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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

Making global value chains visible: Transnational corporations versus domestically owned firms*

Yuning Gao,[a] Bo Meng,[b] Gabriele Suder,[c]
Jiabai Ye[d] and Yongping Sun[e]

Abstract

This paper aims to advance research on transnational corporations (TNCs) and international business policy by identifying the role and influence of foreign-owned TNCs in global value chains (GVCs) compared with those of domestically owned firms. We do this by dividing the topology of trade in value added (TiVA) into three networks composed, respectively, of traditional trade, simple GVC trade and complex GVC trade, based on the OECD intercountry input-output data for 2005–2016. Our empirical results show that China's domestically owned firms have not only been supply centres of manufacturing value added, but have also risen as new regional centres of both supply and demand for services through simple GVC networks. Domestically owned firms of the United States dominate GVCs in services as a global center for both demand and supply, especially in complex GVC networks. TNCs located in Germany and the United Kingdom have a dominant presence in providing value added in manufacturing and services, respectively, through complex GVC networks. By making GVCs visible through TiVA-based network analyses, this paper significantly extends the understanding of who dominates what types of GVC. This will help policymakers better monitor and

[a] School of Public Policy and Management, Tsinghua University, Beijing, China.

[b] Corresponding author. Institute of Developing Economies, Japan External Trade Organization, Chiba, Japan; Tokyo Foundation for Policy Research, Tokyo, Japan; The Collaborative Innovation Center for Emissions Trading System Co-constructed by the Province and Ministry, Wuhan, China (bo_meng@ide.go.jp).

[c] Federation University Australia, Ballarat, Australia.

[d] Corresponding author. Institute for Contemporary China Studies, Tsinghua University, Beijing, China (yejiabai@163.com).

[e] Institute of State Governance, Huazhong University of Science and Technology, Wuhan, China.

enhance their GVC governance and competitiveness strategies in more flexible and diversified ways.

Keywords: global value chain, input–output analysis, firm ownership, international business, trade in value added, transnational corporations

JEL classification codes: D57, F6, F13, F15

1. Introduction

The rise and spread of global value chains (GVCs), mainly organized by transnational corporations (TNCs), are considered among the most important features of economic globalization in the 21st century (Baldwin and Ito, 2021). From the international trade perspective, GVCs have been narrowly defined by Krugman et al. (1995) as follows: "the trend in manufacturing has been to slice up the value chain-to produce a good in a number of stages in a number of locations, adding a little bit of value at each stage". GVCs were later mainly studied in areas such as TNC policy, international business (IB) research, general management, supply chain management and operations management, and also were extensively researched in economic geography, regional development, international trade and investment, and international political economy (Antràs, 2020a; Kano et al., 2020; Inomata, 2017). GVC-related studies are also intricately linked to current international policy practice "beyond the border", ranging from regulation of commercial presence, to tax competition and even to carbon border adjustment mechanisms, especially in light of the importance of TNCs.

The reality of current GVCs is that the "made in" label typical of manufactured goods attributed to a specific economy has become an archaic symbol of a bygone era, as most manufactured goods (e.g. smartphones, autos, aircraft) are now "made in the world" (Antràs and Chor, 2021; WTO and IDE-JETRO, 2011). Eighty per cent of trade takes place in value chains linked to TNCs (UNCTAD, 2013) and "multinationals account for roughly one-half of international trade, one-third of output and GDP and one-fourth of employment in the global economy" (Cadestin et al., 2019, p. 4). Approximately 85 per cent of the market capitalization of the S&P 500 (the 500 largest firms on the United States stock market, most of which are TNCs or involved internationally) comes from intangible assets.[1] This phenomenon will pose a challenge to policymaking that relies on resident-or territory-based accounting of an economy, and it will necessitate further improvements in the measurement of GVCs from the perspective of firm heterogeneity.

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[1] Ocean Tomo, *Intangible Asset Market Value Study*, July 2020, www.oceantomo.com.

Indeed, one issue of interest to transnational and international business that appears relevant for a better understanding of GVCs in both TNC- and IB-related policy considerations has thus far not been studied in depth: the location-bound participation in value added of TNCs. This is particularly relevant to investigation of global and regional GVC orchestration and to understanding of networks and operations in diverse geographical contexts (De Marchi et al., 2020; Enderwick and Buckley, 2020). Although the study of trade in GVCs as disaggregating national and industrial sources of value added has been used for IB insights (Suder et al., 2015), with consideration of TNCs, broader and deeper cross-border direct investment has led to the involvement of a large number of foreign-owned firms in the production activities of many countries, in addition to domestically owned firms. The still predominant view of GVCs, in which TNCs are important participants, keeps the decomposition of the source of value added at the level of the country of origin without considering the real source of producers in terms of firm ownership, limiting understanding relevant for informed policymaking. For example, data from the United States Bureau of Economic Analysis show that in 2015, United States companies (including subsidiaries in China) sold $372 billion of goods and services to China, while sales of Chinese companies to the United States amounted to $403 billion. If we consider that the difference between the two is defined as the "total sales balance", the difference was $30 billion (China's surplus with the United States) that year, much smaller than the bilateral trade balance of $367 billion in the same year, which is mainly considered as context for IB research on GVC patterns. From the perspective of the United States, the difference has shifted from a deficit of $30 billion in 2015 to a surplus of $7 billion in 2016 and a surplus of $20 billion in 2017.[2] However, even if we adjust the total bilateral trade balance in terms of total sales, such as traditional bilateral gross trade, that does not take into account the formation of value added, which would provide insights into the value of the interconnections and the players' involvement.

Given the increasing complexity and importance of GVCs, more challenges have been identified by GVC researchers, policymakers and business leaders. For example:

1. Are GVCs truly global or are they more of a regional phenomenon? (Baldwin and Lopez-Gonzalez, 2015; Los et al., 2015; Mudambi and Puck, 2016; Xiao et al., 2020)

2. Which is dominant in GVCs: domestically owned firms or TNCs? (Fortanier et al., 2019; Ghauri et al., 2021)

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[2] Deutsche Bank, Annual Report 2019, https://investor-relations.db.com.

3. Whether, how and to what extent do growing uncertainties (such as geopolitical conflicts, the COVID-19 pandemic and climate change) affect GVCs? (Antràs, 2020b; Elia et al., 2021; Solingen, 2021; Suder et al., 2021; UNCTAD, 2021 and 2022)

Understanding these issues is crucial to better understanding the impacts on the world economy of the two primary directions of trade liberalization (regional versus global) and a possible decoupling of the trade–investment nexus owing to growing geopolitical risks. They also inform reflections on what better GVC governance should look like.

Academic responses to these challenges might vary greatly because of differences in approaches, measures and presentation formats used in the literature. This is why GVC research requires a more interdisciplinary approach (Kano et al., 2020). This paper contributes to a perspective rarely found in TNC and IB research, by focusing on TNCs' location participation within fragmented GVCs, compared with that of domestically owned firms. We do so by tapping into the first database to use inter-country input–output (ICIO) analyses in a way that allows such considerations, thanks to the inclusion of firm ownership information and network analysis. Through the resulting ability to make GVCs visible by network analyses of trade in value added (TiVA) with consideration of the differences between the GVC activities of domestically owned and foreign-owned firms, this paper aims to extend the understanding of which type of firm dominates which types of GVCs over time and of transnationals' role in GVC governance. Our empirical results can help policymakers better monitor and enhance their GVC governance and competitiveness strategies in more flexible and diversified ways. This could further contribute to a more nuanced analytical and policy-oriented capability and consequently to policy impact in the future.

This paper is organized as follows: we first review the recent evolution of GVC measures and the related literature about how to make GVCs visible. We then conduct a detailed analysis of the basic methods of decomposing bilateral trade into different channels of traditional trade, simple GVC trade and complex GVC trade based on an ICIO model that allows us to further consider value added creation and absorption by firm ownership, country of origin and destination. We provide the findings through visualization and explain the visualization method based on the decomposition while presenting the results as a topological relationship diagram. We analyse the centres of the current GVCs by dividing a country's enterprises into domestically owned firms and TNCs from both the supply and demand sides at sector levels (mainly manufacturing and services). The last section draws the main conclusion and offers thoughts on further research avenues based on our findings.

2. Literature review on GVC measures

Recent research (Johnson and Noguera, 2012; Koopman et al., 2014; Los et al., 2015; Los et al., 2016; Patel et al., 2019) on TiVA in the context of GVCs has led to important developments in and revisions to the concept of bilateral trade balance, revealed comparative advantage, real effective exchange rate and other trade-related measurements. One of the most important advantages of TiVA is that it avoids double counting of value added due to multiple cross-border transactions of intermediates and clearly identifies who produces what for whom in GVCs. Some follow-up studies (Borin and Mancini, 2017 and 2019; Miroudot and Ye, 2020; Nagengast and Stehrer, 2016) provided more detailed decompositions, which can be used to trace the source, transfer, absorption (sink) and double counting of value added along GVCs at the country, sector and bilateral level. More recent studies (Wang et al., 2017; Xiao et al., 2020) further trace value added in GVCs by various trading routes with consideration of the number of times that contents cross national borders. These pioneering works have provided significantly enriched insights into economic globalization and global imbalances, as well as the context of TNC and IB research, with a focus on the role of global production sharing. In recent TNC and IB research, there are growing calls for more mixed methodologies and insights from nontraditional methodologies into GVCs, including from IO (Ambos et al., 2021; Ferreira et al., 2021; Kano and Oh, 2020; Kwon 2020; McWilliam et al., 2020; Miroudot, 2020; Pla-Barber et al., 2021; Veselovská, 2020; Zhan, 2021). There are also calls to strengthen the understanding of firms therein (Kano et al., 2020).[3] This is especially relevant as some mega-risks (e.g. the COVID-19 pandemic, the United States–China trade conflict and climate change) are increasingly seen as potential tipping points in GVC theory building (Antràs, 2020b; Elia et al., 2021; Ghauri et al., 2021; Suder et al., 2021).

To provide an initial accounting of the value added formation of TNCs in GVCs, recent studies (López et.al., 2019) have combined traditional ICIO tables with data on the investment and business activities of TNCs in selected countries, such as the United States. Recently, the Organisation for Economic Co-operation and Development (OECD) constructed new ICIO tables (from the Activity of Multinational Enterprises (AMNE) database) that now also consider TNCs' activities (Cadestin et al., 2018). It further divides production activities within each country according to the country of origin of the producer, and whether the producer is domestically or foreign owned. GVC trade can be mapped in greater detail so that we now know not only the source of the country and industry but also the origin of the value added creator by firm ownership. For example, Fortanier et al. (2019) show that the

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higher import content of exports of TNCs can go hand in hand with the creation of local backward linkages as a function of their much higher specialization in specific parts of the production process relative to domestically owned firms. Meng and Ye (2020) investigated the so-called smile curve phenomenon and identified value added gains, positions, and interdependencies of TNCs and domestically owned firms along GVCs. This new analysis provides previously inaccessible academic research and IB theory-building opportunities for a better understanding of GVCs and interpretation of bilateral trade balances, bilateral value added formation and, importantly, how to trace value added formation of TNCs around the world. This may also provide a strong basis and tools for globally coherent policy frameworks, such as the Base Erosion and Profit Shifting (BEPS) project, that are yet untapped by policy- and strategy-focused IB and TNC research into GVCs.

In the quest to enable a methodology for "how to make GVCs visible", researchers have increasingly used network analyses. Xiao et al. (2020) used the ICIO-based TiVA measure to extend existing network analyses (cf. Amador and Cabral, 2017; Cerina et al., 2015; Ferrarini, 2013; Ferrantino and Taglioni, 2014; Zhou et al., 2016; Zhu et al., 2015) and concluded that GVCs are more likely organized regionally and dominated by large countries, such as the United States, China and Germany. At the sector level, what GVCs look like depends largely on the perspective (supply or demand) and the type of networks adopted. That conclusion enriches our understanding of the topology of GVCs, providing a balanced view between that of Los et al. (2015) and Baldwin and Lopez-Gonzalez (2015). The former finds that a transition from regional production networks to the "World Factory" has appeared in almost all production chains during the years 1995–2011. The latter states more boldly that "supply chain trade is not global – it's regional" and that "the global production network is marked by regional blocks, what could be called Factory Asia, Factory North America and Factory Europe" (Baldwin and Lopez-Gonzalez, 2015, p. 1696).

Nevertheless, to the best of our knowledge, research on GVCs using ICIO models and network analysis tools looks only at country and sector; no such research explicitly considers the role of firm control (e.g. by ownership). It was argued by Mudambi and Puck (2016) that the findings presented by the regional strategy literature do not capture the full array of global activities of the TNCs, and, thus, "are likely to lead to biased interpretations using different theoretical lenses, such as the knowledge-/resource-based view, internalization theory and more general transaction cost economics" (p. 1076). Given this, our paper follows the concept of bilateral TiVA (Johnson and Noguera, 2012; Koopman et al., 2014: Suder et al., 2015) and takes advantage of the recent accounting framework by Meng and Ye (2020) for capturing GVC activities with a clear distinction between domestically owned firms and TNCs. It further uses the network-based analytical framework of Xiao et al. (2020) to remap the GVC topology and its evolution over time and

shows which type of firm (domestically owned or TNC) dominates GVCs in which way and to what extent. Our empirical results can be used to identify the real competitiveness of a country's own firms in a particular industry and to understand the locational participation of TNCs in GVCs, setting the scene for future better-informed research on location decisions and GVC governance. This paper also aims to provide policymakers with tools for better analysis, decision-making and incentives that may contribute to attracting and securing suitable sustainable trade and investment benefits.

3. Measuring value added trade in GVCs with consideration of firm ownership and trading route

The methods used to estimate TiVA by trading route are rooted in the ICIO-based models (Suder et al., 2015; Xiao et al., 2020). Without loss of generality, let us consider an ICIO model with G countries, N industries and two types of firms (D: domestically owned; and F: foreign-owned), which is consistent with the layout of the available transformed ICIO tables from the OECD AMNE, as shown in table 1 and its note (Cadestin et al., 2018).

In our model, $\mathbf{Z}^{sr}$ is a 2*N by 2*N matrix of intermediate input flows that are produced in country s and used in country r by domestically owned or foreign-owned firms (e.g. $\mathbf{Z}^{rs}_{FD}$ is the N by N matrix representing the exports of intermediates produced by foreign-owned firms located in country r used by country s's domestically owned firms). $\mathbf{Y}^{sr}$ is a 2*N by 1 vector giving final products consumed in country r and produced by domestically owned or foreign-owned firms in country s (e.g. $\mathbf{Y}^{rs}_{F}$ is the N by 1 vector representing the exports of final products produced by foreign-owned firms located in country r, used by country s). $\mathbf{X}^s$ and $\mathbf{VA}^s$ are, respectively, a 2*N by 1 and 1 by 2*N vectors of gross outputs and direct value added in country s, including domestically owned and foreign-owned firms. The input coefficient matrix (2*GN by 2*GN) can be defined as $\mathbf{A} = \mathbf{Z} \cdot \hat{\mathbf{X}}^{-1}$, where $\hat{\mathbf{X}}$ denotes a diagonalized matrix of the output vector $\mathbf{X}$; thus $\mathbf{B} = (\mathbf{I} - \mathbf{A})^{-1}$ can be defined as the well-known global Leontief inverse matrix representing the induced output by one unit of final demand through the whole global production network. The value added coefficient vector (1 by 2*GN) can be defined as $\mathbf{V} = \mathbf{VA} \cdot \hat{\mathbf{X}}^{-1}$. Following Johnson and Noguera (2012) and Xiao et al. (2020), the definition of bilateral TiVA (forward link or supply side) by trading route and firm ownership is given as follows:

Value added exports to country r of domestically owned (D) or foreign-owned (F) firms located in country s (s≠r, similarly hereinafter) through the traditional trading route:

$$\widehat{\mathbf{V}^s_{D \text{ or } F}} \cdot \mathbf{L}^{ss} \cdot \mathbf{Y}^{sr}. \tag{1}$$

Table 1. Layout of the transformed OECD AMNE ICIO tables

Inputs	Intermediate use — 1 (D)	1 (F)	2 (D)	2 (F)	…	G (D)	G (F)	Final demand — 1	2	…	G	Total output
1 (D)	z^{11}_{DD}	z^{11}_{DF}	z^{12}_{DD}	z^{12}_{DF}	…	z^{1G}_{DD}	z^{1G}_{DF}	Y^{11}_{D}	Y^{12}_{D}	…	Y^{1G}_{D}	X^{1}_{D}
1 (F)	z^{11}_{FD}	z^{11}_{FF}	z^{12}_{FD}	z^{12}_{FF}	…	z^{1G}_{FD}	z^{1G}_{FF}	Y^{11}_{F}	Y^{12}_{F}	…	Y^{1G}_{F}	X^{1}_{F}
2 (D)	z^{21}_{DD}	z^{21}_{DF}	z^{22}_{DD}	z^{22}_{DF}	…	z^{2G}_{DD}	z^{2G}_{DF}	Y^{21}_{D}	Y^{22}_{D}	…	Y^{2G}_{D}	X^{2}_{D}
2 (F)	z^{21}_{FD}	z^{21}_{FF}	z^{22}_{FD}	z^{22}_{FF}	…	z^{2G}_{FD}	z^{2G}_{FF}	Y^{21}_{F}	Y^{22}_{F}	…	Y^{2G}_{F}	X^{2}_{F}
…	…	…	…	…	…	…	…	…	…	…	…	…
G (D)	z^{G1}_{DD}	z^{G1}_{DF}	z^{G2}_{DD}	z^{G2}_{DF}	…	z^{GG}_{DD}	z^{GG}_{DF}	Y^{G1}_{D}	Y^{G2}_{D}	…	Y^{GG}_{D}	X^{G}_{D}
G (F)	z^{G1}_{FD}	z^{G1}_{FF}	z^{G2}_{FD}	z^{G2}_{FF}	…	z^{GG}_{FD}	z^{GG}_{FF}	Y^{G1}_{F}	Y^{G2}_{F}	…	Y^{GG}_{F}	X^{G}_{F}
Value added	Va^{1}_{D}	Va^{1}_{F}	Va^{2}_{D}	Va^{2}_{F}	…	Va^{G}_{D}	Va^{G}_{F}					
Total input	$(X^{1}_{D})'$	$(X^{1}_{F})'$	$(X^{2}_{D})'$	$(X^{2}_{F})'$	…	$(X^{G}_{D})'$	$(X^{G}_{F})'$					

Source: Cadestin et al. (2018).

Value added exports to country r of domestically owned (D) or foreign-owned (F) firms located in country s through the simple GVC trading route is shown as follows:

$$\widehat{V_{D \text{ or } F}^{s}} \cdot \mathbf{L}^{ss} \cdot \mathbf{A}^{sr} \cdot \mathbf{L}^{rr} \cdot \mathbf{Y}^{rr} \qquad . \tag{2}$$

Value added exports to country r of domestically owned (D) or foreign-owned (F) firms located in country s through the complex GVC trade route is shown as follows:

$$\widehat{V_{D \text{ or } F}^{s}} \cdot \mathbf{L}^{ss} \cdot \left(\sum_{t \neq s}^{G} \mathbf{A}^{st} \cdot \sum_{u}^{G} \mathbf{B}^{tu} \cdot \mathbf{Y}^{ur} - \mathbf{A}^{sr} \cdot \mathbf{L}^{rr} \cdot \mathbf{Y}^{rr} \right), \tag{3}$$

where $\widehat{V_{D}^{s}}$ is the diagonalized matrix of $\mathbf{V}_{D}^{s}$ (a 1 by 2*N row vector including only value added elements of domestically owned firms located in country s); $\widehat{V_{F}^{s}}$ is the diagonalized matrix of $\mathbf{V}_{F}^{s}$ (a 1 by 2*N row vector including value added elements of foreign-owned firms located in country s); and $\mathbf{L}^{ss} = (\mathbf{I} - \mathbf{A}^{ss})^{-1}$ which represents the 2*N by 2*N domestic Leontief inverse of country s, including both domestically and foreign-owned firms (induced output of domestic products by one unit of final demand).

Clearly, equation (1) represents a country's value added sourced in domestically owned or foreign-owned firms used to satisfy foreign final demand of country r that does not involve any crosscountry production activities. It crosses a national border for final demand usage, so is very similar to the traditional "Ricardian" type trade, i.e. "French wine in exchange for English cloth", and, thus, is identified as "traditional trade" in the paper. Equation (2) represents the value added of domestically owned or foreign-owned firms in country s embodied in intermediate exports that are used by the trading partners of domestically owned or foreign-owned firms to produce its final domestic products, which are then consumed in the direct importing country r. In this case, the domestic value added sourced in domestically owned or foreign-owned firms crosses a national border only once (relatively simple production sharing across countries), with no indirect exports to third countries or re-export activities involved; thus, it is identified in this paper as "simple GVC trade". The first part in equation (3) represents the value added of domestically owned or foreign-owned firms in country s, respectively, that is induced by the final demand of country r for imports from a third country u. This implies that the value added by country s must first be embodied in its intermediate products that are exported directly to country t (including country r), which will be further used directly and indirectly by domestically owned or foreign-owned firms in country u (including country r) to produce final products to satisfy the final demand of country r. With the second part, which is equals to minus equation (1), it can be seen that equation (3) represents the value added of domestically owned or foreign-owned firms in country s that is absorbed by country r through third countries. In this case, the factor contents move across country borders at least twice (relatively complex production sharing across countries); thus, it is defined as a case of "complex GVC trade" in this paper.

This decomposition of GVCs by different trading routes is simply illustrated in figure 1 using China's value added creation in the metal industry as an example. This decomposition provides a better understanding of how global production is fragmented and, thus, of the relative position (upstream or downstream) of a specific country in GVCs as well as the complexity (partly reflecting the level of technology embodied in intermediate goods) and length of GVCs involving different types of firms.

Figure 1. Value added creation and absorption along GVCs by trading route

Source: Meng et al. (2023).
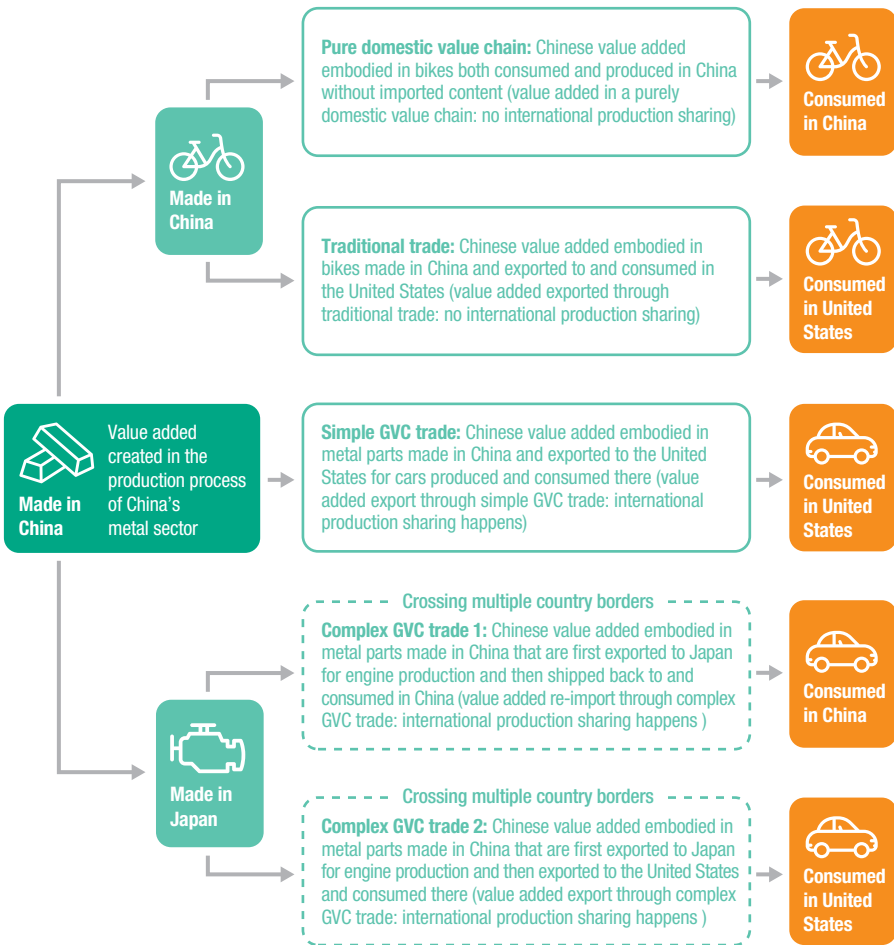
This approach follows the forward industrial linkage. Therefore, it can be used to investigate how a specific firm or industry's value added is embodied in all downstream production stages and finally absorbed by a country's final demand through various trading routes. This approach is suitable for analysing GVC networks from the point of view of a supplier (value added creating firm or industry). Similarly, we can also follow the backward industrial linkage to investigate how the final demand for a specific good or service induces value added along upstream value chains, which could provide a demander's view of GVCs, as shown in the following equations.

Induced value added by domestically owned (D) or foreign-owned (F) firms in country r by country s's final demand for a specific product made in country r (r≠s, similarly hereinafter) through the traditional trading route is shown as follows:

$$\mathbf{V}_{D \text{ or } F}^{r} \cdot \mathbf{L}^{rr} \cdot \widehat{\mathbf{Y}^{rs}}. \tag{4}$$

Induced value added by domestically owned (D) or foreign-owned (F) firms in country r by country s's final demand for a specific product made in country s through the simple GVC trading route is shown as follows:

$$\mathbf{V}_{D \text{ or } F}^{r} \cdot \mathbf{L}^{rr} \cdot \mathbf{A}^{rs} \cdot \mathbf{L}^{ss} \cdot \widehat{\mathbf{Y}^{ss}}. \tag{5}$$

Induced value added by domestically owned (D) or foreign-owned (F) firms in country r by country s's final demand for a specific product made in third countries through the complex GVC trading route is shown as follows:

$$\mathbf{V}_{D \text{ or } F}^{r} \cdot \mathbf{L}^{rr} \left(\sum_{t \neq s}^{G} \cdot \mathbf{A}^{rt} \cdot \sum_{u}^{G} \mathbf{B}^{tu} \cdot \widehat{\mathbf{Y}^{us}} - \mathbf{A}^{rs} \cdot \mathbf{L}^{ss} \cdot \widehat{\mathbf{Y}^{ss}} \right), \tag{6}$$

where $\widehat{\mathbf{Y}^{rs}}$ is the diagonalized matrix of $\mathbf{Y}^{rs}$.

4. Method for visualizing networks of TiVA in GVC analysis

The ICIO data used is from the OECD AMNE database[4], wherein firms are categorized according to their ownership (domestically and foreign-owned) over the period 2005–2016, with 60 economies (appendix) and 34 industries in the

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[4] Main data sources used in compiling the OECD AMNE ICIO tables include the OECD ICIO tables, OECD AMNE statistics, national accounts and other national sources, trade by enterprise characteristics and services trade by enterprise characteristics, and micro-level databases. For other options, refer to the UNCTAD-Eora Global Value Chain Database (Casella et al., 2019), the World Input-Output Database (www.wiod.org), and the ADB-MRIO (https://mrio.adbx.online), which provide different country, sector and year coverage.

ISIC Rev. 4 classification at the basic price[5]. It should be noted that foreign-owned firms are defined as foreign affiliates that have at least 50 per cent foreign ownership and that domestically owned firms include both domestic TNCs (domestic firms with foreign affiliates) and domestic firms not involved in international investment.

To simplify the identification of the relationship between peripheral and core countries of various networks from the perspectives of importers and exporters of value added, separately, networks can be presented in two ways. The first uses a specific country as a supply centre if the majority of value added imports by other countries are from that country. The second uses a specific country as a demand centre if the majority of value added exports from other countries go to that country. In the network figures, a bubble's size represents the share of a country's value added exports or imports of the world total. The shares of value added flowing through trading partners are represented by the thickness of an arrow. The point of the arrow shows the direction of the value added flow.

Note that whether an arrow appears in the network depends on two standards. In the visualization of networks, we use the following criteria: (1) if country A takes the largest share of value added imports from country B, an arrow will lead from A to B; or (2) if country A's share of country B's value added imports is larger than 25 per cent, an arrow will lead from A to B. The first standard is the so-called top 1 threshold, which is widely used in network analyses to identify the most important arcs or links.[6] The second standard is used to adjust the density of the network and, thus, avoids omitting other important links. We must emphasize that the arrows between nodes in the GVC trade networks are not about the relationship of any direct bilateral trade partners. Instead, they are used to explore the complexity of the whole structure of interactions among countries that are indirectly linked with each other in terms of TiVA through third countries.[7]

5. Empirical results

The empirical results show very large variations of networks given the high diversity of dimensions used (including year, time, sector, supply side vs. demand side, trading route and firm ownership). For ease of explanation, we focus on the manufacturing and services sectors for the years 2005 to 2016.

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[5] According to the definition of Eurostat (see https://ec.europa.eu/eurostat/statistics-explained/index. php?title=Glossary:Basic_price), the basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, by the producer as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer.

[6] We checked for robustness by way of the choice of threshold (5–40 per cent) and found that 25 per cent yields a stable situation for the number of links in selected core countries.

[7] For details, see Xiao et al. (2020).

5.1 Centres of TiVA in manufacturing GVC networks by trading route and firm ownership

GVCs involving both domestically owned firms and TNCs in the manufacturing sector can be divided into three subnetworks: traditional trade, simple GVC trade and complex GVC trade. As shown in figure 2, from the supply side, between 2005 and 2016, value chains involving domestically owned firms around the world increasingly developed into three regions centred on China, Germany and the United States, through both traditional trade (figure 2a) and simple GVC trade (figure 2b). There appeared to be a pattern of dual centres in Germany and in China through complex GVC trade (figure 2c). At the country level, relatively rapid changes in network topology can be observed as follows.

First, China took over Japan's position, and its share of value added creation in the manufacturing sector GVC began to exceed that of Germany. China is more likely a global centre with more surrounding countries, especially through both simple and complex GVC trade. This is highly consistent with the recent literature on the success story of China's domestic industrial upgrading.[8] Namely, China is not only the largest final goods provider in the world, but also supplies relatively more high-tech intermediate goods to serve its downstream countries directly through simple GVC trade and indirectly through complex GVC trade.

Second, the United States maintained its position as a regional supply centre of value added, mainly for the members of the Agreement between the United States of America, Mexico and Canada (USMCA), but its presence declined relatively, especially in complex GVC networks, in terms of the number of surrounding countries. Nevertheless, the United States has become more interdependent with China, which can be seen from the growing thickness of the United States–China connection in the figure. This is caused on the one hand by the hollowing out of United States low-technology manufacturing industries (offshored to low-technology, low-wage countries) and on the other, by the enhancement and specialization of United States high-technology manufacturing industries (Meng, Ye and Wei, 2020). Third, Germany's position as a regional centre in Europe has been relatively stable over time, while the Germany–United States connection has been largely replaced by the Germany–China connection.

For GVCs involving TNCs, the overall network topology and evolution over time are similar to GVCs involving domestically owned firms, but significant differences can be identified at the country level. For example, during the period, TNCs in Germany show a much larger presence as a centre to create value added than those in China, especially in complex GVC networks. At the same time, TNCs

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[8]　For example, see Xing (2020).

Figure 2. Supply centres of TiVA in various networks for the manufacturing sector, 2005 and 2016

2a. Traditional trade networks, domestically owned firms
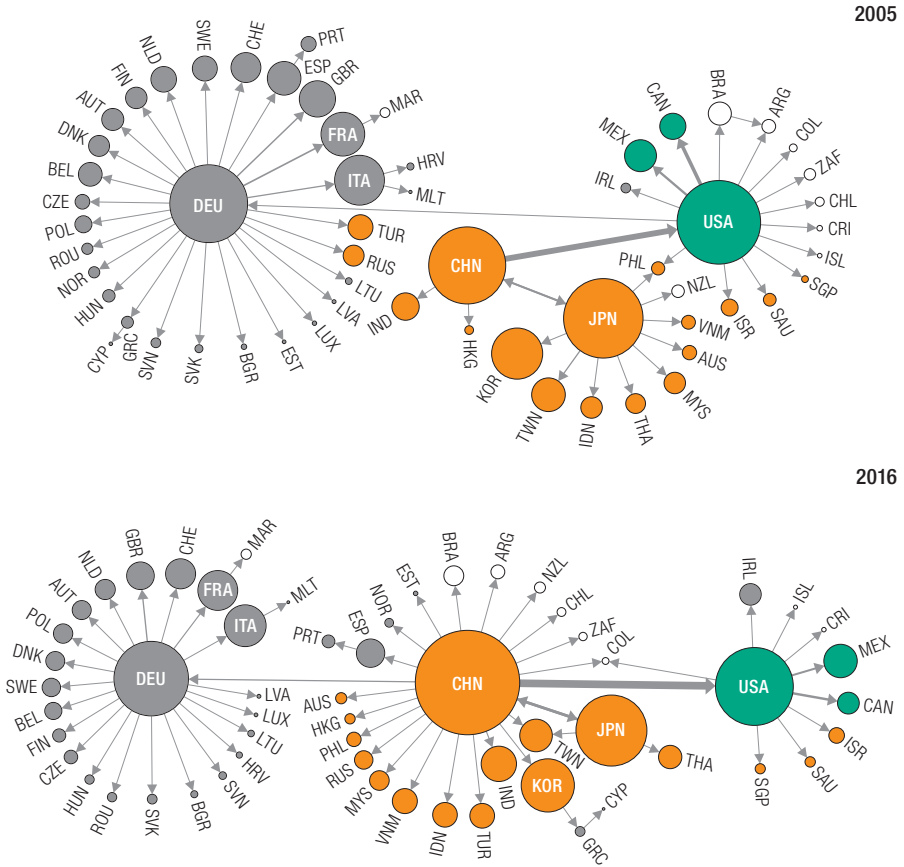
2005

2016

Figure 2. Supply centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

2a. Traditional trade networks, TNCs

2005

2016

Figure 2. Supply centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

2b. Simple GVC trade networks, domestically owned firms
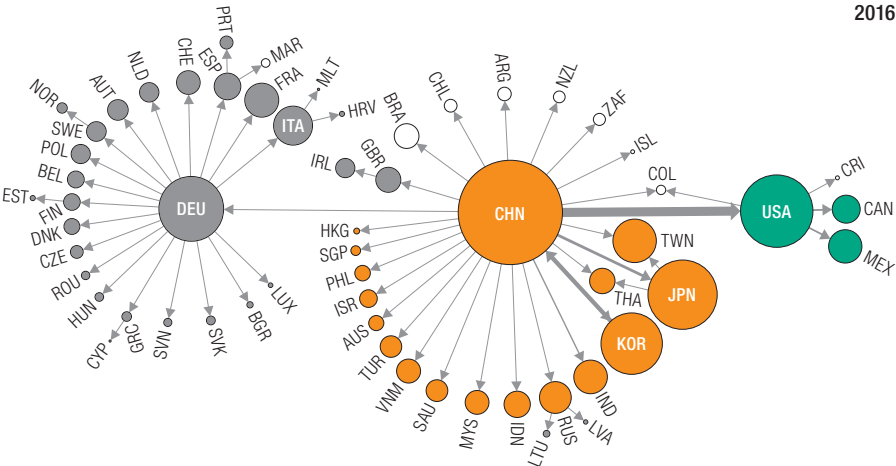
Figure 2. Supply centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

2b. Simple GVC trade networks, TNCs

2005

2016

Figure 2. Supply centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

2c. Complex GVC trade networks, domestically owned firms
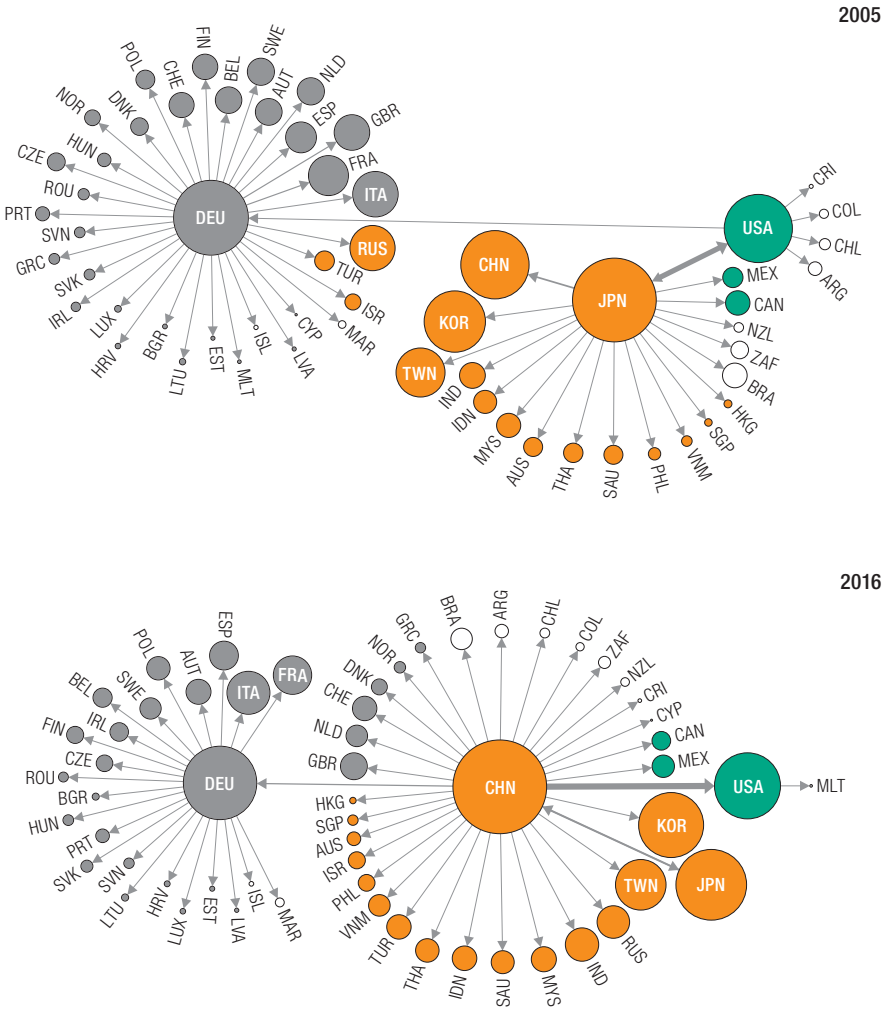
2005

2016

Figure 2. Supply centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Concluded)

2c. Complex GVC trade networks, TNCs
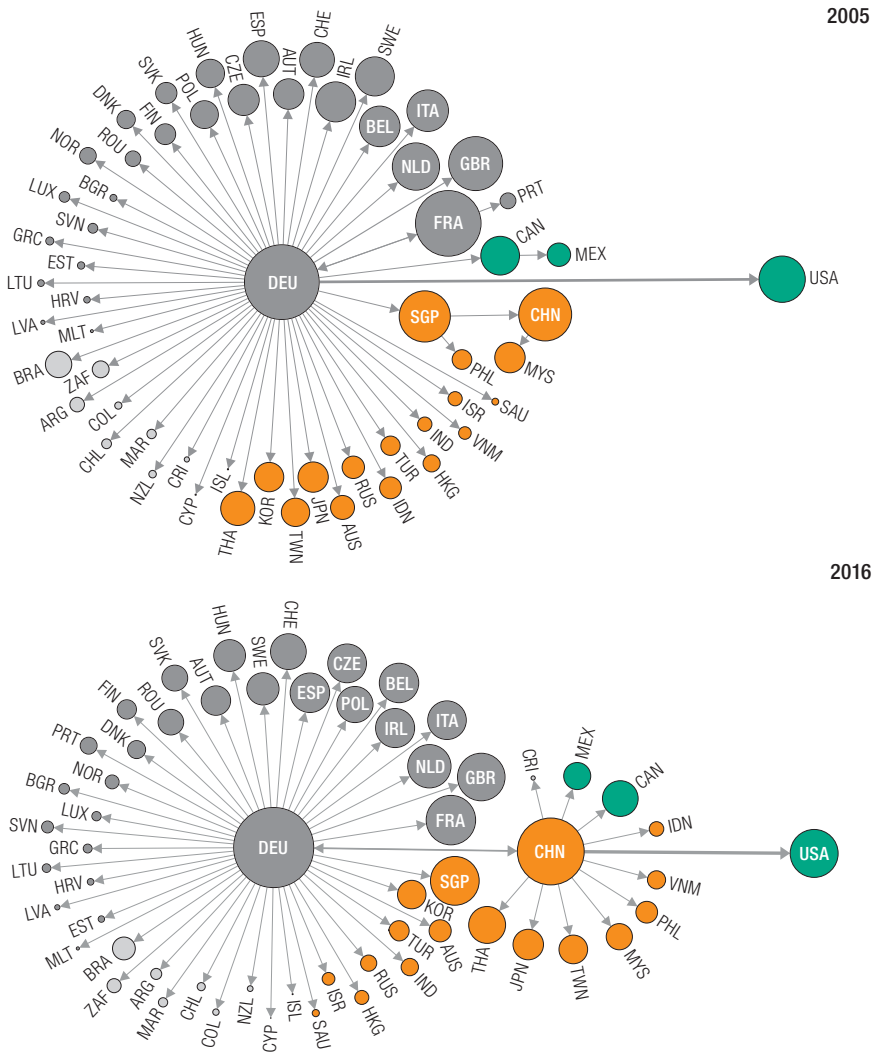
Source: Authors' estimations.

