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Firm Performance and the Geography of FDI: Evidence from 46 Countries

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1

Firm Performance and the Geography of FDI:

Evidence from 46 Countries*

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Abstract

The literature on the link between multinationality and firm performance has generally disregarded the role of geography. However, the geography of FDI may matter, particularly now that globalisation has increased the heterogeneity of overseas investments. Moreover, although the range of countries that conducts FDI has widened considerably, the literature still tends to focus on the case of a relatively small number of US firms. In contrast, our paper draws on firm-level data covering over 16,000 multinationals from 46 countries and allows for different effects upon the performance of the multinational firm depending on the level of development of the host economy. In our results, we find a clear positive and linear relation between multinationality and firm performance. However, investment in developing countries is associated with larger and increasing effects on performance than in the case of investment in developed countries. Overall, our results suggest that the net gains for multinationals from greater geographical diversification have not yet been fully met.

Keywords: Multinationality; Firm Performance; Location Choices

JEL Codes: F20, F23, F02.

1   Introduction

From a theoretical point of view, multinationality can play an important role in enhancing a firm's profitability. For instance, multinationality allows firms to exploit economies of scale and scope, while internalising their tangible and intangible assets (Buckley & Casson 1976, Rugman 1986, Dunning 1988, Tallman & Li 1996, Helpman et al. 2004). Moreover, many empirical studies (although certainly not all) have presented corroborating evidence of this link, in particular when drawing on firm-level data.

However, this literature has generally disregarded the role of location choices, opting instead for an aggregate view of overseas investment. This view may have been appropriate until the 1980s, when the geographical range of FDI investments was relatively narrow. However, more recently such location choices may have become particularly important as globalisation has been opening up new destinations for FDI. In fact, not only has foreign direct investment been increasing considerably (at least until very recently), reaching almost $2 trillion and a stock of over $15 trillion in 2007 (World Investment Report 2008), as developing countries have received an increasing share of these investments, currently accounting for approximately one third of all flows.

One important aspect in this context is that these new FDI destinations in developing countries typically exhibit considerable heterogeneity in several variables typically regarded as important in terms of determining the success of any foreign venture, such as infrastructures, political stability, transportation costs, etc. In this context, an important question for academics and practitioners alike is whether performance gains from FDI differ with respect to the location choice made by multinational firms.

In this paper, we focus specifically on the role of the host country's level of economic development. We want to know if the returns to investment in developing countries are different from the returns to investment in developed countries. This goal is feasible given our access to and analysis of an impressive data set, which includes information about over 16,000 multinational firms with headquarters in 46 different countries.

As in previous related research, we find a clear positive relation between multinationality and firm performance (Tallman & Li 1996, Goerzen & Beamish 2003, Pangarkar 2008). However, while on aggregate we find no nonlinearity in the effects of overseas investments, investment in developing countries is associated with larger effects on performance, which also

increase with the intensity of that investment. We interpret these results as indicating that while the investment in developing countries is riskier than the investment in developed countries (Berry 2006, Qian et al. 2008), the potential of globalisation in terms of the gains from greater geographical diversification probably have not yet been fully met by multinational firms.

The remainder of our paper is organized as follows. We start with a literature review (Section 2). Section 3 then discusses our approach, data and empirical methodology. Section 4 then presents the results and robustness checks. Finally, Section 5 concludes.

2   Literature

Earlier theories of foreign direct investment (Hymer 1960, Vernon 1966) leading to the internalization/eclectic paradigm (Buckley & Casson 1976, Dunning & Lundan 2008) offered a general framework for the extent and pattern of international trade and foreign investment, based in part on the role of transaction costs. According to those views, multinational firms have opportunities to share their core competitive advantages among different geographic markets through the internalization of intangible assets. These theories can explain the emergence and growth of multinational firms.

A related approach include resource-based views which are based on the concept of ownership advantage (Penrose 1959, Barney 1991). These views postulate that resources are the source of competitive advantages if they are valuable, rare and difficult to imitate. Resources include all assets, capabilities, organizational processes, information and human competences controlled by a firm that enable the firm to improve its efficiency and effectiveness.

Other theories include those about learning (Johanson & Vahlne 1977), which predict increasing resource commitments to foreign markets over time as a result of the accumulation of organizational experience. In this case, internationalization is seen as the product of a series of incremental decisions and additional resources committed to foreign markets which affect the firm's perceived opportunities and risks. Moreover, economic theory predicts that the level of engagement with international business is strongly related to the efficiency of the firm. For instance, while the most productive firms will tend to export and/or to invest in foreign plants, their least productive counterparts may only serve the domestic market (Krugman 1980, Melitz 2003). This is explained in part by the considerable sunk costs that

3

need to be met before a firm can export or produce abroad.

At the same time, international business may generate significant feedback effects in terms of enhanced productivity for those firms that do not restrict their operations to their home markets. This hypothesis has been subject to a large literature that tests empirically this multinationality-performance (MP) relationship. In particular, several studies have examined the MP link drawing on firm-level data, which allows one to control for a number of potential biases present in more aggregated data. However, this more recent firm-level literature has not yet produced a solid set of stylised facts, as suggested by recent surveys (Li 2007) and meta-analysis (Wagner & Ruigrok 2004, Bausch & Krist 2007, Yang 2009), even if these gaps may be explained in part by methodological and data set differences.

For instance, some studies that find a positive correlation between multinationality and firm performance (Shaked 1986, Kim et al. 1993, Tallman & Li 1996, Geringer et al. 2000, Goerzen & Beamish 2003, Castellani & Zanfei 2007, Pangarkar 2008). On a theoretical level, this is consistent with firms having opportunities to achieve greater returns from internalizing their intangible assets, leveraging their market power, achieving economies of scale, or drawing on less expensive inputs from foreign locations. These features of multinationality lower the costs of organizing and transacting business and lead to superior performance. On the other hand, other studies that find a negative correlation between multinationality and performance (Siddharthan & Lall 1982, Michel & Shaked 1986, Collins 1990, Denis et al. 2002). These results are consistent with the view that that multinational firms face liabilities from increased coordination and management costs and from cultural diversity. Other related liabilities include that of foreignness and newness (Li 2007, Zaheer 1995, Zaheer & Mosakowski 1997), issues surrounding the establishment of internal management systems and external business networks (Stinchcombe 1965, Lu & Beamish 2004), the complexity of managing foreign exchange fluctuations (Sundaram & Black 1992, Kostova & Zaheer 1999, Guisinger 2001).[1]

For a more detailed overview of the literature, we present a list of 50 papers that we were able to find that examine the linear MP relationship (Tables 1 and 2) and the nonlinear MP relationship (3), based on Yang (2009). We also list some of the characteristics of each paper, such as their measurement of multinationality, the choice of performance indicators, the year(s) covered by their data, the multinationals home countries and the (average) estimate

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[1]Cross-border activities may also be correlated with performance (Rugman 1979, Michel & Shaked 1986, Kim & Lyn 1986, Morck & Yeung 1991).

of the MP effect.

More recent research focuses on curvilinear MP relationships, namely U-shaped or inverted-U-shaped patterns (Grant et al. 1988, Hitt et al. 1997, Qian 2002, Contractor et al. 2003, Christophe & Lee 2004, Lu & Beamish 2004, Ruigrok et al. 2007, Qian et al. 2008). The U-shaped case suggests an initially negative MN-Performance relationship due to organizational costs and complexity associated with overseas expansion outweighing benefits, before the positive returns of foreign direct investment more than compensate the former costs (Qian 1997, Ruigrok & Wagner 2003). An inverted U-shaped relationship suggests that multinationality is initially associated with positive returns but, beyond an optimal desirable level, is again detrimental to performance. The reasons for this downturn in returns can be the liabilities associated with overseas expansion and the difficulties of organizational coordination across different cultures and legal environments (Gomes & Ramaswamy 1999, Qian et al. 2008).

3 Our contribution

Our paper departs from the empirical studies presented above in two major aspects. First, we argue that the location choices of overseas investment - in particular the developed/developing nature of the host country - may be a crucial aspect to explain the performance of multinational firms. In our view there are important areas of differentiation between developed and developing countries that can play a significant role in explaining how well multinationals do in their expansion strategies, including infrastructures, political stability, raw materials, transportation costs, etc. Therefore, these two types of countries should not be lumped together when assessing the effects of international expansion upon firm performance, unlike in previous research.

Some earlier studies make related points. For instance, Pantzalis (2001) considered how a firm's performance differs with respect to different location choices of overseas investment. It is argued there that market imperfections associated with the international transaction of firm-specific intangible assets are a central determinant of foreign direct investment. Moreover, since in developing countries market imperfections may be more prevalent, advantages derived from foreign investment can be more likely to be exploited when firms span their operations into overseas markets. Indeed, the empirical results in Pantzalis (2001) indicate that MNCs with FDI presence in developing economies have significantly higher performance than MNCs

that operate only in developed economies.

