabled by reduced costs of communication, following the "first unbundling", which was the facilitated flow of goods enabled by reduced transportation costs. Since ideas and information required for complex production processes can be easily transmitted as a result of innovations in information technology, production stages that traditionally needed proximity to one another can be dispersed across borders (Baldwin, 2012).

Scholars of international political economy have recently started to explore the political consequences of this transformation in global production processes (Jensen et al., 2015; Osgood, 2017). A growing literature considers the effect of GVCs on lobbying and trade policymaking domestically (Curran and Eckhardt, 2018; Zeng, 2021), but how they affect foreign lobbies has not been examined sufficiently. An important exception is Lee (2020), who studied diverse security and economic determinants of foreign lobbying activities but did not consider GVCs. The current study contributes by exploring the effects of GVCs on lobbying activities from overseas. Other scholars are now paying more attention to the lobbying activities of multinational firms (Kim and Milner, 2021), particularly those of foreign firms through their subsidiaries

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(Lee, 2022 and 2023). The current study seeks to complement this research by focusing on governmental actors, which still play an important role, particularly in relation to foreign private actors that do not have overseas subsidiaries.

3. Trade, GVCs and foreign lobbies: theoretical background

This section presents a theoretical argument for how GVC integration can affect foreign lobbying activities in the United States, in contrast to the trade in goods traditionally measured, focusing on the connections to mobilizing domestic interest there.

Gross trade volume has long been used as a measure to capture economic interdependence in bilateral relations (OECD and WTO, 2012). Scholars still use total trade volumes to measure economic interdependence and the opportunity costs of potential military disputes between trading partners and their allies (Chen, 2021). Research has also shown positive effects of trade on foreign lobbying activities resulting from greater independence (Lee, 2020). Here, the logic of collective action (Olson, 1965) and the framework of exit or voice proposed by Hirschman (1972) are used to explain how participation in GVCs can add to the effects of trade (Zeng, 2021).

In traditional trade relations, both imports and exports mobilize interest groups whose interests might clash with those of foreign producers or governments. Import-competing producers can organize themselves more easily, because of their small size and their concentration, whereas consumers who benefit from those imports cannot overcome the collective action problem (Irwin, 1994). Scholars discuss how import competition from abroad, particularly from emerging economies such as China, could dampen wages and employment, fostering protectionist sentiments and policies in the United States (Autor et al., 2020). Foreign governments and companies whose exports to the United States cause friction must alleviate such negative consequences by lobbying United States government institutions to gather information and by seeking to influence policy outcomes when possible.

Similarly, United States exporters could mobilize to demand lower barriers to foreign trade. The United States Trade Representative issues the annual *National Trade Estimate Report on Foreign Trade Barriers*, which documents United States firms' complaints about foreign trade practices (Ryu and Stone, 2018), to which foreign governments may feel compelled to respond.

Participation by United States firms in global production networks may affect the details, as firms are now intricately tied across borders. Zeng (2021) proposes to frame firms' preferences for trade liberalization and protectionism according to Hirschman's (2010) logic of exit and voice, but under globalization, foreign actors can utilize voice in the target country to pursue their interests. For instance,

a foreign firm providing auto parts to a car manufacturer in the United States will more easily find an ally in the United States on trade issues, lessening the need for diplomats from the firm's country to lobby.

The present study argues from the United States perspective that two types of GVC participation affect foreign governmental lobbying differently. The first mode is forward linkages, by means of which United States firms sell intermediary goods and services, and the second is backward linkages, whereby United States firms purchase intermediary goods and services (Baldwin, 2012).

Among the modes of GVC participation, the effects of forward participation for United States firms and the consequences for foreign governments and companies should not be overlooked. Forward GVC linkages tend to mobilize United States firms to lobby on behalf of, rather than against, foreign buyers that source intermediaries from them. It is therefore likely that deeper GVC linkages will lead to less need for lobbying by the foreign governments those foreign firms reach out to.

Scholars of industrial organization have emphasized that power relations between suppliers and downstream firms depend on the type of governance of the value chains. Gereffi et al. (2005), in their seminal work, classified the types into hierarchical, captive, relational, modular and market-based, in order of higher to lower vertical integration. Suppliers in a more arms-length production network will find it easier to switch buyers (Gereffi et al., 2021).

Yet, Dallas et al. (2019, p. 670) emphasize that "with a few exceptions, the ability of lead firms to determine the functional division of labor along a GVC through buyer power continues, as the central hypothesis and empirical result of much firm and industry-level GVC research". Such deepening relations may also hurt users of those services or inputs in domestic value chains (Pan, 2020), but the hurdle of organizing themselves to demand that the foreign importing countries raise trade barriers would be much higher than in the case of mobilization by United States firms that operate domestically. Even when they are mobilized against imports of final products using inputs from the United States, the country's upstream firms will act as a counterweight. In one case study, Meckling and Hughes (2017) demonstrate that upstream electronics and toolmaking firms and organizations in the United States, as well as upstream manufacturers in Japan and Europe, oppose the imposition of trade sanctions against solar photovoltaics.

Conversely, the participation mode that draws the most attention as regards GVC effects on lobbying in the United States is backward participation – mainly United States firms engaging in input sourcing with overseas producers upstream (e.g. a car manufacturer sourcing its auto parts from East Asian suppliers) (Jensen et al., 2015; Zeng, 2021). How this type of production network affects foreign governmental lobbies is more uncertain, as it mobilizes two opposing lobbies domestically.

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The development of such GVC linkages has caused a backlash against globalization, particularly from local economies and specific industries, which face concentrated impacts from such changes (Congressional Research Service, 2020). For example, Di Tella and Rodrik (2020) demonstrated that information on trade shocks stemming from outsourcing (particularly to developing countries) led to stronger protectionist demand than did information on technology or demand shocks.

As Osgood (2017) points out, firms that participate in globalized production processes make better profits and are better poised to lobby as proponents of trade. Meanwhile, trade opponents are forced to be much less active, as the presence of trade associations representing them has diminished. In contrast to trade in goods, beneficiaries of those imports are firms, not individuals, and can organize themselves more easily. Thus, disruption in such supply chain networks would lead to increased costs for United States buyers, who would oppose policies that hurt overseas suppliers in the production network.

Yet, as explained earlier, there remain opponents to this kind of progress in economic integration. Thus, despite the potential transnational coalitions stemming from backward GVC participation by United States firms, the influence of these coalitions is offset by the opposition to deepening GVC linkages, prompting foreign agents to engage in more lobbying to counter them.

The argument so far suggests that both forward and backward GVC participation can lead to increased domestic lobbying, leading us to posit that *the degree of GVC participation in an industry is positively associated with domestic lobbying in that industry in the United States (H1)*.

Regarding foreign lobbying, this argument requires distinguishing forward and backward linkages. It posited that increased lobbying from United States sectors linked to GVC networks through forward linkages can substitute for lobbying by foreign lobbies while facing only minor countervailing forces such as protectionist demands (which emerge in the case of backward linkages), and thus predict that *forward GVC participation reduces lobbying activities by the government of the foreign country in the production network (H2a).* Conversely, domestic lobbying in response to backward linkages includes both activities that complement foreign lobbies and those that further stimulate them, especially from actors that are discontented with competitive pressures from foreign suppliers. Therefore it is predicted that *backward GVC linkages have more positive effects on lobbying activities in the United States by a foreign government than does forward GVC participation in such a GVC network (H2b),* although it is difficult to predict the exact direction of such effects.

The argument here should apply to both foreign lobbying specific to trade issues and to foreign lobbying in general. Trade-related vulnerabilities that foreign governments experience and are compelled to address through lobbying can also be exploited

in connection with other issues, such as security; the experience of Japan in the 1980s illustrates this point (Calder, 2014; Shinoda, 1989). Similarly, the expansion of lobbying operations by Australia in the 1980s can be ascribed to deepening tensions over agricultural trade and the concern that they might undermine the Australia–United States alliance (Tidwell, 2016).

4. Research design and quantitative results

4.1. Data and methods

To test the theoretical arguments, the author uses two panel data sets. First, to test H1, on how GVC linkages affect domestic lobbying in the respective industries in the United States, data on domestic lobbying expenditures by industry were collected from the LobbyView database used in Kim (2018).[1] For GVC participation rates, the author used the UIBE-GVC indicators developed by the Research Institute for Global Value Chains of the University of International Business and Economics in China (RIGVC UIBE, 2021) and averaged the forward and backward GVC participation rates for each country-year. The model controls for gross output (United States, Bureau of Economic Analysis, 2021b), size of employment (United States, Bureau of Economic Analysis, 2021a) and gross import and export volumes in each industry (OECD, 2021). The data were merged using the International Standard Industry Classification (ISIC) codes,[2] after converting data with the North American Industry Classification System (NAICS) into ISIC codes.

For the main models testing the relationship between GVC linkages and foreign governmental lobbying, another data set was compiled,[3] this one covering 194 economies between 2000 and 2015 (unit of analysis is country-year).[4] The primary dependent variable is the annual amount of lobbying expenditure (in constant 2010 United States dollars) from each country, reported under the FARA. The current study uses spending on lobbying as the primary measurement of lobbying intensity, following previous studies on domestic (Zeng et al., 2020) and foreign (Pevehouse and Vabulas, 2019) lobbying. A problem with this measurement is that reporting expenditures is not mandatory, whereas registering agents is, as Lee (2020) points out.[5]

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[1] Available at www.lobbyview.org/query.

[2] From the UIBE-GVC data, 05T06 was used for mining (05T09 in other data sets) and 90T96 for arts, entertainment and other services (90T98 in other data sets).

[3] The replication materials for this study will be made available on the author's Harvard Dataverse page.

[4] Territories that are not assigned country codes in the Correlates of War data set (https://correlatesofwar. org/data-sets/cow-country-codes-2/), such as Bermuda and Hong Kong (China), are not included.

[5] Alternatively, these expenditures can be viewed as costly public signals of how serious agents are about the issues that they are lobbying for (Zeng et al., 2020).

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These analyses are thus complemented with ones using the annual number of records from each country in the FARA reports, using negative binomial models (Prakash and Potoski, 2006).

Several scholars have used FARA reports to explore the causes and consequences of overseas lobbying activities in the United States. You (2020) provides an overview of the history of the FARA reporting system and explains how to obtain information (from supplemental documents that accompany the reports) about which government officials lobbying agents have contacted. Lee (2020) compiles annual and semi-annual FARA reports from 1971 to produce a data set on foreign lobbying activities in the United States. As of this writing, those data sets are not publicly available; thus, the texts were extracted from FARA reports to obtain the information needed, partly based on these scholars' methodologies, in particular Lee's (2020).

The reports cover several activities of agents who represent foreign principals, from the promotion of tourism and investments to advertising to public relations and lobbying. This study limits the entries to those whose services include the terms lobbying, public relations and consultant, as they evidence activities linking foreign principals and United States public officials.

The lobbying activities analysed in this study are limited to those conducted by foreign government entities (both central and subnational). This is partly owing to the difficulty of assuming homogeneous motivations behind lobbying by foreign private actors. Foreign private entities also dramatically decreased the activities they reported under FARA starting in the 2000s, as the Lobbying Disclosure Act of 1995 allowed foreign companies with subsidiaries in the United States to submit their reports under this less stringent act (You, 2020). In this study, the keywords used to identify government entities from client names include the following: government, embassy, republic, ministry, department, consulate and ambassador – following the coding rule in Lee (2020, p. 79), to which the author added kingdom, delegation, mission, authority, administration, province, provincial, prefecture and city, as well as agencies and offices as part of the government, domestic regions and incumbent presidents, monarchs, ministers and governors.[6]

The author tests the theoretical argument on the relationship between GVC linkages and gross trade volume with the data on lobbying activities in general and on trade-related ones. To identify trade-related lobbying, following Lee (2020), in the sections explaining the services provided by the agents the author uses these

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[6] The keywords listed did not cover government entities of the Russian Federation or of the Federation of Bosnia and Herzegovina. Because the keyword "federation" alone covers both governmental and private entities, the names of the nation and the region were included as keywords to ensure coverage.

key terms: trade, export, import, FTA, NAFTA, CAFTA, DRCAFTA, FTAA, NAFTAS, KFTA, CAFTAS, KORUSFTA, TPP, GSP, MCOOL, tariff, custom, customs, AGOA, TPL, WTO, GATT, MFN, anti-dump and Caribbean & Basin.

As the main independent variables for United States forward and backward GVC participation, the author uses the UNCTAD-Eora Global Value Chain database (Casella et al., 2019), which has the most extensive geographical coverage (189 countries) among several alternatives. The variable for forward GVC linkage indicates the amount of value added from the United States to each target country's exports, and backward GVC linkage refers to the amount of value added from each target country to the United States exports (both in thousands of constant 2010 United States dollars). The other two variables to be compared with the GVC linkages are total (gross) exports and imports; these come from the Correlates of War data set on international trade (Barbieri and Keshk, 2016; Barbieri et al., 2009) (in millions of constant 2010 United States dollars).[7]

Regarding control variables, as this statistical analysis explores the causal effects of GVC and trade variables rather than foreign lobbying activities per se, the models include only those that can be considered as correlating with both independent and dependent variables.

Previous research has shown that free trade agreement (FTA) negotiations and alliance relations positively affect lobbying activities in the United States, whereas the presence of an FTA and a greater degree of democracy make lobbying from a country less active (Lee, 2020). These variables could also correlate with the GVC integration of the United States with those countries; therefore, this study controls for them. The present formation of FTAs is found to be associated with GVC networks (Anderer et al., 2020). Here, a country is regarded as being in FTA negotiation (one variable) in a given year from one to three years before the conclusion of an FTA that is registered at the World Trade Organization.[8] Also included is a variable for pre-FTA negotiation, indicating one to three years before the assumed start of negotiation of an FTA. Furthermore, security alliances affect trade (Gowa, 1995); thus, to identify United States allies, this study uses the Alliance Treaty Obligations and Provisions (ATOP) data (version 5.1) (Leeds et al., 2002).[9]

Moreover, the United States imports heavily from resource-rich countries; such trading relations do not seem to require GVC formation.[10] A variable for democracy

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[7]   Missing observations in trade flows in the original data set are replaced with zeros.

[8]   The data for FTAs come from the Gravity data set of CEPII (Centre d'Études Prospectives et d'Informations Internationales) (Conte et al., 2022).

[9]   From the ATOP data set, only the alliance relationships that include defensive obligations are included.

[10]   See tables 3 and 4 later in this section.

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is included, measured with the Electoral Democracy Index from the Varieties of Democracy (V-Dem) data set.[11]

Finally, as lobbying may be affected by the relative importance of trade for the lobbying governments, rather than in the other direction, the models account for trade dependence – namely (*log*((*US export + US import*)*100/GDP+1*)) – as well as population, gross domestic product (GDP) per capita and membership in the General Agreement on Trade and Tariffs (GATT) from the CEPII Gravity data set.[12]

Figure 1 shows how total and trade-related lobbying expenditures changed during 2000–2015, indicating that the level of spending had not quite recovered since the financial crisis of 2007–2008. In particular, trade-related lobbying expenditures declined steadily since then.

Figure 1. Total and trade-related lobbying expenditures, 2000–2015
(Millions of constant 2010 United States dollars)
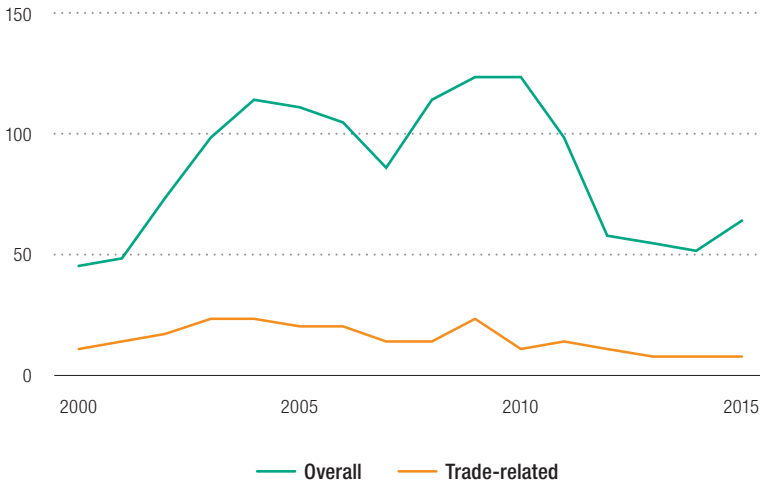
Source: Author's calculation, based on FARA reports, 2000–2015.

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[11] The data set used for this study was "Country-year: V-Dem core", V-Dem Dataset version 9 (2019) (https://v-dem.net/data/dataset-archive). For the construction of the variable, see V-Dem Codebook (Coppedge et al., 2019).

[12] They compiled the population and GDP data from the World Bank Development Indicators, Barbieri (2005), Angus Maddison's Statistics on World Population and the national statistical agency of Taiwan Province of China and the GATT membership data from WTO. For a detailed explanation of the original sources, see Conte et al. (2022).

The biggest lobbying spenders in the three periods (2000–2004, 2005–2009, 2010–2015) are listed in table 1. These are mainly United States allies (e.g. Canada, the Republic of Korea, Türkiye), geostrategically important non-allies (e.g. Ethiopia, Qatar, Saudi Arabia) and several post-conflict countries (e.g. Angola, Haiti, Liberia). The list of the largest spenders on trade-related lobbying (table 2) looks similar but also includes those with stronger economic ties with the United States, such as Israel and Japan.

Figure 2 shows the general trends in United States GVC participation, both backward and forward. It indicates that both modes of participation increased steadily until the Great Recession and have stagnated since then. The top 10 countries with the strongest GVC linkages to the United States are listed in tables 3 and 4, and more detailed descriptive statistics appear in appendix table.

Table 1. Reported lobbying expenditures, top 10 economies
(Constant 2010 United States dollars)

	2000–2004		2005–2009		2010–2015	
	Country	Lobbying expenditure	Country	Lobbying expenditure	Country	Lobbying expenditure
1	Liberia	67 897 981	Liberia	140 654 436	Liberia	81 934 527
2	Angola	38 693 451	Saudi Arabia	51 361 921	Saudi Arabia	35 021 495
3	Ethiopia	27 658 884	Iraq	42 051 845	United Arab Emirates	24 702 743
4	Saudi Arabia	26 163 673	United Arab Emirates	32 304 207	Morocco	18 681 517
5	Canada	21 181 366	Canada	23 037 507	Canada	17 974 186
6	Türkiye	17 807 193	Türkiye	16 718 522	Republic of Korea	16 859 305
7	Panama	13 356 192	Bahamas (the)	13 205 094	Türkiye	14 655 624
8	Bahamas (the)	12 887 730	Morocco	12 248 073	Iraq	13 674 078
9	Haiti	9 581 371	Cyprus	12 149 029	Mexico	13 180 793
10	Ukraine	8 282 708	Taiwan Province of China	11 816 856	Japan	12 047 397

Source: Author's calculation, based on FARA reports 2000–2015.

