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The Asymmetries of a Small World: Entry Into and Withdrawal From International Markets by French Firms

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Dirk Engel, Vivien Procher, and Christoph M. Schmidt¹

The Asymmetries of a Small World: Entry Into and Withdrawal From International Markets by French Firms

Abstract

This paper studies the internationalization behaviour of French companies, using more than 330.000 observations for three two-year intervals. We analyze the role of productivity, organisational and ownership structure, and of financial characteristics for the decision to enter into and exit from foreign markets. High levels of productivity are documented to be characteristic of companies deciding to engage in exporting or foreign direct investment (FDI). However, there does not seem to be a significant correlation between productivity and divestment decisions. Moreover, companies with corporate shareholders are more likely to intensify their international engagement and to retain their cross-border activities. Finally, with some exceptions high levels of short-term and long-term debt tend to make entry into a more intense international engagement more and its reduction less likely.

JEL Classification: F23, D21, L21, C25

Keywords: Foreign markets; entry and exit; exporting; FDI

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1. Introduction

The ongoing process of economic globalization forces firms to continuously evaluate and adjust their participation in international markets. The removal of trade barriers combined with advancements in logistics and communication systems have increased the incentives for firms to invest abroad in order to access new markets and suppliers. However, greater economic integration also implies increased competition and shorter product life cycles, making it more difficult for firms to succeed in international markets. Consequently, their investment in foreign markets is not an irreversible decision.

Indeed firms engaged abroad are increasingly confronted with the decision to withdraw from foreign markets. Just as a rise in market entry increases market exit in subsequent periods (see e.g., Dunne et al. 1988), investments and divestments are two sides of the same coin. The increasing number of foreign direct investments (FDI) in recent years – especially in France where outward investments increased from 50.5 to 224.6 USD billion between 2002 and 2007 (OECD 2007, 2008a)¹ – suggests that the number of cross-border divestments will be increasing over time.

Many case studies stress that poor economic performance of subsidiaries plays an important role in the divestment decision of parent companies (e.g., Boddewyn 1979, Watts and Kirkham 1999). Other motives for business divestures include alterations of the strategic fit between the parent company and its domestic and foreign affiliates (e.g., Boddewyn 1979, 1983; Benito 1997, 2005). Correspondingly, Duhaime and Grant (1984) show that business units exhibiting a low interdependency with other units are more likely to be divested than those characterized by strong organizational links. Moreover, since multinationals have greater opportunities to shift production within their multinational enterprise network (e.g., Feenstra and Hanson 1997), any shutdown decision will tend to be affected by plant attributes as well as by the characteristics of the plant owner.

The study of Bernard and Jensen (2007) confirms that plants owned by U.S. multi-unit or multinational enterprises (MNEs) display a significantly higher probability of being shut down than domestic plants of single-unit firms. There is little econometric evidence,

¹ In fact, France had the third highest FDI outflow in the OECD in 2007 after the U.S. (333.3 USD billion) and the UK (229.9 USD billion). A similar pattern is observable for FDI outflows in previous years.

however, whether the characteristics of the parent company are also playing a role in export and FDI decisions. Moreover, those studies that have examined the role of productivity and ownership for cross-border activities have tended to focus on export participation (e.g., Roberts and Tybout 1997, Bernard and Wagner 2001, Wagner 2008, Greenaway et al. 2007).

This paper takes an encompassing view and analyzes both the decision of enterprises to intensify their international engagement, either via exporting or FDI, and the decision to reduce cross-border activity, distinguishing exporters from MNEs. Our analysis is based on a large sample of about 335,000 observations for French firms from the manufacturing and service industries whose internationalization status has been observed for one of the three two-year intervals 2000-2002, 2002-2004, and 2005-2007, respectively. We apply a multinomial probit (MNP) model to estimate the upward and downward transition probabilities of companies across three regimes of internationalization, purely domestic activities, export and FDI.

