Multinational business groups

Original citation: Originally published in Alcácer, Juan and Kogut, Bruce and Thomas, Catherine and Yin Yeung, Bernard, (eds.) Geography, Location, and Strategy. Advances in Strategic Management,36. Emerald Publishing Limited, Bingley, UK, pp. 87-123. ISBN 9781787142770

Multinational Business Groups

Katalin Szemeredi

London School of Economics CEP

Abstract:

This paper provides a primer on European multinational business groups and their subsidiaries. Firms in these business groups appear to have higher sales performance than firms in domestic groups (15% higher). This leads us to investigate which elements increase the likelihood that a group will transition towards multinational status. Business groups' characteristics matter for foreign acquisition: groups becoming multinational are usually larger, have a more hierarchical structure with respect to the number of layers in a group, and are more diverse in terms of sectors. Groups tend to expand into bordering countries or countries providing particular advantages, such as a large internal market. The first acquisition is a corporate-level decision that appears to be made by the group's controlling firm and is often a diversification into a different industry.

Acknowledgement: I would like to thank Nitika Bagaria, Johannes Boehm, Esther Ann Boler, Swati Dhingra, John Morrow, Evangelina Pateli, Isabel Roland ,Vincenzo Scrutinio, Tommaso Sonno and Gianmarco Ottaviano and others working at the Centre for Economics Performance at The London School of Economics, Miriam Manchin, Christian Fons Rosen, Giorgio Zanarone and Zsuzsanna Szemeredi for their valuable comments.

Contact: K.Szemeredi@lse.ac.uk

1 Introduction

In recent years, researchers in both economics and finance have focused on business groups (BGs, hereafter). In this paper, we look at European business groups across seven years (2001 through 2007) and study the characteristics of multinational and domestic-only business groups. First, we show how the sales performance of firms belonging to multinational groups compares to that of domestic-only groups; second, we look at which characteristics of business groups make them more likely to transition from a domestic group towards a multinational status; and, finally, we look at patterns of first foreign acquisition and try to shed light on possible factors that can influence groups going multinational.

As this paper looks at business groups (BGs), a formal definition is provided. A business group (a.k.a a "corporate group") is defined as a group consisting of two or more legally independent firms operating in multiple and often distinct markets, in which affiliates are under the control of one ultimate owner at the top of the pyramid. Pyramid structures are built through a series of chains of equity ties from the headquarters to all its subsidiaries (La Porta et al, 1999; Almeida and Wolfensohn, 2006), in which the ultimate owner owns the subsidiary either directly—i.e., with direct ownership of its subsidiary—or indirectly—i.e., with an ownership stake through one or more intermediate firms. Being a part of a business group allows interaction among the affiliates, while allowing them to keep their independent status to make final decisions and access markets. It is this latter property that distinguishes business groups from multidivisional markets and standalones. The smallest business group is composed of two firms, with one affiliate and one headquarters. Multinational business groups have at least one firm from a different country than the ultimate holder.

Studies have highlighted the importance of business groups in a number of ways. First, studies dating back as early as the 1980s have shown that group-affiliated firms are more profitable than standalone companies. Chang and Choi (1998) showed that the performance of group-affiliated firms was more profitable than standalone firms in South Korea; other studies have

shown that business groups are able to offset imperfect institutions and missing markets (Caves, 1989; Khanna and Yafeh, 2007; Khanna and Rivkin, 2001; Carney et al., 2011; Mahmood and Mitchell, 2004). Groups also have shown to be effective in sharing management talent and informational flows (Khanna and Palepu, 1997) and in redistributing the financial resources that benefit groups-affiliates' innovative performance (Belonzon and Berkovitz, 2010). The correlation among business group structure, vertical integration and productivity has been analyzed by Altomonte and Rungi (2013). The management literature has focused primarily on within-firm structures, mainly in the context of managerial know-how, with firms modeled as hierarchical organizations of expertise (Garicano, 2000; Garicano and Rossi Hansberg, 2004, 2006, 2012; Garicano and Hubbard, 2007; Bloom, Sadun and Van Reenen (2012).

While more and more studies have focused on how groups matter and why business groups exist, most of their analysis is limited to business group affiliate performance—that is, comparing standalone firms to group-affiliated firms. Little has been done to analyze various group structures—in particular, the differences between multinational and domestic groups. We know that multinational firms tend to do better and are stronger than national firms, but the differences between nationals and multinationals at the group level has not been explored to date, and it is this gap that we aim to fill.

We know that multinational enterprises (MNEs) have attracted increased attention in the economic literature over the past decade, being at the center of various fields, such as international trade, international finance, management and organizational economics. This is not surprising given the relevance of MNEs in the global economy. According to estimates by Unctad (2011), multinational firms represent 25% of global GDP and account for around one third of international trade.

It is well known that enterprises become multinational to gain access to larger markets, to secure cheaper input for production, and to gain access to knowledge. Studies have also shown that plants belonging to MNEs differ from non-MNE plants in both their characteristics and their performance. These plants tend to be larger and more innovative, to perform better, and to

pay higher wages. (Doms and Jensen, 1998; Crisculo, Haskel and Slaughter, 2004).

This difference in firm performance of national versus multinational ownership can be explained in a number of ways: first, if the acquiring foreign owner is more productive, we observe a positive spillover to subsidiaries; second, if the foreign firm comes from a technologically advanced country, the firm enables technology transfer to the subsidiary, hence allowing for better subsidiary performance (Arnold and Javorcik, 2009; Benfratello and Sembenelli, 2006; Carluccio and Fally, 2010; Bloom, Sadun and Van Reenen, 2012). Studies such as Lipsey and Sjoholm (2002) and Girma and Holger (2007) also find a positive post-acquisition wage effect. All of these studies provide compelling evidence for the positive effects of foreign ownership on plant performance. The vital role that multinationals play leads us to ask: what propels business groups to become multinational?

The contribution of this paper is to bridge the literature on Multinational Enterprises and that on Business Groups. As previously discussed, the benefits of belonging to an MNE have been identified: we know why firms chose to cross borders, and we have an understanding of the benefits of belonging to BGs. However, little is known about the dynamics of national and multinational business groups in terms of (i) their respective subsidiaries' sales performance; (ii) the characteristics that lead a group to transition into a multinational status; and (iii) how these domestic groups start their first foreign acquisition in terms of: the countries they decide to enter; the level of the pyramid ownership structure at which the acquisition takes place (see Section 2, "Data," for more details on the definition of pyramid ownership); and whether they decide to take advantage of comparative advantage by acquiring a firm in a different sector of their own.

The remainder of the paper is structured as follows. *Section 2* provides a detailed analysis of the data used in this paper and includes descriptive statistics on the period studied. In *Section 3,* we divide business groups into two categories, multinational and domestic groups, and look at differences at both the group level and the subsidiary level. Multinational groups are larger (in terms of number of firms in a group), more hierarchical (in terms of the verticality of the group, measured as the distance between

the headquarters and the furthest subsidiary in the ownership chain), and have greater sectoral diversity than national groups. Groups expand primarily in their home country and expand across countries only progressively. Subsidiaries belonging to multinational groups have higher employment, capital and sales than those in domestic-only groups. We conclude this section by running a simple OLS regression on subsidiary sales, controlling for group and firm characteristics and including fixed effects. We find that subsidiaries belonging to multinational business groups have a 15% higher sale premium and 12% higher value added than those in domestic groups. In *Section 4*, we first want to understand whether domestic groups become stronger once they gain multinational status (treatment effect) or whether the groups switching to multinational status had different characteristics to start with that allowed them to become multinational (selection effect); second we identify possible drivers to multinational status. We find that firms that belong to switching groups are larger in terms of employment and have higher sales and value added than those in always-domestic groups even before becoming multinational. Likewise, on a group level, switching groups have a different structure from always-domestic groups: they have more affiliates and higher sectoral diversity and are more hierarchical in terms of the number of layers in their group. This suggests a strong selection into becoming multinational. We conclude by using a linear probability model to assess which group characteristics are associated with a group transitioning into a multinational status. We find that better-performing and more-capital-intense groups are more likely to become multinationals, and the probability of becoming a multinational also increases with the size of the group and with group hierarchy. Our last section, *Section 5*, analyzes how a domestic group becomes multinational by looking at the countries in which domestic groups first make their first foreign acquisition; the layer of the hierarchy at which they acquire the foreign subsidiary; and the sector in which the newly acquired foreign firm is active. We find evidence that (i) most groups acquire their first subsidiary in neighbouring regions or in regions that are legally and culturally similar; (ii) that a “corporate-level decision” is made when acquiring a foreign subsidiary, as the new affiliate comes in at the top layer of the group, close to headquarters; and (iii) that the first foreign subsidiary is

usually from a different sector than the overwhelming part of the group and from a different sector than the headquarters, suggesting that becoming a multinational is to take advantage of a new country's comparative advantage.

To carry out the analysis, we use the Amadeus (Bureau Van Dijk) dataset, which provides detailed accounting and financial information on companies and includes ownership data between shareholders and their subsidiaries.[1] Since Amadeus only contains information on direct ownership links, and not on the entire chain of ownership links, we use the "European Pyramid Ownership Structures" dataset created by Bena, Fons-Rosen and Hanousek (2009). By also establishing intermediate ownership links, the authors develop a dataset based on Amadeus that describes pyramid ownership structures of business groups (for more details on the construction of pyramid ownership, see Section 2 "Data").