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Table 2. Reported trade-related lobbying expenditures, top 10 countries
(Constant 2010 United States dollars)

	2000–2004		2005–2009		2010–2015	
	Country	Trade lobbying	Country	Trade lobbying	Country	Trade lobbying
1	Ethiopia	19 550 693	Canada	17 651 461	Canada	8 451 322
2	Canada	13 721 355	Saudi Arabia	15 112 404	Republic of Korea	8 004 483
3	Angola	7 868 161	Iraq	9 487 138	Israel	7 229 387
4	Barbados	3 952 214	Trinidad and Tobago	7 410 350	Japan	6 419 709
5	Israel	3 701 906	Angola	4 867 077	Iraq	5 740 443
6	Venezuela (Bolivarian Republic of)	3 387 498	Panama	4 191 747	Bahrain	1 948 427
7	Bahamas (the)	3 171 577	Israel	4 042 695	Angola	1 628 135
8	Mexico	3 000 314	Japan	2 450 351	Trinidad and Tobago	1 484 699
9	Qatar	2 857 195	Côte d'Ivoire	2 373 136	Qatar	1 356 323
10	India	2 789 144	China	2 313 484	Mexico	1 271 678

Source: Author's calculation, based on FARA reports, 2000–2015.

Figure 2. United States forward and backward GVC participation, 2000–2015
(Billions of constant 2010 United States dollars)
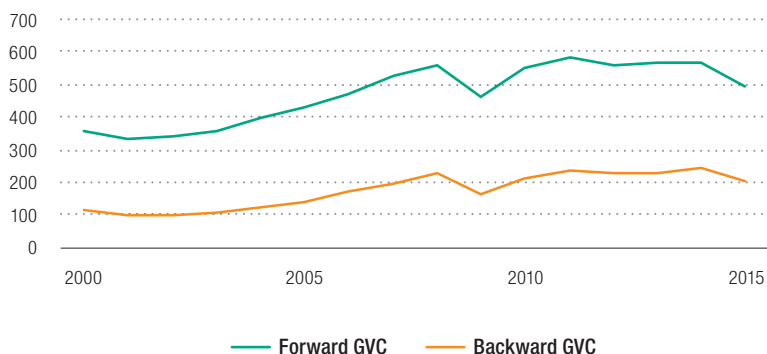
Source: Author's calculation, based on Casella et al. (2019).

Table 3. Top 10 economies for United States forward GVC linkages
(Thousands of constant 2010 United States dollars)

	2000–2004		2005–2009		2010–2015	
	Economy	Forward GVC	Economy	Forward GVC	Economy	Forward GVC
1	Canada	369 952 976	Canada	456 915 112	Canada	580 897 344
2	Mexico	169 311 694	Germany	249 251 708	Germany	336 733 376
3	Germany	160 298 190	Mexico	191 636 560	Mexico	258 469 956
4	Netherlands (Kingdom of the)	102 295 088	Netherlands (Kingdom of the)	145 073 816	Netherlands (Kingdom of the)	194 439 854
5	United Kingdom	86 835 496	United Kingdom	110 747 500	China	165 920 230
6	Japan	79 442 428	Japan	109 023 722	Singapore	149 974 186
7	Belgium	70 678 563	Belgium	103 285 800	United Kingdom	141 894 690
8	Ireland	69 415 163	Ireland	98 259 978	Japan	137 648 634
9	Singapore	68 321 286	Singapore	97 824 169	Belgium	131 784 354
10	France	64 041 228	China	95 844 915	Ireland	127 819 476

Source: Author's calculation, based on Casella et al. (2019).

Table 4. Top 10 economies for United States backward GVC linkages
(Thousands of constant 2010 United States dollars)

	2000–2004		2005–2009		2010–2015	
	Economy	Backward GVC	Economy	Backward GVC	Economy	Backward GVC
1	Canada	103 367 518	Canada	172 093 718	Canada	251 884 704
2	Japan	66 986 874	Japan	73 879 920	China	125 953 668
3	Germany	36 667 870	Venezuela (Bolivarian Republic of)	68 487 859	Venezuela (Bolivarian Republic of)	117 417 438
4	Mexico	34 758 215	China	68 229 595	Japan	89 032 426
5	China	30 044 325	Germany	58 522 648	Mexico	83 038 129
6	Venezuela (Bolivarian Republic of)	27 690 500	Mexico	54 968 497	Germany	80 720 300
7	United Kingdom	25 814 765	United Kingdom	33 618 563	United Kingdom	44 217 666
8	France	19 245 055	France	29 542 367	France	40 618 621
9	Italy	13 906 191	Italy	21 641 891	Republic of Korea	31 009 113
10	Taiwan Province of China	12 861 937	Republic of Korea	20 527 935	Russian Federation	29 854 645

Source: Author's calculation, based on Casella et al. (2019).

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To analyse the relationship between GVC participation and United States domestic lobbying in individual industries, we estimate the following dynamic model (Croissant and Millo, 2019), as industry lobbying in a given year is expected to be strongly predicted by that in the past year:

$$y_{it} = y_{i(t-1)}\rho + , x_{it}\beta + \alpha_i + \gamma_t + u_{it,}$$

where y_{it} is the dependent variable (lobbying expenditure or count in a given ISIC industry group i in year t), x_{it} is the vector of independent variables, and α_i and γ_t are industry and time-fixed effects, respectively.

Because the data set for this analysis is characterized by particularly short time periods (T = 11), the traditional estimators with lagged dependent variables might suffer from Nickell's bias (Nickell, 1981). Recently, Breitung et al. (2022) and Kripfganz and Breitung (2022) proposed a bias-corrected estimator implementable with the STATA command *xtdpdbc*, which corrects the bias by adjusting moment conditions while retaining small variance of the fixed-effects (and random-effects) estimators.

In building a statistical model for the main hypotheses (*H2a* and *H2b*, on the relationship between GVC linkages and foreign lobbying) to explore the relationship between the dependent and independent variables, an issue must be addressed: the data set contains many observations for the dependent variable – lobbying expenditure – that are zero, indicating that the dependent variable is censored at zero, which can lead to biased coefficient estimates from ordinary least squares or other conventional regression models (Henningsen, 2010). Therefore, the author estimates random-effect panel tobit models, a common approach taken in studies of international political economy that handle censored dependent variables, such as foreign aid allocation (Dreher et al., 2012). Its estimation model (Berthélemy and Tichit, 2004; Henningsen, 2010; Tobin, 1985) can be written as follows:

$$y_{it} = max(0, y_{i(t-1)}\rho + x_{it}\beta + v_t + u_{it})$$

where y_{it}, the dependent variable, stands for the amount of lobbying expenditure by a given country i in year t; x_{it} is a vector of independent variables; and v_t is the time fixed effects (that are not reported in the regression tables); y_{it} is zero when $y_{i(t-1)}\rho + x_{it}\beta + v_t + u_{it} < 0$.

As most of the registered foreign agents continue their activities over multiple years, we can expect that the current level of lobbying from a given foreign country will depend on that in the past year, so we include the lagged dependent

variable $y_{i(t-1)}$.[13] Considering the time to respond from the foreign agents' perspective, GVC and trade variables are lagged by one year (which applies to the negative binomial models below, too). It is estimated with the maximum-likelihood method using the mean-variance adaptive Gauss–Hermite quadrature, with the STATA command *xttobit*.

Similar models with annual numbers of records as the dependent variable are also estimated. Since the dependent variable consists of integers equal to or more than zero and the data pose an issue of overdispersion, the models are estimated with the negative binomial random-effects model with year fixed effects (Cameron and Trivedi 2013; Prakash and Potoski 2006), with the following equation:

$$\mu_{it} = exp(y_{i(t-1)}\rho + x_{it}\beta),\ var(y_{it}) = g\mu_{it}\cdot\alpha$$

where g is the negative binomial distribution function and α indicates the dispersion parameter.

4.2. Results

Table 5 presents the results of the analyses on how GVC participation affects *domestic* lobbying by industry in the United States (*H1*). GVC linkages are positively correlated with the logged number of lobbying activities by firms in their respective industries, but not with the amount of their spending. Perhaps lobbying expenditure reflects a lot of factors, such as agents' efficiency and pricing, so the count may reflect the intensity of lobbying for our purposes here. Contrary to our expectations, the results demonstrate a statistically significant negative coefficient for gross exports, with the log number as the dependent variable. One possible explanation is that export interests concentrate their effort in their delegation to the United States Trade Representative (De Bièvre and Dür, 2005). There needs to be further discussion on how future traditional trade in goods mobilizes domestic interest groups.

Figure 3 presents the coefficients and standard errors for the main independent variables (for the full results, see table 6). Overall, the hypotheses about forward (*H2a*) and backward (*H2b*) GVC participation are supported. Forward GVC linkages are associated with reduced foreign lobbying activities, in terms of both overall and trade-related foreign government lobbying (*H2a*). Moreover, the results for backward GVC linkages are consistent with *H2b*, showing positive correlations

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[13] Due to concerns over the problem of incidental parameters (Cameron and Trivedi, 2013; Lancaster, 2000) and Nickell's bias (Nickell, 1981), the tobit models and the negative binomial models explained below do not include country fixed effects.

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Table 5. Effects of GVC participation on domestic lobbying by industry, 2005–2015

Variable	(1) Lobbying spending (logged)		(2) Lobbying count (logged)	
Gross output (logged)	0.237	(0.531)	0.555*	(0.248)
Import (logged)	0.056	(0.482)	-0.092	(0.120)
Export (logged)	-0.541	(0.675)	-0.401**	(0.127)
Employment (logged)	0.869	(1.100)	-0.103	(0.288)
GVC participation	3.640	(5.533)	4.301*	(1.996)
Observations	320		320	

Source: Author's estimations.

Note: Standard errors in parentheses. Dynamic panel model with a one-year lag and two-way fixed effects (not shown in the data set) using bias-corrected method-of-moments estimators proposed by Breitung et al. (2022). * $p < 0.05$, ** $p < 0.01$.

Figure 3. Effects of trade and GVC participation on foreign lobbying
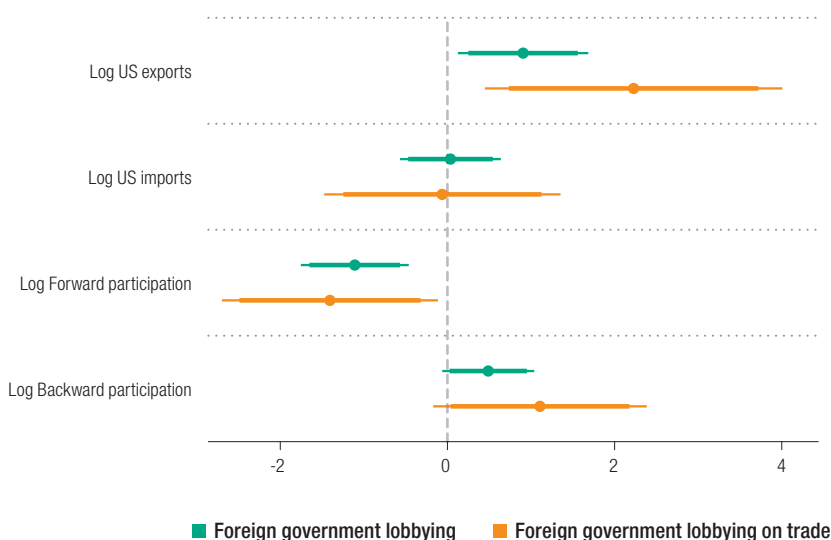
Source: Author's estimation.

Note: Confidence intervals of 90 per cent (thin) and 95 per cent (thick).

with both overall and trade-related lobbying activities, which seems to lead to more lobbying than forward GVC linkages. Notably, while gross exports are positively associated with foreign lobbying activities, gross imports do not seem to be associated in a significant way. As discussed in the theory section, the distributional impacts of import competition may be felt more strongly by industries integrated into the global production processes through backward GVC linkages, particularly as they develop at the expense of domestic suppliers. These effects may have broad ramifications such as exciting public sentiment against countries to which activities are outsourced or deteriorating bilateral relations, which need to be dealt with outside the scope of trade negotiations, and which may explain why the association is statistically significant for overall lobbying activities as well.

Table 6. Panel tobit model of foreign lobbying expenditures

|	(1)		(2)	
	Foreign government lobbying, overall		Foreign government lobbying, trade-related	
Lagged dependent variable	1.022**	(0.047)	1.265**	(0.097)
Log US exports	0.903*	(0.398)	2.225**	(0.907)
Log US imports	-0.036	(0.307)	-0.060	(0.720)
Log Forward participation	-1.106**	(0.328)	-1.405*	(0.659)
Log Backward participation	0.488+	(0.280)	1.106+	(0.651)
Democracy	-2.492+	(1.513)	-4.538	(2.952)
US ally	-0.000	(0.823)	-0.077	(1.652)
FTA partner	0.023	(1.069)	-0.577	(1.950)
FTA negotiation	2.827*	(1.370)	9.123**	(2.234)
Pre-FTA negotiation	1.689	(1.439)	5.158*	(2.405)
Trade dependence on the United States, log percentage	0.774	(0.696)	1.966	(1.544)
Log Population	1.018	(0.681)	0.306	(1.522)
Log GDP per capita	0.618	(0.620)	-0.891	(1.431)
WTO/GATT member	0.634	(0.824)	0.378	(1.640)
Trend	-0.048	(0.070)	-0.160	(0.147)
Constant	-11.40**	(4.296)	20.55*	(9.577)
Observations	2 534		2 534	

Source: Author's estimations.

Note: Random-effect tobit model with year fixed effects (not shown in the table). Standard errors in parentheses. $^+$ p < 0.10, * p < 0.05, ** p < 0.01.

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The signs of the control variables' effects are mostly as expected based on this model. Countries that score lower on the electoral democracy index spend more money on overall lobbying. Countries engaging in FTA negotiations are more active in lobbying (and also those in the pre-negotiation stage for trade-related lobbying), although being an FTA partner does not seem to reduce activities in a statistically significant way. Trade dependence on the United States appears to increase lobbying activities, but this effect is not statistically significant. A security alliance with the United States does not seem to have a significant effect.

The results for the negative binomial models shown in figure 4 are similar to the ones with lobbying expenditures as the dependent variable (for the full results, see table 7).

Figure 4. Effects of trade and GVC participation on foreign lobbying: negative binomial model
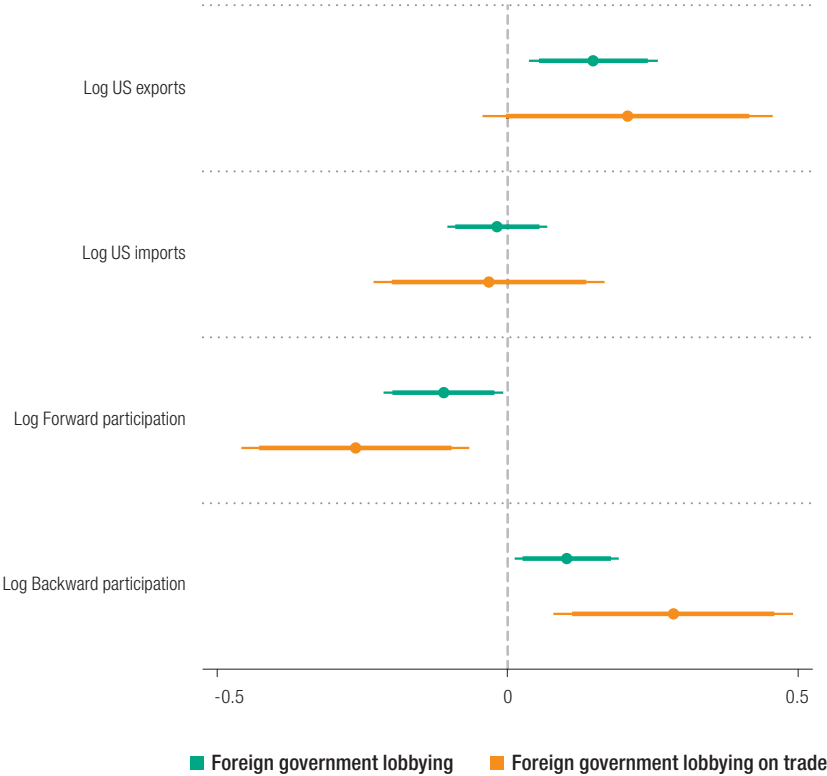
■ Foreign government lobbying   ■ Foreign government lobbying on trade

Source: Author's estimation.

Note: Confidence intervals of 90 per cent (thin) and 95 per cent (thick).

Table 7. Panel negative binomial models on foreign lobbying cases

	(1)		(2)	
	Foreign government lobbying count, overall		Foreign government lobbying count, trade-related	
Lagged dependent variable	0.111**	(0.004)	0.301**	(0.021)
Log US exports	0.147**	(0.057)	0.206	(0.128)
Log US mports	-0.019	(0.044)	-0.032	(0.102)
Log Forward participation	-0.110*	(0.053)	-0.262**	(0.100)
Log Backward participation	0.102*	(0.046)	0.285**	(0.105)
Democracy	-0.435+	(0.247)	-0.632	(0.453)
US ally	-0.371*	(0.156)	-0.006	(0.267)
FTA partner	-0.020	(0.146)	0.275	(0.263)
FTA negotiation	0.397**	(0.152)	1.189**	(0.265)
Pre-FTA negotiation	0.207	(0.160)	0.921**	(0.267)
Trade dependence on the United States, log percentage	0.187+	(0.099)	0.402+	(0.211)
Log population	0.164	(0.109)	0.187	(0.225)
Log GDP per capita	0.054	(0.095)	-0.090	(0.197)
GATT/WTO member	-0.093	(0.097)	-0.015	(0.216)
Trend	-0.011+	(0.007)	-0.022	(0.015)
Constant	-0.161	(0.676)	-1.420	(1.403)
Observations	2 534		2 534	

Source: Author's estimations.

Note: Standard errors in parentheses. Random-effects negative binomial models with year-fixed effects (not shown in the table).
$^+$ p < 0.10, * p < 0.05, ** p < 0.01.

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5. Discussion and illustrative cases in the literature

The quantitative analysis in section 4 mostly supports the theoretical argument in section 3. First, the analyses with the first data set on domestic lobbying activities by industry provide partial evidence of a positive association between GVC participation and private lobbying activities in the United States. Second, the results from the main models on foreign lobbying demonstrate that United States exports are strongly associated with increased lobbying activities from importing countries, whereas the United States forward GVC linkages are seemingly negatively correlated with lobbying activities. Moreover, the effects of backward GVC participation aligned with the author's expectation, although those of United States imports did not. The results showed null effects with United States imports, and GVC participation was associated with increased overall lobbying activities from overseas. This may indicate that the current phenomena representing the backlash to globalization derive from GVC integration rather than from overall imports. Although the first part of the analysis concerns the industry level and the second looks at the country level, when combined they provide partial support for the argument that forward GVC linkages make United States domestic lobbying a substitute for foreign lobbying, whereas backward GVC linkages increase both at the same time.

The remainder of this section presents several cases discussed in the literature, in order to probe the plausibility of the theorized effects of trade and GVC linkages, mainly focusing on the latter, thereby illustrating the possible relationships between trade, GVC linkages and foreign lobbying activities.

Figure 5 shows graphs of United States trade and GVC linkages with three countries in the Asia-Pacific region – China, India and Malaysia. The connection between the United States and China has been the strongest during the period under consideration; both trade and GVC linkages have increased dramatically, although the latter slowed around the Great Recession. Trade volumes in India have grown steadily and reached the level of those of Malaysia for both exports and imports, but its backward (forward from the United States perspective) linkage with the United States seems relatively weak. Notably, the United States forward GVC linkage with Malaysia is quite strong compared with the total trade volume between them, suggesting their integration into strong value chain networks.

