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Do corporate inversions create systematic MNE sampling biases when using the Orbis database?

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ABSTRACT

Corporate inversions, whereby MNEs relocate their ultimate owner to another jurisdiction, pose potential challenges for IB researchers developing samples of MNEs and their foreign subsidiaries using firm-level databases like Orbis. Here we develop a method for identifying inverted MNEs from around the world. We then test two hypotheses relating to whether systematic biases may exist in MNE sampling procedures. Analyzing data from over 52,000 MNEs across 30 nations, we hypothesise that emerging market MNEs and larger MNEs with extensive foreign networks are more likely to invert. Our findings confirm this, revealing systematic differences between inverted and non-inverted MNEs, leading to potential sampling biases. We discuss implications for current IB research and propose ways forward for enhancing cross country MNE sampling procedures.

1. Introduction

It is understandable that International Business (IB) researchers should want to develop large-scale international cross-country samples of MNEs and their foreign subsidiaries to test IB theory. Within IB studies it has become popular to use secondary data from firm-level databases like Orbis (Bureau Van Dijk) to do so (Table 1; Cerar et al., 2021). The Orbis database is very attractive for IB scholars as it allows, among things, users to quickly create large-scale samples of MNEs originating from and investing in multiple national jurisdictions to test their theoretical predictions (see Table 1 for examples of such studies). MNE sampling, however, is typically done by identifying the jurisdictions of the MNEs' 'global ultimate owner' (hereafter GUO) to specify the MNEs' parent country of origin. The GUO is defined as the entity at the top of a corporate ownership chain that exercises ultimate ownership and thus control over an MNE's lower tier of subsidiaries. In firm-level databases such as Orbis, the GUO is identified as the legal entity that holds a direct or indirect ownership stake of more than 50.01 % in a firm and is not itself controlled by any other corporate entity. This GUO is therefore commonly used in international business research to assign a country of origin to MNEs and to distinguish between domestic and foreign ownership in the classification of subsidiaries. Using the GUO, all 'foreign' subsidiaries (i.e. subsidiaries owned outside of the GUO country) can then be automatically identified. This allows researchers to build various types of MNE/foreign subsidiary samples.

Typical samples that are developed in IB studies include looking at the activities or location choices of different types of MNE subsidiaries within specific regions (i.e. activities of MNEs from emerging and developed markets say, to detect differences in their strategies) (Estrin et al., 2018; Jindra et al., 2016). Other studies may look at MNEs from a single specific source country – or by

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contrast the activities of MNEs within a specific market (say all foreign M&As into the U.S.) (Wang et al., 2022). What most IB studies share, however, is the *requirement* to specify an MNE's origin or home country. Without this, it is impossible to define what is 'foreign' (Meyer and Benito, 2016). The approach to defining the country of origin when using Orbis is nearly always reliant upon using the GUO. This raises a question, however, about MNEs that change the location of their GUO via a corporate inversion or other process that redomiciles its GUO. Are MNEs from some countries, or some types of MNEs, more predisposed towards such relocations? If so, how might that affect the sampling procedures commonly used in many IB studies (Table 1)? It is not difficult to see how having a large number (or small number of large) inverted MNEs could potentially complicate empirical approaches to the sampling of MNEs when using GUO criteria in databases like Orbis (Hennart and Sutherland, 2022).

We begin by discussing what the GUO is and how and why corporate inversions may lead to its relocation. We then outline in more detail the ways in which comparative IB studies typically create cross-country MNE parent/foreign subsidiary samples using the GUO approach in Orbis. We explore to what extent inversions can be thought of as introducing random noise as opposed to systematic biases in the MNE sampling process. To do this, we develop two hypotheses based on existing inversion literature and theory (Col et al., 2020). These focus on the drivers of inversions and, more specifically, the types of MNEs that are more likely to invert. Specifically, we explore whether emerging market MNEs (EMNEs) and larger MNEs (i.e. with greater numbers of foreign subsidiaries) are more likely to invert. We test these two hypotheses using a logistic model (modelling the choice to invert or not) on a sample of approximately 52,000 inverted and non-inverted MNEs from 30 different nations. We do so with a view to informing the inversion literature as well, more importantly, as shedding more light on the MNE sampling biases potentially introduced by inversions when using firm level databases like Orbis. In our discussion we consider some typical IB studies that use Orbis and outline potential MNE sampling issues with a view to informing sampling approaches used in future research.

As well as contributing to methodological debates on MNE sampling, we add to IB studies by providing a novel method for identifying inverted MNEs and their actual country of origin (i.e. pre inversion home country). The approach, which we detail in our methods section, is potentially useful for IB researchers looking to develop MNE/foreign subsidiary samples. This is because it provides them with a way of identifying more complete samples of MNEs and their foreign subsidiaries. While in many cases this correction may not be large and of significance, in others it is. Our study thus contributes to the IB literature in three main ways: first, by offering a replicable method for identifying inverted MNEs in Orbis; second, by showing that inversion is systematic and linked to, among other things, EMNE status and scale; and third, relatedly, by highlighting how this creates sampling distortions in GUO-based datasets.

2. Background and context for research questions

2.1. Corporate inversions and the relocation of an MNEs' ultimate owner

Corporate inversions involve relocating a company's GUO as well as legal headquarters to a different country, sometimes with more favourable taxes and often a more favourable institutional and regulatory environment. The choice of the GUO location can be influenced by factors such as tax regulations, regulatory environment, access to markets, and political stability, among other things (Col et al., 2020). Nonetheless, regardless of motivation, inversions by definition result in a change in GUO location while maintaining the original shareholders in majority control (Col et al., 2020; Reyes-Peña et al., 2022). Inversions may, in addition, involve relocation of the GUO to an offshore tax haven and/or financial centre, which may offer additional secrecy to the MNE but further complicate their inclusion in MNE sampling procedures.

Kingsoft Corporation Limited, a leading Chinese software and internet service company, is a suitable illustrative example. Originally headquartered and from Beijing, China, the corporate inversion began with the establishment of a holding company, 'Kingsoft Corporation Holdings', in the Cayman Islands. The inversion was to facilitate the company's expansion (via raising capital) and to streamline its international business operations. Along with this holding company, it structured several special purpose entities, in the British Virgin Islands and Hong Kong. The inversion process involved transferring a significant equity stake from Kingsoft's primary operations in China to the new Cayman Islands-based holding company. According to its annual report, it inverted its corporate structure thus:

'On 15 November 2005, the Company was redomiciled to the Cayman Islands under the Company Law (2004 revision) of the Cayman Islands.'

Table 1
Number of IB related articles that use the Orbis database, by journal and year.

