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Drivers of divestment decisions of multinational enterprises - A cross-country firm-level perspective

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Drivers of divestment decisions of multinational enterprises - A cross-country firm-level perspective

by

Maria Borga, Perla Ibarlucea-Flores and Monika Sztajerowska*

Abstract: *Divestment by multinational enterprises is an important yet understudied phenomenon. The few available estimates indicate that about a fifth of all foreign affiliates are divested every five years. This paper presents the findings from a novel cross-country firm-level dataset with financial and ownership information for over 62 000 foreign-owned affiliates from a selection of 41 OECD and G20 countries and their economic groups from 164 home countries for the period 2007-2014. The data allow an assessment of the relative importance of different determinants of divestment in a cross-country setting, including host country policies and bilateral factors, including trade, investment and tax agreements. The findings confirm that parents divested about one of every five foreign-owned affiliates between 2007-2014 and show that a number of host country policy and economic factors, including labour costs and international trade agreements, influence the divestment decision, on top of the firm considerations considered in previous studies.*

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1. Introduction

Multinational enterprises (MNEs) are the dominant actors in the global market place, accounting for a majority share of world trade, fixed assets and innovation. According to OECD (2018a), the ratio of global inward foreign direct investment (FDI) stock to world GDP increased from 24% in 2005 to 41% in 2017. Multinational affiliate sales as a share of world GDP have also more than doubled in the past two decades, increasing from close to 25% in 1990 to 50% in 2017; and MNEs employ 82 million people, and are responsible for most of the world R&D spending (UNCTAD, 2017). As such, MNE location decisions can impact global trade, investment and knowledge-creation and dissemination patterns, and can be of interest to the host economies in which they establish or maintain their operations.

This trend is reflected in the growing body of literature on the drivers and impacts of FDI in general, and MNE investment decisions (i.e. build, buy, expand) in particular. Meanwhile, much less attention has been paid to MNE divestment decisions (i.e. sell and exit), which means that MNE divestment decisions remain understudied and poorly understood.

In general terms, corporate divestment is an adjustment in the firm ownership and business portfolio structure, involving a partial or full disposal of an asset or a business unit.[1] This paper focuses on foreign divestment to better understand the forces shaping FDI and to help to develop empirical foundations for a better conception of investment retention policies. Specifically, this paper defines divestment as a change in an affiliate's ownership structure that involves a transfer of majority-control over a firm from a foreign to a domestic owner, as per Javorcik and Poelhekke (2017). The focus is, therefore, on sales of affiliates; MNE business closures are not included for data and conceptual reasons.[2] This definition is particularly pertinent to the study of FDI as it involves the loss of a foreign investor in the affiliate, which may negatively affect the firm's performance and the host economy's long-term growth prospects based on the FDI literature (e.g. Barba Navaretti and Venables, 2004).

Why should MNE divestments merit more attention from researchers and policy makers? First, divestment is a frequent corporate occurrence. For example, a study on the behaviour of US manufacturing MNEs, finds that 22% of their larger foreign affiliates (with sales or assets greater than USD 30 million) were divested between 1989 and 2004 (Berry, 2013).

[1] Corporate divestment can take numerous forms, e.g. sale, spin-off, equity carve-out, and leveraged buy-out or disinvestment (i.e. a gradual reduction in investment funds or drawing profits away from the operation and reinvesting them elsewhere). See e.g. Buckley (1991).

[2] Business closures cannot be consistently identified in the ORBIS dataset. Even when firms that are identified as closed down, the information on the date of closure of an affiliate is not readily available in the database. In addition, the rich literature on foreign ownership and plant survival indicates business closures may be driven by factors different from those driving sales of affiliates (see e.g. Görg and Strobl, 2003; Bernard and Sjöholm, 2003; Girma and Görg; 2004; Van Beveren, 2007, Bernard and Jensen, 2007; Alvarez and Görg, 2009). While the existing evidence is sparse, closures appear to be relatively uncommon in MNE supply chains (Norbäck et al., 2015).

Another study finds that 21.4% of the foreign affiliates of Swedish MNEs were divested at least once between 1998 and 2003 (Norbäck et al., 2015).[3]

Second, many public policies specifically aim to attract FDI and to encourage MNEs to locate in the local economy. For example, virtually every country has a national agency charged with the task of attracting FDI (OECD, 2018b; Harding and Javorcik, 2011 and 2012); international investment agreements grant foreign investors additional protections (e.g. Pohl, 2018; Sauvant and Sachs, 2009). OECD (2015a) includes a whole list of policies for promoting and facilitating investment, including some that specifically target foreign firms. Given this policy orientation, an understanding of drivers of MNE divestments can help policy makers shape policies both able to attract and retain FDI.

Last but not least, albeit the literature on this aspect is also sparse, existing studies suggest that divestment can have significant negative effects on the subsequent performance of the affected affiliates and it may potentially affect economic performance of the host and home economies in which they are located, including through dynamic long-term effects.[4]

Meanwhile, little is known about the determinants of MNE divestment decisions. Thus far, evidence has been largely confined to business case studies and analysis of various firm-level factors only (see next section), including strategic and opportunistic reasons. For example, in 2017, General Electric announced a sale of more than USD 20 billion of its non-industrial segments as part of an effort to focus on its core business, reduce debt and generate cash (CNN, 2017 and 2018). Daimler and Nestlé mentioned similar motivations (Financial Times, 2018; Reuters, 2013). Businesses also routinely divest assets after mergers or acquisitions (M&A) to satisfy requirements of competition authorities (e.g. Carlsberg in Sweden or RBS in the United Kingdom) or achieve greater group-wide efficiency (Capron et al., 2001). Firms may also divest due to technological change;[5] for political, ethical or socio-economic grounds (e.g. Soule et al., 2014 and OECD, 2015b); or in the face of a financial crisis or a major political development, such as Brexit.[6]

[3] A global survey conducted by Ernst & Young (2019a) also finds that 84% of MNEs surveyed are planning to divest some of their operations within the next two years.

[4] From a conceptual perspective, if there existed no advantage of being owned by a foreign parent (e.g. in terms of productivity, access to knowledge, resources or markets), then a sale from a foreign to a domestic owner should have no significant impact on the performance of the firm post-divestment, beyond a potential disruption associated with a change in ownership. If, in turn, there are certain advantages associated with being owned by a foreign parent – as documented in the wide theoretical and empirical literature on FDI – then a foreign divestment would have a negative effect on firm performance. In addition, there could be possible spillover effects on other local firms in the economy. For a discussion of the theoretical and empirical FDI literature on the performance premium of MNEs, see Barba Navaretti and Venables (2004), and for a meta-analysis on FDI spillovers, see Görg and Strobl (2001) and Havránek and Iršová (2010, 2013). In addition, several studies specifically find a positive effect of foreign purchases on subsequent affiliate firm (or plant) performance (Arnold and Javorcik, 2009; Criscuolo and Martin, 2009; Guadalupe et al., 2012) while Javorcik and Poelhekke (2017) find a negative effect of foreign divestment on subsequent firm (or plant) performance.

[5] The examples of Kodak and Nokia, who were both pioneers in their respective industries, are among the more well-known (Reuters, 2013; Nokia, 2019).

[6] Following the crisis of 2007-2008, several major global banks (e.g. RBS, Citibank) have undertaken significant restructuring (see e.g. Financial Times, 2017; Bloomberg, 2016), and, more

The next section shows that virtually no cross-country economic studies examine the relative contribution of various firm-level and country-level factors to MNE divestment decisions. This means that little is known about the role of different policies in influencing the probability of divestment by MNEs. Today, a number of countries are implementing, or contemplating, policy changes that may potentially limit the scope for cross-border business activity, including terminations or renegotiations of existing international trade and investment agreements (OECD-UNCTAD, 2018). Further analysis of the impact of such agreements on firm divestment could help policymakers and the public assess the full scope of possible effects of the existence of such treaties, and the planned policy changes.

This paper fills in the current knowledge gap by studying drivers of MNE divestment decisions and considering firm-level and country-level factors, using a new large cross-country dataset with detailed firm-level financial and ownership information for 41 selected OECD and G20 economies for the period between 2007 and 2014.[7] It sheds new light on the role of host country as well as bilateral policies, in particular international investment agreements (IIAs), regional trade agreements (RTAs) and double-taxation treaties (DTTs), in influencing firm divestment decisions. The rest of the paper is structured as follows: section 2 provides a literature review and further explains the contribution of this study; section 3 presents the data and descriptive evidence on the importance of, and trends in, divestment. Section 4 presents the empirical approach; section 5 presents the estimation results; and section 6 presents robustness checks and exploration of heterogonous effects of international agreements. Section 7 concludes, outlining the scope of future research and possible policy implications.

recently, a number of companies announced their divestment intentions in the face of Brexit (e.g. Ernst & Young, 2019b).

[7] The paper focuses on selected OECD and G20 economies due to data availability in the ORBIS database, see Annex A and OECD (forthcoming).

2. Literature review

Rich theoretical and empirical literature on the determinants of FDI is available.[8] Table 1 summarises the various policy and economic factors considered in the empirical studies. In contrast, the economic literature on drivers of firm divestment decisions is much less developed. For example, no comprehensive theoretical framework exists that could guide the analysis of firms' divestment decisions and explain how they differ from investment decisions.[9] In addition, the current empirical literature on divestment is largely limited to management studies, focusing primarily on firm-level characteristics as factors explaining divestment probability (Table 2).

Panel A in Table 2 summarises the different firm-level factors considered in these studies. For example, the size of the affiliate or the parent has been predicted, and found empirically, to be positively associated with MNEs' divestment probability. The weak performance of the affiliate firm or business unit has also been confirmed to be a relevant factor explaining firm divestments, albeit predictions differ on the direction of the relationship.[10] Many studies have also found that poor financial performance of the parent, such as high debt levels or low liquidity ratios, is an important predictor of firm divestments as firms sell parts of their business to meet short-term liquidity constraints. The degree of diversification of the parent firm's economic group as well as the size, geographical scope and internationalisation of its network of affiliates were also found to matter for MNE divestment decisions.[11] Finally,

[8] For theoretical literature, see e.g. Rugman (1980), Helpman and Krugman (1984), Brainard (1997), Dunning (2000), Markusen (2002), Carr et al. (2001), Helpman et al. (2004), Helpman (2006), Caves (2007), Yeaple (2003) and Antràs and Yeaple (2014); or Chapter 1 in Barba Navaretti and Venables (2004) for their overview.

[9] Business literature provides some insights on firm motivations for divestments, including how they differ from investment decisions (e.g. Boddewyn, 1983b; Benito, 1997b) For example, Boddewyn's (1983b) applies Dunning's eclectic theory of investment to foreign divestment decisions highlights several considerations that differentiate a firm's decision to divest from the decision to invest (e.g. the role of affiliate-specific assets that can serve as barriers to exit in case of divestment; the decision to divest taking place in known locations; the role of a potential buyer (i.e. the need to make the asset attractive in order to be able to sell it) and the divisibility and saleability of assets. Harrigan (1981) also stresses the role of firm-specific assets.

[10] Some studies suggest that poorer performing affiliates would be shed as the MNE's capital can be usefully deployed elsewhere (see e.g. Brauer, 2006). Indeed, Berry (2010) measuring affiliate performance as return on assets and return on sales; and Berry (2013), measuring it as subsidiary profits minus taxes and unusual items scaled by assets, find a negative relationship between affiliate performance and divestment probability. Other studies suggest that increased profitability may make a business unit more independent, which may be associated with divestment (e.g. Fluck and Lynch, 1991).

[11] For example, Berry (2010 and 2013) used 4-digit SIC product categories to construct a firm-specific diversification measure and finds it to be positively related to divestment probability. In a widely cited paper, Kogut and Kulatilaka (1994) also explain that the network of affiliates gives a parent firm an "operational flexibility" that allows it to better respond to external shocks. This may mean that firms with a wider network, depending on shocks in different locations, can expand production outside of the host economy without the need to divest. Yet, empirical results remain mixed. For example, Berry (2010) considers the total number of foreign countries in which a firm

the type of relationship between the affiliate and its parent and other affiliates in the economic group (e.g. sectoral relationship or presence of other affiliates of the same parent in the country) have also been analysed in the literature and found to influence divestment probability.[12] In addition, as shown in Panel B in Table 2, certain industries may be more exposed than others to the risk of firm divestment, due to technological, regulatory, competition or other reasons, and are usually controlled for by variables capturing relevant industry-level characteristics (e.g. the degree of exposure to international competition, see Berry, 2013) or fixed-effects.

Meanwhile, the role of host and home country factors – including policies – remains largely under-studied, and is yet to attract the attention of mainstream economics. As can be seen in Panel C of Table 2, many of the factors considered relevant for firm investment decisions are missing from the analysis of divestment. Only a few studies – notably Berry (2010, 2013), Norbäck et al. (2015), and Javorcik and Poelhekke (2017) – have explored the role of such factors but have done so for only a single home or host country. This may be due to the fact that most of the earlier literature stems from business studies, concerned primarily with the role of firm factors, as well as related to the limited access to firm-level data for several host and home economies that could allow such an analysis.

As such, there is a large scope for better understanding if the same factors found to be important for investment attraction also matter (or not) for investment retention. Notably, considering that, unlike in the case of an initial investment decision, firms divest from *known* locations (i.e. locations in which they have operated in for some time), do certain factors become more or less important in these circumstances? For example, while tax policy has been found to be a consistently significant predictor of MNE investment decisions (e.g. see Mooij and Ederveen, 2003 for a meta-study), does it play the same role in MNE divestments? Similarly, do low labour costs, high quality of education or infrastructure, which are frequently stressed as important elements influencing MNE investment choices (see Table 1), also matter for MNE retention? More generally, further guidance on the relative role of different economic and policy factors in explaining firm divestment decisions could help elucidate the differences between successful investment attraction and retention.