Thus, the graphs of government lobbying expenditures (figure 6) indicate that the trend of expenditures from China has not followed that of its economic interdependence with the United States. By contrast to China, lobbying activities from India appear constant, especially when examining overall government lobbying expenditures. Malaysia spent the least on lobbying.

Figure 5. United States trade and GVC integration with China, India and Malaysia, 2000–2014 (Billions of constant 2010 United States dollars)

a. United Stats exports

b. United States imports

c. United States forward integration

d. United States backward integration

China   India   Malaysia
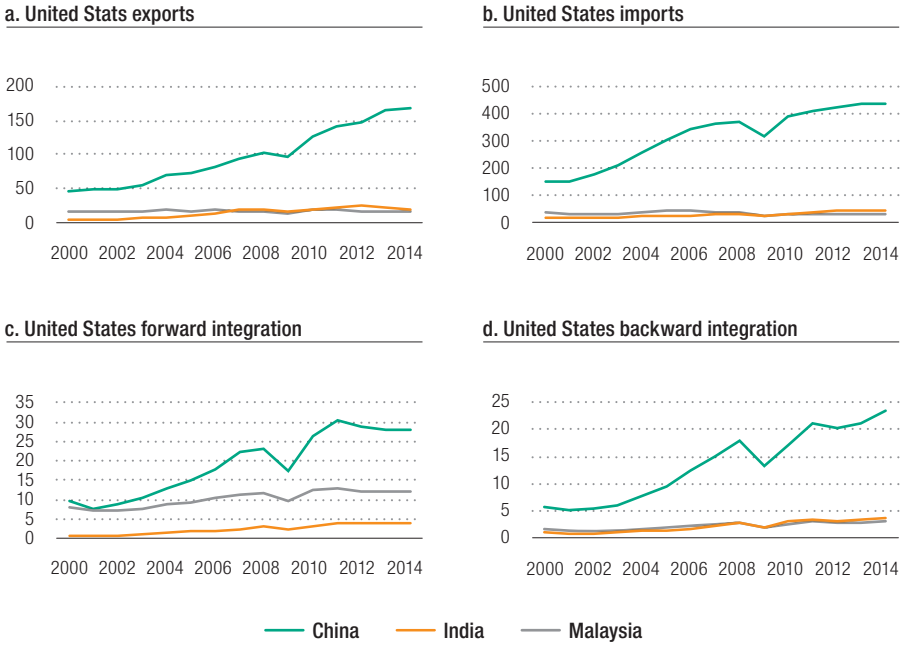
Source: Barbieri et al. (2016) and Casella et al. (2019).

Figure 6. Governmental lobbying expenditures from China, India and Malaysia, 2000–2015 (Thousands of constant 2010 United States dollars)

a. Foreign government lobbying expenditures

b. Foreign government lobbying expenditures on trade

China   India   Malaysia
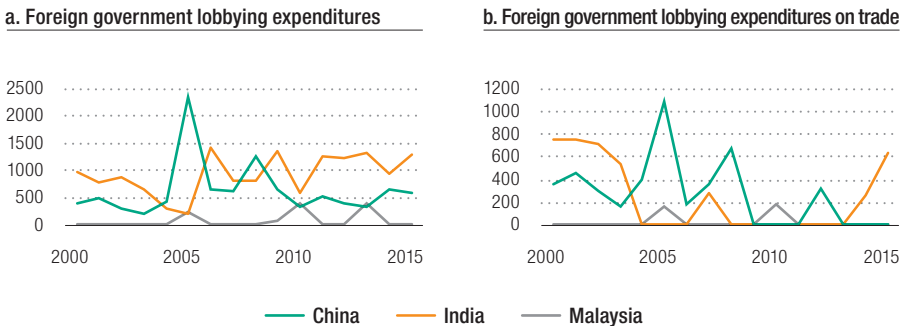
Source: Author's calculation, based on FARA reports 2000–2015.

All these data must be treated with some caution, particularly those for China, as they do not include officially private organizations (Diamond and Schell, 2018).

The question arises as to how strong supply chain linkages can mobilize domestic interest groups in the United States that support the agendas of foreign governments. The shared interests between foreign governments and private actors in the United States can be either explicit or implicit (Wagreich 2013). Studying the multifaceted aspects of Chinese influence in United States politics, Diamond and Schell (2018, p. 109) note that "recognizing the importance of American companies in American politics, China has frequently cultivated, even leveraged, American executives to lobby against policies it opposes". Wagreich (2013) mentions Boeing's pro-China lobbying activities as an example of China leveraging its own market power to influence United States policies, but as Diamond and Schell (2018, p. 110) state, "its key role in international supply chains is also its source of leverage".

Such linkages are, however, often implicit, and it is not always easy to observe instances in which foreign governments, such as China, exercise their influence. This is because "the motivation for U.S. multinational corporations to lobby on China's behalf usually did not result from direct communication or orders from Chinese governmental officials" (Wagreich, 2013, pp. 151–152). Such instances become visible when salient issues occur. Amid heightened political tensions over the rate of the yuan in 2010 and 2011, various interest groups in the United States raised their voices in support of or against a China currency reform bill. For example, in July 2010, a group of retailers and other trade organizations, such as TechAmerica and the Coalition of New England Companies for Trade, stated their opposition to the bill under discussion, in a letter to House Speaker Nancy Pelosi and Majority Leader Steny Hoyer, mentioning its potential impact on United States industries connected with China through trade and supply chains.[14]

Moreover, from the perspective of backward GVC participation by the United States, the lack of a position taken by the National Association of Manufacturers was more telling, because "there was no agreement on whether legislation would help or hurt achievement of that goal [of addressing the undervaluation of the yuan]," according to Frank Vargo, the then vice president.[15] The extent of success of these counter-lobbies and of the modest expenditures by the Government of China on lobbying requires further examination. The Currency Reform for Fair Trade Act of 2009, which was passed by the House, was unable to garner enough

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[14] National Foreign Trade Council, "Association letter to House members on China currency legislation", 22 July 2010, www.nftc.org.
[15] Wolfgang Armbruster, "US-China policy: Is a trade war brewing?", *The Journal of Commerce*, 25 October 2010.

support in the Senate (Hilland and Devadoss, 2013). The Senate passed the Currency Exchange Rate Oversight Reform Act of 2011, which was more modest than the House bill, but it failed to be considered in the then Republican-controlled House, whose speaker, John Boehner, was opposed to both bills.[16]

In the recent trade tensions between the United States and China, the strong opposition of United States suppliers to Chinese producers was clearer. Opponents included suppliers such as Eastman Chemical as well as industry organizations, including the Semiconductor Industry Association (SIA). Eastman Chemical's chief executive officer remarked that it was difficult to reorganize its supply chain in the short term because of its high degree of specialization.[17]

A more surprising move came from the SIA, which had played a major role in the trade tensions with Japan in the 1980s and 1990s).[18] Bown (2021, p. 373) pointed out that this shift was owing to the reorganization of the semiconductor industry supply chains, which in turn reorganized the SIA membership by "[a]ccommodating common interests of key input suppliers". The SIA was also among the United States business organizations that supported the negotiation of the Trans-Pacific Partnership Agreement, in which Malaysia took part. It mentioned the "global supply chain, with Japan, Malaysia, Singapore and [Viet Nam] specializing in the diverse segments that make up the semiconductor ecosystem"[19] to explain the agreement's importance to the industry, which may have alleviated the need for lobbying for South-East Asian countries with strong GVC linkages to the United States. These observations also suggest that, although the data set for the quantitative analysis covers only up to 2015, a similar lobbying dynamism seemingly held well beyond that time.

India has also sometimes been able to invoke ties with interest groups (particularly those of Indian-American communities) and big companies, as in the case of the civilian nuclear agreement in 2005 (Mistry, 2013). However, it enjoys few such ties related to its GVC linkages with the United States. In another relatively high-profile case, in 2010–2011, when the Congress linked the Mexican border security issue with an increase in visa fees for highly skilled workers from India, only the National Association of Software and Services Companies, an Indian consortium, lobbied on this issue, according to Kim's (2018) search on LobbyView. The cosponsors of the bill even said that it "affects outsourcing companies such as Wipro, Tata,

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[16] Ross Eisenbrey, "House Republicans block remedy for China's job-killing currency intervention", Working Economics Blog, Economic Policy Institute, 22 December 2012, www.epi.org.

[17] Kyo Kitazume, "Year one in US–China trade war takes $20bn toll on their exports", *Nikkei Asia*, 6 July 2019.

[18] "SIA statement on Trump Administration tariff announcement", 15 June 2018. www.semiconductors.org.

[19] SIA, "Post-hearing brief in response to investigation No. TPA-105-001", letter to the Secretary, United States International Trade Commission, 22 January 2016, www.semiconductors.org/wp-content/uploads/2018/06/ITC-TPP-Post-Hearing-Statement-Final.pdf.

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Infosys, Satyam, but does not affect American companies such as Microsoft, Oracle, Intel, and Apple" (Calder, 2014, p. 219). The Government of India was actively lobbying at about this time, but its efforts made little change to the United States policy (Calder, 2014).

6. Conclusions and policy implications

Through the analysis of FARA reports, this study has revealed the opposing effects that current economic globalization can have on lobbying activities by foreign governmental entities. Although the growing interdependence caused by trade increases the need for lobbying, the globalization of production – in particular United States participation through forward linkages – may make their activities less aggressive, as they are more likely to find allies in the United States who can serve as proxies. Conversely, United States backward GVC linkages increase lobbying activities from countries from which United States firms source their inputs. Thus, regarding the distributional impacts of import competition, the relevance seems to have shifted from conventional trade to GVCs.

These findings bear two main implications for policymakers. First, the negative correlation between forward GVC linkages and lobbying activities by foreign governments may give policymakers pause, because it suggests that foreign lobbying measures are becoming more intricate and indirect, while FARA registration and stated lobbying expenditures may no longer be enough to capture the extent of their actual influence (Wagreich, 2013). Foreign countries linked with domestic companies through investments and GVCs can benefit from those companies to address their concerns without engaging directly in lobbying themselves. Corporate owners and policymakers involved in decisions on investment overseas and expansion of GVC networks need to be aware of these intricacies and make sure that the pursuit of economic benefits does not harm democratic accountability.

Second, the apparent shift of significance from traditional imports to backward GVC linkages in their effects on foreign lobbying provides another takeaway: that more attention must be paid to GVCs' distributive consequences (Curran and Eckhardt, 2018), particularly as backward GVC integration, or offshoring of segments in value chains, is associated with growing discontent with globalization (Butzbach et al., 2019). The growing links with outsourcing destinations such as Viet Nam have caused concerns among various actors, from industries in which workers might lose their jobs to people who worry about labour conditions, both domestic and abroad (Cezar, 2021; van Assche and Gangnes, 2019), which explain the motivations of lobbying from those countries. Policymakers need to reconcile these competing interests while also addressing the distributive concerns at their root.

Recent studies have started to emphasize the need to focus on private actors and found that deeper integration into the global economy through foreign direct investment and supply chains increases lobbying activities from overseas (Lee, 2022 and 2023). The current study complements those findings by pointing to more nuanced effects regarding foreign governmental actors, and thereby pointing to the importance of distinguishing forward and backward GVC linkages. Of course, the current study's findings do not necessarily contradict existing research: Like domestic suppliers who may play the role of foreign proxies, foreign subsidiaries may also serve as a substitute for foreign governmental lobbies.

The empirical strategy of this paper faces certain limitations arising from data availability. Notably, the current study has not been able to establish the linkage between domestic actors' responses in the United States and changes in the lobbying activities of foreign government entities. Moreover, as noted above, the study has highlighted only foreign governmental lobbying. Due to this choice, inferences drawn from this study may be biased towards the preferences of smaller actors overseas, such as foreign firms that cannot have subsidiaries in the United States and have to rely on their home governments. The theory posited in this paper can be elaborated in its application to the activities of bigger private actors overseas, as well as multinational corporations. Future research should explore GVCs' impacts on those actors, as recent scholars have been utilizing newly available data on their lobbying (Lee, 2022).

This study contributes to the growing literature on the political consequences of GVC networks by analysing lobbying activities by foreign governmental entities in the United States. The country's susceptibility to lobbying, partly owing to the clear separation of powers, justifies this focus. Yet, this choice poses a challenge to the external validity of the study's findings. An interesting avenue for future research would be to examine foreign lobbies in other democratic countries and polities, such as the European Union, and explore how the growing GVC networks have affected them.

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Appendix

Appendix table: Descriptive statistics for the main data set

Variable	Minimum	Mean	Median	Maximum	Standard deviation	Number of observations
Log Foreign government lobbying expenditures, overall	0.00	4.79	0.00	17.64	6.23	3 077
Log Foreign government lobbying expenditures, trade-related	0.00	1.53	0.00	16.02	4.12	3 077
Foreign government lobbying count, overall	0.00	2.09	0.00	60.00	3.76	3 077
Foreign government lobbying count, trade-related	0.00	0.34	0.00	19.00	1.07	3 077
Log US exports	0.00	5.69	5.65	12.45	2.83	3 072
Log US imports	0.00	5.53	5.74	12.99	3.35	3 072
Log Forward participation	5.05	11.23	10.86	18.43	2.94	2 799
Log Backward participation	0.01	10.52	10.17	17.64	2.97	2 799
Democracy	0.01	0.53	0.54	0.95	0.26	2 741
US ally	0.00	0.33	0.00	1.00	0.47	3 077
FTA partner	0.00	0.07	0.00	1.00	0.25	2 960
FTA negotiation	0.00	0.02	0.00	1.00	0.13	3 077
Pre-FTA negotiation	0.00	0.01	0.00	1.00	0.12	3 077
Trade dependence on the United States, log percentage	0.00	1.76	1.59	4.61	0.98	2 871
Log Population	0.01	2.19	2.12	7.22	1.47	2 946
Log GDP per capita	4.86	8.26	8.25	11.64	1.55	2 868
GATT member	0.00	0.77	1.00	1.00	0.42	2 960
Trend	0.00	7.53	8.00	15.00	4.61	3 077

Source: Author's estimations.

Intrafirm transactions and tax haven linkages: Evidence from Indian manufacturing*

Swati Verma[a]

Abstract

This study aims to assess the pattern and prevalence of intrafirm activities in foreign exchange transactions of foreign affiliates in the manufacturing sector in India. The related-party foreign transactions of selected foreign affiliates are analysed for two years, and the shares of financial payments directed to tax haven locations are identified to appraise the vulnerability of these outflow transactions to potential risk of corporate tax avoidance. A majority of foreign exchange earnings and expense transactions were found to be conducted within firms. The major part of intrafirm payments for the key expenditure types was made to various tax haven locations having different levels of tax avoidance risk. Close to half of all expense payments were traced to tax havens, with several firms reporting predominant shares of intrafirm import, financial or services payments linked to certain significant tax havens. The data indicate active involvement of foreign affiliates in India in the use of tax havens for foreign expense transfers, which could be motivated by tax avoidance aims. This tendency is noted to be high for specific channels such as services, interest payments and other miscellaneous transactions, suggesting that these channels may be used for transfer mispricing and tax avoidance strategies by foreign-affiliated firms.

Keywords: corporate tax, foreign direct investment, foreign affiliate, intrafirm trade, intrafirm transaction, multinational corporation, manufacturing sector, tax avoidance, tax haven

JEL classification codes: F14, F21, F23, H25, H26

1. Introduction

The global production and trade operations of multinational corporations (MNCs) are largely characterized by within-firm transactions between their affiliated branch entities operating in various countries. The flow of resources comprises goods, technology, and financial as well as a range of services transactions. Disappointingly, in the case of several countries including India, the customs statistics for such trade are mostly lacking (Dowlah, 2018). Even so, the significance of this phenomenon in current international trade has been highlighted by various macro- and firm-level studies covering selected regions and time periods.

A notable volume of recent global literature has shown evidence of how the intrafirm transactions of large MNCs are routed through tax havens or low-tax locations through transfer mispricing, which is frequently undertaken to avoid taxes in home or host countries of foreign investment and to minimize their total global tax liability. The central role of tax havens as distinct locations that facilitate such activities as tax avoidance through profit shifting by means of their low corporate tax rates, financial secrecy, minimal regulation or other incentives has been underlined in various contemporary research studies. This process puts the developing world at risk of losing much-needed capital as revenue resources at the hands of a handful of global corporations.

India is presently one of the largest and most significant emerging economies. It has been one of the leading recipients of FDI among the developing economies over the past three decades and was among the most buoyant recipients of FDI in Asia in 2022.[1] It is poised to be a leading attractive destination for investment in the next decade, surpassing other emerging markets, according to an IMF (2023) forecast.[2]

It is worth noting that India had one of the highest corporate tax rates in the world until 2021.[3] As such, MNCs operating there have been highly susceptible to shifting profit out of the economy to jurisdictions that offer low corporate tax rates or other incentives such as financial secrecy, minimal regulations and others that may facilitate tax avoidance. Since such factors are commonly present in tax haven jurisdictions, the value of intrafirm transactions involving outflows of payments to low-tax locations

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[1] An increase of 10 per cent in FDI inflows was observed for India in 2022 compared with 2021 (UNCTAD, 2023).

[2] Sumit Poddar, "India: The unstoppable investment destination of next decade", *The Economics Times*, 30 June 2023.

[3] India had a statutory corporate tax rate of 48.3 per cent in 2018 and 2020, the highest among the 94 and 109 jurisdictions, respectively, covered by the Corporate Tax Statistics of the Organisation for Economic Co-operation and Development (OECD, 2019 and 2020). Since 2021, the rate has been 25 per cent (OECD, 2021).

or tax havens is likely to be high for MNC-linked foreign affiliates located in India. The risk level for corporate tax avoidance in the country of the related party is likely to influence the flow of these intrafirm transaction payments positively.

Against this backdrop, it is important to understand to what extent cross-border transactions of foreign affiliates located in India are associated with the undesirable practice of tax haven use by MNCs for the specific purpose of global corporate tax avoidance or evasion. An appraisal of the possible extent of resource loss or even the susceptibility to resource losses through such channels is crucial in the contemporary Indian context and needs deeper investigation.

Interestingly, some studies focusing on India have found substantial losses of gross assets by the economy through trade mispricing (Kar, 2010; Kar and Spanjers, 2015), and a few others have found evidence of profit shifting by MNC-affiliated firms (Janský and Prats, 2013). Yet, the pattern of cross-border transactions of MNC-linked firms, particularly those linked to locations with lower corporate tax rates and tax havens, remains largely unexplored in the Indian context, mainly owing to data insufficiency and complexities present in identifying and analysing numerous intrafirm foreign transactions by foreign-affiliated firms. The present study attempts to address this research gap.

The study has two main objectives. First, it aims to assess the traceable extent and prevalence of intrafirm transactions in total foreign exchange transactions for some main transaction channels of foreign affiliates operating in the manufacturing sector of India, in the presence of various data limitations. The related-party foreign transactions covering trade, financial, services and other miscellaneous transfers are analysed for a selected set of manufacturing foreign affiliates, mainly unlisted subsidiary firms, over two years (2014/15 and 2015/16).

Second, the study attempts to explore the extent of tax haven use in such transactions, mainly expenses, to appraise the vulnerability of such transactions to tax avoidance risk. For this, the shares of foreign exchange payments in the main intrafirm transaction channels made by foreign affiliates that are specifically directed to related parties located in tax haven jurisdictions are evaluated. The country of related party for every reported intrafirm foreign transaction is identified, and the potential risk level of corporate tax avoidance associated with the country, as estimated by the 2019 Corporate Tax Haven Index (CTHI) (Tax Justice Network, 2019), is assessed.