2 Data and Descriptive Statistics

2.1 Data

This paper relies on the Amadeus dataset (Bureau Van Dijk), which provides in-depth annual reports on accounting information and private company information for approximately 8,000,000 firms from 35 countries in both Western and Eastern Europe.[2] Bureau Van Dijk (BvD) gathers data from a number of sources, including company registration offices, national statistics offices and stock exchanges. Amadeus/Orbis also provides information on comprehensive ownership reporting, each firm's shareholders and ownership stakes, and, in particular, each firm's ultimate owner. From Amadeus, we use information on firms' BvD unique identifier, employment, capital (tangible fixed assets) and turnover (sales).

Although Amadeus has detailed data on direct ownership links, it does not offer an entire chain of ownership links (direct and indirect) for business groups and, therefore, fails to provide information on business group structures. Hence, we supplement Amadeus data with the "European Pyramid Ownership Structures" dataset developed by Bena, Fons-Rosen,

[1] https://amadeus.bvdinfo.com/
[2] https://amadeus.bvdinfo.com/

and Hanousek (2009). This dataset provides pyramid ownership structures of business groups based on direct ownership links from Amadeus.[3] To construct an annual panel of ownership data, Bena et al. put together multiple issues of Amadeus DVDs, to construct a pyramid ownership dataset. They use seven Amadeus DVD updates, each including cross-sectional ownership data spanning from 2001 to 2007. The authors construct an algorithm that uses direct ownership links of Amadeus firms to create a database that describes pyramid ownership structures by providing intermediate ownership stakes, where ownership is defined as cash- flow rights. The algorithm works backwards: it begins by taking a firm that does not own any other firm (hence does not have ownership of any subsidiary) and then, based on the ownership relation provided by Amadeus, finds the holders of this firm. The process is repeated until the ultimate owner is reached (the highest on the pyramid, which has no other holder). With this recursive method, several other variables can be constructed: the indirect ownership percentage; the direct ownership percentage; and the aggregate ownership of the ultimate owner in the subsidiary.[4] Further variables constructed by the authors are the number of steps it takes from the subsidiary to the ultimate owner (by counting the links of intermediate owners); the minimum layer at which the subsidiary is present in the group; the maximum layer at which the subsidiary is present. From these statistics, we construct our own business conglomerate measures: total levels (layers) of the business group; the number of affiliates in a group (business group size); and the number of affiliates on a given layer. These variables will aid us to understand the pyramidal structure of the group—that is, the group hierarchy (verticality) in terms of the number of layers in a group and the level on which the affiliates are present.

[3] Data were kindly provided by the authors of the dataset.

[4] To illustrate, suppose that firm A (the headquarters) has a direct ownership share of 26% in firm C (subsidiary 1) and has a direct ownership share of 81% in firm B (subsidiary 2). Furthermore, if firm B has a direct ownership share of 52% in firm C, then the aggregate ownership of firm A in firm C would be the sum of what A directly owns in C and what it indirectly owns in C (through B). Hence, Direct: [(26 % ownership of A in C)] + Indirect: [(81% ownership of A over B) * (*52%) ownership of B over C) = Aggregate ownership of A in C : [26 % direct + (81% *52%) indirect]= 68% .

2.2 Sample Construction

The original panel of pyramid business groups across seven years contains over 10,000,000 firm-year observations. To arrive at our final sample, we consider the following restrictions: (1) In the sample of business groups, to ensure clear interpretation of control, we impose a 50.01% aggregate ownership cut-off. Aggregate ownership is the percentage share that the ultimate holder has in the subsidiary both directly and indirectly. Therefore, this implies that although the ultimate owner may not formally directly control the subsidiary, as long as its aggregate ownership exceeds 50.01%, the ultimate owner qualifies as controlling the subsidiary. Imposing the aggregate ownership cut-off leads to 3,520,000 observations. (2) A business group or a subsidiary must be present for at least two years; therefore, those subsidiaries (and ultimate owners) that are present in only one year are dropped. (3) We also drop firms owned by individuals (resulting in 2,100,000 observations). (4) The number of employees, the tangible fixed assets (EUR mil) and the sales (EUR mil) of a firm are variables used in our regressions. Hence, the requirement that all variables be present for the analysis substantially reduces the final sample, as only 16% of our observations have all of these variables present, leaving us with 339,822 observations. (5) In addition, we drop business groups for which the headquarters' industry (NACE 4) is not known. (6) For our analysis, we exclude business groups that gain and lose multinational status in the sample, as such dynamics would require a relatively high degree of activity in terms of acquisition and dismissal of subsidiaries. This could be due, in large part, to misreporting (when considering such a limited time frame). This reduces the sample by 2%. (7) Moreover, as the focus of the paper is how business groups become multinational, we do not consider BGs that lost their multinational status (an additional 0.07% of the sample is dropped). Therefore, we are left with a total of 268,781 observations as the final sample. These observations belong to 74,213 subsidiaries and 47,948 ultimate holders (BG's).[5]

[5]Each subsidiary belongs to one ultimate owner for two reasons: i) the ultimate owner must own at least 50.01% of the subsidiary; therefore, each subsidiary can belong to only one ultimate owner in a given year; and ii) the handful of subsidiaries where the subsidiary switched ultimate owners across the years is dropped to make the analysis as clean as possible.

2.3 Descriptive Statistics

In this section, we provide some descriptive statistics on the final sample. The panel for our analysis ranges from 2001 to 2007 (Table 1). The number of business groups in our sample increases with time; however, in 2007, our sample drops due to the truncated version of the last available year in the pyramid dataset provided by Bena et al. (2009). The panel contains 180,772 observations for business groups at the year level, for a total of 47,948 unique business groups. In terms of subsidiaries present in the panel, there are 268,731 observations that correspond to 74,213 unique subsidiaries.

Table 1. Number of Observations per Year

Panel A:		
# of Business Groups		
year panel	Freq	Percent
2001	12319	7%
2002	19005	11%
2003	26184	14%
2004	31219	17%
2005	37686	21%
2006	36077	20%
2007	18282	10%
Total	180772	
No. of BG	47948	
Panel B		
# of Subsidiaries		
year panel	Freq	Percent
2001	18456	7%
2002	29792	11%
2003	38464	14%
2004	46367	17%
2005	56462	21%
2006	53044	20%
2007	24442	9%
Total	268731	
No. of sub	74213	

Note: The table shows the number of observations per year. Panel A shows the number of business groups present each year. *Total* refers to the number of business groups in our panel, and *No. of BG* is the unique number of business group in our panel. Panel B shows the number of subsidiaries present each year. *Total* is the number of subsidiaries, and *No. of sub* is the unique number of subsidiaries in our panel. The data come from the Amadeus dataset (Bureau Van Dijk) for years 2001-2007. The sample is restricted to business groups and subsidiaries in which (i) the ultimate holders and subsidiaries were present for at least two years; (ii) the aggregate ownership of the ultimate holder in the subsidiary exceeds 50.01%; and (iii) the information on the number of employees, tangible fixed assets and sales are available for the firm.

Denmark appears to have the largest business groups, and this seems to be related to the presence of few very large groups at the top of the distribution. Portugal and Switzerland also have large business groups, but in their case, the distribution seems entirely shifted towards larger BGs, as suggested by a median business group size that is almost twice as large than those of the other countries. The average size of a business group in our total sample (represented by all 34 countries) is 3.37.

Table 2 provides information on business group size (number of firms in a group) by country, where the country refers to the headquarters' location. The sample comprises 34 countries, but for ease of presentation, the table reports the first 20 countries in terms of the highest concentration of business groups (47,682 business groups, which account for 98% of business groups in our total sample). We then give statistics on the 50^{th} and 90^{th} percentiles, the maximum number of firms in the business group and the total number of business groups by country of origin (ultimate holder's country). Finally, our last column reports the share of total business groups in the sample with headquarters originating in the given country. As the table reveals, a large share of our business groups (75.5%) have headquarters in France, Sweden and Spain. The second column tells us the mean of business group size in terms of the number of subsidiaries for each country. In terms of mean size, we cannot conclude that Southern European or Northern European countries have a larger number of firms within their business groups. Denmark appears to have the largest business groups, and this seems to be related to the presence of few very large groups at the top of the distribution. Portugal and Switzerland also have large business groups, but in their case, the distribution seems entirely shifted towards larger BGs, as suggested by a median business group size that is almost twice as large than those of the other countries. The average size of a business group in our total sample

(represented by all 34 countries) is 3.37.