High levels of productivity are documented to be characteristic of companies deciding to engage in exporting or FDI. However, there does not seem to be a significant correlation between productivity and divestment decisions. Moreover, companies with corporate shareholders are more likely to intensify their international engagement and to retain their cross-border activities. Finally, with some exceptions high levels of short-term and long-term debt tend to make entry into a more intense international engagement more and its reduction less likely.

The remainder of the paper is organized as follows: Section 2 derives the testable hypotheses, drawing on various economic and business theories. Section 3 describes the data, the econometric approach and variables employed. Section 4 presents and discusses the estimation results. Section 5 concludes.

2. Background

It is widely recognized that the mode chosen for serving foreign markets depends on the relative size of trading and sunk costs. A domestic firm choosing to export benefits from the concentration of production and can, therefore, exploit economies of scale. On the other hand, it has to pay higher trade costs and incur some sunk costs (e.g., market-specific R&D, product adaptation, advertising). If the firm is deciding to become a multinational instead, then it can produce closer to each market, but has to pay even higher sunk and fixed costs, since production capabilities have to be duplicated.

Consequently, this internationalization mode requires considerable resources, meaning that the decision to become engaged in FDI is probably governed by different factors than the decision to start exporting.

2.1 *Firm Productivity*

In their seminal work, Roberts and Tybout (1997) model the role of sunk cost and other firm-specific factors for the decision to export. One implication of their theoretical model is that prior export experience facilitates lowering sunk costs. Correspondingly, they show in their econometric investigation for Columbian plants that prior export experience is significantly and positively associated with the probability of exporting. The main role of sunk costs is also confirmed by findings of Bernard and Jensen (1995, 1999). The authors are among the first to show that exporters have already a higher productivity than non-exporters in the period *before* they enter export markets (see Wagner 2007 for an overview). Higher productivity offers the chance to realize higher profits and thus, to receive sufficient compensation for any non-recoverable sunk costs.

Helpman et al. (2004) extend the analysis by differentiating between two main modes of internationalization, export and FDI. The authors suggest that the mode chosen by firms reflects their productivity level: Only the most productive firms become multinational enterprises (DI), whereas firms with intermediate productivity enter foreign markets via exports (DX). The least productive companies produce only for the domestic market (D). This postulated productivity ranking was confirmed for firms from various countries including France (Engel and Procher 2009), Germany (Arnold and Hussinger 2006; Wagner 2006), the UK (Girma et al. 2005) and Japan (Head and Ries 2003).

While productivity differences clearly help to explain why domestic firms choose one or the other mode of internationalization, or why exporting firms intensify their international participation by changing from DX to DI, less research has been conducted on the relationship between productivity and any downward changes (DI to DX or D, and DX to D, respectively). A theoretical background is provided by Hopenhayn's (1992) model of the entry and exit pattern in an industry. He postulates that a firm's productivity is path-dependent. Highly productive firms are more likely to remain highly productive in future periods of time. This implies that firms realizing a productivity level below a certain threshold value will exit the market in the next period whereas firms with productivity levels above this threshold will stay in the market. Thus, in empirical applications, low-

productivity firms in period $t-1$ display a higher propensity to exit the market in period t than highly productive firms.

Farinas and Ruano (2005) provide an empirical investigation of Hopenhayn's model for a sample of Spanish manufacturing firms. The authors find that incumbents display significantly higher productivity levels than entering and exiting firms. With respect to the role of sunk costs, they further show that large firms with high sunk costs are characterized by, on average, lower productivity than large firms confronted with low sunk costs. All these findings are in line with the predictions of the Hopenhayn model.

Wagner (2008, 2010) was the first to test the Hopenhayn model, concentrating on the export market participation. He applies a Kolmogorov-Smirnov test to compare the entire distributions of labour productivity for export starters, export stoppers and continuing exporters. The results reveal that the distribution of labour productivity for continuing exporters stochastically dominates the distributions of export stoppers, in line with Hopenhayn's model, and also that of export starters.