The study contributes to an understanding of the prevalence of intrafirm transactions and the tendency for tax haven use in various types of foreign exchange expense transactions of MNC-linked foreign affiliates of any developing economy. Deeper insight is gained into the role that tax havens have come to play in international capital flows in trade and other transaction channels in contemporary times.

The susceptibility of foreign exchange resource transfers, mainly outflows, to potential corporate tax avoidance conduct by MNC-linked firms is highlighted in the Indian context, which has significant implications for formulating effective policies to address any abusive tax practices by such firms.

Section 2 presents a brief survey of relevant literature on transfer pricing and intrafirm transactions and provides a review of some specific studies that focus on India. Section 3 describes the methodology and data sources used in this study. Section 4 presents the findings on the pattern of intrafirm transactions by the sample of foreign affiliates over the two study years. The findings on their intrafirm transactions with tax havens are discussed in section 5. Section 6 concludes the study.

2. Review of studies on intrafirm transactions and transfer pricing

Some recent estimates indicate that the extent of intrafirm trade within MNC networks in global trade of goods and services is about 33 per cent, and that 80 per cent of global trade is linked to the international production networks of MNCs (UNCTAD, 2013). Other rough estimates indicate that the figures for intrafirm trade stand somewhere between 30 and 70 per cent of global trade. Earlier extrapolation of trade data for Japan and the United States indicated that more than 60 per cent of global trade is conducted within MNCs (OECD, 2002).

A host of studies confirm the high prevalence of intrafirm trade in trade by MNCs or foreign-affiliated firms, especially in high-technology subsectors. Helleiner (1981) found that 48.4 per cent of all United States imports were from related parties, the proportion being relatively higher for manufactured products, at 53.6 per cent, than for primary products and semi-manufactured products. Zeile (1997) found that 36 per cent of exports and 43 per cent of imports by United States MNCs in 1994 occurred within firms, the shares being particularly high in the motor vehicle and machinery industries. Studies by Buckley and Casson (1976), Buckley and Pearce (1979), and Siddharthan and Kumar (1990) also found that intrafirm trade was highest in high-technology industries in the United States.

Bernard et al. (2010) studied industries by three-digit NAICS (North American Industry Classification System) codes in the United States in 2000 and found that at least half of imports in some high-technology manufacturing subsectors took place within firms. Irarrazabal et al. (2013) found that in 2004 in the manufacturing sector 33 per cent and 53 per cent of United States exports and imports, respectively, occurred within firms. Country-by-country reporting data of the United States Internal Revenue Service (IRS, 2018) shows that in 2016 one third of trade by

United States MNCs occurred within firms. The intrafirm trade for these MNCs is estimated to have grown at roughly 6 per cent a year from 2010 to 2014, which was much faster than the growth of trade between unrelated parties (Csilla and Ohnsorge, 2017).[4]

For Germany and the United States, 80 per cent of technology flows in 1995 were found to be within firms (UNCTAD, 1997). Focusing on Chinese firms, Hung and Chow (1997) found a quite strong tendency for intrafirm trade among a large majority of export-oriented foreign-affiliated enterprises. For Korean firms, Yun-Jong (2008) found that shares rose for both intrafirm exports and intrafirm imports over the 2000–2006 period.

A range of recent studies provide evidence that the susceptibility of intrafirm transfers to mispricing practices and profit shifting to no- or low-tax locations for tax avoidance purposes, referred to as base erosion and profit shifting (i.e. BEPS), is extremely high. Research undertaken since 2013 confirms the potential magnitude of the problem, with estimates indicating annual losses of anywhere from 4 to 10 per cent of global revenues from corporate income taxes (OECD, 2015). According to the OECD report, developing countries are the worst affected by this profit shifting.

The scope for transfer mispricing is being increasingly shaped by the emergence of jurisdictions such as offshore financial centres and tax havens that facilitate tax evasion conduct by corporations. These jurisdictions provide special advantages such as financial secrecy, minimal regulation, negligible taxes on profits and low monitoring of domestic companies (Sikka and Willmott, 2010). Mainly, tax havens facilitate profit-shifting activities by MNCs, from high-tax to low-tax locations (Eden, 2009), by offering low taxation rates on corporate profits and high levels of secrecy. Some corporations prefer to create offshore branches in single or multiple tax haven jurisdictions so as to park their transaction funds in shell or non-existent entities.

Several studies have shown evidence of how companies markedly use tax haven locations to transfer profits to avoid corporate taxes, through mostly intrafirm transfers. Indeed, nearly three decades ago Hines and Rice (1994) found that 31 per cent of net profits of United States MNCs were located in tax havens. Nearly two decades ago, about half of world trade apparently passed through offshore financial centres, accounting for about 3 per cent of global gross domestic product (Christensen et al., 2005). Baker (2005) observed that about 200,000 companies

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[4] For additional discussion, see Nick Shaxson, "Over a third of world trade happens inside multinational corporations,", Tax Justice Network Blog, 9 April 2019, www.taxjustice.net/2019/04/09/over-a-third-or-more-of-world-trade-happens-inside-multinational-corporations.

are formed in tax havens each year; the cumulative numbers could be higher than 3 million. More recent studies have made similar observations. In a significant work, Zucman (2015) found that the amount of wealth hidden in tax havens was substantial, accounting for at least 8 per cent of global financial assets, equivalent to $7.6 trillion. Cobham and Janský (2019) used survey data on international operations of multinational groups headquartered in the United States to show major misalignments of profit, a disproportionate share of total profits being captured by the small number of "profit havens". Also, in examining a firm-level data set, Ahmed et al. (2020) found a strong positive association between tax haven use and foreign direct investment (FDI) into countries characterized by low levels of economic development and extreme levels of capital flight.

Various studies focusing on trade data have noted evidence of transfer mispricing. Analysing United States data, Hines (1999) and Newlon (2000) found evidence of profit shifting through transfer-pricing manipulation by corporations. Clausing (2003) found significant evidence of tax-motivated transfer pricing in monthly data on United States intrafirm international trade prices between 1997 and 1999. Controlling for other variables affecting trade prices, the study found that as country tax rates were lower, United States intrafirm export prices were lower and United States intrafirm import prices were higher.

Vicard (2015) and Davies et al. (2018) analysed trade data for French firms and Cristea and Nguyen (2016) for Danish firms, and each found evidence for transfer-pricing manipulation. A number of studies have found evidence of misinvoicing in export and import prices (Baker, 2005; Cuddington, 1986; Zdanowicz et al., 1999).

Transfers of high-value intangibles are especially prone to transfer mispricing as they are difficult to value. Two types of intrafirm transfers, namely cost-sharing arrangements and services transactions, have been pointed out by United States tax authorities as key sources of transfer pricing abuse (GAO, 2008). Hebous and Johannesen (2015) found evidence of German MNCs shifting profits to tax havens through services transactions. Similarly, Janský and Kokes (2016) observed profit shifting from Czechia to European tax havens through debt financing.

Some studies have investigated the link between corporate tax rate and income or profit reporting by companies. Harris et al. (1993) found the presence of affiliates in low-tax countries to be associated with lower tax liabilities for United States MNCs. Grubert (1998) found a negative relation between reported subsidiary income and the statutory corporate tax rate in the host country. Chang (2013) found evidence of extensive income shifting by foreign subsidiaries in China. Foreign firms with high home tax rates reported higher profits, while those with low home tax rates reported lower profits, even while enjoying the same special tax rates in the same economic zone.

The evidence on the extent of intrafirm transactions, transfer mispricing and profit shifting by MNC-affiliated companies at the firm level is much more limited for India. However, some recent research studies have highlighted the possible scale of resource loss through illicit financial flows due to trade mispricing and tax evasion conduct. A study by Global Financial Integrity (GFI) estimated that the Government of India lost gross assets worth US$462 billion over the 1948–2008 period through tax evasion, crime and corruption, in which trade mispricing was a widely used technique (Kar, 2010). Over the 2004–2013 period, GFI estimated that the amount of illicit financial outflows was about $505 billion (Kar and Spanjers, 2015). For 2016, the GFI report estimated that the Government had lost US$14.1 billion, about 5.9 per cent of total revenue collection, due to trade misinvoicing (GFI, 2019). Some studies, such as Biswas and Marjit (2005), have found evidence of misreporting of trade data by Indian traders over the 1960–1998 period.

Among the very few studies examining intrafirm trade data in India, a study by ISID (2002) analysed the country's import consignments in 1994–1995 and found that one third of imports by 77 foreign affiliates occurred within firms. Certain instances of transfer mispricing for specific products were also identified in the study. A few recent studies have also highlighted the preference towards within-group transactions by Indian companies. A study of the country's 500 largest listed companies conducted by *The Hindu Business Line* (Acharya, 2014) found that more than 460 engaged in related-party deals in one form or another in 2012–2013, with about 158 reporting high-value annual dealings (above Rs. 10 billion). Both foreign MNCs and domestic companies showed a strong tendency towards such transactions. Royalty payments to promoter entities were dubiously high, particularly for multinationals.

In a significant study that focused on MNC linkages with tax havens, Janský and Prats (2013) analysed financial and ownership data for about 1,500 MNCs in India and found evidence of profit shifting among them. They found that MNCs with tax haven links reported 1.5 per cent lower profits and paid 30.3 per cent less in taxes per unit of profit than MNCs with no such links.

These India-specific studies highlight the possible prevalence of intrafirm trade among MNC-linked firms. However, the various tangible and intangible channels of intrafirm cross-border transactions of foreign affiliates in India and their links to tax havens or vulnerability to tax avoidance practices such as profit shifting remain largely unexplored, particularly at the firm level. These related-party transactions are often used by MNCs to shift profits from one country to another.[5] In view of the high susceptibility of developing countries to losing financial resources through

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[5] Alex Cobham, "Could the World Trade Organisation see a challenge to tax havenry?", Tax Justice Network, Blog, 4 July 2018, https://taxjustice.net/2018/07/04/why-wto-tax-havens.

such tax practices by global corporations, as highlighted by various studies, much sharper scrutiny is required of the cross-border trade, and services and financial transactions that foreign-affiliated companies conduct within their multinational networks. To what extent MNE affiliates located in a developing and emerging economy such as India engage in intrafirm transactions or are connected to tax havens, and hence are vulnerable to profit-shifting conduct, is a crucial question that needs investigation.

Such deeper research is restricted by issues such as data insufficiency and complications in analysis. In many companies' corporate financial disclosures, the details of foreign transactions and related-party transactions are frequently underreported, ambiguously reported or even unreported. Various transaction types are often clubbed together, and the layout for disclosure details is not uniform across companies or years. A large number of foreign-affiliated companies in India remain unlisted,[6] and their corporate disclosures are often insufficient. Also, the financial reporting of related-party transactions before 2011 used a text format that was inadequate; subsequently an XBRL format of reporting that is more structured was introduced.[7]

Owing to the lack of a comprehensive and precise database on foreign transactions of FDI-invested companies in the public domain, the flow of foreign exchange through intrafirm transactions is difficult to estimate or evaluate from the perspective of tax differentials on corporate profit in various foreign locations of related parties. The present study attempts to address this research gap.

3. Data sources and methodology

The study analyses a set of 109 foreign-affiliated Indian firms in the manufacturing sector over the two study years, 2014/15 and 2015/16, covering mainly large or medium-scale foreign subsidiaries and unlisted firms. The foreign affiliates were identified from databases such as the Investment Map of the International Trade Centre and the ProwessIQ database of the Centre for Monitoring Indian Economy (CMIE), both of which provide information on companies that had any inward FDI flows in recent years. Each of the selected sample firms reported at least one type of intrafirm transaction and a total turnover higher than Rs. 2 billion in 2015/16.

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[6] About 99 per cent (17,648 companies) of all "inward investment" FDI companies covered in the Census on Foreign Liabilities and Assets of Indian Direct Investment Companies in 2017/18 were unlisted (RBI, 2019).

[7] The new XBRL (eXtensible Business Reporting Language) format has fixed layouts for disclosing the details of related party transaction and location of related party, whereas in the former text format, location was not mentioned in many instances.

In the absence of any particular database on the operations or financial data of FDI-affiliated firms in India, the identification of FDI-affiliated manufacturing firms is difficult. For this purpose, three sources of information were used: the Investment Map,[8] the company statistics available at the website of the Ministry of Corporate Affairs (MCA)[9] and the ProwessIQ database of CMIE.[10]

The website of the Investment Map provides names of companies in India that had any inward FDI flows in a given recent year. From this database, the names of about 1,800 foreign affiliates operating in the manufacturing sector (in 10 broad categories) in India were identified. These names were individually searched on the MCA website to obtain information on their corporate identification number (CIN) and paid-up capital in the most recent reported year. After excluding small firms (paid-up capital of less than Rs. 100 million), 609 firms were selected. Further examination of the five-digit ROC (Registrar of Companies) industry code – part of the CIN – was done to identify manufacturing firms (two-digit ROC code of 15–37) specifically, and 440 firms were identified.

The ProwessIQ database of CMIE provides information on the audited annual financial statements of firms listed on the BSE/NSE stock exchange index in India. It was additionally used to identify 120 manufacturing firms that had FDI (a share of foreign corporate bodies and institutions greater than or equal to 10 per cent in total shareholding), were operating in the manufacturing sector (as per the ROC code filter from CIN) and had paid-up capital of at least Rs. 100 million. About 23 such firms were identified from various other web sources. These three lists were combined, and 583 foreign-affiliated manufacturing firms were identified (430 unlisted, 153 listed).

The audited annual financial statements of these 583 firms were procured from the MCA website, which provides financial statements and other company documents for all registered companies in India for various years, available in XBRL format.[11] As the data were not available for various unlisted firms for a longer period, the sample firms were studied for only two recently reported years, namely 2014/15 and 2015/16. Further examination of the financial statements revealed that foreign transactions or related-party transactions were either not reported or substantially underreported for 159 firms, which were dropped. From the remaining firms, a final sample of 109 manufacturing firms was selected for this study; each firm had

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8   International Trade Centre, www.investmentmap.org (accessed 9 October 2017).
9   "View company or LLP master data" under "Master Data" on the MCA Services portal, http://www.mca.gov.in (accessed between 8 November 2017 and 25 December 2018).
10 Versions 1.81 and 1.90, https://prowessiq.cmie.com.
11 Companies incorporated under the Companies Act, 1956 in India are required to e-file various documents each year with the Registrar of Companies (ROC) (under MCA Services), namely a balance sheet, profit and loss account, annual return (forms 20B and 21A) and compliance certificate. Financial statements are available to the public from the MCA Services portal (https://www.mca.gov.in/mcafoportal/viewPublicDocumentsFilter.do).

reported at least one type of intrafirm transaction and was a large or medium-sized foreign affiliate having a total turnover higher than Rs. 2 billion in 2015/16.

Each firm was mapped to an industrial group on the basis of the two-digit Harmonized System code of the principal product (contributing the highest turnover) in 2015/16, as disclosed by firms in their annual financial statements. Harmonized System codes are divided into 98 chapters, representing various industries, on the basis of these first two digits. The sample firms were classified in 12 broad manufacturing industry groups. Some industries in different Harmonized System chapters with similar kind of products or with low number of firms were clubbed together.

The information on related-party foreign transactions of firms was obtained from their annual financial statements, where related-party transaction disclosures are reported under a defined set of transaction types (see annex table A1) for each related party separately.[12] The country of the related party is mentioned for each transaction in these disclosures, and every related party that engaged in any transaction with the firm in the reported year is covered on a separate sheet on which all transactions with it are listed. This specific feature of the data set makes it possible to estimate the approximate extent of intrafirm foreign transactions in total foreign transactions of a given category, with extensive coverage of transactions undertaken in a year by a firm. A wide range of "material" services or miscellaneous transactions, though not all, can be identified. This comprehensive data set has not often been used in previous studies focusing on intrafirm foreign transactions of foreign affiliates in India. The few studies on intrafirm trade or trade mispricing in India (e.g. Biswas and Marjit, 2005; GFI, 2019; ISID, 2002) have mostly used the customs trade database or have referred only to the related-party transaction disclosures in the annual reports of companies (e.g. Acharya, 2014).

Disappointingly, for certain transactions (mostly services or miscellaneous), the individual transaction value could not always be identified due to being clubbed together with other similar transactions, non-reporting or unclear reporting. Transactions that were not covered under the "material" category also remained unreported. These issues may have led to an underestimation of intrafirm transaction values for certain sample firms, and only an approximate estimate of intrafirm transaction shares could be derived.[13]

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[12] Under Accounting Standard 18, reporting of related party transaction disclosures for each "material" transaction (those in excess of 10 per cent of total related party transaction of the same type) in the "notes to accounts" section of annual reports have been mandatory for companies since 4 January 2004. Each such transaction is required to be disclosed individually with information on the value and type of transaction and the name and country of the related party.

[13] In instances where the intrafirm transaction aggregate was significantly higher than the total reported foreign exchange expenses, the latter values were revised for the study and intrafirm transaction shares were considered as 100 per cent.

For calculating the share of intrafirm transaction value in the total foreign exchange transaction value of a firm for a given transaction type, the aggregate of such transactions with any related party located outside India that was reported in related-party transaction disclosures was matched with the disclosures on total foreign exchange transaction values under diverse types reported by the firm separately in annual financial statements. Owing to dissimilarities in categories of transaction types under which foreign exchange transactions and related-party transactions are disclosed, and non-uniformity in coverage of transaction types across firms or years, only certain broad transaction types are evaluated and certain transaction types are clubbed together (annex table A1). The five main intrafirm foreign exchange transaction types that were considered are export of goods, export of services or other earnings, import of goods, royalty or technical fee payments, and payments for services or other miscellaneous expenses.[14] Interest transactions in foreign exchange are mostly reported as a part of miscellaneous transactions, i.e. "Others", and these payments were evaluated separately for only the cases where they were mentioned distinctly. Overall, about 80 types of technology-linked payments, 150 varieties of services-linked or other miscellaneous expenses, and 50 types of services-linked or other earnings types were identified.

To capture transactions within the related global corporate entities, only related parties such as holding companies, ultimate holding companies, fellow subsidiaries, joint ventures, promoters, subsidiaries and associates were considered. Individual foreign promoters and key management personnel were excluded.

The total number of related-party foreign transactions conducted by these firms that were traceable as distinct transactions over the two study years was 5,517.[15] Of these, about 3,316 intrafirm transactions involving payments or outflows were evaluated separately, and the share of transactions of these types that were linked to a related party located in a tax haven jurisdiction were estimated.

A tax haven jurisdiction or low-tax location was identified using two sources of information. The first is the 2019 Corporate Tax Haven Index (CTHI) (Tax Justice Network, 2019). It covered 64 jurisdictions and considered two measures for ranking corporate tax havens, namely the Haven Score, reflecting how aggressively each jurisdiction uses tax cuts, loopholes, secrecy and other mechanisms to attract multinational activity, and the Global Scale Weight, reflecting the countries' level of cross-border activity.[16] The corporate tax Haven Score is assembled from

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[14] Dividend transfers, which are mainly conducted with related parties, were not considered.

[15] The information on name, type and country of related party, and type and value of transaction was collected for each related party transaction, involving manual data compilation for about 22,167 values.

[16] For the ranking and scores of the 64 tax havens in the 2019 CTHI, see https://cthi.taxjustice.net/en/2-uncategorised/2-view-2019-results.