Journal	2019	2020	2021	2022	2023	2024	Total
Journal of Business Research	7	1	8	3	6	2	27
Journal of International Business Studies	0	6	6	3	2	6	23
International Business Review	3	1	1	3	3	3	14
Journal of World Business	3	4	2	2	3	0	14
Journal of International Management	1	3	2	4	1	1	12
Management International Review	0	1	1	0	2	2	6
Journal of International Business Policy	0	1	2	0	1	0	4
Asia Pacific Journal of Management	0	0	1	0	1	0	2
Total	14	17	23	15	19	14	102

(Kingsoft Corporation Limited, 2022)

Later in 2007, Kingsoft Corporation Limited was listed on the Hong Kong Stock Exchange, a move that was aimed at raising capital for expansion and growth, which it achieved after its listing (in its software and internet services sectors) in both the domestic and international market (S&P, C, 2023). The inversion, going beyond tax optimisation, appeared highly beneficial to Kingsoft. Many other Chinese MNEs have chosen to invert like this (Buckley et al., 2015b). In the Chinese case, MNEs typically invert so that they can receive foreign investment (and currency) and access strong institutional environments. Bringing the firms to the investors therefore is efficient. Similar strategies have been used by MNEs from other emerging markets, including India, Russia and Brazil (Buckley et al., 2015b; Dasgupta, 2025).

MNEs originating from developed markets also invert. Inversions, particularly to Ireland, have been common in MNEs from the US. The first U.S. inversion dates to 1983 (McDermott International) but the scale of inversions grew dramatically after 2014, to the extent that they became a major political issue and saw the rise of numerous restrictive government regulations and laws. A well-known and high-profile case involved the US\$48 billion merger of Medtronic (US) with Covidien plc (Ireland). An even higher profile merger between Pfizer (US) and Allergan plc (Ireland) in a US\$160 billion deal was later called off in 2016 owing to political interventions. One of the largest hybrid-intellectual property tax inversions was the US\$300 billion acquisition of Apple Inc.'s IP by Apple Ireland in 2015. Recently, inversions via use of 'special purpose acquisition companies' (SPACs) have become common in the US. SPACs provide a cheaper and quicker way of listing a company than going through the conventional IPO process and thus became popular. Indeed, many of the firms listed on the US stock markets between 2020 and 2024 were based around SPAC related offshore listing vehicles (Olsen, 2025). Lucid Motors, for example, a U.S. electric vehicle manufacturer, went public through a merger with the SPAC Churchill Capital Corp IV in July 2021. This relocated Lucid's GUO to the Cayman Islands. Arrival, an electric vehicle manufacturer originally headquartered in the U.K., merged with the SPAC CIIG Merger Corp in March 2021, relocating its GUO to Luxembourg. Similarly, XP Inc., a major Brazilian brokerage firm, went public through a merger with the SPAC Stone Co in 2019, relocating its GUO to the Cayman Islands. As with the US, UK based MNEs have been attracted to invert in Ireland. Similarly, Japan's Takeda merged with Irish-based Shire plc (a previous UK inversion to Ireland in 2008).

This anecdotal evidence points towards numerous cases of corporate inversion, often involving large MNEs and from a variety of emerging and developed markets. The process provides various corporate advantages, both institutional and tax related but entails moving the MNE's GUO. The number and extent of inversions, moreover, has varied over time. This may again potentially complicate inter-temporal sampling procedures.

2.2. MNE sampling procedures using the firm-level databases like Orbis

Table 1 provides a summary of the number of IB related articles published in a selection of respected mainstream journals over the past five years that use Orbis. As noted, the number of IB studies using the Orbis database has become considerable in recent years.

How do these studies sample MNEs and their related foreign subsidiaries? The standard approach, as noted, is to use jurisdiction of the GUO, the largest shareholding firm that is independent, to distinguish between 'foreign' and domestically owned firms. For example, Estrin et al. (2018) compare a large EMNE with DMNE sample. They identify over 1.64 million foreign subsidiaries and define 'a firm as being foreign owned when the (foreign) ultimate owner holds a direct or indirect participation of at least 50.01% of the stock. If a largest shareholder is not independent, the ultimate owner is traced back again via the largest shareholder until an ultimate owner which is independent is finally identified' (Estrin et al., 2018, p.518). They note that the 'dataset allows us to identify all firms operating in a given host economy owned by firms from any given source country' (Estrin et al., 2018, p.518). In a similar type of comparative study, Sanfilippo (2015) samples 2013 European affiliates of BRIC EMNEs, comparing their productivity with a DMNE sample. Sanfilippo (2015) notes that an 'advantage' of Orbis is that 'it provides full information on the ownership structure of each company, including the degree of domestic and foreign control. This is important in constructing groups with clear-cut definitions of the nationality of foreign affiliates...foreign affiliates are classified according to the nationality of their Global Ultimate Owner (GUO), defined as the corporate entity holding a controlling stake greater than 50.01 per cent' (Sanfilippo, 2015, p.6567).

The Orbis database appears to offer researchers the potential to efficiently build large cross-country international samples of MNE parent firms and, in turn, to identify their foreign subsidiaries. The types of studies typically published using this type of Orbis data include EMNE/DMNE comparative samples (Estrin et al., 2018; Jindra et al., 2016), DMNE versus DMNE comparative samples (Delis et al., 2019; Driffield et al., 2019; Jones and Temouri, 2016; Jones et al., 2018), single host (i.e. a country receiving FDI) (Wang et al., 2022) and single source FDI studies (i.e. Chinese MNEs expanding overseas). This allows for comparative analyses of such things as MNE location choices as well as performance impacts, accounting for country-of-origin effects. These empirically focused studies allow for MNE analysis across different geographic and institutional contexts and over different time periods (panel data is often created). While this GUO approach may appear to allow researchers 'to identify all firms operating in a given host economy owned by firms from any given source country', this will only be true if inverted MNEs are accounted for (Estrin et al., 2018, p. 518). A question remains, therefore, regarding the extent to which corporate inversions may systematically bias the MNE/foreign subsidiary sampling approaches illustrated above, or whether they are nothing more than random noise that can be overlooked (Hennart and Sutherland, 2022). We return to this issue in our discussion.

3. Hypothesis development

To establish whether systematic sampling biases may exist, we first explore whether differences exist between inverted and non-

inverted MNEs. Based on extant literature on corporate inversions, we outline two baseline hypotheses regarding the types of MNEs that may be more predisposed towards corporate inversions. First, as there are a number of recent empirical studies using Orbis that compare the FDI of EMNEs with DMNEs, we consider whether the former are more prone to inversion. The inversion related literature argues they are. Second, as excluding larger MNEs (i.e. with more foreign subsidiaries) has the potential to more seriously impact sampling errors, we outline why larger MNEs may be more predisposed towards inversions.

3.1. Do EMNEs have a greater propensity to invert vis-à-vis DMNEs?

Some have argued inversions are driven primarily by taxation related factors (Reyes-Peña et al., 2022). If so, this may make inversions to lower tax jurisdictions more appealing to DMNEs (which may face higher corporate tax rates than EMNEs). However, many of these studies are single country focused, making it difficult to empirically verify the impact of corporate taxes alone. Col et al. (2020), using one of the only cross-country samples of inversions, have recently challenged this ‘popular notion’, noting ‘that 3 of 5 inversions occur in nontax havens and among these, half are in destination countries with higher statutory tax rates than those faced at home’ (Col et al., 2020, p.167). The motivation for undertaking corporate inversions, therefore, appears to extend beyond reducing corporate tax rates alone.