Furthermore, Hopenhayn (1992) points out that high sunk costs provide a barrier to enter the market. As a consequence, a lower number of entries reduces the productivity threshold for incumbents so that a larger number of low-productivity incumbents tend to stay in the market in the next period. While many case studies focus on foreign divestures (e.g., Boddewyn 1979 for an overview) multivariate analyses are only available for plant closures in general. Watts and Kirkham (1999) detect that U.K. plant closures show a significantly lower labour productivity than comparable plants with ongoing business activities. The study of Bernard and Jensen (2007) confirms this finding for the U.S.

A lower productivity increases the propensity to divest from markets to avoid take-overs and total market exit. This so-called "shadow of death" which refers to the assumption that firm's performance deteriorates in the years before exiting, might imply that low-productivity firms have to reduce overall employment thereby increasing the propensity to divest foreign affiliates. Correspondingly, the findings of Haynes et al. (2003) demonstrate that poorly performing corporations divest to a larger extent than high-productivity corporations. In their preceding study, however, Haynes et al. (2000) failed to detect this effect. Moreover, Carreira and Teixeira (2009) generally confirm that market selection forces low-productivity firms to exit, but there is also non-negligible share of low-productivity firms that stay and high-productivity firms that exit. Thus, based on the models of Hopenhayn et al. (1992) and Helpman et al. (2004), we assume

that high-productivity French firms have a significantly higher propensity to invest abroad and to continue producing abroad than low-productivity firms.

2.2 Multi-unit Characteristics and Ownership Structure

In addition to the central role of a firms' economic performance, many studies point out that multi-unit and multinational characteristics can also affect the firm's mode of internationalization (e.g., Bernard and Jensen 2007). Operating multiple interdependent entities requires the adaptation of organizational structures and the coordination of production processes. Hence, firms which already have a domestic (or foreign) subsidiary benefit from learning effects which in turn might lower the organizational barriers and costs for a new (foreign) affiliate (e.g., Amit 1986).

Feenstra and Hanson (1997) further point out that subsidiaries of MNEs may display a more volatile labour demand than other firms because of their parent's possibilities of re-allocating resources from one location to another. Recent evidence of Bernard and Jensen (2007) supports this view, since plants of multi-unit firms display a significantly higher probability of being shut down than plants of single-unit firms. Consequently, we expect that firms with multi-unit activities will also show a significantly higher propensity to produce abroad and, if they are already engaged in FDI, to stop producing abroad than firms without multi-unit activities.

Furthermore, ownership structure is of increasing interest in explaining foreign market dynamics. Following the resource-based view (e.g., McDougall et al. 1994), investors may provide capital, specific know-how and access to a larger corporate network. Related to foreign market entry, corporate owners, and in particular, foreign corporate owners may provide internationally experienced staff as well as international customer and supplier networks. In addition, the experience of corporate investors and their establishment in foreign markets might help them to effectively monitor the internationalization process of related firms. Hence, compared to firms with individual shareholders, firms with corporate owners are more embedded in the global commodity chain and possess industrial ties to other affiliates, customers or suppliers of the corporate owner and, consequently, are more likely to continue exporting.

In line with this expectation, Roberts and Tybout (1997) find that firms owned by a corporation display a significantly higher propensity to export than other firms. Roper et al. (2006) detected that externally-owned Irish manufacturing plants achieve significantly higher export intensities. With respect to foreign ownership, Greenaway et al. (2007)

observed a significantly higher export participation for foreign-owned UK manufacturing firms. Finally, Ilmakuunas and Nurmi (2007) provide empirical evidence that foreign ownership shortens the duration until a firm will start exporting. Therefore, we expect firms with corporate shareholders to display a significantly higher propensity to become exporters and, if they are already engaged in exporting, to continue exporting than firms with individual shareholders. Moreover, firms owned by foreign corporations are more likely to start and continue exporting than firms with domestic owners.

The effect of corporate ownership on the decision to start a foreign direct investment is probably similar to that for export participation. Corporate owners have the ability to allocate sufficient resources to firms in order to support their international investment projects. Given their international experience, financial backing and worldwide network, firms with corporate shareholders are more likely to become engaged in FDI than firms with individual shareholders.