Table 2. Average business group size by country (based on Ultimate Holder's country)

	BG Size					
	(1)	(2)	(3)	(4)	(5)	(6)
Top 20 Countries	mean	p50	p99	max	#BG	% of BG
France	3.02	2	14	187	18838	39.0%
Sweden	2.98	2	14	157	11329	23.4%
Spain	3.26	2	15	134	6345	13.1%
Germany	3.50	2	15	43	2059	4.3%
Italy	5.46	3	36	142	2005	4.1%
Belgium	4.19	3	21	74	1752	3.6%
Finland	3.14	2	13	100	1505	3.1%
Netherlands	5.56	3	36	237	1021	2.1%
Greece	2.60	2	7	30	445	0.9%
Bulgaria	6.00	2	121	232	392	0.8%
Poland	2.76	2	10	33	316	0.7%
Estonia	2.36	2	5	8	310	0.6%
Switzerland	6.82	4	49	87	296	0.6%
Denmark	11.60	3	185	274	177	0.4%
United Kingdom	2.69	2	11	13	172	0.4%
Austia	2.60	2	10	14	172	0.4%
Croatia	4.93	3	26	59	161	0.3%
Romania	4.48	3	30	72	157	0.3%
Portugal	9.62	5	84	127	143	0.3%
Czech Republic	2.74	2	21	21	97	0.2%
Total (34 countries)	3.37	2	18	331	47948	100.0%

Note: Column (1) shows the mean number of subsidiaries in a business group by county of origin (defined by the country of ultimate holder). Column (2) reports the 50th percentile, column (3) the 90th, column (4) the maximum number of firms in the business group, and column (5) the total number of business groups in the respective country. Finally, column (6) reports the share of total business groups in the sample with headquarters originating from the given country. The source, data and sample used are the same as described in Table 1. There are a total of 34 countries in our sample, of which, for ease of presentation, the table reports the first 20 countries in terms of the highest concentration of business groups (47,692 business groups which account for 98% of all business groups). Total represents the statistics for all our 34 countries in our sample (47948 business groups).

Table 3 reports the size of the groups (number of firms in a group) for the pooled sample. There is a large difference in the number of firms per group: the majority (63%) of our sample is represented by small groups, composed of two firms (an ultimate holder and its affiliate); 26% are composed of three or four firm groups, while the remaining categories make up the remaining 11% of our business groups.

Table 3. Size Category for all Business Groups.

# Affiliates	No. of BG	%
1	30273	63%
2-3	12337	26%
4-5	2875	6%
6-20	2263	5%
21-50	156	0%
51-200	43	0%
201-500	1	0%
Total	47948	

Note: The table reflects the size distribution of business groups in our sample. Size is represented in categories by the number of subsidiaries in a group (*# of Affiliates*). *No. of BG* shows the total number of business groups by size category. *%* shows the share of business groups found in the respective size category. The source, data and sample used are the same as described in Table 1.

Differences in business group size are reflected, in part, by the degree of hierarchy in the pyramid of groups defined as the number of layers, which is described in Table 4 (for definition of layers, turn to the beginning of this section). The majority of our groups have one layer (all subsidiaries being directly under the headquarters). However, even if the group is composed of more firms, subsidiaries seem to be concentrated at the first or second level, as the share of groups with only one layer is larger than the share of groups with only one subsidiary. This suggests that, generally, the group's expansion is a centralized decision, and only for very large groups do subsidiaries play an active part in its expansion.

Table 4. Group Distribution by Hierarchy in the Pyramid

Total Layers	# BGs	%
1	39128	82%
2	6736	14%
3	1407	3%
4	404	1%
(5-10)	265	1%
>10	8	0%
Total	47948	100%

Note: Total Layers reflects the degree of hierarchy of the business group. 1 layer defines a flat business group, where the subsidiaries are directly under the ultimate holder (1 distance away). 2 and more layers imply that there are subsidiaries that are not directly below the

ultimate holder—that is, they are at least 2 distances away from the ultimate holder, with subsidiaries found between the ultimate holder and the respective subsidiary. # BGs are the number of groups by category of hierarchy. % represents the share of the total business groups in the sample belonging to the respective category. Source, data and sample used are as described in Table 1.

Lastly, we look at the industry diversity of groups. For a sector diversity group measure, the affiliates' 4-digit NACE is taken to construct a diversity index using the Herfindahl-Hirschman index (HHI).[6] As we are interested in the sectoral diversity of the group, the 1-HHI index is taken. In general, sector diversification increases with the number of firms in the group (apart from the last category—however, this statistic is based on few observations). As Table 5 shows, the larger groups have more scope for diversifying their activities and might be willing to engage in vertical integration, thus including in the group suppliers that might belong to different sectors.

Table 5. Group Level Sectoral Diversity

Sectoral Diversity (NACE4) by No of Affiliates in a BG	
#Affiliates	Sectoral Diversity
1-5	0.04
6-20	0.23
21-50	0.27
51-200	0.37
Total Average	0.05

Note: # Affiliates reflects the number of firms in a business group. Sectoral Diversity is calculated as the average number of sectors that the business groups are active in by country of headquarters. Sectors are defined at the NACE 4 level. Source and sample are constructed as described in Table 3.

3 Multinational Groups vs Domestic Groups

We further our analysis of business groups by looking at the differences in the characteristics of multinational and non-multinational groups. The first part of this section provides details on the sample composition in terms of group categories (never multinational, always multinational) and presents

[6] HHI is the Herfindahl-Hirschman Index, which is measured as the sectoral concentration (based on 4-digit NACE) in a business group. This is calculated by taking the sum of the sectoral shares squared in a business group. Given that we subtract HHI, concentration index, from 1, a diversity index is created.

descriptive statistics regarding the characteristics of these groups and of their respective subsidiaries. The second part focuses on the sales performance premium of firms in multinational groups accounting for differences in observables. This allows us to isolate the pure multinational effect from compositional changes; for example, firms in multinational groups might be larger to begin with, and, hence, a pure sales comparison between the two categories would not be appropriate.

3.1 Multinational vs Domestic Group Characteristics

We introduce simple summary statistics of our multinational and national groups in our sample. Table 6 gives brief summary statistics of the percentage of domestic versus multinational groups by country of origin (defined as the country where headquarters are located). In our sample, the countries with the highest share of multinational groups are Germany, Italy, Belgium, and the Netherlands. While Denmark and Portugal have only multinational groups, these countries represent just a small fraction of our business groups. Business groups with headquarters in Bulgaria, the United Kingdom and Austria are almost all domestic, but, again, these countries represent only a small proportion of our business groups—probably due to the limitation of accounting and financial information. Most of the business groups in France, Sweden and Spain are also domestic; however, given the high share of groups that they represent, even the small share of multinational groups amounts to a sizable number of the total multinational groups in our sample.

Table 6. Total No. of Domestic and Multinational groups by country

	No. of Business Groups by Country of HQ				
	(1)	(2)	(3)	(4)	(5)
Top 20 countries	Total Groups	Non-MN	Share	MN	Share
France	18838	18590	99%	248	1%
Sweden	11329	10743	95%	586	5%
Spain	6345	6231	98%	114	2%
Germany	2059	1608	78%	451	22%
Italy	2005	1423	71%	582	29%
Belgium	1752	1312	75%	440	25%

Finland	1505	1429	95%	76	5%
Netherlands	1021	554	54%	467	46%
Greece	445	435	98%	10	2%
Bulgaria	392	392	100%		
Poland	316	308	97%	8	3%
Estonia	310	293	95%	17	5%
Switzerland	296	9	3%	287	97%
Denmark	177			177	100%
United Kingdom	172	170	99%	2	1%
Austria	172	171	99%	1	1%
Croatia	161	95	59%	66	41%
Romania	157	138	88%	19	12%
Portugal	143			143	100%
Czech Republic	97	87	90%	10	10%
Total (34 countries)	47692	43988	92.23%	3704	8%

Note: Column (1) shows the total number of groups by country. Of these, Column (2) *Non-MN* reports the number of groups that are domestic by country, and column (4) *MN* reports the total number of groups that are multinational. Columns (3) and (5) report the shares of domestic versus multinational groups by country. There are a total of 34 countries in our sample, of which, for ease of presentation, the table reports the first 20 countries in terms of the highest concentration of business groups (47,692 business groups, which account for 98% of all business groups). *Total* represents the statistics for all 34 countries in our sample (47,948 business groups). The data come from the Amadeus dataset (Bureau Van Dijk) for years 2001-2007. The sample is restricted to business groups and subsidiaries in which (i) the ultimate holders and subsidiaries were present for at least two years; (ii) aggregate ownership of the ultimate holder in the subsidiary exceeds 50.01%; and (iii) information on the number of employees, tangible fixed assets and sales are available for the firm.

It is important to note that the size of the business groups (number of firms in a group) is consistently larger when groups are multinational as opposed to domestic, irrespective of the country considered (Table 7). Moreover, looking at the 99th percentile, respectively, we see that the largest multinational groups are substantially larger than their domestic counterparts for each country in our sample.

Table 7. Business Size Category by Country of HQ

BG Size: # of Affiliates in a Group

Country of HQ (top 20 by BG concentration)	Domestic		Multinational	
	(1)	(2)	(3)	(4)
	Mean Size	99th	Mean Size	99th
France	2.7	10	9.8	81
Sweden	2.6	9	7.4	60
Spain	2.9	11	6.1	38
Germany	2.8	11	3.5	12

Italy	4.2	21	5.8	43
Belgium	3.5	14	5.3	30
Finland	2.8	10	4.7	43
Netherlands	3.5	17	6.5	48
Greece	2.4	7	3.9	8
Bulgaria	5.1	83		
Poland	2.5	7	4.4	10
Estonia	2.2	5	2.3	5
Switzerland	3.6	12	5.5	30
Denmark			9.7	185
United Kingdom	2.5	10	4.5	5
Austria	2.5	10	2.0	2
Croatia	3.4	18	5.1	21
Romania	3.3	15	9.5	72
Portugal			8.3	63
Czech Republic	2.4	8	4.4	21
Total (34 countries)	2.8	11	6.2	48

Note: Column (1) represents the average number of subsidiaries per group for domestic groups, and column (2) represents the 99th percentile broken down by country of headquarters. Similarly, for multinational groups, columns (3) and (4) represent the average number of subsidiaries per group and the 99th percentile, respectively, by country of headquarters. Source, data and sample used are as described in the Note of Table 6.