Inversions, in addition to potentially reducing corporate tax rates, may be a ‘strategy through which MNEs arbitrage institutional differences’ (Reyes-Peña et al., 2022, p.830). They allow EMNEs to circumvent restrictive regulatory and economic environments in their home countries, seeking more favourable conditions that support their international operations and growth ambitions (Cuervo-Cazurra and Genc, 2008). Supporting this insight, Buckley et al. (2015b) highlight the various non-tax related benefits inversions offer EMNEs. Emerging markets, typified by more fragile and volatile institutional environments, may create uncertainty as well as making certain business activities harder to undertake (Karhunen et al., 2022). This places EMNEs at a disadvantage vis-à-vis their developed-market counterparts. As Luo and Tung (2007) note, so-called ‘springboard MNEs’ (of which EMNEs are the major subset) may look to engage in both institutional escapism and arbitrage, so as to place themselves on a more equal footing with their DMNE counterparts. Corporate inversions take the MNEs’ parent and controlling company away from its domestic base, typically to an offshore tax haven/financial centre, circumventing some of the harmful domestic interference they may face while simultaneously accessing superior institutional market environments (Buckley et al., 2015b; Karhunen et al., 2022). Importantly, they allow EMNEs to better access international financial markets, often through offshore financial centres (OFCs). They do so via foreign listings, access to international bond markets and other financial institutions found in OFCs. They may allow EMNEs to access and use international corporate law, allowing for better property rights protection and engagement with international property rights markets (orchestrating further M&As or property rights transactions, for example, offshore). They facilitate EMNEs engagement with advanced business service providers (lawyers, accountants, consultants) that specialise in servicing MNEs (Buckley et al., 2015b). Inversions can also have significant impacts on the governance and control mechanisms of an MNE, shareholder rights, and overall control of the company. This creates positive signals to investors, so raising an EMNEs share price, ability to raise capital and longer-term growth (Karhunen et al., 2022). Inversions, in short, can be highly transformative for EMNEs, as illustrated in our earlier Kingsoft example. We hypothesise:

Hypothesis 1. Systematic MNE sampling biases exist when using the Orbis database to analyse differences between EMNEs and DMNEs using the GUO sampling approach, as EMNEs have a greater propensity for corporate inversion than DMNEs.

3.2. More general systematic sampling biases: do larger MNEs tend to invert?

Anecdotaly, often very large MNEs with extensive foreign subsidiary networks are inverted. Extant research on inversions supports the idea that MNE size is a determinant of inversions. Col et al. (2020), for example, found that firm size was a significant predictor of inversion activity. Hope et al. (2011) suggests that larger firms, due to their complex structures and international reach, are more likely to engage in corporate inversions as part of earnings management and strategic global positioning. Similarly, Reyes-Peña et al. (2022) found firm size predicted inversion likelihood: ‘firms that inverted are significantly larger’ (Reyes-Peña et al., 2022, p. 836). Furthermore, Desai and Hines (2002) found that “that firm size significantly affects the propensity to expatriate [i.e. invert]: larger firms are more likely to do so than are smaller firms” (Desai and Hines, 2002, p.18).

This may be understandable, as managing tax liabilities across multiple jurisdictions may become increasingly burdensome as an MNE’s number of subsidiaries grows. This complexity may incentivise MNEs to seek more favourable tax regimes through corporate inversions, allowing them to consolidate their global tax obligations and to do so under more advantageous conditions (Desai and Hines, 2002). Larger, and typically more internationally diversified MNEs, in addition, have greater resources to investigate and subsequently orchestrate the inversion process. Going beyond taxes, inversions can be more beneficial to large MNEs that seek access to offshore institutions that allow them to leverage their existing resources. This is noticeable in large EMNEs, many of which leverage the domestic market growth potential to access offshore investors and the supporting advanced business service providers found in jurisdictions popular with inverted MNEs.

In short, the inversion literature suggests larger MNEs are more likely to invert. If this is so, excluding them is more likely to lead to sampling biases when using the GUO approach to creating MNE samples. While the relationship between firm size and inversion may appear intuitive, it carries methodological implications: as firms grow in complexity and international scope, the risk of ownership–operations mismatch also increases — with direct consequences for GUO-based sampling. We thus hypothesise:

Hypothesis 2. Systematic MNE sampling biases exist when using the Orbis database to analyse MNEs and their foreign subsidiary activities, as MNEs with more foreign subsidiaries have a greater propensity for corporate inversion.

4. Data & methods

A challenge in this research is identifying inverted MNEs across countries. We therefore first outline how we did this. Second, we explain our logit model, which models the likelihood of an MNE choosing to be inverted or not.

4.1. Data and sampling approach

The only previous study attempting to identify a comprehensive cross-country sample of MNEs that have changed to operate under an inverted structure, as noted, is that of [Col et al. \(2020\)](#). They provide a snapshot of global inversion frequency, country of origin and timings using a ‘hand-collected’ approach ([Col et al., 2020: 165](#)). They focus, however, only on firms from 11 OECD countries, those responsible for the largest share of cross-border M&A activities (i.e. they focus on DMNEs only).¹ For the purposes of testing our hypotheses, which incorporates EMNEs, their approach is not suitable. Moreover, we are interested specifically in using the Orbis database, so that we can provide more insights into the difficulties of developing MNE samples from it (and by doing so inform IB researchers of potential mitigation measures).

[Col et al.’s \(2020\)](#) approach, which we partially draw from, relied upon firm level data related to changes in the first two digits of a firm’s ISIN codes.² Such changes, they argue, indicate a change in corporate structure/form, possibly via inversion. Having identified firms with ISIN changes, they then undertook further detailed investigations, using secondary media reporting to confirm if an inversion had taken place. Using this method, they identified over 600 corporate inversions, as well as the preferred locations for inversions, based on the details of the new ISIN code (which provides the new jurisdiction of the MNE).