In contrast, the decision to continue producing abroad depends positively on the extent of spillover related to the FDI activity and negatively on the size of the global commodity chain. With respect to the former, corporate ownership may improve the entrenchment of firms in multiple supplier-customer networks, and that can result in more efficient business processes. Foreign owners may also contribute significantly to improvements in the knowledge base and technical skills of a firm. Furthermore, Almeida (1996) documents a significant knowledge transfer from the foreign subsidiary to the parent company. The value of knowledge created at foreign affiliates' location increases with the size of the firm network. Knowledge externalities that arise at parent companies with foreign corporate owners can apparently be used simultaneously by more firms compared to parent companies with individual shareholders.

With respect to the second argument, (foreign) corporate ownership implies that the global commodity chain is larger compared to firms without this kind of ownership. This increases the possibility of shifting resources from one affiliate to another. Firms with (foreign) corporate ownership also have more experience in re-organizing and restructuring their production processes. In addition, whereas independent firms (e.g., owner-managed firms) have full control over FDI decisions, firms related to MNEs usually enjoy lower control over their FDI decisions. Benito (2005) argues that subsidiaries of independent firms face the lowest propensity to be divested because these subsidiaries are often part of a global strategy to enter and serve foreign markets. This

conjecture is based, however, on the assumption that spillover effects from foreign affiliates to the parent company's network do not differ between parent companies with individual shareholders and those with (foreign) corporate shareholders. In fact, from a theoretical point of view the effect of (foreign) corporate ownership on the decision to continue producing abroad remains ambiguous.

3. Data and Econometric Approach

3.1 Data

The data used in the paper is taken from the AMADEUS (Analyse Major Databases from European Sources) data base. AMADEUS is a corporate database providing information on financial accounts, the ownership structure and affiliated companies. Bureau van Dijk compiles the AMADEUS database from company accounts filed under legal obligations in a European country. Despite the fact that the data is supplemented with information from company reports and regional providers, data availability can vary to some extent between countries. The sample in this paper is restricted to French firms as France is one of the few countries for which core economic and financial indicators are frequently reported.

Only firms with an unconsolidated financial account have been selected for the analysis. This ensures that firms that are part of a larger company group are not counted twice (i.e. via the consolidated account of the group). Our dataset comprises both, companies from the manufacturing and service industries.² Based on five updates of the AMADEUS database we are able to observe the internationalization status of a company in the years 2000, 2002, 2004, 2005 and 2007, although the exact date of a status change is not available.³ In order to minimize the time gap for status changes to two years, we compare

² The NACE (Nomenclature générale des Activités dans les Communautés Européennes) classification is the statistical industrial code for economic activities in the European Union. We exclude from the analysis industries with the NACE two-digit and four-digit codes 01 and 02 (Agriculture, hunting and forestry), 05 (Fishing), 10-14 (Mining and quarrying), 7415 (Management activities of holding companies), 75 (Public administration and defense, compulsory social security) and 91 (Activities of membership organizations e.g., trade unions) from the analysis. Observations for which variables realize values in the upper and lower 1st percentile of the distribution are eliminated from the dataset in order to control for outliers and coding errors.

³ Whereas financial data are available up to 10 years, the ownership and subsidiary structure is a static information at a given point in time (i.e. depending on the AMADEUS update). The dynamics in the firm structure can only be analyzed via the various updates of the datasets.

Table 1: Internationalization status

Parent companies	2000-2002	2002-2004	2005-2007	Total
D-D	57,427 (92.1%)	71,248 (92.9%)	113,916 (94.6%)	242,591 (93.5%)
D-DX	4,730 (7.6%)	5,384 (7.0)	6,433 (5.3%)	16,547 (6.4%)
D-DI	178 (0.3%)	70 (0.1%)	75 (0.1%)	323 (0.1%)
DX-D	4,936 (22.5%)	5,118 (21.5%)	6,147 (22.5%)	16,201 (22.2%)
DX-DX	16,344 (74.5%)	18,488 (77.6%)	20,900 (76.5%)	55,732 (76.3%)
DX-DI	657 (3.0%)	233 (1.0%)	261 (1.0%)	1,151 (1.6%)
DI-D	59 (17.4%)	20 (2.0%)	58 (4.9%)	137 (5.4%)
DI-DX	107 (31.6%)	159 (15.6%)	86 (7.2%)	352 (13.8%)
DI-DI	173 (51.0%)	843 (82.5%)	1,051 (87.9%)	2,067 (80.9%)
Total	84,611	101,563	148,927	335,101