20 indicators focusing on means used by MNCs to escape taxes; it measures the potential risk for a jurisdiction to become a profit-shifting destination. The two scores are combined to create a final CTHI score for ranking the jurisdictions. The 10 economies with the highest CTHI scores are identified as the top tax havens. These 10 tax jurisdictions account for about 52 per cent of the world's corporate tax avoidance risks.

In addition to the complete list of 64 tax havens covered by the 2019 CTHI in its Haven Score, this study specifically considered the top 30 (accounting for 85 per cent of the world's corporate tax avoidance risk) to evaluate the transfers made to locations associated with a relatively higher risk of tax avoidance or evasion.

The second index used for identifying tax havens is the list of the world's 15 most significant corporate tax havens published by Oxfam (Berkhout, 2016), which assessed the extent to which a country uses the most damaging tax policies, such as zero corporate tax, and unfair tax incentives.[17] The 15 tax havens covered in this list include the top 10 in the 2019 CTHI (Tax Justice Network, 2019).

4. Pattern of intrafirm transaction by foreign-affiliated firms

The sample of 109 FDI manufacturing firms is described in figures 1 and 2. The total turnover of these firms was Rs. 4.7 trillion in 2015/16 and Rs. 4.3 trillion in 2014/15. The sample comprises mainly large firms with turnover higher than Rs 2 billion, although some firms were very large, with turnover higher than Rs. 5 billion (figure 1). The majority of the sample firms, about 82, were unlisted. All but three were foreign subsidiaries, and more than half were wholly owned subsidiaries (figure 2). The sample firms were negative net foreign exchange earners in aggregate in both study years, with net foreign exchange losses of about Rs. 969 billion and net export losses of about Rs. 794 billion in 2015/16.

Table 1 shows that the majority of the sample firms reporting foreign exchange earnings or expenses of different types engaged in intrafirm foreign transactions. The highest number of related-party foreign transactions were for the import of goods, while royalty or technical fee payments and interest payments were reported by a smaller number of firms. Overall, 5,517 (2,738 in 2014/15 and 2,779 in 2015/16) related-party foreign transactions by sample firms were traced.

More than two thirds of the total transactions were found to be within firms in both study years (figure 3). The majority of the foreign exchange earnings, through
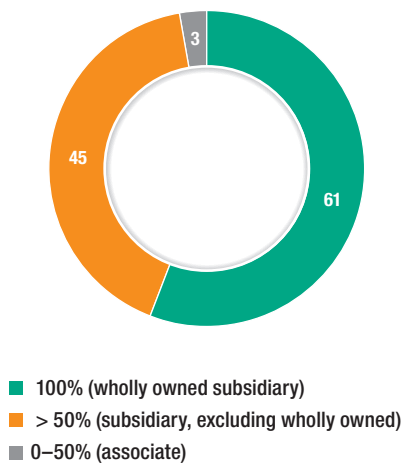
Figure 1. Total revenue for sample firms by number of firms
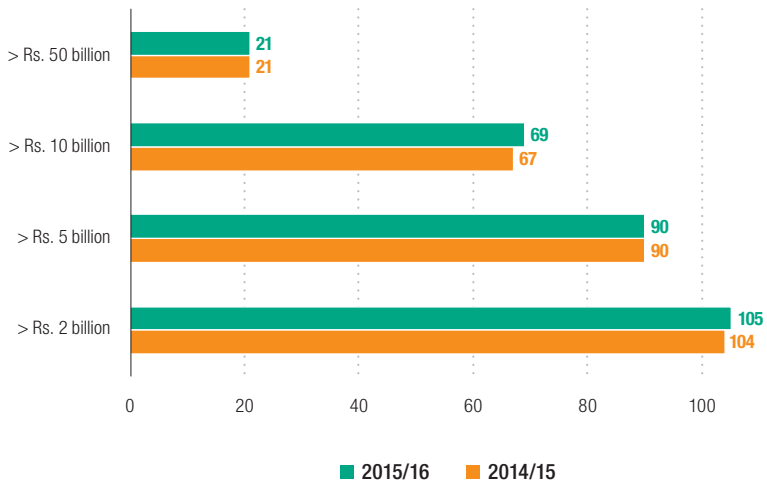
Source: Author's compilation, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Figure 2. Distribution of sample firms by shares held by foreign promoters
(Percentage)

- 100% (wholly owned subsidiary)
- > 50% (subsidiary, excluding wholly owned)
- 0–50% (associate)

Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Table 1. Reporting of intrafirm foreign transactions by sample firms

Type of foreign exchange transaction	2014/15			2015/16		
	Number of firms reporting a transaction	Number of firms reporting intrafirm transactions (1)	Total number of intrafirm transactions by firms in (1)	Number of firms reporting a transaction	Number of firms reporting intrafirm transactions (2)	Total number of intrafirm transactions by firms in (2)
Export of goods (1)	101	97	586	102	99	621
Export of services or other earnings (2)	90	89	528	90	84	540
Total foreign exchange earnings (3 = 1 + 2)	**191**	**186**	**1 114**	**192**	**183**	**1 161**
Import of goods (4)	109	108	894	109	109	899
Royalty or technical fee payments (5)	87	77	132	87	77	139
Payments for services or other expenses, including interest (6)	109	102	598	109	101	580
Interest payments (7 = part of 6)	46	33	39	44	31	35
Total foreign exchange expenses (8= 4 + 5 + 6)	**305**	**287**	**1 624**	**305**	**287**	**1 618**
Total foreign transactions (9 = 3 + 8)	..	..	**2 738**	..	..	**2 779**

Source: Author's calculations, based on companies› annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).
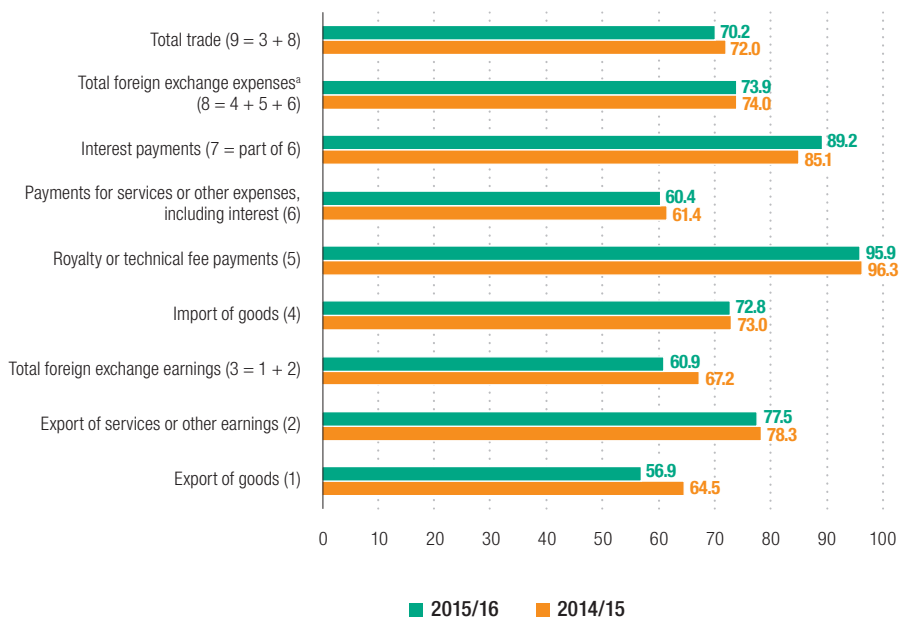
Note: Transaction numbers in parentheses from annex table A1.

export of goods, export of services or other earnings, and total earnings, were also within firms. Nearly three fourths of the import of goods were from related parties. The intrafirm share in payments of royalty and technical fees and interest payments were quite high as well, while the shares for services or other expenses were about 60 per cent. Overall, nearly three fourths of the foreign exchange expenses could be traced to related parties.

The observed findings are broadly similar to the pattern noted in some previous studies focused on the share of intrafirm trade in either overall trade or trade among MNEs in other countries, which found a high prevalence of intrafirm trade, particularly for affiliates in high-technology manufacturing subsectors (e.g. Helleiner, 1981; Buckley and Pearce, 1979; Siddharthan and Kumar, 1990; Zeile, 1997). In fact, the observed intrafirm transaction shares of imports and exports of goods,

Figure 3. Shares of intrafirm transaction value in total foreign exchange transaction value of sample firms (Percentage)

	2015/16	2014/15
Total trade (9 = 3 + 8)	70.2	72.0
Total foreign exchange expenses[a] (8 = 4 + 5 + 6)	73.9	74.0
Interest payments (7 = part of 6)	89.2	85.1
Payments for services or other expenses, including interest (6)	60.4	61.4
Royalty or technical fee payments (5)	95.9	96.3
Import of goods (4)	72.8	73.0
Total foreign exchange earnings (3 = 1 + 2)	60.9	67.2
Export of services or other earnings (2)	77.5	78.3
Export of goods (1)	56.9	64.5

Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).
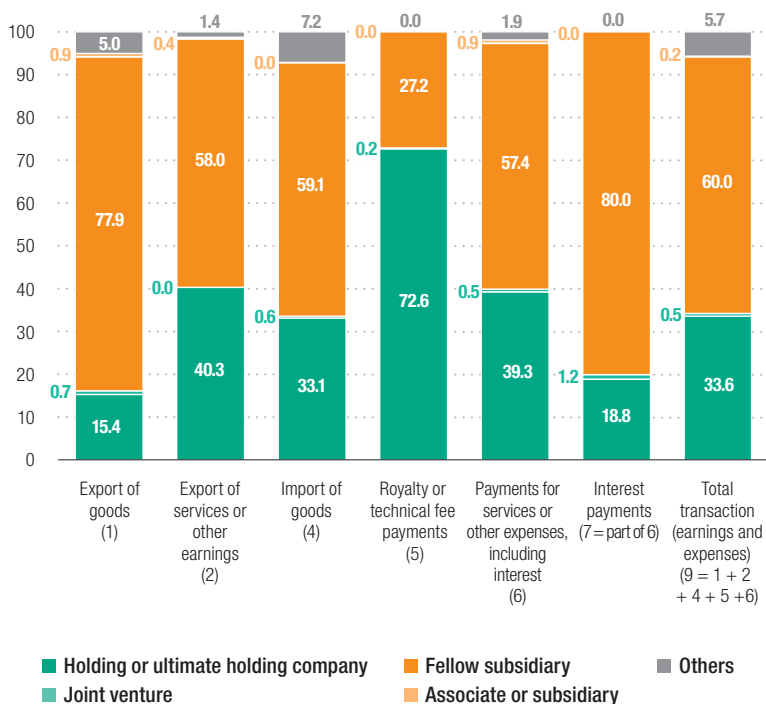
Note: Transaction numbers in parentheses from annex table A1.

[a] Excludes dividend payments of Rs. 49.6 billion in 2014/15 and Rs. 43.5 billion in 2015/16.

imports of technology and total transactions are mostly higher for the sample firms than the shares found in certain other studies that focus on overall intrafirm trade in goods and technology flows in other countries.

In the specific context of India, the observed shares of intrafirm import transactions for the sampled foreign affiliates are significantly higher than the shares estimated by ISID (2002). Acharya (2014) found that royalty payments to promoter entities were high, and the present findings also highlight intensive involvement of foreign affiliates in intrafirm trade for these payments, which were mostly made to holding companies.

For both total foreign exchange earnings and expenses, a majority of the transaction shares were found to occur within firms for two thirds or more of the sample firms (figure 4). Nearly 60 percent of the sample firms reported that the majority of goods imports occurred within the firm. More than two thirds reported that for all other

earnings and expense types covering goods and services transactions, the majority of transactions occurred within the firm. Also, 49 per cent or more of the sample firms engaged intensively (a share of 80 per cent or more) in intrafirm transactions for various foreign exchange earning types and for payments for royalty or technical fees and services or other expenses. Involvement in related-party transactions was significant for most of the sample firms when different transaction routes were analysed.

Figure 4. Shares of reporting sample firms with significant intrafirm transaction share in total transactions (Percentage)
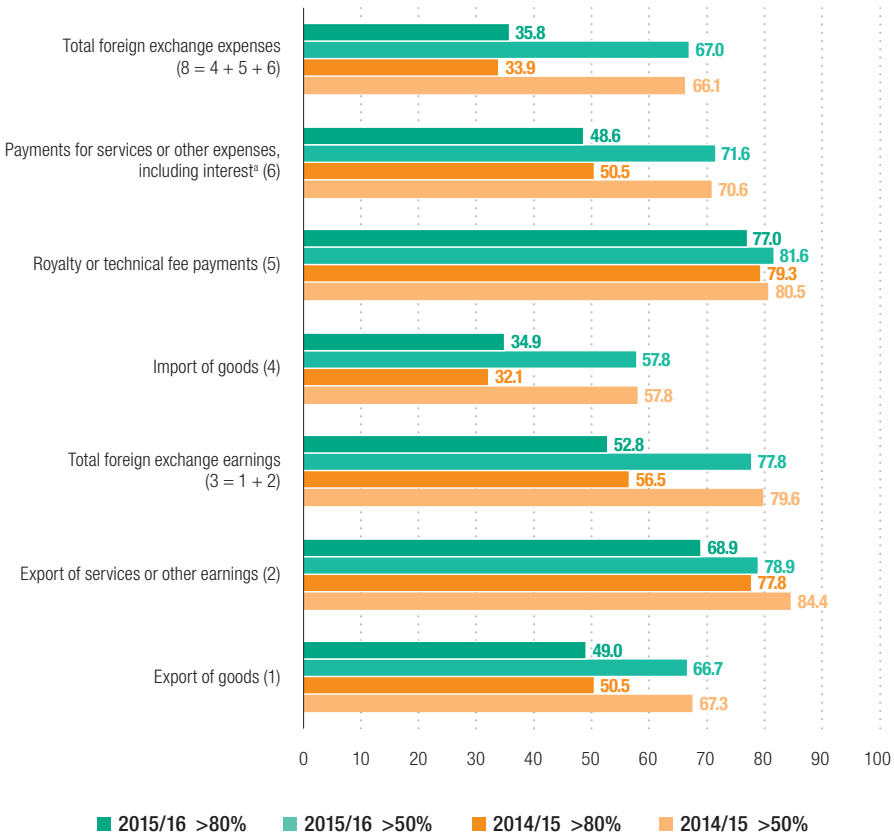
Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Note: Transaction numbers in parentheses from annex table A1. Includes only firms reporting such transactions.

[a] Interest payments are not shown separately because of the very low number of transactions.

Only one third of overall intrafirm transactions were conducted with holding companies; a majority were conducted with fellow subsidiaries (figure 5). Whereas payments for royalty or technical fees were largely made to parent companies, the other payments (import of goods, services, other expenses, interest) and earnings (export of goods and services) primarily involved fellow subsidiaries and network companies under common control.

Table 2 indicates the intrafirm transaction shares in 2015/16 for some main transaction types across the 12 manufacturing industry groups. More than half of the exports of goods occurred within firms in eight manufacturing industries, with shares exceeding two thirds in most cases, whereas they were about half for the remaining industries. Also, a majority of the imports of goods occurred within firms

Figure 5. Intrafirm transactions by type of related party, as share of total intrafirm transaction value, 2015/16 (Percentage)

Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Note: Transaction numbers in parentheses from annex table A1.

in eight manufacturing industries (covering 80 per cent of sample firms); the shares were particularly high for some high-technology industries. In every industry except for pharmaceuticals and rubber and plastic, royalty and technical fee payments were found to be predominantly within firms.

Particularly for imports of goods, the high prevalence of intrafirm transactions in high-technology sectors has been observed in various studies (e.g. Bernard et al., 2010; Irarrazabal et al., 2013). A similar pattern is noted for the sample firms in most of the high-technology subsectors (transport, machinery, electrical equipment, chemicals and so on). In most subsectors the data suggest significant involvement of foreign-affiliated firms in the global production chain of their parent MNC networks as buyers of inputs, finished goods or technology assets, or as suppliers of goods.

Table 2. Intrafirm transaction value as share of total transaction value, by industry group, 2015/16

Industry group	Harmonized System 2-digit chapter codes	Number of companies	Export of goods (Percentage)	Import of goods (Percentage)	Royalty or technical fee payments (Percentage)
Base metals and products	72–74, 82–83	4	56.3	83.7	96.3
Chemicals or allied industries	28–29, 31–36, 38	16	77.9	59.0	99.8
Diversified activity[a]	99	5	97.9	94.2	100.0
Electrical machinery and equipment, electronics	85	10	46.2	78.8	93.3
Instruments and accessories[b]	90–92	5	64.2	78.0	93.6
Machinery and mechanical appliances	84	24	72.6	64.5	86.3
Mineral stone and glass	25, 27, 68–70	3	47.5	20.7	92.8
Other manufacturing[c]	42, 48, 57, 61, 64, 94, 96	8	71.3	34.9	99.9
Pharmaceuticals	30	7	49.9	35.4	6.0
Rubber and plastic	39–40	3	97.1	59.3	27.5
Vegetable products, edible oils, foodstuffs	11, 13, 15, 17–19, 21–24	5	56.4	37.0	96.6
Vehicles and transport equipment	86–87	19	42.0	82.5	97.0

Source: Author's calculations, based on companies› annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

[a] Firms engaged in manufacturing, having trading or services (Harmonized System code 99) as main activities.

[b] Optical, photographic, precision, medical and surgical instruments or apparatus, clocks and watches, musical instruments.
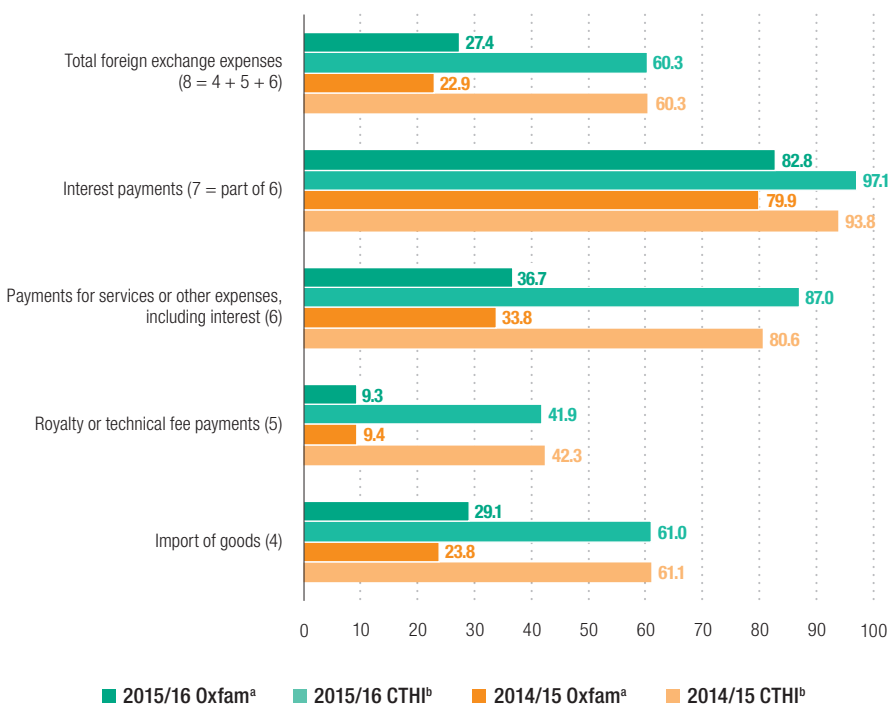
[c] Leather, paper, carpet, apparel or clothing, footwear, furniture, miscellaneous manufacturing goods.