Note: A bubble's size represents the share of a country's value added exports or imports of the world total. The shares of value added flowing between two countries are represented by the thickness of the arrow. The point of the arrow shows the direction of the value added flow. Country and economy codes appear in the appendix.

located in the United States were isolated in both traditional and simple GVC trade, forming a region that included the economies of the USMCA and Singapore. In the complex value chain network involving TNCs, the United States was always on a relatively independent periphery, receiving supply through direct connections with Germany in 2005 and with China in 2016. It seems that TNCs have enhanced their FDI capacity in China and tend to provide more sophisticated intermediate goods through GVCs to serve more countries, most of them in Asia but also including Canada and Mexico, especially through complex trade.

From the demand side, the United States has been the global centre of the GVC network through final demand for manufacturing goods, in terms of both the various value chain channels and the distinction between domestically owned firms and TNCs (figure 3). In traditional trade (figure 3a) and simple value chain trade (figure 3b), Germany has been the regional demand centre in Europe. France and Italy lost their central positions in Europe, absorbed by Germany in 2005, but by 2016 had become surrounding countries that provide value added mainly to the United States. In complex value chain trade (figure 3c), however, Germany is linked to the United States as a separate economy and as of 2016 was no longer the centre of the regional value chain. In contrast to Germany, China has traditionally traded directly with the United States, providing value added to fulfil final demand in the United States for manufacturing goods.

A more significant change can be seen in the rapid rise of demand in China through simple value chains. In 2005, China absorbed value added from its neighbouring Asian countries, but by 2016, it had evolved into a global hub by attracting value chains from neighbouring Asian countries, some European countries, the United States and Latin American countries. It is for this reason that China's relative volume in simple value chain trade has approximated that of the United States in value added absorption. In complex value chains, the United States' long-time dominance as a global demand centre has enhanced its connection with China. These findings reflect the huge absorption power of the United States' final demand for manufacturing goods in GVCs and also imply that GVCs ending in the United States are much longer and more complex. At the same time, China not only functions as the world's factory, but has also become a regional demand centre, particularly through simple GVCs, given the growing strength of its final domestic demand.

Figure 3. Demand centres of TiVA in various networks for the manufacturing sector, 2005 and 2016

3a. Traditional trade networks, domestically owned firms

2005

2016

Figure 3. Demand centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

3a. Traditional trade networks, TNCs

2005

2016

Figure 3. Demand centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

3b. Simple GVC trade networks, domestically owned firms

2005

2016

Figure 3. Demand centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

3b. Simple GVC trade networks, TNCs

2005

2016

Figure 3. Demand centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Continued)

3c. Complex GVC trade networks, domestically owned firms

2005

2016

Figure 3. Demand centres of TiVA in various networks for the manufacturing sector, 2005 and 2016 (Concluded)

3c. Complex GVC trade networks, TNCs

Source: Authors' estimations.

Note: A bubble's size represents the share of a country's value added exports or imports of the world total. The shares of value added flowing between two countries are represented by the thickness of the arrow. The point of the arrow shows the direction of the value added flow. Country and economy codes appear in the appendix.

5.2 Centres of TiVA in GVC service networks by trading route and firm ownership

From the supply side, the service industry exhibits the characteristics of a dual centre involving the United States and Europe (figure 4). In the supply of services from TNCs, Europe occupies a very important position in GVCs. Whereas Germany has always been the European supply centre for services, the United Kingdom has also played a very important role through TNCs as a value added provider, whether in traditional trade (figure 4a), simple value chain trade (figure 4b) or complex value chain trade (figure 4c). In fact, the United Kingdom was the core of the value chain of global TNCs in 2005, and it was only in 2016 that Germany and the United States joined the United Kingdom to form a triumvirate of complex value chains in global services trade. TNCs in Singapore and Hong Kong (China) also play an important role in the entire Asian region through traditional trade and simple value chain trade. Domestically owned firms in the United States have always been an important source of supply for the three kinds of trade. The centre of supply for simple value chain trade in services for domestically owned firms in Asia gradually changed from Japan in 2005 to China in 2016.

In GVC services networks, China is in general better able to participate through links with the United States. Although in traditional and simple value chain trade, domestically owned Chinese firms have increasingly played the role of regional service trade supply centres, from the perspective of TNCs, China still needs to be globally connected through links with Hong Kong (China) or with the United States. In terms of complex value chain trade, in 2005, China's domestically owned firms still needed to pass through Japan to connect to the United States-centric GVC services network, whereas by 2016, China was more directly connected to the United States in participating in this network. However, TNCs in the services sector have no outstanding presence in China compared with TNCs in the manufacturing sector. This partly reflects the fact that market openness for services in China is still low.

Figure 4. Supply centres of TiVA in various networks for the services sector, 2005 and 2016

4a. Traditional trade networks, domestically owned firms
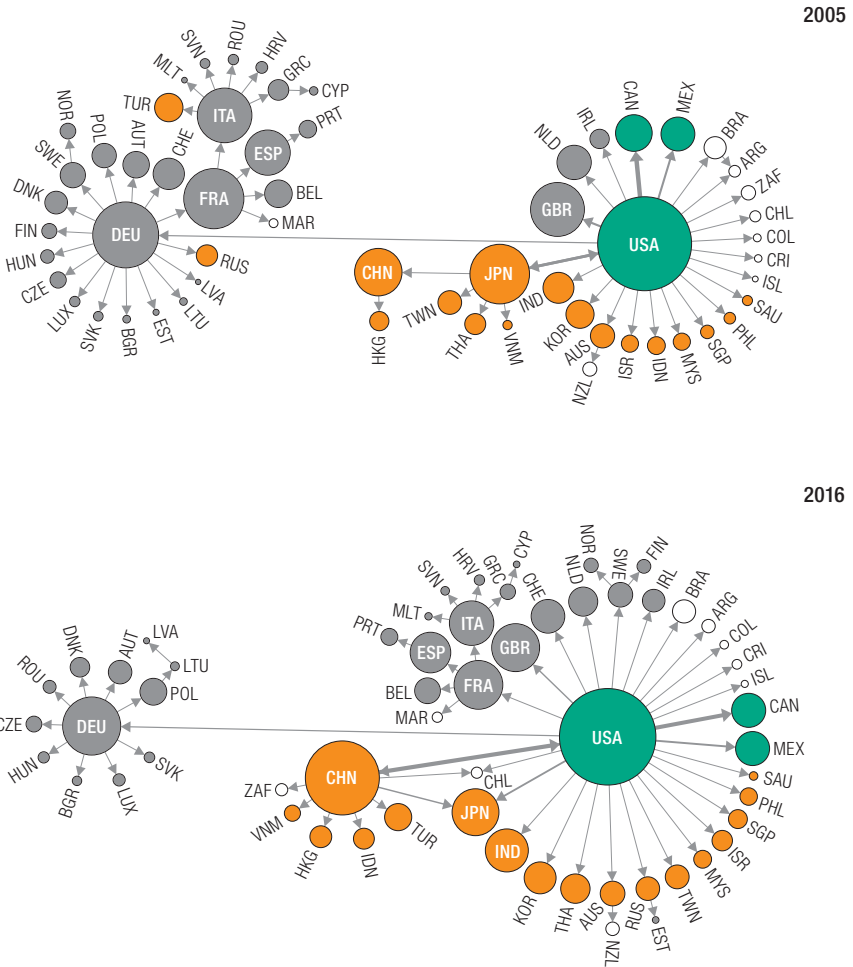
2005

2016

Figure 4. Supply centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)
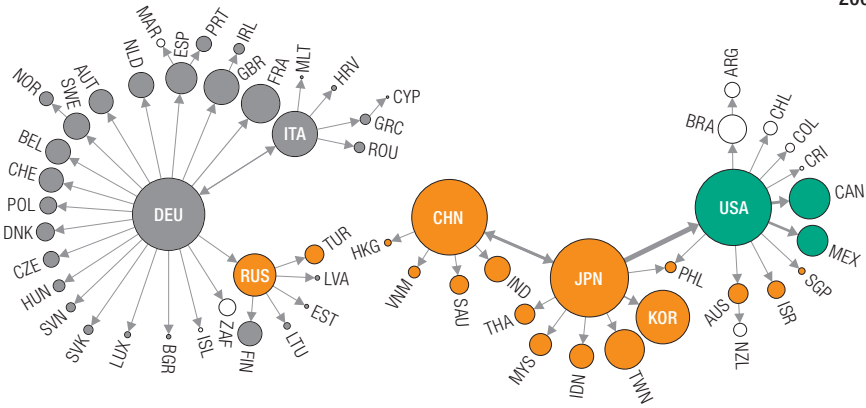
4a. Traditional trade networks, TNCs
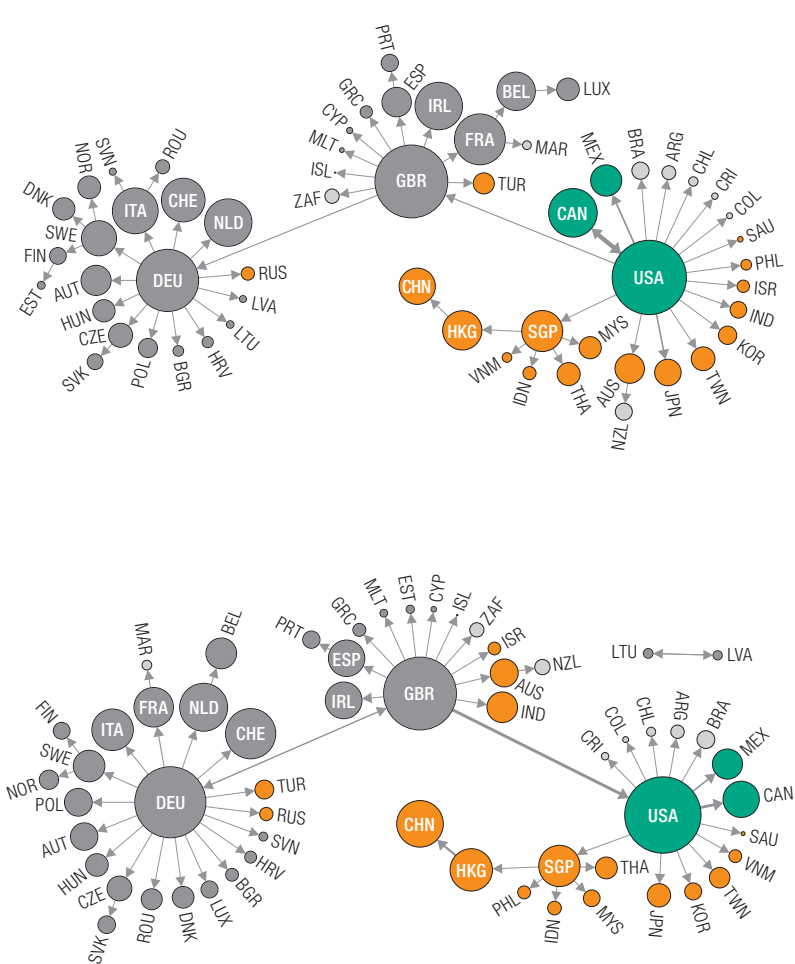
2005

2016

Figure 4. Supply centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)

4b. Simple GVC trade networks, domestically owned firms
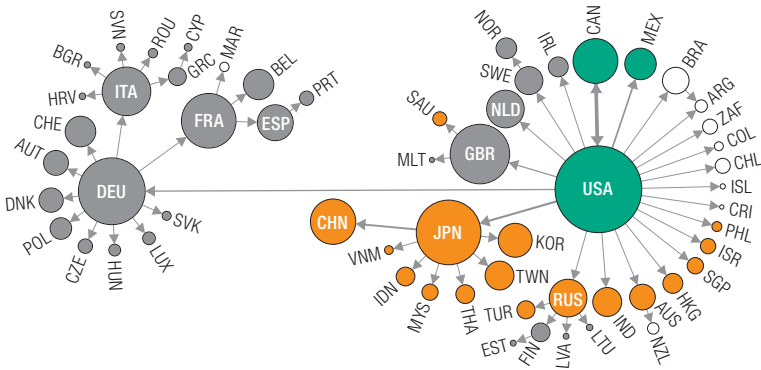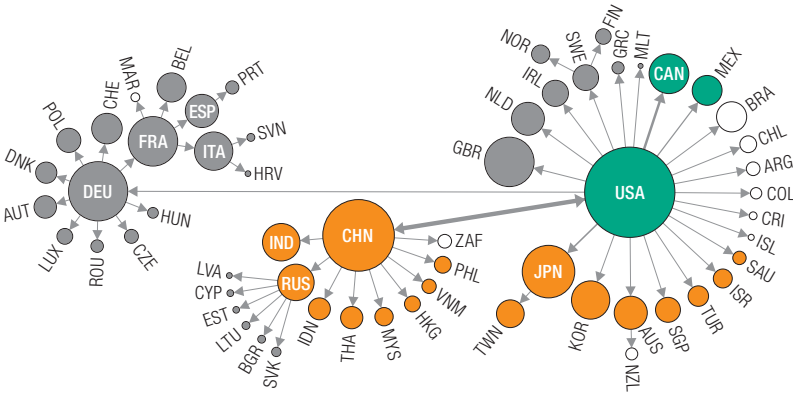
2005

2016

Figure 4. Supply centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)

4b. Simple GVC trade networks, TNCs
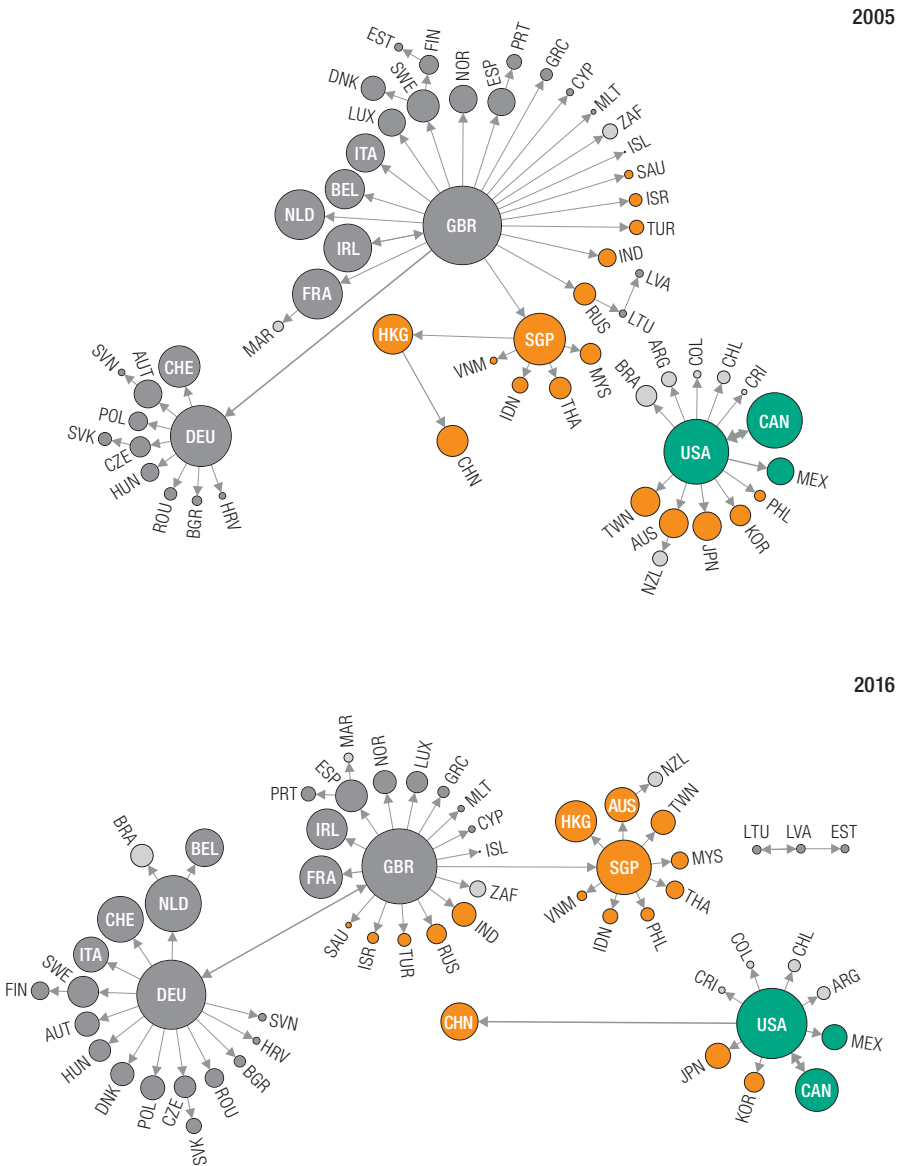
2005

2016

Figure 4. Supply centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)

4c. Complex GVC trade networks, domestically owned firms

Figure 4. Supply centres of TiVA in various networks for the services sector, 2005 and 2016 (Concluded)

4c. Complex GVC trade networks, TNCs

Source: Authors' estimations.

Note: A bubble's size represents the share of a country's value added exports or imports of the world total. The shares of value added flowing between two countries are represented by the thickness of the arrow. The point of the arrow shows the direction of the value added flow. Country and economy codes appear in the appendix.

Similar to the demand side of manufacturing, the United States has always been the core of GVCs for services (see figure 5). Other economies, including Germany and China, participate in the complex value chains of global trade in services through direct links with the United States, and both domestically owned firms and TNCs exhibit similar basic characteristics.

In traditional trade (figure 5a), the United States and Germany maintained their dominance as both global and regional demand centres, whereas domestically owned firms and TNCs in Switzerland and China matured and began to play a role in North Europe and Asia, respectively, as small demand centres. In the simple trade value chain (figure 5b), China by 2016 had attracted a large number of Asian regional economies to meet their services needs – including Japan, which was a demand sub-centre in 2005, directly connected with the United States. This is evident not only in China's domestic corporate value chains, but also in the services trade value chains of China-centric TNCs, reflecting China's growing importance in simple value chains trade in services. In complex value chain trade (figure 5c), in 2016 the United States' dominance as the global centre remained stable, while Germany had matured and functioned as the European centre, attracting the value added of more TNCs. Unlike the significant role of a regional centre played by TNCs in the United Kingdom from the supply side, the United Kingdom had no significant presence on the demand side and was merely attracted by the United States as a value added provider.

Figure 5. Demand centres of TiVA in various networks for the services sector, 2005 and 2016

5a. Traditional trade networks, domestically owned firms
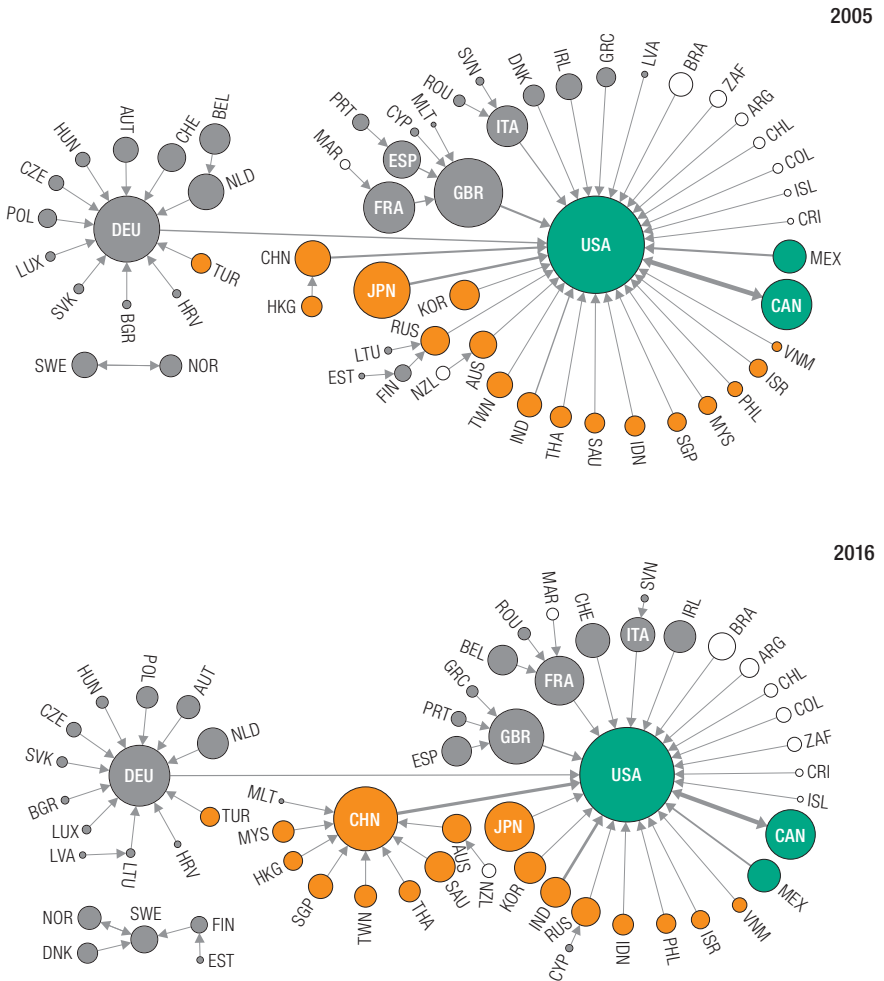
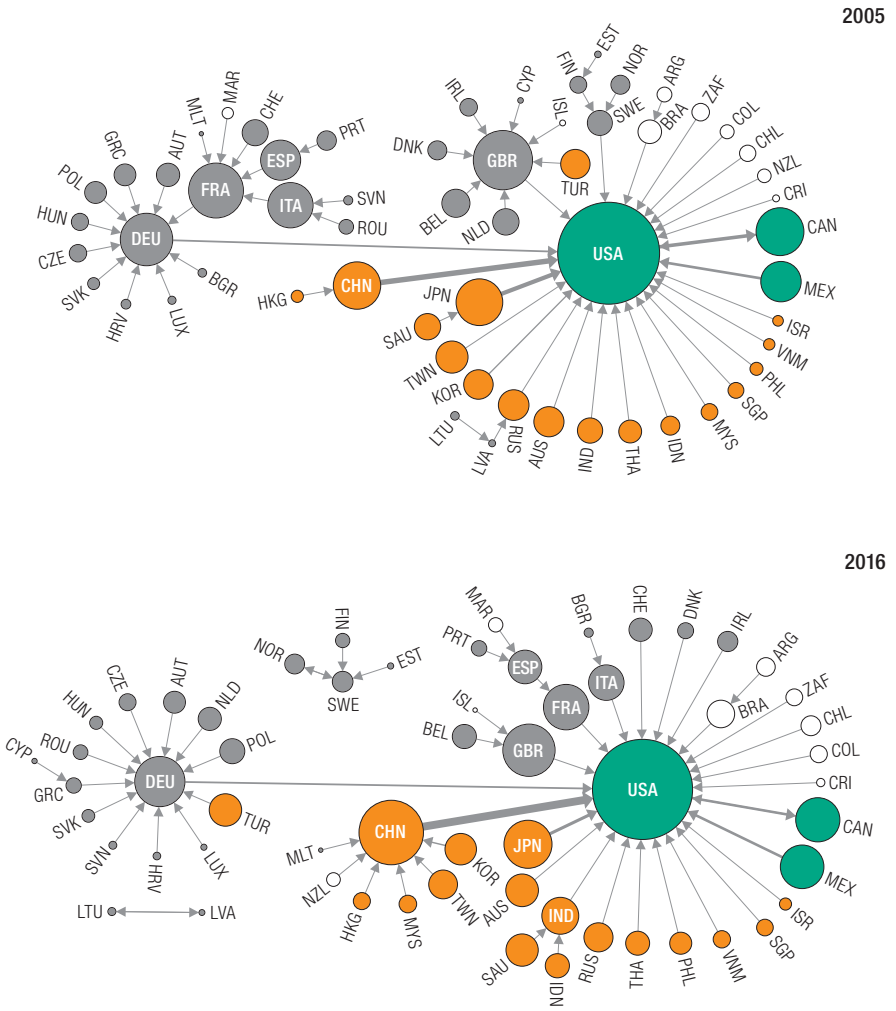2005

2016

Figure 5. Demand centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)

5a. Traditional trade networks, TNCs
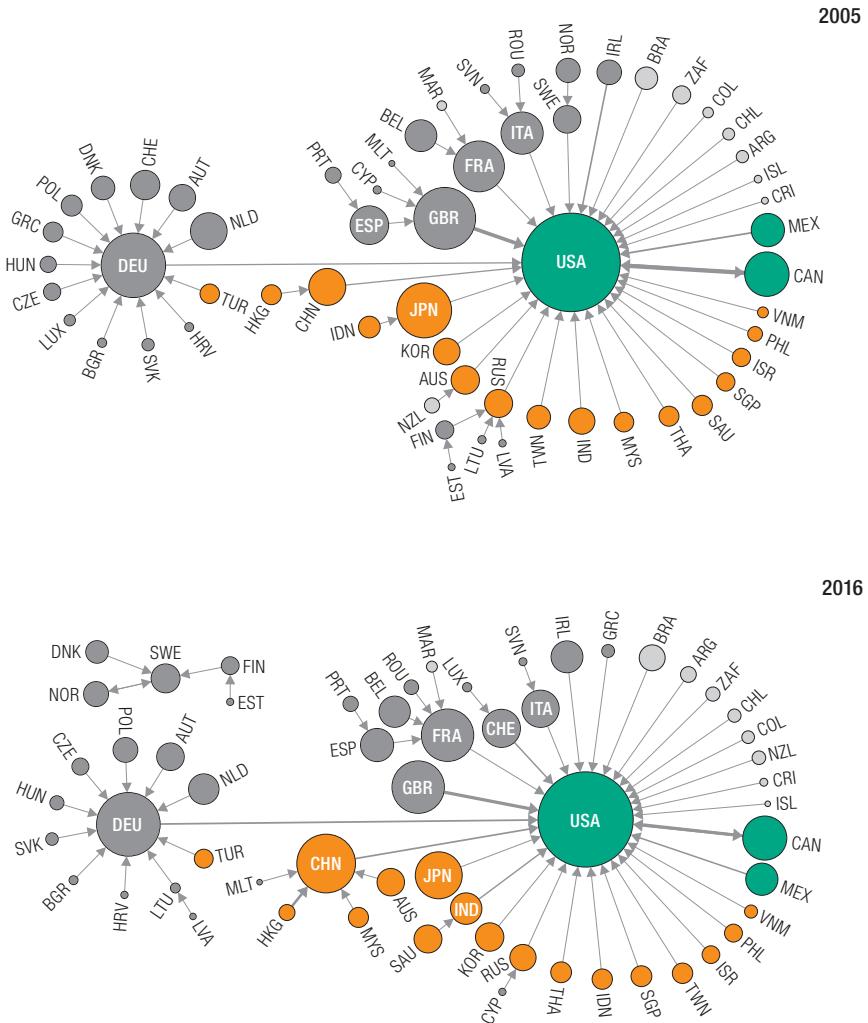
Figure 5. Demand centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)
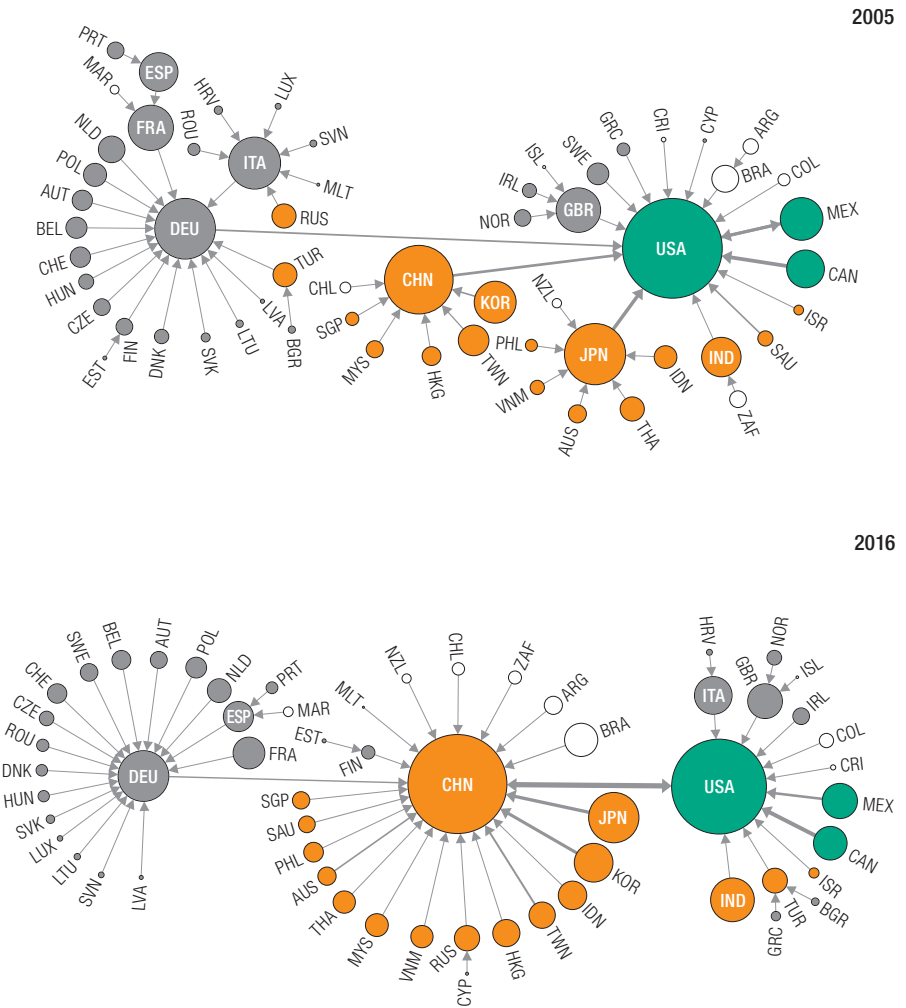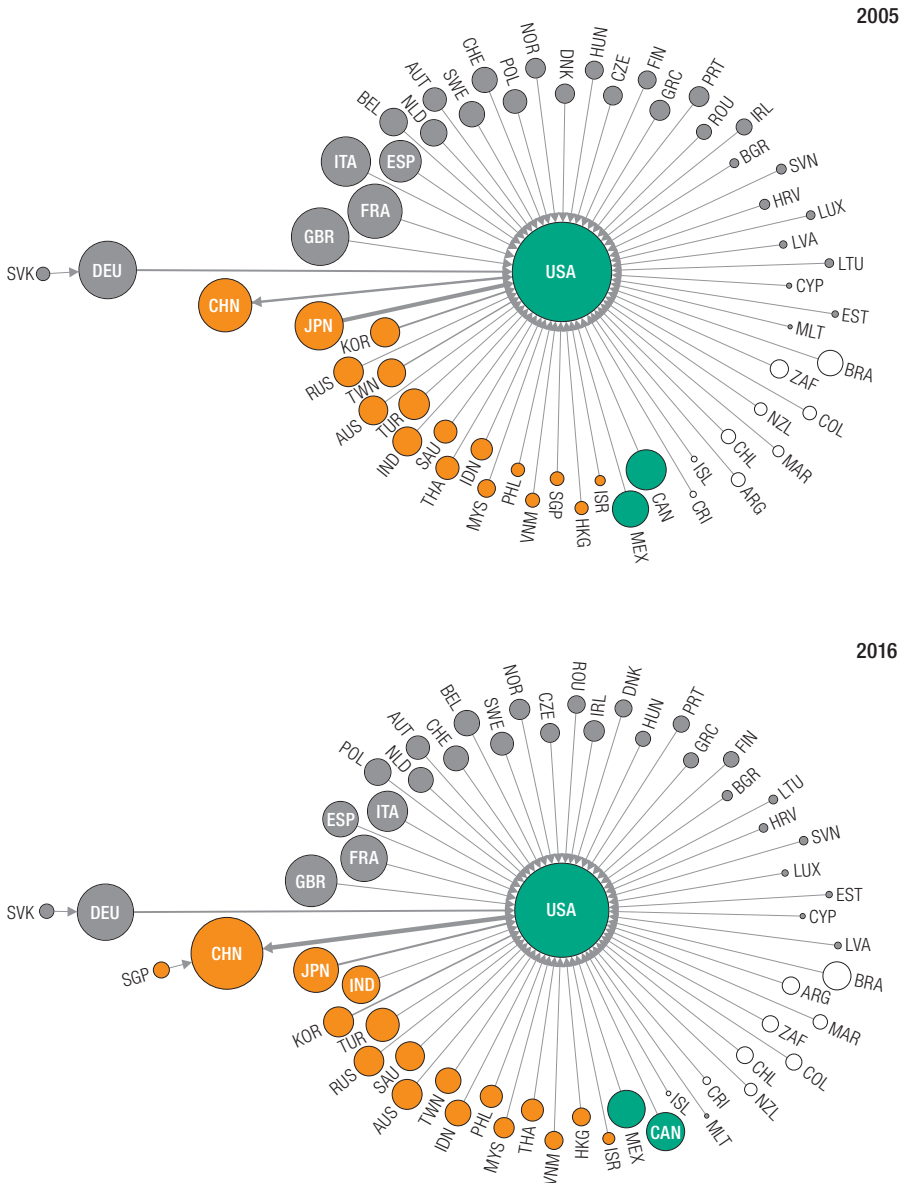
5b. Simple GVC trade networks, domestically owned firms