Notes: Changes in the internationalization status can occur between 2000 and 2002, 2002 and 2004, 2005 and 2007. For example, firms in the D-DX group in 2000-2002 were still domestic firms (D) in 2000 which became exporters (DX) by 2002. *Total* refers to firm-year observations.

a company's status in 2000 to 2002, 2002 to 2004 and 2005 to 2007.⁴ In the context of this paper, we analyze firms that change their internationalization status and compare their firm characteristics to those of the respective group of non-changers. For testing our hypotheses empirically we differentiate the three main modes of internationalization, namely MNEs that are engaged in FDI (DI), exporters (DX) and domestic companies that neither export nor have foreign subsidiaries (D).

Table 1 Table 1 provides an overview of the internationalization status of the companies in the sample. The sample contains 335,101 firm-year observations with non-missing

⁴ Information stems from the AMADEUS updates no. 88, 113, 136, 146 and 168. Companies that were only observed in e.g. 2000 and 2004, or 2002 and 2005 had to be dropped from the sample. Moreover, given our data structure we implicitly assume that a company only changes its status once within the two year period.

values for the internationalization status and other major firm characteristics. The number of MNEs is relatively small, which might be due the high level of sunk costs that need to be incurred with FDI. For example, the dataset contains 1,051 continuing MNEs in 2005-2007, whereas the number of continuing domestic companies is more than one hundred times larger in the same period.

Given that international market integration tends to be highest for multinational firms, followed by exporters, domestic companies who rank lowest in this regard might continue operating as domestic firms (D-D) or they change upwards and become exporters (D-DX) or even establish foreign affiliates (D-DI). Exporting firms might change their mode of internationalization up- and downwards, i.e. they can be continuous exporters (DX-DX), become engaged in FDI (DX-DI) or stop exporting (DX-D). Finally, MNEs might either continue their foreign activities (DI-DI) or change downwards with respect to the mode of internationalization (DI-DX, DI-D).

On average 10.4% of all sampled French firms change their mode of internationalization within any observed two-year period between 2000 and 2007. The share of changers, however, varies to a large extent across the three company types. In particular, some 93.5% of the domestic companies retain their internationalization status, compared to only 76.3% for the exporters and 80.4% for the MNEs. While, correspondingly, some 6.5% of all domestic companies move upward in terms of their internationalization status in any of the two-year periods under study, only 1.6% of the exporting companies become multinationals. By contrast, some 19.2% of the multinationals reduce their foreign exposure in any two-year period, with most of them (13.8%) becoming exporters, but still 5.4% stopping to serve international markets altogether. Also among the exporters, we are much more likely to observe a downward change (22.2%) than an upward change.

Thus, we conclude that, while both investments and divestments are rather rare events, in absolute terms, their order of magnitude is roughly the same, keeping the share of each of the three company types in the population of companies quite stable over time. If anything, we see a slight tendency to increasing internationalization over time. Yet, since there are much more domestic companies in the population at each point in time, followed by the share of exporters, in relative terms divestment is a frequent event.

3.2 *Econometrics and Variable Description*

In our endeavour of analyzing the role of firm-characteristics for upward or downward changes in the mode of internationalization, given our data structure with the internationalization status of firms only being observed in a limited number of years, we refrain from applying an econometric panel data model. In particular, only a few companies engage internationally, so a long-term series of data would be needed to construct a representative panel of firms investing *and* divesting abroad. Instead, we estimate the transition probabilities for firms between two consecutive time periods, applying separate Multinomial Probit Models (MNP) conditional on the internationalization status in the respective starting period.