Difference in size is also related to differences in other dimensions, such as the hierarchy in the pyramid structure of the group and sectoral diversification. Table 8 shows that groups that are cross-national also have a higher level of sectoral diversity—that is, their subsidiaries belong to more sectors. Similarly, multinational groups are more hierarchical and span more layers (subsidiaries can be farther from their) than their national counterparts within each country. With the systematic differences between multinational and domestic groups across countries, we can safely claim that these differences are not country-specific.

Table 8. Sectoral Diversity (mean), # of Layers (mean) of BGs by Country of HQ.

	(1) Sector(NACE 4)		(2) # Layers		(3) #Cntry
Country of HQ	Non-MN	MN	Non-MN	MN	MN
France	1.2	2.0	1.0	1.3	1.3
Sweden	1.1	1.6	1.0	1.2	1.2
Spain	1.2	1.9	1.0	1.2	1.2
Germany	1.1	1.2	1.1	1.3	1.1
Italy	1.2	1.3	1.0	1.1	1.2

Belgium	1.3	1.4	1.1	1.2	1.2
Finland	1.2	1.6	1.0	1.1	1.3
Netherlands	1.1	1.3	1.2	1.3	1.2
Greece	1.1	1.2	1.0	1.0	1.0
Bulgaria	1.3		1.0		
Poland	1.1	1.0	1.0	1.3	1.0
Estonia	1.1	1.1	1.0	1.1	1.1
Switzerland	1.1	1.2	1.0	1.2	1.2
Denmark		1.2		1.7	1.3
United Kingdom		1.1		1.4	1.0
Austria	1.1	1.2	1.1	1.3	1.1
Croatia	1.1	2.0	1.0	1.5	1.0
Romania	1.1	1.0	1.0	1.0	1.0
Portugal	1.1	1.4	1.0	1.3	1.1
Czech Republic	1.1	1.6	1.0	1.1	1.1
Total (34 countries)	1.1	1.4	1.0	1.2	1.2

Note: The table reflects the diversity characteristics for domestic (*Non-MN*) and multinational (*MN*) groups by country of headquarters. Domestic groups are those in which all firms belonging to a group are from the ultimate holder's country, while multinational groups are those in which at least one firm comes from a different country than the ultimate holder. Column (1) shows the average sectoral diversity of firms belonging to domestic and multinational business groups by country of headquarters, where sector is at the NACE 4 level. Column (2) reflects the average number of layers business groups have, and column (3) shows the average number of countries present in groups by country of headquarters. Source, data and sample used are as described in the Note of Table 6.

Multinational groups expand across countries progressively and select countries according to expected cost of entry and potential benefit. On the one hand, multinational groups could expand first into neighbouring countries, as this kind of expansion probably involves lower transaction costs. On the other hand, a group might be willing to face higher costs in the presence of higher expected revenues. Countries with especially larger markets, for example, might be more attractive to groups eager to get direct access to consumers. In order to shed light on this aspect, it is worth explicitly examining the country composition of subsidiaries. This is done in Table 9, which reports the mean number of subsidiaries for each country. As seen on the diagonal of the table, as expected, in all the countries, business groups tend to expand in their home country primarily. This appears reasonable, as a group would tend to consolidate its structure in its home

country, where transaction costs are lowest, before moving into different countries.

Table 9. BG's country presence

Mean number of subsidiary firms per country of HQ

Sub / HQ		AT	BE	BG	CH	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HR	IT	NL	PL	PT	RO	SE
Austria	**AT**	0.8				0.2	0.1			0.3		0.2			0.3	0.1	0.1	0.6		0.3	
Belgium	**BE**	0.1	1.5	0.1		0.3	0.1		0.1	0.2	0.2	0.2		0.3	0.1	0.2	0.8	0.8	0.1	0.5	0.3
Bulgaria	**BG**			2																	
Switzerland	**CH**	0.4	0.7	0.7	0.5	0.5	0.2		0.3	0.1	0.4	0.6		0.1	0.2	0.2	0.3	0.4	0.3	0.2	1
Czech Rep.	**CZ**					1.1	0.1			0.1		0.2						0.5			
Germany	**DE**	0.2	0.5	0.1		0.1	1.6		0.3	0.8	0.3	0.2		0.3	0.5	0.2	0.8	0.4		0.8	0.7
Denmark	**DK**	0.1	0.7			0.4	0.1		0.5	0.2	0.1	0.3		0.2	0.1	0.2	0.3	0.1		0.7	0.8
Estonia	**EE**								1.2												0.3
Spain	**ES**					0.1	0.1			1.7		0.2		0.1		0.3		0.1	0.1	0.1	
Finland	**FI**		0.3				0.5		0.5	0.1	1.5	0.3				0.1	0.3	0.6		0.1	0.5
France	**FR**		0.2				0.1			0.7		1.6				0.3		0.1			
UK	**GB**			0.6			0.9		0.1	0.3	0.6	0.7		0.5	0.6	0.3	0.1	0.6	0.1	0.1	0.1
Greece	**GR**									0.2				1.4						0.9	
Croatia	**HR**														1.4						
Italy	**IT**	0.2	0.6				0.7			0.5	0.2	0.1		0.5	0.4	1.3	0.1	0.1		0.1	0.5
Netherlands	**NL**	0.1	0.1	0.3		0.4	0.6		0.7	0.2	0.9	0.2		0.2	0.4	0.7	0.7	0.6	0.2	0.1	0.2
Poland	**PL**						0.3											1.3			
Portugal	**PT**									0.8		0.4						0.1	1.3		
Romania	**RO**																			1.7	
Sweden	**SE**		0.2				0.1		0.6	0.2	0.1	0.5				0.1		0.2			1.3

Note: The table reflects the expansion of groups by country of headquarters (*HQ*) to countries of subsidiaries (sub). The table shows the average number of subsidiaries for each country given the ultimate holder's country. The table reports the first 20 countries in terms of the highest concentration of business groups (47,692 observations which account for 98% of all business groups in our sample). The data come from the Amadeus dataset (Bureau Van Dijk) for years 2001-2007.

Previous steps have shown that multinational groups tend, at the aggregate level, to be different from domestic groups along several dimensions. Our analysis, however, has neglected possible differences at the subsidiary level. Firms belonging to multinational business groups could be larger and more profitable, thus allowing the headquarters to face the cost of making the group multinational. We address this question in Table 10, which compares affiliate-level size and profitability measures across our groups of firms by country of headquarters' origin. More specifically, we look at whether subsidiaries belonging to multinational groups are, on average, statistically different in terms of employment, capital and sales to subsidiaries in national groups. For each characteristic, the first two columns report averages for

firms, whereas the last column for each set of firm characteristics reports the p-values for the differences in averages. Subsidiaries of multinational groups are larger in terms of both capital and employment. They also have higher sales, which suggests a possible higher profitability; however, this could be related to differences in the other observables or to the group structure. We address this concern more formally in the next section in a regression framework.

Table 10. Subsidiary Differences by Non-MN and MN Groups by Country of HQ

	Subsidiary Characteristics belonging to Domestic and Multinational Groups								
	Employment			Capital			Sales		
Country of HQ	Domestic	Multinational	p-val	Domestic	Multinational	p-val	Domestic	Multinational	p-val
France	44.0	192.0	0	0.6	7.9	0	7.0	35.4	0
	[6.16]	[29.83]		[.03]	[3.8]		[.23]	[4.84]	
Sweden	16.2	98.5	0	2.1	4.9	0	3.3	26.7	0
	[.48]	[9.81]		[.23]	[1.1]		[.11]	[2.78]	
Spain	46.0	292.6	0	2.2	15.2	0	8.5	92.3	0
	[3.17]	[71.79]		[.16]	[5.14]		[.67]	[21.18]	
Germany	121.2	191.1	0	5.5	6.1	0	25.8	41.7	0
	[5.99]	[25.93]		[.79]	[1.02]		[1.83]	[6.13]	
Italy	104.0	103.0	0	7.8	5.8	0	30.9	27.5	0
	[6.63]	[14.08]		[2.17]	[.95]		[1.76]	[3.58]	
Belgium	61.4	83.5	0	2.6	3.2	0	17.4	27.3	0
	[3.65]	[16.14]		[.22]	[.61]		[.9]	[6.32]	
Finland	37.8	142.9	0	2.0	3.8	0	8.0	28.1	0
	[3.27]	[33.15]		[.48]	[.95]		[.86]	[6.4]	
Netherlands	69.2	198.8	0	2.7	10.0	0	20.0	57.1	0
	[5.44]	[32.43]		[.7]	[1.59]		[1.7]	[8.95]	
Greece	60.0	80.6	0	3.5	3.7	0	6.1	14.4	0
	[12.71]	[44.96]		[.71]	[2.63]		[.57]	[6.79]	
Bulgaria	133.9	.	0	1.7	.	0	3.3	.	0
	[13.26]	[.]		[.3]	[.]		[.61]	[.]	
Poland	187.4	111.3	0	2.3	4.5	0	12.2	14.7	0
	[26.36]	[40.43]		[.33]	[3.09]		[1.97]	[7.61]	
Estonia	71.1	34.4	0	2.1	0.5	0	5.3	5.2	0
	[13.31]	[8.45]		[1.16]	[.16]		[.9]	[1.12]	
Switzerland	128.8	127.5	0	37.6	4.6	0	34.3	29.7	0
	[53.43]	[16.43]		[18.5]	[.76]		[15.48]	[3.55]	
Denmark		55.0	0		2.2	0		15.4	0
		[7.94]			[.55]		[.]	[2.02]	
United Kingdom	.	84.3	0	.	3.3	0	.	34.3	0
	[.]	[13.55]		[.]	[.78]		[.]	[11.99]	
Austria	218.3	160.2	0	18.5	8.4	0	46.3	31.9	0
	[39.68]	[37.09]		[7.74]	[3.4]		[7.97]	[5.48]	
Croatia	191.1	528.0	0	16.1	63.0	0	12.4	46.0	0
	[53.65]	[197.55]		[8.20]	[38.72]		[3.1]	[23.23]	
Romania	92.7	83.0	0	0.7	0.5	0	1.1	1.9	0
	[22.37]	[.]		[.22]	[.]		[.28]	[.]	
Portugal	208.6	627.1	0	4.4	57.2	0	11.9	92.5	0
	[31.73]	[294.94]		[1.1]	[33.24]		[1.7]	[43.18]	
Czech Republic	208.6	627.1	0	4.4	57.2	0	11.9	92.5	0
	[310.85]	[1251.33]		[10.81]	[141.03]		[16.7]	[183.21]	