Finally, a related stream of research is the literature on the impact of international investment, trade, and tax agreements on FDI and firm investment decisions. Apart from Blake and Moschieri (2017), there are no studies analysing the effect of international trade, investment and tax agreements on MNE divestment decisions.[13] Meanwhile, there is a wide and growing literature on the impact of such treaties on trade, investment and cross-

has operations, and finds a positive relationship; while Norbäck et al. (2015) includes a measure of internationalisation (share of parent firm's foreign sales in total sales) and find a negative relationship to divestment.

[12] Berry (2013) considers if the affiliate operates in the same 3-digit SIC code line as a foreign parent and finds that those do not have a higher divestment probability. Both Berry (2013) and Norbäck et al. (2015) control for the presence of other affiliates of the MNE in the same host country and find that it increases divestment probability.

[13] Blake and Moschieri (2017) consider specifically the impact of investor-state disputes under investment treaties on firm divestment probability, finding a positive relationship between a dispute experienced by a host country and the likelihood of firm divestment in that country, conditional on other factors.

border business decisions.[14] In addition, given large differences in the design and depth of such agreements, increasingly the research focused on possible heterogeneous effects of treaties, depending on their content.[15] There is, hence, a scope for understanding better the role of such agreements, and their design, in influencing firm divestment choices.

This study expands on the earlier literature to consider the relative role of the various firm as well as host and home country-level factors. In particular, besides firm characteristics explored in the divestment business studies, it includes a wide set of economic and policy variables found to be relevant to MNE location choices in the economic FDI literature. These include the size of the GDP, per capita income, exchange rate, inflation, unit labour costs, tax policy, trade policy and openness, and policy stability, among others. International trade, investment, and double taxation treaties are also included in the analysis. The study takes a cross-country perspective, studying the divestment decisions of firms operating in 41 host economies and from 164 home economies. Section 3 presents descriptive evidence on patterns of divestment, and Section 4 introduces the empirical approach that permits evaluation of the relative importance of these various determinants of firm divestment decisions identified in the literature, before results are presented.

[14] The literature on the impact of PTAs and BITs on international investment yields conflicting findings. For example, some studies find positive effects of PTAs on investment (Baltagi et al., 2007b) and others insignificant or negative effects (Stein and Daude, 2007). The findings on the impact of BITs on FDI are similarly divided; for example, Egger and Merlo (2012) and Egger and Pfaffermayr (2004) find positive effects while Tobin and Rose-Ackerman (2005) and Hallward-Driemeier (2003) none or negative effects (see Bellak, 2015 for a meta-analysis). In the case of DTTs, Blonigen and Davies (2004a, 2004b) and Di Giovanni (2005) find insignificant effects of such treaties on FDI stock and cross-border M&A; Egger et al. (2009) find negative effects on outward FDI stock; while Blonigen et al. (2014) find significant positive effects on the probability of firms to establish in the economy.

[15] See Baier and Bergstrand (2007), Dür et al. (2014), Kohl (2014), Baier et al. (2014), Orefice and Rocha (2014), Kohl et al. (2016) for examples of studies on the importance of content of trade agreements; Berger et al. (2013) and Alschner and Skougarevskiy (2016) for studies on investment treaties and Blonigen et al. (2014) on double-taxation treaties.

Table 1. Overview of host and home country-level factors that influence firm investment decisions

Policies	Specific elements	Relationship	Relevant Studies
Market size and per capita income	GDP level and per capita income	+	Daude and Stein (2007), Di Giovanni (2005), Bergstrand and Egger (2007)
Exchange rate	Exchange rate level or volatility	-	Bénassy-Quéré et al. (2001), Brzozowski (2006)
Labour costs	Wages or Labour Units Costs	-	Biswas (2002), Alam and Shah (2013)
Distance	Geographic distance, border adjacency, common language, colonial ties	-	Wheeler and Mody (1992) Wei (2000), Di Giovanni (2005), Alfaro et al. (2007), Daude and Stein (2007), Head and Ries (2008)
Inflation	Inflation level or volatility	-	Alfaro et al. (2007), Asiedu (2002)
Agglomeration effects	Presence of other foreign-owned firms	+	Crozet et al. (2004), Disdier and Mayer (2004)
Taxation	Corporate tax levels, labour tax levels	-	Arulampalam et al (2017), Egger and Radulescu (2011), Bellak et al. (2009), Bellak and Leibrecht (2009), De Mooij and Ederveen (2003), Alfaro et al. (2007), Devereux and Freeman (1995)
Trade policy	Average tariffs, anti-dumping duties	-/+	Grubert and Mutti (1991), Kogut and Chang (1996), Blonigen (2002), Di Giovanni (2005), Daude and Stein (2007)
Quality of institutions	Quality of domestic institutions, regulatory quality, the rule of law and judicial system, control of corruption, protection of intellectual property rights	+/-	Bénassy-Quéré et al. (2007), Daude and Stein (2007), Alfaro et al. (2007), Wei (2000, 1997), Javorcik and Spatareanu (2005), Javorcik, (2004b), Javorcik and Wei (2009), Biswas (2002)
Education and human capital	Years of total schooling, percentage of adults who are literate	+/-	Alfaro et al. (2007), Noorbakhsh et al. (2001)
Infrastructure	Quality of transport, communications, energy infrastructure	+	Kinda (2010), Bellak et al. (2009), Asiedu (2002), Biswas (2002), Wheeler and Mody (1992)
Investment policy	Lack of FDI restrictions; the ease of doing business; sectoral targeting or quality of investment promotion agencies	+	Mistura and Roulet (2019), Corcoran and Gillanders (2015), Harding and Javorcik (2011, 2012), Nicoletti et al. (2003)
International investment, trade and tax agreements	Bilateral investment agreements, preferential trade agreements, double taxation treaties	+/-	Blyde et al. (2015), Blonigen et al. (2014), Egger and Merlo (2012), Egger et al. (2009); Baltagi et al.(2008); Egger and Pfaffermayr (2004), Blonigen and Davies (2004, 2005)

Table 2. Overview of factors that influence firm divestment decisions

Factors considered	Relationship	Relevant Studies
Panel A. Firm-level or business unit-level factors		
Size (of the affiliate or the parent)	+	Norbäck et al. (2015), Berry (2010), Sembenelli and Vannoni (2003); Shimizu and Hitt (2005), Duhaime and Grant (1984) Bergh (1997), Hamilton and Chow (1993),
Parent's performance	-	Berry (2010), Dranikoff et al. (2002), Markides (1992), Pashley and Philippatos (1990), Montgomery and Thomas (1988), Duhaime and Grant (1984), Harrigan (1981, 1982)
Affiliate's performance	-/+	Berry (2013), Hitt et al. (1996), Chang (1996), Hoskisson and Johnson (1992), Hamilton and Chow (1993), Markides (1992), Montgomery and Thomas (1988), Ravenscraft and Scherer (1987), Duhaime and Grant (1984), Harrigan (1981)
Business relatedness	+	Berry (2010, 2013), Capron et al. (2001), Zuckerman (2000), Bergh (1995, 1997), Harrigan (1981, 1985), Hoskisson et al., (1994)
Business diversification	+	Berry (2010, 2013), Chang and Singh (1999), Bergh (1997), Chang (1996), Hoskisson and Hitt (1994), Duhaime and Grant (1984)
Internationalisation / the geographic scope of the economic group	+/-	Norbäck et al. (2015), Berry (2010, 2013)
Existence of other affiliates	+	Norbäck et al. (2015), Berry (2010, 2013)
Other divestments/acquisitions	+/-	Procher and Engel (2017), Norbäck et al. (2015), Berry (2010), Capron et al. (2001)
Strong parent firm governance	+	Chatterjee et al. (2003), Sanders (2001), Hoskisson et al. (1994); Johnson et al. (1993)
Panel B. Sector-level factors		
Growth	+/-	Berry (2010), Sembenelli and Vannoni (2000), Ilmakunnas and Topi (1999), Harrigan (1982)
Concentration	+/-	Norbäck (2015), Tan and Yuan (2003), Chang and Singh (1999), Ilmakunnas and Topi (1999)
Technological change	+	Harrigan (1982), Jovanovic and MacDonald (1994), Jensen (1993)
Changes to regulation and institutional setting	+	Norbäck et al. (2015), Chatterjee et al. (2003), Bergh and Lawless (1998), Shleifer and Vishny (1991), Hoskisson and Hitt (1990), Turk and Baysinger (1989)
Level of internationalisation	+/-	Berry (2013)
Sunk costs		Harrigan (1982), Sembenelli and Vannoni (2003), Norbäck et al. (2015)
Panel C. Host country-level factors		
GDP	-	Norbäck et al. (2015), Blake and Moschieri (2017), Berry (2010)
Real exchange rate volatility	+	Berry (2010)
Capital-to-labour ratio	-	Norbäck et al. (2015)
Wages	+	Berry (2010)
Trade openness	+	Norbäck et al. (2015)
Skills	+	Norbäck et al. (2015)
Policy stability	-	Blake and Moschieri (2017), Berry (2013)
ISDS disputes against the host	+	Blake and Moschieri (2017)

3. Descriptive evidence: Divestment patterns

Data and definitions

The data used in this paper come from several different sources. First, the firm-level data is based on the information from Bureau van Dijk's ORBIS database. As explained in several recent studies of FDI and MNE activity, the ORBIS database offers one of the richest sources of firm-level data with ownership and financial information available for a number of countries over time (e.g. Fons-Rosen et al., 2013; Kalemli-Ozcan et al., 2015; Alfaro and Chen, 2018; Chen and Bao, 2018). In particular, for OECD countries, which are the focus of this paper, it offers good coverage of MNE activity and the official FDI statistics (e.g. see Kalemli-Ozcan et al., 2015 and Alfaro and Chen, 2018). As such, it offers an attractive tool to study the drivers of divestment decisions, as well as changes in firm ownership structure more generally, in ways that were previously possible for selected countries or groups of investors only (see Section 2).

After a thorough data-construction and cleaning exercise, a panel dataset has been created, containing financial and ownership information on over 62 000 foreign-owned affiliates, located in 41 selected OECD and G20 countries and those firms' parents as well as their economic groups located in 164 different countries.[16] As such, the dataset tracks those affiliates each year during the period 2007-2014 in order to identify when they were sold by their foreign parents, either to domestic or foreign owners. As explained at the outset. this paper focuses on foreign divestments and follows Javorcik and Poelhekke (2017) to define such divestments as a change in the affiliate's ownership structure that involves a transfer of majority-control over a firm from a foreign to a domestic owner. Finally, this approach takes into account solely changes in the company's global ultimate owner, i.e. the individual or entity at the top of the corporate ownership structure, in order to capture shifts that affect the beneficial ownership of an affiliate, and exclude other corporate restructuring.

All the definitions of the variables used as well as the associated sources are listed in Table 3. Most data for country-level variables come from the World Bank's World Development Indicators Database, World Economic Forum's Global Competitiveness Index, the WTO, CEPII as well as the relevant OECD databases (e.g. OECD Productivity Database and OECD Environmental Policy Stringency Index). The information on the coverage of international trade, investment and tax agreements comes from the OECD International Investment Agreements database, Baier et al. (2014), as well as the OECD and the Exchange of Tax Information Portal of the Global Forum on Transparency. All variables for the affiliate firms and economic groups of their parents are constructed using ORBIS.[17]

Descriptive evidence

Overall, using definitions and data described above, it is found that 22% of firms that were foreign-owned at the start of the sample period were divested at least once by their foreign-owned parent (representing about 13 000 divestments throughout the whole period). This

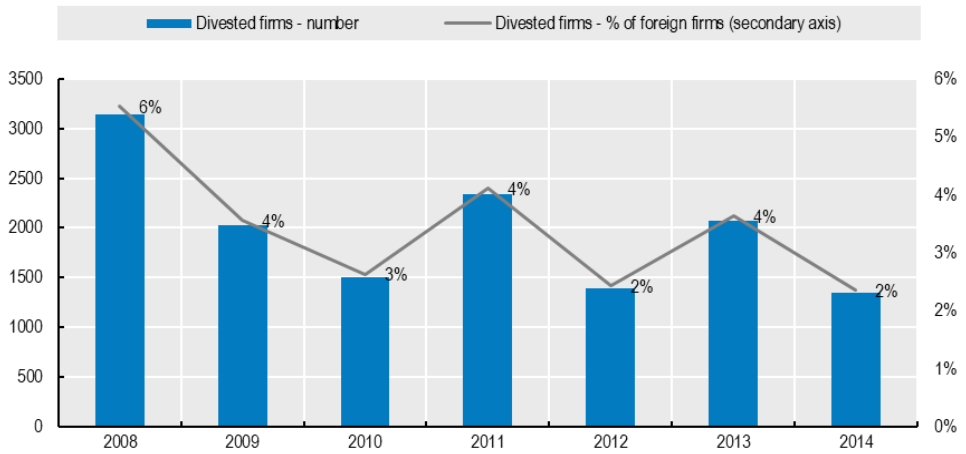
[16] See Annex A and (OECD, forthcoming) for more information.

[17] Financial information on the affiliate firms (parent firm's economic groups) comes from the unconsolidated (consolidated) accounts reported in ORBIS (see OECD, forthcoming)

translates into an annual rate of about 4%, which is commensurate with other studies.[18] Using another metric, 34% of all total assets of foreign-owned firms in 2007 have been divested by 2014, accounting for 17% of their sales and 23% of their employees.

Figure 1 shows the evolution of the number of divested firms observed in the sample as well as their share in all foreign-owned firms in different years. As can be seen, divestment rates vary over time, potentially responding to fluctuations in the business cycle and other time-varying factors. Divestment shares also differ by sector (Figure 2), being relatively higher in certain services sectors, also pointing to the importance of sector characteristics. These trends highlight the need to account for a series of macroeconomic, sectoral and other structural factors to establish the effect of various drivers on the probability of MNE divestment of an affiliate.