The MNP assumes that the decision unit chooses one of the mutually exclusive alternatives. In contrast to a Multinomial Logit Model, MNP relaxes the restrictive Independence of Irrelevant Alternatives (IIA) assumption. According to the IIA, the ratios of the probabilities of any two choices do not depend on the presence of other choices in the choice set. Instead, the MNP allows for correlations between the alternatives of the dependent variable.

In our analysis, firms can continue their mode of internationalization or change it until the end of the period. The observed final mode j of internationalization y_{ij} for firm i is linked with its latent counterpart y_{ij}^* that can be written as follows

$$y_{ij}^* = \beta_j' x_i + \varepsilon_{ij} \text{ with } i = 1, \dots, N; j = 1, 2, 3$$

where ε_{ij} is distributed according to a multivariate normal distribution allowing for correlations across choices j , y_{ij}^* is the unobserved latent variable, and β_j are the choice-specific parameter estimates for the vector of firm-specific exogenous variables x_i . The parameter estimates can be efficiently obtained by using the so-called GHK (Geweke-Hajivassiliou-Keane) simulator (see Geweke et al., 1994).

Table 2 provides a statistical summary of the explanatory variables separated by initial internationalization status.⁵ In essence, there are three samples of firms with 259,461 domestic firms, 73,084 exporters and 2,556 MNEs. All firm-specific factors refer to the parent company and are taken from the starting year, e.g. from 2000 for analysing

⁵ An extended version of Table 2 is provided in the Appendix.

company decisions between 2000 and 2002. Following most of the internationalization literature, the *productivity* measure refers to total factor productivity (TFP). Applying the procedure suggested by Levinsohn and Petrin (2003), consistent estimates of firm-level TFP are obtained from a Cobb-Douglas production function.⁶ The descriptive statistics in Table 2 confirm the expected productivity ranking with MNEs exhibiting the highest productivity, followed by exporters and domestic companies.⁷

The ownership structure of the firm is used as a proxy for the underlying strategic interests of its owners. External ownership is defined as a direct investment, if a financial or non-financial owner holds 10% or more of the equity of a French enterprise (OECD 2008b). An ownership share of at least 10% ascertains an effective voice in the management of the company, implying that the investor is able to decisively influence the company's course. The ownership structure is captured by the three dummy variables *corporate shareholder*, *corporate shareholder* \times *foreign* and *financial shareholder*. The interaction term *corporate shareholder* \times *foreign* is defined to test for significant differences between domestic and foreign corporate investors.

The number of firms with at least one foreign financial shareholder is very low and thus, an interaction term is not meaningful. Firms with only individual shareholders serve as a reference group. MNEs exhibit the highest percentage of firms with corporate and financial owners, 76.0% and 12.8% respectively. In contrast, only 29.2% of the exporters and 10.5% of the domestic firms have corporate shareholders. Similarly, a mere 1.1% and 2.7% of the exporters and domestic firms have financial owners, respectively.

The multi-unit characteristic is further measured by the number of a firm's *domestic subsidiaries*. The descriptive statistics reveal that MNEs have, on average, 2.46 domestic subsidiaries whereas only a minority of the exporters and domestic companies have established a domestic affiliate. We further include some measures of the firm's financial performance. In his theoretical model, Chaney (2005) argues that financially constrained

⁶ Levinsohn, Petrin and Poi (2003) provide a STATA command (*levpet*) to implement their TFP estimations. The TFP value corresponds to the residual obtained from a firm-specific logarithmized Cobb-Douglas production function. In contrast to labour productivity, which measures turnover per employee, TFP has no obvious scaling or natural base values thereby impeding a direct interpretation.

⁷ For comparison: The TFP value for exporters in our sample is around the size than the TFP in the sample of Greenaway et al. (2007). However, exporters in our sample are remarkable smaller than in Greenaway's study and thus, economies of scale might matter to a lower extent.