Our multi-step method, which draws initially from the Orbis database, then the CRSP and Compustat – Capital IQ databases, starts by using the most popular inversion jurisdictions identified by [Col et al. \(2020\)](#). We employed the Orbis database to identify all MNEs with GUOs in these jurisdictions (see [Table 5](#), top row). We focus on all of the popular inversion jurisdictions that [Col et al. \(2020\)](#) identified as being home to multiple inversions (i.e. namely the Bahamas, Bermuda, Cayman Islands, Cyprus, France, Germany, Ireland, Italy, Japan, Luxembourg, Malta, Marshall Islands, Netherlands, Norway, Panama, Singapore, Spain, Switzerland the U.S. and BVI). From Orbis we then identified all GUOs in these jurisdictions that owned at least one foreign subsidiary (based on a 50 % plus ownerships share) outside of the inversion jurisdiction. Our reasoning here was that inverted companies, as a consequence of moving their GUO, will usually own many now ‘foreign’ subsidiaries (i.e. in their original country of origin, i.e. China in the aforementioned Kingsoft case). Corporate inversions, moreover, result in a change in GUO location while maintaining the original domestic market shareholders in majority control. It follows, therefore, that an inverted MNE will have (a) a large number of (now) ‘foreign’ subsidiaries within their original domestic market from which they grew and (b) that the majority shareholders will also be from the same jurisdiction as these foreign subsidiaries. For example, most of Kingsoft’s ‘foreign’ subsidiaries are in China and it has Chinese nationals as its major shareholders. Our initial screening approach therefore identified the nationality of the major shareholders, followed by checking to see whether that MNE had a significant number of its foreign subsidiaries in the country of the shareholders.

Following this initial screening using Orbis, we followed up by using both the CRSP and Compustat – Capital IQ databases, copying [Col et al.’s \(2020\)](#) method, to identify if any of these MNEs had undertaken a change in the first 2-digits of their ISIN numbers (in the period of 1994–2023). This enabled us to verify that the MNEs had indeed inverted, comprising 1326 inverted MNEs from 45 countries. However, 15 of these home countries that only had 1 corporate inversion (12 emerging; 3 developed). This left 31 home countries (15 emerging; 16 developed). Likewise, with the host countries, there were 14 countries that only had 1 corporate inversion. This left 20 host destinations, 13 of which were tax havens ([Table 6](#)). (To note: [Table 6](#) shows 1297 inversions, as we chose to include only those countries with more than one inversion, [Table 6](#)). Finally, we carried out additional manual checks, which included reviewing annual reports and, for unlisted entities, using Orbis to investigate their ownership structures and activities, with a focus on detailed business history, to check if they had indeed inverted. Importantly, our approach allowed us to accurately identify the original home country (i.e. China in the Kingsoft case), determined by the original ISIN code location, location of the now inverted MNE’s foreign (originally domestic) subsidiaries, as well as shareholders.

To test our hypotheses, we required a comparator group of non-inverted MNEs from the same origin countries that our inverted MNEs originated from. We took this MNE comparator group directly from the 30 countries of origin that we identified using the above process. We adopted the standard MNE sampling approach (i.e. that used in studies highlighted in [Table 1](#)). This involves (a) selecting firms with GUOs in the 30 home countries (b) that own at least one foreign subsidiary (50 % plus share) in a country different to that of the GUO. Carrying out these steps created a sample of 51,431 non-inverted MNEs and 1326 inverted MNEs.

4.2. Model specification

To test for differences between inverted and non-inverted MNEs, we use a logistic model, applying the maximum likelihood method, using robust standard errors clustered by year and industry to test our two hypotheses³:

¹ From Australia, Canada, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

² They used the SIX Financial Information database.

³ $P(i) = \frac{1}{1+e^{-\beta X(i)}}$ $P(i)$ is the probability of parent firms undertaking an inversion. $X(i)$ is the independent variables and β is the coefficients.

$$\text{Probability}(\text{Inversion}_{it} = 1; \text{Non inversion}_{it} = 0) = f(\text{GDPPC}_{it}, \text{CGS}_{it}, \text{MSMNE}_{it}, \text{SSMNE}_{it}, \text{VLSMNE}_{it}, \text{GUOTH}_{it}, \text{CTDIFF}_{it}, \text{EMNE}_{it}, \text{NFS}_{it}, \text{Country Dummies}_{it} + \varepsilon_{it}).$$

where i denotes the parent firms and t represent the investment year.

4.3. Dependent variable

Our binary dependent variable indicates whether an MNE has chosen to undertake a corporate inversion or not (one for inverted MNEs, zero otherwise). This allows us to test which types of MNEs are prone to inversion (i.e. EMNEs, larger MNEs).

4.4. Explanatory variables

The variable EMNE designates whether an MNEs' home country is in an emerging market, based on IMF/OECD country classification schema (H1). We use the number of foreign subsidiaries as a proxy for a firm's multinational presence and size (H2).

4.5. Control variables

Our model is relatively parsimonious (Table 2), as we are primarily interested in the general question of whether inverted MNEs systematically differ from non-inverted MNEs. Identifying the exact causal factors, therefore, is useful in so far as it allows us to think about which types of studies may have more acute sampling issues (i.e. say ones which compare EMNEs with DMNEs). We include several firm specific (i.e. firm, industry, size) and home country specific (i.e. tax rate) control variables. Orbis classifies corporations by size (i.e. small, medium, and very large) and we employ this variable. In addition, we incorporate country of origin dummies, home country GDP per capita, corporate tax (home less host) and institutional quality (home less host) to identify any institutional arbitrage motives. Dharmapala and Hines Jr (2009) found that tax havens provide strategic fiscal benefits crucial in inversion decision-making processes. We include a dummy variable, one when a tax haven acts as an inversion host, zero otherwise (based on Jones and Temouri's (2016) approach). A dummy high-tech sector variable is included, given its unique regulatory challenges and intellectual property considerations (Branstetter et al., 2011) (Table 2).

5. Results

Tables 2, 3 and 4 provide a summary of the variables and descriptive statistics. Pairwise correlations suggest multicollinearity is not a significant concern. Table 6 illustrates the distribution of corporate inversions by home country and preferred inversion host countries, based on the aforementioned novel approach for identifying inverted MNEs. Emerging markets like China and Brazil had a large number of inversions, predominantly orchestrated from tax havens such as Bermuda and the Cayman Islands (Table 6), as did some developed markets, notably the US.

The logistic regression results (Table 5, Model 1) indicate a positive and significant coefficient for the EMNE dummy ($\beta = 2.831$, $p < 0.01$). Hypothesis 1 is therefore supported. Hypothesis 2, that MNEs with a greater number of foreign subsidiaries are more likely to engage in corporate inversions, is also supported ($\beta = 0.018$, $p < 0.01$). As regards control variables of interest, while very large firms are significantly more likely to invert (Table 5, Model 1: $\beta = 2.025$, $p < 0.01$; Model 3: $\beta = 1.794$, $p < 0.01$), small firms have a negative and significant likelihood of inversion (Model 1: $\beta = -1.279$, $p < 0.01$; Model 3: $\beta = -1.674$, $p < 0.01$).

To aid interpretation, we exponentiate the log-odds coefficients to present odds ratios. The results suggest that EMNEs are substantially more likely to invert: the odds of inversion for EMNEs are nearly 17 times higher than for DMNEs (OR = 16.96, $p < 0.01$). Firm size also plays an important role. Very large firms have over 7.5 times higher odds of inversion compared to medium-sized firms (OR = 7.58, $p < 0.01$), while small firms are significantly less likely to invert, with odds reduced by about 72 % (OR = 0.28, $p < 0.01$). Each additional foreign subsidiary increases the odds of inversion by about 1.8 % (OR = 1.018, $p < 0.01$). Finally, MNEs with GUOs located in tax havens are overwhelmingly more likely to invert (OR = 493.6, $p < 0.01$), underlining the central role of tax haven jurisdictions in facilitating corporate inversions.