However, this approach has been criticized in Berry (2006), which argues that, as the majority of foreign investment occurs in advanced countries, it would be unlikely that any positive MP relationship would be derived from developing country investment alone. Berry (2006) also highlights the riskiness of investment in developing countries and the importance of gaining experience from other international investments and capabilities. Moreover, Qian et al. (2008) finds that firms based in developed countries maximize their performance when they operate across a moderate number of developed regions and a strictly limited number of developing regions.

Our second contribution concerns the analysis of a much wider range of multinationals headquarter countries than before. As indicated in Tables 1, 2 and 3, all previous studies consider only a single country (typically the US) or, in alternative, a small set of countries. This relatively short range of countries may raise questions concerning how representative the evidence is, in terms of the worldwide MP relationship. In this context, our paper makes a highly original contribution as we exploit comparable data for a very large number of firms (16,533 in total), covering almost all economic sectors from 46 countries, including many OECD countries and also the largest developing nations.

One important shortcoming of these three papers is that all of them focus on the case of US multinationals only: Pantzalis (2001) draws on data for 420 US multinational firms observed in 1990; Berry (2006) studies 191 US multinational firms in the period of 1977-2000; and Qian et al. (2008) examines 189 US firms between 1996 and 2000. Our data are far more comprehensive, as we explain below.

3.1 Data

Our analysis draws on the Orbis data, which is collected by Bureau van Dijck, a consultancy. According to Bureau van Dijck, the information in Orbis is sourced from different providers, all of which are experts in their regions, providing detailed descriptive information, in particular about the company financial status.[2]

The records of each company include information on whether the company has owner-ship stake in its subsidiaries (defined as a minimum 25.01% shares control over its overseas

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[2]Orbis also contains further detail such as news, market research, ratings and country reports, scanned reports, ownership and MA data. Orbis has a number of different reports per company. For listed companies, banks and insurance companies plus major private companies more detailed information is available.

subsidiary) and the subsidiary location. Therefore, we are able to calculate the ratio of subsidiaries in foreign countries in relation to its total subsidiaries, the proxy for the multinationality of a firm we consider in this paper. Financial and operational information of samples in our data is available for the period 1997-2007. However, multinationality information concerns only the latest year available in the data, which in most cases in 2007.

We consider firms that have information available on expenditure on investment, employees, assets, firm age, return on sales, number of subsidiaries (including overseas subsidiaries). Firms without at least one of these variables are excluded from our sample.[3] As all monetary measures are reported in home currencies, we convert them to euros using IMF annual exchange rates.

Firms are concentrated in some EU countries, most G8 countries and some developing countries, with significant numbers in France, Germany, Italy, Japan, UK, US and South Korea. The pattern of firm locations looks broadly consistent with typical patterns of investment: taken together, firms from US, UK, France, Germany, Italy and Japan account for 55.2% of the total sample.

3.2 Key variables

The main variables considered in this study are the following:

Firm Performance: During the last 30 years, several performance measures have been considered in the MP literature, including accounting-based variables (return on assets, return on sales, return on equity, etc), market-based variables (Tobin's q, risk-adjusted returns, etc), innovations, patents, and technical efficiency. Accounting- and market-based variables became predominant in the last decade, as can be seen from Tables 1, 2 and 3. In our paper, performance is measured using return on sales (ROS), an accounting-based variable. Return on equity and return on assets were excluded because they are sensitive to capital structure differences (Hitt et al. 1997, Li et al. 2007, Qian et al. 2008), which will be used as an independent variables in our estimation equation. Market-based performance variables were excluded as they are not available for all countries. On the other hand, ROA and ROS are highly correlated, generating similar results (Hitt et al. 1997, Capar & Kotabe 2003). ROS is defined as after-tax profits divided by total sales.

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[3]This criterion leads to the exclusion of several firms in some countries, in particular Canada, Mexico and India. However, this is not a relevant problem for the overwhelming majority of countries.

Multinationality: Although a considerable number of studies have tested the MP relationship, almost all of them have used aggregate measures to calculate a firm's multinationality level. The most common aggregate multinationality measure used in the literature is foreign to total sales ratio (FSTS). However, one problem with this variable is that a firms sales in foreign countries does not exclude intermediate goods exported from the home country and resold by its overseas subsidiaries, which may bias the MP estimate (Geringer et al. 2000, Tallman & Li 1996, Qian et al. 2008). Our paper uses instead another common multinationality measurement, the ratio of number of overseas subsidiaries in relation to total subsidiaries (OSTS).[4] We exploit the availability in our data set information on whether the company has an ownership stake on its subsidiaries. Moreover, we also draw on information about where the subsidiary locates in the latest year released in the Orbis dataset.

However, as we mentioned above, OSTS or other typical measures of international involvement cannot capture any differentiated effects from location choices upon performance. In particular, the costs and benefits associated with various country environments may vary widely. Therefore, our paper takes different location choices of overseas investment into consideration (Pantzalis 2001, Berry 2006, Qian et al. 2008). Specifically, we split the locations of investment in terms of developed and developing countries.[5] We then measure multinationality in three ways: OSTS, the ratio of number of overseas subsidiaries in relation to its total subsidiaries, $OSTS^{D'ed}$, the ratio of number of subsidiaries in developed countries in relation to its total subsidiaries, and $OSTS^{D'ing}$, the ratio of number of subsidiaries in developing countries in relation to its total subsidiaries.

Intangible Assets: According to the theoretical background, overseas subsidiaries have opportunities to internalize intangible assets of their multinational parents. Moreover, intangible assets may also facilitate the bargaining with host governments, in terms of subsidies, tax breaks or other concessions, given the potential for technological spillovers and other benefits to the host economy. While expenditures on R&D are typically used as a proxy for intangible assets (Allen & Pantzalis 1996, Pantzalis 2001, Lu & Beamish 2004, Berry 2006, Li et al. 2007), we do not have this variable for most firms in our data set. Therefore, we use instead investment expenditure as a proxy for R&D expenditures. We also consider firm size,

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[4]The list of multinationality measures also includes the total number of foreign nations in which firms have subsidiaries (see a list in Tables 1, 2 and 3 and related surveys (Sullivan 1994, Annavarjula & Beldona 2000, Li 2007)).

[5]In our data, developed countries include the members of G8 (except Russia), most EU members, Norway, Iceland, Switzerland, New Zealand, Australia, Bermuda, Israel, Japan, Taiwan, South Korea, and Hong Kong.

as a proxy for the physical and financial resources of a firm, in terms of the log of total assets (Pantzalis 2001) and the log of the number of employees (Elango 2004, Qian et al. 2008).

Other controls: As in other studies, we also control for a number of other variables that may also influence firm performance, including firm age, ownership structure and business cycle effects. Firm age is measured as the actual duration of existence of a firm since the starting year of its operations (Qian et al. 2008). In addition, ownership structure is controlled for by calculating the ratio of shares owned by foreign firms in relation to total shares (Pantzalis 2001). We also control for industry and region effects in our analysis.

3.3   Descriptive Statistics

Table 4 presents summary statistics of our data set. There is a total of 38,291 firms, of which 16,533 are multinationals. The left panel of table presents the descriptive statistics for firms with at least one subsidiary in overseas country (multinational firms), while the right panel contains firms with at least one subsidiary (all firms available in our sample from the Orbis data set). Some of the key variables are return on sales (ROS), the ratio of foreign subsidiaries in relation to total subsidiaries (OSTS), the ratio of number of foreign subsidiaries in developed countries in relation to total subsidiaries ($OSTS^{D'ed}$), and the ratio of number of foreign subsidiaries in developing countries in relation to total subsidiaries ($OSTS^{D'ing}$).

The left panel of Table 4 shows that, on average, a multinational firm in our data has 20.8 subsidiaries in total, out of which 9.9 are located in the overseas. Almost seven (6.98) subsidiaries are located in developed countries, while the remaining three (2.92) are located in developing countries. In terms of ratios, 58% of the multinational subsidiaries are located in overseas markets, 38% are located in countries with developed economies, and 20% are located in developing countries.

Unsurprisingly, multinational firms apear to be more productive than the wider group of firms on the right panel. For instance, the average return on sales for multinational firms is 0.084, while for all firms is 0.077. Moreover, multinational firms are older (36 vs 31 years); invest more (116 vs 64 million); more capital intensive (1,372 vs 875 million), and employ bigger workforces (4,807 vs 2,908 employees).

Table 5 and 6 present the country distribution of firms, along with the most important variable used in our analysis. Firms are concentrated in some EU countries, most G8 countries

and some developing countries. Taken together firms from US, UK, France, Germany, Italy and Japan, account for 55.2% of the sample.