Figure 1. Number of divestments and share of divested firms in all foreign-owned firms, 2008-2014.



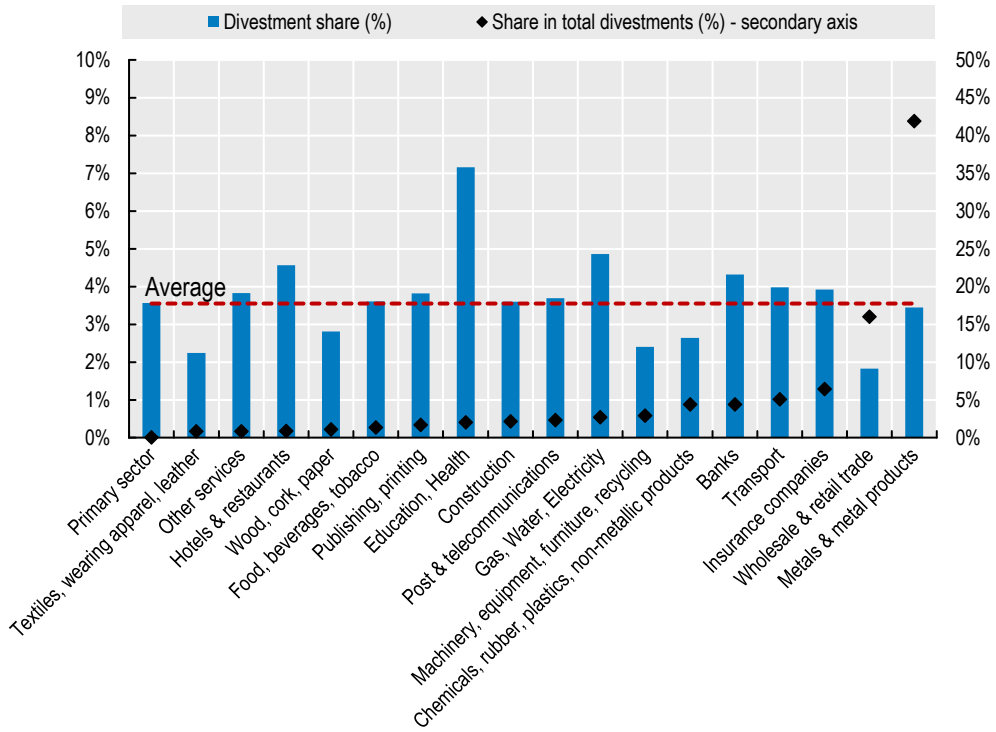
Note: A foreign divestment refers to a situation when a foreign global ultimate owner of an affiliate in year t-1 ceases to have a majority control over that affiliate in year t and a domestic owner commences to exert a majority control. Divestment share here refers to the number of divested firms to the total number of foreign-owned firms that year.
Source: OECD calculations using ORBIS © data.

Comparing the evolution of foreign divestments and acquisitions over time can provide additional insights. Figure 3 and 4 show the relative importance of foreign divestments to foreign acquisitions in the sample period. On net, foreign acquisitions outnumber foreign divestments in most years between 2007 and 2014. Yet, in some years, the number as well as the value of total assets of foreign divestments are as significant, or even outweigh foreign acquisitions. This suggests that divestment is not a trivial phenomenon and can potentially affect a sizable share of business activity. Combined with existing evidence on the possible negative effect on the sold-off affiliate's performance, it merits further attention and analysis of factors that may explain it.[19]

[18] Despite differences in definitions and time periods in several earlier country studies, they generally find an annual divestment rate to be between 1.7 and 4%. In addition to Berry (2013) and Norbäck et al. (2015), cited earlier, Belderbos et al. (2006) and Belderbos (2003) find annual divestment rates of Japanese MNEs in electronics manufacturing in ASEAN and Europe to be about 3%. UNCTAD (2009) also reports that divestments "affect between one quarter and four fifths of all FDI projects".
[19] For example, Javorcik and Poelhekke (2017), using a detailed plant-level panel dataset from Indonesia, find that the sold-off plants experienced a subsequent 3.8% drop in productivity, a 28% drop in output, and

The summary statistics for the variables included in the model outlined in the next section are included in Table A.2 in Annex A at the end of this paper.

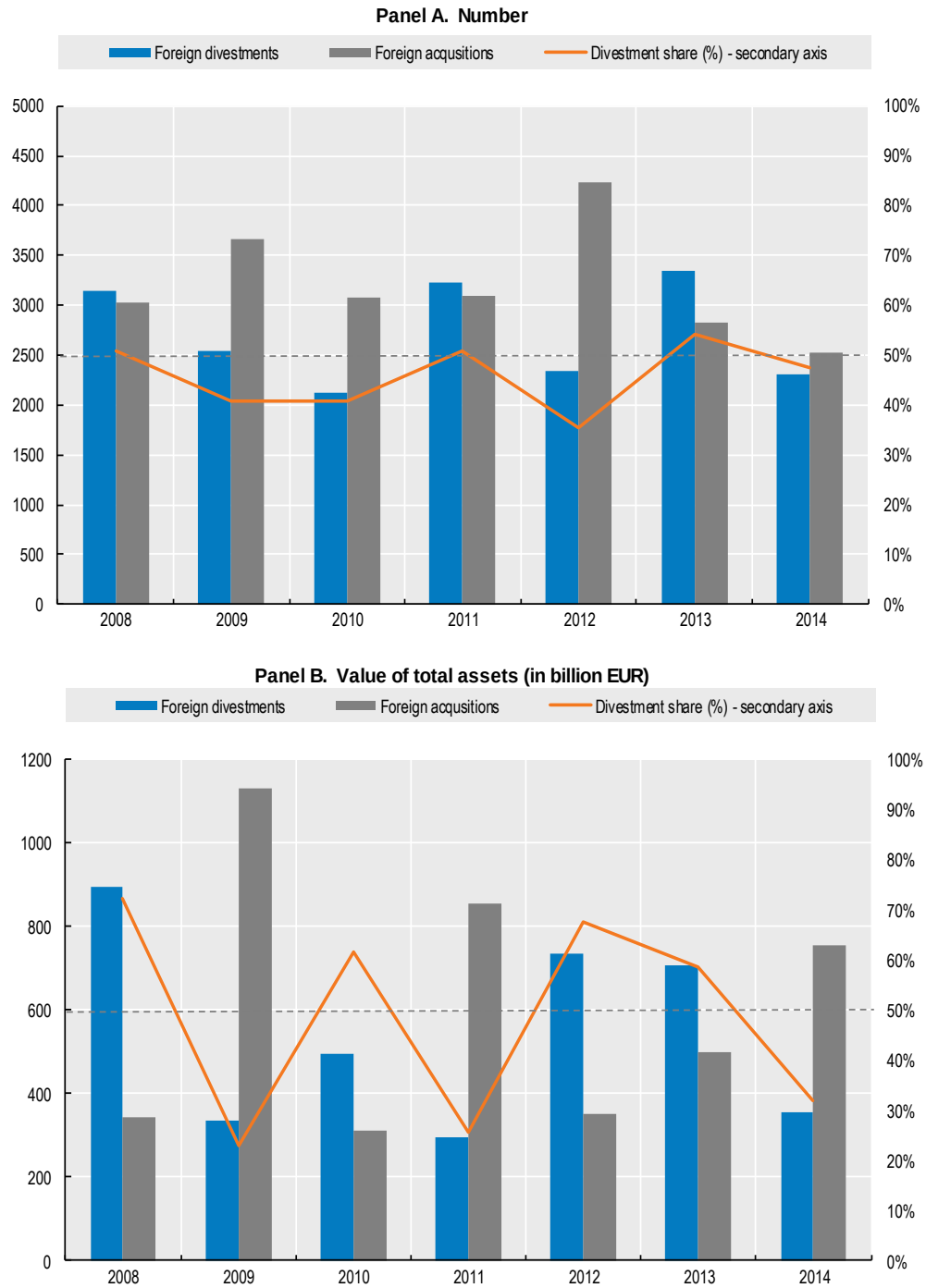
Figure 2. Foreign divestments rate by the sector of the affiliate firm, in %, 2008-2014.



Note: A foreign divestment refers to a situation when a foreign-owned global ultimate owner of an affiliate in year t-1 ceases to have a majority control over that affiliate in year t and a domestic-owned firm commences to exert a majority control. Divestment rate is defined as the share of divestments to the total number of foreign-owned firms in a given sector. The broad sector classification shown here is provided by ORBIS; the empirical analysis presented later uses NAICS sector classification.
Source: OECD calculations using ORBIS © data.

a 15.3% drop in blue-collar employment relative to the control group of similar firms that have not been divested. Analysis using the firm-level data employed in this paper also finds a negative relationship between foreign divestment and the performance of the divested affiliates relative to firms that stayed foreign-owned through the period (see Table B1 in Annex B).

Figure 3. Number and value of foreign divestments and acquisitions, 2008-2014.



Note: A foreign divestment refers to a situation when a foreign-owned global ultimate owner of an affiliate in year t-1 ceases to have a majority control over that affiliate in year t and a domestic-owned firm commences to exert a majority control. A foreign acquisition refers to a situation when a domestic-owned global ultimate owner of an affiliate in year t-1 ceases to have a majority control over that affiliate in year t and a foreign-owned firm commences to exert majority control. Divestment share is the share of foreign divestments to the sum of all foreign divestments and acquisitions in a given year.
Source: OECD calculations using ORBIS © data.

4. Empirical approach

A linear probability model is used to identify the impact of various country- and firm-level factors on firms' divestment decisions. The reason is threefold. First, OLS estimation is simple and the respective estimates are easily and directly interpretable. As such, it has been applied, among other reasons, in several empirical studies focusing on the determinants of binary outcome variables (e.g., Bernard and Jensen, 2004). Second, in practice, the estimated effects generated by nonlinear models are likely to be very similar to their OLS counterparts (Angrist, 2001, 2006).[20] Third, non-linear models may yield inconsistent estimates when a large number of fixed effects is included to account for several unobserved relevant factors and thus avoid omitted variable biases.[21] The specific estimation equation is as follows:

$$D_{fsceht} = \beta_1 X_{ct-1} + \beta_2 W_{ch(t-1)} + \beta_3 Y_{ft-1} + \beta_4 Z_{et-1} + \gamma_{cs} + \delta_{hst} + \varepsilon_{fsceht} \quad (1)$$

where $D_{fcsh(e)t}$ is a binary variable that takes a value of 1 if an affiliate *f* in a (4-digit NAICS classification) sector *s* in a host country *c* is divested (i.e. ceases to have majority control) by its foreign-owned parent belonging to an economic group *e* in a home country *h* in a given year *t*, and zero otherwise; X_{ct-1} is a vector of relevant (time-variant) host country economic and policy characteristics, selected based on their use in the existing literature on the drivers of FDI and firm divestment decisions (listed in Panel A of Table 3 underneath). $W_{ch(t-1)}$ is a vector of relevant bilateral host-home country-pair characteristics, notably the existence of IIAs, RTAs, and DTTs between the countries of location of the affiliate and its parent firm (see Panel B in Table 3). Y_{ft-1} is a vector of relevant (time-variant) affiliate firm–level characteristics listed in Panel C in Table 3; and Z_{et-1} is a vector of relevant (time-variant) economic group–level characteristics, listed in Panel D in the same table. The rest of the terms are relevant fixed effects, accounting for different sources of time-invariant and time-variant heterogeneity; γ_{cs} – host country-sector fixed effects; δ_{hst} – home country-sector-year fixed effects; and ε is the error term.[22]

A number of (time-variant) controls at the affiliate- and the parent's economic group-level (i.e. Y_{ft-1} and Z_{et-1}, respectively), are constructed using the firm-level dataset described in the earlier section. The choice of the variables considered is guided by the earlier literature (see

[20] This is the case due to a general regression property according to which, regardless of the conditional mean function being estimated, OLS regression always provides the minimum mean square approximation to it (e.g. Goldberger, 1991). At the outset of the research, probit and logit models were estimated for the same set of specifications (without inclusion of the full set of relevant fixed effects) and the results were very close to the OLS-based ones.

[21] This is the well-known "incidental parameter problem" first analysed by Neyman and Scott (1948) (see also Lancaster, 2000).

[22] Lags are used to alleviate potential simultaneity problems (e.g. if a large divestment is associated with a simultaneous drop in GDP or in other ways impacts some of the explanatory variables or may lead to change in the policy of a country) as well as to account for the possibility that the decision to divest may lag behind the initial factor prompting it (e.g. a firm observes reduced return on assets in year t and incorporating this decision into its strategy decides to divest in t+1).

Section 2). For example, building on earlier studies (e.g. Berry, 2010, 2013; Norbäck et al. 2015), the size of the affiliate (proxied by the size of its fixed assets), its financial performance (proxied by the return on assets, ROA) or financial health (proxied by its liquidity ratio) are examined to see if they influence the probability of the affiliate being divested by its foreign parent, *ceteris paribus*. Similarly, controls for the size, financial performance and health of the economic group of the foreign parent are included, building on earlier studies. The "opportunistic" versus "strategic" motivations of MNEs for divesting affiliates, i.e. those motivated by short-term liquidity constraints versus those linked to the desire to refocus on the firm's core business (e.g. Markides, 1992), are considered by including relevant controls for the sectoral and geographic nature of the parent's economic group and its ability to service debt.[23] Finally, as also done elsewhere, several measures of interaction between the parent's economic group and the affiliate firm, such as whether they operate in the same 4-digit NAICS sectors, and if there are any other affiliates of the same parent operating in the host country of the affiliate (see Panel C and D in Table 3), are taken into account.