Note: Table shows whether subsidiaries belonging to multinational groups are, on average, statistically different to subsidiaries in national groups. Variables tested are employment,

capital and sales. For each characteristic, the first two columns report averages for firms, whereas the last column for each set of firm characteristics reports the p-values for the differences of average. The table reports these results for firms belonging to the first 20 countries in terms of the highest concentration of business groups. The data come from the Amadeus dataset (Bureau Van Dijk) for years 2001-2007.

3.2 Subsidiary sales performance in Multinational versus Non-Multinational groups.

Our first empirical strategy focuses on understanding whether a sales premium of subsidiaries in multinational groups, as opposed to those in domestic-only groups, is due to differences in group characteristics. We control for different organizational characteristics that we previously found for multinational and domestic groups (hierarchy, size and sectoral diversity of groups). We compare subsidiaries that belong to multinational groups to subsidiaries in domestic-only groups. The first part of the analysis is based on a classical Cobb-Douglas production function. This specification describes the effect of belonging to a multinational group on subsidiary sales.

$$\ln Y_{igt} = \beta_0 + \beta_1 MN_{gt} + \beta_2 \ln L_{igt} + \beta_3 \ln K_{igt} + \sum_{j=1}^{k} \gamma_j \, Layer_{gtj} + \sum_{j=1}^{k} \alpha_j \, BG\_size_{gtj} + \beta_4 DIV\_Sector_{gt} + \lambda_t + \varepsilon_{igt}, \quad (1)$$

where Y_{igt}, measures the sales performance of subsidiary *i* belonging to business group *g* at time *t*, as in Bloom, Sadun, and Van Reenen (2012a). For estimating the production function, we use standard input variables: L_{igt} and K_{igt}, which are labour and capital of subsidiary *i*. Our variable of interest is MN_{gt}, a dummy variable taking on value 1 if business group g is multinational at time t. Our coefficient of interest is β_1. A positive coefficient of β_1 would imply that being part of a multinational group is correlated with higher subsidiary sales. We control for different group characteristics found in the previous section for multinational and domestic-only groups. We control for hierarchy in the pyramid structure of a group by including a set of controls for the total number of layers in a group, $Layer_{gtk}$. These allow for a richer description of the effects of the hierarchy on sales performance, allowing for

a clearer identification of non-linearities such as those identified by Altomonte et al. (2013). Similarly, we control for the effects of the size of the group using a set of dummy variables identifying different size classes based on the number of firms in group g at time t, BG_size_{gtj}. As multinational groups are more likely to be large, we introduce the size control to avoid a biased multinational coefficient. DIV_Sector_{gt}, the diversity of the sector of the group (identified by NACE 2), is also included to control for the level of sectoral diversification within a group. The sectoral diversity of a group might be related to its degree of vertical integration or to its level of diversification, which can lead to a higher level of sales if sectors in the group are characterized by synergies. Furthermore, year fixed effects λ_t are included to control for common time shock. Finally, ε_{gt} is a random noise error term at the group level at time t.

We find that firms belonging to a multinational group have 15-percentage-point higher sales than those in non-multinational groups after controlling for firm characteristics, group characteristics and country/sector fixed effects.

The results in Table 11 show, on an affiliate level, the effect of being in a multinational group on subsidiary performance (log of subsidiary sales), accounting for different group characteristics. Column (1) shows the cross-sectional effect of belonging to a multinational group and finds that being in such a group is positively correlated with firm sales. Firms belonging to multinational business groups have about 36% higher sales than those in national groups (without the inclusion of fixed effects). Column (2) introduces year fixed effects to control for yearly shocks; headquarters sector fixed effects to ensure that it is not the headquarters' industry characteristic that is driving the result; location fixed effects. The result still shows 19% higher sales for firms belonging to multinational groups. Column (3) includes fixed effects for country and sector composition and interactions between country and sector fixed effects to allow for a more flexible heterogeneity, still resulting in 15% higher sales for firms belonging to multinational groups. Although the multinational premium drops considerably (by approximately one half), it is still substantial and highly statistically significant. More hierarchical groups with more layers are also correlated with higher

subsidiary sales. Finally, this result is confirmed using a more refined measure in column (4): firms in multinational business groups have 12% higher value added ceteris paribus. This is in line with the previous literature on multinationals, which points out the better performance of firms belonging to multinational enterprises (Doms and Jensen, 1998; Crisculo, Haskel and Slaughter, 2004).

Table 11. Subsidiary sales and value added in Multinational Groups

	Subsidiary sales and value added in a Multinational Group			
	(1)	(2)	(3)	(4)
Variables	Sales	Sales	Sales	Value Added
Multinational	0.359***	0.190***	0.147***	0.121***
	-0.035	-0.016	-0.014	-0.01
Subsidiary L (log)	0.757***	0.775***	0.779***	0.757***
	-0.005	-0.005	-0.004	-0.003
Subsidiary K (log)	0.135***	0.136***	0.134***	0.152***
	-0.003	-0.003	-0.003	-0.002
Affiliates: 2-3	0.117***	0.061***	0.072***	0.031***
	-0.011	-0.009	-0.008	-0.006
Affiliates: 4-5	0.137***	0.061***	0.092***	0.051***
	-0.018	-0.015	-0.013	-0.009
Affiliates: 6-20	0.168***	0.093***	0.157***	0.088***
	-0.026	-0.022	-0.017	-0.013
Affiliates: 21-50	0.106	0.100*	0.226***	0.178***
	-0.069	-0.054	-0.04	-0.029
Affiliates: 51-200	-0.689**	-0.205	0.286***	0.251***
	-0.282	-0.182	-0.067	-0.049
Affiliates: 200+	-2.060***	-0.357**	0.098	-0.077
	-0.347	-0.159	-0.132	-0.116
No. Layers 2	0.148***	0.130***	0.116***	0.115***
	-0.014	-0.011	-0.009	-0.007
No. Layers 3	0.171***	0.179***	0.165***	0.200***
	-0.027	-0.022	-0.018	-0.013
No. Layers 4	0.203***	0.219***	0.193***	0.206***
	-0.054	-0.039	-0.024	-0.02
No. Layers 5	0.176*	0.229***	0.181***	0.256***
	-0.1	-0.066	-0.034	-0.028
No. Layers 6 +	0.411***	0.339***	0.187***	0.275***
	-0.14	-0.097	-0.046	-0.038
Industry Diversity	-0.166***	-0.03	-0.042**	-0.012
	-0.034	-0.026	-0.02	-0.015
Obervations	267,027	267,027	267,027	223,468

R-Squared	0.663	0.757	0.766	0.836
Year FE	NO	YES	YES	YES
Sector FE	NO	YES	YES	YES
Country FE	NO	YES	YES	YES
Country Comp	NO	NO	YES	YES
Sector Comp	NO	NO	YES	YES
CountryXSector FE	NO	NO	YES	YES

Note: The statistical significance is as follows: * significant at 10% ; ** significant at 5%, *** significant at 1%. The table shows on an affiliate level the effect of being in a multinational group on subsidiary performance (log of subsidiary sales), accounting for different group characteristics. *Multinational* is a dummy variable that takes on a value of 1 if firm i belongs to a multinational group at time t. The dependent variable is (log of) subsidiary sales. *(Subsidiary_L)* is the log of the number of employees of the subsidiary*; Log (Subsidiary_K)* is the log of capital of the subsidiary; *Affiliates*, is the number of subsidiaries in a business group; *No. of Layers* is the number of layers of the business group; and *Industry Diversity* is an index measuring the diversity of the group based on NACE 4. Standard errors are clustered at the Headquarters level.

4 Becoming a Multinational Group

We previously showed that multinational groups have more industry diversity and are more hierarchical than national groups. Given the sales premium of subsidiaries in multinational groups, even after controlling for group characteristics, it is imperative to understand whether domestic groups become stronger after gaining their multinational status (treatment effect), or whether these switchers have different characteristics that allow them to become multinational (selection effect). We first examine whether switchers already look different from always-domestic groups before their first international move, and, second, we identify possible drivers to multinational status.

4.1 Domestic Groups that make a foreign acquisition

Until this point in our analysis, we have concentrated on two large groups: multinational and domestic. As Table 12, shows, domestic groups can be further divided into two groups: always-domestic (never change to multinational status) and those that went through a change by acquiring a foreign firm.