We also present a distribution of multinationality (OSTS) across countries (Figure 1), including the mean firm performance per level of multinationality, in which we find some (moderate) evidence of a positive relationship between firm performance and multinationality. However, when breaking down our measure of multinationality (OSTS) into its two components according to our definition ($OS^{D'ed}$ and $OS^{D'ing}$), we find that performance is much higher in the case of the latter. In other words, multinationals that invest in developing countries appear to exhibit higher levels of performance.

Finally, we also present a scatterplot of both the number of overseas subsidiaries in developed countries ($OS^{D'ed}$) and in developing countries ($OS^{D'ing}$) - Figure 3. Here we find some evidence of a trade-off between the two variables.

4 Results

The relationship between multinationality and firm performance in our analysis is estimated from the two following main equations:

$$Y_{it} = \beta_1 OSTS_{it} + \lambda X_{it} + \gamma_t + e_{it}, \tag{1}$$

and

$$Y_{it} = \beta_2 OSTS_{it}^{D'ed} + \beta_3 OSTS_{it}^{D'ing} + \lambda X_{it} + \gamma_t + e_{it}, \tag{2}$$

where Y_{it} is the return on sales of firm i in period t. $OSTS_i$ refers to the ratio of number of foreign subsidiaries in relation to total subsidiaries over the same period. $OSTS_{it}^{D'ed}$ ($OSTS_{it}^{D'ing}$) is the ratio of number of overseas subsidiaries in developed (developing) countries in relation to total subsidiaries.[6] As mentioned above, the equation also includes other control variables, including intangible assets, firm age, ownership structure, industry and region effects (X_{it}) and business cycle effects (γ_t). The key parameters are β_1, which indicates the average change in performance driven by multinationality, and β_2 and β_3, which indicate the average change in performance atributed to the overseas presence in developed and developing countries, respectively.

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[6]Therefore, $OSTS_{it} = OSTS_{it}^{D'ed} + OSTS_{it}^{D'ing}$.

Table 7 reports our main estimates. First of all, we find from column 1 that our control variables have the expected signs and sizes in terms of their roles upon our measure of firm performance. For instance, investment, assets and foreign ownership predict higher levels of firm performance. Moreover, these signs are largely unchanged across subsequent specifications in columns 2 to 5, when controls for different types of subsidiaries are included.

More important, we document a positive and very significant relationship between multi-nationality (as proxied by OSTS) and firm performance. In column 2, we find that a 10 percentage-point increase in the share of overseas subsidiaries with respect to total subsidiaries translates into an increase of return on sales of 0.0013. Although our point estimate is small, it compares with a mean return on sales of 0.084, suggesting a significant economic effect.

However, when we turn to the separate estimation of the importance of developed and developing subsidiaries, we find that the latter are much more relevant: while column 3 indicates that the developed subsidiaries coefficient is only 0.003 (and not significant even at the 10% level), column 4 shows that the developing subsidiaries coefficient is much bigger, at 0.016, and significant at the 1% level.

Finally, in column 5, we control both for developed and developing subsidiaries shares, following the specification of equation 2. We find that controlling for the developing subsidiaries share increases the size and significance of the developed coefficient (0.01, significant at the 1% level) while the developing coefficient remains as significant as before but of an even higher magnitude (0.02). Overall, we conclude from this set of results that the developing subsidiaries have a stronger linear effect upon multinational performance.

We now turn to a test of the curvilinear MP relationship, drawing on the following equations:

$$Y_{it} = \beta_1 OSTS_{it} + \beta_2 (OSTS_{it})^2 + \lambda X_{it} + \gamma_t + e_{it}, \tag{3}$$

and

$$Y_{it} = \beta_3 OSTS_{it}^{D'ed} + \beta_4 (OSTS_{it}^{D'ed})^2 + \beta_5 OSTS_{it}^{D'ing} + \beta_6 (OSTS_{it}^{D'ing})^2 + \lambda X_{it} + \gamma_t + e_{it}, \tag{4}$$

in which we add the squares of $OSTS_{it}$, $OSTS_{it}^{D'ed}$ and $OSTS_{it}^{D'ing}$ to equations 1 and 2 to test the curvilinear MP relationship.

Table 8 reports our estimates of the equations above. Column 1 indicates that there is

no evidence of curvilinear relationship between performance and multionationality: while the linear term is positive and significant (a coefficient of 0.015 and a standard error of 0.007) the quadratic term is insignificant. In columns 2 and 3 we then consider separately the developed and developing subsidiaries shares. Here we find again evidence of no nonlinearities in the case of developed-country subsidiaries, given that the quadratic term is again insignificant. In the case of developing-country subsidiaries, we find that only the quadratic effect is significant but its sign is positive. This indicates that performance increases with multinationality at an increasing rate. Finally, when we pool the quadratic controls for developed- and developing-country multinationality, we find that the former dominates and only the linear control for developed-country overseas subsidiaries shares is significant.

From this set of results, we conclude that the relationship between multinationality and performance appears positive and essentialy linear. When separating between overseas subsidiaries in developed and developing countries, we find that only the latter appear to induce nonlinear effects but that the performance effects are increasing - not decreasing - with the level of multinationality. In other words, performance appears to increase at an increasing rate with our measure of multinationality in the case of investments in developing countries. This result may support the views that underline the large costs involved in subsidiaries in developing countries. These costs are then likely to become relatively small only when the size of the investment in such subsidiaries is big enough.

4.1 Robustness

To check the robustness of our previous results, we now conduct estimations under different specifications. In particular, we split our sample in terms of the developed/developing status of the home country of the multinationals in our data. Our interest in this decomposition follows from the evidence of an increasing number of multinationals emerging from developing countries, contrasting with the focus in the literature on multinationals based in the US (and, to a lesser extent, other developed countries too).

Table 9 presents our results based on multinationals based in developed countries only. We find, similarly to the results for all firms, a positive effect from foreign presence, in particular that in developing countries. Moreover, when we allow for nonlinear effects in Table 10, we find again that there are no nonlinear effects in the case of subsidiaries in developed countries,

while the effects from their counterparts in developing countries are nonlinear but increasing.

Finally, we consider only those multinationals that have their headquarters in developing countries. As expected, the number of observations in this analysis falls considerably, which may have implications in terms of the statistical significance of our results. Table 11 finds again a positive effect from overseas expansion upon multinational performance: the OSTS coefficient in column 2 is 0.008 and significant at the 10% level. However, when decomposing the two effects in terms of either developed or developing subsidiaries, we find that both coefficients are again positive but none of them is significant, at least at the 10% level. Finally, when controlling simultaneously for foreign penetration in both developed and developing countries, the latter coefficient proves significant, although again only at the 10% level.[7]

4.2 Extension

Our data include information on whether the company has an ownership stake in a foreign affiliate and identifies affiliates by name. We are therefore able to find matches between multinational parents and their matched foreign subsidiaries. Over the period 1996 to 2007, we find 6,442 parents and 19,070 foreign subsidiaries.

In this extension, we exploit this different version of our data to study the relationship between overseas subsidiaries' assets and the parents' performance. This approach is in many ways more satisfactory than the traditional methods used in the literature, as one can measure with some precision the actual relevance of a subsidiary in terms of the conglomerate, rather than just assuming that all subsidiaries are equally important, for instance. The cost of this approach is that we have to draw on a smaller data, even if still large by the standards of the previous literature.

In the case of this new data set, including information about parents and subsidiaries characteristics, we find that the parents are concentrated in developed countries, with significant numbers in France, Germany, Italy, Japan, Netherlands, UK and US (60.84% of all parents). The majority of overseas subsidiaries are also found in these countries as well as Australia, Belgium, Brazil, Canada, China, Ireland, Poland, Portugal, Singapore and Spain, where they account for 68.47% of total overseas subsidiaries. The average net profit for parent is 6.4

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[7]We also extend the analysis of multinationals based in developed countries to nonlinear specifications and again find positive coefficients but insignificant at the 10% level. The exception is when not differentiating between developed- and developing-countries subsidiaries, in which case we find a significant effect from the linear term of 0.024. These results are not included but are available upon request.

million euro, and average overseas assets in developed (developing) countries of each parent are 31.7 (67) million euro.

The relationship between parents' profit and overseas subsidiaries' assets in our analysis is estimated from the following equations:

$$Y_{it} = \beta_1 OA_{it}^{D'ed} + \beta_3 OA_{it}^{D'ing} + \lambda X_{it} + \gamma_t + e_{it}, \tag{5}$$

where Y_{it} is the net profit of firm i in period t in logarithm. $OA_{it}^{D'ed}$ and $(OA_{it}^{D'ing})$ are the overseas assets in developed (developing) countries of firm i in period t (measured in logarithms). The equation also includes industry and region effects (X_{it}) and business cycle effects (γ_t). The key parameters are β_1 and β_2, which show the average change in performance related to overseas presences in developed and developing countries, respectively.