Table 2: Definition and summary statistics of the explanatory variables

Variable	Definition	D	DX	DI
Productivity				
Productivity	Total factor productivity (TFP) (in logs)	2.57 <i>1.00</i>	2.87 <i>1.06</i>	3.36 <i>1.33</i>
Multi-unit and ownership structure				
Corporate shareholder (d)	= 1, if at least one corporate shareholder with ownership share >10%	0.105 <i>0.31</i>	0.292 <i>0.45</i>	0.760 <i>0.43</i>
Corporate*foreign shareholder (d)	= 1, if foreign corporate shareholder with ownership share >10%	0.006 <i>0.08</i>	0.043 <i>0.20</i>	0.136 <i>0.34</i>
Financial shareholder (d)	= 1, if at least one financial shareholder with ownership share >10%	0.011 <i>0.10</i>	0.027 <i>0.16</i>	0.128 <i>0.33</i>
Domestic subsidiaries	Number of domestic subsidiaries	0.073 <i>0.80</i>	0.218 <i>0.96</i>	2.460 <i>6.29</i>
Financial characteristics				
Cash flow ratio	Cash flow / tangible fixed assets	1.22 <i>28.4</i>	1.28 <i>15.2</i>	1.66 <i>3.3</i>
Current liability ratio	Current liabilities / total assets	0.562 <i>0.22</i>	0.508 <i>0.15</i>	0.524 <i>0.21</i>
Non-current liability ratio	Non-current liabilities / total assets	0.125 <i>0.16</i>	0.079 <i>0.10</i>	0.101 <i>0.10</i>
Basics				
Employees	Number of employees	18.96 <i>490.4</i>	54.51 <i>871.2</i>	663.65 <i>4149.3</i>
Age	Age of company	17.23 <i>12.6</i>	23.88 <i>17.6</i>	34.08 <i>25.6</i>
Capital intensity	Total assets / employees	23.32 <i>611.0</i>	20.61 <i>502.2</i>	28.84 <i>78.7</i>
Year dummies				
y2000 (d)	= 1, if company is observed in the 2000-2002 period	0.240 <i>0.43</i>	0.300 <i>0.46</i>	0.133 <i>0.34</i>
y2002 (d)	= 1, if company is observed in the 2002-2004 period	0.296 <i>0.46</i>	0.326 <i>0.47</i>	0.412 <i>0.49</i>
y2005 (d)	= 1, if company is observed in the 2005-2007 period	0.464 <i>0.50</i>	0.374 <i>0.48</i>	0.456 <i>0.50</i>
Number of observations		259,461	73,084	2,556

Note: D, DX and DI represent the initial internationalization status of firms in 2000, 2002 or 2005. Reported is the mean and standard deviation (in italics) of the main explanatory variables. Dummy variables are indicated by (d). Control dummies include legal type, regional and industry and dummies. The descriptive statistics including all control dummies are available upon request.

firms may have some disadvantages in entering foreign markets. However, recent empirical evidence of Greenaway et al. (2007) and Stiebale (2010) on export participation is rather mixed. Nonetheless, the importance of financial restrictions may increase with the level of sunk costs and thus, have a major impact on the mode of internationalization. Therefore, we consider three different measure of financial performance in this paper.

A company can fail to finance its internationalization because of a cash shortage even while being profitable. In line with literature on investment and financial constraints we first use the *cash flow ratio* defined as cash flow divided by tangible fixed assets. With a

figure of 1.66, MNEs exhibit a higher cash flow ratio than exporters and domestic companies who have ratios of approximately 1.2. Like Stiebale (2010), we do not detect any difference in the cash flow ratio between exporters and domestic firms.

Borrowing constraints constitute a major investment barrier and two further indicators of this barrier address a firm's ability to finance foreign investments. The *current liability ratio*, defined as current liabilities to total assets, represents short-term debt which needs to be re-paid within one year. In contrast, the *non-current liability ratio*, defined as non-current liabilities to total assets, represents long-term liabilities that a company is not required to repay within the next 12 months.⁸ The latter one is also used by Stiebale (2010) and Greenaway et al. (2007). Companies with high liabilities might face internal problems in financing their international growth strategy. Moreover, these debt obligations can also influence the cost for external credit since creditors usually prefer a high liquidity ratio in order to reduce their short-term risk exposure. Both financial indicators suggest that exporters have lower debt levels than domestic firms. Stiebale (2010) and Greenaway et al. (2007) derive the same conclusion.