5. Intrafirm transactions with tax havens by foreign-affiliated firms

The intrafirm pattern of transactions conducted by sample firms with related parties located in tax havens was further evaluated to assess in particular the outflows of foreign exchange to tax havens on account of various intrafirm transfers. The analysis looked at about 3,316 intrafirm transactions, covering some key payment channels, that firms conducted over the two study years.

A majority of the payments for intrafirm import of goods and the total intrafirm foreign exchange expenses were directed to tax havens included in the 2019 CTHI (Tax Justice Network, 2019), as shown in figure 6. The shares of payments for

Figure 6. Intrafirm payment transactions with tax havens, by share of total intrafirm foreign transaction value (Percentage)

Total foreign exchange expenses (8 = 4 + 5 + 6): 27.4, 60.3, 22.9, 60.3

Interest payments (7 = part of 6): 82.8, 97.1, 79.9, 93.8

Payments for services or other expenses, including interest (6): 36.7, 87.0, 33.8, 80.6

Royalty or technical fee payments (5): 9.3, 41.9, 9.4, 42.3

Import of goods (4): 29.1, 61.0, 23.8, 61.1

■ 2015/16 Oxfam[a]   ■ 2015/16 CTHI[b]   ■ 2014/15 Oxfam[a]   ■ 2014/15 CTHI[b]

Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).
Note: Transaction numbers in parentheses from annex table A1.
[a] Based on the 15 tax havens in Berkhout (2016).
[b] Based on the 64 tax havens in Tax Justice Network (2019).

services or other expenses and interest payments made to these tax havens were high, whereas the shares of royalty and technical fee payments were less than half. Considering payments not linked to merchandise (i.e. royalty or technical fees, services or other expenses including interest) together reveals that a majority (55 per cent) of them were indeed made to these tax havens. More than one third of services or other expenses and a slightly lower share (23–30 per cent) of payments for intrafirm import of goods and total intrafirm foreign exchange expenses could be traced to related parties located in the 15 significant tax havens in the Oxfam list (Berkhout, 2016). Intrafirm interest transfers were predominantly made to these same tax havens.

The intrafirm transaction payments made to tax havens were further assessed as a share of the value of all foreign payment transactions (figure 7). Less than half of the total payments for imports, royalty and technical fees, and foreign exchange expenses and at least half of the payments for total services or other expenses were made to tax havens in the 2019 CTHI (Tax Justice Network, 2019). For interest payments, the share of total outflows to tax havens was very high. Varying shares of these outflows could also be traced to the Oxfam list (Berkhout, 2016). In 2015/16, about one fifth of all outflow transactions could be traced to these tax havens.

Various cases of foreign-affiliated firms with very high shares or values of intrafirm payments for import of goods, royalty or technical fees, interest and services or other miscellaneous expenses in foreign exchange made to the 15 significant tax havens in the Oxfam list are presented in annex tables A2 and A3. Instances of multiple payments made to related parties located in the same or different tax havens by a foreign-affiliated firm were noted.

The use of tax haven locations for parking profits or for routing trade flows through goods, services or financial transaction channels mainly for profit-shifting purposes has been indicated by some earlier studies, as discussed in section 2. The findings of the present study highlight a similar notable tendency for tax haven use by MNC-linked affiliates in India to some extent, although the objective of profit shifting behind such conduct is neither empirically investigated or established in this study.

Payments for management fees, cost-sharing arrangements, debt financing and a range of services and miscellaneous transactions – frequently involving the transfer of an intangible asset – are some of the transfer routes that have high vulnerability to transfer pricing abuse.[18] Against this backdrop, findings such as

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[18] In OECD (2013), Actions 4, 8 and 10 specifically focused on designing rules to prevent base erosion through some high-risk transactions such as interest expense, financial transactions, intangibles, management fees and head office expenses.

about half of total payments for services or miscellaneous transactions and four fifths of payments for total interest transactions being directly linked to tax havens, or various traceable cases of foreign affiliates having high tax haven use in specific transaction channels such as services, interest or other miscellaneous expenses, are quite suggestive of such channels (such as services or intangible asset-related transfers, debt financing and the like) being potentially used for tax avoidance by the foreign affiliates. As noted earlier, close to half of the total payments for import of goods by the sample firms could be traced to tax havens; various individual firms made payments for their imports exclusively to these locations. This suggests that trade mispricing could be another channel for tax avoidance by firms.

Figure 7. Intrafirm payment transactions with tax havens, by share of total payment transaction value in foreign exchange (Percentage)
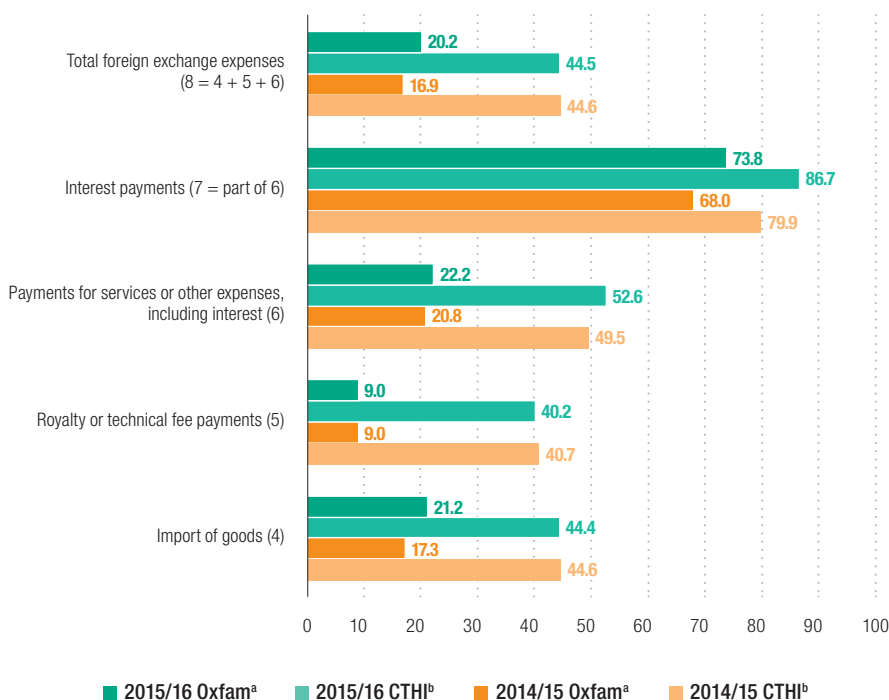
Legend: 2015/16 Oxfam[a] 2015/16 CTHI[b] 2014/15 Oxfam[a] 2014/15 CTHI[b]

Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).
Note: Transaction numbers in parentheses from annex table A1.
[a] Based on the 15 tax havens in Berkhout (2016).
[b] Based on the 64 corporate tax havens in Tax Justice Network (2019).

The top 15 economies to which the intrafirm payments in various key outflow channels were made by sample firms in 2015/16 were identified and ranked. The transactions were assessed in terms of both value of payments and frequency of transactions (tables 3 and 4). These 15 economies account for a predominant part of the intrafirm transaction values in each of the outflow channels. In the total value of intrafirm payments made by different transaction types, these 15 economies accounted for 94.8 per cent of goods imports, 92.17 per cent of services or other expenses, 99.39 per cent of royalty and technical fees, 100 per cent of interest, and 93.7 per cent of total intrafirm foreign exchange expenses. All 64 tax havens by Haven Score in the 2019 CTHI (Tax Justice Network, 2019) were specifically identified and marked in each ranking in the two tables, and the top 30 distinguished from the others.

Table 3. Top 15 economies linked by intrafirm transactions, by value of transactions

	Import of goods	Services or other expenses	Royalty or technical fee payments	Interest payments	Total foreign exchange expenses
1	Republic of Korea	United States	Japan	**Luxembourg**	Republic of Korea
2	**Singapore**	**Luxembourg**	Republic of Korea	**Mauritius**	Japan
3	Germany	Germany	United Kingdom	United Kingdom	**Singapore**
4	**Hong Kong (China)**	Japan	United States	**Netherlands**[a]	Germany
5	Japan	**Singapore**	**Switzerland**	**Belgium**	**Hong Kong (China)**
6	Finland	**Netherlands**[a]	Finland	**Cyprus**	United States
7	**United Arab Emirates**	**Switzerland**	Germany	Germany	Finland
8	United States	**Mauritius**	France	Japan	**United Arab Emirates**
9	China	United Kingdom	**Netherlands**[a]	**Switzerland**	China
10	United Kingdom	China	China	**Singapore**	United Kingdom
11	**Switzerland**	Sweden	Denmark	Italy	**Switzerland**
12	Viet Nam	Czechia	Australia	France	**Netherlands**[a]
13	France	France	Sweden	Republic of Korea	France
14	**Netherlands**[a]	Finland	**Luxembourg**	Australia	Viet Nam
15	Taiwan Province of China	**Belgium**	**Singapore**	United States	Taiwan Province of China

Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Note: Using the Haven Score in Tax Justice Network (2019), shading indicates economies ranked 1–64 and bold type indicates economies ranked 1–30.

[a] Excludes the other three countries in the kingdom.

Table 4. Top 15 economies linked by intrafirm transactions, by number of transactions

	Import of goods	Services or other expenses	Royalty or technical fee payments	Interest payments	Total foreign exchange expenses
1	China	United States	United States	Japan	United States
2	United States	Germany	Germany	**Netherlands**[a]	Germany
3	Germany	Japan	Japan	Germany	China
4	Japan	**Singapore**	Republic of Korea	**Luxembourg**	Japan
5	**Singapore**	United Kingdom	**Switzerland**	**Singapore**	**Singapore**
6	Republic of Korea	China	United Kingdom	United Kingdom	Republic of Korea
7	Thailand	Republic of Korea	China	Australia	United Kingdom
8	**Switzerland**	**Netherlands**[a]	Italy	**Belgium**	**Switzerland**
9	Italy	**Switzerland**	Australia	**Cyprus**	Italy
10	France	Italy	France	France	Thailand
11	United Kingdom	Sweden	**Netherlands**[a]	Italy	France
12	**Belgium**	France	Sweden	Republic of Korea	**Netherlands**[a]
13	**Hong Kong (China)**	Finland	Czech Republic	**Mauritius**	**Belgium**
14	Indonesia	Thailand	Denmark	**Switzerland**	**Hong Kong (China)**
15	**Netherlands**[a]	Canada	**Singapore**	United States	Sweden

Source: Author's calculations, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Note: Using the Haven Score in Tax Justice Network (2019), shading indicates economies ranked 1–64 and bold type indicates economies ranked 1–30.

[a] Excludes the other three countries in the kingdom.

The 64 tax havens in the 2019 CTHI (by Haven Score) account for at least 11 of the 15 positions in each table, covering different transaction channels, in terms of both value of transfers and number of transactions conducted. This indicates that these intrafirm payments were mostly made to tax haven countries that are associated with some level of tax avoidance risk. Some of the top 30 tax havens in the CTHI list (by Haven Score) are also present in these tables (at least three positions across all transaction types and as many as seven for some), which shows that a certain fraction of such transfers was made to jurisdictions with a high risk of corporate tax avoidance. The number of non-tax haven countries in each of the tables is quite low.

6. Conclusions and policy implications

A close investigation of the foreign transaction pattern in recent years of a selected set of large foreign-affiliated manufacturing firms in India revealed that a major part of their merchandise trade, services and other miscellaneous transfers and technology- or interest-linked payments involved foreign related-party transactions. A majority of the firms had intrafirm foreign transaction shares greater than 50 per cent for nearly all transaction types, and various firms were found to engage intensively in intrafirm transactions for certain transaction types. The majority of transactions occurred within firms. The shares were particularly high in some high-technology industries for goods imports and technology-linked payments, showing a preference to buy inputs and technology from entities in the parent MNC's network in those industries.

A major part of the intrafirm payments for goods imports, non-merchandise trade expenses and overall foreign exchange expenses could be traced to the tax havens in the 2019 CTHI (Tax Justice Network, 2019), associated with different levels of tax avoidance risk. Some parts of these outflows were found to be directed to the 15 significant tax havens in the Oxfam list, associated with a relatively high risk of tax avoidance. When the total transaction values involving outflows are analysed, close to half of the transfers were made to corporate tax havens and about one fifth could be traced to the 15 significant tax havens. The tax havens in the 2019 CTHI were the foremost locations to which intrafirm payments of key transfer types were made, in terms of both aggregate transfer value and frequency of transactions. In particular, several instances were noted of firms making substantial shares of payments for intrafirm expenses through different channels to one of the 15 significant tax havens.

These findings indicate the involvement, to varying degrees, of foreign-affiliated firms of India in tax haven use in their cross-border outflow transactions, most of which were conducted within the firms. This involvement could be motivated by tax avoidance or evasion purposes, given the corporate tax avoidance risk associated with the tax haven jurisdictions. However, a deeper empirical investigation is essential for inferring such motivations.

The study finds evidence that intrafirm interest payments and services or other miscellaneous payments by foreign-affiliated firms were predominantly made to tax haven locations. This could indicate that such expense routes are potentially being used for tax avoidance strategies by foreign-affiliated firms in India, apart from the merchandise trade channel. Global evidence has indicated that trade mispricing is a route frequently used for tax avoidance and illegal transfer of resources by corporations worldwide. However, evidence is rather limited for means of payments such as services, interest and miscellaneous expenses being used with such motivations, particularly in developing economies.

At the same time, such expense routes are usually of diverse forms and variety, particularly when conducted within MNC networks. They may involve substantial resource transfers under complex contract terms, may entail multiple transactions with the same or diverse parties, may be clubbed together with other transactions as part of a single deal and frequently involve intangible asset or services transfers for which a precise economic valuation is difficult. These features make tax audits of their fair transfer pricing very difficult and complex for revenue authorities globally, primarily because identifying the distinct transaction and finding an appropriate comparable arms-length market transaction to assess the possible extent of mispricing is challenging. The susceptibility of these transfer channels to mispricing is fairly high in the presence of limited means for precise tax assessment. In India, several tax assessments related to royalty payments and a range of services payments (management consultancy, software development, advertising and marketing, intragroup services and so on) have been disputed legally over recent decades, and several of these disputes have been about issues of arms-length comparability.

In scenarios where it is challenging to conduct identification, valuation and tax audits of a range of services and miscellaneous transactions to check any possible abuse by means of corporate tax evasion strategies, any engagement of foreign-affiliated firms with tax haven locations through intrafirm transaction channels raises policy concerns for India. Given the increasingly expanding production and trade activities of MNCs across the globe and their rapidly evolving intrafirm transactions in goods and services across networks and global value chains, the challenge of ensuring a fair tax appraisal of these cross-border resource transfers is immense and rising, mostly in terms of complexities.

For enhanced accountability of an MNC's global financial operations, transparency in disclosures of its financial accounts and beneficial ownership of network companies is crucial. Exposure to tax havens in financial and bank accounts, and in trade-related operations involving direct goods, services or asset transfers within network entities needs precise identification and adequate public disclosure. This will be essential to tackle corporate tax malpractices that frequently exploit such channels.

To achieve this objective, the host economies of MNCs need to develop efficient and stringent standards for disclosure of corporate financial accounts, wherein every transaction with any tax haven is reported accurately, identified adequately, and fairly valued and audited. In India, the current corporate disclosure norms do not sufficiently cover every type of service, financial or miscellaneous foreign transaction, whether conducted intrafirm or with unrelated entities, and several of them remain unidentified. Merchandise trade data are not disclosed for every single transaction and are reported only in aggregate terms in financial statements. The reporting quality is frequently insufficient for unlisted firms, and the majority of foreign-affiliated firms are presently unlisted.

Clearly, to check the possible drain of capital through corporate tax avoidance, any resource-constrained developing economy needs to ensure the transparent and adequate sharing of financial accounts and trade data in the public domain by corporate entities, particularly by foreign-affiliated firms.

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Appendix

Annex table A1. Coverage of intrafirm foreign exchange transaction types in study

Transaction types reported in related party transaction disclosures in annual financial statements	Transaction types included in the study	Transaction type number (as used in study)
Revenue from sale of goods	Export of goods	1
Other income	Export of services or other earnings	2
Revenue from services rendered		
Reimbursement of expenses (income)		
	Total foreign exchange earnings	3 (1 + 2)
Purchase of goods	Import of goods	4
Purchase of tangible assets		
Expense from agency arrangement, transfer of R&D cost or license fees[a]	Royalty or technical fee payments	5
Other expenses	Payment for services or other expenses (including interest)	6
Services received		
Reimbursement of expenses (paid)		
Interest paid		
Interest paid (as separate head)[b]	Interest payments (part of 6)	7
	Total foreign exchange expenses	8 (4 + 5 + 6)
Amount payable, receivable or written off	*(Excluded)*	
	Total transaction[c]	9 (3 + 8)

Source: Author's compilation, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

[a] Includes technology-linked payments reported under "other expenses" or "services received" by firms; excluded from the total value of "other expenses" or "services received" for those firms.

[b] Covers interest transactions if mentioned separately, else included in transaction type number 2 or 6.

[c] Dividend transfers excluded from both earnings and expenses.

Annex table A2. Cases of sample firms with a high share of intrafirm import, services or other expense payments to 15 significant tax havens, 2015/16

Name of company	Share of intrafirm payments to significant tax havens in total intrafirm payments (%)	Related-party economy	Value of transaction (Rs. million)
Import of goods			
Lenovo (India)	97.3	Hong Kong (China)	68 801
MCPI	97.7	Singapore	35 480
Syngenta India	100.0	Singapore	7 886
Philips India	99.7	Netherlands,[a] Singapore	7 338
Ricoh India	99.4	Hong Kong (China)	5 558
MSD Pharmaceuticals	100.0	Netherlands,[a] Singapore	4 584
Ineos Styrolution India	87.9	Singapore, Switzerland	4 537
DSM Sinochem Pharmaceuticals India	82.8	Netherlands,[a] Singapore	4 500
Gillette India	88.2	Singapore	3 886
Alcon Laboratories (India)	92.0	Switzerland	3 273
Pfizer	88.7	Ireland, Singapore	2 319
NCR Corporation India	97.0	Hong Kong (China), Ireland	1 648
Givaudan (India)	91.5	Singapore, Switzerland	1 971
Services or other expenses			
ABB India	76.2	Netherlands,[a] Switzerland	2 099[b,c]
Johnson & Johnson	70.5	Singapore	2 030[b]
Philips India	100.0	Netherlands[a]	1 138[b,f]
Hindustan Unilever	98.4	Netherlands,[a] Switzerland	977[d,h]
Procter & Gamble Home Products	79.7	Singapore	630[e,f]
Mondelez India Foods	74.5	Singapore, Switzerland	1 442[d]
Pernod Ricard India	99.1	Hong Kong (China), Mauritius	1 274[b,d]
DSM Sinochem Pharmaceuticals India	88.9	Netherlands[a]	416[b,c]
Syngenta India	93.9	Singapore, Switzerland	240[b,d,g]

Source: Author's calculation, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Note: Based on the 15 tax havens in Berkhout (2016).

[a] Excludes the other three countries in the kingdom.

[b] Services.

[c] Interest.

[d] Reimbursement.

[e] Business process outsourcing expenses.

[f] Other expense.

[g] Charges for shared services.

[h] Maintenance and support costs for licences and software.