2005

2016

Figure 5. Demand centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)

5b. Simple GVC trade networks, TNCs
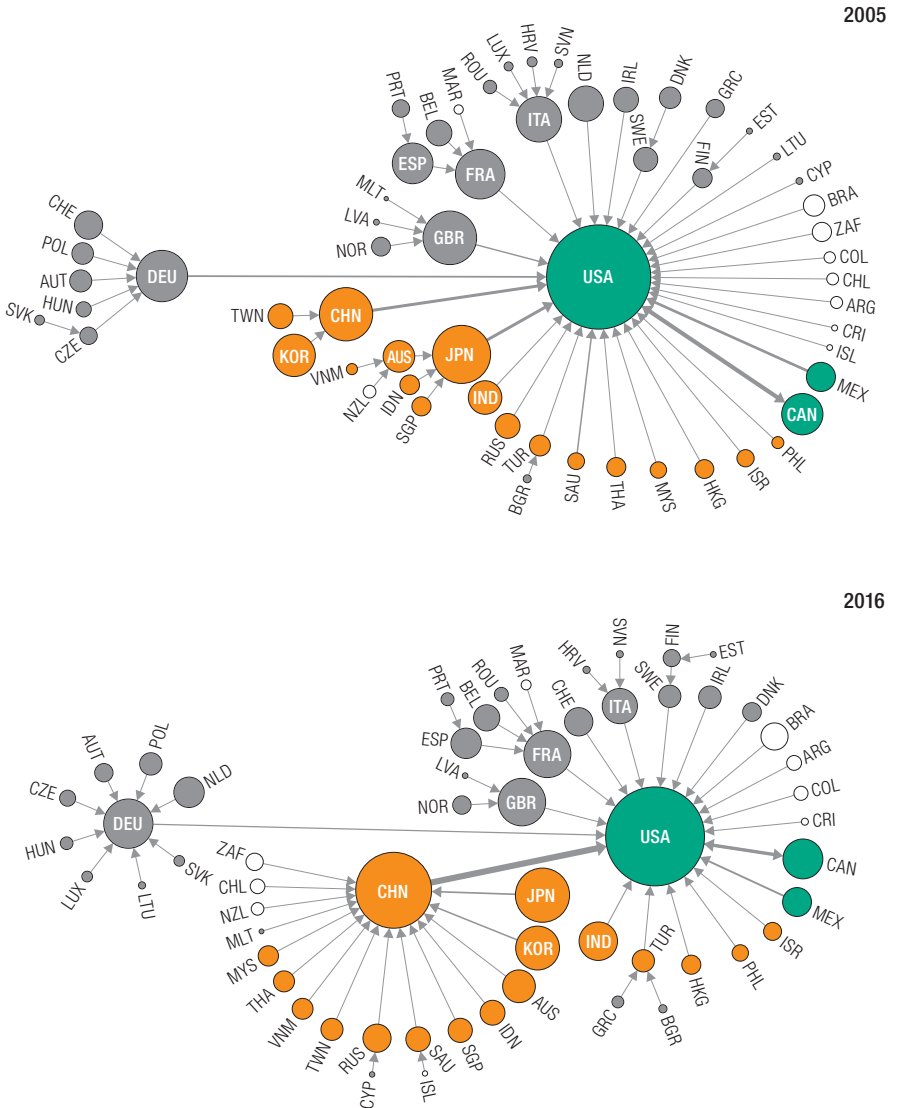
2005

2016

Figure 5. Demand centres of TiVA in various networks for the services sector, 2005 and 2016 (Continued)

5c. Complex GVC trade networks, domestically owned firms

2005

2016

Figure 5. Demand centres of TiVA in various networks for the services sector, 2005 and 2016 (Concluded)

5c. Complex GVC trade networks, TNCs
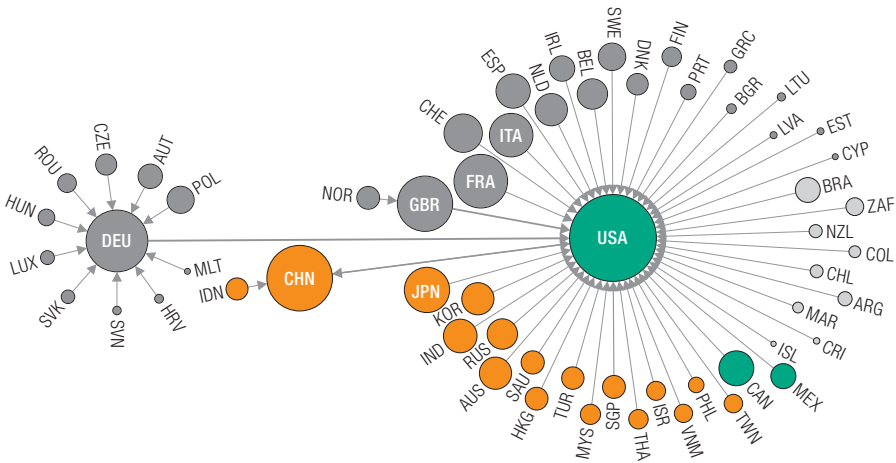
2005

2016

Source: Authors' estimations.

Note: A bubble's size represents the share of a country's value added exports or imports of the world total. The shares of value added flowing between two countries are represented by the thickness of the arrow. The point of the arrow shows the direction of the value added flow. Country and economy codes appear in the appendix.

6. Conclusions and policy considerations

Using intercountry input–output tables that distinguish between domestically owned firms and TNCs, this paper depicts the network centre characteristics and interrelationships of countries in GVCs through traditional trade, simple value chain trade and complex value chain trade. Our empirical results contribute to a better understanding of some important puzzles widely considered in research on both TNC and IB policy, such as what GVCs look like, whether GVCs are more regional or global, which country dominates which type of GVC, and whether or not TNCs organize GVCs with different or similar patterns regarding domestically owned or foreign-owned firms. We provided a more detailed, nuanced and insightful way to consider GVCs, further empowering both businesses and policymakers. Our general conclusion is that GVCs are more likely to be organized regionally and dominated by large countries; more interestingly, different types of firm ownership exhibit different types of presence, which vary by perspective (supply side or demand side), sector (manufacturing or services) and the type of network adopted.

Compared with the literature on GVC topology, we find that the polycentricity of supply through channels and the demand through networks of traditional and simple value chain trade are supported by three regional centres, namely, the United States, Europe (especially Germany) and China – the most important centres during the period studied. Monocentric demand through complex GVC networks is still dominated by the United States. We also found that the characteristics of GVC networks of TNCs and of domestically owned firms are quite different. Several European countries, which were originally overshadowed by aggregate measures, e.g. the United Kingdom, show particular importance in transnational trade in GVCs, especially in complex value chains that cross borders several times. This is also related to the practice of TNCs placing a large number of financial services into centres such as the United Kingdom. A third finding, in terms of distribution of the three value chain networks, is that China has occupied a very important position in manufacturing GVCs. In the simple value chain trade of the services sector, China has also become a core of East Asia's services sector trade, from both the supply and the demand side. This is also related to the high demand for productive services associated with China's role as a manufacturing hub. These findings redefine and extend scholarly understandings of the role of TNCs and their ownership in GVCs, as depicted in both the TNC and IB literature. They also affect policy decisions related to developments in GVC hubs and participation in the future.

This paper also sets the scene for making various assumptions about how locational decisions of TNCs are affected by these patterns. TNCs typically oversee their value chains directly (direct suppliers and buyers), yet our analysis

makes GVC participation visible across networks and with all indirect participants and their interdependencies. This also paves the way for better analyses of country-level relations, as we focused on the United States–China relationship for illustration. This links to contributions that further the important research on the impact on degrees of openness, participation and position of a country or region in GVCs (Maliszewska et al., 2020; Sforza and Steininger, 2020). This is particularly relevant as the COVID-19 pandemic, a concurrent recurring exogenous shock to GVCs, has triggered certain GVC reconfigurations both during the pandemic and in the post-pandemic world. These effects have been documented in qualitative TNC and IB research since early 2020 and include strategic supply chain diversification (Gereffi, 2020), reshoring and regionalization (Elia et al., 2021), greater localization of production of essential supplies, and the consideration of realignment and reduction in "irreversible" investments abroad as part of GVCs (UNCTAD, 2021; Verbeke, 2020). Furthermore, based on our empirical results on the evolution of GVC topology, we could argue that, in the short run, the rising importance of TNCs in GVC will greatly increase the complexity of the current governance of international economics as the regulatory system has to expand from "on the border" to "beyond the border". In the medium and long run, however, it would be wise for global policymakers to establish a broader system of bilateral and multilateral investment treaties as well as to advance to deeper international regulatory cooperation. This will reduce the cost of TNCs' activities while also encouraging them to take more comprehensive social responsibility throughout GVCs when they receive the dividend. By then, GVC studies that can clearly trace value creation through the international division of labour, such as the research in this paper, will become powerful tools for global policymaking.

We suggest that future research use these new tools for analyses and the findings we present in this paper to complement research related to TNCs, IB and policy on the role of TNCs in GVCs, extending to further developments in the theorization of GVC locational fragmentation and governance. As this study was limited to the most recent data available in the database, i.e., to 2016, we urge future and further research into GVCs to continue testing our findings as new data becomes available. Differentiating domestically owned firms from domestically owned TNCs and those firms that cannot be classified as TNCs will also become relevant to TNC research. Finally, it is also necessary to conduct econometric analyses (using gravity models with consideration for trading route and firm type) of the determinants of GVC topology shown in our empirical results. We believe that more unique reasons might arise concerning TNCs' GVC governance and market strategies (e.g. transfer price, profit transfer, intellectual property protection) adopted in different countries or industries. This should take us well beyond conventional thinking on determinants (e.g. size of economy, distance, tariff and nontariff barriers) of trade and investment facilitation issues.

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Appendix. Country or economy code

Serial number	OECD code	OECD countries	Serial number	Non-OECD code	Non-OECD economies
1	AUS	Australia	37	ARG	Argentina
2	AUT	Austria	38	BRA	Brazil
3	BEL	Belgium	39	BGR	Bulgaria
4	CAN	Canada	40	CHN	China
5	CHL	Chile	41	COL	Colombia
6	CZE	Czechia	42	CRI	Costa Rica
7	DNK	Denmark	43	HRV	Croatia
8	EST	Estonia	44	CYP	Cyprus
9	FIN	Finland	45	IND	India
10	FRA	France	46	IDN	Indonesia
11	DEU	Germany	47	HKG	Hong Kong (China)
12	GRC	Greece	48	MYS	Malaysia
13	HUN	Hungary	49	MLT	Malta
14	ISL	Iceland	50	MAR	Morocco
15	IRL	Ireland	51	PHL	Philippines
16	ISR	Israel	52	ROU	Romania
17	ITA	Italy	53	RUS	Russian Federation
18	JPN	Japan	54	SAU	Saudi Arabia
19	KOR	Korea, Republic of	55	SGP	Singapore
20	LVA	Latvia	56	ZAF	South Africa
21	LTU	Lithuania	57	TWN	Taiwan Province of China
22	LUX	Luxembourg	58	THA	Thailand
23	MEX	Mexico	59	VNM	Viet Nam
24	NLD	Netherlands	60	ROW	Rest of the world
25	NZL	New Zealand			
26	NOR	Norway			
27	POL	Poland			
28	PRT	Portugal			
29	SVK	Slovakia			
30	SVN	Slovenia			
31	ESP	Spain			
32	SWE	Sweden			
33	CHE	Switzerland			
34	TUR	Türkiye			
35	GBR	United Kingdom			
36	USA	United States			

Source: OECD, Analytical AMNE database (www.oecd.org/sti/ind/amne.htm).

Challenges at the intersection between investment provisions in regional trade agreements and implementation of the GloBE Rules under Pillar Two*

Ruth Wamuyu,[a] Belisa Ferreira Liotti[a] and Jeffrey Owens[b]

Abstract

A number of regional trade agreements (RTAs) include investment protection provisions that may limit a country's ability to change tax measures. This limitation could raise concerns for States as regards the recently agreed global minimum tax under the Global Anti-Base Erosion (GloBE) Rules, as its implementation could amount to a breach of investment obligations. Therefore, this paper analyses how the GloBE Rules and their impact on investment incentives interact with investment provisions in RTAs, also considering the impact of the minimum tax on regional integration efforts and the potential for a regional approach to its implementation.

1. Introduction

From an economic standpoint, investment protection is argued to increase foreign direct investment (FDI) by providing certainty to investors and lessening the risks they face.[1] This argument served as a catalyst for the adoption of international investment agreements (IIAs) that provide rights and protections to investors.[2] Initially countries entered into bilateral agreements between two States, but it has now become the trend to incorporate investment protection rules within regional trade agreements (RTAs) (Lesher and Miroudot, 2007). This shift was largely influenced by the revolution in information and communication technology that transformed the nature of trade by making it "cheaper, easier and faster to coordinate activities from a distance" (Baldwin, 2011).

During this shift, new risks arose for investors, including technical, intellectual property and managerial risks, and it became apparent to policymakers that real economic integration could not be achieved without including investment provisions to alleviate these risks (UNCTAD, 2006). Trade laws at the time, developed for simpler trade concerns, were not sufficient, resulting in a governance gap that was filled by the signing of more in-depth RTAs that tackled complex issues that could not be addressed at a multilateral level, including investment protections. The large jurisdictional protection of investment, additional coverage of issues such as intellectual property, and instances of both pre-entry and post-entry investment protections, make RTAs unique.

Although investment protection provisions are important,[3] other big drivers of FDI are political stability, infrastructure, market and economic potentials, and natural resources (UNCTAD, 2022a). Though not the major factor in investment decisions, the availability of tax relief and other fiscal policies in a jurisdiction are seen as influencing investors, who are more likely to select a location that offer more beneficial incentives, other things being equal (Owens and Zhan, 2018). This has led countries to engage in tax competition to attract and retain investments, competition that is not only characterized by a reduction in corporate tax rates but has also produced a greater reliance on investment incentives (UNCTAD, 2022a).

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[1] Laura Puccio, "Investment rules in trade agreements: Developments and issues in light of the TTIP debate", European Parliamentary Research Service, 22 September 2015, https://epthinktank.eu.

[2] IIAs are divided into two types: bilateral investment treaties and treaties with investment provisions. UNCTAD, "International Investment Agreements Navigator", Investment Policy Hub, https://investmentpolicy.unctad.org/international-investment-agreements/ (accessed 1 February 2023).

[3] Although the actual impact of IIAs on FDI has more recently been a subject of intense debate among policymakers, with studies varying in their conclusions, there is a general consensus that IIAs form part of a broader policy framework for investment that affects investment decisions (UNCTAD, 2009). For a review of the evidence of social benefits and costs of IIAs, see Pohl (2018).

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However, tax incentives have had minimal impact on FDI flows and decisions on investment locations, rendering this tax competition detrimental to countries' economies as it prevents them from raising significant tax revenues (OECD, 1998). Thus, the international tax arena has long been trying to constrain States' (harmful) tax competition for investment.

In a recent attempt, the international community – through the OECD Inclusive Framework (IF) on Base Erosion and Profit Shifting (BEPS) – has agreed to a minimum effective tax rate (ETR) of 15 per cent on corporate profits. This is the Global Anti-Base Erosion (GloBE) Rules under the Pillar Two solution. Such minimum tax is expected to limit the use of tax incentives to attract investment by putting a floor on tax competition (Liotti et al., 2022; UNCTAD, 2022a). Nevertheless, investment obligations under RTAs may act as barriers to the implementation of the minimum tax as they could protect investors from changes in the domestic law of jurisdictions to adapt to the post-GloBE reality, especially if RTA signatories choose to revoke the tax incentives they offer to investors from other RTA members.

The aim of this paper is to analyse whether the implementation of the GloBE Rules or changes to domestic tax incentive regimes could amount to a breach of RTAs' investment protections. In addition, the paper considers the impact of the global minimum tax on regional integration efforts and the potential for a regional approach to its implementation. The analysis is limited to only five RTAs: the North American Free Trade Agreement (NAFTA), the Agreement between the United States, Mexico and Canada (USMCA), the Southern Common Market Agreement (MERCOSUR), the Association of Southeast Asian Nations Free Trade Area (ASEAN) and the Common Market for Eastern and Southern Africa (COMESA).[4]

Sections 2 and 3 describe the relevant investment provisions within RTAs and provide a summary of the GloBE Rules. Section 4 considers the relationship between investment provisions and measures to implement GloBE Rules, analysing whether the changes in domestic law required to adapt to them can breach RTAs' investment protections based on previous tribunal awards. Section 5 discusses the implications of these challenges for the future of regional integration efforts and proposes a regional approach to implementing the GloBE Rules.

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[4] As these RTAs not only cover a large part of the world, but are used as a basis for other IIAs. However, other IIAs may similarly have provisions that limit a country's ability to implement GloBE. Thus, the paper intends to serve as a basis for further research into IIAs to determine whether a review of these agreements will be necessary.

2. Investment provisions in RTAs

2.1 Scope

The approach and depth of investment provisions varies across RTAs, driven by the policy objectives of each agreement.[5] For the purposes of this paper, four provisions are analysed: non-discrimination clauses, fair and equitable treatment (FET) requirements, expropriation clauses and investor–State dispute settlement (ISDS) clauses.

2.1.1 Non-discrimination clauses

Non-discrimination provisions prevent a host country from treating foreign investors less favourably than national investors (national treatment, or NT) or treating foreign investors from one State more favourably than foreign investors from another (most favoured nation treatment, or MFN) (Diebold, 2011). These obligations apply with regard to the post-entry, and in some instances the pre-entry, treatment of investors (UNCTAD, 1999a). They are intended to ensure the same competitive conditions in the host State for foreign and domestic investors (NT) and between two foreign investors (MFN). Consequently, member States are restricted from unduly favouring domestic investors under NT or specific foreign investors under MFN (UNCTAD, 1999a and 1999b). The obligations apply only to investors or investments in "similar" or "like" circumstances.[6] All RTAs under review provide for the application of and exceptions to NT and MFN obligations.[7]

2.1.2 Fair and equitable treatment

Broadly, the analysis of whether a particular State's action has violated the FET provision includes assessing whether the certainty, stability and predictability of the legal framework and the legitimate expectations of foreign investors have been breached (Ranjan, 2022). The FET clause has been criticised for its ambiguous wording, which has led to a broad interpretation by arbitral tribunals (UNCTAD, 2021). On one hand, FET is considered to provide protection similar to that afforded under customary international law; on the other, it is considered to set a higher standard than the international minimum (UNCTAD, 2006). This divergence in approaches has made it challenging to balance foreign investment protection and the sovereign right to regulate matters of public interest (UNCTAD, 2012).

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[5] For an analysis of the structure and content of RTA investment provisions, see UNCTAD (2006).

[6] For an analysis of the approaches taken by tribunals in defining likeness, see UNCTAD (2005). The USMCA includes additional provisions that clarify what tribunals should consider when determining "likeness" (article 14.4(4)).

[7] For a deeper analysis of the exclusionary lists adopted in different agreements, see UNCTAD (2006).

Three of the RTAs – ASEAN (article 11), USMCA (article 14.6) and COMESA (articles 14–15) – provide clarifications that limit the FET requirement to the international minimum standards. NAFTA adopted an open-ended approach to FET, leading to several disputes in ISDS. Though NAFTA has been replaced by the USMCA, new NAFTA claims may be filed before 1 July 2023 in relation to disputes that arise out of investments made while NAFTA was in force and which existed on 1 July 2020.[8]

2.1.3 Expropriation

Generally, expropriation provisions prevent direct and indirect expropriation, the latter including "regulatory takings, creeping exportation and acts that are 'tantamount to' or 'equivalent to' expropriation" (UNCTAD, 2021, p. 30). By its very nature, taxation may be seen as a form of indirect expropriation. This must be determined case by case, ensuring that reasonable government action, such as new or modified tax regimes, can be achieved without claims for compensation because of adverse effects (UNCTAD, 2021, p. 37).

NAFTA (article 1110) provides for direct and indirect expropriation, or a measure tantamount to nationalization or expropriation. However, the USMCA offers more clarity on the factors to be considered when determining whether there has been indirect expropriation.[9] MERCOSUR only provides for direct expropriation where "investment is directly expropriated through the formal transfer of the title or the right of ownership" (article 6). COMESA provides for expropriation or measures tantamount to expropriation and also includes an exception for regulatory measures taken by countries to "protect or enhance legitimate public welfare objectives, such as public health, safety and the environment" (article 21). ASEAN (article 14) provides for direct expropriation or measures equivalent to expropriation.

2.1.4 Investor–State dispute settlement

ASEAN (section B), COMESA (article 28), NAFTA (section B, chapter 11) and USMCA (annex 14-D) all provide for ISDS. However, ISDS under the USMCA is available only between the United States and Mexico.

The future of ISDS remains a topic of debate as countries consider how best to balance the need for increased integration and the flexibility of countries to adopt domestic regulations that may be limited as a result of the lock-in effect of investment

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[8] Debevoise & Plimpton LLP, "From NAFTA to USMCA: Main changes to the investor–State dispute settlement system", *Debevoise Update*, 7 May 2020.

[9] It considers several factors, including the economic impact of the government actions, the extent to which they interfere with distinct, reasonable investment-backed expectations and the character of the action (annex 14-B, chapter 14).

protections (UNCTAD, 2006). This has led recently to RTAs eliminating ISDS as a whole, though State–State disputes remain, or introducing new provisions to clarify the obligations in the agreement.[10]

2.2 Treatment of tax under RTA investment provisions

An important feature of taxation is that "it is based on the domestic legislative process, which is an expression of national sovereignty" (UNCTAD, 2000, p. 7). This heightens the sensitivity of the discipline and explains the limited inclusion of taxation matters into RTAs. Moreover, dialogue between the investment and tax communities has traditionally been limited.

Therefore, RTAs usually include a general tax carve-out excluding tax matters from the ambit of the agreement. There are also more specific exclusions of the preferential treatment afforded under double taxation treaties (DTTs) from the application of the MFN and NT obligations (UNCTAD, 2000). Moreover, an exclusion may also be provided if a tax measure is adopted to ensure an equitable or effective imposition or collection of taxes. Thus, in principle, the provisions of RTAs do not protect investors in the event of any change in the host State's tax system. However, in some cases, a claw-back in the carve-out is included to restore the application of certain protections in relation to tax measures.

The MERCOSUR Investment Protocol (article 5(6)) excludes preferential treatment afforded under DTTs from the application of non-discrimination provisions. It also states that nothing in the protocol shall be "construed in a manner that prevents the adoption or execution of any measure aimed at guaranteeing the *equitable or effective imposition or collection of taxes* in accordance with the provisions of the legislation of the state parties" (article 10 [emphasis added]). COMESA similarly excludes preferential treatment afforded under DTTs from the application of MFN (article 19), while also providing for a general exclusion of RTA protection for taxation matters, except in regard to the expropriation clause (article 23).

ASEAN (article 3(4)) has a carve-out for taxation matters, except for provisions on transfers and expropriation. DTTs are also given priority over the agreement (article 3(6)). Similar to MERCOSUR, a general exception is also provided to ensure that the agreement shall not prevent the adoption of measures "aimed at ensuring *equitable or effective imposition or collection of direct taxes* in respect of investment or investors of any member state" (article 17(1)(d) [emphasis added]). The disputing member State and the investor's State, also a member State, must determine whether a

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[10] The MERCOSUR Investment Protocol does not provide for ISDS, and the USMCA seeks to clarify a number of provisions that have been disputed under NAFTA.

challenged measure is a taxation measure and, in the case of expropriation, whether a tax measure has an effect equivalent to expropriation (article 36(6–7)).

NAFTA excludes preferential treatment under DTTs (article 2103). However, MFN and NT are extended to "all taxation measures, *other than those on income, capital gains or on the taxable capital of corporations*, taxes on estates, inheritances, gifts and generation-skipping transfers" (article 2103(4)(b) [emphasis added]). Moreover, MFN and NT do not apply where the aim of the taxation measure was to ensure "*equitable and effective imposition or collection of taxes* and … does not arbitrarily discriminate between persons, goods or services of the parties, or arbitrarily nullify or impair benefits accorded under those Articles" (article 2103(4)(g) [emphasis added]). NAFTA also provides for a claw-back for the expropriation provision in relation to taxation, but an investor cannot institute a dispute under ISDS if the measure has been determined not to be expropriation by the appropriate competent authorities (article 2103(6), unless such decision is not given within six months.

The USMCA (article 32.3) generally adopts a similar approach to DTTs as NAFTA did, while providing further guidance on treatment of inconsistencies between the agreement and the DTT (article 32.3(3)). It also includes similar provisions on the application of and exclusions to the NT and MFN clauses (article 32.3(6)(b)). Additional exclusion is provided where a taxation measure is aimed at ensuring the "equitable or effective imposition or collection of taxes, *including a taxation measure that differentiates between parties based on their place of residence for tax purposes*, provided that the taxation measure does not arbitrarily discriminate between persons, goods or services of the parties" (article 32.3(6)(h)[emphasis added]). Furthermore, the principle of exhaustion of location remedies is introduced, requiring an investor to have obtained a final decision from a court of last resort in the host State before submitting a claim to arbitration (article 14.4.5). However, this requirement is excluded for certain industries that fall under annex 14-E. Importantly, the ISDS process is limited to the United States and Mexico, where no ISDS claim can be brought by a United States or Mexican investor against Canada. Member States may also include a regime of tax incentives for investors (UNCTAD, 2000). Although none of the agreements reviewed have such regimes, it is important for policymakers to review their IIAs to identify such obligations, as they may have an impact on the implementation of the GloBE Rules.

Despite these robust exclusions, tax-related measures have been disputed under ISDS.[11] This is generally credited to broad language and lack of sufficient clarity in drafting (Uribe and Montes, 2019). Hence, RTAs' carve-outs have not prevented the institution of tax-related disputes.

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[11] See annex 3 in UNCTAD (2022c).

3. International tax reform under BEPS 2.0

3.1 The GloBE Rules under Pillar Two

On 20 December 2021, the IF released the GloBE Model Rules (OECD, 2021) to ensure that large MNEs pay a minimum effective tax rate of 15 per cent on income arising in each of the jurisdictions in which they operate, through the application of a top-up tax. The global minimum tax is implemented through three domestic rules:

(i) the **income inclusion rule** (IIR), requiring that the ultimate parent entity (UPE) or an intermediate parent entity of an MNE group pay top-up tax on its share of the income of any low-taxed constituent entity (LTCE)

(ii) the **undertaxed payments rule** (UTPR), serving as a backstop to the IIR, providing a mechanism for making an adjustment of the top-up tax in relation to profits of a LTCE that is not in the scope of an applicable IIR

(iii) the **qualified domestic minimum top-up tax** (QDMTT),[12] allowing the low-tax jurisdiction to charge the top-up tax itself. Such a tax may reduce the top-up tax by the UPE jurisdiction to nil, as GloBE Rules give priority to the application of the QDMTT over the IIR (OECD, 2022a, article 5.2.3, para. 20)

The GloBE Rules are intended to apply to LTCEs of MNE groups that meet a €750 million threshold in the consolidated financial statements of the UPE in at least two of the four preceding fiscal years.[13] There are certain exclusions from the top-up tax application, which depend on the entities' activity and types of income.

For in-scope MNE groups, the top-up tax liability will have to be calculated for each jurisdiction where its constituent entities are located that has an ETR below 15 per cent. The jurisdiction's ETR is calculated through the following formula:

$$ETR = \text{Adjusted Covered Taxes}[14]/\text{Net GloBE Income}[15]$$

If the ETR is below 15 per cent, the jurisdiction is a "low-tax jurisdiction" and a top-up tax percentage has to be calculated, being the difference between the minimum rate and the ETR calculated for that jurisdiction (OECD, 2021, article 5.2.1.). The top-up tax will then be levied on the "excess profit", which corresponds to the

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[12] The QDMTT is defined in article 10.1. GloBE Model Rules.

[13] Including excluded entities (OECD, 2022a, article 1.1, para. 12).

[14] Including, generally, income-based taxes (OECD, 2021, article 4.2)

[15] Articles 3.1–3.5 in OECD (2021).

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amount of GloBE income for the jurisdiction remaining after applying a "substance-based income exclusion" (OECD, 2021, article 5.2.2), which is a formulaic carve-out that excludes a fixed return on payroll and tangible assets costs from the application of the Rules (OECD, 2022a, article 5.3, para. 25).

3.2 Implications of the GloBE Rules for investment tax incentives

The idea behind the GloBE Rules is that global action is needed both to stop a harmful race to the bottom on corporate taxes and to address the remaining risk of shifting profits to entities subject to low or no taxation. As such, the application of the top-up tax will limit the ability of countries to offer measures that reduce the corporate income tax (CIT) liability below 15 per cent.

The GloBE Rules do not explicitly prohibit countries from offering fiscal incentives or reduced CIT rates. Nevertheless, based on how the Rules are intended to operate, it is expected that the minimum tax will have a profound impact on the use of such incentives and rate reductions (OECD, 2022b; UNCTAD, 2022a). This is because the top-up tax will act in parallel to existing CIT systems to ensure that a group pays at least 15 per cent tax in every jurisdiction in which its constituent entities are located. As such, levying a top-up tax might lead to a situation in which the revenue forgone by one jurisdiction because of tax incentives is recaptured until a minimum 15 per cent tax is achieved.

An overall assessment of the impact of Pillar Two on the main categories of tax incentives adopted to attract FDI is provided by UNCTAD (2022a, table III.2) and Liotti et al. (2022).

4. Implications of investment provisions for the implementation of the GloBE Rules

The implementation of the GloBE Rules will require a number of domestic reforms that may affect an investment, including these three:

- Implementation of the IIR and UTPR: This will require a change in domestic law to introduce a top-up tax and provisions for adjustments.

- Introduction of the QDMTT: Countries may opt to introduce a QDMTT applicable only to in-scope companies or a QDMTT that applies to all taxpayers in the jurisdiction.

- Rationalization of tax incentives: Since the imposition of the top-up tax affects the actual benefit received from CIT incentives, countries may choose to eliminate certain incentives for in-scope companies.

It is therefore important to understand whether any of these changes could constitute a breach of investment protections identified within RTAs and what remedies, if any, are available for investors to challenge these changes.

4.1 Does GloBE amount to a breach of investment provisions under RTAs?

4.1.1 Fair and equitable treatment

Investors commonly rely on the FET provision (UNCTAD, 2005). Tribunals have found that the FET standard is breached where "it is shown that an investor has been treated in such an unjust or arbitrary manner that the treatment rises to the level that is unacceptable from the international perspective" (*S.D. Myers v. Canada*, 2020, para. 263). In the merits of claims, tribunals have considered whether the right to stability and predictability of the legal framework and the legitimate expectations of investors were violated (Ranjan, 2022).

In this context, investors could claim that the GloBE Rules and their impact on incentives amounts to a FET breach, arguing that the adoption of the minimum tax will violate the certainty, predictability and stability of the legal framework providing for the incentive. For example, investors could argue that the adverse effect of the GloBE Rules on tax incentives, or their direct revocation by the host State as a response to the Rules was unpredictable and not in line with their expectations of regulatory stability, on which the investor relied when making an investment in that jurisdiction. In certain circumstances, it could be argued that the State promised or assured investors that the incentives would be made available, giving rise to a legitimate and reasonable expectation.

Such an argument can be made both if the host country chooses to repeal tax incentives and if it elects to retain incentives and introduce the QDMTT for in-scope companies. In the latter case, the QDMTT would negate the benefits of the incentives, as a top-up tax would increase the financial burden on the investor, arguably leading to instability and uncertainty for investors and being against their legitimate expectations.

As discussed in section 2, the RTAs reviewed have carve-outs for taxation and no exceptions are provided for the FET requirement. This means that the FET obligation may not protect investors in the event of any change in the tax system of the invested jurisdiction. Thus, in principle, for the agreements under review, tax measures could not be challenged under FET (*Feldman v. Mexico*, 2002, para. 141). Nevertheless, as further discussed in section 4.1.4, the application of the tax carve-out is deemed contingent on the State's conduct being considered a bona fide taxation measure, whereby if investors can prove that the adoption of the minimum tax is a mala fide measure, they will be able to rely on the FET in ISDS irrespective of the carve-out.

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In a previous tax-related claim based on a violation of the FET provision in NAFTA, the tribunal stated that a government's conduct towards an investment may be a violation of the customary FET obligation if it "amounts to gross misconduct, manifest injustice or […] bad faith or the wilful neglect of duty, whatever the particular context the actions taken in regard to the investment" (*Cargill v. Mexico*, 2009, para. 286). According to the tribunal, the action might fail to meet the FET requirement if

> …the complained of measures were grossly unfair, unjust or idiosyncratic; arbitrary beyond a merely inconsistent or questionable application of administrative or legal policy or procedure so as to constitute an unexpected and shocking repudiation of a policy's very purpose and goals, or to otherwise grossly subvert a domestic law or policy for an ulterior motive; or involve an utter lack of due process so as to offend judicial propriety (*Cargill v. Mexico*, 2009, para. 296).

In effect, the assessment of whether the State's conduct is "fair" and "equitable" broadly depends on the facts of the particular case. Such an obligation has to be enforced while examining the background and justifications for the change in the legal framework and its impact on the investment. That is, despite having an obligation to provide FET in RTAs, absent a stabilization clause or similar provision, States should still be free to change their regulatory regime and legal framework as an exercise of their sovereignty and in line with their policy objectives, without automatically incurring a breach of investors' legitimate expectations of stability and predictability of the system. In contrast, an actual violation of the FET may occur "where the investor has acquired rights, or where the state [sic] has acted in such a way so as to generate a legitimate expectation in the investor and that investor has relied on that expectation to make its investment" (*Micula v. Romania*, 2013, para. 667).

Based on this rationale, a claim challenging GloBE Rules under FET seems unlikely to succeed as not only might it be difficult for investors to prove that application of the Rules and/or withdrawal of an incentive is a mala fide taxation measure (so that the carve-out does not apply), but also that its effects (albeit unexpected) amount to gross misconduct and manifest injustice towards the investor affected.

4.1.2 Non-discrimination clauses

The GloBE Rules and their effects on incentives could be seen as discriminatory, since the top-up tax will in principle apply only to corporations that are members of MNE groups, thus affecting only "foreign investors". This could be seen as a discrimination (or a difference in treatment) based on nationality. If, for example, an incentive is granted generally to every company located in the territory of a State (thus, to both domestic and foreign investors) and owing to the GloBE Rules' operation, the incentive becomes ineffective only for foreign investors, or the host

State opts to withdraw the incentive only for in-scope companies, this could raise issues of violation of the NT provision in RTAs. In addition, a country may opt to introduce a QDMTT that applies only to in-scope companies while exempting domestic companies, where an argument could be made that the foreign investors are being treated less favourably than domestic companies in "like circumstances" and that therefore the country is breaching NT provisions.

For claims on NT, tribunals consider a number of factors, including (i) whether domestic investors are in "like circumstances" with the foreign investor making a claim, (ii) whether there has been discrimination, (ii) whether treatment is as a result of nationality and (iii) whether the foreign investor should receive the most favourable treatment given to domestic investors (*Feldman v. Mexico*, 2002, para. 166). A determination of "like circumstances" involves examining whether the foreign and domestic investors are in "the same sector, which [is] is interpreted widely to include the "economic sector" and "business sector" (*S.D. Myers v. Canada*, 2020, para. 250). This examination includes an analysis of the competitive relationship between the foreign and domestic investors (*ADM v. Mexico*, 2007, para. 199). As this is a high standard, satisfying the likeness test – that the MNE is in "like circumstances" with the domestic company – may prove challenging, though not completely impossible.