We also test the curvilinear MP relationship, drawing on the following equations:

$$Y_{it} = \beta_3 OA_{it}^{D'ed} + \beta_4 (OA_{it}^{D'ed})^2 + \beta_5 OA_{it}^{D'ing} + \beta_6 (OA_{it}^{D'ing})^2 + \lambda X_{it} + \gamma_t + e_{it}, \tag{6}$$

in which we add the squares of $OA_{it}^{D'ed}$ and $OA_{it}^{D'ing}$ to equations 5 to test the curvilinear MP relationship.

Table 12 reports our estimates of the equations above. The main results prove to be similar to our previous analysis as there is a positive effect from foreign presence, in particular that in developing countries. Columns 2 and 3, presenting the results from the separate estimation of the role of developed and developing subsidiaries on parents' profit, indicate that the latter are much more positive and significant. Column 2 indicates that the developed subsidiaries coefficient is 0.010 (and only significant at the 10% level), while column 2 shows that the developing subsidiaries coefficient is almost twice as big, at 0.019, and significant at the 5% level. However, both coefficients become insignificant when we control for both $OA_{it}^{D'ed}$ and $OA_{it}^{D'ing}$ in column 4.

In column 5 to 8 we then consider the curvilinearity. In column 5 and 6 we find evidence of an inverted-U-shaped model in the case of all and developed-country-only subsidiaries, given that the linear term is positive and the quadratic term is negative, and they are both significant. However, in column 7 we find no evidence of nonlinearities in the case of developing-country subsidiaries as all terms are insignificant. Finally, when we pool the

14

quadratic controls for developed- and developing-country subsidiaries, we find again that all terms are insignificant.

We regard these results as supportive of our main findings about the greater role of developing-country subsidiaries than their developed-country counterparts in terms of multinationality performance. However, unlike in the case of our main analysis, drawing on the OSTS measure, here not all results are particularly robust (not reported but available upon request). This can be explained taking into account the data restrictions in this extensions. For instance, while on average each parent has ten overseas subsidiaries (see Table 4), here, again on average, we could only draw on information on three of those subsidiaries. Moreover, missing observations force us to drop multinationals that have both developing- and developed-country subsidiaries, which makes the contrast between the effects of each type of affiliate less robust.

5   Conclusions

The large literature on the relationship between multinationality and performance is almost exclusively based on data from specific home countries (typically the US) and a period of time focused on the 1990s. Moreover, the current literature tends to not distinguish between different host economies in particular in terms of their development. We believe these are important gaps, in particular the aggregation of subsidiaries into a single variable, regardless of the level of development of the host economy. Indeed, globalisation has been opening up new destinations for FDI which typically exhibit considerable heterogeneity, a fact that could influence the performance effects considerably.

This paper fills these research gaps by examining a large sample of multinationals (over 16,000) from a very large number of countries (46) over a recent period (2000-2005). Our central finding is that while the relationship between multinationality and performance follows a positive and linear pattern in general, that relationship is not only positive but also increasing for the case of investment in developing economies. In other words, our estimates indicate that the effects from investing abroad are stronger in the case of developing-country subsidiaries when compared to developed-country counterparts.

We interpret these results as indicating that the potential of globalisation, in particular in terms of increasing investments in developing countries, has not yet been met by multi-

15

national firms. In particular, geographical diversification into developing countries may be an important source of competitive advantages that deserves more serious consideration from business leaders and academics alike. Moreover, the most promising expansion strategies may involve setting up subsidiaries in several developing countries rather than just a small number of such countries. This can be rationalised by taking into account not only the many obstacles in developing countries but also the likely similarities of such obstacles across developing countries.

One limitation of our study is the cross-sectional nature of our data set. This prevents us from relating the changes in multinationality within firms to the changes in their performance over time, holding constant time-invariant factors that may affect both multinationality and firm performance. Our estimates also do not rule out some form of reverse causality: maybe only sufficiently profitable multinationals can afford to establish subsidiaries in developing countries. Finally, additional robustness checks would involve the consideration of complementary measures of multinationality. We leave these topics for future research.

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Figure 1: The Distribution of Multinationality (All Countries - OSTS)
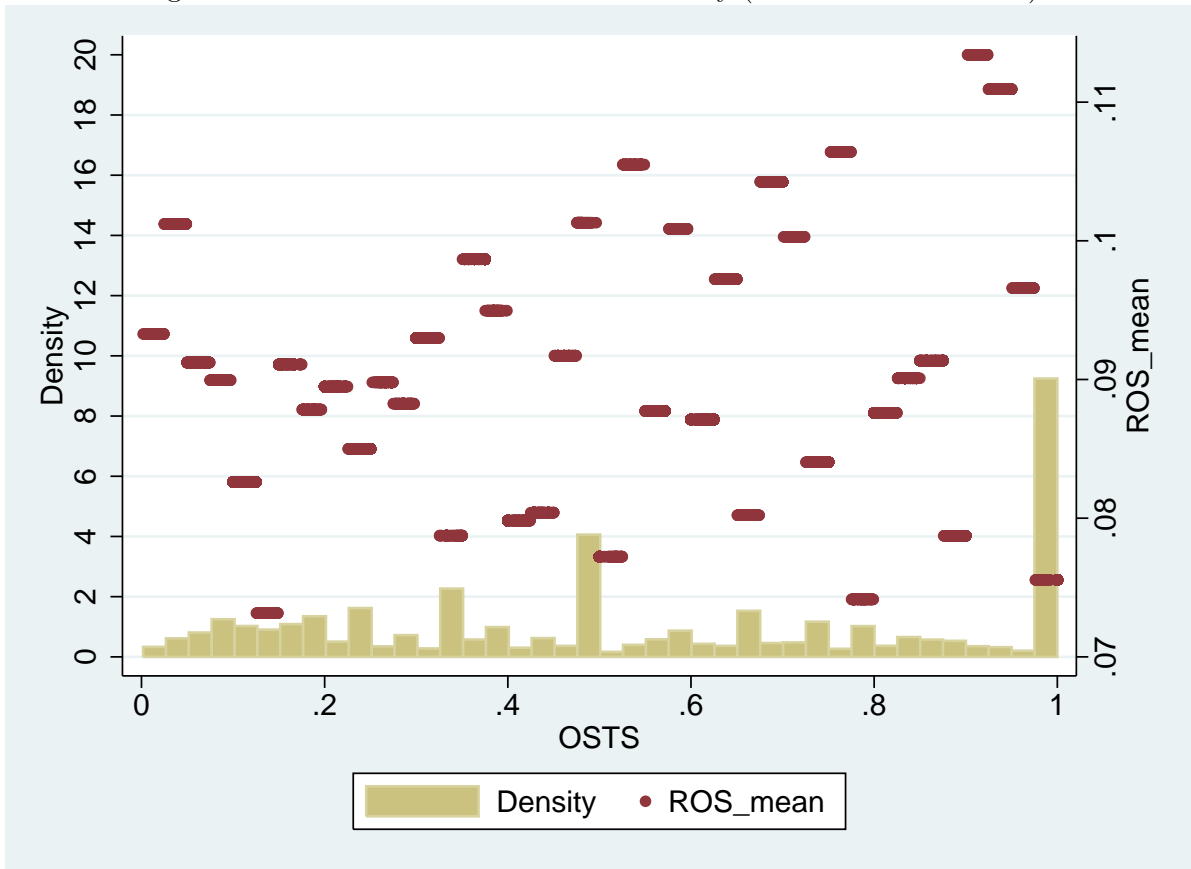
Notes: OSTS is the ratio of number of overseas subsidiaries in relation to its total subsidiaries.