Panel A of Table 12 shows that 12% are always multinational, that the overwhelming majority, 86%, remain domestic and never switch, and 3% are domestic groups that switch status at some point. One can draw a similar conclusion by looking at Panel B: throughout our entire study period, 17% belonged to groups that were multinational. Meanwhile, 80% of our firms belong to groups that remained domestic, while a small share of firms, 3%, belonged to groups that experienced a change in status.

Table 12. Business Group Status

Panel A
 # Business Group

Multinational	**Domestic**		
Always	Never	**Switchers**	Total
3789	43237	**922**	47948
12%	86%	**3%**	100%

Panel B
 # Subsidiary

Multinational	**Domestic**		
Always	Never	**Switchers**	Total
8759	63555	**1899**	74213
17%	80%	**3%**	100%

Note: Panel A shows the division of business groups, while Panel B shows the division of subsidiaries that are national versus domestic. *Multinationals* are those that have always been multinational throughout our sample, identified as *Always*. *Domestic* status is further divided into two groups: *Never*—that is, never changed to multinational status—and those that went through a switch by acquiring a foreign firm, identified as *Switchers*. These are constructed based on our 47,948 business groups that have, in total, 74,213 subsidiaries. The data comes from the Amadeus dataset (Bureau van Dijk) for years 2001-2007.

We now narrow our analysis to the two domestic groups: always-domestic and those that were domestic and switched status. Table 13 shows a comparison of the subsidiary firms of switching groups and always-domestic groups, using a simple average comparison. The first two columns report averages for firm characteristics, while the last two columns report p-values of t-test for differences in averages between the two categories: switchers and domestic groups (column 3). There appear to be important differences between domestic subsidiaries belonging to groups that will switch to a multinational status (these firms are still considered in their domestic state), and domestic subsidiaries that remain in national groups.

On average, firms in groups that switch employ more people than do firms in domestic groups. In addition, they also have higher productivity, as proxied by sales and value added per worker. This is consistent with models such as those of Melitz and Ottaviano (2008), where access to a foreign market is related to a productivity threshold rule. By the same token, in this setting, groups may become multinational after the average productivity of its subsidiaries is sufficient to offset the costs of internationalization. Moreover, on a group level, switching groups are structurally different from always-domestic groups: they have more affiliates in their group, have higher sectoral diversity and are more hierarchical in terms of the number of layers in a group.

Table 13. Firm and Group Characteristics: Always-Domestic vs Switchers

		(1)	(2)	(3)
		Domestic	**Switchers**	p-value:
Subsidiary -Level	Subsidiary Sales/L	0.3	0.4	0.0
	Subsidiary L	44.9	119.1	0.0
	Subsidiary K/L	0.1	0.1	0.8
	Subsidiary Sales	7.7	27.9	0.0
	Subsidiary VA	2.1	7.1	0.0
	Subsidiary VA/L	0.1	0.1	0.0
Group- Level	Business Group Size	2.8	4.5	0.0
	Number of Sectors in BG	1.1	1.4	0.0
	Layers of BG (mean)	1.0	1.1	0.0

Note: The table compares the subsidiary firms of always-domestic groups (*Domestic*) and switching groups (*Switchers*) in our sample, using a simple average comparison. Column (1) and column (2) report averages for firm characteristics for the two groups, respectively. The upper panel does the analysis at the subsidiary level, while the lower panel does it at the group level. Column (3) reports p-values (*p-value)* of the t-test for differences in averages between the two categories: switchers and domestic groups. Data are from the Amadeus (Bureau Van Dijk) dataset, 2001-2007, and the subsample considered is the one described in Table 12. However, only two types of business groups are considered from this subsample—those that become multinational and those that were never multinational (groups always having a multinational status in the study period are dropped). This leads to 44,159 business groups, which have in total 65,454 subsidiaries.

To evaluate which group characteristics are associated with a group transitioning into multinational status, we rely on equation (2). This specification aims to identify which business groups are more likely to become multinational. The two groups in our regression are those that are never multinational and those that become multinational. A linear probability model is used to assess the probability of the group becoming multinational given its characteristics. Our specification is:

$$\text{BecomeMN}_{\text{g}} =$$

$$\beta_0 + \beta_1 \text{avglnL}_{\text{g}} + \beta_2 \text{avglnK/L}_{\text{g}} + \beta_3 \text{avglSales}_{\text{g}} + \sum_{j=1}^{k} \gamma_{\text{j}} \text{Layer}_{\text{gj}} +$$

$$\sum_{j=1}^{k} \alpha_{\text{j}} \text{BG\_size}_{\text{gj}} + \beta_4 \text{Industry Diversity}_{\text{g}} + \lambda_{\text{t}} + \phi_{\text{g}} + \psi_{\text{g}} + \varepsilon_{\text{g}},$$

(2)

where the dependent variable, $BecomeMN_g$, is a dummy variable taking on a value of one if business group *g* becomes a multinational at any point during our sample period. $avglnL_g$ is the average log employment of a subsidiary in business group *g*; $avglnK/L_g$ is the average log capital intensity of a subsidiary for group *g*, while $avglSales_g$ is the average log of sales of a subsidiary for group g. Similar to specification (1), we include a set of dummies for the number of layers in the group, a set of business group size dummies, and a variable to control for the sectoral diversity of a group. Included also are controls, (i) λ_{t} for the year in which the group appears in the panel [7] to account for any year shocks; (ii) for the industry of the company headquarters, ϕ_{g}, as the headquarters' sector can influence business strategies on how to expand the group, which, in turn, can be correlated with becoming a multinational; and (iii) headquarters county, ψ_{g}, which allows us to control for the possibility of different patterns of internationalization according to country. We also include (iv) dummies for sector composition; and, finally, (v) interaction between country and sectors fixed effects to allow

[7] For this estimation, there is only one observation for each business group. We take the first year in which the BG is present in our panel.

for a certain degree of heterogeneity across countries. The results of equation (2) will allow us to describe which characteristics of a group seem to matter for its transition into a multinational group.

Groups that become multinational are compared strictly with groups that are never multinational (always-multinational groups are excluded in this setting). On a group level, the results in Table 14 suggest that better-performing and more-capital-intense groups (proxied by the average log of sales and log of capital intensity for the subsidiaries in these groups) are more likely to become multinational: a one-percentage-point increase in average sales for subsidiaries in the group leads to a 0.008-percentage-point increase in the probability of becoming a multinational group (the magnitude of the effect is, however, small). The probability of becoming a multinational group increases with the size of the group (number of firms in a group), as well as with group hierarchy (measured as the number of layers in a group).

These results clearly show that domestic groups in our sample that become switchers already look different than always-domestic groups prior to their first international acquisition; therefore, our findings suggest that there is a strong selection into becoming multinational.

Table 14. Probability of Becoming a Multinational Group

Dependant variable: Become a Multinational Group				
	(1)	(2)	(3)	(4)
Variables				
Avg Subsidiary L (log)	0.003*	0.003*	0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Avg Subsidiary K/L (log)	0.002**	0.002**	0.001***	0.001***
	(0.001)	(0.001)	(0.000)	(0.000)
Avg Subsidiary Sale (log)	0.008***	0.008***	0.006***	0.007***
	(0.002)	(0.002)	(0.001)	(0.001)
No. Layers 2	0.013**	0.013**	0.013***	0.012***
	(0.005)	(0.005)	(0.004)	(0.004)
No. Layers 3	0.040***	0.041***	0.037***	0.036***
	(0.011)	(0.012)	(0.011)	(0.011)
No. Layers 4	0.044***	0.044***	0.044***	0.048***
	(0.013)	(0.013)	(0.013)	(0.014)
No. Layers 5	0.066	0.066	0.061	0.058
	(0.039)	(0.040)	(0.041)	(0.043)
No. Layers 6 +	0.080	0.080	0.087	0.075
	(0.061)	(0.059)	(0.059)	(0.056)

Affiliates: 2-3	0.007***	0.008***	0.005***	0.005***
	(0.002)	(0.002)	(0.002)	(0.001)
Affiliates: 4-5	0.016**	0.017**	0.011*	0.012*
	(0.007)	(0.007)	(0.006)	(0.006)
Affiliates: 6-20	0.048***	0.050***	0.043***	0.044***
	(0.014)	(0.015)	(0.013)	(0.014)
Affiliates: 21-50	0.085*	0.092**	0.070*	0.071*
	(0.041)	(0.041)	(0.038)	(0.037)
Affiliates: 51-200	0.107	0.130	0.146	0.205
	(0.116)	(0.108)	(0.121)	(0.128)
Industry Diversity	0.043***	0.042***	0.022***	0.017**
	(0.006)	(0.005)	(0.007)	(0.007)
Obervations	44,159	44,159	44,159	44,159
R-Squared	0.036	0.043	0.064	0.1
Year FE	YES	YES	YES	YES
Sector FE	NO	YES	YES	YES
Country FE	NO	NO	YES	YES
Sector Comp	NO	NO	YES	YES
CountryXSector FE	NO	NO	NO	YES

Note: The statistical significance is as follows: * significant at 10% ; ** significant at 5%, *** significant at 1%. OLS regression on group level. The dependent variable is a dummy taking on a value of 1 if the group becomes a multinational in our sample period (and 0 if it is never multinational). *Avg Subsidiary L (log)* is the average log of the number of employees of the subsidiary in a group, *Avg Subsidiary _K/L (log)* is the average log of the capital intensity of the subsidiary in a group, *Avg Subsidiary_Sales (log);* is the average log of the sales of the subsidiary in a group. *Affiliates* is the number of subsidiaries in a business group. *No. of Layers* is the number of Layers of the business group; *Industry Diversity* is an index measuring the diversity of the group based on NACE 4. Standard errors are clustered at the Headquarters level. Data are from the Amadeus (Bureau Van Dijk) dataset, 2001-2007. The subsample considered is the one described in Table 1. However, only two types of business groups are considered—those that become multinational and those that were never multinational (groups always having a multinational status in the study period are dropped).