Annex table A3. Cases of sample firms with high intrafirm royalty or technical fees, or interest payments to 15 significant tax havens, 2015/16

Name of company	Related-party economy	Value of transaction (Rs. million)
Royalty or technical fee payments		
ABB India	Switzerland	3 416
Bosch	Netherlands[a]	502[b]
Johnson & Johnson	Singapore	328
Nestle India	Switzerland	3 625[c, d]
Ambuja Cements	Switzerland	903
Givaudan (India)	Switzerland	143[e]
Akzo Nobel India	Netherlands[a]	698
Samsonite South Asia	Luxembourg	431
NCR Corporation India	Ireland	279
Interest payments		
Mylan Laboratories	Luxembourg, Mauritius	7 061
Praxair India	Luxembourg	2 565[f]
ABB India	Netherlands[a]	448
Cosma International (India)	Cyprus, Luxembourg	391
Michelin India	Switzerland	266

Source: Author's compilation, based on companies' annual financial statements, available from the Ministry of Corporate Affairs, India (www.mca.gov.in).

Note: Based on the 15 tax havens in Berkhout (2016).

[a] Excludes the other three countries in the kingdom.

[b] Royalty and technical service.

[c] General licence fees.

[d] Information technology and management information systems expense.

[e] Information technology expense.

[f] Finance cost.

Internationalization of small and medium-sized enterprises (SMEs): A new assessment*

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Abstract

The contributions of small and medium-sized enterprises (SMEs) to domestic economies are sizeable. The most productive and dynamic ones venture abroad and internationalize by exporting or by investing overseas. For smaller firms, foreign direct investment (FDI) implies the commitment of a high level of resources, potentially increasing the risk of failure. This study empirically assesses the question of whether outward investment is a valuable growth strategy or whether engaging in FDI might hurt performance. The results show that while displaying higher revenue growth rates than their larger counterparts, SMEs experience a bigger shock after their foreign investment: the sales growth of SMEs decreases by about 6 per cent during the first three years after a cross-border greenfield project; it starts recovering only after the fourth year. Larger MNEs show no significant change in growth rate after an investment. The decrease in revenues in SMEs occurs mostly in manufacturing enterprises, and less so in services companies. This is primarily because for services companies a foreign affiliate, which almost by definition is market-seeking, tends to make an immediate contribution to sales and sales growth, whereas many manufacturing affiliates require a start-up period and may engage in activities that contribute less to sales growth, such as supply chain activities.

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1. Introduction

In 2017, the United Nations designated 27 June as Micro, Small and Medium-sized Enterprises (MSMEs) Day to raise awareness of MSMEs' critical role in economic growth, job creation and the achievement of the Sustainable Development Goals. Despite their contribution to economic development, small and medium-sized enterprises (SMEs) face significant challenges, such as limited access to finance, markets and technology – challenges that are recognized as "the liability of smallness"[1] and severely limit their performance, including their operations abroad. Very few SMEs participate in the global economy using the most prominent avenues of internationalization, namely exporting and investment abroad.

Research on the internationalization of SMEs has mostly focused on exporting, which has been extensively employed by firms as a core growth strategy. Exporting allows a firm to broaden its consumer base and potentially achieve a higher sales volume. In turn, a higher sales volume results in a higher production volume, new investments in technologies and a consequent increase in productivity. Numerous international organizations, including the World Bank, the Organisation for Economic Co-operation and Development, the United States International Trade Commission, the World Trade Organization and UNCTAD, recommend that member States support SME exports as a strategy to strengthen and diversify an economy. Not many have included outward investment promotion by SMEs in their policy advice packages.

In comparison to exports, foreign direct investment (FDI) implies higher sunk costs and risks, potentially adding to the challenges that SMEs already face. Thus, although there is general agreement in the literature that internationalization by exports benefits the performance of SMEs, the relationship is less clear-cut for FDI. This is mainly due to the additional strains that FDI can put on the internal resources of SMEs.

In the context of SMEs, the concept of the liability of smallness highlights their higher risk of failure and comparatively poorer performance relative to larger firms. When SMEs engage in international investment, they introduce additional complexity to both their internal and their external processes, primarily owing to the unfamiliarity of foreign markets (Cho and Lee, 2018; Lee et al., 2012; Rhee, 2008). Fulfilling the additional demand for resources to invest abroad, for instance logistics, labour or information processing, may hurt SME performance (Schwens et al., 2018). An overseas investment that does not quickly increase returns can disrupt the vulnerable business balance of an SME and potentially lead to failure.

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[1]   In the literature, the liability of smallness manifests in a lack of resources such as finance, technology, human resources and detailed information on target foreign markets (Buckley, 1989; OECD, 2021).

Similarly to exports, FDI broadens a firm's customer base through entrance into new markets, enabling the firm to achieve a larger volume of production and to grow. FDI is unique in the way it is associated with exploitation of proprietary assets and exploration or acquisition of new knowledge, which leads to sustainable growth of the firm (Lu and Beamish, 2006). FDI involves companies bringing proprietary assets such as technology, patents and trademarks to foreign markets, giving companies a competitive edge. By leveraging these assets, companies can strengthen their market position, expand their market share and boost profits. Moreover, FDI enables firms to gain new knowledge through exposure to foreign markets, technologies and practices. This knowledge leads to innovation, improved processes and enhanced competitiveness for growth. The former is usually the effect of investments from developed to developing economies, whereas the latter is usually the reverse. Competitive advantages such as brand equity, trademarks or patents are necessary for internationalizing firms to succeed in foreign markets. The subsidiary presence of the internationalizing firm in the foreign market, without any trade intermediaries, can minimize transaction-related risks and increase the value of proprietary assets (Roberts and Muralidharan, 2022; Li et al., 2018).

Empirical evidence for the impact of SMEs' internationalization on their performance is contradictory, in part owing to the use of confounding measures for internationalization and performance. Most of the literature considers internationalization only through exports,[2] not through FDI. Moreover, performance is mostly measured by profitability and less often by sales growth. This study focuses on the impact of FDI on sales growth. This is because many SMEs in the early stages of their evolution place a strong emphasis on sales growth, and an analytical focus on profitability might understate the true performance achieved by these firms (Pangarkar, 2008; Lu and Beamish, 2006).[3]

Focusing on sales and sales growth rates obviously has some disadvantages. For one, sales is one of the criteria that determines SME status, and investing abroad and subsequent sales growth may push a firm out of that status. Furthermore, whereas profitability is a ratio that is not affected by the number of affiliates, sales are affected by the addition of a company unit. In this study, the issue is addressed empirically by employing the appropriate panel data technique – i.e. a difference-in-difference (DID) estimator – and by controlling for the size of the firms over time.

Among the studies considering the impact of FDI by SMEs on their performance, a few found a positive relationship between FDI and firms' growth (Lu and Beamish, 2006; Li et al., 2018). However, the growth path is not linear, which means SMEs'

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[2] For a review of the research on the relationship between degree of internationalization (by exports) and SME performance, see Schwens et al. (2018).
[3] We also run regressions using profitability without obtaining significant results.

performance starts to improve only after an initial deterioration at the beginning of the internationalization effort. The initial decline could be due to the shock of foreignness and resource constraints. Shin et al. (2017) confirmed the same type of U-shaped relationship between FDI and performance for SMEs in capital-intensive services, whereas they find an inverted U-shaped relationship for those in knowledge-intensive services. This is related to the special characteristics of knowledge- and technology-intensive firms that are often global at their inception, i.e. "born global" (Singh, 2017).

The study of firms born global falls within a strand of international entrepreneurship literature that focuses on the speed of internationalization and the related learning and knowledge acquisition. These theories posit that when a firm internationalizes earlier, it is less constrained by the past and therefore can learn more effectively from its foreign activities, be truly innovative and improve its performance. Yet, rapid internationalization could have negative effects owing to foreign commitments (Mohr and Batsakis, 2017; Hilmersson and Johanson, 2016). However, most of the studies on the speed of internationalization (including on born globals) consider only exporting companies. For multinationalism, the evidence is scarce. For example, the study by Lu and Beamish (2006) shows that engaging in FDI has a greater impact on firms' growth performance among those that did so in their early years.

Moreover, the literature on internationalization does not lend much consideration to SMEs from the services sector, tending to focus more on those in the manufacturing sector. Rapid advancements in information and communication technology, as well as the implementation of international services trade agreements (such as the General Agreement on Trade in Services, in force since 1995), have contributed to the gradual servicification of the economy and facilitated the internationalization of services SMEs (UNCTAD, 2020). In fact, many services companies have lower capital needs than manufacturing firms and thus benefit from lower entry barriers into foreign markets in terms of financial constraints – establishing an office, for example, is much cheaper than setting up a manufacturing plant (Lejpras, 2009; Roberts and Muralidharan, 2022; Shin et al., 2017). As a consequence, the majority of multinational SMEs are active in the services sector.

This study contributes to two strands of the literature on multinationalism and performance by comparing the performance of SMEs and larger enterprises, hence adding a comparative perspective on both size and sector. To the best of our knowledge, virtually no empirical studies have simultaneously examined such a link in a single sample of large firms and SMEs.[4] This gap in the literature is somewhat

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[4]   Benito-Osorio et al. (2016) and Fisch (2012) consider size effects on the relationship of internationalization and performance, measuring the degree of internationalization as the ratio of foreign sales to total sales, thus mostly capturing exports.

striking given that SMEs' resources, organization and management radically differ from those of larger firms (Orser et al., 2000). The study also verifies whether this relationship varies by sector, considering that services-based SMEs might benefit from facing fewer constraints on resources.

The study provides an innovative empirical analysis of the growth performance of SMEs when they internationalize through outward investment. We find that after cross-border greenfield investment SMEs experience an initial drop in their growth rate, which starts to recover only from year 4 after the investment, whereas their larger counterparts do not experience a significant change. The negative shock in the growth rate of SMEs is largely found in small manufacturing enterprises, for which establishing a foreign subsidiary requires a sizeable and long-lasting commitment of resources. This could be explained by two concurring factors: First, manufacturing plants take time to set up and may engage in activities that contribute less to sales growth, such as supply chain activities. Second, for very small businesses, a foreign investment may divert key resources – in terms of organizational and managerial capacity – from the home market, temporarily slowing down their growth rate. In contrast, services affiliates, almost by definition market-seeking, tend to make an immediate contribution to sales and sales growth. In accordance with these results, this research note suggests that interventions should focus on reducing the costs of venturing abroad – especially information and transaction costs – by creating occasions to liaise and establish networking contacts with foreign counterparts. Also, securing access to adequate financing is critical for the implementation and success of FDI (confirming previous findings; e.g. De Maeseneire and Claeys, 2012).

The rest of the note is structured as follows: section 2 presents the data and methodology, section 3 discusses the results and policy implications, and section 4 concludes.

2. Data and methodology

This study focuses on greenfield investments by all companies with annual turnover of less than US$100 million using data collected from the fDi Markets database of The Financial Times. The data set includes announced greenfield investments from 2015 to 2022. Investors with higher turnover are excluded, since such companies are typically multinational enterprises that have numerous investment projects over the period of study.

The sample initially consisted of 11,127 projects, from which we selected only the ones conducted by independent companies (not affiliated to a larger group) that invested only one time during the period considered. Excluding projects by companies that announced multiple greenfield projects over the period of analysis
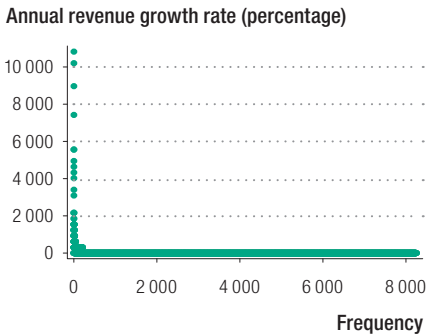
allows us to compare growth rates before and after an investment more accurately. Using this selection procedure, our sample consists of smaller companies than the full sample of investor companies obtained from the fDi Markets database. After applying these filters, the data set was reduced to 4,441 projects, providing a more focused and relevant sample for our analysis of the activities of smaller companies from 2015 to 2022.

The investment data were matched with financial data from the Bureau van Dijk business database (Orbis) to obtain revenue information for the years prior to and following the investment. The process of matching the fDi Markets and Orbis data sets involved three steps. First, the 4,441 companies investing in the projects obtained from fDi Markets were manually searched for by name in Orbis. For the companies whose name did not precisely match in the two databases, Orbis automatically identifies the closest name to the searched company, with a success rate of over 95 per cent. Total annual revenue of all companies from 2010 to 2022 was obtained from Orbis for the years that financial data were available. Then, the initial company names obtained from fDi Markets and Orbis were rematched to build the data set, which includes both greenfield investment data (from fDi Markets) and financial data (from Orbis).

The discrepancies between the names in the two data sets made the last step complicated. Choosing only exact matches between the databases resulted in the loss of over 80 per cent of the companies. To overcome this issue, a fuzzy matching of the names of companies was performed using the PolyFuzz package in Python,[5] implementing the Levenshtein algorithm. This algorithm measures the minimum number of single-character edits (insertions, deletions or substitutions) required to transform one string into another and provides a score between 0 and 1, with higher scores indicating greater similarity. A threshold score of 0.88 was set to determine whether two company names were considered a match. Fuzzy matching produced a sample of 1,354 investing companies and 8,554 observations with valid revenue data. The distance between the host and home countries of the investments were added to the data set, using data obtained from Mayer and Zignago (2011).

Figure 1.a shows the distribution of annual growth of all investing companies, which is markedly right skewed (with a skewness of 25). To eliminate the effect of outliers, investing companies with at least one annual growth rate in the top 2 per cent of the distribution were dropped. Figure 1.b shows the distribution after removing the outliers. The final sample consisted of 7,717 observations for 1,203 investing companies.

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[5]   Maarten Grootendorst, "Polyfuzz: fuzzy string matching, grouping, and evaluation", Zenodo, 25 January 2021, https://zenodo.org/record/4461050.

Figure 1. Annual revenue growth: sample distribution with and without outliers

a. With outliers

Annual revenue growth rate (percentage)

Frequency

b. Without outliers

Annual revenue growth rate (percentage)

Frequency
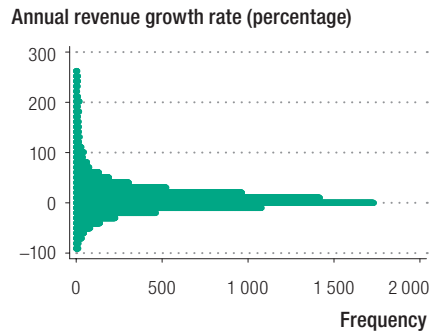
Source: Authors' elaboration, based on data from The Financial Times, fDi Markets database.

Because information on the number of employees, which is one of the criteria for defining SMEs, is mostly missing, companies in the sample were classified as SMEs if their revenue in the year of investment was less than US$15 million, and as larger enterprises otherwise – which is consistent with definitions in the literature (UNCTAD, forthcoming).[6] The sample consists of companies with annual turnover of less than US$100 million. Of those, larger enterprises are defined as those with turnover of US$15–100 million. Across the limited number of companies in the data set with data available on employee numbers, the data show that on average, the SMEs have only 66 employees while the larger enterprises have more than 1,200. Table 1 presents the descriptive statistics for the sample by SMEs and larger enterprises as categorized in our sample, which indicate that, in general, SMEs experience higher rates of annual revenue growth than larger enterprises. However, the decline in annual growth rates after a greenfield investment is more

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[6] The definition of what constitutes an SME varies significantly across national and international sources. Some definitions are exclusively based on the number of employees of a firm or its annual turnover, capital and/or fixed assets or all of these characteristics. The number of employees is the most common criterion, yet the maximum thresholds vary across countries or regions, in some cases also across industries within the same country. For instance, in the World Bank Enterprise Surveys, SMEs are defined as enterprises with fewer than 100 employees. The European Union and the United Kingdom define an SME as an enterprise that employs fewer than 250 persons and has an annual turnover not exceeding €50 million, and/or a balance sheet total not exceeding €43 million. In the United States, the threshold is 500 employees and US$1 billion of revenues, and the Republic of Korea uses the threshold of about US$110 million (UNCTAD, forthcoming).

pronounced for SMEs than for larger enterprises. More than half of SMEs are in the services sector, and their investments are closer to their home country than those of larger enterprises. Most of the investments are in software and information technology services, business services and industrial equipment. There is no significant difference in the top three sectors between SMEs and larger enterprises, as shown in the matching similarity index (see table 1).

Table 1. Summary statistics: final sample		
Variable	**SMEs**	**Larger enterprises**
Annual growth before investment (%)	15.30 (1.05)	9.91 (0.62)
Annual growth after investment (%)	11.87 (1.01)	7.70 (0.68)
Revenue before investment (US$1,000)	7 128.60 (19 033.86)	44 838.21 (55 684.99)
Revenue after investment (US$1,000)	7 745.70 (14 640.22)	49 347.33 (54 452.83)
Services sector (%)	0.56 (0.02)	0.34 (0.02)
Matching similarity index	0.95 (0.002)	0.95 (0.002)
Distance (km)	2 105.69 (72.51)	2 964.46 (56.45)
Number of investment projects	518	685
Number of observations	3 184	4 533
Average number of years	6.15	6.62

Source: Authors' elaboration, based on data from The Financial Times, fDi Markets database.
Note: Standard errors are in parentheses.

Table 2 presents data on the number of investments and the distance between the home country and host country, categorized by six source regions: Africa, Asia, Europe, Latin America and the Caribbean, North America and Oceania. The data reveal that Europe received the highest number of investments overall, followed by Asia, while Oceania received the lowest number. The distance of the host economy from the home economy differed widely by region given their geographical positions.

Oceania had the highest average distance for investments, whereas both Africa and Latin America and the Caribbean had relatively shorter distances, suggesting investments made closer to home. SMEs tend to invest in countries closer to the home country in all source regions except for North America, where SMEs prefer to invest in Europe rather than in neighbouring Latin America.

Table 2. Number of investments and distance between home and host country, by source region

| Source region	Number of investments		Distance (km)	
	SMEs	**Larger enterprises**	**SMEs**	**Larger enterprises**
Africa	3	2	4 030	8 658
Asia	36	122	4 377	5 536
Europe	362	424	1 558	2 028
Latin America and the Caribbean	4	4	1 223	5 900
North America	46	73	6 047	5 456
Oceania	18	15	11 120	11 652

Source: Authors' elaboration, based on data from The Financial Times, fDi Markets database.

Simple descriptive statistics of the average growth before and after investment for SMEs and larger enterprises are illustrated in figure 2. It shows that although both SMEs and larger enterprises experience declines in growth rate after foreign investment, the decline is more prominent for SMEs.

For the empirical analysis, we employed a DID approach with staggered treatment timing and two-way fixed effects for time and company. In this approach, all investing companies (both SMEs and larger ones) are categorized in the treatment group in the year after they invest abroad, while all companies that have not invested abroad yet or already invested abroad before the year of observation constitute the control group. Although all companies eventually enter the treatment group within the research time frame, their staggered introduction across different periods enables meaningful comparisons between new treatment group companies and others. This facilitates the evaluation of the impact of investment.

The regression analysis focuses on a maximum of four years before and after the investment. Because of the staggered nature of the DID design, the availability of data differs across investors. On average, there are 3.5 years of data before the investment and 3.16 years of data after the investment.