5.1. Robustness checks

While most studies comparing EMNEs with DMNEs include China in their EMNE dummy (Estrin et al., 2018; Jindra et al., 2016; Sutherland et al., 2020), given its potentially strong influence on this grouping, we consider the EMNE dummy without Chinese MNEs included. In additional tests (not reported) we found this restricted EMNE dummy to be significant, reinforcing H1. We also ran additional tests using individual country level dummies to ascertain whether MNEs from any specific countries are more likely to invert. Interestingly, we found the United States, China, India and Brazil feature prominently as home countries with high greater likelihood for inversion (Table 5, models 2/3).

As we model an MNEs choice to invert, it is conceptually difficult to envisage reverse causation. Might certain countries (say offshore financial centres) differentially target specific groups of MNEs (say EMNEs) to undertake inversions in their jurisdictions (offering more generous packages, for example), leading them (differentially versus DMNEs) to do so? Then the causation is driven more by the host jurisdiction as opposed to the EMNE. We find no evidence, however, to support this argument. Moreover, even if this was the case, it is worth keeping in mind that our main purpose here is to explore whether systematic MNE sampling biases may exist or

Table 2
Variables, descriptions, and data sources.

Variable	Proxy	Data source
GDP per Capita	Host-country gross domestic product per capita.	World Bank
Corporate Group Size	Number of entities under the corporate umbrella.	Orbis
Firm Size	Categorical variable for firm size (Small, Medium, Very Large).	Orbis
GUO Tax Haven	Dummy variable for if the firm is in a tax haven.	Financial Secrecy Index
Corporate Tax (Home less Host)	The difference between corporate tax rates. Country of origin less host country.	OECD, PwC
EMNE (H1)	Dummy variable for if the MNE is from an emerging market.	MSCI, IMF/OECD country classification schema
Number of Foreign Subsidiaries (H2)	Number of foreign subsidiaries a firm has.	Orbis
Country Dummies	Dummy variables for each country to account for country-specific effects (e.g., Brazil, Canada, China, India, etc.)	Study-specific (Logistic model)
Year Dummies	Dummy variables for each year to account for year-specific effects.	Study-specific (Logistic model)

Table 3
Descriptive statistics.

Variable	Obs	Mean	Std. dev.	Min	Max
Corporate Inversion	52,598	0.025	0.157	0	1
GDP per capita	52,598	51,571.018	25,261.794	2410.888	108,729.19
Number of Foreign Subsidiaries	52,598	2.634	10.731	0	517
Corporate Group Size	52,598	46.10277	211.6541	0	4778
Firm Size	52,598	2.974	0.922	1	4
GUO Tax Haven	52,598	0.043	0.203	0	1
Corporate Tax (home less host)	52,598	0.898	4.163	−25.122	39.162
EMNE	52,598	0.166	0.372	0	1
Institutional Quality (home less host)	52,398	1.206	7.484	−71.078	76.576
Home/Origin Country	52,598	32.221	14.823	1	46

Table 4
Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Corporate Inversion	1.000									
(2) GDP per capita	−0.054	1.000								
(3) Number of Foreign Subsidiaries	0.090	−0.017	1.000							
(4) Corporate Group Size	0.000	0.009	0.053	1.000						
(5) Firm Size	0.142	−0.033	0.152	0.019	1.000					
(6) GUO Tax Haven	0.732	−0.046	0.067	0.007	0.103	1.000				
(7) Corporate Tax (home less host)	0.703	−0.084	0.045	0.014	0.097	0.812	1.000			
(8) EMNE	0.189	−0.684	0.014	−0.009	0.123	0.127	0.172	1.000		
(9) Institutional Quality (home less host)	−0.497	0.269	−0.049	0.093	−0.096	−0.482	−0.510	−0.307	1.000	
(10) Home/Origin Country	−0.140	0.443	−0.002	−0.003	−0.142	−0.083	−0.114	−0.473	0.271	1.000

not. With this goal in mind, the cause of the inversion does not matter as much as whether an association exists (or not). For omitted variable biases similar arguments apply. There could be other omitted variables (say correlated with MNE size/scale) that drive our results. Even if this was true, however, systematic differences would still exist between types of MNEs that invert and do not invert. These will in turn lead to the sampling biases we identify.

Nonetheless, we did investigate the feasibility of applying a Heckman selection model. However, because our dataset includes corporate inversion status for all sample firms, there is no variation in outcome observation to support this approach. Similarly, while instrumental variable approaches were considered, we did not identify a valid instrument that met the exclusion restriction and was exogenous to the inversion decision. In the absence of specific techniques to explore endogeneity and the above reasoning, our identification strategy therefore rests on a robust set of firm-level controls, country and industry fixed effects, and robustness checks such as the exclusion of outliers (e.g., China) and subsample trimming based on size and internationalization. These additional design choices collectively mitigate the risk of unobserved confounding.

6. Discussion

Over 100 studies published in mainstream IB focused academic journals used the Orbis database between 2019 and 2024 (Table 1). While by no means all these studies use the GUO sampling approach to develop MNE and related foreign subsidiary samples, many do. To investigate potential MNE sampling issues owing to GUO relocation, we used the inversion literature to develop two testable

Table 5

Logistic regression: determinants of corporate inversions.

	(1)	(2)	(3)
	Corporate inversion	Corporate inversion	Corporate inversion
GDP per capita	0*** (0)	0** (0)	0*** (0)
Corporate group size	−0.002*** (0)	−0.002** (0.001)	−0.001 (0)
Medium firm size	0.704** (0.281)	0.613 (0.478)	0.273 (0.432)
Small firm size	−1.279*** (0.289)	−1.278*** (0.46)	−1.674*** (0.424)
Very large firm size	2.025*** (0.177)	2.076*** (0.252)	1.794*** (0.242)
GUO tax haven	6.203*** (0.205)	8.033*** (1.123)	9.57*** (1.267)
Corporate tax difference	0.053*** (0.007)	0.132*** (0.016)	0.109*** (0.012)
EMNE (H1)	2.831*** (0.176)		
Number of foreign subsidiaries (H2)	0.018*** (0.002)	0.021*** (0.004)	0.018*** (0.003)
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Brazil		9.781*** (1.203)	12.495*** (1.353)
Canada		2.755*** (0.603)	2.632*** (0.552)
China		−0.607 (0.897)	3.647*** (0.409)
India		5.788*** (1.218)	8.49*** (1.165)
Indonesia		−1.696 (1.055)	2.303** (0.909)
Malaysia		2** (0.967)	4.286*** (0.763)
Norway		2.11*** (0.597)	1.423** (0.569)
Russia		−1.468 (1.087)	3.292*** (0.725)
South Africa		−1.678* (0.868)	1.792*** (0.666)
Spain		−3.78*** (1.124)	−1.838* (1.104)
Ukraine		−1.025 (1.297)	3.051*** (1.084)
U.S.		1.828*** (0.41)	2.535*** (0.412)
_cons	−10.099*** (0.305)	−13.824*** (1.224)	−15.83*** (1.372)
Observations	52,598	52,110	52,235
Pseudo R ²	0.804	0.868	0.854