Moreover, the general tax carve-outs in RTAs may limit claims of an NT breach. As mentioned earlier, although the USMCA, NAFTA, and other RTAs were modelled after this approach and include a claw-back for NT and MFN provisions that restores their application, such claw-backs usually apply only to cases that do not relate to income and taxable capital of corporations. As such, investors may not be protected in relation to application of the GloBE Rules and withdrawal of tax incentives as they relate to taxation of income and profits of corporations.

Where the RTA does not include a claw-back but allows for the adoption or application of a measure aimed at ensuring the equitable and effective collection of taxes as provided for in the States' domestic legislation,[16] it also seems unlikely that a tribunal would find the application of GloBE Rules or the withdrawal of a tax incentive to be a breach of NT obligations.[17] This is especially because it could be argued that since the GloBE Rules aim to curb tax competition and ensure a minimum level of taxation on large MNE groups to reduce profit shifting, it may be a measure adopted to ensure an "equitable" and "effective" collection of taxes.

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[16] Article 10(2), MERCOSUR Investment Protocol, and article 17(1)(d), ASEAN.

[17] It is important to mention that the USMCA as well, in article 32.3(6)(h), provides that nothing in the articles included in the claw-back apply to "the adoption or enforcement of a new taxation measure aimed at ensuring the equitable or effective imposition or collection of taxes, including a taxation measure that differentiates between persons based on their place of residence for tax purposes, provided that the taxation measure does not arbitrarily discriminate between persons, goods, or services of the Parties".

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Therefore, the carve-outs available within RTAs may give sufficient protection to host countries for the actions they take and make it difficult for investors to succeed in claims of discrimination. Nevertheless, ensuring non-discriminatory treatment of cross-border investment is extremely important, especially in the context of those investments covered by IIAs. Thus, even if carve-outs are included, investors might still be able to challenge the rules' application based on a discriminatory treatment. This concern can be seen in the case of the European Union, where the directive proposed to implement the GloBE Rules states that it "should also apply to very large-scale, purely domestic groups. In this way, the legal framework would be designed to avoid any risk of discrimination between cross-border and domestic situations" (EU Commission, 2021, Recital 6). Such an approach arguably indicates the intention to avoid the discriminatory treatment that the rules may bring and that could restrict the functioning of the European Union internal market (De Broe and Massant, 2021; Pinto Nogueira, 2020).

4.1.3 Expropriation

As discussed in section 2, some RTAs contain a claw-back on the tax carve-out for expropriation, which means that investors may be protected against the application of the top-up tax and the withdrawal of tax incentives on the basis of the expropriation provision. That is, the GloBE Rules may be considered to be indirect expropriation as they involve charging additional tax on the investor, which may interfere with the value of the investment. As such, in principle, investors could seek to challenge the effects of the GloBE Rules before ISDS tribunals for unlawful expropriation.

In *Feldman v. Mexico* (2002), the tribunal noted that although there are many ways in which governmental authorities can force a company out of business, or significantly reduce its business's economic benefits, there are also valid government regulations, where "governments must be free to act in the broader public interest through [… e.g.,] the granting or withdrawal of subsidies" (para. 103). In this sense, a distinction must be made between indirect expropriation and the valid right of States to regulate.[18] An expropriation will take place

> when [the state] subjects alien property to taxation, regulation, or other action that is confiscatory, or that prevents, unreasonably interferes with, or unduly delays, effective enjoyment of an alien's property or its removal from the state's territory .... *A state is not responsible for loss of property or for other economic disadvantage resulting from bona fide general taxation, regulation …,*

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[18] On the idea of this distinction under international investment law, see OECD (2004).

> *or other action of the kind that is commonly accepted as within the*
> *police power of states, if it is not discriminatory* (*Feldman v. Mexico*,
> 2002, para. 105).[19]

On the basis of this distinction, the tribunal in the case concluded that there was no expropriation under NAFTA, as

> not all government regulatory activity that makes it difficult or impossible
> for an investor to carry out a particular business, change in the law or
> change in the application of existing laws that makes it uneconomical
> to continue a particular business, is an expropriation under Article
> 1110. Governments, in their exercise of regulatory power, frequently
> change their laws and regulations in response to changing economic
> circumstances or changing political, economic or social considerations.
> Those changes may well make certain activities less profitable or even
> uneconomic to continue (*Feldman v. Mexico*, 2002, para. 112).

Such changes do not always rise to the level of a violation of NAFTA.

Under such an interpretation, a tax measure might not constitute an indirect expropriation if it is bona fide general taxation. Although tribunals in later ISDS cases have applied this approach,[20] it does not necessarily make the analysis of whether a tax measure constitutes an indirect expropriation any clearer. The assessment depends on an examination of the facts and the States' conduct in the relevant case. A matter to consider will be the context of these changes, where the fact that the law has been made based on international agreement may make it difficult for investors to prove a state's action is mala fide.

This analysis applies to NAFTA, ASEAN and COMESA. Yet the USMCA, which also includes a claw-back in the carve-out for expropriation (article 14.8), excludes the possibility of investors submitting a claim to arbitration if the State has breached the provision with respect to indirect expropriation (article 14.D.3; annex 14-D). This means that under the USMCA, tax-related claims may not be submitted on the basis of an indirect expropriation by the host State.[21]

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[19] Quoting American Law Institute (1987, section 712, comment g).
[20] Lisa Bohmer, "Looking back: In Feldman v Mexico, arbitrators unanimously rejected expropriating claim, but disregard on shifting the burden of providing discrimination", *Investment Arbitration Reporter*, 10 December 2018. www.iareporter.com.
[21] Notwithstanding this, claims with respect to a "legacy investment" (i.e. in relation to an investment established or acquired between 1 January 1994 and the termination date of NAFTA, and in existence on the date of entry into force of the USMCA) can still be submitted to arbitration in accordance with NAFTA, even after the entry into force of the USMCA. This possibility expires three years after the termination of NAFTA. Thus, while tax-related claims in relation to existing investments based on an indirect expropriation under NAFTA can still be submitted to arbitration, the three-year limit may not be sufficient for claims relating to the GloBE Rules.

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4.1.4 Bona fide application of tax carve-outs

Beyond indirect expropriation, the bona fide general taxation standard has also been applied in claims relating to the application of the tax carve-out in RTAs. As highlighted in some cases, in order for the carve-out to apply, the State's conduct must be in line with its genuine exercise of taxation power, meaning that it is not intended to shield the State from egregious conduct. For instance, in a case concerning, among other issues, the revocation of tax incentives, the tribunal held that the carve-out "can apply only to bona fide taxation actions, i.e., actions that are motivated for the purpose of raising general revenue for the State" (*Yukos v. Russia*, 2014, para. 1431).

Thus, as long as the conduct of the State is perceived as a mala fide taxation measure, investors are protected by RTAs' obligations. As such, ISDS tribunals may have jurisdiction to examine a tax-related claim based on a violation of not only the indirect expropriation provision (except under the USMCA), but also of obligations such as FET, NT and MFN, even if not included in the claw-back in the RTAs' carve-out.

Against this background, claims regarding the negative impact of GloBE Rules on tax incentives and investments may not be automatically disregarded by arbitral tribunals if based on the argument that it is not a bona fide taxation measure. Yet it may be difficult for investors to prove that the State's action in implementing a minimum tax and (directly or indirectly) withdrawing incentives (as a response to the GloBE Rules) is a mala fide taxation measure and a violation of an RTA. This is because the Rules require a minimum level of taxation of 15 per cent, and that level has garnered international support. Thus, it may be difficult to prove that applying the Rules is a confiscatory and excessive State action that prevents the enjoyment of the investors' property in their territory. Moreover, the GloBE Rules aim to curb the harmful race to the bottom on CIT and address the risk of profit shifting to low- or no-tax locations. These facts may be relied on to argue that the GloBE Rules are an equitable and efficient imposition of corporate taxes, representing bona fide general taxation.

By contrast, the GloBE Rules have been perceived as unfair (not only to investors, but also to some States), as they go beyond their initial purpose and, in effect, may not bring about equitable and effective taxation for some jurisdictions (Dourado, 2022; Tandon, 2022). Furthermore, the Rules have the potential to undermine most tax incentives, even those granted e.g. to support environmental measures, or to help businesses cope with crises such as the COVID-19 pandemic, which can be assessed as being disproportionate in certain circumstances.

Nonetheless, as mentioned earlier, the analysis of the real impact of adopting the GloBE Rules on a particular investor must be made case by case. There can be specific cases where the State, by granting or assuring an incentive and

subsequently signing up to an international agreement, acted egregiously towards an investor that cannot operate in that jurisdiction under those circumstances, resulting in a breach of the RTA. Nevertheless, should investors begin to challenge the GloBE Rules and their effect on tax incentives based on a violation of RTAs, the arbitral tribunals' approach to this issue is not yet clear and may depend on case-by-case, fact-based investigations taking into account the context within which these measures have been taken. Yet, for the implementation of the IIR, QDMTT and UTPR, it seems that a claim would not likely succeed as they form part of the broader international agreement.

4.2 Remedies available to investors in RTAs

Because investors may seek to challenge a State's action under the GloBE Rules as being a violation of the relevant RTA, it is important to understand what remedies are available through RTAs' dispute resolution mechanisms. In the event of an investment dispute arising over the interpretation and application of an RTA, it is typically preferable under the RTA that the disputing parties initially seek to resolve the dispute by "amicable means", such as consultation and negotiation, the use of good offices, conciliation or mediation.[22] If the dispute is not settled satisfactorily through these means (usually within a certain period of time), then investors are allowed to submit to arbitration a claim that the State has breached a (qualifying) provision of the RTA, such as under international arbitration provided for under the ICSID Convention, among others.

In such investor–State disputes, "[t]he foreign investor will challenge *acts and measures* (or the lack of appropriate action) *taken by the sovereign State* or a sub-entity thereof in its sovereign capacity" (UNCTAD, 2010, p. 11) that effectively hinder or have the potential to hinder their investments and are allegedly violations of the obligations under RTAs. In this sense, before delving into the question of whether there is an actual breach of the RTA, for the purposes of the GloBE Rules it is relevant to clarify a preceding point, namely, which State should be regarded as taking an action detrimental to investment in relation to the application of the minimum tax?

As discussed in section 2, the RTAs under review allow for ISDS, with the exception of MERCOSUR. Investors may only be able to institute ISDS proceedings that relate to an action of a member State that is the host State, i.e. where the investment is located. This means that if the damage is caused by a jurisdiction that is not a party in the RTA, or by another party of the RTA that is not the host State,

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[22] Article 1118, section B, chapter 11, NAFTA; article 14.D.2, annex 14-D (Mexico-United States Investment Disputes) USMCA; article 26, COMESA; and section B, ASEAN.

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it may not be possible to submit claims to ISDS. Such a conclusion is relevant in relation to the GloBE Rules, since the detrimental effect on an investment may arise in three different scenarios, depending on both the rule applicable and the jurisdiction applying it. In addition, for the purposes of ISDS, claims can be brought forward only if the "covered investment" and "investor" requirements are satisfied under the relevant RTA, both of which may also vary in relation to the GloBE Rules, depending on the charging mechanism and the affected entity.

The GloBE Rules provide an order that establishes the order of priority in the application of its charging provisions.[23] Accordingly, if a top-up tax is to be levied in a jurisdiction, such a low-tax jurisdiction has priority to levy the tax under the QDMTT. If the jurisdiction does not charge the QDMTT, then the UPE jurisdiction can apply the IIR and charge the top-up tax. If neither the QDMTT nor the IIR is available, the UTPR can be applied by another jurisdiction where a constituent entity of the MNE group is located. In this context, the detrimental effect of the GloBE Rules on an investment can be caused by (i) the jurisdiction itself through the QDMTT, (ii) the UPE jurisdiction (or an intermediate parent entity) through the IIR or (iii) another jurisdiction where the MNE group has a constituent entity through the UTPR.

The first scenario, i.e. QDMTT application, might be covered by the ISDS provisions. That is, the State in whose territory the investor has made an investment (the host State) that has breached an RTA obligation by imposing the QDMTT, a situation in which it is usually allowed to submit a claim to arbitration under these agreements. In this case, the "investment" is the participation, ownership or control in the constituent entity that has an ETR below 15 per cent, and the "investor" is the owner or shareholder (such as the UPE). Thus, investors could seek to challenge the QDMTT charge on the basis of a violation of a protection granted under RTAs. A similar claim could also be raised by an investor if the State chooses to directly revoke incentives that the investor has relied on to make an investment therein (e.g. breaking their legitimate expectation of a regulatory stability) as a result of adopting the GloBE Rules. In these claims, it could be argued that the States' conduct is not a bona fide taxation measure and amounts to an unlawful (indirect) expropriation, and/or a breach of the FET, NT or MFN requirements, as discussed in section 4.1.

The second (IIR) and third (UTPR) scenarios might also be covered under ISDS. However, in these claims the host State that causes the damage, the investor and the covered investment will change. Moreover, the case will not relate to the impact of the GloBE Rules on the incentives granted in the low-tax jurisdiction (the host State in the first scenario), but on the additional tax imposed by either the UPE or the UTPR jurisdiction.

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[23] See on the matter, Devereux et al. (2022).

Under the second scenario, where no QDMTT is applied and the IIR is levied by the UPE jurisdiction, the relevant investor will be the UPE's owner (e.g. a shareholder), the covered investment will be the UPE itself and the host State causing a damage to the investment will be the UPE jurisdiction. As such, investors may challenge the UPE jurisdiction's top-up tax charge on their investment under RTAs, since, even though the top-up tax is charged because the LTCE is located in another territory, under the IIR it is the UPE that pays the top-up tax. Thus, the action of the host State (the UPE jurisdiction) in applying the IIR could be seen as detrimental to the investor's investment (the UPE).

The third scenario concerns charging the UTPR, the host State being the State applying the UTPR. The investment is the participation, ownership or control in the affected constituent entity and the investor is the owner of the constituent entity affected by the UTPR (e.g. the UPE). Thus, the action of the host State (the UTPR jurisdiction) in applying the UTPR could be seen as detrimental to the investor's investment (the constituent entity located in the UTPR jurisdiction), and thus be challenged in ISDS.

Where an IIA relies on a broader definition of investment, both indirect and direct investment in the constituent entity may be considered a "covered investment" (UNCTAD, 2021). Thus, under a broader definition, even if the UPE does not directly own or control the constituent entity, where an intermediate company is interposed, the participation may be considered a covered investment.

As mentioned in section 2, some RTAs such as MERCOSUR have removed the ISDS provisions, a trend that may be adopted in other agreements. It increasingly seems that investors may find themselves limited from instituting ISDS claims. Nevertheless, investors may still be able to bring claims directly before domestic courts, depending on the circumstances of the case. Moreover, a claim can be advanced by the investor's home State using the State-to-State dispute settlement mechanism, explained in section 5.

4.3 Lessons from past experience

Investors have previously used ISDS to challenge proposed international reforms. For example, Phillip Morris brought ISDS claims against both Uruguay and Australia, challenging measures taken to implement the World Health Organization Framework Convention on Tobacco Control 2013 (*Philip Morris Asia v. Australia*, 2015; *Philip Morris v. Uruguay*, 2016). Yet, in neither case was Phillip Morris successful. Of note, in the Uruguay case the tribunal held that, in consideration of the breach of the FET obligation, Uruguay's actions were a response to scientific consensus that tobacco had harmful effects and could not therefore be considered "arbitrary, grossly unfair, unjust, discriminatory or disproportionate" (*Philip Morris v. Uruguay*, 2016, para. 410). The tribunal's decision may be indicative of an

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acceptance that where there is a global consensus, it would be difficult to prove an infringement of the FET obligation.

Investors have also challenged countries' climate change policies (UNCTAD, 2022b). Unlike the tobacco control regulation where the tribunals have seemingly reaffirmed the global agreement on the harmful impact of tobacco, claims against climate-related measures have had more polarizing results. For instance, of the environmental cases that have been concluded, 40 per cent were decided in favour of the country and 38 per cent decided in favour of the investor (UNCTAD, 2022b). A similar trend is noted in cases raised in regard to renewable energy. Although half of the cases are pending, 53 per cent of the concluded cases have been decided in favour of the investor (UNCTAD, 2022b). Therefore, in this context, ISDS challenges may limit the ability of countries to adapt their renewable energy regulatory framework (UNCTAD, 2022b). Nonetheless, although investors are entitled to certainty, the host State should still be free to change its regulatory regime and legal framework in line with its policy objectives, without automatically breaching its investment obligations.

A large number of the cases linked to climate change relate to old-generation IIAs, creating significant pressure for States to undertake the necessary reform of IIAs to reduce the risk of disputes and provide sufficient room for policy reform (UNCTAD, 2022b). Other steps could be taken to prevent these risks, including signing interpretive statements that clarify the relationship between investment provisions and these reforms (Shadikhodjaev, 2016, p. 343).

5. Implications and future for regional integration efforts

5.1 Interaction between IF and non-IF member States that are signatories to RTAs

The GloBE Rules have been agreed to as part of BEPS 2.0 by all but four members of the IF.[24] The IF was established in June 2016 to engage interested non-OECD jurisdictions, including developing economies, in the implementation of the BEPS 1.0 package, ensuring that all those joining would participate in the activities on an equal footing. The role of the IF was extended to BEPS 2.0, for which it worked intensively to provide a consensus-based solution, culminating in the agreement on the two-pillar approach. As a result, as of 16 December 2022, 138 jurisdictions joined the IF agreement under the OECD/G20 BEPS Project (2021), which encompasses the GloBE Rules.[25]

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[24] Holdouts are Kenya, Nigeria, Pakistan and Sri Lanka.

[25] The list of members is available at www.oecd.org/tax/beps/oecd-g20-inclusive-framework-members-joining-statement-on-two-pillar-solution-to-address-tax-challenges-arising-from-digitalisation-october-2021.pdf.

Although the IF is a significant global tax body with the important objective of bringing together OECD and non-OECD member jurisdictions at the negotiation table, no legal obligations arise from its commitments. As the OECD acknowledges, BEPS outputs are merely "soft law legal instruments", not legally binding on the parties, where "there is an expectation that they will be implemented accordingly by countries that are part of the consensus" (OECD/G20 BEPS, 2015, p. 5), since the decisions taken within the IF are "morally binding to all parties in the process" (OECD, 2017, p. 10).

Thus, whereas there is an expectation that the IF agreement on the GloBE Rules will be implemented by the countries that are part of the consensus, in principle, the agreement itself does not create any legal obligation. The minimum tax will come into effect only if and when implemented in the domestic law of the IF members that have joined the agreement, where once effectively adopted, it will represent hard, legally binding law.

Moreover, the GloBE Rules are meant to be implemented as part of a "common approach" (OECD, 2022a, Introduction, para. 1). This means that IF members that join the agreement are not required to adopt the rules themselves but accept their application by other IF members (OECD/G20 BEPS Project, 2021, p. 3). Furthermore, if a jurisdiction decides to adopt the GloBE Rules, "it agrees to implement and administer them in a way that is consistent with the outcome provided under the GloBE Rules and the commentary" (OECD, 2022a, Introduction, para. 14). Such a common approach represents "an agreement in principle regarding a tax policy direction" (Schoueri and Galdino, 2020, p. 5), where there is the (mere) expectation that countries will reach a level playing field in the future.

Against this background, it might seem that the GloBE Rules will apply to and affect only investments of jurisdictions that have agreed to them under the IF agreement. Nevertheless, it has already been stated that no country can afford not to adapt to this new reality, as those countries that do not adhere to the minimum tax may still be affected. As UNCTAD points out, "Residence countries will apply the top-up tax under the IIR to countries that have not accepted the agreement in exactly the same way as they will to countries that have. The key point is that topping up to the minimum can be achieved unilaterally by the residence country" (UNCTAD, 2022a, p. 143). This global reach may have a significant impact on RTAs and regional integration efforts, especially since IF and non-IF members can coexist within the RTA framework.

Though the GloBE Rules have been agreed on by most members of the IF, a significant number of countries – especially developing countries – are not members of the IF and were not part of the agreement.[26] This lack of a real "global" consensus may raise

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[26] The IF has 127 countries as members (excluding the 17 that are jurisdictions rather than countries), and the United Nations has 193 Member States and 2 permanent observers. This means that only two-thirds of countries recognized by the United Nations are at the table in the IF and took part in the discussions. For a list of United Nations Member States, see www.un.org/en/about-us/member-states.

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some questions for regional integration, as there are cases in which signatories to the GloBE Rules are members of the same RTA as States that are not signatories. This is the case, for example, with Kenya (IF member) and Burundi, Comoros, Djibouti, Eritrea, Eswatini, Ethiopia, Libya, Madagascar, Malawi, Rwanda, Sudan, Uganda and Zimbabwe (none of them IF members), which (so far) have not signed the global agreement but are members of the COMESA Agreement together with the Democratic Republic of the Congo, Egypt, Mauritius, Seychelles and Zambia, which have joined the international agreement.

In this context, does the lack of a real global consensus have implications at a regional level and within the RTA context? Can jurisdictions that have not joined the agreement and those that have done so be parties to the same RTA? In principle, the answers to these questions seem to depend on whether countries that have adhered to the IF agreement apply the minimum tax only in relation to those countries that have also signed on to it, or whether they go beyond and apply it equally to those that have not.

To achieve the overarching objectives of Pillar Two, the minimum tax must be applied to in-scope MNEs located in most or all jurisdictions around the world in a coherent and coordinated manner. If this does not happen, tax competition will not be reduced as intended, but rather shifted to those jurisdictions that are not part of the IF agreement. Thus, as UNCTAD (2022) has correctly pointed out, it seems unlikely that countries that have not signed the agreement will be able to avoid the top-up tax effects.

At the regional level, the uneven application of the GloBE Rules could lead to distortions in the location of investment, which is not beneficial for regions. Foreign investors could divert their investments from one jurisdiction to another in the same region to avoid the application of the minimum tax in the former, creating (or increasing) tax competition in the region.

States sign RTAs seeking to establish and intensify economic cooperation, investment liberalization and protection among members, with the objective of promoting and ensuring dynamic development of the region. It would be counterproductive for RTA jurisdictions to adopt different approaches towards the GloBE Rules, creating or increasing the competition among them, rather than assisting each other and the region to achieve a better level of development.

If they choose to do so, and investors from RTA jurisdictions that have not joined the agreement are taxed under the GloBE Rules by another RTA jurisdiction that has implemented them, the former may wish to challenge the action of the latter in a State-to-State dispute, arguing that the result of the application of the top-up tax is not in line with the objectives of the RTA.

The inverse may also be problematic. If jurisdictions choose to apply the GloBE Rules only in relation to others that have signed the agreement, this can cause a difference in treatment of investors from different RTA jurisdictions. That is, the top-

up tax would be levied on investors from States that have joined the IF agreement, but not on investors from others that have not, whereas under the RTA, the jurisdictions should ensure similar treatment among their investors or with investors from other jurisdictions. For instance, if an RTA jurisdiction levies the QDMTT on an investor from another RTA jurisdiction that has signed the agreement, but not on an investor from another jurisdiction that has not signed it, then it could be argued that that State applying the GloBE Rules has not accorded the same treatment to foreign investors as it does to its own investors or to investors from third countries, breaching an obligation under the RTA. Although it could be said that the home state of the affected investor "allowed" this difference in treatment to arise by joining the agreement,[27] the investor could try to argue that under the RTA this implies a breach of the NT or the MFN provisions.

Although nothing prevents the coexistence of IF and non-IF members within the RTA framework, for purposes of regional integration and development, it is not desirable for signatories to an RTA to adopt different approaches to the GloBE Rules, as demonstrated above. Rather, RTA signatories should adopt a coordinated approach to the application and operation of GloBE Rules, not only to avoid State-to-State disputes and eventual termination of these agreements, but also to ensure the development of the region as a whole and intensify economic integration as initially intended under the RTA.

5.2 State-to-State disputes

While the paper focuses on investor–State dispute, it is relevant to note that the agreements under review also provide for State-to-State dispute (UNCTAD, 2003), which may be instituted to challenge the application and effects of the GloBE Rules.

If RTA signatories choose to adopt different approaches to implementing the GloBE Rules, or if IF and non-IF members coexist within the RTA framework, State-to-State dispute could be instituted to analyse whether the action of the State applying the minimum tax is consistent with the objectives and purpose of the RTA.[28] For the five RTAs under review, State-to-State disputes may be possible only between member states of the same RTA. In State-to-State dispute settlement, therefore, it is relevant to identify whether the jurisdiction applying the charging provision is a party to the same RTA as the investor's home State.

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[27] Though, as mentioned earlier, the IF agreement is not legally binding on the States signing it, and if that State does not charge the QDMTT, another State may apply the IIR or UTPR anyway.

[28] This could be possible as "[a] given dispute, matter or question may relate to the 'interpretation' or 'application' of an IIA. [...] 'Application' relates to the extent to which the actions or measures taken or proposed by the contracting parties comply with the terms of an agreement, its object and purpose" (UNCTAD, 2003, p. 14).

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Although possible, State-to-State dispute settlement has almost never been resorted to (UNCTAD, 2003). However, the mechanism is gaining attention, especially as a result of growing limitations on the scope of ISDS. Thus, while the use of State-to-State dispute settlement is contentious (Bernasconi-Osterwalder, 2014) and might seem unlikely, it is not completely ruled out in the case of the GloBE Rules, especially because a real global consensus is lacking, resulting in the coexistence within the same RTA framework of signatories and non-signatories to the IF agreement.

5.3 A regional approach to the implementation of Pillar Two

Though difficult to achieve, global tax harmonization has been promoted as a solution to the negative side effects of tax competition (Konrad and Schjelderup, 1999). This is why the agreement on Pillar Two is of particular importance (Casella and Souillard, 2022). However, despite this positive aspect, the minimum tax may intensify competition for out-of-scope corporations, high-net-worth individuals, tax incentives outside of the CIT system and non-tax incentives. Therefore, the implementation of the GloBE Rules introduces new opportunities for tax coordination within regional blocs, to implement taxation in line with regional investment objectives and prevent "new" or adapted forms of tax competition (UNCTAD, 2022a).

Noting the importance of having coherent and consistent implementation of Pillar Two, the European Union formally adopted the Directive on the minimum tax.[29] The Directive reflects the agreement at the IF, with adjustments to ensure conformity with European Union law (EU Commission, 2021). The African Tax Administration Forum (ATAF) has also published a suggested approach to drafting the domestic minimum tax top-up tax legislation that has been customized to meet the specific challenges that African countries face (ATAF, 2023). Such joint approaches provide certainty for all stakeholders, especially where levels of regional integration are high. They may also include a shared accounting standard, strengthening information exchange and building capacity through technical support in the region.

Most importantly, by adopting a coordinated regional response to the GloBE Rules, a region could benefit from sharing resources to reduce the administrative costs and burdens that may arise from implementation of the Rules. Moreover, jurisdictions could join their strengths to make investors more attracted to the region, despite the adoption of the minimum tax.[30]

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[29] European Union, "Fair taxation: Commission welcomes agreement on minimum taxation of multinationals", press release, 13 December 2022, https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7674.

[30] For example, Titus (2022) called on African countries to adopt a regional response to the implementation of a QDMTT and to adapt their tax incentives to become non-tax equivalents.

In addition, countries may consider the signing of a multilateral treaty instrument that clarifies the position of the RTAs and the GloBE Rules to mitigate risks that implementing the rules could be considered a breach of commitments (UNCTAD, 2022a). Such a treaty may be more easily signed or developed within a more integrated regional bloc.

The adoption of a regional approach to implementing and interpreting measures such as the QDMTT and the adoption of a common understanding of this new environment also have the potential to prevent uncertainty for investors. This regional approach could then be relied on in the domestic courts to ensure consistency and certainty in the treatment of investment within the regional bloc.

6. Conclusions and policy considerations

A growing number of RTAs include substantive investment provisions that may limit a country's ability to change tax measures. This paper analyses how the GloBE Rules and their impact on investment incentives interact with RTAs' investment protection provisions.

Although the GloBE adoption and its effects may be challenged under the ISDS mechanism of RTAs, the likelihood of success is unlikely. Not only because of tax carve-outs under RTAs that may limit the possibility of submitting tax-related cases to arbitration, but also because countries may successfully claim that the measures were aimed at "effective or equitable" imposition of direct taxes and are excluded from the investment protection afforded in the agreement. Moreover, MNEs have faced significant public pressure and scrutiny over perceived unfair tax practices (Speitmann, 2021). Consequently, there is a likelihood that MNEs that choose to challenge the GloBE Rules would face reputational risk, since they could be seen as challenging a political consensus that the tax system reform is needed to curb tax competition, eliminate tax havens and minimize profit shifting.

Nonetheless, in order to avoid both distortions in the location of investment and the creation of new (or increased) tax competition, regional blocs should consider adopting a regional approach to the implementation of the GloBE Rules. This will ensure consistency in the implementation and provide certainty of treatment to investors. In addition, countries may need to consider whether similar rules are required outside of CIT, including tax incentives provided for capital taxes and value added taxes.

By adopting a coordinated regional response to the GloBE Rules, signatories of RTAs may not only avoid State-to-State disputes among the Member States, but could also benefit from sharing resources to reduce administrative costs and burdens that may arise and from joining their strengths to make the region more

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attractive to investors. Such a regional approach to addressing the recent changes in the international tax arena has the potential to ensure the development of a region as a whole and intensify economic integration. This paper can be seen as a basis for ongoing dialogue on these issues.

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Online incorporation platforms in Estonia and beyond: How administrative spillover effects hamper international taxation*

Matti Ylönen,[a] Wolfgang Drechsler[b] and Veiko Lember[c]

Abstract

Online platforms that allow non-residents to register firms have emerged to boost economic development goals in jurisdictions ranging from Wyoming (United States) to Estonia. They create novel governance challenges that fall between governance frameworks. The global tax governance agenda needs to address the role of such platforms, which often involve conflicts between economic policy aspirations and other goals. Our Estonian case study demonstrates the inability of authorities to perform background checks of numerous non-resident entrepreneurs, as national administrative capacities get strained. Building on the nascent tax spillover approach, we analyse administrative spillover effects caused by online incorporation platforms in international taxation. Mapping de facto administrative capacities requires analysing conflicts between governmental priorities and the obstacles of sharing information between administrative and criminal procedures. When the non-resident community grows compared with the size of the domestic economy, supervisory systems tailored for domestic entrepreneurs become strained. We show that resolving this policy conflict assumes targeted investments into administrative capabilities from skilled personnel to data exchange and interorganizational coordination.

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a Corresponding author. World Politics, Faculty of Social Sciences, University of Helsinki, Helsinki, Finland (matti.v.ylonen@helsinki.fi).

b Ragnar Nurkse Department of Innovation and Governance, Tallinn University of Technology, Tallinn, Estonia; Institute for Innovation and Public Purpose, University College London, London, United Kingdom.

c Ragnar Nurkse Department of Innovation and Governance, Tallinn University of Technology, Tallinn, Estonia; FinEst Centre for Smart Cities, Tallinn University of Technology, Tallinn, Estonia.

1. Introduction

Registering small companies abroad used to be associated with international crime and the super-rich, or with holding companies of transnational corporations (TNCs). However, technological advances and digital business models have incentivized microentrepreneurs and small firms to incorporate in places such as Wyoming (United States) and Estonia. Driven by economic development logic, policymakers have sought to support online incorporation platforms through legislative, policy and service innovations. Such efforts can generate conflicts between governmental policy goals, calling attention to effective national administrative capacities to align diverse goals without compromising any of them. Drawing from a case study on the Estonian e-residency programme, we address a major gap in global tax scholarship by studying the governance challenges created by online incorporation platforms.

We argue that global tax scholarship needs to pay more attention to the growth of small-scale, "born global" (Cavusgil and Knight, 2015) entrepreneurs and the incorporation platforms that they use. We maintain that the growth of such platforms may result in a situation in which the collective governance impact of such entrepreneurs becomes significant despite the small economic significance of any single entrepreneur. Such situations create new kinds of challenges for national authorities and international organizations – such as the United Nations and the Organisation for Economic Co-operation and Development (OECD) – that are tasked to monitor their member States and advise them on policy issues.

Our research suggests that micro-entrepreneurs register companies abroad for four sometimes intertwined reasons: (1) the ease of managing firms, (2) access to digital infrastructure (e.g. PayPal), (3) access to new markets (e.g. the European Union) and (4) circumventing taxes and regulations. Given the overall scarcity of scholarship on online incorporation platforms, any of these rationales would merit a detailed study. However, we focus on the fourth reason as such activities undermine tax collection and anti-money-laundering efforts both nationally and internationally in ways that the existing literature does not cover.

We analyse the governance implications of this fourth rationale through an analysis of the Estonian e-residency initiative, which allows foreign citizens to obtain access to digital services provided by the Estonian Government, as well as to a range of private online services. We identify three governance failures that sustain this rationale: the unexpected spillover effects in the national supervision of e-residents, ensuing difficulties in supervising firms without taxable income and gaps in the international exchange of information. We argue that these administrative challenges and spillover effects should be considered also when discussing the "concept-measurement" gap of global economic governance (Mügge and Linsi, 2021).

By highlighting such spillover effects in an OECD country that is not a tax haven, we make an important contribution to the emerging body of literature on global tax

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governance and national development strategies (Binder, 2019; Finér and Ylönen, 2017; Baker and Murphy, 2019; Stausholm, 2022). We also make a normative contribution by discussing how countries should balance their attempts to lure foreign investment and the associated administrative capacities. Such discussion is much needed in a situation where the pace of new major policy initiatives to curb international tax spillovers has stalled compared with the rapid policy innovation of the early 2000s and the 2010s (Picciotto, 2022).

The rest of the paper progresses as follows. The next section situates the paper in conceptual debates on tax governance and international business (IB). Section three outlines the methodological approach. Section four introduces online incorporation platforms and the Estonian e-residency programme. Sections five, six and seven tackle governance challenges arising from online incorporation systems, using Estonia as a case study. The penultimate section draws together the conceptual contributions of our findings, and the final section outlines our policy contributions.

2. The conceptual approach

Scholars of IB and international political economy have studied corporate tax avoidance and tax havens for more than 50 years. The modern research agenda for tax governance began to emerge in the late 1990s (Eden, 1993; Kindleberger, 1970; Strange, 1988; Sævold, 2022; Ylönen and Finér, 2023). It was initially a small but multidisciplinary field, encompassing not only tax havens and their users but also online shipping registers, export processing zones and other discontents of the international race to the bottom in tax and financial regulation (Abbott and Hampton, 1999; Eden and Kudrle, 2005; Hampton and Christensen, 2002; Palan, 2003). Subsequently, the major growth of the policy agenda on tax governance – championed by the OECD, the European Union, the United Nations and other international organizations – steered scholarly interest to a narrower bundle of policy-relevant topics and quantitative research settings (Temouri et al., 2022).

The first current in this literature concerned taxation of TNCs (Cobham et al., 2018; Lips, 2019; Picciotto, 2018), while the second has focused on the exchange of information on financial assets (Ahrens et al., 2021; Lesage et al., 2020). These two strands of research have been complemented by studies on structures and actors in tax avoidance and evasion, from tax havens to financial service providers (Christensen, 2011; Christensen, 2021; Picciotto, 2022; Seabrooke and Wigan, 2022).[1]

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[1] Notable exceptions in the relative lack of attention on money laundering, financial crime and associated tax leaks in recent global tax governance literature include Binder (2019); Eggenberger (2018); Konalova, Tuck and Ormeño-Pérez (2022); Baker and Murphy (2019); and Sharman (2017).

In IB, the late 2010s saw a renewed interest in tax avoidance and tax havens, predominantly through quantitative studies on corporate profit shifting.[2]

Research agendas that rhyme with timely policy debates are needed, but they can also create blind spots, which consist of phenomena that are peripheral to prevailing policy agendas or remain outside them (Best et al., 2020; LeBaron et al., 2020). Online incorporation platforms constitute one such blind spot. They are used by micro- and small enterprises and involve policy challenges related to money laundering and financial crimes. These themes have been at the margins of the recent global tax governance literature, and they have been discussed mostly through case studies revolving around major financial scandals. Such studies are typically published in journals dedicated to research on financial crime and money laundering (Hoes and Kehlert, 2020; Rose, 2022).