To control for host-country, home-country and host-home county pair characteristics, a mix of relevant time-variant country characteristics and appropriate fixed effects are included. For example, in the baseline regressions, to explore the role of different host-country and bilateral country-pair considerations, home-country-time fixed effects (δ_{hst}) and a series of time-variant economic and policy host-country factors and time-variant and time-invariant bilateral characteristics, are included as has been done in the FDI literature (Panels A and B in Table 3). When the focus is on the role of international agreements, these host country characteristics are later absorbed by the relevant host-country-(sector)-time fixed effects ($\gamma_{c(s)t}$) to control for sources of unobserved heterogeneity along this dimension.

In the second stage, additional robustness checks are performed to better corroborate the effects of bilateral host-home country factors, including RTAs, IIAs and DTTs, on foreign divestment probability. First, to test if the effect of treaties varies depending on the sample composition, the sample is increased to include all 146 countries for which firm-level ownership information over time is available in ORBIS.[24] Second, to account for potential sources of unobserved heterogeneity and relax the timing assumptions regarding the impact of international agreements on divestment decisions, and thereby alleviate potential endogeneity concerns, the following alternative specification is used:

$$\Delta\, D_{fsceht_0} = \beta_1 IIA_{cht_0} + \beta_2\, RTA_{cht_0} + \beta_3 DTT_{cht_0} + \gamma_{cs} + \delta_{hs} + \varepsilon_{fsceh} \tag{2}$$

where $\Delta\, D_{fcshet_0}$ is a binary variable that takes a value of 1 if an affiliate *f* in a (4-digit NAICS classification) sector *s* in a host country *c* that was foreign-owned in 2007 was divested (i.e. ceased to have majority control) by its foreign parent belonging to an

[23] While inherently difficult to capture, this paper builds on earlier studies described in Section 2 and considers the parent's ability to meet its debt obligations as proxied by the economic group's insolvency ratio (i.e. the ratio of shareholders' funds to total assets) and its current financial constraints as proxied by the liquidity ratio (i.e. ratio of current assets to current liabilities) to capture the parent's potential motivation to sell affiliates to gather funds. Strategic factors are based on earlier studies and are captured by metrics of sectoral spread (i.e. number of 4-digit NAICS sectors in which the economic group operates), geographic breadth (i.e. number of countries) as well as the level of internationalisation of the MNE global network of affiliates (i.e. the share of foreign affiliate to all affiliates in the group).

[24] This expansion means adopting an alternative specification because, among other reasons, the sample does not have data for all of the affiliate-level and group-level variables included above.

economic group e in a home country h at some point between 2007 and 2014, and zero otherwise ($\Delta\, D_{fsceht_0}$= $D_{fsceh(2008-2014)}$-$D_{fsceh(2007)}$) and where $D_{fsceht_0}$is equal to 0 for all firms because all firms are foreign-owned in 2007; IIA_{cht_0} is a binary variable that takes a value of 1 if there was an IIA in place between the host country of the affiliate f and the home country of its economic group's parent e at the beginning of the sample period and 0 otherwise; RTA_{cht_0} is a binary variable that takes a value of 1 if there was an RTA in place between the host country of the affiliate f and the home country of its economic group's parent e at the beginning of the sample period and 0 otherwise; DTT_{cht_0} is a binary variable that takes a value of 1 if there was a DTT in place between the host country of the affiliate f and the home country of its economic group's parent e at the beginning of the sample period and 0 otherwise. The rest of the terms are relevant fixed effects, accounting for different sources of time-invariant and time-variant heterogeneity; γ_{cs}- host country sector fixed effects and δ_{hs}- home sector fixed effects; and ε is the error term.

Finally, the existence of possible heterogeneous effects of agreements is explored, depending on their content. For this purpose, the classification of RTAs according to their depth developed by Baier et al. (2014) is used to provide nuance in place of the earlier employed RTA dummy. In particular, RTAs are divided into two groups: *Shallow RTAs* covering preferential trade agreements (PTAs) and free trade agreements and *Deep RTAs*, covering customs unions, customs markets and economic unions, and these two variables are used in place of the RTA dummy in both specifications outlined above.

In line with the literature, some of the different factors at the firm, country- and country-pair level explored in earlier studies are expected to be statistically significant determinants of MNE divestments. In the first instance, all of them are included in the benchmark specification to assess their relative importance. Then, progressively more stringent specifications are introduced that include fixed effects to control for some of these factors – such as time-variant host-country and home-country and time-invariant host-home effects – to focus on time-variant bilateral country variables (i.e. international agreements), and explore the existence of possible heterogeneous effects. Table 3 provides the definitions of all variables used as well as the expected signs of the relationship.

Table 3. List of the variables used in the analysis

Variable	Expected sign	Definition	Source
		Panel A. Host Country Variables	
Log GDP t-1	-	Size of GDP (current LCU)	World Bank's World Development Indicators
Log GDP pc t-1	+	GDP per capita income	World Bank's World Development Indicators
Log Real Exchange Rate t-1	+	Real effective exchange rate index (2010 = 100)	World Bank's World Development Indicators
Log Real Exchange Rate Variability t-1	+	Standard deviation in real exchange rate changes over the prior three-year period	Authors' calculation using the World Bank's World Development Indicators
Log Trade-to-GDP	+	(Exports+Imports)/GDP(%)	WTO

Log Unit Labour Costs (ULC)	+	Labour compensation per unit of labour input / Labour productivity, i.e. output per hour worked (Index, 2010=100, total economy, annual)	OECD Productivity database
Log Tax rate t-1	+	Total tax rate (% of commercial profits)	World Bank's World Development Indicators
Log Applied Trade Tariff Rate t-1	+	Tariff rate, applied, simple mean, manufactured products (%)	World Bank's World Development Indicators
Log Time to Trade t-1	+	Average time to import and export (days)	World Bank's World Development Indicators
Log Quality of Overall Infrastructure t-1	-	Quality of overall infrastructure, 1-7 (best)	World Economic Forum Global Competitiveness Index
Log Corruption (TI) t-1	-	Corruption Perception Index (0 =highly corrupt; 100=very clean.)	Transparency International
Log Political Stability t-1	-	Political Stability (higher='better' performance)	World Banks's Worldwide Governance Indicators
Log Education t-1	-	Labour force with advanced education (% of total working-age population with advanced education)	World Bank's World Development Indicators
Log Environmental Policy Stringency t-1	+	Index on the degree of stringency of environmental policy instruments mainly related to climate and air pollution (0='not' stringent; 6=most stringent)	OECD Environmental Policy Stringency Index
Log Labour Market Efficiency t-1	-	Labour Market Efficiency, 1-7 (best): Index taking into account the following aspects: cooperation in labour-employer relations, flexibility of wage determination, hiring and firing practices, redundancy costs, effects of taxation of incentives to work, pay and productivity and other related factors	World Economic Forum Global Competitiveness Index
Log Inflation t-1	+	Inflation, consumer prices (annual %)	World Bank's World Development Indicators
Panel B. Bilateral Host-Home Country Variables			
Distance t-1	-	Geographic distance between the host and home country	CEPII database
IIAs t-1	-	International Investment Treaties	OECD IIA database
RTAs t-1	-	Regional Trade Agreements (RTAs) including information on the type of RTA (e.g. FTA, PTA, CU, CM, EUN)	Baier et al. (2014)
DTTs t-1	+/-	Double Taxation Treaties	Exchange of Tax Information Portal of the Global Forum on Transparency and OECD
Panel C. Affiliate Firm-Level Variables			
Log Affiliate's Fixed Assets t-1	+	Affiliate's Fixed assets	ORBIS database
Log Affiliate's Liquidity Ratio t-1	-	Affiliate's ratio of current assets to current liabilities	Authors' calculation using ORBIS database
Log Affiliate's RoA t-1	-	Affiliate's ratio of EBITDA/Total Assets	Authors' calculation using ORBIS database

Other Affiliates in the Same Host Country Dummy t-1	+	A dummy taking a value of 1 when another affiliate operates in the same host country as the affiliate, and 0 otherwise	Authors' calculation using ORBIS database
Same Sector as Parent's Core Sector Dummy t-1	-	A dummy taking a value of 1 when an affiliate operates in the same save 4-digit level NAICS sector as its parent (core sector), and 0 otherwise	Authors' calculation using ORBIS database
Panel D. Economic Group Firm-Level Variables			
Log Economic Group's Total Assets t-1	+	Economic group's total assets (consolidated)	ORBIS database
Log Economic Group's Liquidity Ratio t-1	+/-	Economic group's ratio of current assets to current liabilities	Authors' calculation using ORBIS database
Log Economic Group's RoA t-1	+/-	Economic group's ratio of EBITDA/Total Assets	Authors' calculation using ORBIS database
Log Economic Group's Solvency Ratio t-1	-	Economic group's ratio of shareholders' funds to total assets	Authors' calculation using ORBIS database
Economic Group's No. of Sectors Covered t-1	+	Number of 4-digit NAICS sectors in which the economic group operates	Authors' calculation using ORBIS database
Log Economic Group's Internationalisation Level t-1	+/-	The share of the number of foreign affiliates to all affiliates covered in the economic group	Authors' calculation using ORBIS database
Log Economic Group's No. of Countries Covered t-1	+/-	Number of countries in which the economic group operates	Authors' calculation using ORBIS database

5. Estimation results

Table 4 reports the least squares estimates of Equation (1).[25] Column 1 shows those corresponding to a baseline specification, in which a set of core policy factors encountered in the FDI literature outlined earlier is controlled for, together with a set of controls for affiliate firm and economic group characteristics, following in particular Norbäck et al. (2015) and Berry (2011). Additional policy variables are then incorporated, notably the stringency of environmental policies, education, labour market efficiency and inflation to test if the baseline estimates remain robust when these factors are controlled for (Columns 2-4).

5.1. Role of host country factors

According to the specification in Column 4, which includes a full set of policy variables as well as relevant controls, several policies explored in the FDI literature influence MNE divestment decisions. For example, unit labour costs (ULCs), trade openness, applied average tariff rates, real exchange rate volatility, level of control of corruption, labour market efficiency and environmental policy stringency are found to be statistically significant and consistent across the specifications presented in Table 4. They are described in more detail below.

ULCs are defined as the average cost of labour per unit of output produced (that is, the ratio of total nominal labour compensation per hour worked to the volume of output per hour worked). They are often used as a proxy for countries' international competitiveness but care needs to be taken in their interpretation.[26] Higher ULCs are associated with a higher foreign divestment probability, *ceteris paribus*. For example, a 10% increase in a country's ULCs is associated with an increase in foreign divestment probability of 3 percentage points, on average.[27] This finding is consistent with the FDI literature that generally finds that higher wages or total labour costs are, on average, associated with lower FDI inflows (e.g. Bellak, et al. 2008, Cheng and Kwan, 2000, Nicoletti et al., 2003). Thus, lower FDI inflows due to a loss of international competitiveness can be compounded by divestments.

[25] The sample includes all foreign-owned firms that were never divested throughout the period and those that were divested at least once until the year in which they were divested for the first time.

[26] Because the measures are based on national currencies, they will not be able to capture direct increases in competitiveness that may, for example, come through a currency devaluation. In addition, ULCs can fall due to drops in total output and labour input during economic downturns. Moreover, ULCs only consider labour costs and not changes in the cost of other inputs, including capital. Note, too, that countries can remain competitive in the export of high quality goods and services where demand is relatively price inelastic even with relatively high ULCs. See the OECD (2018c) for a discussion.

[27] This result is obtained by multiplying the estimated coefficient on the variable of interest by the natural log of the increase in that variable. For example, in this case, it would be 0.318*ln(1.1)=0.03. This and the following comparisons are *ceteris paribus*.

Table 4. Estimation results: Drivers of divestment

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Divestment	Divestment	Divestment	Divestment	Divestment	Divestment
	Panel A. Host Country Factors					
Log GDP t-1	-0.1760*	-0.4590**	-0.4840**	-0.7010***	-	-
	(0.0997)	(0.1800)	(0.2050)	(0.2440)	-	-
Log GDP pc t-1	0.1780*	0.4040**	0.5100***	0.6620***	-	-
	(0.0965)	(0.1670)	(0.1890)	(0.2190)	-	-
Log Real Exchange Rate t-1	-0.0232	0.0249	0.0049	-0.0682	-	-
	(0.0284)	(0.0339)	(0.0343)	(0.0476)	-	-
Log Real Exchange Rate Variability t-1	0.0034**	0.0030	0.0040*	0.0056**	-	-
	(0.0017)	(0.0023)	(0.0024)	(0.0025)	-	-
Log Trade-to-GDP t-1	0.0376***	0.0747***	0.0719***	0.0642***	-	-
	(0.0123)	(0.0160)	(0.0162)	(0.0180)	-	-
Log Unit Labour Costs, Total t-1	0.1380***	0.2280***	0.2260***	0.3180***	-	-
	(0.0293)	(0.0547)	(0.0600)	(0.0913)	-	-
Log Tax rate t-1	-0.0040	-0.00334	0.0115	0.0060	-	-
	(0.0129)	(0.0306)	(0.0317)	(0.0491)	-	-
Log Applied Trade Tariff Rate t-1	0.0287***	0.0585***	0.0491***	0.0574***	-	-
	(0.0072)	(0.0169)	(0.0175)	(0.0211)	-	-
Log Time to Trade t-1	-0.0278	-0.0229	-0.0109	-0.0273	-	-
	(0.0193)	(0.0235)	(0.0248)	(0.0269)	-	-
Log Quality of Overall Infrastructure t-1	-0.0019	-0.0224	-0.0342**	-0.0201	-	-
	(0.0103)	(0.0159)	(0.0166)	(0.0202)	-	-
Log Corruption 1 (TI) t-1	-0.0478***	-0.0571***	-0.0836***	-0.0877***	-	-
	(0.0148)	(0.0192)	(0.0197)	(0.0210)	-	-
Log Political Stability	-0.0109***	-0.0269***	-0.0152**	-0.0120		
	(0.0037)	(0.0069)	(0.0074)	(0.0076)		
Log Environmental Policy Stringency t-1	-	0.0491***	0.0453***	0.0477***	-	-
	-	(0.0138)	(0.0146)	(0.0147)	-	-
Log Education t-1	-	-	-0.0862	-0.2770	-	-
	-	-	(0.1770)	(0.1850)	-	-