Robust standard errors are in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Notes: in models 2 and 3 we report individual country level dummies but only for significant countries in our sample, thus identifying countries with MNEs that are more likely to invert.

hypotheses regarding the types of MNEs that might be more likely to invert. Then, drawing upon a novel, multi-database approach to systematically identify inverted MNEs, we tested these hypotheses. Our results suggest that the impact of inversions on an MNE's GUO location is not simply 'random noise'. Rather, systematic biases exist in the sampling process, as certain types of MNEs are more likely to invert than others (EMNEs and MNEs with more foreign subsidiaries). Our analysis of over 52,000 MNEs shows, such inversion-induced errors are not isolated anomalies but rather systematic occurrences. These types of MNEs and their subsidiaries, therefore, may be missed and thus underrepresented in standard GUO sampling approaches. We thus identify previously overlooked limitations in the GUO-based sampling practices. Without correcting for inversions, IB researchers may systematically misclassify MNEs' country of origin, leading to biased inferences. For example, EMNEs that invert into offshore centres may be excluded from EMNE samples or, worse, recorded in datasets as DMNEs, obscuring theoretically important differences and potentially weakening or distorting findings on location choice, performance, or institutional arbitrage (Estrin et al., 2018; Sanfilippo, 2015; Hennart and Sutherland, 2022). This

practical risk underscores the need for researchers using Orbis or similar firm-level datasets to carefully screen for inversion-related biases when constructing samples (Evenett and Pisani, 2023).

Table 6 summarises some of the descriptive data from the inversions we identified, including the number of inversions by actual home country, inversion location and foreign subsidiary number of inverted MNEs (i.e. the number of subsidiaries not properly captured in current sampling GUO sampling approaches). The table can act as a useful guide for researchers thinking of creating MNE samples using Orbis. Specifically, it may help them to consider whether they should attempt to include inverted MNEs in their samples or not. While Orbis may appear to provide a 'clear cut definition of the nationality of foreign affiliates' (Sanfilippo, 2015, p. 6567) and allow researchers 'to identify all firms operating in a given host economy owned by firms from any given source country' (Estrin et al., 2018, p. 518), the reality is more complex. The extent of the sampling biases we identify, however, will vary by study type. We briefly discuss in more details the types of studies that may be most affected by these issues.

6.1. What types of IB studies are most affected by the GUO sampling issue?

Our first hypothesis, building on the inversion literature, argued EMNEs are more likely to invert than DMNEs, meaning EMNEs will be systematically underrepresented. With the rise of EMNEs, this study type has become quite popular (Estrin et al., 2018; Jindra et al., 2016; Sutherland et al., 2020). Estrin et al. (2018), for example, focus on the comparative location choices of EMNEs/DMNEs in the OECD using data from Orbis. They develop a large sample (1,644,226 foreign subsidiaries). Among the EMNE' foreign subsidiaries sampled, however, are those with GUOs from China, Brazil, India, Russia, South Africa, Mexico, and Turkey. Similarly, Jindra et al. (2016) compare EMNE/DMNE location choices in Europe using the same GUO approach. They compare EMNE foreign subsidiaries in Europe from 37 emerging markets, also including China, Brazil, Malaysia, Indonesia, India, Russia, Ukraine, Taiwan and South Africa (with DMNE subsidiaries from 26 developed markets). Our results found that EMNEs from some of these countries are more prone to inversion (i.e. China, Brazil, see Table 6). China alone had 574 inversions, Brazil 69, Malaysia 21, India 19 and Russia 18 (Table 6) but these EMNEs controlled many thousands of foreign subsidiaries. In a similar way, studies that look only at EMNEs (EMNE comparative or single country studies), because of the relatively high absolute numbers and propensity for inversions in EMNEs, will similarly be susceptible to these sampling issues. Jones et al. (2023), for example, investigate the influence of institutional environments on 6731 parent companies from 40 emerging markets. Again, this sample includes China, India, and Brazil. Similarly, Chen et al. (2012) focus on knowledge transfer in 493 parent companies from 20 emerging markets, also including the BRIC countries. China and Brazil, as noted, stand out as cases where the absolute level of inversions is high (Table 6). Evenett and Pisani (2023), moreover, look at the way in which European MNEs divested their interests in Russia after the outbreak of the Ukraine conflict. In one of the few studies we identified that acknowledges the GUO relocation problem, they go to considerable lengths to find Russian GUOs in Europe undertaking found-tripping FDI back to Russia. While the purpose of the study is to track foreign corporate responses to geopolitical events, in doing so they also provide evidence to show that the inversion issue is highly relevant to the study of Russian MNEs.

In addition to explicit DMNE/EMNE comparative and pure EMNE focused samples, numerous other studies incorporate EMNEs in their cross-country samples (without the explicit purpose of comparison with DMNEs). These types of studies introduce potential biases, albeit as they are not looking to directly research EMNE/DMNE differences, they may not be quite as obvious. Yang and Driffield (2022), for example, look at 19,096 MNEs from 90 countries, again including China and India, considering impacts of FDI on profitability and productivity. Kohlhase and Pierk (2020) use Orbis to examine the impact of worldwide and territorialised tax systems (i.e. country or origin policy effects) on the effective tax rate paid by MNE' foreign subsidiaries found in 19 European countries. The GUO parents of these European foreign subsidiaries originate from 58 home countries, including China. Andrews and Meyer (2023) study MNEs from Canada, Germany, India, Japan, Korea, Taiwan, UK, and the US. Several of both the emerging and developed markets we identify with high absolute levels (and higher relative propensities) for inversion (Table 6). There are numerous other examples of this type of sample (Contractor et al., 2016; Driffield et al., 2016).⁴

Some empirical studies using Orbis use only DMNE samples (Delis et al., 2019; Driffield et al., 2016; Jones et al., 2018).⁵ These types of studies, as with DMNE/EMNE comparisons, might even consider checking if their samples include nations hosting MNEs (a) with relatively higher prevalence for inversions (b) and higher absolute levels of inversions (see Tables 5 and 6). For intra DMNE

⁴ Contractor et al. (2016: 954), for example, sample 3438 multinational parents from 45 countries and their 9280 overseas subsidiaries, looking at the general question of how extent of multinational activity impacts intangible assets. Driffield et al. (2016) use MNEs from 122 home countries and 125 host countries to explore changes in foreign affiliates' ownership, incorporating around 70,000 parent firms and over 90,000 affiliates. In all of these examples, it is hard to know, without replicating them with supplemental data, exactly what impact incorporation of MNEs with relocated GUOs may have.