5 The First Foreign Acquisition

We now examine how a group becomes multinational—what the first acquired subsidiary of these switching groups looks like. We analyse how the first foreign subsidiary compares to the existing domestic subsidiaries: (i) geographically—whether it is close or distant from the domestic group's country; (ii) the layer at which it enters within the hierarchy of the group; and (iii) the industry in which it performs its activity. By so doing, we hope to shed light on some of the reasons that a business group might choose to go multinational.

Table 15 reports how domestic groups become multinational. More specifically, it shows where these groups chose to acquire their first subsidiaries. Note that the distribution of switchers across countries mirrors the distribution of groups, as seen in Table 2. Countries with more groups tend to have a larger number of switchers. This is expected, and it ensures that the country composition in previous sections will be reflected in the present analysis.

As reported in Table 15, many business groups acquire their first subsidiary in neighbouring regions or in regions that are legally and culturally similar to their own. This is in line with standard gravity model results in the trade literature. Business groups in Spain, for example, acquire subsidiaries mostly in Portugal, which aligns with the idea of acquiring firms in close geographic proximity. Similarly, French groups enter Belgium (both culturally close and neighbouring), Spain (bordering country) and countries characterized by rich and large markets, such as Germany, the UK and Italy (with which it also retains some historical ties). Many of these groups also acquire their first subsidiary in Germany. This comes as no surprise given the large market and hub for industrial production that Germany offers. We also observe that business groups in a large number of countries enter the Netherlands, also perhaps due to its proximity to Germany and its sea access to the Nordic countries.

Table 15. Probability of Becoming a Multinational Group

		Switching BG's Country of first move																			
BG HQ's		**Subsidiary's Country of First Move**																			Total
Nationality		AT	BE	CH	CZ	DE	DK	EE	ES	FI	FR	GB	GR	IT	NL	NO	PL	PT	RO	SE	BGs
Austia	AT	0	0	0	0	6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	7
Belgium	BE	1	0	0	1	12	3	0	2	0	29	5	3	2	17	1	3	0	1	0	80
Germany	DE	18	0	5	1	0	3	0	5	0	3	24	0	0	15	0	9	0	0	0	83
Spain	ES	1	1	1	6	18	2	1	0	0	33	24	1	18	8	0	0	3	3	1	121
Finland	FI	1	0	0	0	9	5	39	0	0	1	9	0	0	1	11	2	0	0	1	79
France	FR	1	25	3	0	45	1	0	4	1	0	52	0	13	9	2	4	3	4	0	167
Italy	IT	4	3	1	0	21	0	0	11	0	14	26	3	0	1	0	0	1	0	1	86
Netherlan	NL	1	2	1	0	9	0	0	2	0	0	3	0	0	0	0	2	0	0	1	21
Portugal	PT	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	1	0	0	0	6
Sweden	SE	0	1	0	0	5	17	7	2	8	2	14	0	2	2	29	2	1	0	0	92
Total BGs		27	32	11	8	125	31	47	30	9	83	158	7	35	53	43	23	8	8	4	742

Note: The table shows domestic groups that make their first foreign acquisition (switchers) in the time period studied (2001-2007). To maintain consistency with the rest of the tables in terms of countries represented, we report only switching groups (742 observations)

belonging to those 20 countries that had the highest concentration of business groups in our original sample (as reflected in Table 2). *BG HQ's Nationality* is the ultimate holder's nationality, while *Subsidiary's Country of First Move* reflects the foreign country into which the business group first decided to expand. Data are from the Amadeus (Bureau Van Dijk) dataset.

The group's decision to become multinational can be made at various levels within the group: the acquisition could be done by the headquarters or by one of the close subsidiaries; a decision at the top level could imply a "corporate-level decision"; or a decision by a different subsidiary could represent an independent move with respect to the rest of the group. In the latter case, the acquisition would also change the group structure, making it more hierarchical by increasing the number of layers.

Table 16 reports the tabulation of the mode of the level in the domestic part of the group and the mode of the level of the entrant that makes the group multinational (we use the mode since, in a few cases, there are more than one new foreign subsidiaries). As the table reflects, becoming a multinational group appears to be mainly a centralized decision by the headquarters or one of its close subsidiaries. The mode of the entrant making the group multinational is at a higher level than the mode of the layer of domestic subsidiaries. There are 583 groups for which the mode of the layer of subsidiaries belonging to the group is level 1. In 344 of these cases, the mode of the foreign subsidiary that first makes the group multinational also comes in at level 1, at the top—that is, directly under the headquarters. However, in 228 of the cases, the subsidiaries that make the group multinational come in on level 2. The large number of observations on the main diagonal, which identifies groups whose new foreign subsidiary comes in at the typical level of existing domestic subsidiaries, suggests that the usual subsidiaries making acquisitions in the group are also responsible for the group internationalization.

Table 16. Layer of Entry of 1st acquired subsidiary

# of Switching Groups :
Layer of entry of subsidiary making group Multinational

Layer of domestic subsidiaries of group	1	2	3	4	5	# Switchers
1	344	228	9	1	1	583
2	9	43	10	1	1	64
3	1	0	2	3	0	6

4	0	0	1	0	0	1
	354	271	22	5	2	654

Note: The table reports the mode of the level in the domestic part of the group and the mode of the level of the entering subsidiary that makes the group multinational (the mode is used, as in few cases, there are more than one new foreign subsidiaries). The sample considered are the subsidiaries that made domestic groups multinational during the time period studied (2001-2007). Data used are from the Amadeus (Bureau Van Dijk) dataset.

Differences in terms of layer of entry could also be related to some characteristics of the group or of the subsidiaries belonging to the group. In order to take these elements into account, we run a simple OLS regression on an affiliate level, having as our dependent variable the layer of the group to which the subsidiary belongs and as our independent variables several group and subsidiary characteristics (Table 17). The variable of interest is the dummy "New foreign Sub," which identifies the firm making the group multinational. This regression largely confirms what is shown in the Table 16: the level of entry of the foreign subsidiary is higher than, but quite close to, that of the typical firm in the group. This implies that the decision is made at the top, and, therefore, it reflects a "corporate-level decision" that can affect the whole group.

Table 17. Foreign subsidiaries' level of entry

VARIABLES	(1)	(2)	(3)	(4)	(5)
New foreign Sub	0.327***	0.334***	0.321***	0.221**	0.227**
	(0.036)	(0.037)	(0.032)	(0.079)	(0.087)
avg_lemp	0.006	0.008	-0.005	0.005	-0.005
	(0.018)	(0.018)	(0.018)	(0.029)	(0.031)
avg_lcap_emp	0.001	0.005	0.005	-0.006	-0.005
	(0.007)	(0.006)	(0.005)	(0.009)	(0.007)
avg_lturn	-0.019	-0.023	-0.017	-0.041	-0.038
	(0.018)	(0.016)	(0.018)	(0.030)	(0.030)
Layers_2	0.089***	0.067**	0.061**	0.123***	0.122***
	(0.020)	(0.025)	(0.025)	(0.032)	(0.034)
Layers_3	0.315***	0.302***	0.301***	0.378***	0.373***
	(0.049)	(0.048)	(0.048)	(0.053)	(0.053)
Layers_4	0.705***	0.686***	0.680***	0.746***	0.762***
	(0.086)	(0.072)	(0.080)	(0.141)	(0.140)
Layers_5	0.416*	0.384*	0.391*	0.448*	0.478**
	(0.223)	(0.209)	(0.207)	(0.222)	(0.202)
Layers_6more	0.371***	0.358***	0.383***	0.351**	0.334**
	(0.122)	(0.117)	(0.116)	(0.126)	(0.140)

BG_Size_2_3	0.293***	0.329***	0.393***	0.197	0.265
	(0.051)	(0.057)	(0.065)	(0.162)	(0.177)
BG_Size_4_5	0.371***	0.400***	0.450***	0.263	0.314*
	(0.043)	(0.040)	(0.046)	(0.161)	(0.179)
BG_Size_6_20	0.386***	0.431***	0.469***	0.210	0.262
	(0.055)	(0.045)	(0.055)	(0.154)	(0.158)
BG_Size_21_50	0.613***	0.653***	0.674***	0.299**	0.344**
	(0.112)	(0.141)	(0.145)	(0.118)	(0.123)
Sector_Div	-0.027	-0.027	-0.010	0.047	0.048
	(0.030)	(0.025)	(0.030)	(0.052)	(0.074)
Observations	903	903	903	903	903
R-squared	0.282	0.311	0.339	0.545	0.574
Year FE	YES	YES	YES	YES	YES
Sector FE	NO	YES	YES	YES	YES
Country FE	NO	NO	YES	YES	YES
CountryXSector FE	NO	NO	NO	YES	YES
Sector Composition	NO	NO	NO	NO	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression on a subsidiary level. Dependent variable is the layer of the group to which the subsidiary belongs. *New foreign Sub* identifies the firm making the group multinational. Independent variables are characteristics of subsidiaries (employment, capital, sales) and of groups (total number of layers (*Layers*) and number of subsidiaries *BG_Size* in a group). Time period studied is 2001-2007; data used come from Amadeus (Bureau Van Dijk) dataset.