Figure 2. Average annual revenue growth before and after investment
(Percentage)
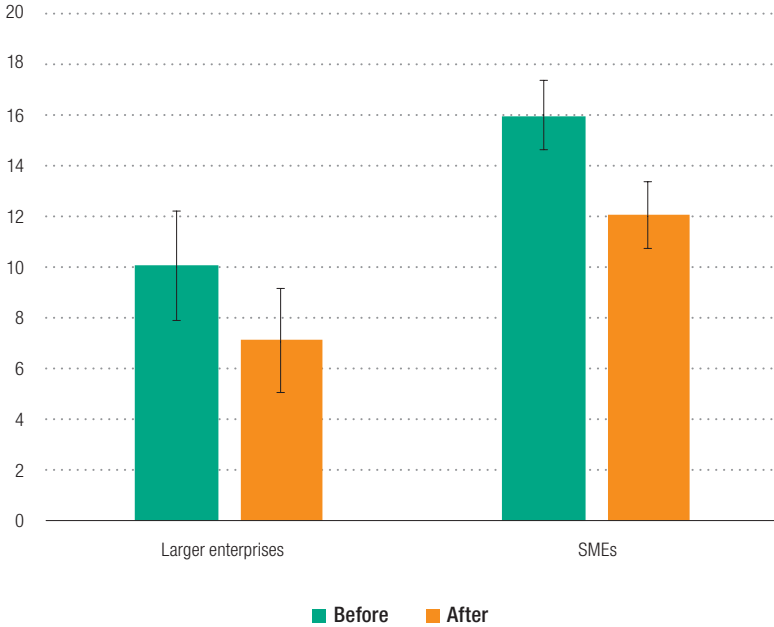
Source: Authors' elaboration, based on data from The Financial Times, fDi Markets database.
Note: Error bars represent the 95 per cent confidence interval.

Our baseline regression model is as follows:

$$Y_{it} = \beta_0 + \beta_1 D_{it} + u_i + v_t + w_{it} \tag{1}$$

in which Y_{it} is the log of revenue or the annual revenue growth of company i in year t; D_{it} is the treatment (post-investment) dummy, which is equal to 1 if the year t is greater than the investment year of company i, and zero otherwise; and u_i and v_t represent the company and year fixed effects, respectively.

To investigate the impact of investment on revenue growth at different periods after the investment, we introduce a normalized year variable denoted as G_{it}. It is calculated as $T_{it} - I_i$, where T_{it} represents the year of observation and I_i represents the year of investment for company i. That is, G_{it} represents the number of years before or after the investment when the revenue growth occurred. Then we replace the dummy of G_{it} with the treatment dummy, D_{it}.

This method allows us to verify a critical assumption in the DID method known as the "parallel trend assumption": in the absence of foreign investment the revenue growth trend of internationalizing companies (the treatment group) would have the same trend as that of other companies (the control group). When the parallel trend assumption is met, there should be no significant difference between the treatment and control groups before the foreign investment takes place. The model with the normalized year dummy is represented as follows:

$$Y_{it} = \beta_0 + \beta_{1t} G_{it} + u_i + v_t + w_{it} \qquad (2)$$

To examine the impact of greenfield investment on revenue growth for SMEs, an interaction between the treatment dummy and the SME indicator variable is included. Moreover, to explore any heterogeneity of the effect on the services and manufacturing sectors, a dummy variable for the services sector was added to the model.

3. Results

Table 3 presents the findings of the baseline regression, which examines the impact of FDI on annual revenue growth. In this analysis, we use both the actual annual revenue growth and its logarithmic transformation as outcome variables.

The first column of table 3 shows a significant decline of 3.3 percentage points in annual revenue growth for internationalizing companies. The regression analysis using the logarithmic transformation as the dependent variable reveals a comparable decrease in the growth rate, with a similar level of statistical significance and effect size.

These results allow us to compare the annual revenue growth rates of internationalizing companies before and after their investment. The inclusion of the logarithmic transformation regression is intended to reinforce the consistency observed in the revenue growth results. All other models in this study utilize the annual revenue growth as the outcome variable.

Table 4 presents the results of replacing the treatment dummy with the normalized year dummy variable, and figure 3 displays the coefficients of the year dummy, which represents the marginal change in annual revenue growth in each year compared with the growth rate in the year of investment. The dummy of the investment year is the omitted year dummy, so each coefficient represents the difference between each year and the investment year. The findings suggest that the declining trend of the post-investment growth rate persists for three years after the investment. In the fourth year post-investment, the annual growth rate does not differ significantly from that of the investment year, which could be a sign of bouncing back to the year of investment value. This finding is in line with the U-shaped performance that Shin et al. (2017) found for capital-intensive service SMEs.

Table 3. Annual revenue growth after investment

	Dependent variable	
	Annual revenue growth	Revenue (log)
	(1)	(2)
Post-investment	-3.313** (1.486)	-0.031** (0.013)
Company fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	7 717	7 717
R^2	0.259	0.974
Adjusted R^2	0.121	0.969

Source: Authors' estimations.
Note: Standard errors are in parentheses. ** significant at 5 per cent.

## Table 4. Revenue growth relative to the year of investment

	Dependent variable
	Annual revenue growth
Year (-3)	1.395 (1.852)
Year (-2)	0.775 (1.507)
Year (-1)	1.139 (1.313)
Year (1)	-2.554 (1.653)
Year (2)	-4.390** (2.130)
Year (3)	-5.745** (2.466)
Year (4)	-4.172 (3.033)
Company fixed effects	Yes
Year fixed effects	Yes
Observations	7 717
R^2	0.259
Adjusted R^2	0.12

Source: Authors' estimations.
Note: Standard errors are in parentheses. ** significant at 5 per cent.

Figure 3. Average annual revenue growth before and after investment
(Percentage)
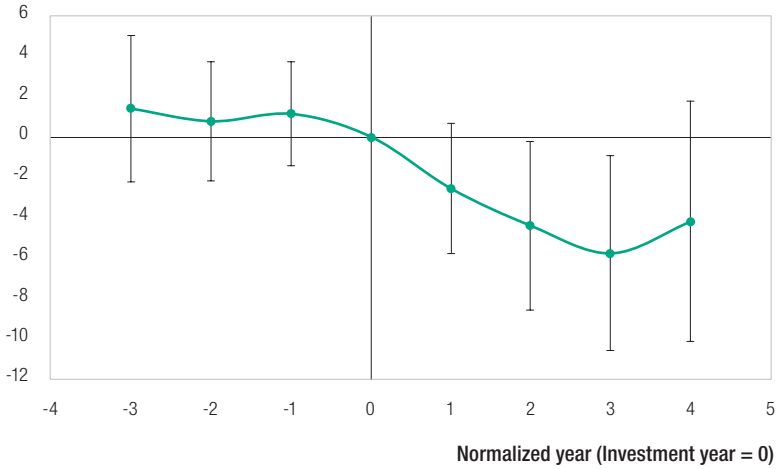
Source: Authors' estimations.
Note: Error bars represent the 95 per cent confidence interval.

To compare the effect of investment on the performance of firms of different size, we added the interaction between the SME dummy variable and the treatment variable to the baseline regression (equation 2). The results show that the decline in annual revenue growth rate is not statistically significant for larger enterprises, whereas SMEs face a statistically significant 6 percentage point decline after investment (table 5). This initial decline could be explained by the shock of foreignness – that is, the difficulties foreign firms have in accessing relevant information regarding markets, culture and institutional environment in the host country. These problems are more pronounced when internationalizing by FDI, rather than by exporting. Even though the liability of foreignness may in principle affect both large MNEs and SMEs, SMEs are more restricted by it than larger firms because of their limited resources.

Definitions of SMEs use different thresholds of total revenue; we considered companies with annual revenue of less than US$15 million as SMEs, as discussed earlier. To ensure that our findings are not sensitive to the revenue threshold, the SME indicator was replaced with a continuous variable representing the revenue of the investing company in the year of investment. The results indicate that regardless of the threshold of SME definition, smaller companies experience a more pronounced decline in revenue growth after an investment (table 6). Specifically, the analysis shows that for every US$1 million increase in revenue, the decline in growth rate is 0.3 percentage points lower on average.

Table 5. Effect of investment on SMEs relative to large firms

	Dependent variable
	Annual revenue growth
Post-investment	-1.371 (1.562)
Post-investment x SME	-4.614** (1.967)
Company fixed effects	Yes
Year fixed effects	Yes
Observations	7 717
R^2	0.260
Adjusted R^2	0.121

Source: Authors' estimations.
Note: Standard errors are in parentheses. ** significant at 5 per cent.

Table 6. Post-investment revenue growth, by investment year

Variable	Annual revenue growth
Post-investment	-3.356** (1.489)
Post-investment x Investment year revenue	0.0003** (0.000)
Company fixed effects	Yes
Year fixed effects	Yes
Observations	7 717
R^2	0.259
Adjusted R^2	0.121

Source: Authors' estimations.
Note: Standard errors are in parentheses. ** significant at 5 per cent.

Several factors could explain the results. SMEs in the services and manufacturing sectors could perform differently after making an investment. Services companies are less capital intensive: opening an office in foreign markets is cheaper and faster than setting up a manufacturing plant, and also more likely to generate immediate additional foreign sales. Especially in the high-technology sector, foreign subsidiaries are set up to expand the market for highly innovative products; often the aim is to create partnerships with key clients and possibly create personalized products. These investments, though, may still require a fair amount of management and coordination effort or marketing activity.

For example, an SME from Australia – ActiveVue Technologies – is a highly innovative company producing proprietary technology for solar (energy-generating) glass windows. In 2019 it opened a subsidiary in Singapore to operate the ClearVue business in that country and in Malaysia (sales and marketing support). Although ActiveVue is considered a successful business with very promising chances of becoming a market leader in this special glazing product, the investment did not lead to a major increase in turnover, which instead remained at a relatively constant level. The reason relates mostly to the time needed for homebuilders in the new market to adopt this technology and to adjust to the different technical regulations and standards.

To control for an SME being in the services sector, an interaction term is included in the regression. The regression results suggest that SMEs operating in the services sector experience a smaller decline in annual revenue growth than do SMEs in the manufacturing sector (table 7). The summary of the marginal change after the investment by sector and size appears in figure 4. The findings indicate that SMEs in the manufacturing sector witness a decline of 7.5 percentage points in their growth rate following internationalization. This decline is larger than the decrease experienced by SMEs in the services sector, equivalent to 4.6 percentage points.[7]

Table 7. Effect of investment on revenue growth, by size and sector

|	Dependent variable
	Annual revenue growth
Post-investment	-0.031 (1.641)
Post investment x SME	-7.487*** (2.831)
Post-investment x Services	-4.059* (2.146)
Post-investment x SME x Services	6.929* (4.129)
Company fixed effects	Yes
Year fixed effects	Yes
Observations	7 717
R²	0.26
Adjusted R²	0.122

Source: Authors' estimations.
Note: Standard errors are in parentheses. *** significant at 1 per cent, * significant at 10 per cent.

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[7] The marginal change of the revenue growth of SMEs in the services sector after the investment is equal to the sum of all coefficients in table 7, which is (-0.03) + (-7.49) + (-4.06) + (6.93) = -4.65.

A potential reason for the sectoral difference is the different resource constraints faced by services SMEs and manufacturing SMEs. For larger enterprises this relationship does not hold; instead, it is reversed, with larger enterprises in the services sector experiencing a statistically significant decline. This may be due to idiosyncratic effects; however, larger enterprises in the manufacturing sector do not show a statistically significant change in their growth rate after internationalization, whereas those in the services sector experience a decline of 4 percentage points, although the estimated coefficient is significant only at 10 per cent.

Figure 4. Annual revenue growth rate after investment, by company type and sector (Percentage point change)
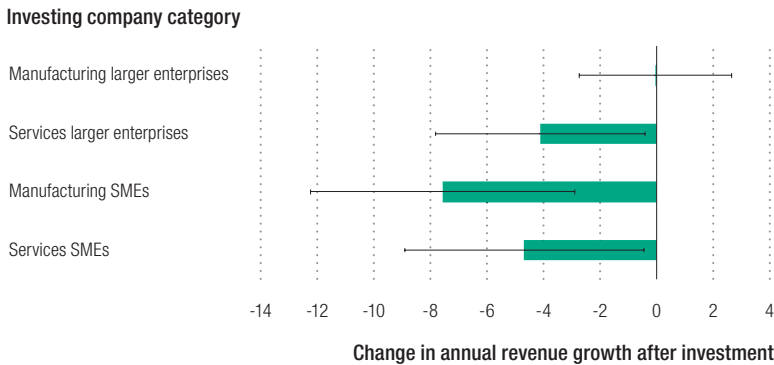
Source: Authors' estimations.
Note: Error bars represent the 90 per cent confidence interval.

4. Conclusions and policy recommendations

This study analyses the impact of investing abroad on enterprises' performance. In particular, it assesses whether outward investment is a significant growth strategy for SMEs compared to larger firms. To address the question empirically, we applied a DID analysis. The empirical results show that internationalizing firms experience a decline in the rate of revenue growth of 3.3 percentage points. The negative effect persists for three years after the investment, and in the fourth year the growth rate recovers. Our findings confirm the U-shaped performance after investment found in the literature (e.g. Shin et al., 2017). The analysis reveals that the negative effect is primarily observed in SMEs, which experience a decline of 6 percentage points in annual revenue growth rate following investment abroad.

The change in growth rate for larger enterprises, though still negative, is not statistically significant. Furthermore, SMEs in the manufacturing sector experience a more significant decline than SMEs in the services sector.

The empirical findings of this study challenge the notion that internationalization through FDI is invariably an advantageous growth strategy. The observed decline in sales growth following internationalization may be attributed to the challenges associated with the foreignness shock, which can be more pronounced when engaging in FDI than in export strategies, which leverage existing trade intermediaries. The foreignness shock means that foreign subsidiaries may need some time before revenues increase significantly, while SMEs' intrinsic deficiencies in resources and capabilities undermine performance in the home market, particularly after investing previous years' revenue in a foreign subsidiary. Lu and Beamish (2006) show that FDI has first a short-term negative impact on profitability. The present study shows that for very small businesses, internationalization can slow down growth in the first years after investment. This is particularly true for small manufacturing businesses that set up a production facility abroad or that try to introduce a new product in markets abroad. In the case of highly technical, specialized products, the adoption of host-country regulations and standards may slow the foreign expansion of dynamic SMEs. It also needs to be noted that in many cases the sample captured the evolution of young SMEs that experienced rapid growth in their first years followed by their first greenfield investment (mostly sales and marketing subsidiaries). This investment led to a temporary slowdown in the growth rate that was related to the difficulties of applying the same product and business model to new markets.

In contrast, small services enterprises are less capital intensive and can be more agile in undertaking foreign investment. Often, for services or highly innovative SMEs, FDI is a necessity to protect their brand and facilitate international sales while delivering for customers that require physical support and interaction or services in their own language and time zone. In other words, provision of knowledge content tends to explain the need to be physically close to key clients. Especially for innovative SMEs, direct contact with customers can be crucial to avoid intellectual property rights issues. Many firms that were born global internationalize by establishing a presence in so-called strategic markets in order to provide customers with a superior service and to work on and develop new products in close cooperation with them. This is particularly evident in software and information technology services, which predominate among service-oriented SMEs.

To support the international expansion of such SMEs, including in the technology sector, policymakers should aim to develop solid digital infrastructure and platforms and set in place strategic investment policy that supports SMEs' digital transition. For Industry 4.0 activities, the regulatory frameworks in both home and host countries of FDI are key factors in enhancing the attractiveness of the investment environment.

For manufacturing SMEs, policymakers should especially focus on lowering the costs of investing abroad, by strengthening national measures to ease access to finance by these SMEs. Also, policy-setters should push investment promotion agencies and other investment stakeholders – e.g. outward investment promotion agencies, export credit agencies, guarantee schemes – to better cater for SMEs by extending facilitation and aftercare investment services, as well as helping them access local networks and partnerships. This involves partnerships between outward investment promotion agencies and investment promotion agencies, as suggested in the UNCTAD Investment Policy Facilitation Framework for Sustainable Development. In addition, as the negative effects appear to be short term, spanning three to four years, policy interventions could prioritize support for SMEs during the initial stages following investment, rather than focusing solely on facilitating internationalization efforts.

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The first page of the manuscript should contain the (i) title of the manuscript; (ii) full name(s) of author(s), institutional affiliation(s) and country name(s); (iii) mailing address, email address, telephone number of the author (or corresponding author, if more than one).

The main text should not include any information that may identify the authors. It should be presented in the following order: (i) title; (ii) abstract (describing aims, methods, scope of analysis, results and conclusions); (iii) key words (between 4 and 8); (iv) JEL classification codes; (iv) main text; and (v) list of references.

Style guide

Spelling is guided by the <u>United Nations Editorial Manual</u>. A number of words ending in -*ise* and -*isation* in British English should be spelled -*ize* and -*ization*.

Quotations should be accompanied by the page number(s) from the original source (e.g. "Cantwell, 1991, p. 19" and "UNTAD, 2019, pp. 104–105"). Quoted words, sentences and paragraphs are enclosed within double quotation marks. Single quotation marks are used to enclose quotations within quotations.

Footnotes should be numbered consecutively throughout the text with Arabic-numeral superscripts. Important substantive comments should be integrated in the text itself rather than placed in footnotes. For citations from newspaper and magazine articles and Internet-based materials (e.g. blog posts, webpages and online databases), authors are encouraged to list them in footnotes, rather than in the references section.

Examples:

[1] India, Ministry of New and Renewable Energy, "India achieves 100 GW milestone of installed renewable energy capacity", 12 August 2021, https://pib.gov.in.

[2] European Commission, "What category do I fit into?", EU Immigration Portal, https://ec.europa.eu/immigration (accessed 13 December 2021).

[3] Based on UNCTAD, "International investment agreements navigator", Investment Policy Hub, https://investmentpolicy.unctad.org/international-investment-agreements (accessed 15 April 2018).

[4] *The Financial Times*, "Gig workers should get pension rights now, says regulator", 19 May 2021.

[5] Bloomberg News, "Tracking tax runaways", Bloomberg Special Reports: Corporate Tax Inversions, 1 March 2017, www.bloomberg.com/graphics/tax-inversion-tracker.

Figures must be accompanied by heads, subheads, units, labels and full sources. Footnotes to figures should be preceded by lowercase letters and should appear after the figure sources. Figures should be numbered consecutively. The position of figures in the text should be indicated as follows:

> **Put figure 1 here**

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Abbreviations should be avoided whenever possible, except for FDI (foreign direct investment), MNEs (multinational enterprises) and TNCs (transnational corporations).

Citations in the text should appear as: "UNCTAD (2019) reported that …" or "(Cantwell et al., 2010; Dunning, 2000)". The family name of the first co-author, followed by "et al.", can be used when the source was co-authored by three people or more.

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Examples:

Cantwell, John (1991). "A survey of theories of international production", in Christos N. Pitelis and Roger Sugden, eds., *The Nature of the Transnational Firm* (London: Routledge), pp. 16–63.

Cantwell, John, John H. Dunning and Sarianna M. Lundan (2010). "An evolutionary approach to understanding international business activity: the co-evolution of MNEs and the institutional environment", *Journal of International Business Studies*, 41, pp. 567–586.

Dunning, John H. (2000). "The eclectic paradigm as an envelope for economic and business theories of MNE activity", *International Business Review*, 9(1), pp. 163–190.

UNCTAD (United Nations Conference on Trade and Development) (2009). *Investment Policy Monitor*, No. 1, 4 December. unctad.org/system/files/official-document/webdiaeia200911_en.pdf.

_____(2019). *World Investment Report 2019: The Special Economic Zones* (New York and Geneva: United Nations).

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