⁵ Jones et al. (2018), for example, create an intra-DMNE sample of 5912 MNEs (between 2005 and 2013). Their panel dataset consists of 24,781 observations from 12 countries. This includes, however, the US, Norway and Canada – all with significantly higher likelihood of MNE inversions (Table 6). Driffield et al. (2016), by contrast, develop a sample of 122 home countries and 125 host countries to explore changes in foreign affiliates' ownership (covering around 70,000 parent firms and over 90,000 affiliates). Given the broader range and scale of home country sampling, relative sampling errors might be reduced. Somewhere in between these two studies, Delis et al. (2019) studied 3683 parent companies from the 14 developed countries, including the UK, Germany and Italy and the Netherlands (between 2006 and 2013). They only include one country, Norway, which we found to have a higher propensity for MNE inversions. Nonetheless, they include a number of countries with higher absolute levels of inversions. Their sample therefore still potentially excludes inverted MNEs originating from Germany (14), France (3), the UK (62), Italy (4), Netherlands (4) and Norway (13) (i.e. around 100 MNEs) (Table 6). Many of these excluded inverted MNEs are likely to be large, making it difficult to know exactly what impacts their exclusion may have on their results.

studies, samples incorporating countries with greater propensity for inversion (like the US, Canada and Norway; Table 6), or higher absolute levels of inversion potentially introduce greater sampling biases. While the numbers of MNE inversions, some might argue, are small for DMNE samples (in the context of the large sample sizes being generated using Orbis), our results show that MNEs with more foreign subsidiaries (hypothesis 2) are more likely to invert (i.e. thousands of foreign subsidiaries owned by these parents are being excluded from some samples, Table 6). Indeed, the 1000 or so inverted MNEs we identified had a total of 42,479 foreign subsidiaries, with 22,708 foreign subsidiaries attributable to inverted DMNEs and 19,771 to inverted EMNEs (Table 6).

Some empirical studies develop samples that are focused on MNEs from a single country or MNEs investing into a single country. In the former case, for outward FDI, if the source country in question has a high prevalence of inversions (i.e. China), sampling care is clearly required. For example, Alon et al. (2020) examine 152 parent companies from China, based on GUO sampling criteria. Many of the most successful, larger MNEs (Tencent, Alibaba, for example), however, have GUOs offshore, typically in the Cayman Islands. These MNEs are likely larger and different in other ways (i.e. are non-state owned) to MNEs incorporated onshore. Looking specifically at Chinese MNEs, we identified 8936 firms with a Chinese GUO recorded on Orbis (as of 3 July 2025). However, our separate inversion identification process shows that around 600 Chinese MNEs (approximately 7 % of the total) have GUOs registered outside of China. These inverted firms are not just marginal cases. Many are very large, high-profile, and listed in international financial centres such as New York or Hong Kong. They are disproportionately concentrated in dynamic and high-growth sectors, including information technology, biotechnology, and advanced services (e.g. Tencent, Alibaba, Wuxi Pharmatech). The omission of these types of firms from “China-based” samples introduces systematic underrepresentation of some of the most internationally competitive and institutionally strategic Chinese MNEs.

Single country studies look at MNE investments into a specific country may also face interesting sampling challenges. Wang et al. (2022), for example, look at foreign M&A activity into the US. They are interested in why the acquiring MNE may use an intermediate subsidiary located either in the host country, or in countries similar to the host country. They hypothesise this strategy could be used as a strategic response to institutional distance. They therefore need to measure the distance from parent to the US target. They do so from the ‘ultimate parent corporation that owns a majority of the voting power of the direct acquirer’ (p. 1676) and identify 3070 acquirers from 46 countries. Again, it is not clear in this case exactly what they do with inverted Chinese firms – whose ultimate parent (in the Cayman Islands) would be institutionally closer than China itself. These types of larger EMNEs would also be quite active in the M&A market during their sample period, so it is hard to know what impacts inverted GUOs could have on their results. These issues are not discussed in the paper. The impact of not properly identifying the MNE’s GUO in this way can be found in other studies. Nippa et al. (2021), for example, explore the impact of being part of an MNE group on carbon emissions using Orbis’s ultimate owner. The potential role of inversions is not explored.

In sum, there are many IB related studies that use the GUO to sample MNEs and their foreign subsidiaries. Each type of study faces its own challenges. EMNE/DMNE comparatives do stand out, but many other types of MNE sample are potentially affected. Researchers need to be aware of the issue and may need to take appropriate steps to include inverted MNEs, depending upon the exact nature of their study. Of all the empirical studies we have reviewed that used Orbis, we have found only one that engages with the issue (Evenett and Pisani, 2023). Interestingly, their approach to dealing with the problem was somewhat like ours. As they were looking at Russian investments, they first identified the inversion hubs (Cyprus and Luxembourg for Russian MNEs) and established if Russian owners existed among the GUOs recorded in these locations. This was then complemented by additional detailed firm-level analysis on a case-by-case basis. The problem in their samples was not insignificant and required the remedial measures they developed.

6.2. How to tackle the sampling issue?

Many types of IB cross-country comparative empirical studies are prone to sampling error, the extent of which depends upon exposure to inverted MNEs (Tables 5 and 6). In our methods section we outlined an approach for identifying inverted MNEs. It is possible for IB researchers to use this approach in their sampling of MNEs, as it allows them to identify MNEs (ultimate owners and foreign subsidiaries) that have inverted GUOs. An important step in the process we outline, however, involves first identifying jurisdictions in which the parent GUO commonly chooses to relocate (i.e., The Cayman Islands in the case of say Chinese MNEs (Buckley et al., 2015a)). Our approach used the findings of Col et al. (2020), as they provide a breakdown of the most popular inversion hubs. Once these are identified, it is then possible to use Orbis to screen the MNEs to look for ones that have subsidiaries in the same location as their major shareholders. Finally, using CRSP and Compustat - Capital IQ databases, changes in ISIN numbers can then be tracked and checked for changes, thereby accurately capturing shifts in domicile or incorporation country codes. This approach, we believe, is a relatively efficient and accurate way of identifying inversions. For example, it allowed us to quickly identify more than 500 plus inverted Chinese MNEs. These can then be incorporated in samples using the offshore GUOs of the domestic MNEs to build up a more accurate picture of the activities of MNEs from these home countries.

Orbis also allows for filtering by ‘headquarters’ and some have used this approach to create MNE samples. Delis et al. (2019), for example, sampled 3683 MNEs with headquarters in 14 European countries. Yang et al. (2013), moreover, used data from MNEs headquartered in 46 different countries. Is using headquarters a viable alternative? In the inverted MNEs in our sample (1297), we found that only 781 (60 %) reported the location of their headquarters in Orbis. The absence of headquarter reporting in Orbis is particularly significant, moreover, for countries like China (139 of 574 inverted MNEs) and the U.S. (106 of 151 inverted MNEs). In addition, our sample showed that all 781 inverted firms had moved their headquarters after inversion, with the Cayman Islands (460) and Bermuda (166) accounting for 80 % of these relocations. The sampling issue we identify therefore extends to the headquarters location. Unfortunately, using headquarters may not always provide an easy solution to this problem.