Log WEF Labour Market Efficiency t-1	-	-	-0.2230***	-0.1960***	-	-
	-	-	(0.0465)	(0.0481)	-	-
Log Inflation t-1	-	-	-	-0.0009	-	-
	-	-	-	(0.0016)	-	-
Panel B. Bilateral Host-Home Country Factors						
Log Distance	-0.1130***	-0.1240***	-0.1240***	-0.1260***	-0.0972***	-
	(0.0039)	(0.0044)	(0.0044)	(0.0046)	(0.0032)	-
IIA t-1	-0.0066	-0.0057	-0.0056	-0.0018	0.0023	0.0179***
	(0.0045)	(0.0051)	(0.0051)	(0.0051)	(0.0041)	(0.0044)
RTA t-1	-0.0670***	-0.0715***	-0.0715***	-0.0722***	-0.0917***	-0.1040***
	(0.0062)	(0.0070)	(0.0070)	(0.0071)	(0.0057)	(0.0064)
DTT t-1	0.0593***	0.0630***	0.0633***	0.0634***	0.0401***	0.0080**
	(0.0055)	(0.0062)	(0.0062)	(0.0064)	(0.0036)	(0.0036)
Panel C. Affiliate Firm-Level Factors						
Log Affiliate's Fixed Assets t-1	-7.64e-06	5.50e-05	5.65e-05	-2.61e-05	0.0001	0.0006**
	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0003)	(0.0003)
Log Affiliate's Liquidity Ratio t-1	-0.0007	-0.0003	-0.0003	-0.0003	-0.0003	4.20e-05
	(0.0009)	(0.0010)	(0.0010)	(0.0010)	(0.0007)	(0.0008)
Log Affiliate's RoA t-1	-0.0008	-0.0003	-0.0002	-0.0003	-0.0011**	-0.0013**
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0005)	(0.0006)
Other Affiliates in the Same Host Country Dummy t-1	-0.0053***	-0.0063***	-0.0063***	-0.0068***	-0.00177	0.00765***
	(0.0020)	(0.0022)	(0.0022)	(0.0022)	(0.0016)	(0.00159)
Same Sector as Parent's Core Sector Dummy t-1	-0.0049	-0.0027	-0.0027	-0.0027	-0.00351	-0.00230
	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0031)	(0.0031)
Panel D. Economic Group Firm-Level Factors						
Log Economic Group's Total Assets t-1	0.00530***	0.0058***	0.0058***	0.0058***	0.0058***	0.0050***
	(0.0009)	(0.0010)	(0.0010)	(0.0010)	(0.0008)	(0.0008)
Log Economic Group's Liquidity Ratio t-1	0.0074***	0.0076***	0.0075***	0.0079***	0.0081***	0.0082***
	(0.0021)	(0.0023)	(0.0023)	(0.0023)	(0.0016)	(0.0015)
Log Economic Group's RoA t-1	0.0015	0.0019	0.0020	0.0021	0.0030**	0.0030**
	(0.0015)	(0.0017)	(0.0016)	(0.0017)	(0.0012)	(0.0012)
Log Economic Group's Solvency Ratio t-1	-0.0025	-0.0031*	-0.0031*	-0.0030	-0.0014	-0.0045***
	(0.0017)	(0.0019)	(0.0019)	(0.0019)	(0.0014)	(0.0015)

Log Economic Group's No. of Sectors Covered t-1	0.0018	0.0013	0.0012	0.0020	-0.0009	0.0029
	(0.0032)	(0.0034)	(0.0034)	(0.0034)	(0.0026)	(0.0026)
Log Economic Group's Internationalisation Level t-1	0.0304***	0.0351***	0.0350***	0.0348***	0.0299***	0.0223***
	(0.0038)	(0.0042)	(0.0042)	(0.0043)	(0.0031)	(0.0033)
Log Economic Group's No. of Countries Covered t-1	-0.0007	-0.0015	-0.0014	-0.0020	-0.0038*	-0.0114***
	(0.0025)	(0.0027)	(0.0027)	(0.0027)	(0.0021)	(0.0022)
Panel E. Included Fixed Effects						
HOST COUNTRY SECTOR FE	Yes	Yes	Yes	Yes	Yes	No
HOST COUNTRY TIME FE	No	No	No	No	Yes	No
HOST COUNTRY SECTOR TIME FE	No	No	No	No	No	Yes
HOME COUNTRY SECTOR TIME FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	45,899	38,157	38,157	36,274	71,881	65,142
R-squared	0.512	0.519	0.519	0.530	0.499	0.504
Adjusted R-squared	0.410	0.413	0.413	0.424	0.404	0.349

Note: Stars denote statistical significance at: *** 99%, ** 95%, * 90%, respectively. Robust standard errors are clustered by firm. The sample comprises 41 countries listed in Annex A. Robustness checks in columns 7-9, replicating models 4-6, are performed on larger sample of 146 countries for which ownership information is available in ORBIS and can be followed through time in order to verify the sensitivity of results to changes in the country coverage. Information on financial performance and other firm-level characteristics is not available for larger sample of countries, which disallows for an inclusion of time-variant firm-level controls included in Columns 1-6 for the sample of 41 selected OECD and G20 economies.

Source: OECD calculations using ORBIS © data.

Meanwhile, higher labour market efficiency as proxied by the World Economic Forum (WEF) *Labour Market Efficiency Index*, which covers a series of different labour practices for a large set of countries[28], is also found to reduce the probability of foreign divestment, *ceteris paribus*. A 10% increase in a country's labour market efficiency is associated with a reduction in foreign divestment probability of 2 percentage points, on average. Earlier studies testing the influence of labour market flexibility on FDI have accordingly found that lower labour flexibility can act as a deterrent to FDI (Dewit et al., 2003b; Javorcik and Spartareanu, 2005; Görg, 2005).

Other aspects of domestic regulation matter as well: consistent with findings in studies on FDI attraction (e.g. Javorcik and Wei, 2009), better control of corruption, as measured by the *Transparency International Corruption Perception Index (CPI)* (where 0 means "highly corrupt" and 100 means "very clean"), matters for investment retention, too.[29] An improvement by 10% in a country's level of control of corruption is associated with a reduction in foreign divestment probability of 1 percentage point, on average.[30]

The level of stringency of environmental protection, as measured by the OECD *Environmental Policy Stringency Index*[31], is also found to influence foreign divestment probability: a 10% increase in a country's stringency of environmental protection is associated with an increase in foreign divestment probability of 0.5 percentage points, on average.

In the area of trade, higher trade tariffs are found to be associated with an increased divestment probability. A 10% increase in a country's tariffs is associated with an increase in foreign divestment probability of 0.5 percentage points, on average. Trade openness itself, measured as the ratio of trade (exports plus imports) to GDP, also increases divestment probability, potentially reflecting the substitutability between trade and FDI as means of serving markets.

Meanwhile, higher tax rates were not consistently found to be a driver of foreign divestments. Being able to resort to accounting techniques that shift profits across borders as well as the use of tax agreements (discussed later) could mean that firms are able to adjust to changes in tax burdens in ways other than through divestment.[32] Other policies that matter for FDI attraction in the literature, such as the quality of education and infrastructure, for example, were found not to be statistically significant determinants of foreign divestment probabilities. This could be because these aspects are potentially more

[28] The Index covers such aspects as cooperation in labour-employer relations, flexibility of wage determination, hiring and firing practices, redundancy costs, effects of taxation on incentives to work, pay and productivity (WEF, 2017).

[29] The average score of countries in the sample is 68 (with Iceland scoring the highest and Russia the lowest), which reflects the overall high level of development in the countries in the sample (primarily OECD and EU economies). Indeed, Western Europe is the highest scoring region on the Index.

[30] Results remain robust when an alternative metric for control of corruption sourced from the World Bank's *World Governance Indicators* is used.

[31] See Botta and Koźluk (2014) for more information.

[32] In addition, it could also be that the metric used here does not capture the true extent of taxation or tax burden faced by firms. As such, future work could focus on refining the metric (see OECD, 2015b).

difficult to capture in simple country-level variables and that they do not have sufficient variation over time.[33]

Finally, rather than the level of the real exchange rate itself, it is found that it is the exchange rate volatility (calculated as a standard deviation in real exchange rate changes over a three-year period, following Berry, 2013) that matters for divestment decisions; once real exchange rate volatility is controlled for, the real exchange level ceases to be statistically significant. This suggests that volatility incentivises firms to leave, perhaps by making hedging more difficult or costly.[34]

5.2. Role of firm-level factors

Certain MNE's economic group-wide considerations are found to be statistically significant determinants of firm divestments, confirming that the parent takes into account the performance of, and the strategic opportunities within, the economic group as a whole when deciding to sell a particular affiliate (e.g. Norbäck et al., 2015; Berry, 2010, 2013; Kogut and Kulatilaka, 1994). For example, affiliates belonging to parents with larger economic groups (in terms of total assets) are divested relatively more frequently than those belonging to firms with smaller groups, which is consistent with earlier studies (e.g. Berry 2010, 2013), and predictions outlined earlier. The internationalisation level of the group, i.e. the share of the foreign affiliates to all affiliates in the group, also increases divestment probability (a 10% increase in the internationalisation level increases the probability of divestment by 0.3 percentage points). Consistent with other studies, it is also found that parents with higher solvency ratios, defined a as ratio of shareholders' funds to total assets in the group, are less likely to divest.[35] This confirms that parents may sell affiliates to improve the overall financial health of the group, all else being equal (e.g. Berry, 2010). The affiliate performance, as captured by the affiliate's return on assets (ROA) is also found to be statistically significant and negatively correlated with divestment probability, albeit only in some specifications and is found to have marginal

[33] Unlike in the case of an investment decision, a decision to divest takes place in *known* locations, *i.e.* countries where a firm has already operated and is familiar with. For example, Boddewyn (1983b) explains this difference between a decision to invest and a decision to divest by adapting the eclectic theory of investment (Dunning, 1979) and highlighting that a firm incorporates first-hand knowledge of actual business prospects in the country in the case of divestments.

[34] Interestingly, once real exchange rate volatility and inflation are controlled for, which could serve as proxies of countries' economic instability, political stability, as measured by the World Banks's Worldwide Governance Indicators, is not statistically significant (see Column 4 in Table 4).

[35] At the same time, conditional on the parent's solvency ratio, affiliates belonging to parents with a higher liquidity ratio and ROA are found to be divested more frequently (coefficients are positive and statistically significant). This may suggest that relatively more successful parents undertake divestments, holding debt levels constant. This may be explained by strategic divestments by MNEs (e.g. Markides, 1992, 1995).

economic significance.[36] It is possible that the effect of this dimension of firm performance on divestment take longer to materialise (see e.g. Blonigen et al., 2014).[37]

Meanwhile, there is not strong evidence that other group-level factors matter in firm divestment decisions. For example, the level of diversification of the economic group, proxied by the number of core sectors in which the group operates, is not found to be a statistically significant predictor of MNE divestment, above and beyond the effect of the company's size. While there is some evidence that the "operational flexibility" provided to the MNE by a wide network of countries covered in its group (Kogut and Kulatilaka, 1994), the effect is small and not confirmed in all specifications. Similarly, there is no evidence that being in the same core sector as the parent (at either 2- or 4 digit NAICS level) influences divestment probability of the affiliate.[38] The presence of other affiliates of the same parent in the same host country also renders ambiguous results. Considering these findings and the insights from the management literature referred to earlier, it is possible that these strategic firm-specific factors are more difficult to capture in the model and would require further analysis,[39] or devoted business case studies.

5.3. Role of international agreements

Besides the role of general investment climate factors, the specific role of regional trade agreements (RTAs), international investment agreements (IIAs), and Double-Taxation Treaties (DTTs) on firm divestment probability is also considered. This analysis seems particularly timely as the benefits of investment agreements specifically have come under public scrutiny and as several G20 countries have reformed or terminated some of their existing treaties (OECD-UNCTAD, 2018). Most of countries included in the sample are covered by at least one type of such an agreement and many are covered by all three types of treaties.[40]

[36] Note that ROA can take negative values, and it is the case in over 20% of affiliate firms in the sample (but is the case for only 3% of MNE parents). Therefore, an alternative specification is tested where the variables that can take negative values (i.e. the affiliate's and economic group's ROA as well as the economic group's solvency ratio) are included in regressions in levels (rather than logs), among others. The relative size and significance of the coefficients on policy variables does not change significantly while the coefficient on ROA loses significance. Results are available from the authors upon request.

[37] Additional lags of this variable would need to be added to test this. Unfortunately, the dataset does not have a sufficiently long span to do so.

[38] This metric could serve as a proxy of "relatedness" described in the business literature (see e.g. Brauer, 2006). For example, Berry (2013) explores the role of "relatedness" of an affiliate and parent by considering if an affiliate operates in the same 3-digit SIC business line as the core business of the parent firm.

[39] For example, the sectoral relationship between the affiliate and the parent could be tested further taking into account the relationships between firms' secondary and tertiary sectors. Similarly, an additional control could be considered for affiliates that are "horizontal" or "vertical" in nature, i.e. operate in the same or different sector than a parent and provide or not inputs to the parent's sector (e.g. following the methodology developed by Alfaro and Charlton, 2009). One could also compare the characteristics of the affiliate relative to the whole economic group or the industry's average.