Figure 2: The Distribution of Multinationality (Developed Countries - $OSTS^{D'ed}$ and Developing Countries - $OSTS^{D'ing}$)
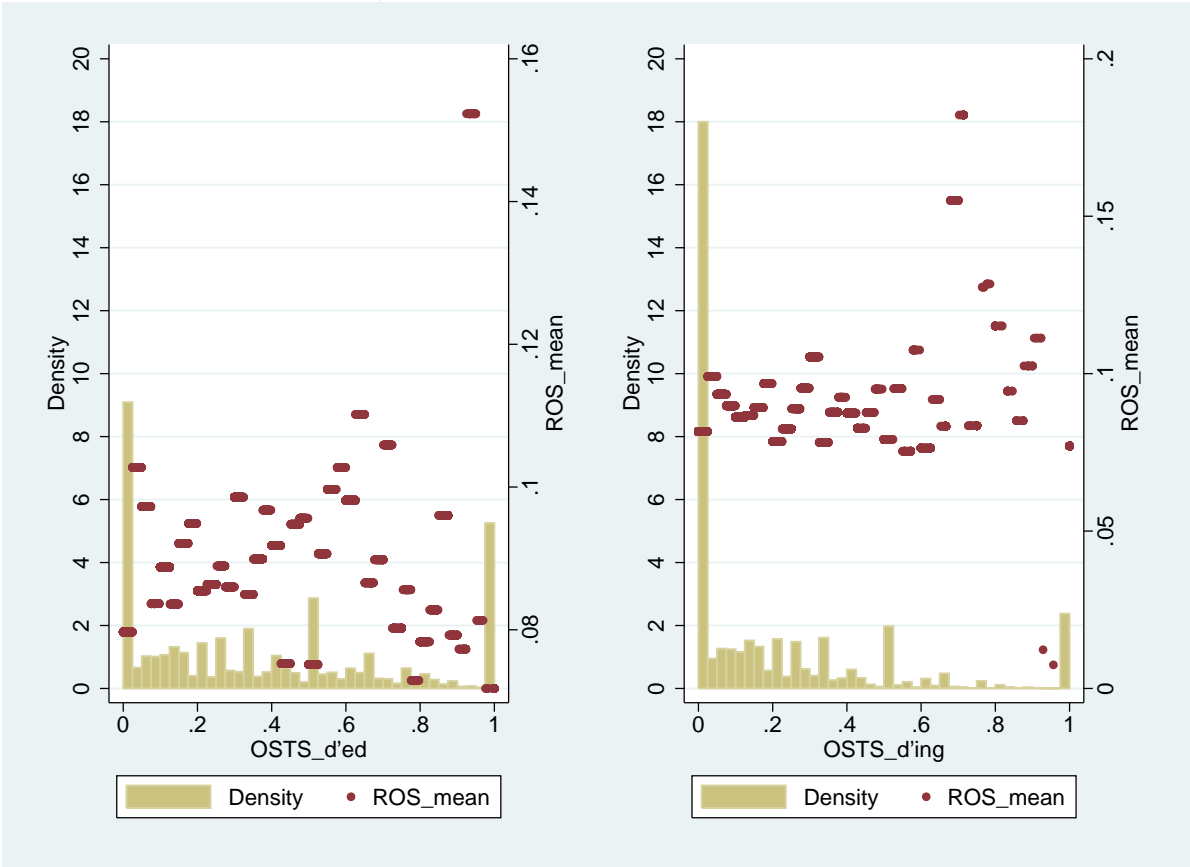
Notes: $OSTS^{D'ed}$ is the ratio of number of subsidiaries in developed countries in relation to its total subsidiaries. $OSTS^{D'ing}$ is the ratio of number of subsidiaries in developing countries in relation to its total subsidiaries.

Figure 3: Scatterplot of number of overseas subsidiaries in developed and developing countries
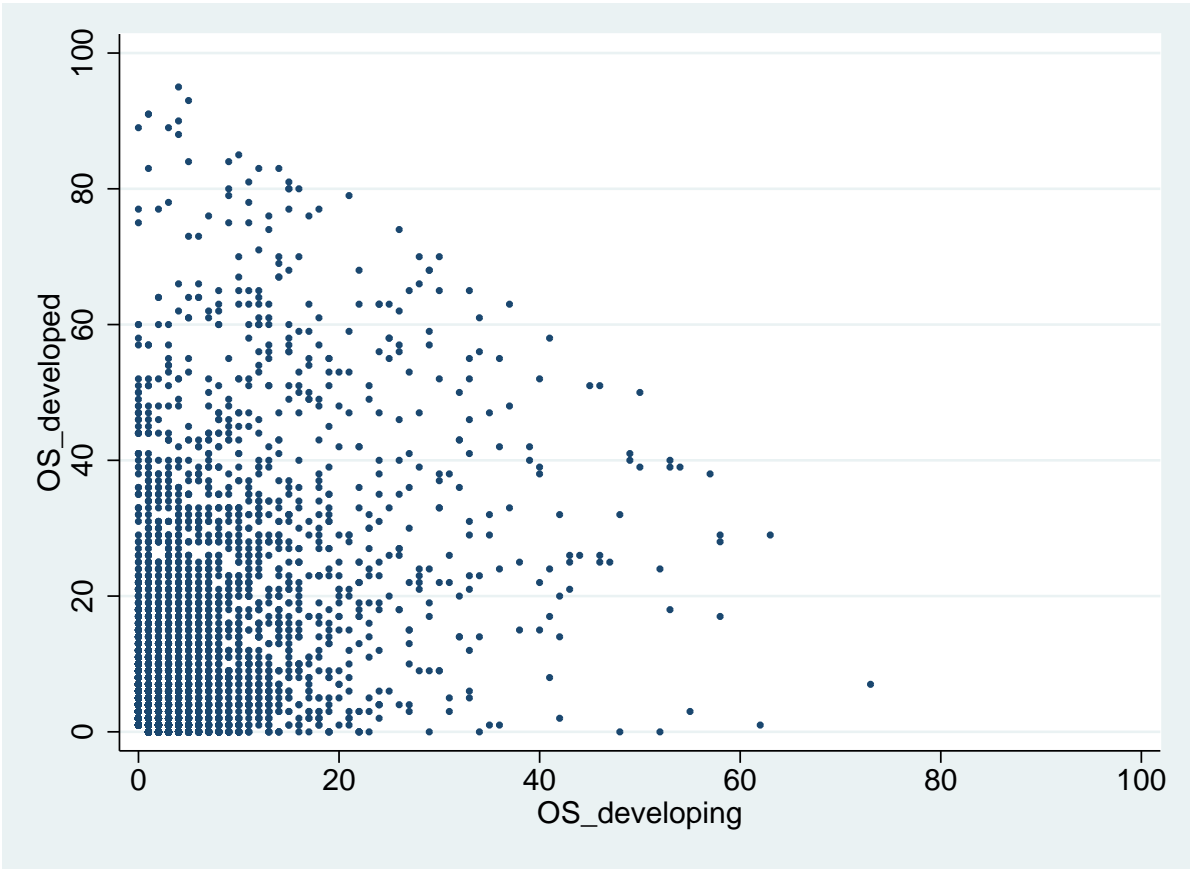
Notes: X-axis presents number of overseas subsidiaries in developing countries. Y-axis presents number of overseas subsidiaries in developed countries.

Table 1: List of studies on (linear) MP relationship and some of their characteristics

Reference	Multinationality Measurements	Performance Indicators	Time Period	Countries	Coef.
Severn & Laurence (1974)	Forgin assets	Profitability	1960, 1965	US	0.87
Hughes et al. (1975)	Foreign sales	Risk adjusted returns	1970-1973	US	0.04
Siddharthan & Lall (1982)	Foreign sales	Growth of sales	1976-1979	US	-0.4
Kim & Lyn (1986)	Foreign sales/subsidiaries	Excess market	1974-1978	US	0
Michel & Shaked (1986)	Forgin sales	Risk adjusted returns, Capitalization	1973-1982	US	-0.05
Shaked (1986)	Foreign sales	ROA	1980-1982	US	0.03
Buhner (1987)	Foreign sales, Herfindahl-type	ROA, ROE, Risk	1966-1981	Germany	4.72
Grant (1987)	Foreign sales	ROS, ROA, ROE	1972-1984	UK	2.95
Grant et al. (1988)	Forgin sales	ROS	1972-1984	UK	3.84
Geringer et al. (1989)	Foreign sales	ROS, ROA	1977-1981	World(1)	0.65
Collins (1990)	Foreign sales	Average rate of return	1976-1985	US	-0.09
Soenen (1990)	Foreign sales/asset/profit	Systemtaic risk, PE	1978-1986	US	0.04
Morck & Yeung (1991)	Forgin subsidiaries/countries	Tobin Q	1976-1980	US	-0.04
Kim et al. (1993)	Foreign countries	ROA	1982-1986	US	0.26
Al-Obaidan & Scully (1995)	Foreign sales	Scale/Technical efficiency	1976-1982	World(2)	-0.01
Sambharya (1995)	Foreign sales/asset/subsidiaries	ROS, ROA, ROE	1985-1986	US	-0.24
Allen & Pantzalis (1996)	Foreign countries	Excess valuation	1991	US	-0.01
Tallman & Li (1996)	Foreign sales/subsidiaries	ROS	1987	US	0.03
Hitt et al. (1997)	Foreign sales/subsidiaries	ROA	1988-1990	US	0.04
Qian (1997)	Foreign subsidiaries/countries	ROA, ROE	1981-1990	US	0.02
Mishra & Gobeli (1998)	Foreign subsidiaries	Tobin Q	1986-1988	US	0.34
Qian (1998)	Foreign sales	ROE	1981-1992	US	0.06
Bodnar et al. (1999)	Foreign sales	Excess value	1987-1993	US	0.02
Delios & Beamish (1999)	Foreign subsidiaries	ROS, ROA, ROE	1991-1995	Japan	0.06
Doukas et al. (1999)	Foreign subsidiaries	Excess value	1991	US	0.18
Gomes & Ramaswamy (1999)	Foreign sales/assets/subsidiaries	ROA	1990-1995	US	0.01

Notes: ROA, ROS and ROE refer to return on assets, return on sales and return on equity, respectively. OCTS and TFP are operating cost in total sales and total factor productivity, respectively. Country groups: (1): US and Europe; (2): Argentina, Austria, Brazil, Belgium, Chile, Colombia, Finland, France, India, Italy, Japan, Korea, Mexico, Netherlands, Norway, Philippines, Portugal, Spain, Taiwan, UK, USA; (3): 42% of firm sample from US and the rest 58% from other nations; (4): US 42%, the rest 58%; (5): US, Europe and Japan. 'Coef.' is the average coefficient of each paper.