The nascent tax spillover approach has presented one attempt to bridge the gap between studies of corporate profit shifting, exchange of information on financial assets, and the actors and structures that sustain these phenomena (Baker and Murphy, 2019; IMF, 2014). In an important report on corporate tax flight, the International Monetary Fund (IMF, 2014, p. 1) defined spillovers in international taxation as "the effects of one country's rules and practices on others". Subsequently, Baker and Murphy (2019) argued that this framework should be broadened from corporate taxation to other tax classes and ownership structures (e.g. trusts). Following pioneering studies by non-governmental organizations and the Governments of Ireland and Denmark, they called for qualitative country assessments on tax spillovers. They argued that such assessments should study how tax spillovers emerge from the interplay between various tax items (such as personal and corporate income tax), country-specific ownership structures and possible flaws in administrative practices that sustain tax spillovers. We develop this argument by highlighting the complex and sometimes surprising ways in which such spillovers can occur in non-tax-haven jurisdictions.

3. Background and methodology

Studying online incorporation platforms is tricky. Company registers and official statistics of jurisdictions such as Wyoming offer little information on foreign companies, in line with their broader emphasis on financial secrecy (Shaxson, 2018). Financial secrecy hinders attempts to find relevant data for quantitative studies. Moreover, foreign entrepreneurs seldom promote their incorporation in secrecy jurisdictions, which complicates finding potential interviewees or other data for qualitative research

[2] For reviews, see Cooper and Nguyen, (2020) and Temouri et al. (2022).

settings. Estonia is an exception. Its e-residency programme has become a powerful tool of what the literature is calling "nation branding" (Tammpuu and Masso, 2018 and 2019), as this small Northern European country seems to have struck a balance between promoting both global entrepreneurship and its prudent regulation. Several active communities in social media exist for e-residency, and success stories are actively marketed by the e-residency programme and other Estonian State agencies. The programme's merits and perils have been discussed in various assessments, and in a growing number of peer-reviewed articles (Blue, 2021; Calzada, 2021; Drechsler, 2018; Tammpuu et al., 2022; Tammpuu and Masso, 2018 and 2019).

With transparent governance structures, relatively flat hierarchies and a governance culture that supports interview-based policy research, Estonia provides a perfect location for a revelatory case study that illuminates the governance challenges associated with online incorporation platforms. Revelatory case studies involve opportunities "to observe and analyze a phenomenon previously inaccessible to scientific investigation" (Yin, 2003, p. 42). The governance challenges related to online incorporation platforms have been such a phenomenon. The underlying hypothesis for this paper is that, in addition to being a nation-branding exercise, Estonian e-residency should also be interpreted as part of the broader reconfiguration of economic residency. This reconfiguration is occurring in an era characterized by the international prominence of start-up ecosystems and born-global entrepreneurs.

The bulk of our research material consists of 30 semi-structured interviews conducted in 2020 and 2021 with three key stakeholder groups – civil servants, entrepreneurs, and service providers – who are familiar with the Estonian e-residency programme (annex table). Semi-structured interviews provide a useful method for obtaining information on an evolving initiative for which academic research is limited (Kallio et al., 2016). The first interviews were conducted as background interviews to facilitate the formulation and polishing of the interview guide. The interviews were driven by three goals. First, we aimed to understand the motivations and business strategies of entrepreneurs that use e-residency; second, the role of providers of e-residency-related services, which has been a blind spot in research; and third, to gain insights on governance aspects of e-residency from government officials and to mirror these insights with information gained from e-residents and service providers.[3] Most interviews were anonymized to enable discussion of sensitive issues.

The first interviewees were found by contacting people who had commented on e-residency-related issues in public or who had dealt with issues related to the programme in their work. Following the "chain" or "snowballing" approach (Noy, 2008),

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[3] Three of the civil servants interviewed were from Finland, to cover the internationally unique information exchange arrangements between Estonia and Finland.

interviewees were asked for suggestions for other interviewees. Other interviewees were also found by approaching people who had been active in discussing e-residency in traditional or social media. The snowballing approach is useful for studying an evolving phenomenon characterized by close social networks among many members of each of the three interviewee groups, i.e. government officials, e-residents and intermediary firms.

Interviews typically began with open-ended questions such as "from which roles have you followed the e-residency initiative" and "how would you characterize the current state of the e-residency initiative". Subsequently, they proceeded to discuss specific experiences that interviewees had encountered as e-residents, service providers or regulators. They concluded by discussing interviewees' insights into how problematic issues should be alleviated – if such issues emerged – and who should be tasked to do this. Interview guides were tailored for each interviewee, which was necessary given the broad positioning of interviewees relative to the research theme. Interviews were continued with each of these groups until we reached "meaning saturation" (i.e. a sufficient understanding of key issues) (Hennik et al., 2016). Determining these points was further facilitated by the mixed-method setting, which enabled us to reflect the takeaways from the interviews against information obtained from textual sources. Specifically, insights gained from interviews were complemented with analysis of a range of other sources from government reports to media articles, as well as with information acquired from two industry seminars that focused on themes relevant to this article.[4]

Textual sources were sought by reviewing relevant, publicly available governmental reports and evaluations that had been mentioned in the assessments of e-residency reviewed. Relevant media sources were sought by searching the archives of the Estonian business newspaper *Äripäev*, the largest daily newspaper, *Postimees* and the website of the Estonian National Broadcasting Channel. The media and policy data were initially obtained for 2014–2020, but further updates were sought as research progressed, until the end of 2022. As noted, the purpose of these textual sources was to deepen our understanding of the e-residency programme and its effects and to validate insights gained from the interviews. Such mixed-method settings are typical for qualitative analysis of policies and their societal impact (Bowen, 2009).

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[4] The first of these industry seminars was organized in December 2020 and focused on the financial and regulatory risks associated with e-residency. The second seminar, in May 2021, discussed anti-money-laundering risks in Estonia. Both were organized by a private company called Finesto Advisors.

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4. The nature of online incorporation platforms

Jurisdictions that offer online incorporation services can be grouped into two categories. The first category involves destinations that grant opportunities for private intermediaries to provide online company registrations. For example, service providers advertise Wyoming as a location for digitalized incorporation, board resolutions and annual meetings; minimum reporting requirements; zero taxes for foreign-sourced income; lax incorporation rules; and digital signatures. Locations offering varying bundles of these perks include the British Virgin Islands, Delaware, Panama, Seychelles and London.[5] All these jurisdictions have been at the centre of various scandals related to their secrecy regimes (Konovalova et al., 2022; Palan et al., 2013; Robertson, 2021). Yet, they also strive to carve out markets for their corporate registries through the other perks mentioned above.

The second category consists of state-initiated incorporation platforms. Although countries such as Azerbaijan, Lithuania and Portugal have also established online incorporation systems (interviews 6, 16, and 30; Ministry of Finance, 2021), the Estonian e-residency is internationally the best-known example. It was established in late 2014 as a governmental "start-up" that aimed to enable foreigners to access the Estonian digital infrastructure (interview 15). Its bedrock is the Estonian e-State, which relies on a digital ID infrastructure and a unique ecosystem for exchanging information between public and private registries, both of which are actively marketed abroad as part of the national communication strategy (Budnitsky, 2022; Drechsler, 2018; Tammpuu and Masso, 2018). A digital ID card enables e-residents to establish companies, submit financial reports and taxes, and use digital signatures, all remotely. Estonia boasts low share capital requirements – lowered to €0.01 in 2023 – and it only taxes profits withdrawn from a company.[6] As of February 2021, approximately 90,000 e-residency permits had been granted to applicants from 174 countries, which had established more than 20,000 companies.[7]

While the dynamics behind private-sector-driven and State-initiated systems differ, they also have significant similarities. As one of the founders of the e-residency programme noted,

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[5] Based on information available from https://1office.co/company-formation-portal-uk (accessed 14 March 2022); www.firstbase.io/start (accessed 27 April 2022); and https://korporatio.com (accessed 27 April 2022).

[6] "Share capital requirement to be removed 2023", 25 April 2022, https://unicount.eu.

[7] Based on "E-residency in numbers", www.e-resident.gov.ee/dashboard (accessed 14 March 2022). The figure includes issued permits but excludes those that are no longer in force. In 2020, more than 20,000 e-residents had apparently failed to pick up their permit or had not renewed them, which lowers the total number (Pau, 2020).

> You are familiar with the concept what Delaware offers to the Fortune 500 companies, right? […] Wyoming wants to do the same basically to everybody, so that small and medium enterprises can become virtual. […] So, it's the same concept what we have been doing with e-residency, but given that it happens in the US, it is way bigger than our pioneering [e-residency programme] here in Estonia (interview 23).

In addition to such similarities, which strengthen the generalizability of our analysis, one further reason why Estonian e-residency provides an interesting case study is that the information exchange between authorities works more smoothly there than in most jurisdictions (OECD, 2017). The Estonian tax authority is also highly digitalized (Lember et al., 2018). Hence, Estonian concerns about supervising foreign entrepreneurs likely exist in other countries that offer similar online company registration and management services, allowing us to highlight research gaps in the literature (Yin, 2003). While the State-centered approach of Estonian e-residency differs from its private-sector-driven competitors, there are also overlaps between their two clienteles (interviews 15 and 23). In the following three sections, we document challenges encountered by Estonian authorities through three issue areas: the unexpected negative spillover effects in national supervision, the difficulties of supervising firms with no taxable income and the challenges in exchanging various kinds of information between authorities.

5. The unexpected negative spillover effects in national supervision

Policy challenges arise when countries develop their domestic economies by attracting foreign-based entrepreneurs while trying to achieve possibly conflicting policy goals. A former Finnish civil servant who followed Estonian governance closely at the time when the e-residency programme was developed notes how the programme was "developed by only a handful of people, after which it was soon initiated. Little by little, administrative problems started to emerge", as other government agencies had not been properly consulted in the design of the programme (interview 11). As a former Estonian civil servant notes, "The key question is balance, how to motivate e-residents to invest to Estonia and at the same time to get the taxes" (interview 17). Maintaining such a balance can be tricky because of negative spillover effects. As noted earlier, Baker and Murphy (2019) suggest that such effects should be examined with qualitative country assessments on the role of different tax classes and administrative practices in international spillover effects of national tax systems. Yet, they provide little guidance on where to look for such administrative hindrances, what they might look like and how they ought to be studied. This section starts unpacking this puzzle by documenting how administrative difficulties have generated tax spillovers in Estonia.

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When an entrepreneur wants to establish a company using e-residency, the first layer of control involves identifying the applicant. The e-residency team manages applications under the government agency Enterprise Estonia, but background checks are conducted by the Police and Border Guard (PBG) in cooperation with the tax authority. Depending on the home country, a successful applicant can obtain a digital ID card from an Estonian embassy or a visa consultancy firm (Ministry of Interior 2021; interview 16). As a civil servant (interview 21) explained, setting up a business is straightforward after obtaining an ID card. This interviewee noted that staff sometimes educate foreign "colleagues how you can set up a company in five minutes, and I log into the commercial register, and they just can't believe you can do this".

Although the claim of five minutes is somewhat exaggerated, the comment points to an important administrative problem: establishing companies online is highly streamlined, but monitoring them is cumbersome. After the e-residency programme started, several authorities – from the tax administration to the Financial Intelligence Unit (FIU) and the PBG – faced new and unanticipated tasks. Monitoring e-residents requires cross-governmental cooperation, but conducting background checks has been demanding both within Estonia and internationally (interviews 4 and 18). In Estonia, the PBG started receiving information on whether the Tax and Customs Board had reviewed applications only in 2018. Prospective e-residents were able to avoid any background checks by submitting their application as "a fan of Estonia". This deficiency surfaced only in 2020 in an audit by the National Audit Office (NAO). The audit report also noted how e-residency permits had been granted to entrepreneurs who had bans on business operations abroad (NAO, 2020).

The PBG gained automatic access to the Estonian criminal register only in 2019. Earlier, it had to conduct cumbersome manual inquiries of the register. A shortage of skilled labour, failed recruitment processes and staff turnover hampered cooperation between agencies. The NAO (2020) noted that the PBG managed to control the eligibility of less than 3 per cent of the e-residents over five years (2014–2019). Another issue was that an applicant might have a clean criminal record when applying for an e-residency but that later misdemeanors abroad might go undetected (interview 21). The Estonian Government has addressed some of these gaps, e.g. by starting to demand more detailed information from applicants (interviews 4 and 20; *The Baltic Times*, 2021). Yet, the situation remains far from ideal. For example, it can be difficult to monitor foreign entrepreneurs whose names match those of other people (in this context, entrepreneurs who have many namesakes). As a former Estonian civil servant notes, "you don't know the language, you don't know the culture, it is really hard for a police officer to do background checks on some person […] who has perhaps fifteen namesakes. Then it is really hard to find the reliable information" (interview 18).

The proliferation of digital identities can also enable entrepreneurs to switch IDs when registering for different services, jeopardizing supervision (Alev, 2020; Asari, 2020). As more countries start to offer various digital identities, the higher the chances that one of these systems enables people with malicious intentions or backgrounds to leverage their digital identity to access services in other countries. Even if administrative capacity and adequate IT systems are in place, legal reasons can make effective exchange of information between national authorities impossible (see next section).

The challenges that have hampered e-residency underline how limited administrative capabilities can obstruct effective monitoring even in countries ranking high in international digitalization comparisons. Such challenges in exchanging information are markedly different from the difficulties documented in the literature on global tax information exchange. The challenges we encountered concern either administrative issues within one country (i.e. Estonia), undetected changes over time in relevant background information, or lack of access to relevant background information. These are not the kinds of data points that have been in the focus of the literature on tax information exchange. The opportunity for fixing such loopholes through international treaties or organizations is limited. Rather, the countries that maintain such non-resident company registration systems need to ensure that relevant technical and administrative capabilities are in place.

6. Difficulties in supervising firms without taxable income

When corporate transparency has been discussed in the global tax governance agenda, it has typically been done through the country-by-country reporting initiative or some of its sector-specific applications (Garcia-Bernardo et al., 2021; Murphy, 2016; Seabrooke and Wigan, 2016; Stausholm et al., 2022). Country-by-country reporting obliges multinational enterprises to make detailed country-level financial data available in an easily readable form either for authorities or for the public. Yet, even its most ambitious proposals focus on expanding the publicity of financial information of large multinationals, leaving smaller companies aside. A separate policy debate has been waged on expanding beneficial ownership registers, which list persons who ultimately own, benefit from or control a company or an arrangement – directly or indirectly (van der Merve, 2020). Beneficial ownership registers would be useful for monitoring companies managed through online incorporation platforms, but even they would not alleviate many of the problems discussed here.

Tax authorities obtain information on companies and their owners from financial reports and tax declarations. Mismatches between countries of registration, ownership, management and operations can turn these documents into unreliable

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sources of information (interview 20). In early 2021, about one-third of e-residents' companies were liable for value added tax and less than 4 per cent declared that they had employees. Only about 15 per cent had paid taxes to Estonia.[8] Consequently, the Tax and Customs Board has lacked information about businesses operated by e-residents, including whether they pay taxes in the right jurisdiction or at all. Authorities rely on financial reports that often are submitted late or lack information. Sanctions for late or incomplete submissions are rarely imposed (interview 21).

These policy concerns differ markedly from those concerning the publicity of financial data of multinational enterprises. All major multinationals maintain meticulous records of the financial performance of their group companies, even if they are registered in secretive jurisdictions and hence kept out of the public domain. In the case of e-residents, a key problem is that this accounting data is not populated in the first place, because of mismatches between the locations of entrepreneurs and their companies.

In principle, Estonian financial service providers constitute another layer of control that would ideally weed out entrepreneurs and companies with questionable backgrounds or intentions. Yet, in some respects, this layer is only as strong as its weakest links. One service provider working for a well-established intermediary company criticized the ease of getting listed as a service provider on the Government's e-residency website, which brings a certain stamp of credibility. As this service provider notes, "I'm not sure if everyone [at the service provider marketplace] is okay, there are a lot of small hustlers" (interview 6). This interviewee also sees the inability or unwillingness of many entrepreneurs to pay for services as part of the problem:

> The whole concept of do-it-yourself is bringing in a lot of people who are very aggressive towards service providers. They are very critical about the fees that service providers ask, they are looking to get everything for free. It means that in terms of business, you also get a lot of nasty people. They are looking to do their business for free, mostly they are micro-entrepreneurs who are not used to pay for anything and they expect everything to be free just like internet is for free. (interview 6)

Interviewees also criticized the lack of reporting requirements for providers of e-residency-related services (interviews 4 and 6). The ability to swiftly form companies online – another attempt to support overall economic development and to boost nation branding – obstructs effective monitoring (interview 4).

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[8] Email from a representative of the Estonian Ministry of Finance, 8 April 2021.

Tax authorities in Estonia and abroad have responded to the issues generated by cross-border economic activities, for example, by algorithmic screening methods (using artificial intelligence) that look for red flags of suspicious transactions and business models (interview 20). Yet, such benefits may evaporate when numerous small firms enter a relatively small country with limited or no information available on firm activities. Novel algorithmic methods can help in screening transactions, but they cannot replace the investigative work needed for investigating suspicious cases, with resourcing that is typically matched with the size of the country's economy, instead of unpredicted influxes of foreign entrepreneurs.

The insufficient access to relevant financial information documented earlier relates to mismatches between places of residence and places of economic activities. Such mismatches result in situations in which the effective transparency requirements are watered down when the legal home of a company differs from the places where it is liable for value added tax or has employee responsibilities. These mismatches could be addressed by establishing new national or international standards for reporting and effective enforcement mechanisms.

7. Gaps in the international exchange of information

In the early 2010s, advances in the automatic exchange of tax information expanded opportunities for obtaining information on foreign investment (Ahrens and Bothner, 2020; Hakelberg, 2015; Lesage et al., 2020). Automatic exchange of tax information means that tax authorities exchange information on financial investments automatically, without having to resort to cumbersome cross-border information requests.

While expanding automatic information exchange has been a genuine advancement in global tax governance, it has involved loopholes related to sometimes high reporting thresholds and financial items that are excluded from reporting. Knobel and Meinzer (2014) point out for example that real estate and other asset classes remain excluded, and that although more than 100 countries have committed to the automatic exchange of tax information, the United States remains uncommitted. The collective impact of these loopholes and gaps in the exchange of information on economic and tax data generate manifold opportunities for tax avoidance. Researchers have also noted that the wealthy may use "golden visas", anonymous trusts and shell companies to circumvent reporting rules. As Ahrens et al. (2022, p. 652) point out, "a Maltese bank, for instance, may no longer feel obliged to report the account of an Italian citizen if she can document tax residence in Malta despite not having her center of vital interests there".

Yet the policy-level focus on automatic exchange of *tax* information may also lead us to miss other aspects of economic data that currently do not cross borders,

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even though they would be relevant for effective tax collection. Such gaps have received scant attention in the literature. For example, relevant officials may lack information on when a citizen of country X establishes a company abroad, even if said officials have a legitimate interest in such information (interviews 7 and 8). The challenges associated with the e-residency programme illustrate such difficulties, as mirrored in the NAO (2020) audit and a subsequent report from the Estonian Ministry of Finance (2021). Obtaining information on e-residents from countries with which Estonia has insufficient administrative cooperation has been particularly challenging, according to the Ministry's report.

Information on bans of business operations has not typically crossed borders and has largely remained outside relevant academic debates. The ensuing problems can be illustrated by one of the best-functioning bilateral information exchange systems in the world, between Finland and Estonia. These two countries have agreed to exchange relevant registry-related information automatically, including information on bans on business operations. A joint declaration by the prime ministers for exchanging such data was signed in 2016, but IT issues significantly slowed its implementation. In 2021, the scope expanded to cover information on many other items, such as value added and labour taxes. It effectively took five years to establish this internationally unique system (NAO 2020), which highlights the importance of tackling national administrative and resourcing challenges to exchange information. Moreover, even this system is not comprehensive. As an example, a Finnish civil servant notes, "We lack a mechanism that would notify the Finnish tax administration when a Finnish person takes a position of responsibility in an Estonian firm" (interviewee 8).

The European Union has recently begun to demand better information exchange on disqualified company directors (Council of the European Union, 2019; interview 20). Yet, the IT problems in two highly digitalized countries such as Finland and Estonia suggest that similar problems are likely to emerge elsewhere as well. Another issue is whether applicants have criminal records abroad. In principle, the PBG can make inquiries about offenses in public databases and international criminal record databases.[9] Yet, convictions related to economic crimes are often excluded from such databases, which points to yet another deficiency in international information exchange (NAO, 2020). Finally, as the OECD (2017, p. 13) notes, "There appear to be barriers to the ability of tax administrations to share information with the police or public prosecutor in non-tax investigations". International criminal records are accessible in criminal proceedings but inaccessible when granting e-residency permits (Ministry of Finance, 2021). FIUs exchange data mutually on the assumption that such data will be used only in criminal proceedings. Asking for such permission from a foreign FIU would be unusual.

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[9] See, for example, Interpol databases (www.interpol.int/How-we-work/Databases).

As an Estonian civil servant (interview 4) explains, they gather information and analyse it "in administrative procedures, and the background checks also takes place in administrative procedures. We have information that could be used in criminal intelligence, but we can't share it… It is a very complicated legal issue, how to spread intelligence among investigative authorities". This difficulty boils down not only to different organizational mandates of key agencies such as the FIU and the tax administration, but also to differences in proceedings that take place under administrative and criminal procedures. Such differences can make effective information exchange impossible. Other such items could be found with similar case studies, highlighting the potential scope of expanding both policy and academic debates on the international exchange of tax information.

The veracity of such risks can be further exemplified by pointing to the recent inflow of cryptocurrency firms in Estonia. The growth of the cryptocurrency industry began in 2016, when Estonia introduced a licensing system for crypto businesses. The threshold for conducting know-your-customer checks in crypto trades was set to €15,000. Any trades that remained under this threshold were essentially anonymous. The perks of e-residency provoked a rapid inflow of foreign crypto entrepreneurs to Estonia. At its peak (2019), some 1,300 licensed cryptocurrency service companies were registered in Estonia (FIU, 2022). The number of active firms has since collapsed to fewer than 400 as a result of stricter reporting rules and other new regulations. Yet, according to the FIU, over half of global cryptocurrency service providers were still registered in Estonia in mid-2021 (FIU, 2022).

8. Discussion: Overcoming the "concept-measurement" gap

Our case study has demonstrated that although policy relevance is often encouraged and important in research, we should also be open-minded about tacit policy concerns that have not yet emerged as major policy issues but that carry such potential. Online incorporation platforms and their governance constitute one such phenomenon. Understanding their operational logic highlights the novel ways in which national and international governance challenges get intertwined, generating failures in governing global business. In this section, we address such dynamics by discussing the nascent "concept-measurement gap" approach in the context of our analysis of administrative tax spillovers.

Recent years have seen important analytical openings on the deteriorating quality of economic statistics and the increasing rift between statistical artefacts and the theoretical concepts that we attach to them (Linsi and Mügge, 2019; Mügge and Linsi, 2021). Statistical categories are essentially Weberian (2012) ideal types that provide models for the scrutiny and systematic characterization of concrete situations. It has been claimed that to remain relevant, ideal types should be seen

as models to be developed as new empirical evidence comes along (Parker, 2013; Seabrooke and Wigan, 2022). Such reforms have been rare in the realm of economic statistics. The resulting concept-measurement gaps (Mügge and Linsi, 2021) have been mostly discussed in the context of the macroeconomic data that statisticians process. The key initiators of this approach, Mügge and Linsi (2021, p. 411) note how "massive increases in the volume and complexity of international economic transactions have multiplied the probability that a transaction will escape the nets of statistical measurement, or that it will be misattributed in the national accounts".

The firm-specific foundations of such misattributions have recently received some attention (Babic et al., 2020; Ergen et al., 2023; Schwartz, 2022) in the context of large multinational firms. We argue that the debate can be further improved by examining the micro-foundations of the concept-measurement gap against the three observations by Baker and Murphy (2019, p. 182), who argue that "tax spillovers occur both within and between jurisdictions; tax spillovers exist between different taxes; [and] tax spillovers can be created by administrative disorder and regulatory arrangements". These observations – especially the last one – point to the problems that public administrators face when collecting economic data.

As summarized in table 1, we have analysed such problems with the three-fold categorization of the unexpected spillover effects in the national supervision of e-residents, ensuing difficulties in supervising firms without taxable income and gaps in the international exchange of information. Each step of our analysis has pointed to complex administrative issues that have both generated concept-measurement gaps in assessing the economic activities of mobile entrepreneurs and carried real risks of significant tax spillovers. The ensuing tax spillovers and concept-measurement gaps are related neither to the work of statisticians nor to the activities of large multinational enterprises. Rather, they point to the importance of tackling the role of online incorporation systems and the ensuing spillover effects in the world economy.

Broadening the analyses of online incorporation systems and their spillover effects encourages developing closer cooperation between IB, global tax governance scholarship and research from a related perspective in public administration and policy (Moloney and Stone, 2019). The need for such trans-disciplinarity is highlighted by the situation in which the advances in tackling tax evasion and money laundering have often constrained the effective national capacity to supervise foreign entrepreneurs (interviews 4, 7, 8, 18, 20 and 21). We argue that the importance of addressing such deficiencies grows with the international proliferation of both State-driven (interviews 6, 16 and 30) and private-sector driven (e.g. Wyoming; also interview 23) online incorporation systems. The more important a jurisdiction becomes for such incorporations, the more crucial it is to nurture well-functioning and appropriately resourced national supervisory systems and associated mechanisms of international cooperation.

Table 1. Key takeaways by category of effect

Effects	Characteristics
Unexpected negative spillover effects of national tax systems	Difficulties in conducting background checks for applicants of online incorporation systems
	Administrative bottlenecks in exchanging information between agencies across borders
	Mismatches between the ease with which companies can be created in online incorporation systems and adjustments in administrative capacities to monitor these firms
Difficulties in supervising firms without taxable income	Mismatches between countries of registration, ownership, management and operations that make financial reports and tax declarations unreliable sources of information for authorities
	Risks related to effectively outsourcing supervisory responsibilities to business service providers
Gaps in international exchange of information	Limitations of automatic information exchange on bans of business operation, corporate registrations, and tax items such as value added and labour taxes
	Difficulties in sharing information between administrative and criminal procedures

Source: Authors' elaboration.

9. Concluding remarks and policy implications

This paper has pointed to an important area for further research and policy work for interdisciplinary scholarship on global tax governance by delving into the governance challenges created by online incorporation systems. We have demonstrated that while the OECD's efforts to expand the international exchange of tax information are laudable, de facto national capabilities to benefit from them vary greatly within and between countries. If the lack of such capacity has been an issue for a well-functioning country like Estonia, other countries that attract or aim to attract large amounts of foreign small-scale entrepreneurs are likely affected as well. Given the allure of the economic benefits – such as registration fees or even some real economic activities – brought by foreign entrepreneurs, tackling the administrative challenges discussed here is of great urgency. Although most of the businesses that use online incorporation services are small, their collective impact can be significant.

Several policy changes could be executed in the national, regional and global spheres of governance. Starting with the first category, the NAO (2020) has suggested that permissions to establish and manage companies abroad should be granted only to individuals from countries with which the registrant country has well-functioning administrative cooperation and information exchange. Applying this proposal would also benefit the governance of foreign-owned small firms in places such as Wyoming or London. Moreover, the NAO points out that the burden of proof of a clean criminal record and permission to conduct business could be with the entrepreneur, even if individuals may sometimes attempt to counterfeit these documents.

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One counterargument to such proposals is that these steps could undermine efforts targeted at attracting foreign entrepreneurs. As the evidence shows, solving this policy conflict assumes targeted investments into administrative capabilities ranging from skilled personnel to data exchange and interorganizational coordination. The question remains if the expected benefits in one policy area would outweigh the investment needed and potential indirect setbacks, such as reputation loss, in another policy area.

Finally, the exchange of information on bans on business operations and other relevant items of economic data needs to be expanded regionally (e.g. within the European Union) as well as internationally. International organizations also need to overcome the difficulties in exchanging information between administrative and criminal procedures, which currently hamper the use of information on criminal records related to economic crime. Mapping the full range of such difficulties should be supported by incorporating such efforts into the country reviews of organizations such as the Financial Action Task Force, the OECD and the International Monetary Fund. A growth in the ratio of foreign-based entrepreneurs and national administrative resources should be reflected in such reviews, and it could be incorporated in tax spillover analyses.

The challenges and policy proposals discussed here have different implications for countries in the global North and South. It is generally easier for the highly developed OECD countries to mitigate the effects of tax spillovers in general, not to mention emerging themes such as online company registration platforms. Hence, addressing the international administrative bottlenecks and secrecy structures that enable ensuing tax spillovers is also very much a development policy issue. The negative development impacts could be addressed by both stronger international transparency and administrative cooperation, as well as in tax-related technical assistance programs.

Further research could examine the administrative capacities of countries that have established, or plan to establish, similar programmes. Such analyses could be complemented with interviews of entrepreneurs and service providers in these countries. More research would also be needed on how key international organizations (such as the Financial Action Task Force) could alleviate issues related to, for example, sharing of information between FIUs and other regulators, and the difficulties in sharing information between administrative and criminal procedures.

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Annex table. Interviewees

Interview number	Interviewee position	Date
1	Service provider, non-recorded background interviews	9 July 2018 6 October 2020
2	Finnish civil servant, non-recorded background interview	10 September 2020
3	Finnish civil servant, non-recorded background interview	23 September 2020
4	Estonian civil servant	9 October 2020
5	Estonian civil servant	22 October 2020
6	Service provider	10 November 2020
7	Finnish civil servant	18 November 2020
8	Finnish civil servant, joint interview with Interview 7	18 November 2020
9	Service provider	16 November 2020
10	Entrepreneur, non-recorded background interview	25 November 2020
11	Former Finnish civil servant	27 November 2020
12	Entrepreneur	10 February 2021
13	Service provider	12 February 2021
14	Entrepreneur	19 February 2021
15	Estonian civil servant	3 March 2021
16	Former Estonian civil servant, entrepreneur	5 March 2021
17	Former Estonian civil servant	8 March 2021
18	Former Estonian civil servant	9 March 2021
19	Entrepreneur	1 March 2021
20	Estonian civil servant	5 April 2021
21	Estonian civil servant	8 April 2021
22	Entrepreneur	22 April 2021
23	Former chief executive officer of the e-residency team	4 May 2021
24	Service provider	6 May 2021
25	Entrepreneur	20 September 2021
26	Researcher and e-resident	21 September 2021
27	Entrepreneur	4 October 2021
28	Entrepreneur	6 October 2021
29	Entrepreneur	7 October 2021
30	Former department head in the Ministry of Interior	11 October 2021

Source: Authors' compilation.

Drivers of R&D greenfield investment projects in the communications, software and IT service industries in developing countries*

David Schulzmann,[a] Evis Sinani,[b]
Bersant Hobdari[c] and Bent Petersen[c]

Abstract

Globalization has led to the decentralization of research and development (R&D) activities by multinational enterprises (MNEs). Investment in these activities is affected by both the host-country environment and the investment strategies of the entrant MNEs. Using data on greenfield R&D investment projects for a sample of digital MNEs in the communications, software and IT service industries during the period 2003–2019, we investigate the importance of host-country characteristics on MNEs' R&D investment and examine the moderating role of the host country's innovation capabilities as well as two strategies – exploitation versus exploration – on the part of MNEs. We find that the size of investment projects is larger in developing countries than in developed ones, especially when host countries have stronger innovation capabilities and when MNEs pursue strategies of exploitation rather than exploration. Our findings contribute to the extant research in this area and furnish related policy implications for developing countries.

Keywords: developing countries, global innovation index, host country innovation capabilities, R&D greenfield investment project, R&D investment strategies

JEL classification codes: F21, F23, F68, L21, L86

[a] Department of International Business, Centre for International Business at the University of Leeds, Leeds University Business School, Leeds, United Kingdom; Aalborg University Business School, Aalborg, Denmark.

[b] Corresponding author. Department of International Economics, Government and Business, Copenhagen Business School, Frederiksberg, Denmark (es.egb@cbs.dk).

[c] Department of International Economics, Government and Business, Copenhagen Business School, Frederiksberg, Denmark.

1. Introduction

International business research has paid close attention to foreign direct investment (FDI) in research and development (R&D) (Choquette et al., 2021; Dachs and Zahradnik, 2022) and has shown that multinational enterprises (MNEs) play an important role in generating foreign R&D activities in both developing and developed countries. The last decades have seen a shift in the international R&D investment of MNEs from developed economies to emerging and developing ones (UNCTAD, 2005a; von Zedtwitz, 2004). The rise of emerging and developing economies in MNEs' location choice for foreign R&D challenged the traditional approach to overseas R&D, by focusing solely on the technological and knowledge capacity of host countries as key determinants of R&D internationalization. This calls for a better understanding of the importance of location characteristics among investment characteristics for MNEs' international R&D investment.

The importance of the digital industries as a destination for R&D investment has been increasing over time. A survey of the top 2,000 companies that invested the most in R&D in 2014 found that 21 per cent of their subsidiaries were in the information and communication technology (ICT) industry, and that the share of subsidiaries going to developing countries such as China, India and Malaysia was larger than the share going to the United States or Northern Europe (Daiko et al., 2017). Within the ICT industry, the largest share of active subsidiary companies was in IT services, telecommunication, computers and electronics and publishing and broadcasting. The number of FDI projects in these industries rose from 2,232 in 2020 to 2,886 in 2021, and most of them were greenfield investment – 1,778 in 2020 and 2,206 in 2021.[1] Geographically, while almost all regions experienced increases in the number of projects attracted, four – Western Asia and Northern Africa, and Central America and the Caribbean – experienced the highest growth rates.[2] In addition, research shows that low-cost developing countries are hubs for the non-core R&D activities of many MNEs (Awate et al., 2015; Reddy, 2000) and that digitalization, development of new technologies and advancements in ICT have created immense opportunities for developing countries (UNCTAD, 2017). These trends underscore the growing importance of developing countries as destinations for R&D investment and necessitate a closer look at factors that drive this phenomenon.

Although there is extensive research on MNEs' use of exploitation and exploration strategies (e.g. Choquette et al., 2021; Frost et al., 2002), little attention has been paid to the interdependence between the host-country context, firms' investment

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[1] Lara Williams, "FDI in software and IT services in 2021: The state of play", Investment Monitor, 8 September 2022.
[2] Ibid.

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strategies and the size of R&D investment of digital MNEs in developing and developed countries. Accordingly, this paper explores the role of location and investment project characteristics in determining the size of MNEs' greenfield R&D investment in communication, software and IT service industries (used interchangeably with "digital industries" in the rest of the paper)[3] across the globe over the period 2003–2019.

The ability of developing countries to attract R&D investment depends, among other things, on the host country's characteristics, such as innovation capabilities (Choquette et al., 2021). The globalization of R&D has led to higher technological intensity in MNEs' products, strengthening their competitive advantage through improved innovation capabilities in international operations (von Zedtwitz and Gassmann, 2002). By targeting developing countries for establishing subsidiaries that focus on R&D activities, MNEs are expected to gain access to national innovation systems (Patel and Vega, 1999), facilitating successful adaptations (Dunning, 1988). Hence, we focus on developing-country factors – and especially their national innovation systems – in attracting greenfield R&D investment.

Furthermore, the patterns of globalization of R&D activities depend on MNEs' market expansion strategies. To ensure both short-term success and long-term survival, MNEs may choose between exploiting existing knowledge or exploring new knowledge. Exploitation refers to market expansion strategies in which MNEs adapt their technological assets in response to new demand conditions (Kuemmerle, 1997; Patel and Vega, 1999), and exploration refers to new market entry strategies in order to access and absorb specific local knowledge (Kuemmerle, 1997). Over the last decades, many MNEs have shifted from exploitation strategies to exploration ones in their international R&D activities (Awate et al., 2015). The optimal balance between the two strategies depends not only on firm-specific factors, but also on technological dynamism and market competitiveness. Developing countries are characterized by environmental uncertainties driven by political, economic and institutional changes. Such uncertainties demand that firms not only reconfigure existing resources and competencies to survive in the short term but also create new products and processes to compete in the long term.

The objective of this research is to understand (i) whether developing or developed countries attract higher investment in greenfield projects in the communication, software and IT service industries, (ii) the role of a country's innovation capabilities in determining the size of R&D greenfield investment and (iii) whether the size of greenfield investment projects is affected by the project's investment strategy.

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[3] Although "digital industries" is broader than the industries we focus on, the communication, software and IT service industries constitute a large part of them.

The analysis is based on comprehensive and authoritative data on greenfield R&D investments compiled by fDi Markets, and our conclusions do not generalize beyond this context. Our findings provide important contributions to the literature on R&D internationalization and have several policy implications.