Table 6

Home country, number of inversions, inversion location and foreign subsidiary number of inverted MNEs.

	Inversion location																					
Home country	No of foreign subsidiaries	Bahamas	Bermuda	Cayman Islands	Cyprus	France	Germany	Ireland	Italy	Japan	Luxembourg	Malta	Marshall Islands	Netherlands	Norway	Panama	Singapore	Spain	Switzerland	U. S.	BVI	Number of inversions
Emerging markets																						
China	17,297	0	89	449	0	0	0	0	0	0	0	0	0	0	0	0	18	0	2	0	16	574
Brazil	320	1	4	7	0	5	3	0	7	4	12	2	0	9	2	0	1	4	1	7	0	69
Taiwan	166	0	1	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
BVI	228	0	5	14	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	23
Malaysia	170	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	21
India	207	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	14	0	1	2	0	19
Russia	283	0	0	0	15	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	18
Cyprus	128	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	1	6
South Africa	131	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	5
Cayman Islands	109	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	4
Luxembourg	167	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	4
Indonesia	31	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3
Saudi Arabia	384	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Bermuda	15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Ukraine	28	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	19,850	1	105	505	19	5	3	5	7	4	14	3	2	10	2	1	57	4	13	9	21	778
Developed markets																						
Hong Kong	3133	0	77	132	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	5	222
United States	15,737	1	32	46	5	0	0	33	0	0	6	1	4	0	0	3	5	0	10	0	5	151
United Kingdom	1147	0	11	13	4	0	0	6	0	0	3	0	1	0	0	0	4	0	7	0	13	62
Germany	863	0	0	1	0	0	0	1	0	0	4	0	0	0	0	0	1	0	9	0	0	16
Norway	323	0	5	1	3	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0	0	13
Australia	151	0	5	1	0	0	0	2	0	0	0	0	0	0	0	0	3	0	0	0	2	13
Canada	342	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10
Sweden	304	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	6
Singapore	53	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Italy	355	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	0	4
Netherlands	96	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4
Switzerland	32	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	4
France	54	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
Israel	53	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Japan	21	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Belgium	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Total	22,711	2	137	208	12	0	0	42	0	0	21	1	8	0	0	4	21	0	39	0	27	519
	42,561	3	242	713	31	5	3	47	7	4	35	4	10	10	2	5	78	4	52	9	48	1297

6.3. Contributions to the corporate inversion literature

Going beyond measurement of MNE activity via refining sampling approaches, our findings contribute to the corporate inversion literature by providing new cross-country evidence on the characteristics of firms most likely to undertake inversions. Specifically, we show that EMNEs and larger MNEs with more extensive foreign subsidiary networks are significantly more prone to invert. This contributes to a growing body of work that challenges the conventional view of inversions as primarily tax-driven strategies concentrated among developed market firms (Col et al., 2020; Reyes-Peña et al., 2022). Instead, our findings reinforce the notion that inversions serve as a strategic tool for institutional arbitrage, particularly for EMNEs seeking to escape home-country constraints such as weak legal systems, limited access to international capital, or burdensome regulatory environments (Buckley et al., 2015b; Karhunen et al., 2022).

The observed positive relationship between firm size and inversion propensity also supports existing evidence that larger MNEs are more likely to engage in structural transformations such as inversions due to their greater complexity, global exposure, and capacity to navigate legal and financial restructuring processes (Desai and Hines, 2002; Col et al., 2020). By validating these dynamics in a broader international sample—including both developed and emerging economies—our study extends the generalizability of previous findings and provides further empirical support for the strategic rationale behind inversions beyond simple tax minimization.

Taken together, these results underscore the need to treat inversions as a multifaceted phenomenon shaped not only by fiscal considerations but also by firms' strategic responses to their institutional environments and global expansion ambitions. Our findings thus enrich the inversion literature by identifying systematic firm-level predictors of inversion.

7. Conclusion

It is understandable that IB researchers should want to develop large cross-country samples of MNEs to test IB theories using firm-level databases like Orbis. Indeed, using firm-level data has numerous advantages when compared to using aggregated FDI data (Hennart and Sutherland, 2022). MNE samples that reach into the hundreds of thousands, or even millions of foreign subsidiaries, are impressive and have great potential to advance IB research. An additional degree of care is required, however, when developing these samples. This is because corporate inversions are not uncommon in some cases. Moreover, they are associated with larger MNEs (i.e. that own more foreign subsidiaries). Specific countries, moreover, have comparatively higher absolute numbers of inverted MNEs and some have a greater relative propensity for inversions (i.e. China, Brazil and the US). Excluding inverted MNEs when developing samples that include these cases, can therefore potentially lead to more serious sampling biases, as systematic differences exist between inverted and non-inverted MNEs. We have attempted to outline the types of studies that may be vulnerable to these sampling issues and proposed an approach for creating more inclusive sampling procedures. More broadly, failing to account for corporate inversions risks systematic misclassification of MNEs' origins, which can in turn bias theory testing in IB research. This in turn may lead to misleading conclusions about country-of-origin effects.

7.1. Limitations, future research and implications

The only way to establish whether these sampling issues impact upon the results of previous studies is by replicating some of them. Good replication candidates in the first instance would be EMNE/DMNE comparatives, where one might expect to see more inclusive EMNE samples, in particular. Future research might consider this. Reevaluating some of this research may in turn lead to alternative policy and managerial implications.

The main limitation of our sampling approach is that it only considers the inversion hotspots identified by Col et al. (2020) as the first step in identifying inverted MNEs. There may be more jurisdictions which host inversions and are commonly used by MNEs. Future research may help identify if this is the case. By doing so, we will be able to better include inverted MNEs during the sampling stage. Our approach was designed to identify broad patterns and systematic biases rather than to develop a granular theory of inversion motives.

Finally, we have not touched upon the question of how inversions have evolved over time and implications for longitudinal sampling procedures when using panel data sets. As the US and China decouple, many listed Chinese MNEs incorporated in the Cayman Islands are looking to move their listings back to Hong Kong. Will their GUOs change once again? If so, where to? Similarly, SPACs, which use inverted structures, are becoming more popular again in the US under the second Trump administration. Will this trend continue and if so, will inversions remain a popular approach to this form of investment vehicle? It is still not clear, but these examples point to the evolving nature of the issue. Future research, moreover, should explore the strategic and organizational consequences of inversion in more depth, including how inversion affects internationalization pathways, subsidiary control, innovation capabilities, and investor relations. Given the political sensitivity around inversions, scholars may also explore the role of state regulations and domestic institutional pressures in shaping MNE inversion behaviour over time.

CRediT authorship contribution statement

Jamie Hurst: Formal analysis, Data curation. **Dylan Sutherland:** Conceptualization.

Data availability

The data that has been used is confidential.

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