Table 2: List of studies on (linear) MP relationship and some of their characteristics [Cont'd]

Reference	Multinationality Measurements	Performance indicators	Time period	Countries	Coef.
Click & Harrison (2000)	Foreign sales/affiliates/countries	ROA, Tobin Q	1991-1997	US	-0.11
Geringer et al. (2000)	Foreign sales	ROS	1977-1993	Japan	0.04
Zahra et al. (2000)	Foreign sales	ROE	1993	US	0.18
Pantzalis (2001)	Foreign affiliates	Tobin Q, Excess Q	1990	US	0.03
Ramírez-Alesón & Espitia-Escuer (2001)	Foreign affiliates	Tobin Q, Opearting profit in asset	1991-1995	Spain	0.11
Christophe & Pfeiffer (2002)	Foreign sales	Tobin Q	1990-1994	US	0.26
Dastidar (2002)	Foreign sales	Excess value	1990-1998	UK	-0.03
Denis et al. (2002)	Foreign sales	Excess value	1984-1997	US	-0.17
Kotabe et al. (2002)	Foreign sales	ROA	1988-1993	US	-0.01
Qian (2002)	Foreign sales	ROS	1989-1993	US	2.61
Capar & Kotabe (2003)	Foreign sales	ROS	1997-1999	Germany	-0.11
Contractor et al. (2003)	Foreign sales/employees/countries	ROS	1983-1988	World (3)	0.02
Goerzen & Beamish (2003)	Foreign affilites/countries	Jensen's alpha	1999	Japan	0.09
Ruigrok & Wagner (2003)	Foreign sales	OCTS	1993-1997	Germany	-0.33
Christophe & Lee (2004)	Foreign sales/assets/affiliates	Tobin Q	1999	US	-0.19
Thomas & Eden (2004)	Foreign top managers; Foreign sales/assets	ROA, ROE, Excess market, Avg.market value	1990-1994	US	-0.62
Lu & Beamish (2004)	Foreign affiliates/countries	ROA, Tobin Q	1986-1997	Japan	-0.9
Andersen (2005)	Foreign affiliates/countries	ROA	1996-2000	US	0.98
Li (2005)	Foreign sales	ROS	1997-2001	US	-0.59
Castellani & Zanfei (2007)	Foreign affiliates	Value added, TFP	1994-1996	Italy	0.13
Ruigrok et al. (2007)	Foreign sales	ROA	1998-2005	US	0.2
Andersen (2008)	Foreign countries	ROA	1996-2000	US	-0.02
Pangarkar (2008)	Foreign sales	ROS, ROA, Profit	2004	Singapore	0.02
Qian et al. (2008)	Foreign sales/countries	ROS, ROA	1996-2000	US	0.22

Table 3: List of studies on (nonlinear) MP relationship and some of their characteristics [Cont'd]

Reference	Multinationality Measurements	Performance indicators	Time period	Countries
(a) Curvilinear-[U-shaped]				
Grant et al. (1988)	Foreign sales	ROS	1972-1984	UK
Lu & Beamish (2001)	Foreign subsidiaries/countries	ROA	1986-1997	Japan
Capar & Kotabe (2003)	Foreign sales	ROS	1997-1999	Germany
Contractor et al. (2003)	Foreign sales/employees/offices	ROS	1983-1988	World (4)
Ruigrok & Wagner (2003)	Foreign sales	OCTS	1993-1997	Germany
Thomas & Eden (2004)	Foreign sales/assets/employees	ROA, ROE	1990-1994	US
	Foreign countries/subsidiaries	Excess Market/Value		
Lu & Beamish (2004)	Foreign subsidiaries/countries	ROA Tobin Q	1986-1997	Japan
Andersen (2008)	Foreign countries	ROA	1996-2000	US
(c) Curvilinear-[inverted U-shaped]				
Haar (1989)	Foreign sales	ROS	1980-1985	World (5)
Hitt et al. (1997)	Foreign sales	ROA	1988-1990	US
Gomes & Ramaswamy (1999)	Foreign sales/assets/subsidiaries	ROA	1990-1995	US
Qian (2002)	Foreign sales	ROS	1989-1993	US
Christophe & Lee (2004)	Foreign sales/assets/subsidiaries	Tobin Q	1999	US
	Foreign top managers			
Li (2005)	Foreign sales/assets/employees	ROA ROS	1997-2001	US
Li & Qian (2005)	Foreign sales	ROS	1993-1997	US
Li et al. (2007)	Foreign countries	ROA	1996-2000	US
Ruigrok et al. (2007)	Foreign sales	ROA	1998-2005	US
Qian et al. (2008)	Foreign sales	ROA ROS	1996-2000	US

Notes: ROA, ROS and ROE refer to return on assets, return on sales and return on equity, respectively. OCTS and TFP are operating cost in total sales and total factor productivity, respectively. Country groups: (1): US and Europe; (2): Argentina, Austria, Brazil, Belgium, Chile, Colombia, Finland, France, India, Italy, Japan, Korea, Mexico, Netherlands, Norway, Philippines, Portugal, Spain, Taiwan, UK, USA; (3): 42% of firm sample from US and the rest 58% from other nations; (4): US 42%, the rest 58%; (5): US, Europe and Japan. 'Coef.' is the average coefficient of each paper.

Table 4: Descriptive statistics

Variable	Multinational Firms			All Firms		
	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs
Sales	1233.11	10652.29	16531	778.87	8579.14	38291
Return on Sales	0.084	0.10	16533	0.077	0.10	38294
Subsidiaries	20.82	51.92	16533	12.13	37.27	38294
Overseas Subsidiaries	9.91	28.74	16533	4.28	19.51	38294
Dev	0.75	0.43	16533	0.73	0.44	38294
$OS^{D'ed}$	6.98	22.16	16533	3.01	14.96	38294
$OS^{D'ing}$	2.92	8.98	16533	1.26	6.08	38294
OSTS	0.58	0.32	16533	0.25	0.35	38294
$OSTS^{D'ed}$	0.38	0.34	16533	0.16	0.29	38294
$OSTS^{D'ing}$	0.20	0.28	16533	0.08	0.21	38294
Firm Age	36.35	34.14	16533	31.56	30.84	38294
Investment	115.55	615.67	16533	64.69	423.17	38294
Employment	4808.10	24471.92	16533	2908.18	16705.14	38294
Total Assets	1372.64	11423.60	16533	875.44	9177.06	38294
Foreign Ownership	12.24	26.95	16533	10.13	26.45	38294
Sector	43.51	19.86	16533	46.04	20.39	38294

Notes: All monetary variables are denominated in millions of euro. 'Multinational Firms' are firms with at least one subsidiary in overseas market, which are considered as the sample in our analysis. 'All Firms' are firms with at least one subsidiary. 'Subsidiaries' refers to the total number of subsidiaries; 'Overseas Subsidiaries' refers to the number of subsidiaries in foreign countries; 'Dev' describes the ratio of firms from developed countries in relation to its total firms; $OS^{D'ed}$ ($OS^{D'ing}$) is the number of subsidiaries in developed (developing) countries; OSTS refers to the ratio of number of overseas subsidiaries to total subsidiaries; $OSTS^{D'ed}$ ($OSTS^{D'ing}$) is the ratio of subsidiaries in developed (developing) countries to total subsidiaries.