2. Literature review and research questions

2.1 Digital MNEs' greenfield R&D investment projects in developing and developed countries

Research on international business argues that developed countries have traditionally attracted R&D FDI (Haakonsson and Ujjual, 2015; Lemi, 2010). Indeed, in line with the theory of technological competence, MNEs have chosen to invest in developed countries because of their more advanced technologies (Le Bas and Sierra, 2002). Developed countries have also offered comparable advanced technological infrastructure for developed-country multinationals, allowing them to combine home- and host-country R&D activities (Chung and Yeaple, 2008). For example, communication technology companies such as Ericson, Motorola and Qualcomm preferred to apply R&D investment and conduct the majority of their R&D activities in developed countries that have strong enforcement of intellectual property rights, which serves as a safety net for their investments (Di Minin and Bianchi, 2011). By comparison, developing countries have traditionally not been desirable locations for international R&D (UNCTAD, 2005b).

Yet, this pattern has been changing. Digital MNEs in particular have recently started to carry out investment related to ICT infrastructure. For instance, Alphabet has made telecommunication investments and Amazon has started a number of renewable energy projects in Africa (UNCTAD, 2022). Furthermore, most developing countries have embraced digitalization to improve business transparency, revolutionize the banking system and increase revenue mobilization (Ayakwah et al., 2021; Senyo and Osabutey, 2020). This has led to growing demand for digital technologies, driving international R&D investment by digital MNEs in developing countries (Thursby and Thursby, 2006).

Research shows that a variety of factors influence R&D FDI in developing countries. Availability of internet infrastructure can help attract digital MNEs to build regional cooperation with local governments to invest in infrastructure and subsequent R&D investment projects (UNCTAD, 2017). The strength of intellectual property rights protection and government support through fiscal policies can further attract larger R&D FDI (Nielsen et al., 2017; UNCTAD, 2005a). Yet, market size and income-level growth are the two main drivers of such investment (Dunning, 1981; Grosse, 2019; Grubert and Mutti, 1991; Lim, 1983; Schneider and Frey, 1985).

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A sizeable and growing market offers better prospects for return on investment to digital MNEs by lowering R&D costs per unit of sales, and creating opportunities to recoup R&D investment quickly (Cohen and Klepper, 1996; Hitt et al., 1997). For instance, Ghana represents a large market prospect for mobile and telecommunication companies, given the increased importance of the banking industry's mobile money accounts (Senyo and Osabutey, 2020). Furthermore, the growth in local demand from a rising affluent middle class with augmented purchasing power has led MNEs to adopt market development or market penetration strategies in many developing countries (Ansoff, 1957).

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In addition to market size and income-level growth, the need to attract more FDI and to amplify the benefits from foreign to local firms (Meyer and Sinani, 2009) has spurred developing countries to invest in building their human capital and innovation potential. A well-educated and comparatively cheap labour force represents an innovation recruitment pool for R&D projects, whether in strategies of exploitation or exploration (Gassmann and Han, 2004). Investment-friendly fiscal policies and government investment in R&D infrastructure, e.g. science parks and incubators, have further driven MNE R&D investment expansion in developing countries (Chen, 2008; Haour and Jolly, 2014; UNCTAD, 2005a). Utilizing these advantages, many jobs in digital industries have been outsourced to developing countries, such as to China, India, Mexico and Viet Nam (Sethi et al., 2021; UNCTAD 2005a). For example, Accenture and IBM are among digital companies outsourcing their R&D to India (Hira, 2020). Over time, growing market-driven pressure for customized solutions has led leading digital MNEs such as Adobe Systems in India (Asakawa and Som, 2008), Google (Komoda et al., 2021) and Motorola (Qi et al., 2014) expand their R&D-related investment projects in developing countries towards more knowledge-seeking activities to meet local demand (UNCTAD, 2005a; Zhao et al., 2021).

In comparison with developing countries, the majority of digital industry R&D investment projects in developed countries has occurred through mergers and acquisitions (M&As) rather than greenfield investment (UNCTAD, 2017 and 2022). Among developing countries, greenfield R&D projects have primarily been located

in upper-middle-income countries such as Brazil, Mexico and South Africa. Digital MNEs have a high FDI lightness index, defined as the share of foreign sales to foreign assets, which determines their business models (UNCTAD, 2022). For instance, digital platforms and solutions do not require large physical capital investments, whereas e-commerce and digital content MNEs more often do. FDI research on developing countries shows that they attract more greenfield investment as such investment contributes more to economic growth (Wang and Wong, 2009). In this regard, market size and growth in income level are expected to play important roles also in attracting greenfield R&D investment (Athukorala and Kohpaiboon, 2010; Wang and Wong, 2009). This seems to be corroborated from our data showing that upper-middle-income countries, such as Brazil, Mexico and South Africa, do attract larger R&D projects (table 2). Although the overall tendency of global R&D investment in digital industries might lean towards M&As as the preferred entry mode, when one focuses on greenfield transactions it may be that developing countries might attract larger-sized projects. Therefore, we ask the following research question:

RQ1: Do developing countries attract higher investment in greenfield R&D projects in the communications, software and IT services industries compared with developed countries?

2.2 Host-country innovation capabilities and greenfield R&D investment projects

MNEs' investment in R&D improves their ability to acquire, absorb and utilize new technologies through FDI (Birkinshaw and Hood, 1998; Kogut and Zander, 1993; Wei and Nguyen, 2020). Thus, it is important to understand the nature of factors specific to a host country that "have an influence in creating national technological advantage, including the competitive climate, the financial system and education, training and basic research institutions" (Patel, 1995, p. 152).

Many developing countries seek to attract R&D investment to encourage technology transfer, knowledge stock and human capital formation, international trade integration and a competitive environment, as well as local enterprise development (Buckley et al., 2007; Liu et al., 2000; Meyer and Sinani, 2009). R&D investment is also expected to increase the developing country's absorptive capacity and strengthen the country's technological capabilities, thus ultimately improving its innovation capabilities (Buckley et al., 2007; Meyer and Sinani, 2009). Attracting R&D investment is also expected to improve any weaknesses in a host country's national innovation system, for example by fostering science–industry links and creating a critical mass of innovation capabilities (Bell and Pavitt, 1995; Lall, 1992). Hence, developing countries with established and improved innovation capabilities are expected to attract more R&D investment (Guimón et al., 2018).

Indeed, evidence shows that Chile's Government has promoted R&D FDI with policies that aim to improve the country's technological and innovative capabilities and target knowledge-based industries (Guimón et al., 2018).

The growing importance of developing countries as destinations for R&D-related FDI indicates the combined effect of economic development, technological progress and improved business environments. Many developing countries have made significant progress on a set of factors necessary to attract R&D investment, particularly in the digital industries, such as investing in skill and capacity development; improving research infrastructure, education and innovative capability; and increasing their own R&D investment as a proportion of GDP (World Bank, 2018; UNCTAD, 2017). These factors serve as proxies for the concept of absorptive capacity (Lane et al., 2006), which is the cornerstone of a country's ability to attract R&D-related investment. Continued improvements in developing countries' innovative capabilities, coupled with the global digitalization drive, are expected to increase the attractiveness of developing countries as destinations for R&D-related FDI.

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In research question RQ1 we asked whether developing countries attract higher investment in greenfield R&D projects in the digital industries than developed countries considering their large market size and growth potential. We extend this research question and ask whether digital MNEs with R&D investment projects will prioritize investments in developing countries with stronger innovation capabilities:

RQ2: Is the size of R&D greenfield investment projects in the communications, software and IT service industries in developing versus developed countries affected by the host country's innovation capabilities?

2.3 MNE investment strategy and greenfield R&D investment projects

Decentralization of knowledge-sourcing activities through R&D-related FDI has been a prerequisite for fuelling and sustaining MNEs' unique competitive advantages in any industry (Ambos, 2005; Grosse, 2019; Zhao et al., 2021). MNEs invest in a range of R&D and other knowledge-based activities in host countries to expand their global innovation networks and access market and technological opportunities (Haakonsson and Ujjual, 2015). The literature on R&D internationalization has identified home-based augmenting (exploration) and home-based exploitation (Kuemmerle 1997) as important knowledge-sourcing investment strategies. Both strategies take place across heterogenous locations that make use of both location- and firm-specific advantages (Cano-Kollmann et al., 2016; Narula and Santangelo, 2012).

Considering the complexity of globalization and FDI, MNEs may use a distinct, single strategy or a combination of the two strategies in their foreign subsidiaries (Haakonsson and Ujjual, 2015). MNE investment in accordance with exploitation strategies seeks to expand the current knowledge base and leverage already acquired skills and capabilities to utilize technologies (Choquette et al., 2021; Lavie et al., 2010). Hence, exploitation strategies tend to exploit existing competitive advantages (Kang et al. 2021; Makino et al., 2002). Exploitation activities are supported by intra-MNE knowledge transfer with the aim of recombining knowledge within the host market (Awate et al., 2015). They have been common to improve the ability to serve local market needs, reduce import tariffs (i.e. tariff-jumping) (Kojima, 1978) and to lower production costs in the host country (Pearce, 2012).

Exploration strategies are those through which MNEs develop new technical skills and capabilities (Lavie et al., 2010). MNEs that follow exploration strategies gain advantage by creating new products, often using novel technology (Kang et al., 2021). MNEs choose to focus on exploration strategies in developed countries, considering their advanced technological capabilities (Song et al., 2011). In some cases, however, MNEs use exploration strategies with the intent to invest in new, more creative R&D projects in developing countries in order to access specific tacit and locally bound knowledge that is unavailable in their home market (Choquette et al., 2021; Papanastassiou et al., 2020). Exploration strategies may thus generate additional innovation and facilitate the establishment of centres of excellence that become global leaders within the MNE in specific areas (Frost et al., 2002).

Previous research has argued that new larger R&D investments under exploration strategies tend to be located mainly in developed countries, owing to their higher innovation levels and stronger innovation capabilities (Choquette et al., 2021), whereas developing countries are the stage for exploitation investment in R&D owing to their lower R&D costs and capabilities (Demirbag and Glaister, 2010). However, as argued earlier, market and institutional developments have made

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developing countries more attractive destinations for R&D investment projects, including as locations for both exploiting and exploring knowledge (Andersson et al., 2016). While there seems to be agreement on this development, there are opposing views on whether exploitation and exploration take the form of an either-or type of activity or can be combined at different levels, leading to different forms of ambidexterity (Dodourova et al., 2023). Taking a microfoundational perspective, Dodurova et al. (2023) find support for MNEs' combined use of both strategies, albeit in different combinations leading to different types of ambidexterity.

It is important to note that the distinction between exploration and exploitation is often a matter of degree and should therefore be viewed as a continuum, with both activities being essential for firms. Yet, building on past research one could expect developed countries to attract relatively more R&D investment for exploration purposes than developing countries (Demirbag and Glaister, 2010; Gereffi et al., 2005). Therefore, we ask the following research question:

RQ3: Is the size of greenfield R&D investment projects in communications, software and IT industries in developing versus developed countries affected by the MNE's investment strategy?

3. Data, variables and methodology

Our data consists of greenfield R&D investment projects made by digital MNEs, in the communications and software and IT service industries, (i.e., digital industries) during the period 2003–2019. The source of the data is fDi Markets data by fDi Intelligence, a division of the Financial Times, which is widely used in previous research (Albino-Pimentel et al., 2022; Castellani et al., 2013; Castellani and Lavoratori, 2020; Choquette et al., 2021). This data provides information on the size of investment projects and the revenue generated for each R&D investment project, as well as whether the project is new or an expansion project, and whether the R&D investment is made in design, development and testing; ICT and internet infrastructure; research and development; or technical support. Moreover, it provides information on the home and host countries as well as the industry of each greenfield R&D investment.

The dependent variable is *investment size*, which is measured as the logarithm of the investment project size. The independent variables used to explore the three research questions are *host-country type*, *investment strategy* and *innovation capability*.

Host-country type equals one if a host country is a developing country and zero otherwise. We delineate developing countries on the basis of the OECD's Development Assistance Committee list of ODA recipients on which the OECD

database "Statistics on resource flows to developing countries" is based.[4] On that basis we create the dummy variable, dividing host countries between developing and developed countries.[5]

Investment strategy captures the nature of the MNE R&D investment strategy (i.e. exploiting versus exploring). It equals one if the project in the fDi Markets data is an expansion project, and zero if it is a new project. In line with existing research, we argue that expansion projects exploit current firm knowledge and *existing* competitive advantages, and thus reflect exploiting strategies, whereas new projects (or new products) allow firms to explore new competitive advantages and reflect exploration strategies (Kang et al., 2021; Makino et al., 2002).

Innovation capability is measured with the Global Innovation Index (GII), which is an indicator of the host country's ability to innovate and support innovative activities and is based on the premise that innovation is a driver of a host country's economic growth and prosperity (Dutta et al., 2020). The larger the index, the more innovative and supporting of innovative activities the economy is.

In the analysis we also control for home- and host-country characteristics, as well as investment project characteristics that have previously been associated with MNE investment decisions in foreign markets. For instance, the extant research has shown that firm decisions depend on location-specific characteristics such as market size, market growth, labour costs, human capital and knowledge stock needed in R&D production (Alcácer and Chung, 2007; Castellani et al., 2013; Nachum et al., 2008). Thus, we control for home- and host-country characteristics that capture economic and institutional differences at the country level and the dyad level.

At the country level, we control for home- and host-country *Investment incentives* and *R&D expenditure per capita*. Research has shown that a country's investment policy and stock of knowledge are important factors in attracting FDI (Borensztein et al., 1998; Grosse, 2019). For instance, a country's investment policy may encourage both outward as well as inward FDI (Meyer and Sinani, 2009). *Investment incentives* is an index that rates countries in terms of how attractive the investment climate is for foreign investment. The higher the index, the more attractive the investment incentives. Furthermore, countries that invest in R&D improve their absorptive capacities and are expected to attract more FDI (Guimón

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[4] See www.oecd.org/dac/financing-sustainable-development/development-finance-data/statisticson resourceflowstodevelopingcountries.htm. The list of ODA recipients we used is for aid reported in 2022–2023 (www.oecd.org/dac/financing-sustainable-development/development-finance-standards/ DAC-List-of-ODA-Recipients-for-reporting-2022-23-flows.pdf).

[5] The grouped countries are not identical to developing and developed economies under the United Nations classification.

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et al., 2018; Krammer, 2010). *R&D expenditure per capita* is the ratio of total R&D expenditure (in dollars) to a country's population. Furthermore, in line with previous research (Albino-Pimentel et al., 2022; Castellani and Lavoratori, 2020), we account for host-country location-specific characteristics that increase the likelihood of MNE investment such as market size, which is measured with the logarithm of host-country population, and growth in income levels, which is measured with the growth of host-country GDP per capita.

Research also suggests that a firm's investment decisions in a given location depend on the country's political risk and that all things equal, political risk deters firms' new entry and new investment (Delios and Henisz, 2003; Oetzel and Oh, 2014). Therefore, we control for home- and host-country political risk. A country's *political risk* score varies from the least risky (0) to the riskiest (100) in terms of unfavourable political environment for international business.

At the dyad level we control for whether home and host countries share a *common border*, have had *colonial ties* or have a *common primary language*. Research by Castellani et al. (2013) and Witte et al. (2020) shows that these variables increase the probability of MNEs' engaging in FDI in a specific host country, given that they reflect institutional similarities and a firm's ability to engage in more FDI investment. *Colonial ties* is a dummy that takes the value of 1 if the home and host countries had colonial ties and 0 otherwise; *common language* is a dummy that equals 1 if the home and host countries share a common primary language and 0 otherwise; and *contiguous* is a dummy that equals 1 if the home and host countries share a common border.

Finally, in line with prior research that controls for firm characteristics that affect investment decisions (Albino-Pimentel et al., 2022; Castellani et al., 2013; Choquette et al., 2021; Oetzel and Oh, 2014), we control for investment project characteristics. For instance, we control for project *performance* with the logarithm of the revenues it generated, and for the *R&D project designation* with a dummy for whether investments are made in business activities such as design, development and testing; ICT and internet infrastructure; R&D; or technical support. Table 1 provides a summary of the variables definitions, measurements, data sources and the level in the analysis.

Table 1. Variables, definitions and sources

Variable	Measurement	Source
Investment size	The logarithm of the size of each investment project.	fDi Intelligence, fDi Markets project database, 2003–2019.
Host-country type	1 = if a country is subject to the OECD's official development assistance (ODA) (i.e. considered a "developing country"), 0 = otherwise.	OECD, "Statistics on resource flows to developing countries", updated 22 December 2022; "DAC list of ODA recipients: Effective for reporting on 2022 and 2023 flows", www.oecd.org.
Innovation capability	The GII, ranging from 0 to 100 (highest innovation performance), indicates the host country's ability to innovate and support innovative activities as a driver of economic growth and prosperity. The overall GII is constructed as the average of the innovation input and innovation output sub-indexes.	Cornell University, INSEAD and the World Property Organization, "Global Innovation Index 2022", www.globalinnovationindex.org.
Investment strategy	1 = if the investment is an expansion project, 0 = if it is a new project.	fDi Intelligence, fDi Markets project database, 2003–2019.
Project designation – ICT and infrastructure	1 = if the investment is made in ICT infrastructure, 0 = otherwise.	fDi Intelligence, fDi Markets project database, 2003–2019.
Project designation – R&D	1 = if the investment is made in R&D, 0 = otherwise.	fDi Intelligence, fDi Markets project database, 2003–2019.
Project designation – Technical support	1 = if the investment is made in technical support, 0 = otherwise.	fDi Intelligence, fDi Markets project database, 2003–2019.
Project performance	The logarithm of revenue of each investment project.	fDi Intelligence, fDi Markets project database, 2003–2019.
Investment incentives	An index from 0 to 10 that rates countries in terms of how attractive their investment incentives are to foreign investors.	IMD, "World competitiveness 2022 ranking", World Competitiveness Online, www.imd.org.
R&D expenditure per capita	The ratio of total R&D expenditure to a country's population (in $ per capita).	IMD, "World competitiveness 2022 ranking", World Competitiveness Online, www.imd.org.
Political risk	Scores countries from least risky (0) to riskiest (100) in terms of political changes that are unfavourable for international business.	PRS Group, "International Country Risk Guide (ICRG)", November 2020, www.prsgroup.com.

Table 1. Variables, definitions and sources (Concluded)

Variable	Measurement	Source
Colonial ties	1= if a colony–colonizer relationship existed between the home and host country, 0 = otherwise.	CEPII, Gravity database, November 2022 (202211) version, www.cepii.fr.
Common language	1 = if the home and host country share a common primary language, 0 = otherwise.	CEPII, Gravity database, November 2022 (202211) version, www.cepii.fr.
Common border	1 = if the home and host country share a common border, 0 = otherwise.	CEPII, Gravity database, November 2022 (202211) version, www.cepii.fr.
Market size	The logarithm of the host country's population.	World Bank, "World Development Indicators" (accessed on 25 January 2023).
Market growth	The growth of the host country's GDP per capita (as a percentage).	World Bank, "World Development Indicators" (accessed on 25 January 2023).
Patent applications per capita	Measured as the number of applications filed by the applicant's country of origin, per 100,000 inhabitants.	IMD, "World competitiveness 2022 ranking", World Competitiveness Online, www.imd.org.
Patents granted	Measured as the number of patents granted by the applicant's country of origin (average 2016–2018).	IMD, "World competitiveness 2022 ranking", World Competitiveness Online, www.imd.org.

Source: Authors' compilation.
Note: CEPII = Centre d'Études Prospectives et d'Informations Internationales, DAC = Development Assistance Committee, GDP = gross domestic product, GII = Global Innovation Index, IMD = International Institute for Management Development, INSEAD = Institut Européen d'Administration des Affaires, OECD = Organisation for Economic Co-operation and Development, R&D = research and development.

4. Results and discussion

The distribution of the host countries and the respective (average) size of investment (table 2), shows that while the number of investment projects is higher mostly in developed countries, such as Australia, Canada, France, Germany, the United Kingdom and the United States, the size of investment is larger in the upper-middle-income ones, such as Argentina, Brazil, Mexico and Peru. This is important information; it shows that the size of R&D investment during the period 2003–2019 has, on average, been larger in developing countries. Therefore, identifying the factors that explain this pattern is an important contribution to the extant literature on MNE's internationalization of R&D.

Table 2. Distribution of the mean size of investments and number of investments, by host economy, 2003–2019

Destination economy	Mean investment ($ millions)	Number of investments	Destination economy	Mean investment ($ millions)	Number of investments
Argentina	249.99	44	Latvia	37.38	7
Australia	57.24	92	Lithuania	17.79	44
Austria	47.09	27	Luxembourg	288.08	5
Belgium	83.65	37	Malaysia	48.99	51
Brazil	169.34	177	Mexico	231.93	74
Bulgaria	14.13	43	Mongolia	91.00	1
Canada	124.42	251	Netherlands	231.01	97
Chile	236.90	38	New Zealand	41.74	16
China	48.17	224	Norway	79.92	12
Colombia	89.80	63	Peru	128.39	16
Croatia	30.04	13	Philippines	34.92	13
Czechia	27.34	41	Poland	21.48	123
Denmark	129.36	29	Portugal	35.15	39
Estonia	32.14	24	Qatar	15.30	1
Finland	70.00	51	Romania	18.27	137
France	35.72	170	Russian Federation	25.94	76
Germany	25.98	250	Singapore	71.13	203
Greece	60.19	11	Slovakia	43.14	22
Hong Kong, China	113.23	79	Slovenia	38.96	5
Hungary	24.37	52	South Africa	84.97	50
Iceland	107.00	4	Spain	31.04	211
India	36.49	459	Sweden	50.20	51
Indonesia	42.02	17	Switzerland	36.51	8
Ireland	49.06	223	Thailand	63.96	19
Israel	25.04	72	Türkiye	58.72	21
Italy	119.85	40	United Arab Emirates	60.56	31
Japan	36.85	92	Ukraine	28.54	19
Jordan	32.50	5	United Kingdom	46.04	423
Kazakhstan	64.16	10	United States	62.38	318
Korea, Republic of	66.56	38	Venezuela, Bolivarian Republic of	99.97	19
			Total	**65.85**	**4 788**

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

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Table 3. Distribution of the number of investments from communications and software and IT services across business activities, 2003–2019

Business activity	Communications	Software and IT services	Total
Design, development and testing	547	2 027	2 574
ICT and internet infrastructure	1 325	384	1 709
Research and development	51	100	151
Technical support	86	268	354
Total	2 009	2 779	4 788

Source: Authors' calculations, based on fDi Markets project database.
Note: ICT = information and communication technology, IT = information technology.

Furthermore, a distribution by business activities (table 3) shows that most of the investments in the digital industries are in design, development and testing and in ICT and internet infrastructure. This pattern is in line with the *World Development Investment Report 2022* (UNCTAD, 2022), which points out that the need (which prevailed during the pandemic) to adopt new digital solutions has led to new entrants in digital MNEs' market, mainly in digital platforms and e-commerce. Furthermore, although international investment in ICT infrastructure has increased, only the top digital MNEs pursue such investment abroad (UNCTAD, 2022).

Table 4 shows the summary statistics and the correlation matrix of our main variables. The results show that correlations are low, suggesting there are no multicollinearity issues.

Our data consists of 4,788 R&D investment projects, made by parent firms across multiple host countries, over the period 2003–2019. Since the project data represent different R&D investments made by parent firms over time, the database represents a cross-section of R&D investment. However, given that a parent firm may have made several R&D investments over the period 2003–2019, we are able to cluster the errors at the firm level and estimate ordinary linear regressions with heteroscedastic and autocorrelation-consistent standard errors, also including year, digital industries and region fixed effects.

The regression results are reported in table 5, models 1–3. Model 1 tests for research question RQ1, and models 2 and 3 test for the proposed moderators. RQ1 inquires whether developing countries attract higher R&D investment than developed countries. Our results show that the coefficient for the *host-country type* is positive and significant at the 1 per cent significance level (model 1: b1 = 0.184, p = 0.002). The coefficient of the *host-country type* implies that, on average, R&D investment in developing countries is larger than investment in developed countries

Table 4. Summary statistics and correlation matrix of main variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Host-country type	1																	
2. Innovation capability	-0.41	1																
3. Investment strategy	-0.06	0.01	1															
4. Project designation – ICT and infrastructure	-0.04	-0.03	-0.08	1														
5. Project designation – R&D	0.03	-0.02	-0.01	-0.19	1													
6. Project designation – Technical support	0.01	-0.06	0.01	-0.21	-0.07	1												
7. Project performance	0.03	-0.07	0.01	0.04	0.10	0.02	1											
8. Contiguous	-0.15	0.04	-0.01	0.07	-0.01	-0.03	-0.02	1										
9. Common language	0.05	0.08	0.07	-0.02	-0.01	0.00	-0.15	0.09	1									
10. Colonial ties	-0.18	0.09	0.01	0.02	-0.03	-0.02	-0.05	-0.01	0.28	1								
11. Investment incentives – Home	-0.05	0.23	0.06	-0.04	-0.01	-0.02	-0.12	-0.02	0.20	-0.01	1							
12. Investment incentives – Host	-0.12	0.37	0.03	-0.03	0.03	-0.02	-0.04	0.01	0.26	0.03	0.04	1						
13. R&D expenditure per capita – Host	-0.49	0.47	-0.02	0.13	-0.06	-0.07	-0.03	0.04	0.03	0.08	0.02	0.30	1					
14. R&D expenditure per capita – Home	-0.05	0.12	0.07	-0.03	-0.04	-0.02	-0.06	-0.10	0.05	-0.05	0.33	0.02	0.02	1				
15. Political risk – Home	-0.05	0.08	0.07	-0.02	0.01	-0.02	-0.07	-0.07	0.02	-0.01	0.35	0.02	-0.01	0.51	1			
16. Political risk – Host	-0.52	0.44	0.02	0.04	-0.02	-0.03	-0.02	0.12	0.03	0.07	0.06	0.35	0.70	0.07	0.10	1		
17. Market size	0.33	0.13	0.01	0.22	0.07	0.01	-0.04	0.03	0.10	0.02	0.02	0.15	0.32	0.00	0.03	0.42	1	
18. Market growth	0.46	0.04	0.01	0.14	0.10	0.03	0.01	0.07	0.10	0.12	0.03	0.20	0.39	0.04	0.01	0.32	0.31	1
Mean	0.46	41.54	0.19	0.35	0.06	0.08	8.13	0.09	0.39	0.15	6.52	6.24	575.72	1 117	81.2	76.8	10.90	3.03
Standard deviation	0.50	18.58	0.39	0.48	0.24	0.27	3.16	0.29	0.49	0.36	0.93	1.13	552.17	523.63	6.74	8.92	1.77	3.49
Minimum	0	2.02	0	0	0	0	0.01	0	0	0	0.94	0.67	1.26	0.64	52	45	5.77	-14.40
Maximum	1	68.40	1	1	1	1	13.09	1	1	1	8.98	8.98	2 782	2 782	93	93	14.29	25.10

Source: Authors' estimations.

Note: ICT = information and communication technology, R&D = research and development.

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Table 5. Results of regression analysis

Variable	(1)	(2)	(3)
Host-country type	0.184*** (0.059)	-0.120 (0.082)	0.154** (0.060)
Innovation capability	0.006* (0.004)	0.006* (0.004)	0.006* (0.004)
Investment strategy	0.012 (0.048)	0.017 (0.048)	0.129 (0.088)
Host country x Innovation capability		0.008*** (0.002)	
Host country x Investment strategy			0.168** (0.082)
Project designation – ICT and infrastructure	1.538*** (0.043)	1.539*** (0.043)	1.537*** (0.043)
Project designation – R&D	0.322*** (0.085)	0.314*** (0.085)	0.320*** (0.085)
Project designation – Technical support	-0.374*** (0.061)	-0.371*** (0.061)	-0.371*** (0.061)
Project performance	0.056*** (0.007)	0.055*** (0.007)	0.056*** (0.007)
Contiguous	-0.071 (0.087)	-0.075 (0.088)	-0.067 (0.088)
Common language	0.003 (0.041)	0.008 (0.041)	0.001 (0.040)
Colonial ties	-0.082 (0.059)	-0.085 (0.059)	-0.079 (0.058)
Investment incentives – Home	0.031 (0.028)	0.030 (0.027)	0.031 (0.027)
Investment incentives – Host	0.066** (0.026)	0.054** (0.026)	0.068*** (0.026)
R&D expendigure per capita – Home	-0.047 (0.000)	-0.042 (0.000)	-0.049 (0.000)
R&D expenditure per capita – Host	0.300*** (0.000)	0.300*** (0.000)	0.300*** (0.000)
Political risk – Home	0.005 (0.005)	0.005 (0.005)	0.005 (0.005)
Political risk – Host	-0.001 (0.005)	-0.002 (0.005)	-0.001 (0.005)
Market size	0.072*** (0.020)	0.066*** (0.020)	0.074*** (0.020)

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Table 5. Regression results for the main and moderating hypotheses (Concluded)

Variable	(1)	(2)	(3)
Market growth	0.040*** (0.006)	0.020*** (0.006)	0.040*** (0.006)
Constant	2.395*** (0.757)	2.654*** (0.755)	2.426*** (0.756)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects (Communication vs. Software and IT)	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
Observations	4 777	4 777	4 777
R-squared	0.541	0.543	0.541

Source: Authors' estimations.

Note: ICT = information and communication technology, IT = information technology, R&D = reseaarch and development. OLS regressions with industry, region and year fixed effects, and with errors clustered at the firm level. Robust standard errors in parentheses. Significance levels *** p<0.01, ** p<0.05, * p<0.10.

by 18.4 per cent. This result, in the context of greenfield investment projects in communications, software and IT services industries, supports the new pattern of R&D internationalization (UNCTAD, 2005a; von Zedtwitz, 2004) that highlights the shift of international R&D by MNEs from developed countries to emerging and developing countries as well as the arguments that the comparatively lower R&D costs and larger investment incentives in developing countries encourage R&D investment projects by digital MNEs (Hitt et al., 1997; Nielsen et al., 2017).

Model 2 investigates the moderating effect of the host country's innovation capabilities. The interaction effect of the *host-country type* with the host country's *innovation capability*, measured by GII, is positive and significant at 1 per cent significance level (model 2: b4 = 0.008, p = 000). Thus, the host country's *innovation capability* positively moderates the effect of developing countries on the size of R&D investment projects, providing support for the arguments leading to RQ2 and further reinforcing the finding that developing host countries attract larger R&D greenfield investment projects in the communications, software and IT service industries than do developed host countries.

The moderating effect of host countries' *innovation capability* is graphically displayed in figure 1, for the *innovation capability* values at the mean, one standard deviation above the mean and one standard deviation below the mean. We see that the predicted values of the size of investment increase as the *innovation capability* increases by one standard deviation along the horizontal axis (from 22.96 to 41.54 or to 60.11). Furthermore, this effect is stronger for developing host countries.

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We calculate that an increase in host-country *innovation capability* by one standard deviation (18.57) increases the size of investment projects in developing countries by 17.1 per cent.

Research by Choquette et al. (2021) shows that the magnitude of the effect of the innovation framework in emerging and advanced economies does not differ significantly for investment projects in the pharmaceutical industry. We expand upon this finding and show that for developing and developed host countries at the same innovation level (i.e. at the mean), an increase in the host country's innovation level will lead to larger greenfield investments in developing countries than in developed ones by MNEs in the digital industries. These results, furthermore, support the broader statements in the literature about the importance of host-country innovation, in that host countries with innovation capabilities, such as the ability to innovate and support innovative activities, are able to attract more FDI (Papanastassiou et al., 2020).
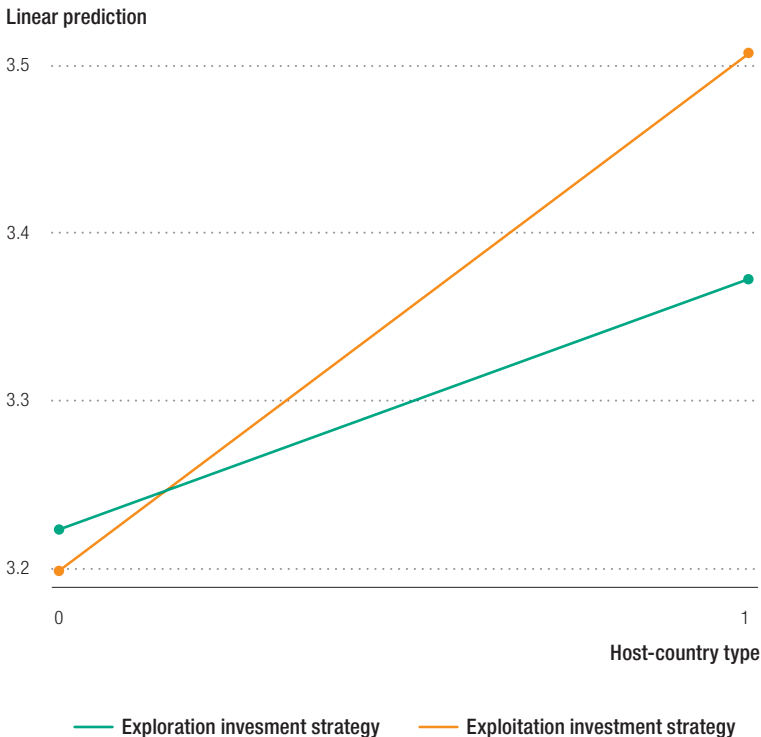
Figure 1. The moderating effect of host-county innovation capability on the relationship between size of R&D investment projects and type of host country

Linear prediction

Developing host countries — Developed host countries

Innovation capability - Host
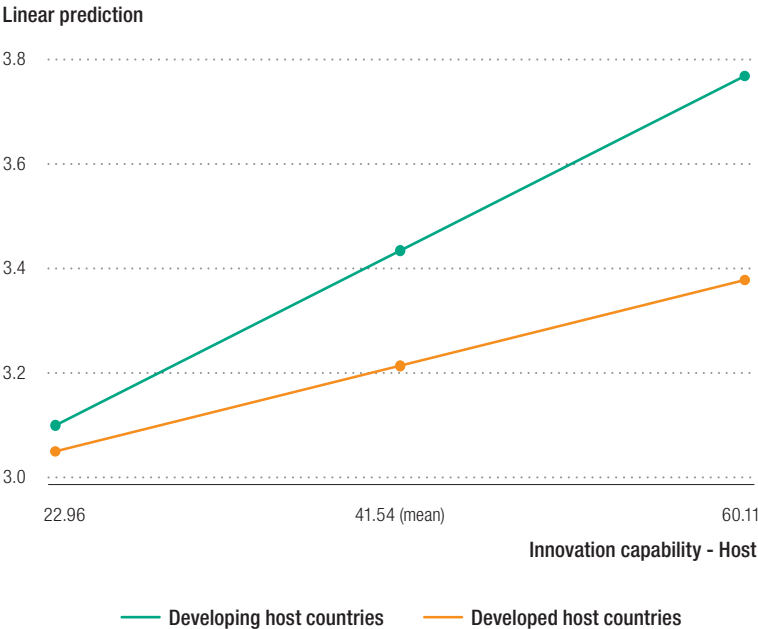
Source: Authors' estimations.

Model 3 tests for the moderating effect of investment strategy, namely, exploitation projects rather than exploration projects (i.e. expansion projects rather than new projects, in the fDi Markets data) (model 3: b5 = 0.168, p = 0.041). The results show that R&D investment projects in developing countries are 16.8 per cent larger for exploitation projects than exploration projects. Indeed, figure 2 shows that R&D investments are larger for exploitation than for exploration projects and that this effect is larger in developing countries than in developed ones. Thus, we find evidence supporting the reasoning behind RQ3. These findings also support prior arguments that developing countries tend to attract exploitation rather than exploration R&D investment due to the lower R&D cost and the incremental knowledge base characterizing such projects (Demirbag and Glaister, 2010).

Figure 2. The moderating effect of MNE investment strategy on the relationship between size of R&D investment projects and type of host country

Linear prediction

Host-country type

Exploration invesment strategy   Exploitation investment strategy

Source: Authors' estimations.

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We also control for a range of project and home- and host-country characteristics. Among the project characteristics, we find that compared with projects dedicated to design, development and testing (the base case), projects dedicated to ICT and infrastructure and R&D are significantly larger, while projects in technical support are significantly smaller. Furthermore, project performance correlates significantly with investment size, suggesting that the more profitable projects are also larger. Among the home- and host-country characteristics, in line with our predictions, host-country investment incentives and expenditure on R&D per capita are significant and positive in sign, suggesting that host countries with stronger incentives for FDI and with higher R&D expenditure per capita attract larger R&D investment projects. In addition, we find that market size and growth are positive and significant in all regressions, providing support for their importance for R&D investment (Grosse, 2019; Nielsen et al., 2017). This finding also provides further support for the trend of upper-middle-income developing countries attracting the substantial share of greenfield R&D investment in developing countries in the communications, software and IT industries.

In our robustness checks, we also consider other measures for host-country innovation capabilities. For instance, we run regressions using patent applications per capita and/or patents granted, as measures of host-country innovation. The results in table 6, models 2 and 4, show supporting evidence for RQ2, as the coefficients of the interaction of the *host-country type* for developing and developed countries with patent applications per capita or with patents granted are significant at 1 per cent significance level.