[40] The EU accounts for a majority of RTAs in the sample given that most of the firms are those operating within the European Union. Following the classification by Baier et al. (2014) and Kohl et al. (2016), the EU is later classified as a Deep RTA.

Table 4 also reported results of regressions on the effect of RTAs, IIAs, and DTTs on the probability of foreign divestment, including specifications where unobserved time-varying host-country and host-country-sector characteristics are controlled for through relevant fixed effects (Columns 5-6), which could not be controlled for in earlier regressions, considering also the role of individual host country factors (Columns 1-4).

As shown in Table 4, for the OECD and G20 economies, the effect of having an RTA is statistically significant and is found to systematically reduce the probability of foreign divestment across all specifications. Specifically, existence of an RTA between a pair of countries of an affiliate and its parent reduces the probability of foreign divestment by 7-10%, all else being equal, depending on the specification.[41] Meanwhile, the overall effect of IIAs appears mixed and relatively small. The effect of DTTs is also small. The variable of IIAs includes both bilateral investment treaties and RTAs with investment chapters. As such, it is found that on average, and controlling for the presence of other agreements, these types of provisions do not appear to have a significant impact on the divestment probability by firms located in 41 selected OECD and G20 economies studied here. The following section presents a series of robustness checks that aim to corroborate the results presented here.

[41] Column 6, showing that the presence of an RTA reduces the probability of foreign divestment by 10%, represents the most stringent model that allows for a study of the effect of bilateral host-home country factors on divestment probability.

6. Robustness checks and heterogeneous effects of international agreements

Besides testing alternative models and the sensitivity of the estimations to the inclusion of different control variables (see Table 4 in the earlier section), Table 5 below presents a series of additional robustness checks performed to corroborate the results on the effects of international agreements on firm divestment probability.

First, the role that international agreements play can differ significantly for different types of countries. Indeed, some of these agreements, notably IIAs, are much more frequently used by less developed economies.[42] As such, the original sample of 41 selected OECD and G20 economies is extended to 146 countries globally for which the ORBIS dataset contains relevant ownership information to test whether results differ when a larger group of advanced and developing economies is considered.[43] Table 5 reports results of these regressions where Columns 1-3 correspond to regressions 5-6 in Table 4. The findings for RTAs and DTTs do not change. In particular, the presence of an RTA between a host country of the affiliate and the home country of the parent is associated with a 5-7% lower probability of divestment of that affiliate. Meanwhile, the effect of IIAs changes as the presence of IIAs reduces foreign divestment probability in the wider sample that includes less developed economies. Specifically, existence of an IIA between a home country of the parent and the host country of the affiliate is associated with a 2% decrease in foreign divestment probability of the parent firm, all else being equal. The results are robust when standard errors are clustered at the firm- as well as host-home country pair level, at which the data varies for the bilateral factors, and international agreements in particular.

To account for further sources of unobserved heterogeneity, an additional robustness check is conducted by testing an alternative specification described in Equation 2 (reported in Columns 5-6 in Table 5).[44] The effect of a presence of an RTA on foreign divestment probability remains consistent and statistically significant in all specifications, in particular when standard errors are clustered at the firm-level. The effect of IIAs and DTTs meanwhile ceases to be statistically significant. This can point to limited variation in the sample; but it is also possible that different elements of these agreements have opposite effects, causing an average effect to be insignificant.[45] This highlights the importance of studying possible heterogeneous effects.

[42] For example, according to the data in UNCTAD's database of international investment agreements that includes information on IIAs signed and in force globally, as of 2019, 64% of IIAs worldwide were signed by countries outside of the OECD and G20 (with the remaining 36% being in the sample used in this paper).

[43] Please note that information on financial performance or other firm characteristics is mostly unavailable for this group of countries. Hence, it is not possible to control for a set of time-variant affiliate-firm and economic group's level characteristics as was done in the baseline regressions for the sample of selected OECD and G20 countries. This is also the reason why the paper focuses on the sample of OECD and G20 countries for which ORBIS has a better coverage.

[44] Columns 5-6 show the results of the same estimation while Column 6 additionally restricts the sample to firms that have not changed their foreign-owned parent between 2007-20014 to control for any further ownership changes throughout the period.

[45] For example, Blonigen et al. (2014) find that while the aggregate effect of DTTs on firm investment decisions is insignificant, their different provisions have positive effects.

Table 5. Effect of international integration agreements: Robustness checks with alternative sample and specification

	Alternative Sample			Alternative Sample & Specification	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	Divestment	Divestment	Divestment	Δ Divestment	Δ Divestment
Panel A. Robustness Checks					
IIA t-1	-0.0229	-0.0050	-0.0160	-0.0093	-0.0115
Cluster Firm	(0.0028)***	(0.0014)***	(0.0015)***	(0.0077)	(0.0090)
Cluster Host-Home	(0.0107)**	(0.0092)	(0.0122)	(0.0127)	(0.0151)
RTA t-1	-0.0452	-0.0936	-0.0643	-0.0205	-0.0274
Cluster Firm	(0.0034)***	(0.0017)***	(0.00175)***	(0.0107)*	(0.0122)**
Cluster Host-Home	(0.0120)***	(0.0147)***	(0.0165)***	(0.0164)	(0.0185)
DTT t-1	0.0354	0.0210	0.0051	0.0004	-0.0006
Cluster Firm	(0.0023)***	(0.0013)***	(0.0013)***	(0.0056)	(0.0064)
Cluster Host-Home	(0.0106)***	(0.0089)**	(0.0084)	(0.0095)	(0.0110)
Panel B. Included Controls & Fixed Effects					
TIME VARIANT HOST COUNTRY FACTORS t-1	Yes	No	No	No	No
TIME INVARIANT HOST-HOME COUNTRY FACTORS t-1	Yes	No	No	Yes	Yes
HOST COUNTRY SECTOR FE	No	No	No	Yes	Yes
HOME COUNTRY SECTOR FE	No	No	No	Yes	Yes
HOST COUNTRY TIME FE	No	Yes	No	No	No
HOST COUNTRY SECTOR TIME FE	No	No	Yes	No	No
HOME COUNTRY SECTOR TIME FE	Yes	Yes	Yes	No	No
Observations	209,318	487,305	482,922	67,389	53,294
R-squared	0.345	0.375	0.345	0.269	0.289
Adjusted R-squared	0.283	0.317	0.248	0.164	0.175

Note: Stars denote statistical significance at: *** 99%, ** 95%, * 90%, respectively. The sample comprises 146 countries for which firm-level ownership information is available in the ORBIS © dataset. Columns 1-3 correspond to Equation 1 and show the results of a regression of a foreign divestment variable that is a binary variable that takes a value of 1 if an affiliate f in a (4-digit NAICS classification) sector s in a host country c is divested (i.e. ceases to have majority control) by its foreign-owned parent belonging to an economic group e in a home country h in a given year t, and zero otherwise, controlling for a set of time-variant host country-level and time-invariant bilateral host-home country factors (as reported in Table 4) as well as a set of host country time, host country- sector time and home country sector time fixed effects, depending on the specification. Columns 4-5 correspond to Equation 2 and show the results of a regression of a foreign divestment variable that is a binary variable that takes a value of 1 if an affiliate f in a (4-digit NAICS classification) sector s in a host country c was foreign-owned in 2007 and was divested (i.e. ceases to have majority control) by its foreign parent belonging to an economic group *e* in a home country *h* at some point between 2007 and 2014, and zero otherwise ($\Delta D_{fsceh(t)} = D_{fsceh(2008-2014)} - D_{fsceh(2007)}$), controlling for a set of time-invariant host-home country pair factors as well as host country sector and home country sector fixed effects, depending on the specification.. Column 6 includes the results of the same specification as Column 5, while additionally limiting the sample to firms that have not changed their foreign-owned parent between 2007-20014 to control for any further ownership changes throughout the period. Robust standard errors are clustered by firm and host-home country pair, respectively.
Source: OECD calculations using ORBIS © data.

To illustrate this point, and given the importance of treaty content found in the literature[46], a further robustness check is undertaken by allowing the effect to vary depending on the character of RTA for which the data are available. For this purpose, RTAs are classified according to their depth as developed by Baier et al. (2014), and the earlier employed RTA

[46] For the discussion on the importance of content of PTAs and RTAs, see e.g. Dür et al. (2014), Kohl (2014), Kohl et al. (2016), Baier et al. (2014), Orefice and Rocha (2014), Blyde, Graziano and Volpe Martincus. (2015); the content of IIAs, see e.g. Berger et al. (2011, 2013) and Alschner and Skougarevskiy (2016); and the content of DTTs, Blonigen, Oldenski and Sly (2014).

dummy is nuanced. In particular, RTAs are divided into two groups: *Shallow RTAs*, covering preferential trade agreements and free trade agreements, and *Deep RTAs*, covering customs unions, customs markets and economic unions.

Table 6 reports the estimation results using these categories and the various specifications used earlier for both samples.[47] It is found that the impact of international agreements on firm divestment probability is heterogeneous, depending on the depth of an agreement. Specifically, it is particularly deep RTAs (i.e. economic unions, customs markets and customs unions) that reduce foreign divestment probability. The results are consistent for both samples. Meanwhile, the coefficients on BITs and DTTs remain similar as those in earlier regressions. In the future, a similar exercise could be undertaken differentiating between IIAs and DTTs, depending on their content.

To summarise, the results presented here are consistent with the earlier FDI literature in the reverse scenario, which generally finds a positive relationship between the presence of an RTA, including a deep RTA, and FDI flows into the host economy or MNE presence (e.g. number of foreign affiliates operating in the host country). The more mixed results for the impact of IIAs and DTTs are also consistent with the earlier literature.

[47] In particular, Columns 1-6 show the results of the estimation described in Equation 1 on both samples (Columns 1-3 for 41 selected OECD and G20 economies and Columns 4-8 for all 146 countries) and Columns 7-8 show the results of the estimation described in Equation 2 for the full sample of 146 countries.

Table 6. Effect of international integration agreements: Heterogeneous effects

	Benchmark Sample			Alternative Sample			Alternative Sample and Specification	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Divestment	Divestment	Divestment	Divestment	Divestment	Divestment	Δ Divestment	Δ Divestment
Panel A. Heterogeneous Effects								
IIA t-1 (2007)	-0.0025	0.0021	0.0175	-0.0215	-0.0012	-0.0094	-0.0088	-0.0110
Cluster Firm	(0.0051)	(0.0041)	(0.0044)***	(0.0028)***	(0.0014)	(0.0015)***	(0.0077)	(0.0090)
Cluster Host-Home	(0.0167)	(0.0176)	(0.0195)	(0.0103)**	(0.0088)	(0.0112)	(0.0125)	(0.0150)
Shallow RTA t-1 (2007)	-0.0163	-0.0075	-0.0308	0.0051	-0.0683	-0.0201	-0.0072	-0.0152
Cluster Firm	(0.0129)	(0.0093)	(0.0097)***	(0.0052)	(0.0021)***	(0.0021)***	(0.0125)	(0.0142)
Cluster Host-Home	(0.0247)	(0.0205)	(0.0203)	(0.0149)	(0.0125)***	(0.0110)*	(0.0182)	(0.0208)
Deep RTA t-1 (2007)	-0.0781	-0.1020	-0.1120	-0.0532	-0.1060	-0.0860	-0.0394	-0.0455
Cluster Firm	(0.0073)***	(0.0060)***	(0.0066)***	(0.0034)***	(0.0019)***	(0.0020)***	(0.0129)***	(0.0149)***
Cluster Host-Home	(0.0270)***	(0.0262)***	(0.0317)***	(0.0130)***	(0.0166)***	(0.0201)***	(0.0200)**	(0.0221)**
DTT t-1 (2007)	0.0616	0.0372	0.0053	0.0342	0.0193	0.0024	-0.0002	-0.0013
Cluster Firm	(0.0064)***	(0.0036)***	(0.0036)	(0.0023)***	(0.0013)***	(0.0013)*	(0.0056)	(0.00640)
Cluster Host-Home	(0.0163)***	(0.0123)***	(0.0086)	(0.0106)***	(0.0087)**	(0.0082)	(0.0095)	(0.0110)
Panel B. Included Controls & Fixed Effects								
TIME VARIANT HOST COUNTRY FACTORS t-1	Yes	No	No	Yes	No	No	No	No
TIME VARIANT AFFILIATE FIRM FACTORS t-1	Yes	Yes	Yes	No	No	No	No	No
TIME VARIANT ECONOMIC GROUP FACTORS t-1	Yes	Yes	Yes	No	No	No	No	No
HOST COUNTRY SECTOR FE	No	No	No	No	No	No	Yes	Yes
HOME COUNTRY SECTOR FE	No	No	No	No	No	No	Yes	Yes
HOST COUNTRY TIME FE	No	Yes	No	No	Yes	No	No	No
HOST COUNTRY SECTOR TIME FE	No	No	Yes	No	No	Yes	No	No
HOME COUNTRY SECTOR TIME FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Observations	36,274	71,881	65,142	209,318	487,305	482,922	67,389	53,294
R-squared	0.532	0.503	0.507	0.347	0.376	0.348	0.269	0.289
Adjusted R-squared	0.426	0.409	0.353	0.285	0.319	0.252	0.164	0.176

Note: Stars denote statistical significance at: *** 99%, ** 95%, * 90%, respectively. RTAs are divided into two groups following Baier et al. (2014): Shallow RTAs covering preferential trade agreements (PTAs) and free trade agreements and Deep RTAs, covering customs unions (CU), customs markets (CM) and economic unions (EUN). Shallow RTAs is a binary variable that takes a value of 1 if there is a shallow RTA (i.e. PTA or FTA) between the host country of the affiliate f and the home country of its economic group's parent e in time t and 0 otherwise. Deep RTAs is a binary variable that takes a value of 1 if there is a deep RTA (i.e. CU, CM, EUN) between the host country of the affiliate f and the home country of its economic group's parent e in time t and 0 otherwise. Columns 1-6 show the results of the baseline specification described in Equation 1 and Columns 7-8 the alternative specification described in Equation 2. Note that Columns 1-3 correspond to Columns 4-6 in Table 4, while nuancing the effect of an RTA by dividing it into Deep and Shallow RTA, for the sample of 41 selected OECD and G20 economies. Columns 4-6 follow the same approach, nuancing the effect of an RTA on the sample of 146 countries (i.e. correspond to Columns 1-3 in Table 5). Finally, Columns 7-8 test the new specification on the sample of 146 countries (corresponding to Columns 4-5 in Table 5). Robust standard errors are clustered by firm and host-home country pair, respectively

Source: OECD calculations using ORBIS © data.