Table 5: Descriptive statistics (averages), by multinational's home country

Country	N	ROS	Subsidiaries	Overseas Subsid.	OSTS	$OSTS^{D'ed}$	$OSTS^{D'ing}$
Australia	87	0.16	30.45	15.70	0.50	0.32	0.17
Austria	198	0.07	9.45	5.13	0.59	0.39	0.21
Belgium	694	0.06	14.67	9.46	0.63	0.49	0.14
Bulgaria	150	0.09	5.83	2.35	0.52	0.00	0.52
Canada	2	0.17	15.50	12.00	0.66	0.60	0.06
China	218	0.09	21.04	3.65	0.30	0.12	0.18
Czech Republic	63	0.07	2.10	1.60	0.90	0.49	0.41
Denmark	640	0.09	13.88	9.71	0.70	0.54	0.17
Estonia	46	0.11	3.85	1.50	0.70	0.13	0.57
Finland	351	0.08	15.64	9.56	0.60	0.33	0.27
France	1,478	0.08	12.89	6.56	0.61	0.46	0.15
Germany	885	0.07	16.94	7.87	0.52	0.42	0.09
Greece	377	0.08	5.89	3.16	0.64	0.08	0.56
Hong Kong	64	0.29	28.56	12.95	0.39	0.10	0.29
Hungary	17	0.08	20.59	8.59	0.44	0.29	0.14
Iceland	20	0.10	12.10	8.50	0.64	0.25	0.39
Indonesia	15	0.18	12.33	2.73	0.76	0.68	0.08
Ireland	109	0.08	29.54	16.33	0.51	0.49	0.02
Italy	2,411	0.06	10.31	4.55	0.51	0.28	0.22
Japan	1,373	0.07	13.94	9.23	0.89	0.80	0.09
Latvia	19	0.06	3.00	1.21	0.57	0.12	0.46
Liechtenstein	1	0.09	28.00	28.00	1.00	0.89	0.11
Lithuania	185	0.06	2.12	2.05	0.99	0.01	0.98
Luxembourg	17	0.12	52.35	49.35	0.89	0.58	0.31
Malaysia	43	0.11	10.56	4.51	0.66	0.46	0.20
Mexico	2	0.01	6.50	2.00	0.39	0.05	0.34
Netherlands	766	0.08	24.20	15.86	0.65	0.49	0.16
New Zealand	12	0.14	15.92	8.58	0.55	0.42	0.13
Norway	190	0.14	16.02	8.13	0.53	0.46	0.07
Philippines	5	0.18	2.00	1.60	0.80	0.60	0.20
Poland	79	0.07	6.70	2.18	0.50	0.35	0.15
Portugal	79	0.06	12.57	4.04	0.41	0.30	0.11
Romania	13	0.10	4.38	1.08	0.45	0.38	0.08
Russia	69	0.14	11.75	3.41	0.43	0.10	0.34
Singapore	53	0.17	15.19	9.42	0.75	0.50	0.26
Slovenia	9	0.10	4.67	4.67	1.00	0.16	0.84
South Africa	24	0.12	12.42	6.79	0.57	0.27	0.31
South Korea	41	0.06	7.83	3.63	0.44	0.37	0.07
Spain	690	0.08	27.65	9.92	0.44	0.27	0.17
Sweden	694	0.10	24.79	14.78	0.62	0.50	0.12
Switzerland	140	0.10	44.24	36.53	0.72	0.60	0.12
Taiwan	1,171	0.09	6.44	2.72	0.55	0.03	0.52
Thailand	28	0.14	16.54	3.32	0.64	0.29	0.35
Turkey	16	0.10	16.44	7.19	0.68	0.43	0.25
UK	1,367	0.10	42.26	12.55	0.35	0.31	0.05
US	1,622	0.12	53.77	24.55	0.47	0.37	0.10

Notes: All monetary variables are in millions of euro. 'Subsidiaries' refers to the total number of subsidiaries; 'Overseas Subsidiaries' refers to the number of subsidiaries in foreign countries; OSTS refers to the ratio of number of overseas subsidiaries in relation to total subsidiaries; $OSTS^{D'ed}$ ($OSTS^{D'ing}$) is the ratio of subsidiaries in developed (developing) countries to total subsidiaries.

Table 6: Descriptive statistics (averages), by multinational's home country [Cont'd]

Country	Sales	Firm Age	Investment	Employment	Asset	For.Ownership
Australia	1202.19	34.30	108.26	3846.66	1742.19	13.89
Austria	559.77	29.47	30.46	2083.54	489.98	20.01
Belgium	2597.41	31.22	93.41	2017.50	2470.07	17.98
Bulgaria	58.42	30.11	3.55	755.16	63.97	4.97
Canada	2294.50	32.00	127.40	16315.00	6872.89	6.53
China	1329.18	12.36	114.47	11947.22	1342.60	3.94
Czech Republic	331.53	13.35	23.33	1915.98	328.25	32.73
Denmark	390.82	26.63	30.94	2584.64	354.69	11.28
Estonia	61.77	16.24	10.08	741.96	97.70	29.10
Finland	703.18	34.02	52.78	2452.21	581.71	12.20
France	717.27	37.63	81.49	2255.86	674.76	14.12
Germany	1616.73	47.31	114.69	5953.49	1659.61	15.41
Greece	209.12	26.80	20.37	785.49	246.21	12.26
Hong Kong	957.03	51.63	236.24	9612.38	2242.09	17.16
Hungary	1038.79	26.35	115.10	3887.35	922.74	22.40
Iceland	290.16	35.00	17.49	1940.10	425.31	2.59
Indonesia	446.36	36.20	65.75	6640.80	630.17	18.64
Ireland	1388.18	34.57	160.32	3219.25	1543.75	20.91
Italy	309.15	28.03	19.80	950.19	363.12	5.50
Japan	2202.44	64.38	243.69	7441.72	2478.90	7.06
Latvia	82.13	12.95	1.36	588.05	43.78	22.99
Liechtenstein	2290.98	66.00	555.06	17250.00	2050.30	0.00
Lithuania	19.64	12.77	0.65	256.79	19.56	5.07
Luxembourg	1313.23	32.12	223.47	9894.59	2345.79	30.17
Malaysia	372.22	24.49	78.09	4953.19	659.48	8.54
Mexico	205.15	20.50	14.97	2394.50	166.91	0.00
Netherlands	1395.46	36.30	112.23	4383.77	1238.30	23.17
New Zealand	2226.62	27.50	306.96	6628.83	2567.78	16.51
Norway	790.27	27.12	73.64	1885.96	785.09	14.15
Philippines	86.23	40.20	8.44	2743.60	98.46	2.48
Poland	441.38	29.25	35.27	2482.75	460.92	16.76
Portugal	431.45	37.71	26.56	1974.76	377.44	13.86
Romania	179.46	20.62	14.58	2463.62	140.41	0.05
Russia	1310.62	33.99	168.00	15420.20	2522.51	3.66
Singapore	471.68	25.32	132.92	3405.32	723.97	19.69
Slovenia	726.44	74.78	29.28	5410.44	691.15	15.90
South Africa	594.10	37.75	81.16	5512.96	1234.92	3.33
South Korea	483.98	24.46	28.13	748.49	483.70	2.69
Spain	898.08	30.96	108.08	3185.21	1150.16	18.89
Sweden	613.68	40.16	50.99	2761.65	633.27	12.91
Switzerland	2455.95	72.28	377.04	11086.22	2704.90	18.63
Taiwan	289.89	22.25	45.09	2896.90	314.40	2.15
Thailand	2405.99	34.25	161.84	8925.11	1798.25	12.94
Turkey	1343.58	37.38	205.93	6812.13	1354.11	10.68
UK	1543.17	32.27	135.49	6926.04	2212.62	17.95
US	3400.35	49.07	350.79	15011.96	3796.85	14.09

Notes: All monetary variables are in millions of euro. 'For.Ownership' refers to foreign ownership.