Table 6. Robustness checks with patent applications and patent granted

Variable	(1)	(2)	(3)	(4)
Host-country type	0.201***	0.119*	0.163***	0.086
	(0.055)	(0.061)	(0.055)	(0.056)
Patent application per capita	0.001***	0.001***		
	(0.000)	(0.000)		
Host country x Patent applications per capita		0.003***		
		(0.001)		
Patents granted			-0.002	-0.022***
			(0.003)	(0.003)
Host country x Patents granted				0.042***
				(0.004)
Investment strategy	0.055	0.062	0.051	0.059
	(0.043)	(0.044)	(0.044)	(0.044)

Table 6. Robustness checks with patent applications and patent granted (Concluded)

Variable	(1)	(2)	(3)	(4)
Project designation – ICT and infrastructure	1.567*** (0.042)	1.571*** (0.042)	1.573*** (0.042)	1.580*** (0.042)
Project designation – R&D	0.277*** (0.052)	0.276*** (0.052)	0.278*** (0.052)	0.274*** (0.053)
Project designation – Technical support	-0.394*** (0.055)	-0.391*** (0.055)	-0.390*** (0.054)	-0.380*** (0.053)
Project performance	0.055*** (0.006)	0.054*** (0.007)	0.055*** (0.007)	0.053*** (0.007)
Contiguous	-0.076 (0.072)	-0.088 (0.073)	-0.074 (0.072)	-0.134* (0.070)
Common language	0.062* (0.035)	-0.049 (0.036)	0.088** (0.036)	0.090** (0.036)
Colonial ties	-0.028 (0.054)	-0.044 (0.054)	-0.031 (0.054)	-0.019 (0.053)
Investment incentives – Home	0.020 (0.025)	0.021 (0.025)	0.023 (0.025)	0.024 (0.025)
Investment incentives – Host	0.067*** (0.018)	0.056*** (0.018)	0.060*** (0.017)	0.046*** (0.017)
R&D expenditure per capita – Home	-0.090 (0.000)	-0.091 (0.000)	-0.093 (0.000)	-0.110 (0.000)
R&D expenditure per capita – Host	0.450*** (0.000)	0.490*** (0.000)	0.310*** (0.000)	0.140** (0.000)
Political risk – Home	0.006 (0.005)	0.006 (0.005)	0.006 (0.005)	0.005 (0.005)
Political risk – Host	0.011*** (0.004)	0.010** (0.004)	0.011*** (0.004)	0.011*** (0.004)
Market size	0.041** (0.017)	0.032* (0.018)	0.033* (0.018)	0.016 (0.017)
Market growth	0.040*** (0.005)	0.050*** (0.005)	0.040*** (0.005)	0.010* (0.006)
Constant	0.969 (0.596)	1.068* (0.597)	0.948 (0.595)	0.998* (0.593)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effects (Communication vs. Software and IT)	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Observations	4 788	4 788	4 788	4 788
R-squared	0.516	0.517	0.515	0.522

Source: Authors' estimations.

Note: ICT = information and communication technology, IT = information technology, R&D = reseaarch and development. OLS regressions with industry region and year fixed effects, and with errors clustered at the firm level. Robust standard errors in parentheses. Significance levels *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

5. Conclusions and policy implications

In this paper we investigate the importance of host-country characteristics on MNEs' R&D investment decisions and examine the moderating role of host-country innovation capabilities and MNEs' exploiting versus exploring investment strategies. Using greenfield R&D project data for a sample of digital MNEs in communications, software and IT services during the period 2003–2019, we find that the size of R&D investments is larger in developing countries than in developed ones. This effect is positively moderated by host-country innovation capabilities and MNEs' strategies (exploitation versus exploration). Our paper makes three important contributions to the R&D internationalization literature.

First, our findings support the recent shift in the pattern of R&D internationalization from developed to developing countries (von Zedtwitz, 2004) and provide support to the arguments that despite the lack of strong institutions or innovation systems, developing countries pursue digitalization as a means to achieve development (Ayakwah et al., 2021; Senyo and Osabutey, 2020) and that lower R&D costs and larger investment incentives in developing countries encourage digital MNEs' greenfield R&D investment projects (Hitt et al., 1997; Nielsen et al., 2017).

Second, we contribute by showing that an increase in the host country's innovation capabilities leads to larger greenfield R&D investments by digital MNEs in the communications, software and IT service industries in developing countries than in developed countries (Choquette et al., 2021). Furthermore, this finding provides broad support to the argument that host countries with innovation capabilities, such as the ability to innovate and support innovative activities, are able to attract more FDI (Papanastassiou et al., 2020).

Third, our findings suggest that digital MNEs that pursue exploitation strategies in developing versus developed countries tend to engage in larger greenfield investment projects. We argue that in the last decade, most developing-country governments have recognized the benefit of digitalization for development and have incorporated it in their strategic initiatives (Ayakwah et al., 2021), thus encouraging digital MNEs to expand their projects by engaging in larger greenfield investment projects.

Our findings lead to several policy recommendations. First, our finding that the size of greenfield R&D investment projects in the communications, software and IT service industries is larger in developing countries than in developed ones has important policy implications with respect to the importance of developing countries' market size and growth potential for R&D FDI. It follows, as a general policy implication, that maintaining strong growth prospects is necessary to remain an attractive destination for MNEs' greenfield R&D investment. A prerequisite for achieving stable and sustainable economic growth is macroeconomic stability.

To achieve this goal, developing countries must use a set of macroeconomic tools, such as fiscal and monetary policies, appropriate investment and exchange rate regimes, and strong financial industry regulation and supervision.

Our findings that market size and growth play an important role in attracting greenfield R&D investment projects in developing markets, coupled with upper-middle-income countries attracting larger investment projects, imply that upper-middle-income developing countries are more successful in attracting greenfield R&D investment projects. Policies that lead to sustainable growth are thus indispensable for all developing countries that aim to attract greenfield R&D investment. A large literature points to total factor productivity as a major driver of economic growth (Bulman et al., 2014; Daude and Fernández-Arias, 2010; Eichengreen et al., 2012). Among the drivers of total factor productivity, especially for upper-middle-income countries, strengthening innovative activities and building innovative capacities are crucial factors to support continued growth. For lower-income countries, total factor productivity growth seems to be driven more by economic openness, ability to attract FDI, demography and development of the financial system and its ability to support private sector development. The fact that the factors associated with growth differ between types of developing countries suggests that policy prescriptions for attracting greenfield FDI related to R&D are far from homogenous for the group of developing countries in our study.

Second, we find that enhancing innovation capabilities improves a country's ability to attract greenfield R&D-related FDI and its likelihood of doing so. Especially, as stressed earlier, upper income developing countries must increasingly prioritize building innovation capabilities through continued investment in education and training, as well as research and knowledge diffusion. Moreover, policymakers in these countries need to improve their ability to effectively transform inputs into outputs. Policymakers must focus on several areas to ensure sustained improvements on the input side. For instance, inputs in institutional reforms are needed to address key weaknesses in the political, regulatory and business environment. Improvements in the business environment require attention to market sophistication (access to credit, investment climate, trade and competition) and to business sophistication (knowledge workers, innovation system linkages and absorption of knowledge). These factors are key elements of the Global Innovation Index, including both sub-indexes (innovation input and innovation output), as well as the innovation efficiency ratio.

In the digital industries, ideas and knowhow move relatively seamlessly, making country progress dependent on striking a balance between local and imported knowledge and being able to mesh these two sources of knowledge effectively. As such, policymakers need to pay attention to both increasing absorptive capabilities, that is, openness to knowledge from abroad, as well as developing "in-house" research and knowledge capability.

Related to the building up of knowledge capabilities, further investment in tertiary education is required – in terms of both volume and quality. Improving access to tertiary education is clearly an ongoing issue for all developing countries. Tertiary education ranking, measured by tertiary enrolment, science and engineering graduates, and inbound mobility, shows that a few emerging markets – notably China, India and Malaysia – are making notable progress in this respect. Yet, there is an apparent disconnect between ranking on tertiary education and conduct of research. Better linkages between teaching and research could be an important objective going forward.

Third, we find that digital MNEs make larger commitments in exploiting projects than in exploring projects in developing countries. The choice between the two kinds of projects depends on MNEs' strategic intent and their learning over time, as well as the features of the business environment, including the stage of development of a country. While attracting exploiting R&D investments potentially generates benefits for all developing countries, these benefits are likely to more pronounced in advanced developing countries, i.e., upper-middle-income countries, with more sophisticated innovative capabilities in place. This may increase their attractiveness as a location for certain types of exploring R&D investment in digital industries. From the perspective of an upper-middle-income host country, exploiting projects may be less desirable than exploring projects, as the former tend not to bring new and significant knowledge to the table. Policies aimed at further developing and upgrading innovative capabilities are thus important considerations for advanced developing countries for their attractiveness for exploiting R&D investment. In contrast, for low-income countries it will be more beneficial to focus on attracting exploiting investment in the first instance while gradually building innovative capabilities. The key to attracting the desired type of investment projects is to use policy to influence MNEs' choices, understanding what location antecedents are important to MNEs given their strategic intent. Once these factors are understood, policymakers can review and redesign industrial policies, investment policies, education and technology policies, and the like within the framework of their overall development strategy to be conducive for encouraging specific types of R&D FDI.

Although our findings are robust and lead to important policy considerations, we acknowledge that the study has limitations which open up opportunities for future research. First, we pose the research questions on a sample of MNEs from communications, software and IT service industries. Thus, the findings and implications derived from this study do not extend beyond these industries. Future studies should consider samples of MNEs from larger pools of industries, particularly R&D-intensive ones, to investigate the determinants of their R&D investment projects.

Second, we use a dummy to distinguish between developing and developed countries to proxy for differences in market growth potential. However, other differences among countries are worth exploring that can also affect MNE

investment decisions, such as the level of development and political differences. Thus, future research can employ more refined measures of home- and host-country differences or dyadic political or conflict variables to capture variations in R&D investment decisions.

Third, we capture host-country innovation capabilities with the Global Innovation Index, which incorporates the input and output factors of innovation. Although we were interested in the overall innovation capabilities of host countries, future research may focus on its separate dimensions, such as inputs, thus investigating the moderating effect of learning and knowledge accumulation to capture innovative capabilities.

Finally, our sample relates to greenfield investment projects and the findings can thus not be generalized beyond the context of such projects in the communications, software and IT service industries. However, because digital MNEs tend to engage mainly in M&As rather than greenfield investments, unlike traditional MNEs (UNCTAD, 2022), future research when investigating the investment behavior and investment patterns of digital MNEs should also focus on M&As.

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Greater risk and a smaller opportunity:
The opportunity space of SME internationalization in lower-income countries*

Chikondi Ng'ombe,[a] Theunis Mans[a] and Helena Barnard[b]

Abstract

Why do small and medium-sized enterprises (SMEs) from lower-income countries internationalize using high-commitment modes? In this exploratory, qualitative study of 22 SMEs from South Africa (a middle-income country) and Malawi, Zambia and Zimbabwe (low-income countries), we document that the SMEs typically have both a greater tolerance for risk, likely due to the region from which they originate, and an appetite for opportunities smaller than what would be acceptable to multinational enterprises (MNEs) from advanced economies. This provides a very different opportunity space for the two types of enterprises. The size of the home country seems to matter: SMEs from middle-income countries often work on their own and target other emerging markets, but in poorer countries, SMEs often work synergistically with MNEs from more advanced economies, acting as their "delivery arm" into the small markets in their immediate region. This opens up a new way of understanding MNE-led development. Facilitating the development of partnerships between local SMEs and advanced MNEs is a potentially fruitful avenue that policymakers from poor countries can pursue to help their countries open to the benefits of internationalization.

Keywords: Africa, CSA, FSA, micro-multinationals, opportunity, risk

JEL classification codes: F63, L25, L26, M16, O19

1. Introduction

How can firms that are not only small but also from less developed countries use high-commitment modes to internationalize? Extant literature has long suggested that small and medium-sized enterprises (SMEs) use low-commitment modes like exporting when they internationalize (Knight and Cavusgil, 2004; Oviatt and McDougall, 2005). There is increasing evidence that SMEs also set up subsidiaries abroad, so-called "micro-multinationals" (e.g. Stoian et al., 2018). This has been documented even for middle-income countries (e.g. in Peru by Dimitratos et al., 2014), but the evidence of such firms challenges existing ways of understanding internationalization.

It is not clear what capabilities SMEs from lower-income countries – arguably lacking both firm-specific and country-specific advantages (Rugman and Verbeke, 2001) – have to support internationalization. Even later studies where the emphasis is on efficient versus inefficient markets (Hillemann and Gestrin, 2016) suggest that such SMEs would not internationalize. Ibeh (2015) points out that the nascent MNEs from Africa represent the largest indigenous enterprises. In this paper, we set out to explain the apparent anomaly of why SMEs and not large indigenous enterprises choose to internationalize, and also how they do this.

Given how little work has been done on the topic, we approached the question with an open-ended, qualitative approach, and asked 22 SMEs from four Southern African countries why and where they internationalized. We spoke to executives and/or founders of SMEs from South Africa (with a maximum of 250 employees) and from Malawi, Zambia and Zimbabwe (with at most 50 employees in a location). Although many of the existing explanations for internationalization held, e.g. the importance of a market-seeking motive, our key contribution is to demonstrate that SMEs from lower-income countries operate in a very different opportunity space to that of advanced multinational enterprises (MNEs). The opportunity space we document has two dimensions: risk and opportunity.

The SMEs from Southern African low-income countries had a higher risk threshold, brought about by the inevitable requirement of dealing with the often quite risky conditions both at home and in the region. This higher risk threshold meant that they were willing to consider markets that would be deemed too risky by many other firms. The SMEs also had a different reference point for what made an opportunity attractive. Being small firms from small countries with small economies, they tended to find quite small prospects worth pursuing. But they also realized that there was less competition for smaller opportunities and thus were also more confident that they had the capabilities to succeed there.

This also meant that these SMEs were not competing against advanced MNEs. In fact, they almost always operated synergistically with those MNEs. Thus, whereas it has been presumed that MNEs lacking their own resources and in

inefficient markets would seek out "close strategic partnerships with local partners" (Hillemann and Gestrin, 2016, p. 770), we find that the partners themselves internationalized. The SMEs from Malawi, Zambia and Zimbabwe were often the local "delivery arm" of typically a single MNE, an anchor client requesting the presence of the SME in another country in the region. In turn, the SME provided work at a known and acceptable level of quality.

This was much less the case for the slightly larger South African SMEs, where both the size of the firm and the size of the home economy predisposed SMEs to seek larger opportunities, often in other emerging markets. Practically, this suggests that their relationship with advanced MNEs is a potentially less synergistic one. But it also confirms the value of seeking nuanced explanations for how internationalization takes place at different tiers of the global economy (Barnard, 2021).

Our paper proceeds as follows. We first review the literature on SME internationalization, before explaining our research design, Southern African setting and data gathering. We then provide our evidence; the more traditional explanations that remain important, and the different understandings of risk and also of opportunity. We discuss the symbiotic relationship of the SMEs from low-income countries with advanced MNEs and conclude with implications for theory and especially policy.

2. Literature review

The literature on early internationalizers (Oviatt and McDougall, 2005) or as they are often called, "born globals" (Knight and Cavusgil, 2004) examines why and how SMEs go about accessing international markets. The trajectory of these SMEs differs from the internationalization typically described for MNEs. One difference is in the mode of international market entry: Born global firms tend to use low-commitment modes such as exporting, whereas MNEs come about because they set up subsidiaries abroad. In addition, those SMEs from the outset seek international markets, whereas MNEs typically internationalize after some period of time. This occurs once they have developed what has been called ownership advantages (Dunning, 1980), firm-specific advantages (Rugman and Verbeke, 2001) or capabilities (Teece, 2014) to support internationalization and, for those from emerging markets, sometimes once they realize that international markets can help develop such capabilities (Luo and Tung, 2007; Mathews, 2006).

It does happen that SMEs internationalize using high-commitment modes. UNCTAD published a study in 1998 on the internationalization of SMEs in Asia, finding that the collective impact of these relatively small entities can be significant (UNCTAD Secretariat, 1998). Dimitratos and co-authors in 2003 theorized what they termed "micro-multinationals", and a number of papers have further developed the concept

(e.g. Prashantham, 2011; Shin et al., 2017; Stoian et al., 2018; Vanninen et al., 2022). Evidence is emerging that the internationalization of SMEs (more so than for larger enterprises) is particularly aided by new technologies (Park et al., 2022), but this presupposes that SMEs have mastered advanced technologies.

There is some evidence of the internationalization of SMEs from middle-income countries (e.g. Peru; Dimitratos et al., 2014). UNCTAD (2022) reports that SMEs are more likely to invest in countries at a similar level of development that are geographically closer to them and also that they tend to avoid industries that require extensive capital investment, focusing instead on professional and information and communication services. However, this raises further questions on how firms from small, less developed countries are even able to internationalize, as it suggests that these enterprises from behind the technology frontier are competing essentially on human capital.

The question is made particularly salient by the fact that the nascent MNEs from Africa are known to be the largest indigenous firms, arguably because larger firms have the resources that make it easier to deal with the challenging local environment (Ibeh, 2015). Given that scholars have hitherto overlooked internationalizing SMEs from Africa, we needed an open-ended research design that would allow for the discovery of new explanations.

3. Research design

Understanding the internationalization of SMEs requires systematic evidence on a business activity that combines two challenging data-gathering contexts, namely (i) less developed countries, as in Africa, and (ii) SMEs, with their high failure rate and often fluid operations (Barnard, 2020). To advance the field, we decided to use a qualitative and exploratory approach to answer key questions about the high-commitment internationalization of SMEs. We first sought to understand why SMEs from low- and middle-income countries internationalized. We then sought to understand how, focusing on both the enablers and the barriers they encountered. Mindful that the generalizability of qualitative research is limited, we nonetheless offer insights that we believe can help focus the future efforts of both policymakers and governments.

3.1. Setting

We gathered data from four countries in Southern Africa with a shared history as British colonies: South Africa to represent middle-income countries, and Malawi, Zambia and Zimbabwe as examples of low-income countries. The four countries provide a range of contexts with non-trivial differences but also similarities, especially in terms of institutional underdevelopment and home-country instability. Table 1 summarizes some important differences.

Table 1. Key country-level data, 2021					
	GDP/capita ($)	Population size	Human Development Index	Net inward FDI ($ million)	Net outward FDI ($ million)
Malawi	635	19 889 742	0.4	50	-21
South Africa	7 055	59 392 255	0.7	40 889	19
Zambia	1 137	19 473 125	0.4	-457	-453
Zimbabwe	1 774	15 993 524	0.5	166	55

Source: World Bank Development Indicators (for GDP per capita, population size and Human Development Index); UNCTADstat (for FDI).

South Africa was long the most industrialized country in Africa, but under white (Apartheid) dominance which triggered extensive social and political resistance. Although both the South African Government (through capital controls) and most of the developed world (through censure and later sanctions) sought to isolate South Africa economically, the country instead saw escape FDI and the emergence of MNEs (Luiz and Barnard, 2022). Thus, there is a long tradition of international business in the country, most of it in conditions of instability.

Malawi, Zambia and Zimbabwe have not experienced similar violence. They are an interesting case, because from 1953 until independence they were administered as one country under the name the Federation of Rhodesia and Nyasaland. The territory crossed tribal boundaries and is therefore an example of the quite random borders that scholars have speculated might influence international business (Barnard et al., 2017). As a result of this history, the three countries share similar administrative and institutional structures.

Nevertheless, they have followed very different trajectories since independence. For example, before 2000 Zimbabwe was a beacon of development, but since then, the macroeconomic environment has substantially deteriorated (Madimu, 2020). In contrast, after many lost years, Zambia became one of the fastest-growing economies in the world in the early 21st century. This means that internationalization from the three countries, from a similar point of departure, can highlight the importance of differences in the home- and host-country conditions (Cuervo-Cazurra, et al., 2015).

3.2. Data gathering

We opted for a purposive sampling method, identifying potential cases from our own networks, media reports and conversations with other businesses. This interaction allowed us to identify businesses from a range of industries that operated first as domestic enterprises before deciding to internationalize, and moreover, decided on a high-commitment mode of doing so.

All were SMEs with wholly owned operations in at least two countries. In the case of SMEs from Malawi, Zambia and Zimbabwe, we used the definition from the African Development Bank and applied a cut-off of 50 employees or fewer. For the SMEs from South Africa, a middle-high-income country, we used the World Bank definition and applied a cut-off of at most 250 employees. It was hard to obtain a clear picture of the financials of the SMEs. Moreover, their estimated annual turnover varied extremely, ranging between $100,000 and $5 million from the three lower-income countries, and between $150,000 and in excess of $10 million from South Africa.

It is worth noting that in neither setting did our selected sample represent isolated cases. For example, an informal appraisal of firms in Malawi, Zambia and Zimbabwe resulted in a list of more than 30 firms potentially meeting the criterion of having wholly owned operations in at least two countries but at most 50 employees in each location. Closer inspection revealed that some of them were primarily exporting or that some of them had more than 50 employees in a location – for example, some retail chains with a large number of lower-level employees exceeded the limit. It is therefore important to note that the 13 cases selected from those three countries for detailed investigation were chosen to represent a spread across industries and countries. Table 2 gives more detail about the cases. We also identify the countries to which the firms internationalized in appendix table A1.

Table 2. Details of cases reported in this study

| | Number of cases | Number of employees | Time from founding to first internationalization | Number of countries to which SMEs internationalized | Industries represented |
		Average (range)	Average (range)	Average (range)	
Malawi	6	21 (10–50)	6 (3–13)	2 (1–4)	IT and software development Advertising and marketing services Vehicles and tire services Tourism and hospitality
Zambia	2	35 (20–50)	3 (2–3)	5 (2–7)	Financial services and consultancy Merchandising services

/…

Table 2. Details of cases reported in this study (Concluded)

	Number of cases	Number of employees Average (range)	Time from founding to first internationalization Average (range)	Number of countries to which SMEs internationalized Average (range)	Industries represented
Zimbabwe	5	45 (35–50)	7 (2–12)	3 (2–5)	Advertising and marketing services Manufacturing Audit and consulting services
South Africa	9	60 (24–139)	5 (1–32)	2 (1–4)	Manufacturing Financial Fintech Technology Consulting services Asset management

Source: Authors' interviews.

Semi-structured interviews were conducted with the founders, chief executive officers and/or executives with primary responsibility for internationalization. The smaller the SME, the more often these three roles were filled by the same individual, but especially in the South African SMEs (with a maximum of 250 employees), the roles could be filled by different individuals. Interviews probed why and how the SMEs internationalized; they were recorded and transcribed.

The cases were then examined to establish what the motives for internationalization were, why SMEs chose the locations they chose and what barriers they encountered in the process. In reporting our findings, we rely heavily on verbatim quotations of respondents.

4. Findings

Three themes emerged from the data. First, many of the traditional explanations for internationalization hold, and as is typical, market-seeking was the dominant motive. Second, the respondents understood risk differently to what has been previously documented, and finally, they also saw opportunities differently. Table 3 summarizes our findings.

Table 3. Themes from data

Theme	Elements identified under theme
Traditional reasons for internationalizing	• Market-seeking a key motive • Desire to exploit capabilities in other countries • Familiarity with the region
A different understanding of risk	• Risky home-country conditions make SMEs keen to escape or at least diversify internationally • Risky conditions in the region make SMEs more likely to accept high levels of risk in host countries
A different understanding of attractive opportunities	• The smaller scale of SMEs makes smaller opportunities attractive • Regions have long been shunned by investors, resulting in less competition • SME capabilities are not extensive, but adequate for the needs of the region

Source: Author's compilation.

4.1. Traditional reasons for internationalizing

The executive of an internationalizing South African SME explained that "the objective here is to make money. We're not an NGO". Similarly, an SME that started in Zimbabwe in 1990 before relocating to Malawi in 2001, a year after the infamous "land grabs" of Zimbabwe started, explained:

> It's based on opportunity. You know, we would open up in any country where there's an opportunity, and we see the business opportunity. (Originally Zimbabwean, then migrated to Malawi)

The point that opportunities in other markets were available because of their capabilities was made a few times by SMEs from different home countries and of different sizes:

> What we found out was, for even most tech companies who are based in Zambia, their core engineers [are] outsourced, you know, from Kenya, from India and so on. They don't really have like the local skills within there. (Malawian SME)

> We have three things: 1) the uniqueness of the product, 2) the expertise to develop the product and 3) the ability to commercialize it. (South African SME)

Cultural proximity was often provided as an explanation for why SMEs located in certain countries, especially among the three countries that used to be governed as a single entity. As one founder explained:

> So, the initial thinking about us being all former colonial partners, kind of thing, was true to some extent, in all these countries. I found

> people who called me brother, and were willing to take me into their
> homes without anything… That happened in Zambia; that happened
> in Malawi. That happens in Zimbabwe. (Zimbabwean SME)

However, it was clear from the interviews that these more traditional considerations were secondary. They supported the decision of why and where to internationalize, but they did not explain it. Instead, what seemed to be the main explanation was that the SMEs understood both the magnitude of business risk and the size of the opportunity very differently than how larger firms and firms from larger economies would understand them. Opportunities that were unattractive elsewhere were attractive to these firms.

4.2. A different understanding of risk

Our evidence suggests two main reasons why SMEs from low- and middle-income countries have a higher risk threshold than more established firms from institutionally better developed countries. The first has to do with the fact that a different level of risk prevails in their general environment. Risk was often understood as the risk of being personally in danger rather than risk in terms of financial or operational challenges. Second, the home-country conditions of these firms were highly variable, and SMEs had no choice other than engage with those risky conditions. They sometimes chose to internationalize to escape them, but even when the predominant motives for internationalization related to pull rather than push factors, their risk tolerance was greater than is generally reported.

4.2.1. Risky business conditions in region

The SMEs we interviewed operated in and were familiar with regions that were generally risky. We found three types of risk assessment. The risk of being personally in danger was mentioned a few times and seen as an unacceptable risk. But other risks of operating in the region were either seen as requiring a workaround or lay at the heart of the business offering. Finally, the more typical business risks, e.g. of extensive restructuring in a host country, were noted, but treated almost as an afterthought. Appendix table A2 provides quotes in support.

4.2.2. Risky home-country conditions

Another reason why these SMEs had a different risk appetite related to the riskiness of their home countries. As highlighted in appendix table A2, the concern that the home-country conditions could deteriorate to the point that business was not sustainable, or was being plundered by government, was repeatedly expressed. Internationalization was seen as a way to counter that.

The weak institutions also presented risks to the SMEs, who repeatedly mentioned especially the challenges of getting access to foreign exchange. Certain countries (e.g. Malawi and Zimbabwe) were seen as particularly bad, and others (e.g. Botswana and Ghana) as attractive destinations for financial headquarters in particular because of the relative ease of obtaining foreign exchange. One of the few cases in our data set to internationalize out of the region, to the United States, did so because that eased payments.

In the course of explaining such workarounds, it became clear that respondents did not see direct investment as a more arduous commitment mode than exporting; on the contrary. There were many other challenges in the underdeveloped countries: Flight options were limited and flights were often cancelled. Connectivity by virtual means was not always guaranteed due to connectivity and electricity challenges. To the extent that businesses required more flexible and sophisticated services than were available in their home countries, direct investment in another country tended to ease rather than complicate the process of internationalization. Combined, the conditions in the region and at home resulted in the SMEs having quite a high tolerance for risk.

4.3. A different understanding of attractive opportunities

At the same time, the small economies of these countries – owing to the combined effect of relatively small populations and low GDP per capita – meant that SME owners were excited by much smaller opportunities than would be considered viable by other firms.

There are three reasons why SMEs saw small opportunities as attractive. The first has to do with scale. The firms were small, and they came from small economies. The reference point for what was an acceptably large opportunity was simply different than elsewhere. Second, the SMEs realized that they faced less competition in (for many other firms) less familiar markets. Third, SMEs were quite realistic about their capabilities. Their capabilities would not necessarily have given them a competitive advantage in more developed economies, but often allowed them to attract smaller deals.

4.3.1. A smaller scale

Numerous respondents explained that they were satisfied with the scale of operations in their small and low-income home and host countries. One Malawian SME with operations in Ghana, Kenya, South Africa and Zambia explained why it would not abandon its home market:

> So, we felt that Malawi is still a big market for us. We've got no plans to exit Malawi but at the same time, we're able to cushion ourselves by being able to get a premium in other markets. (Malawian SME)

To contextualize the claim, Malawi then had a population of fewer than 20 million people and gross domestic product (GDP) of only $12.6 billion. Similarly, two technology companies from Malawi had expanded on the back of the Malawian MNE NICO. Although the scope of work for this client would have been unattractive for many other firms, for this SME it provided a launch pad for internationalization:

> I think I can say the NICO Group was our…. base client. We worked with them for about five years or so. And so, the reason why: we're addressing a small need and that allowed us to access, you know, the internal sort of system ecosystem, the internal structure of the company, and then we've identified some other needs around there. So, in the five-year relationship, I think they've given us maybe $500,000 worth of business. (Malawian SME)

The point was perhaps most succinctly made by the founder of another Malawian SME:

> If I'm making $250,000 in three months, it's good revenue for me. But to a government that might be small money. Big businesses like Microsoft would not set a headquarters then in Botswana [with a population of under 2 million]. But for us, the revenue we make is good enough. (Malawian SME)

4.3.2. The benefit of less competition

Participants were aware of the fact that they were willing to consider opportunities that others did not. They recognized that the small size of the market and the fact that countries were not particularly well known outside of the region meant that competition was reduced. They used that to their advantage. Appendix table A.2 provides some examples.

SMEs tended to seek out business opportunities in other small and/or poor countries, often in the region. They did so precisely because those host locations tended to not be on the radar of more formidable competitors. This leads into the final reason why the SMEs valued opportunities differently.

4.3.3. An adequate capability base

By the metric of advanced economies, the SMEs often had limited capabilities. They typically offered a narrow range of offerings, e.g. distribution or after-sales service of the offerings of an advanced MNE. In keeping with prior findings (UNCTAD, 2022), they rarely had extensive capital investment, and more often their local knowledge was key, e.g. in the case of auditing or consulting services. Although some SMEs might have been able to outcompete competitors from

across the world – for example in the case of some Zimbabwean marketing and advertising agencies or South African technology SMEs – it is unlikely that many of these SMEs would have been able to survive direct competition from more sophisticated competitors.

SMEs were not blind to that fact, and instead selected locations where their capabilities were adequate to ensure competitive success. This was clearly explained by a Zimbabwean SME:

> We love South Africa, we thought there were lots of opportunities. But we thought that those guys, they'll give us a run for our money… Because of the cultural connections between the former colonial setup where Zimbabwe, Zambia and Malawi were kind of like together, and because these economies seemed to be growing, then we felt that if we went into Zambia, or Malawi, or one of those other countries like that, we would be able to afford the investment. (Zimbabwean SME)

A number of respondents explained that they were able to internationalize because they met the expectations of an international client, for example:

> In the process of interaction and doing business with one another, we were able to seek the opportunities that were existing in as far as the quality and levels of execution in the way that were expected by the client. We were able to pick that there is an opportunity in this country, whereby the large multinational's expectations were, where they were confident with the quality and levels of delivery we were offering them in Zimbabwe. So they wanted a seamless delivery. (Zimbabwean SME)

In sum, the SMEs were able to pinpoint the capabilities they had that allowed them to internationalize, although those capabilities were often relatively limited by the standards of advanced economies.

5. Discussion

The evidence suggests that the SMEs operated in a different opportunity space, rather than in competition with MNEs. Indeed, they often seem to act as the local "delivery arm" of advanced MNEs. We discuss these two points, before concluding with insights for policymakers.

5.1. A different opportunity space

Our evidence suggests that the SMEs operating from low- and middle-income countries are generally willing to accept a higher level of risk and a smaller opportunity than their counterparts from larger firms and countries. This means that the two sets of companies operate in very different opportunity spaces, a relationship that is explained in stylized fashion in figure 1.

Figure 1. Opportunity space for SMEs from low- and middle-income countries versus for advanced MNEs
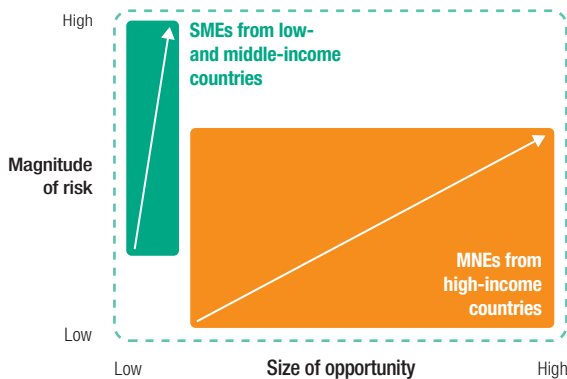
Source: Authors' elaboration.

Although figure 1 presents only a stylized impression of the likely opportunity space conceptualized by SMEs from smaller and lower-income economies relative to that of advanced MNEs, it does help to explain why these SMEs continued to operate and even thrive alongside more advanced MNEs. These SMEs do not compete in the same opportunity space as advanced MNEs. Indeed, there was extensive evidence that the SMEs in the low-income countries had a symbiotic relationship with advanced MNEs.

5.2. The symbiotic relationship between SMEs and advanced MNEs in low-income countries

A striking finding was how often the SMEs from Malawi, Zambia and Zimbabwe reported that their internationalization was triggered by an advanced MNE requiring a partner in another less developed country in the region. Some of these numerous quotes appear in appendix table A2.

Ethics considerations prohibit us from disclosing the names of the SMEs. Because they so often work very closely with MNEs from advanced economies, we also cannot disclose the names of those MNEs. But the MNEs included vehicle, technology, fast-moving consumer goods and financial services firms from North America, Europe and Asia, all household names.

In many ways, it appeared that the SMEs were the "delivery arms" of advanced MNEs in these low-income countries. MNEs who had identified a competent provider would either directly or indirectly (by way of an "anchor" contract) support the internationalization of the SME into other, similar countries in the region. This was of benefit to the MNEs, because they could externalize the risk of operating in the region and still derive some sales from it.

It is important to note that the South African respondents did not mention this type of relationship. It seems that the symbiotic relationship existed only when both the countries and the SMEs were very small.

5.3. Insights for policymakers and scholars

SMEs from lower-income countries that use high-commitment modes to internationalize do exist. Because it is often assumed that SMEs operate primarily domestically or would prefer use to use low-commitment modes like exporting if they do decide to internationalize, very few databases track the international expansion of SMEs. Moreover, almost no government support exists for such SMEs. Yet it seems that the contemporary global economy is connected to such an extent that even very small firms from small and poor countries operate across borders. It is therefore important to track this activity on a more systematic basis.

Much of what is known about internationalization remains relevant when studying the high-commitment internationalization of SMEs originating from lower-middle-income countries. Firm resources and capabilities remain key enablers of internationalization, and market-seeking is, as elsewhere, the dominant motive for internationalization. However, it is necessary to clarify existing concepts to allow them to be of use across different levels of the economic hierarchy.

For example, it is not clear how one is to most accurately describe the motive of Malawian SMEs locating their financial headquarters in Botswana because

of foreign exchange regulations at home. Is it an example of seeking "efficiency", language used by some respondents but with a different meaning in traditional international business research (Dunning, 1993), or is the search for a more efficient way of banking "created asset-seeking"? SMEs are clearly seeking to avoid poor home-country conditions, but it is not clear whether they are exploiting existing resources ("escape") or exploring new resources ("buy better"), using the language of Cuervo-Cazurra et al. (2015). These are matters of precision in terminology, and they are needed because globalization has resulted in a situation where internationalization can take place from anywhere, including home countries with (remediable or non-remediable) institutional dysfunction, and by virtually any enterprise, including SMEs.

Much more work has to be done to unpack how risk is understood in such contexts. In our work, we noted that respondents differentiated between the risk of violence to persons, the risk of expatriation of the firm or funds, risks associated with weak institutions and business risks. Because our focus was not primarily on the different ways that risk was understood, we are not certain that the list encompasses all risks, and neither can we suggest the differential effects of different risks on the SMEs. These are important matters for further research.

A notable difference emerged in comparing the South African SMEs with those from Malawi, Zambia and Zimbabwe: The South African SMEs were generally more ambitious in the scale of opportunities that they sought, but the SMEs from the low-income countries almost exclusively operated in the region, in countries that were typically quite risky and quite poor. It was clear that the different SMEs operated with different reference points of what constituted an attractive opportunity. We saw evidence of a regional anchoring effect, but also a fairly realistic assessment of their own capabilities. Determining how different-sized firms decide whether an opportunity is worth pursuing is important to assist in brokering more extensive international contact.