7. Conclusions, further research and policy implications

This paper has provided novel cross-country evidence on the importance of foreign divestment by MNEs – a phenomenon that remains understudied and poorly understood. It has shown that foreign divestment is a frequent economic occurrence that affected every fifth foreign-owned affiliate in selected 41 OECD and G20 economies in the period 2007-2014.

It also provided cross-country evidence on various drivers of divestment decisions by MNEs, including firm-, host-country, and bilateral host-home country pair factors, studying a large set of firms operating globally. It finds that several different factors, including policies, matter for MNE divestment decisions; for example, raising unit labour costs, trade openness, applied average tariff rates, real exchange rate volatility, level of control of corruption, labour market efficiency and environmental policy stringency appear to influence firm divestment probability. Several firm-level considerations studied in the management literature, such as the overall size, financial health or the level of internationalisation of the parent's business group, are also found to play a role. Finally, the results also confirm the relevance of international agreements to divestment decisions by MNEs. For example, the existence of an RTA in general, and a deep RTA in particular (e.g. single market or customs union), has been found to be consistently associated with a lower probability of divestment by an MNE. This finding holds true for both developed and developing countries, and may be relevant to the on-going discussions about possible renegotiations of such agreements. The impact of IIAs and DTTs appears less clear, in particular for OECD and G20 economies.

Several tentative policy implications emerge. First, while the role of policies in shaping firm foreign divestment decisions has been virtually unstudied to-date, this paper suggests that public policies can influence MNE divestments. For example, unit labour costs and labour market efficiency are found to be an important determinant of MNE divestments, highlighting the importance of ongoing labour market reforms to maintain competitiveness. Control of corruption also matters for both investment attraction and retention; and political and economic volatility also comes at a price of increased divestment probability, highlighting the critical role of institutional factors. Last but not least, the existence of international economic integration agreements – recently subject to debate in political circles – has been found to significantly influence firm divestment decisions. Notably, affiliates located in countries with which the parent firm's home country has a deep RTA, which includes the EU membership, are significantly less likely to be divested. In addition, higher applied trade tariffs also increase significantly divestment probability. These findings may need to be born in mind during future negotiations on this issue.

Lastly, while investment retention may be an objective that policymakers need to bear in mind to the same extent as investment attraction, policy actions required to reduce the risk of MNE divestments may also clash with other policy objectives. For example, increased environmental stringency is found to increase divestment probability but may need to be pursued on other grounds, including to alter the profile of firms that operate in the economy.

These findings suggest that there is a merit in better understanding firm divestment decisions and their drivers – including differences in factors that influence MNE investment and divestment decisions. These results could be corroborated through further research, including testing of alternative specifications and estimation techniques as well as performing additional robustness checks (e.g. placebo tests). The analysis in this paper focuses on the years 2007-2014 due to data limitations. A possible extension could

consider, and add, longer sample periods to check if the trends identified here also emerge when a longer term perspective is taken. Improvements could also be made to the variables used, both at the firm- and country-level, to ensure that they meaningfully capture the underlying business and policy dynamics. For example, some of the strategic and corporate factors influencing firm divestment decisions could be explored further, including to reflect better the role of parent-affiliate relations and corporate strategies. Similarly, the role of specific aspects of policies and their design could be explored.

One example of such an avenue for further study is the role of specific provisions of international economic integration agreements, and their differential impact on firm divestment decisions. As both this paper and recent trade literature show, the effects of such treaties can vary significantly depending on their design as well as firm characteristics. As such, further nuancing of the IIA and DTT variables as well as their interaction with different firm characteristics could provide meaningful insights into their role and existence of possible heterogeneous effects. As different elements of these treaties may influence firm decisions in opposite directions, it is possible that the average affect is not statistically significant while "unpacking the box" would provide important insights. The only known study assessing the effect of IIAs on firm behaviour using firm-level data is Egger and Merlo (2012) and it does not differentiate between treaties, depending on their specific provisions. Considering the on-going debate about benefits and costs of such treaties, further evidence on their effects on firms could be particularly pertinent. The availability of rich information on treaty content available in the OECD IIA database and other sources as well as an increasing availability of firm-level data, as used in this paper, could allow such an analysis in the future.

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Annex A. Data

The data used in this paper come from multiple sources. First, firm-level data comes from Bureau van Dijk (ORBIS). The ORBIS database offers one of the richest sources of firm-level data with ownership and financial information available for a number of countries over time, and has been used in studies of FDI and MNE behaviour (e.g. Alfaro and Chen, 2018; Chen and Bao, 2018; Kalemli-Ozcan et al., 2015; Fons-Rosen et al., 2013).

After a thorough data-construction and cleaning exercise, a panel dataset has been created, containing financial and ownership information for 770,669 affiliates from 41 selected OECD and G20 countries as well as their parents located in 164 different countries. Both financial and legal information is available for years 2007-2014, allowing the tracing of ownership changes and financial performance of the affiliates over time. The database also includes information on these affiliates' parents, located in 164 different countries, including their financial information (at a consolidated level), legal information and other data on their economic groups that allows us to construct control variables (e.g. total number of affiliates, total number of 4-digit NAICS sectors, total number of countries in which the MNE operates). A forthcoming methodological paper describes in detail the data construction and cleaning process (OECD, forthcoming).

About 62 000 of affiliate firms in the sample were foreign-owned in 2007. Over 13 000 of those foreign-owned firms (i.e. 22%) were divested at least once by their foreign parent (i.e. majority control was transferred from a foreign to a domestic global ultimate owner) between 2007 and 2014. Table A1 provides an overview of countries included in the analysis and Figures A1 and A2 provide information on the number of firms by host and home country. In some regressions, the sample is extended to 146 countries for which ownership information is available in ORBIS even though it is not possible to use financial data for those firms due to limited data coverage (see Ribeiro et al., 2010 and Kalemli-Ozcan et al., 2015).

Data on host country policies come from many different sources, including the OECD, World Bank, CEPII, World Economic Forum, Transparency International. Data on regional trade agreements (RTAs) come from Baier et al. (2014) and Kohl et al. (2016), on international investment agreements (IIAs) from the OECD Database on International Investment Agreements, and on double taxation agreements (DTTs) from the Exchange of Tax Information Portal of the Global Forum on Transparency and the OECD. All sources and definitions are provided in Table 3 of this paper.

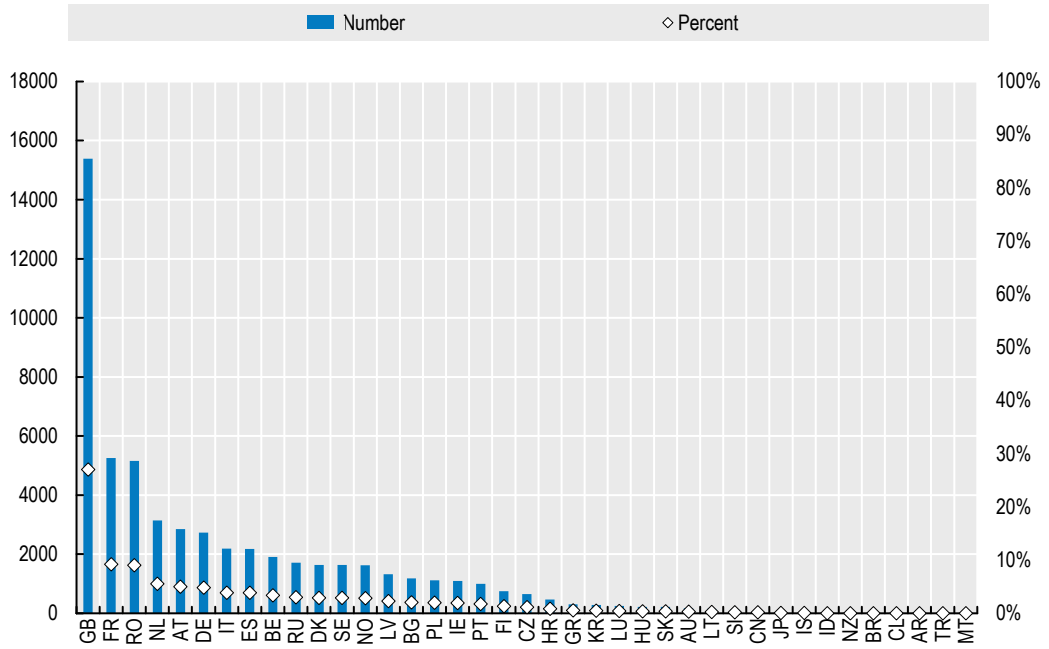
Table A.1. List of countries included in the database.

Number	Country
1	Argentina
2	Austria
3	Australia
4	Belgium
5	Bulgaria
6	Brazil
7	Switzerland
8	Chile
9	China
10	Czech Republic
11	Germany
12	Denmark
13	Spain
14	Finland
15	France
16	United Kingdom
17	Greece
18	Croatia
19	Hungary
20	Indonesia
21	Ireland
22	India
23	Iceland
24	Italy
25	Japan
26	Korea
27	Lithuania
28	Luxembourg
29	Latvia
30	Malta
31	Netherlands
32	Norway
33	New Zealand
34	Poland
35	Portugal
36	Romania
37	Russia
38	Sweden
39	Slovenia
40	Slovakia
41	Turkey

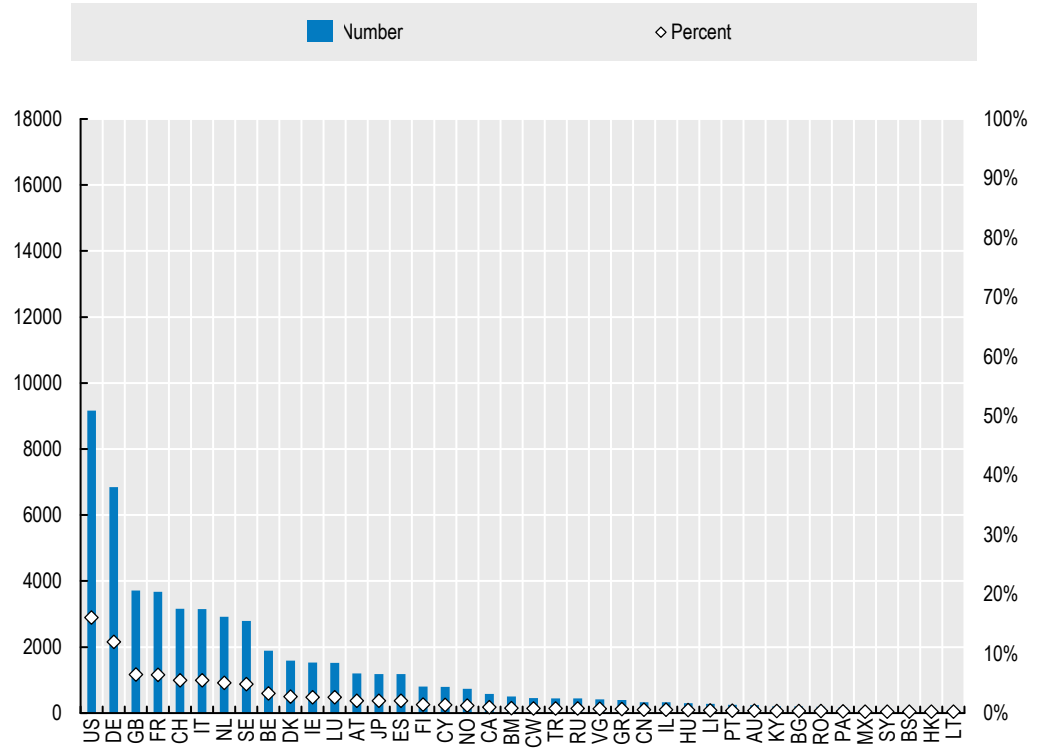
Source: Authors using ORBIS © data.

Figure A.1. Number of firms in the sample, by country, 2008-2014.

Panel A. Host country of the affiliate firm



Panel B. Home country of the parent firm*



Note: *The figure shows top 40 home countries with the largest number of affiliates in the dataset.
Source: Authors calculations using ORBIS © data.