Table 7: Multinationality and performance: Linear effects

	(1)	(2)	(3)	(4)	(5)
OSTS		.013***			
		(.003)			
$OSTS^{D'ed}$			.003		.010***
			(.003)		(.003)
$OSTS^{D'ing}$				.016***	.020***
				(.003)	(.003)
Investment	.005***	.005***	.005***	.005***	.005***
	(.0004)	(.0004)	(.0004)	(.0004)	(.0004)
Employment	-.022***	-.023***	-.022***	-.023***	-.023***
	(.0007)	(.0007)	(.0007)	(.0007)	(.0007)
Total Assets	.023***	.023***	.023***	.023***	.023***
	(.0008)	(.0008)	(.0008)	(.0008)	(.0008)
Firm Age	.001	.001*	.001	.001	.001*
	(.0008)	(.0008)	(.0008)	(.0008)	(.0008)
Foreign Ownership	.00007***	.00006**	.00007***	.00006**	.00006**
	(.00003)	(.00003)	(.00003)	(.00003)	(.00003)
Const.	-.385***	-.402***	-.388***	-.393***	-.403***
	(.093)	(.093)	(.093)	(.093)	(.093)
Obs.	16533	16533	16533	16533	16533
R^2	.228	.229	.228	.229	.230

Notes: Dependent variable is return on sales. OSTS refers to the ratio of number of overseas subsidiaries in relation to its total subsidiaries; $OSTS^{D'ed}$ ($OSTS^{D'ing}$) is the ratio of subsidiaries in developed (developing) countries to total subsidiaries. 'Firm Age', 'Investment', 'Employment' and 'Total Assets' are in logarithms. All columns above include a full set of fixed effects, including sector, region and year dummies. Values in parentheses are standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 8: Multinationality and performance: Nonlinear effects

	(1)	(2)	(3)	(4)
OSTS	.015**			
	(.007)			
$OSTS^2$	-.004			
	(.006)			
$OSTS^{D'ed}$		.011*		.018***
		(.006)		(.006)
$(OSTS^{D'ed})^2$		-.005		-.009
		(.006)		(.006)
$OSTS^{D'ing}$			-.002	.004
			(.006)	(.006)
$(OSTS^{D'ing})^2$			.011*	.009
			(.006)	(.006)
Investment	.005***	.005***	.005***	.005***
	(.0003)	(.0003)	(.0003)	(.0003)
Employment	-.013***	-.013***	-.013***	-.013***
	(.0005)	(.0005)	(.0005)	(.0005)
Total Assets	.013***	.013***	.013***	.013***
	(.0006)	(.0006)	(.0006)	(.0006)
Firm Age	.0007	.0005	.0005	.0007
	(.0006)	(.0006)	(.0006)	(.0006)
Foreign Ownership	.00006***	.00007***	.00007***	.00006***
	(.00002)	(.00002)	(.00002)	(.00002)
Const.	-.211***	-.205***	-.206***	-.211***
	(.065)	(.065)	(.065)	(.065)
Obs.	15712	15712	15712	15712
R^2	.238	.236	.237	.238

Notes: Dependent variable is return on sales. OSTS refers to the ratio of number of overseas subsidiaries in relation to its total subsidiaries; $OSTS^{D'ed}$ ($OSTS^{D'ing}$) is the ratio of subsidiaries in developed (developing) countries to total subsidiaries. 'Firm Age', 'Investment', 'Employment' and 'Total Assets' are in logarithm. All columns above include a full set of fixed effects, including sector, region and year dummies. Values in parentheses are standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 9: Multinationality and performance: Firms from developed countries

	(1)	(2)	(3)	(4)	(5)
OSTS		.015***			
		(.003)			
$OSTS^{D'ed}$			.004		.011***
			(.003)		(.003)
$OSTS^{D'ing}$				.019***	.024***
				(.004)	(.004)
Investment	.005***	.005***	.005***	.005***	.005***
	(.0005)	(.0005)	(.0005)	(.0005)	(.0005)
Employment	-.024***	-.024***	-.024***	-.024***	-.024***
	(.0009)	(.0009)	(.0009)	(.0009)	(.0009)
Total Assets	.024***	.024***	.024***	.024***	.024***
	(.001)	(.001)	(.001)	(.001)	(.001)
Firm Age	.0009	.001	.0009	.001	.001
	(.001)	(.001)	(.001)	(.001)	(.001)
Foreign Ownership	.00004	.00003	.00004	.00003	.00003
	(.00003)	(.00003)	(.00003)	(.00003)	(.00003)
Const.	-.233**	-.249**	-.236**	-.237**	-.248**
	(.098)	(.098)	(.098)	(.098)	(.098)
Obs.	12356	12356	12356	12356	12356
R^2	.232	.234	.232	.234	.235

Notes: Dependent variable is return on sales. OSTS refers to the ratio of number of overseas subsidiaries in relation to its total subsidiaries; $OSTS^{D'ed}$ ($OSTS^{D'ing}$) is the ratio of subsidiaries in developed (developing) countries to total subsidiaries. 'Firm Age', 'Investment', 'Employment' and 'Total Assets' are in logarithm. All columns above include a full set of fixed effects, including sector, region and year dummies. Values in parentheses are standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 10: Multinationality and performance: Firms from developed countries - Nonlinear effects

	(1)	(2)	(3)	(4)
OSTS	.012			
	(.009)			
$OSTS^2$	-.001			
	(.007)			
$OSTS^{D'ed}$		.012*		.020***
		(.007)		(.007)
$(OSTS^{D'ed})^2$		-.006		-.010
		(.007)		(.007)
$OSTS^{D'ing}$			-.004	.001
			(.007)	(.007)
$(OSTS^{D'ing})^2$			.014*	.014*
			(.008)	(.008)
Investment	.005***	.005***	.005***	.005***
	(.0004)	(.0004)	(.0004)	(.0004)
Employment	-.014***	-.014***	-.014***	-.015***
	(.0006)	(.0006)	(.0006)	(.0006)
Total Assets	.014***	.014***	.014***	.014***
	(.0007)	(.0007)	(.0007)	(.0007)
Firm Age	.0002	.00003	.00006	.0003
	(.0007)	(.0007)	(.0007)	(.0007)
Foreign Ownership	.00004*	.00004*	.00004*	.00004*
	(.00002)	(.00002)	(.00002)	(.00002)
Const.	-.256***	-.250***	-.251***	-.257***
	(.070)	(.070)	(.070)	(.070)
Obs.	11726	11726	11726	11726
R^2	.252	.251	.251	.252

Notes: Dependent variable is return on sales. OSTS refers to the ratio of number of overseas subsidiaries in relation to its total subsidiaries; $OSTS^{D'ed}$ ($OSTS^{D'ing}$) is the ratio of subsidiaries in developed (developing) countries to total subsidiaries. 'Firm Age', 'Investment', 'Employment' and 'Total Assets' are in logarithm. All columns above include a full set of fixed effects, including sector, region and year dummies. Values in parentheses are standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 11: Multinationality and performance: Firms from developing countries

	(1)	(2)	(3)	(4)	(5)
OSTS		.008*			
		(.004)			
$OSTS^{D'ed}$			.002		.006
			(.004)		(.005)
$OSTS^{D'ing}$				.007	.010*
				(.005)	(.006)
Investment	.005***	.005***	.005***	.005***	.005***
	(.0007)	(.0007)	(.0008)	(.0008)	(.0008)
Employment	-.018***	-.018***	-.018***	-.018***	-.018***
	(.001)	(.001)	(.001)	(.001)	(.001)
Total Assets	.017***	.018***	.017***	.018***	.018***
	(.002)	(.002)	(.002)	(.002)	(.002)
Firm Age	.003*	.003*	.003*	.003*	.003*
	(.002)	(.002)	(.002)	(.002)	(.002)
Foreign Ownership	.0001***	.0001***	.0001***	.0001***	.0001***
	(.00005)	(.00005)	(.00005)	(.00005)	(.00005)
Const.	-.241***	-.247***	-.279***	-.245***	-.285***
	(.087)	(.087)	(.086)	(.087)	(.086)
Obs.	4177	4177	4177	4177	4177
R^2	.224	.225	.224	.225	.225

Notes: Dependent variable is return on sales. OSTS refers to the ratio of number of overseas subsidiaries in relation to its total subsidiaries; $OSTS^{D'ed}$ ($OSTS^{D'ing}$) is the ratio of subsidiaries in developed (developing) countries to total subsidiaries. 'Firm Age', 'Investment', 'Employment' and 'Total Assets' are in logarithm. All columns above include a full set of fixed effects, including sector, region and year dummies. Values in parentheses are standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 12: Multinationality and performance: A subsample (6442 multinationals, 19070 overseas subsidiaries)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OA	.008				.100***			
	(.005)				(.029)			
$OA^{D'ed}$		.010*		.004		.139***		-.040
		(.005)		(.008)		(.032)		(.054)
$OA^{D'ing}$			.019**	.008			.015	.035
			(.009)	(.009)			(.044)	(.049)
OA^2					-.003***			
					(.001)			
$(OA^{D'ed})^2$						-.004***		.001
						(.001)		(.002)
$(OA^{D'ing})^2$							.0001	-.0009
							(.001)	(.002)
Obs.	21586	17535	9068	5017	21586	17535	9068	5017
R^2	.927	.93	.933	.95	.927	.93	.933	.95

Notes: Dependent variable is the net profit. $OA_{it}^{D'ed}$ and ($OA_{it}^{D'ing}$) is the overseas assets in developed (developing) countries of firm i in period t. 'net profit', '$OA_{it}^{D'ed}$', and '$OA_{it}^{D'ing}$' are in logarithm. All columns above include a full set of fixed effects, including sector, region, year dummies and parent firm fixed effects. Values in parentheses are standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.