We summarize suggestions for policymakers in table 4. The fact that investment took place mainly in the region suggests that regional blocs such as the South African Development Corporation should be key drivers of SME FDI policy. The blocs can conduct forums, create databases, provide information and assist with the cross-border set-up of businesses. This support could include investment policies that allow regional players easier access to foreign exchange (a recurring complaint) as well as incentives and tax breaks for investing across borders within the African region. Often, policymakers could do well by simply removing current obstacles to the mobility of funds and the mobility of people.

One of the investment promotion activities that can be targeted specifically at SMEs involves building relationships. The role of partnerships and networks is a theme that came through very strongly across the cases. This suggests that substantial benefits can be derived if policymakers can facilitate the formation of relationships,

Table 4. Suggestions for policymakers

Recommendation	Elaboration
Improve records of SMEs with international ties	The known benefits of internationalization also accrue to these smaller players.
Improve the ease of foreign exchange, especially within regions	Many low-income countries suffer recurring foreign exchange shortages. Making it easier to pay for especially foreign transactions in the region is likely to have particular benefits because that is where most internationalization takes place.
Use the regional trading blocs to develop investment promotion strategies	Given that most internationalization takes place within regions, the regional blocs such as South African Development Corporation or the Economic Community of West African States are likely the most important vehicles for investment promotion.
Ensure that relationship building is a key part of a foreign investment promotion strategy	SMEs operate informally and often identify opportunities through interpersonal relationships.
	Relationships with other local SMEs are useful for helping local SMEs identify challenges and solutions when internationalizing.
	Relationships with SMEs in neighboring countries are useful when a local partner is needed.
	Relationships with advanced MNEs are particularly productive. MNEs often need proof that local SMEs can deliver, but are also involved in helping with capability development.

Source: Authors' compilation.

both among SMEs in the region and also with MNEs from elsewhere. Perhaps the most important international partners for the SMEs from low-income countries were advanced MNEs. MNEs from high-income countries have increasingly organized themselves as differentiated networks with quite specific subsidiary mandates (Birkinshaw, 1996; Ghoshal and Bartlett, 1990).

Our work suggests that especially in low-income countries, not even the sales and service mandate is given to local subsidiaries. Instead, it is outsourced to local SMEs. When those providers prove to be competent, the MNE often facilitates the internationalization of SMEs. This symbiotic relationship is potentially an important pathway for MNE-enabled development and deserves much more attention.

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Appendix table A1. Countries to which SMEs internationalized

Home country	Employees	Founded	First internationalized	First host country	Second host country	Subsequent host countries
Malawi	10	2012	2015	Botswana	Zambia	Ghana
	25	2013	2016	Rwanda	Zambia	..
	16	2010	2014	United Kingdom	..	..
	40–50	1995	2008	Zambia	..	..
	16	2004	2011	South Africa	Zambia	Ghana, Kenya
	10	2011	2019	Zambia	Rwanda	..
Zambia	10	2013	2015	South Africa	Zimbabwe	Malawi, Kenya, United States, United Kingdom, United Arab Emirates
	40	2009	2012	Malawi	Zimbabwe	Mozambique
Zimbabwe	40	1998	2006	Malawi	Zambia	..
	40	2012	2018	Zambia	Malawi	..
	35	2009	2011	Zambia	Malawi	Mozambique, Nigeria, South Africa
	50	2000	2015	Botswana	Zambia	Malawi
	50+	1996	2004	South Africa	Zambia	Mozambique
South Africa	24	2014	2023	Europe (planning phase)	..	..
	139	1991	2019	Mauritius	..	..
	75	1998	2020	Australia	Philippines	..
	60	2020	2021	United Kingdom	Uganda	Other emerging markets (planning phase)
	19	2021	2022	United Kingdom	..	..
	83	2015	2017	Zimbabwe	Kenya	..
	51	2000	2006	Nigeria	Zambia	Mozambique
	5	2022	2022	United Kingdom	..	..
	15	2016	2016	United States	..	..

Source: Authors' interviews.

Appendix table A2. Risk and opportunities for SMEs internationalization: Qualitative evidence from Malawi, South Africa, Zambia and Zimbabwe	
Theme	**Comments by interviewees**
Risky business conditions in the region	
Personal danger deters business	Mozambique has constantly been a political problem for us…. We have written it off completely because there are some amazing beaches and places there that I would love to send clients in the future. But certainly at the moment, northern Mozambique, we wouldn't touch because it's not safe for…for clients at the moment. (Malawian tourism SME)
	It was criminality rather than market fundamentals that made us exit. It was just that we weren't willing to put our employees at risk with having to operate in a market where you had drug lords now entering the cigarette market and wanting to impose the rules of the drug trade in cigarettes. (Zimbabwean SME)
Risks in the region shape the business and/or internationalization	When it comes to the Congo… You know Congo has too much corruption. If you go through the proper way, they give you a hard time…. So we were planning initially to start in Kinshasa but now we said we will start the other part of DRC, like you know, near the Zambian border. Then someone from Zambia, they can drive there. (Malawian SME)
	I mean our vision as a company is to create a world where everyone is safe. We've created a platform that democratizes access to safety services and from Day One we always said that we are going to do this globally…. And I think that's definitely the driving reason why not only me, my staff and my investors are all geared to export this in regions where people are unsafe or where we can add value. (South African SME)
Business risks seen as almost secondary	And I had to make a decision to put Nigeria on hold irrespective of its attractiveness. Because [it is] a very attractive market. Tough, but the setup cost was getting a bit too much. And there was also a lot of structural changes on the ground. (Zimbabwean SME)
Risks in home country	
Home-country conditions problematic	You know the goal was for the group to have an offshore income, like US dollar income. So, they wanted to diversify the group's income because if you look at the main activity… everything is earned in rand. Which is not a good thing, given the economic situation in South Africa. (South African SME)
	From an international perspective, is trust. Government isn't going to, like, come and just like, take everything from you, on some level, as the fear goes in South Africa and a couple of other African countries. (South African SME)
	Zimbabwe was already on the decline as an economy. But by about 2005, 2006, that decline really accelerated. And it became visible and clear to me that we would not be able to continue with the same path in Zimbabwe…. So, I said well, we need to find ways of accelerating our international ideas, because that can diversify our income streams and can reduce our risk. (Zimbabwean SME)

/…

Appendix table A2. Risk and opportunities for SMEs internationalization: Qualitative evidence from Malawi, South Africa, Zambia and Zimbabwe (Concluded)	
Theme	**Comments by interviewees**
Home-country restrictions on foreign exchange	With Malawi you can't make such payments because of forex restrictions, whereas in Botswana or Ghana I just log in and make a payment. I don't have to call the bank; I don't have to apply for forex. So, when the business reaches a certain level you have no choice but to leave the country. (Malawian SME)
	The reason why we're moving to the US and not any other market is: the US banks in dollars…the dollar is…easier to move it around, and they don't have that much forex controls when it comes to moving money out of their jurisdictions. (Zambian SME)
Benefits of reduced competition	
Familiarity with often-overlooked host locations	When you speak about Africa in certain boardrooms, internationally, they're going to think of South Africa, Nigeria and Kenya… No one thinks of Zambia. (Zambian SME)
	As others like to say, there is no economy in the Zimbabwe, it means there's still opportunity in that space. (Zambian SME)
Awareness of opportunities in underserved markets	Nigeria seems to be a no-brainer. It's a tough market…. But I think you can use that as an advantage to grow in there. (Zimbabwean SME)
	The sort of areas I'm going to be going after is potentially Nigeria and Kenya, to start, because there's quite a big opportunity in African markets. (South African SME)
	We specifically want to focus on the sort of places where other people in our space don't necessarily want to go. So, it'll be sort of more emerging markets kind of destinations. That's why South-east Asia is really interesting to us and Eastern Europe. (South African fintech SME)
The symbiotic relationship between SMEs from low-income countries and advanced MNEs	
Relationships of SMEs with advanced MNEs	It's an insurance company, we did some work for them, and they needed the same work done in their Zambia office…. So, If you look at the size of the deal, and how availability to the client would be affected for the fact that we're based in Malawi, and some things needed to be done locally. So that was the main drive that took us to Zambia. (Malawian SME)
	That was the thinking for [global software MNE] by the way of needing to have a specialist provider because they needed someone who had enough muscle to be able to do the large projects. And they knew they couldn't find that in-country. So [global software MNE] was very supportive of our moves when I first went. The first couple of meetings that I had in Kenya, [global software MNE] came along. They were very supportive of the move…. I went to Uganda and [global software MNE] representative came along with me. So, there was a lot of support from [global software MNE's] point of view, because they wanted to introduce stronger partners into those markets. (Zimbabwean SME)
	[Global distribution MNE] was on a very aggressive, aggressive geographical expansion plan into Africa, which was largely driven through the relationship that they had with [global fast-moving consumer goods MNE], [which] then passed on our name to [global distribution company]. And we got discussing, and what had been found is that…we operated in the same manner. So that obviously was… the foundation to bringing the companies together. (Zambian SME)

Source: Authors' interviews.

The role of innovation policies in SME internationalization: Evidence from Türkiye*

Seda Koymen,[a] Amelia U. Santos-Paulino,[b]
Claudia Trentini[c] and Berna Dogan[c]

Abstract

This research note investigates the relative innovation performance and international presence of small and medium-sized enterprises (SMEs) in Türkiye. Using administrative data for the period 2006–2020, the empirical analysis shows that government support for research and development (R&D) correlates positively with firms' innovation activities and R&D expenditure. The results also suggest that innovation activities increase the probability of outward foreign direct investment. The results have important policy implications for Türkiye and developing countries in general. The findings highlight the key role of public incentives in targeting innovative activities towards internationalization of SMEs.

Keywords: FDI, innovation, innovation policy, panel data, R&D, SMEs

JEL classification codes: D25, F21, F23, O31, O32

[a] Baskent University, Ankara, Türkiye.

[b] Corresponding author. Division on Investment and Enterprise, United Nations Conference on Trade and Development (UNCTAD) (amelia.santos-paulino@unctad.org).

[c] Division on Investment and Enterprise, United Nations Conference on Trade and Development (UNCTAD).

1. Introduction

Innovation is a key determinant of productivity and long-term growth, and helps enhance the capacity of firms to grow and adapt to market challenges, especially small and medium-sized enterprises (SMEs) (Braunerhjelm and Thulin, 2022; Nunes et al., 2012; Onetti et al., 2012). Innovation activities can play an important role in the internationalization of a firm. Technological innovation is shown to catalyze exports by improving productivity and enhancing product quality (Edeh et al., 2020; Haddoud et al., 2023). It is also associated with greater acquisition of knowledge about foreign markets (Musteen and Datta, 2011). High multimarket overlap in knowledge activities with industry rivals is another factor that pushes firms to internationalize and protect their innovations (Berry, 2020).

The aim of this research note is to empirically examine the role of innovation and innovation policies in the internationalization of SMEs in Türkiye. Türkiye actively supports the innovative activities of SMEs through two main organizations: the Organization for the Development of Small and Medium Enterprises (KOSGEB) and the Scientific and Technological Research Council of Türkiye (TUBITAK). KOSGEB, established in 1990, constitutes the main body for executing SME policies in the country. Since 2004, the Government has adopted four strategic action plans concerning SMEs. A major focus of these plans is to improve the international competitiveness of industrial SMEs to make them more outward-oriented and expand their operations abroad. Despite the proactive policies, SMEs in Türkiye still face major challenges and limitations in their innovation activities. Most manufacturing SMEs (87 per cent) operate in low-tech or medium-low-tech sectors, preventing them from benefiting from improved productivity through intra-industry spillovers such as knowledge and industry-wide cost reductions. Moreover, research and development (R&D) is still relatively costly, hindering the innovative capacity of SMEs. Furthermore, funding challenges limit universities' R&D infrastructure and industry–university cooperation (Ministry of Development, 2018).

This research note uses firm-level data from the Turkish Statistical Institute (TURKSTAT) for the period 2006–2020 to investigate the relative innovation performance and international presence of SMEs. It seeks to answer two main research questions: Are more innovative firms more prone to open their operations to foreign markets? Does government policy support for innovation activities play a role in the internationalization process of SMEs? Our empirical findings suggest that government support for R&D is positively associated with firms' innovation activities and R&D expenditure. The empirical findings herein can support evidence-based policymaking on how domestic policies can shape and sustain the productivity of enterprises by supporting their innovation activities, hence, indirectly helping SMEs to join global value chains by investing abroad.

The rest of the research note is organized as follows. Section 2 provides a brief overview of SMEs in Türkiye and their innovation activities compared with large MNEs. Section 3 outlines the innovation policy in Türkiye. Section 4 presents the research methodology and discusses the empirical findings. The final section concludes and provides some policy recommendations.

2. SMEs and innovation in Türkiye

SMEs constitute a major part of the economic activity in Türkiye, with a share of 99.7 per cent of all registered enterprises and 71 per cent of total employment in 2021.[1] They account for 50.6 per cent of total value added and 55.1 per cent of total trade. The significance of SMEs in Türkiye is not only due to their vast share in the economy but also to their "backbone" function in the dynamic but turbulent Turkish economy (Karadag, 2015). As Türkiye experienced severe economic crises in the last decades, SMEs became one of the major elements in the growth and development policies of the country.

In 2021, 36.5 per cent of Turkish SMEs were operating in the wholesale and retail trade, 14.9 per cent in the transportation and storage sectors, and 12.3 per cent in the manufacturing industry. Most SMEs in the manufacturing industry are in medium-low-tech or low-tech economic activities (figure 1). SMEs typically operate in low-tech activities – 55.9 per cent do so, compared with 45.9 per cent in large-scale enterprises – and only 0.7 per cent of SMEs are in the high-tech manufacturing industry. This ratio is four times higher for large enterprises, with a share of 2.8 per cent. The presence of medium-sized enterprises in high- and medium-high-tech sectors is higher than that of micro and small enterprises with shares of 20.4 per cent, 18.2 per cent and 11.8 per cent, respectively. The low share of SMEs in high-tech economic sectors is a limiting factor in their innovative activities.

The high cost of R&D and the lack of skilled researchers, particularly at the doctoral (PhD) level, are factors adding to the challenges faced by SMEs (Ministry of Development, 2018). The share of SMEs in R&D expenditure fell to 27.1 per cent in 2021 from 35.3 per cent before the COVID-19 pandemic. Of the 146,735 R&D personnel (including researchers, technicians and other support staff) in the country, SMEs employed 63,938 – 43.6 per cent of all R&D personnel.[2] Similar to R&D expenditure, this number was higher before the pandemic, reaching 47 per cent for three consecutive years from 2017 to 2019.

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[1] All data and statistics in this section are from TURKSTAT (https://data.tuik.gov.tr) unless otherwise stated.
[2] Employment numbers are reported in terms of fulltime equivalent (FTE).

Figure 1. Share of SMEs and large enterprises in manufacturing, by technology level, 2021 (Percentage)

SMEs

Large enterprises

High   Medium-high   Medium-low   Low
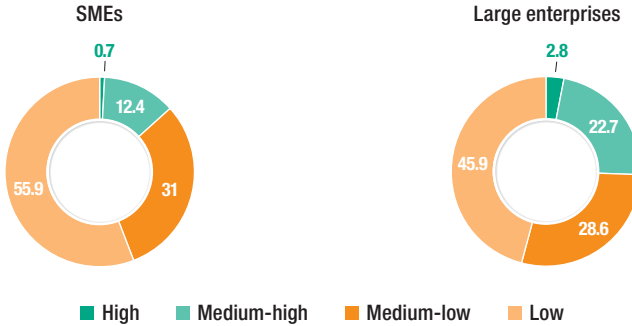
Source: TURKSTAT.

Figure 2 shows that the number of patent applications – a well-established measure of innovation activities – followed an upward trend until 2018 when financial turbulence hit the economy. It continued to increase for SMEs until 2020, and it has remained stable since then for large enterprises. Although the total number of patent applications by SMEs in 2021 was 1,263, 513 patents were registered in the same year (figure 3). In SME scales, micro-sized enterprises ranked first in patent applications with 454 applications but in terms of patent registrations medium-sized enterprises ranked first with 238 registered patents.

Figure 2. Patent applications, by firm size, 2015–2021 (Number)

SMEs   Large enterprises
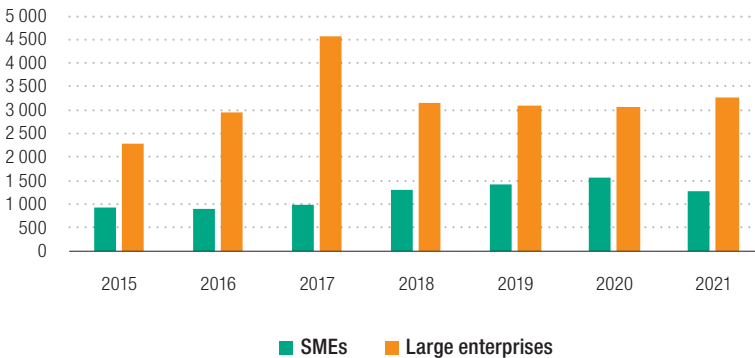
Source: TURKSTAT.

Figure 3. Patent applications and registrations, by firm size, 2021 (Number)

Patent applications		Patent registrations
454	Micro	113
383	Small	162
426	Medium	238
1 263	SME	513
3 255	Large	2 027
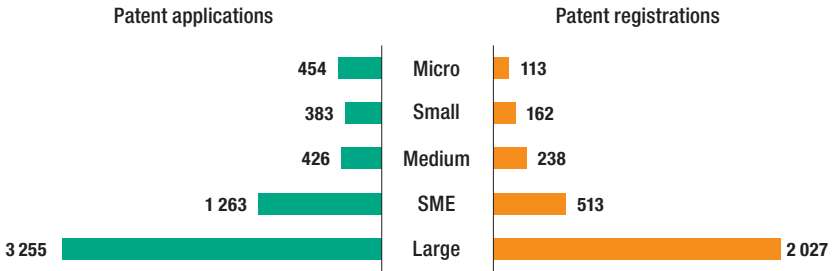
Source: TURKSTAT.

3. Innovation policy for SMEs in Türkiye

Türkiye supports the innovative activities of SMEs through two main organizations: the Organization for the Development of Small and Medium Enterprises (KOSGEB) and the Scientific and Technological Research Council of Türkiye (TUBITAK). KOSGEB constitutes the main body for executing SME policies in the country. It was established in 1990 to provide services and to support SMES in the manufacturing sector. With increasing value production and employment by SMEs in other sectors, the coverage of KOSGEB was expanded in 2009. Today, it offers a wide range of incentives to SMEs including low-interest loans, technical and managerial support, and training programmes. In 2018, its support programmes were updated with a vision to prioritize SMEs that produce innovative, technological and high value added products, that aim to carry these products to international markets and that are export oriented (KOSGEB, 2018).

The major programmes operated by KOSGEB, and by its Enterprise Development Centers (IGEM) and Technology Development Centers (TEKMER), are structured like the ones prevailing in more advanced countries. The laboratories operated by KOSGEB provide SMEs with access to testing and analysis equipment and methodologies that would otherwise not be available to most small firms. These programmes are well designed and effectively managed according to international standards. The technological and managerial assistance provided to SMEs enrolled in the programmes helps these firms to cope successfully with their business problems (OECD, 2020). TUBITAK specifically focuses on scientific and technological research, and supports R&D activities of SMEs. TUBITAK provides grants and support programmes to SMEs. Table 1 shows various types of innovation support programmes provided to SMEs in Türkiye.

SME policies in Türkiye are defined as part of a multi-year action plan. KOSGEB has developed the *KOSGEB Strategic Action Plan 2019–23* to contribute to coordinated delivery of SME policy. The main objectives of the plan include promoting innovation, technology and R&D, fostering entrepreneurship, and strengthening skills, internationalization and productivity of SMEs (KOSGEB, 2018). It also provides specific provisions for monitoring and evaluation. The proactive and up-to-date policy support make Türkiye a particularly relevant case for studying the role of innovation policies in promoting foreign direct investment (FDI) by SMEs.

Table 1. Innovation support programmes in Türkiye	
KOSGEB incentives	**TUBITAK incentives**
R&D and innovation support programme	Industrial R&D projects grant programme
Product development and innovation support programme	University-industry collaboration support programme
SMEs technological product investment support programme	SME R&D start-up support programme
Industrial application support programme	International industrial R&D grant programme
Strategic product support programme	Research, technology development, and innovation projects in priority areas grant programme
General SME support programme	Technology Transfer Office support programme
SME development support programme	Venture capital funding programme (Tech-InvesTR)
Foreign market operations support programme	Frontier R&D laboratory support programme
	Capacity-building for R&D grant programme

Source: Authors' elaboration based on KOSGEB (2018) and sectoral plans of Türkiye.

4. Empirical analysis

4.1. Data

The empirical analysis uses firm-level administrative data from TURKSTAT. The data on SMEs are consolidated by TURKSTAT using annual industry and service statistics, foreign trade statistics, entrepreneurship and business demographics statistics, research and development activities surveys, patent applications and registration data of the Türkiye Patent and Trademark Office. The database covers firms for the period 2006–2020.

Internationalization is measured as outward FDI. Empirical research focusing on internationalization of firms usually measures it as foreign trade; however, the most productive firms are often involved in both FDI and exports. In fact, exports and FDI tend to be complementary (UNCTAD, 2013).

First, in order to draw out sample characteristics, we focused only on firms that invest abroad and present specific features of FDI by SMEs with respect to FDI by large firms. For this purpose, we extracted firms that reported income from foreign subsidiaries for a given year. Using this sample of the over 15 million firms for the given period, only 2,558 were found to have foreign subsidiaries, of which 1,518 were SMEs and 1,070 were large enterprises (see table 2).

Between 2006 and 2020, SMEs in Türkiye constituted more than half of the firms in the sample that reported revenue from foreign subsidiaries (figure 4). SMEs in Türkiye mainly operate in wholesale trade, construction of buildings and architectural and engineering activities, while large MNEs are more active in real estate and civil engineering in addition to the former two (figure 5).

Figure 4. SMEs with foreign subsidiaries, 2006–2020
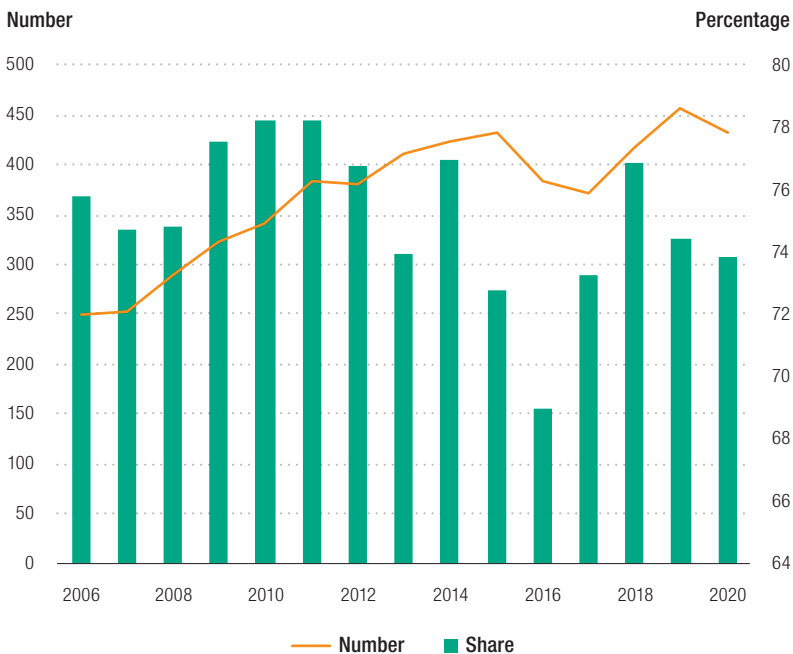
Source: Authors' calculations based on TURKSTAT data.

Figure 5. Industrial composition of MNEs in Türkiye (Percentage)
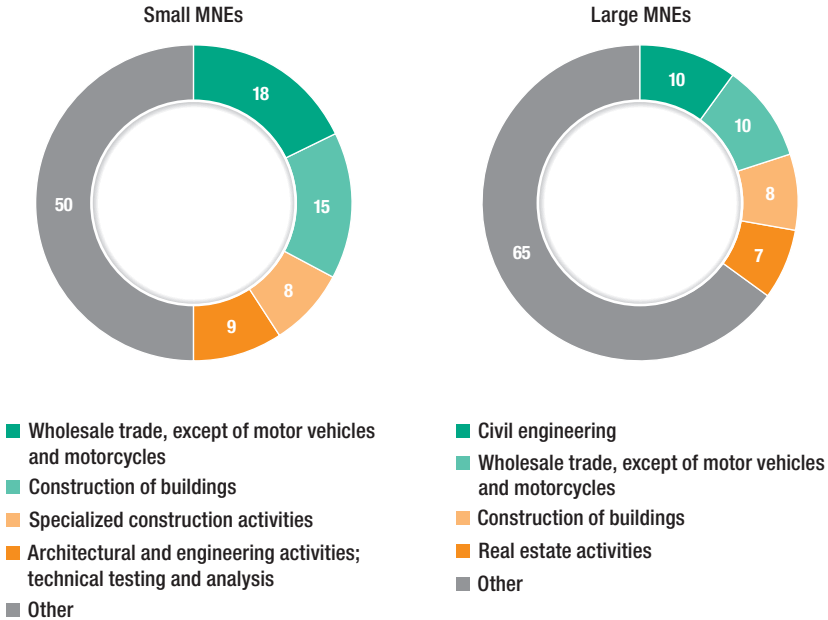
Source: Authors' calculations based on TURKSTAT data.

Innovation is not easy to quantify. Traditionally the most common indicators to measure business innovation include (i) input measures such as expenditure on R&D, (ii) intermediate output measures such as numbers of patents and (iii) output measures such as growth rates of productivity. This study employs a combination of the first two indicators. R&D expenditure is broadly used as an indicator of innovative activities. In addition, we consider intellectual property rights that encourage innovation by providing innovators with time-limited exclusive legal rights, thus enabling them to generate appropriate returns from their innovative activity (WIPO, 2022). For this, we use applications for patents, trademarks, industrial design, and utility models. Although patents require certain standards of novelty, the other innovation tools do not. A trademark is used to distinguish the goods or services of one enterprise from those of another. Industrial design includes a wide range of activities to develop a new or modified function, form or appearance for goods, services or processes. Utility models provide minor improvements to, and adaptations of, existing products. As a result, they do not qualify for patents but still require some sort of protection as they may have an important role in a national innovation system (OECD and Eurostat, 2018).

Table 2 shows the innovation performance of all enterprises with a foreign subsidiary. The innovation variable shows the total number of firms to which one or more innovation indicators applied: 472 of 2,588 firms have identifiable innovation activities, corresponding to a share of 18 per cent of all firms. For SMEs the share is 12 per cent, and for large MNEs it is 32 per cent. Decomposition of innovation activities across patent, trademark, design and model applications displays a similar picture. Large MNEs dominate in all categories. Trademark filings make up 89 per cent of all applications by SMEs (table 2).

Table 2. Innovation performance of firms with foreign subsidiaries

	Whole sample (N = 2,588)	SMEs (N = 1,518)	Large MNEs (N = 1,070)
Innovation	472	181	291
Patent applications	100	6	94
Trademark applications	408	165	243
Design applications	87	8	79
Utility model applications	33	7	26

Source: Authors' calculations based on TURKSTAT data.
Note: The innovation variable shows the total number of firms that applied to one or more innovation indicators. Details of the type of innovation do not add up to the total innovation values because a firm can submit more than one application.

4.2. Model specification

The empirical strategy follows a three-step analysis. The first step examines whether there are any significant differences in firm outcomes between SMEs and large MNEs that have foreign subsidiaries. For this purpose, the following equation is estimated:

$$firm\_outcome_{ijt} = \beta_0 + \beta_1 SME_{ijt} + \gamma_{ij} + \varepsilon_{ijt} \tag{1}$$

for firm i operating in industry j at time t. *SME* is the variable of interest, which is a binary variable that takes the value 1 if the firm has 250 employees or fewer. Firm outcome is the dependent variable, which takes different values for individual estimations including export intensity, foreign revenue, wage, R&D expenditure and innovation. Export intensity is the share of exports in total sales of the firm. Foreign revenue is measured as the share of revenue from foreign subsidiaries in total sales of the firm. Wage is the average wage at the firm, used in natural logarithm form. R&D expenditure is calculated as the share of R&D expenditure in total sales of the firm. Innovation is a binary variable that takes the value 1 if the firm applies for at least one patent, trademark, design or utility model, and 0 otherwise.

Finally, γ_{ij} is industry-year fixed effects and ε_{ijt} is the error term. This model is estimated on a sample of firms with foreign subsidiaries.

The second step investigates the role of government incentives in promoting innovation activities of SMEs. To examine this relationship, the following linear probability model is estimated:

$$innovation_{ijt}=\beta_0+\beta_1 incentive_{ijt}+\beta_2 lnsize_{ijt}+\beta_3 lnage_{ijt}+\gamma_{ij}+\varepsilon_{ijt} \tag{2}$$

where the variable *incentive* stands for the support received by the firm for its R&D-related activities either from KOSGEB or TUBITAK. This is a binary variable which takes the value 1 if the firm benefits from any incentives or support programmes from one of the two organizations. Then, two binary variables are introduced to examine the efficiency of different support programmes separately. These variables are named *kosgeb* and *tubitak*, and they take the value 1 if the firm receives support from KOSGEB and TUBITAK, respectively, and 0 otherwise. The variable *size* is the number of employees of the firm, and *age* is the age of the firm, to control for the firm's experience. Both variables are used in natural logarithm form to normalize the distribution. This model is estimated for all SMEs.

The third, and last, stage of the analysis focuses on the internationalization pattern and trends of SMEs within the context of innovation. The role of innovation on internationalization, measured as outward FDI, is analyzed comparing fully domestic firms with firms that invest abroad. The model takes the following form:

$$fdi_{ijt}=\beta_0+\beta_1 innovation_{ijt-1}+\beta_2 lnsize_{ijt}+\beta_3 lnage_{ijt}+\gamma_{ij}+\varepsilon_{ijt} \tag{3}$$

where *innovation* is used with a one-year lag. There may, in principle, be a dynamic impact from FDI on innovation as FDI can enhance firms' innovation capacity by promoting firms' learning and access to resources in foreign markets. This reverse causality is disentangled using a lagged independent variable ($innovation_{ijt-1}$) in a first difference model (Allison, 2009). This model is estimated for all SMEs using a linear probability model.

All three models are run initially by using industry-year fixed effects. The analysis is repeated by including industry and year fixed effects separately, and results do not change. Standard errors are clustered at the industrial level using the two-digit Nomenclature of Economic Activities (NACE) classification.

4.3. Empirical results

The empirical results provide a set of stylized facts observed in the sample that explain the role of innovation in investing abroad. The results of the first model are displayed in table 3. The key message is that SMEs are less innovative but

as internationalized as larger firms. The findings also suggest that SMEs that invest abroad pay lower wages than their large counterparts. In addition, SMEs' participation in innovative activities such as applications for patents, design, trademark and utility models, is lower than that of large firms. Yet, the empirical analysis does not provide evidence in support of a statistically significant difference between SMEs and large firms in terms of their export intensity, foreign revenue share and R&D expenditure share in total sales.

Table 3: SMEs vs. large firms with foreign subsidiaries

	Export intensity	Foreign revenue	Wage	R&D expenditures	Innovation
SME	0.004 (0.039)	0.000 (0.021)	-3.811*** (0.135)	-0.001 (0.003)	-0.096*** (0.027)
N	2 038	2 193	2 011	2 036	2 332
Fixed effects	Industry and year	Industry and year	Industry and year	Industry and year	Industry and year
R^2	0.221	0.222	0.683	0.369	0.325

Source: Authors' estimations.
Note: t statistics in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4 presents the results of estimating the relationship between government incentives for R&D and firms' innovation performance. Initially, the model is estimated using one common incentive variable to examine the effect of incentives overall regardless of their origin. Then, each model is estimated for *kosgeb* and *tubitak* incentives separately to investigate the efficiency of different support programmes. The results suggest that government support for R&D is positively associated with firms' increase of innovation activities and R&D expenditures, independent of the source of the incentive and of the type of innovation activity. Although both *kosgeb* and *tubitak* variables yield statistically significant coefficients, the magnitude of *tubitak* is greater. This is in line with expectations, as TUBITAK incentives directly target R&D and innovation activities, whereas KOSGEB provides broader incentives, including programmes for general SME support and foreign market operations support.

Table 4. Effect of government incentives on innovation

	Patent applications			Innovation			R&D expenditure		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Incentive (lag_1)	0.068*** (0.006)			0.148*** (0.010)			0.062*** (0.014)		
Kosgeb (lag_1)		0.058*** (0.006)			0.142*** (0.011)			0.055*** (0.011)	
Tubitak (lag_1)			0.069*** (0.005)			0.145*** (0.011)			0.066*** (0.016)
Firm size (ln)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.026*** (0.002)	0.027*** (0.002)	0.025*** (0.002)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Firm age (ln)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.010*** (0.000)	-0.010*** (0.001)	-0.010*** (0.001)	-0.000** (0.000)	-0.000** (0.000)	-0.000*** (0.000)
N	5 165 840	5 165 840	6 309 650	5 165 840	5 165 840	6 309 650	5 018 583	5 018 583	6 126 257
Fixed effects	Industry and year	Industry and year	Industry and year	Industry and year	Industry and year	Industry and year	Industry and year	Industry and year	Industry and year
R^2	0.018	0.010	0.015	0.042	0.041	0.044	0.071	0.054	0.065

Source: Author's estimation.

Note: t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5 presents the findings on the relationship between innovation activities and outward FDI by SMEs, focusing on the aforementioned three measures of innovation. The results suggest that innovation activities increase the probability of outward FDI. The model does not provide evidence for statistically significant results for patent applications and R&D expenditures.

Table 5: Effect of innovation on outward FDI

	(1)	(2)	(3)
Innovation (lag_1)	0.015%** (0.0000)		
Patent (lag_1)		0.067% (0.0004)	
R&D expenditures (lag_1)			0.089% (0.0009)
Firm size (ln)	0.017%*** (0.0000)	0.017%*** (0.0000)	0.018%*** (0.0000)
Firm age (ln)	-0.002%** (0.0000)	-0.020%** (0.0000)	-0.002%** (0.0000)
N	6 882 491	6 882 491	6 677 693
Fixed effects	Industry and year	Industry and year	Industry and year
R^2	0.0009	0.0009	0.0010

Source: Authors' estimations.
Note: Average marginal effects are reported. The dependent variable is whether the firm invests abroad or not. *t* statistics in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The empirical analysis confirms the established theory that only innovative and dynamic SMEs are more likely to invest abroad. Engaging in innovative activities increases SMEs' probability of foreign investment by 0.015 percentage points. The model does not provide significant evidence for the effect of patent applications and R&D expenditures on FDI. The insignificance of the relationship might be explained by the fact that the economic benefits of being granted a patent might be slow to materialize and translate in geographic expansion.

5. Conclusion and policy implications

This research note investigates the relative innovation performance and international presence of SMEs, looking at government incentives that promote innovation and hence internationalization in Türkiye. The relationship between innovation and outward FDI is examined through the lens of three incentives for innovation: patent application, innovation activities and R&D expenditures. Using administrative data for a period of 15 years, empirical analysis shows that government support for R&D is positively associated with firms' innovation activities and R&D expenditure. The results also suggest that innovation activities increase the probability of outward FDI.

The results have important implications for policy. They highlight the role of public incentives in promoting innovation and boosting FDI by SMEs. Public funds in the form of research grants, prizes and loans can be crucial in supporting SMEs' R&D operations. Our results also underline the importance of intellectual property rights for promoting innovative activities. Intellectual property rights defined by international agreements must be recognized and implemented by national laws. Policies also must be adopted to ensure countries have a regulatory framework for market competition to provide satisfactory returns to innovators, and complementary infrastructure.

Access to innovation assets, such as technology, data, information and networks, is critical for firms of all sizes but it is more restricted for SMEs. SMEs are also more dependent on external sources of knowledge. Governments should facilitate and ensure the access of SMEs to innovation assets through technological and managerial training, networking events and skills programmes, as well as the necessary complementary infrastructure. Digitalization of SMEs is of great importance as it facilitates access to resources, including finance (e.g. peer-to-peer lending), training and recruitment channels, as well as government services.

Policymakers can further support innovation in SMEs by fostering a sound business environment, helping SMEs to develop and use their internal strategic resources effectively. Strong collaboration between SMEs and university labs is an essential part of a productive innovation ecosystem. Finally, information matters: it is essential that SMEs are well-informed about the incentives and support programmes available to them.

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[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.

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