Finally, we turn to the sector of the subsidiary that makes the group multinational. We proceed in two different ways: first, we compare the sector of the new firm to the one most common in the group (mode of the sector of domestic subsidiaries); then, we compare it to the sector of the ultimate owner. Also in this case, the mode of the sector of the entrant is used for the cases in which more than one entrant is present. Industry sectors are defined at NACE 4. Panel A of Table 18 shows that in two thirds of the cases, the sector of the new foreign entrant does not correspond to the sector of the classical majority of the group. Panel B of the table shows a comparison between the first acquired firm's sector—i.e., that is, the firm that made the group multinational—and the ultimate owner's sector. The sector of the new foreign firm coincides even less frequently with that of the ultimate owner. It seems, then, that the new foreign firm does not belong to the characteristic domain of activity of the rest of the group. Therefore, our finding suggests that the group does not go multinational for the purpose of horizontal FDI, to perform local production to access local markets; rather, it goes multinational

to diversify its activities with the aim of exploiting other countries' comparative advantage. Our finding is consistent with that of Alforo and Charlton (2009), who show that once we get to detailed enough industry codes (4-digits), much of the FDI proves to be vertical.

Table 18. Industry of Entry of 1st acquired subsidiary

	Panel A Group Sector (subsidiary mode)		**Panel B Ultimate Holder's Sector**	
	# Switchers	Percentage	# Switchers	Percentage
Different Sector	419	64%	514	79%
Same Sector	235	36%	140	21%
Total # of Switchers	654		654	

The findings presented in this section offer evidence about why a group goes multinational. The data suggest that a multinational expansion of a group is a rather centralized process, initiated by the ultimate owner itself or by one of the closest subsidiaries (layer 1), which means that it is a "corporate-level decision." This comes as no surprise, as the important strategic decision to expand into a different country probably has to take into account the group structure and characteristics. However, the expansion seems to also further diversify the group in terms of economic activity: the first foreign subsidiary is usually from a different sector than the major part of the group and from a different sector than that of its ultimate owner. This suggests that group multinational expansion might be driven by the desire to acquire particular inputs from a foreign country or to make use of a country's comparative advantage.

6 Conclusion

An extensive literature provides evidence on the advantages of affiliate performance when belonging to business groups (BGs), as opposed to being standalones, as well as the benefits of multinational enterprises over domestic firms. However, no attempt had been made so far to connect these two streams of the literature and to analyse business groups from a multinational/domestic perspective. This paper aims to bridge the two

different literatures by exploiting the Amadeus dataset, together with the business group information from the dataset of Bena, Fons-Rosen and Hanousek (2009). We look at sales performance of firms that belong to a multinational business group and analyse possible drivers that increase the likelihood of becoming a multinational group. We then look at how the acquisition of multinational status affects the group structure and activities by focusing on the first foreign subsidiary acquired.

Multinational groups appear to differ substantially from domestic groups: they are usually larger and more hierarchical in terms of group structure; and their subsidiaries also appear to be superior to subsidiaries of domestic groups in terms of both size and sales performance. More specifically, we find that firms belonging to multinational groups have 15% higher sales after accounting for differences in observables at the group and firm levels.

Transition to multinational status is related to group characteristics. Groups that are larger (with more affiliates) and more hierarchical (having many layers in the group), and those that have higher sectoral diversity (industry mix of the affiliates) are more likely to become multinational. This suggest that there is a strong selection into becoming a multinational.

The transition to multinational status appears to be a rather centralized decision. The foreign subsidiary is, in most of cases, acquired by the ultimate owner itself or by a subsidiary directly controlled by it. This implies that the decision does not have substantial effects on the business group structure. However, foreign subsidiaries appear to differ from the group with respect to their main economic activity: only in a minority of cases does the sector of the first foreign subsidiary coincide with the sector of domestic subsidiaries or with that of the headquarters. This provides some preliminary evidence that the decision to acquire a foreign subsidiary might be driven by the group's desire to expand its set of activities, possibly gaining access to valuable inputs to exploit a country's relative advantage in some sector.

7 References

Alforo, L. and Charlton, A., (2009): "Intra-industry foreign direct investment. The American Economic Review, 99(5), pp 2096-2119

Altomonte, C., and A. Rungi (2013): “Business Groups as Hierarchies of Firms: Determinants of Vertical Integration and Performance,” Working Papers 2013.33, Fondazione Eni Enrico Mattei.

Arnold, J., and B. Javorcik (2009): "Gifted kids or pushy parents? Foreign direct investment and plant productivity in Indonesia" *Journal of International Economics*, Elsevier, vol. 79(1), pp 42-53

Bloom, N., J. Reenen and R. Sadun (2012)
“Americans Do IT Better: US Multinationals and the Productivity Miracle,” *American Economic Review* 102, no. 1 (2012): 167–201

Bloom, N., J. Reenen and R. Sadun (2012) : “The Organization of Firms Across Countries” *Quarterly Journal of Economics* , 127(4): 1663-1705

Almeida, H., and D. Wolfenzon (2005): “A Theory of Pyramidal Ownership and Family Business Groups,” NBER Working Papers 11368, National Bureau of Economic Research, Inc.

Belonzon, S. and T. Berkovitz (2010): “Innovation in Business Groups” *Management Science*, 56(3): 519-535

Bena, J., Fons-Rosen C., and J. Hanousek (2009) "European Pyramid Ownership Structures", Manuscript

Benfratello, L., and A. Sembenelli (2006): “Foreign ownership and productivity: Is the direction of causality so obvious?,” *International Journal of Industrial Organization*, 24(4), 733–751.

Carluccio, J. & T. Fally (2010). "Multinationals, Technological Incompatibilities, and Spillovers," CEPR Discussion Papers 7869, C.E.P.R. Discussion Papers.

Carney, M., E. Gedajlovic, and S. Sur (2011): “Corporate governance and stakeholder conflict,” *Journal of Management and Governance*, 15(3), 483–507.

Caves, R.E. (1989) “Mergers, takeovers, and economic efficiency - Foresight vs. hindsight” *International Journal of Industrial Organization*, 7, pp. 150-172

Crisculo, C., E, Haskel and M.J Slaughter, 2004 “Why are some firms more innovative? Knowledge Inputs, Knowledge Stocks, and the Role of Global Engagement”, Tuck School of Business mimeo

Doms, M. E., and J. . B. Jensen (1998): “Comparing Wages, Skills, and Productivity between Domestically and Foreign-Owned Manufacturing Establishments in the United States,” in *Geography and Ownership as Bases for Economic Accounting*, NBER Chapters, pp. 235–258. National Bureau of Economic Research, Inc.

Garicano, L. (2000): “Hierarchies and the Organization of Knowledge in Production,” *Journal of Political Economy*, 108(5), 874–904.

Garicano, L. and Hubbard T.N. (2007)- “The Return to Knowledge Hiearchies.”, NBER Working Paper N. 12815.

Garicano, L, and Rossi-Hansberg E.(2006). “Organization and Inequality in a Knowledge Economy”, *The Quarterly Journal of Economics*, 121(4), pp. 1383-1435.

Girma, S. and H. Gorg, Holger, 2007. "Evaluating the foreign ownership wage premium using a difference-in-differences matching approach," *Journal of International Economics*, Elsevier, vol. 72(1), pages 97-112, May

Kahane, L., N. Longley, and R. Simmons (2013): “The Effects of Coworker Heterogeneity on Firm-Level Output: Assessing the Impacts of Cultural and Language Diversity in the National Hockey League,” *The Review of Economics and Statistics*, 95(1), 302–314.

Khanna, T., and K. Palepu (2000): “Is Group Affiliation Profitable in Emerging Markets? An Analysis of Diversified Indian Business Groups,” *Journal of Finance*, 55(2), 867–891.

Khanna, T., and Y. Yafeh (2005): “Business Groups in Emerging Markets: Paragons or Parasites?,” CEI Working Paper Series 2005-1, Center for Economic Institutions, Institute of Economic Research, Hitotsubashi University.

Lipsey, R.E. (2001a), “Foreign direct investment and the operations of multinational firms: concepts, history and data”, NBER Working Papers 8084, National Bureau of Economic Research.

Lipsey, R.E. (2001b), “Foreign direct investors in three financial cirses”, NBER Working Papers 8665, National Bureau of Economic Research.

Mahmood, I. P., and W. Mitchell (2004): *“Two Faces: Effects of Business Groups on Innovation in Emerging Economies,”* Management Science, 50(10), 1348–1365.

Melitz, M., and G. I. P. Ottaviano (2008): "Market size, trade, and productivity," Review of Economic Studies, 75(1), 295-316.

---(2006) “The economic value of cultural diversity: evidence from US cities,” *Journal of Economic Geography*, 6(1), 9–44.

Porta, R. L., F. Lopez-De-Silanes, and A. Shleifer (1999): “Corporate Ownership Around the World,” *Journal of Finance*, 54(2), 471–517.

United Nations Conference on Trade and Development, UNCTAD ,(2009). Training Manual on Statistics for FDI and the Operations of TNCs Vol. II. United Nations.

.