Table A.2. Summary statistics

Variables	Number of observations	Mean	Standard deviation	Min	Median	Max
Divestment	423 057	0.04	0.19	0.00	0.00	1.00
Log GDP t-1	485 498	27.74	1.43	22.47	28.08	36.90
Log GDP pc t-1	485 498	10.62	1.1	9.05	10.30	17.54
Log Real Exchange Rate t-1	480 647	4.63	0.06	4.32	4.61	5.01
Log Real Exchange Rate Variability t-1	353 751	0.89	0.77	-1.24	0.88	3.31
Log Trade-to-GDP	485 498	3.68	0.39	2.43	3.53	5.11
Log Unit Labour Costs (ULC)	468 656	4.64	0.07	4.35	4.65	4.92
Log Tax rate t-1	485 494	3.75	0.27	2.91	3.72	4.92
Log Applied Trade Tariff Rate t-1	484 771	0.27	0.39	-0.89	0.23	2.31
Log Time to Trade t-1	485 494	2.27	0.33	1.70	2.20	3.11
Log Quality of Overall Infrastructure t-1	485 498	1.61	0.27	0.84	1.68	1.89
Log Corruption (TI) t-1	485 490	1.87	0.32	0.74	2.01	2.25
Log Political Stability t-1	455 708	-0.66	0.77	-4.42	-0.61	0.41
Log Environmental Policy Stringency t-1	371 977	1.02	0.36	-0.98	1.10	1.42
Log Education t-1	470 133	4.39	0.05	3.84	4.39	4.51
Log Labour Market Efficiency t-1	485 498	1.54	0.11	1.09	1.55	1.72
Log Inflation t-1	463 388	0.79	0.86	-7.39	0.90	2.74
Distance t-1	478 947	7.09	1.25	2.95	7.02	9.88
IIAs t-1	485 498	0.74	0.44	0.00	1.00	1.00
DTTs t-1	485 498	0.86	0.35	0.00	1.00	1.00
RTAs t-1	485 498	0.71	0.46	0.00	1.00	1.00
Log Affiliate's Fixed Assets t-1	393 835	13.52	3.41	0.00	13.61	25.69
Log Affiliate's Liquidity Ratio t-1	419 204	0.51	1.77	-16.61	0.40	18.73
Log Affiliate's RoA t-1	211 012	-2.41	1.19	-18.26	-2.24	15.58
Other Affiliates in the Same Host Country Dummy t-1	485 498	0.67	0.47	0.00	1.00	1.00
Same Sector as Parent's Core Sector Dummy t-1	288 449	0.15	0.36	0.00	0.00	1.00
Log Economic Group's Total Assets t-1	197 803	21.79	2.46	8.17	22.06	28.41
Log Economic Group's Liquidity Ratio t-1	197 516	0.4	0.59	-8.95	0.36	12.61
Log Economic Group's RoA t-1	178 861	-2.35	0.74	-11.04	-2.25	2.75
Log Economic Group's Solvency Ratio t-1	193 125	-1.06	0.6	-10.45	-0.96	5.78
Economic Group's No. of Sectors Covered t-1	483 336	1.27	0.87	0.00	1.39	2.94
Log Economic Group's Internationalisation Level t-1	463 834	-0.49	0.49	-6.80	-0.37	0.00
Log Economic Group's No. of Countries Covered t-1	485 498	2.09	1.36	0.00	1.95	4.84

Source: Authors calculations using ORBIS © data.

Annex B. Effect of foreign divestments on firm performance

Empirical estimation

In the baseline estimation, the following model is used to explore the relationship between foreign divestments and firm performance:

$$lnX_{fsct} = \alpha D_{fsct} + \lambda_{sct} + \varepsilon_{fsct} \quad (1)$$

where *f* denotes affiliate firm, *s* stands for sector, *c* corresponds to the host country, and *t* indexes year; *X*={Sales, Employees, Value Added, Turnover per Employee, Value Added per Employee, ROA, Liquidity Ratio}; *D* is a binary indicator that takes the value of one if the affiliate firm *f* operating in sector *s* in host country *c* is divested by a foreign parent firm; λ_{sct} is a set of sector-host country-year fixed effects that accounts for systematic time-varying differences across host countries and sectors such as size, level of development, sectoral comparative advantages, and country-specific sectoral policies; and ε is the error term.

The comparison group for the baseline regressions are firms that were foreign-owned at the beginning of the sample period, 2007, and have never been divested. This shows the effect of foreign divestment on the performance of firms without the conflating effects of business cycle fluctuations, sectoral dynamics, etc. To identify the effect of a nationality change on firm performance beyond the sheer effect of a change of an owner, a sale of a foreign-owned affiliate to another ultimate foreign owner is also explicitly accounted for.

Several alternative specifications are tested and robustness checks performed. For example, in one specification the comparison group is changed to compare performance of divested foreign-owned firms to those that remained domestic-owned firms throughout the whole period; and, in another, additional controls for several years after a foreign divestment happened are included to test how persistent the effects may be.[48] Last but not least, in an alternative specification, heterogeneous effects of divestment on outcomes are allowed across groups of firms (e.g., financial, industrial, individual investors; small and large firms):

$$lnX_{fsct} = \sum_{j=1}^{J} \alpha_j \, \Theta_j D_{fsct} + \sum_{j=1}^{J} \Theta_{j(-1)} + \lambda_{sct} + \varepsilon_{fsct} \; (2)$$

where $\Theta = \{\Theta_1, \dots, \Theta_J\}$ is a set of binary indicators that identify the group of firms.

In the case of foreign acquisitions, the estimating equation is the same as in (1) whereby D refers to foreign acquisitions, instead of foreign divestments, and the comparison group become firms that have been domestic-owned at the beginning of the sample period, 2007, and have never been acquired. Similarly, in the case of regressions on the relationship between foreign ownership and performance, the estimating equation is also (1) whereby D refers to a binary variable when a firm is foreign-owned. Firm fixed effects are included in one alternative specification (not reported).

[48] The results for these exercise are not reported here but are available upon request.

Table B.1. Estimation results: Foreign divestments and acquisitions and performance of affiliates

Panel A. Foreign Divestments

	(1) Sales (log)	(2) Employees (log)	(3) Value-added (log)	(4) Turnover per employee (log)	(5) Value-added per employee (log)	(6) ROA (log)	(7) Liquidity ratio (log)
Foreign Divestment	-0.281***	-0.132**	-0.244***	-0.147***	-0.112***	-0.0312	0.0112
	(0.0514)	(0.0450)	(0.0476)	(0.0295)	(0.0262)	(0.0346)	(0.0365)
Foreign-to-foreign sale	0.155***	0.105***	0.137***	0.0430**	0.0316**	0.00240	0.0240
	(0.0243)	(0.0214)	(0.0221)	(0.0134)	(0.0106)	(0.0139)	(0.0128)
Observations	91215	91215	91215	91215	91215	91215	91215
R-squared	0.548	0.426	0.546	0.596	0.600	0.201	0.206
Country-year-sector fixed effects	YES	YES	YES	YES	YES	YES	YES

Panel B. Foreign Acquisitions

	(1) Sales (log)	(2) Employees (log)	(3) Value-added (log)	(4) Turnover per employee (log)	(5) Value-added per employee (log)	(6) ROA (log)	(7) Liquidity ratio (log)
Foreign Acquisition	1.219***	0.910***	1.168***	0.303***	0.259***	0.0522*	-0.0354
	(0.0403)	(0.0364)	(0.0379)	(0.0219)	(0.0195)	(0.0248)	(0.0225)
Domestic-to-domestic sale	0.629***	0.483***	0.602***	0.150***	0.118***	0.00733	-0.0416***
	(0.0132)	(0.0116)	(0.0124)	(0.00686)	(0.00594)	(0.00738)	(0.00772)
Observations	701958	701958	701958	701958	701958	701958	701958
R-squared	0.568	0.393	0.579	0.646	0.662	0.206	0.171
Country-year-sector fixed effects	YES	YES	YES	YES	YES	YES	YES

Note: Stars denote statistical significance at: *** 99%, ** 95%, * 90% respectively. Turnover per employee is calculated as OPR_TURNOVER/ NUMBER_OF_EMPLOYEES, return on assets (ROA) as EBITDA/TOTAL_ASSETS and the liquidity ratio as (CURRENT_ASSETS)/ CURRENT_LIABILITIES. Robust standard errors are reported in parenthesis and are clustered by firm. The country-year-sector fixed effects included in the estimation are at 4-digit level (NAICS classification). Panel A shows a comparison of previously foreign-owned firms that were sold by their foreign parents to domestic investors to other foreign-owned firms; while Panel B shows a comparison of previously domestic-owned firms that were acquired by foreign parents from domestic investors to other domestic owned firms.

Source: Authors calculations using ORBIS © data.

Table B.2. Estimation results: Foreign divestments and performance of affiliates firms– Heterogeneous effects according to the affiliate firm size

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Sales (log)	Employees (log)	Value-added (log)	Turnover per employee (log)	Value-added per employee (log)	ROA (log)	Liquidity ratio (log)
DivestmentxMicrofirms	-0.108	0.0535	0.0352	-0.143	-0.0183	0.0472	0.114
	(0.0845)	(0.0462)	(0.0764)	(0.0778)	(0.0705)	(0.0792)	(0.0950)
DivestmentxSMEs	-0.160***	-0.00191	-0.178***	-0.162***	-0.176***	-0.0469	-0.0313
	(0.0431)	(0.0312)	(0.0397)	(0.0323)	(0.0268)	(0.0415)	(0.0395)
DivestmentxLarge firms	-0.171	-0.0354	-0.0741	-0.139*	-0.0387	-0.108	-0.0689
	(0.0885)	(0.0669)	(0.0911)	(0.0594)	(0.0621)	(0.0891)	(0.0734)
Foreign-to-foreign sale	0.0725***	0.0179	0.0655***	0.0525***	0.0476***	0.00354	0.0319*
	(0.0174)	(0.0114)	(0.0148)	(0.0135)	(0.0106)	(0.0139)	(0.0126)
Micro firms	-4.439***	-4.702***	-4.284***	0.292***	0.418***	-0.0624*	0.346***
	(0.0381)	(0.0229)	(0.0316)	(0.0310)	(0.0239)	(0.0253)	(0.0259)
SMEs	-2.239***	-2.364***	-2.226***	0.126***	0.137***	0.0251	0.196***
	(0.0278)	(0.0193)	(0.0237)	(0.0205)	(0.0150)	(0.0182)	(0.0172)
Observations	91215	91215	91215	91215	91215	91215	91215
R-squared	0.761	0.831	0.783	0.599	0.608	0.201	0.212
Country-year-sector fixed effects	YES	YES	YES	YES	YES	YES	YES

Note: Stars denote statistical significance at: *** 99%, ** 95%, * 90% respectively. Turnover per employee is calculated as OPR_TURNOVER/ NUMBER_OF_EMPLOYEES, return on assets (ROA) as EBITDA/TOTAL_ASSETS and the liquidity ratio as (CURRENT_ASSETS)/ CURRENT_LIABILITIES. Robust standard errors are reported in parenthesis and are clustered by firm. The country-year-sector fixed effects included in the estimation are at 4-digit level (NAICS classification). Following the standard OECD statistical definition, micro firms refer to firms that have less than 10 employees, small- and medium-sized firms (SMEs) to firms that have between 10 and 249 employees and large firms to those with more than 250 employees.

Source: OECD calculations using ORBIS © data.

Table B.3. Estimation results: Foreign divestments and performance of affiliates Firms– Heterogeneous effects according to the type of parent firm

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Sales (log)	Employees (log)	Value-added (log)	Turnover per employee (log)	Value-added per employee (log)	ROA (log)	Liquidity ratio (log)
DivestmentxFinancial	-0.0914	0.0339	-0.0655	-0.129	-0.0993	-0.134	0.157
	(0.137)	(0.122)	(0.130)	(0.0876)	(0.0806)	(0.105)	(0.112)
DivestmentxIndustrial and other	-0.231***	-0.111	-0.211***	-0.128***	-0.101***	-0.0929*	-0.0218
	(0.0632)	(0.0576)	(0.0585)	(0.0356)	(0.0300)	(0.0422)	(0.0379)
DivestmentxIndividual	-0.296**	-0.137	-0.226*	-0.133*	-0.0892	0.151*	0.0166
	(0.101)	(0.0845)	(0.0930)	(0.0617)	(0.0575)	(0.0717)	(0.0908)
Foreign-to-foreign sale	0.123***	0.0817***	0.115***	0.0385**	0.0329**	0.00685	0.0269*
	(0.0238)	(0.0212)	(0.0217)	(0.0134)	(0.0106)	(0.0139)	(0.0127)
Financial	0.886***	0.552***	0.792***	0.323***	0.240***	-0.0420	0.0139
	(0.0546)	(0.0476)	(0.0505)	(0.0305)	(0.0255)	(0.0266)	(0.0294)
Industrial and other	1.096***	0.716***	1.003***	0.371***	0.287***	-0.0531**	0.0323
	(0.0402)	(0.0344)	(0.0374)	(0.0206)	(0.0173)	(0.0187)	(0.0218)
Observations	91215	91215	91215	91215	91215	91215	91215
R-squared	0.570	0.442	0.568	0.603	0.605	0.201	0.206
Country-year-sector fixed effects	YES	YES	YES	YES	YES	YES	YES

Note: Stars denote statistical significance at: *** 99%, ** 95%, * 90% respectively. Turnover per employee is calculated as OPR_TURNOVER/ NUMBER_OF_EMPLOYEES, return on assets (ROA) as EBITDA/TOTAL_ASSETS and the liquidity ratio as (CURRENT_ASSETS)/ CURRENT_LIABILITIES. Robust standard errors are reported in parenthesis and are clustered by firm. The country-year-sector fixed effects included are at 4-digit level (NAICS classification). An investor is considered a financial investor if its legal entity type is an insurance company, a bank, a mutual fund, pension fund, a trust, a nominee, a financial company, a private equity firm, a venture capital fund or a hedge fund. An investor is considered to be an industrial company if its legal entity type is an industrial company (state-owned enterprises are also included in this category). An investor is considered an individual investor if its legal entity is self-ownership, individual(s) or family(ies), foundation or research Institute, employees/managers/directors, unnamed private shareholders or other unnamed shareholders.

Source: OECD calculations using ORBIS © data.

Annex C. OECD Working Papers on International Investment

www.oecd.org/investment/working-papers.htm

2019

2019/02 The broad policy toolkit for financial stability: Foundations, fences, and fire doors

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2006/1 Improving the System of Investor-State Dispute Settlement: An Overview

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2005/3 Corporate Responsibility Practices of Emerging Market Companies - A Fact-Finding Study

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