Because factors such as economies of scale, learning curves, technological differences and the impact of the local environment will affect different companies in varying degrees, our study also took into account firm *age* to pick up learning effects as well as firm *size* and *capital intensity* to control for economies of scale. The larger the firm and the higher its capital intensity, the larger the economies of scale tend to be. Capital intensity is measured as total assets over the number of employees. A comparison of the indicators across groups reveals higher levels of international integration correspond on average to larger and older firms. Not surprisingly, MNEs display on average the highest capital intensity, and the capital intensity of domestic companies is significantly larger than for exporters.

Several *industry dummies* based on the two-digit NACE classification and *legal form dummies* capture remaining firm-specific heterogeneity. *Regional dummies* based on the first-level NUTS⁹ classification control for effects of firm's local environment and *year dummies* are included to pick up business cycle effects or secular trends.

⁸ Alternatively, we have constructed these liability ratios by using tangible fixed assets in the denominator (instead of total assets). The main results remain unchanged. Using total assets has the advantage that current assets are also taken into account.

⁹ The NUTS (Nomenclature des Unités Territoriales Statistiques) classification is the standard statistical geographic code for the regional sub-division of a country in the European Union.

4. Results

For the purpose of estimation, we split the total sample of firms in three subsets according to the firm's initial internationalization status. Separate regressions are estimated for all three subsets in order to empirically test our hypotheses. In each subset, firms decide whether they keep their current status or whether they switch to one of the two other internationalization states. In Section 4.1 we investigate whether and how *domestic companies* internationalize (via exporting or FDI). Section 4.2 analyses the role of firm-specific factors on the decision of *exporters* to stay or to leave the export market, or to become engaged in FDI. Finally, the transition probabilities of *MNEs* that can either continue or cease all their foreign operations are estimated in Section 4.3.

4.1 Internationalization of Domestic Companies

Our first sample of firms focuses on domestic companies which are confronted with the alternatives to either continue serving only the domestic market or to internationalize via exporting or FDI. Columns (1) to (2) of Table 3 present the marginal effects, calculated at the means of the independent variables, from a multinomial probit model explaining the transition choices of continuing domestic companies (D-D) (reference group), export starters (D-DX) and firms that become engaged in FDI (D-DI).

We clearly find that domestic firms with a higher productivity are more likely to enter international markets. Our estimates suggest that when productivity increases from 2.57 by one unit (i.e. equal to an increase of 40%), *ceteris paribus*, the likelihood of becoming an exporter increases by 0.34 percentage points and to become a MNE by 0.006 percentage points. Despite the large variation in productivity levels, foreign market entry constitutes a rare event as the predicted probability of domestic companies to start exporting is approximately 5.31% and less than 0.002% to become engaged in FDI. Evaluated at the sample mean, the transition probability of export starters increases from 5.31% to 5.65% ($5.31 + 0.34$) when a firm's productivity is increasing by one unit. Thus, even a large positive productivity shock implies that the transition probability to become an exporter tends to increase only slightly, albeit significantly.

Ownership information is quite important for predicting any changes in the mode of internationalization of domestic companies. Companies with a corporate shareholder are substantially more likely to start exporting, with a marginal effect (i.e. the effect of a discrete change) of 2.13 percentage points. This marginal effect is even as large as 5.08

Table 3: Foreign market entry by domestic companies

	Multinomial probit model		Rare event logit model
	base group D-D D-DX Marginal effect	D-DI Marginal effect	base group D-DX D-DI Marginal effect
Productivity			
Productivity	0.00341*** (7.36)	0.0000557*** (3.52)	0.00127*** (3.59)
Multi-unit and ownership structure			
Corporate shareholder (d)	0.0213*** (12.77)	0.00123*** (5.57)	0.0140*** (5.84)
Corporate*foreign shareholder (d)	0.0295*** (4.95)	0.000197 (1.50)	0.000573 (0.36)
Financial shareholder (d)	0.0133*** (3.08)	0.000240 (1.45)	0.00679* (1.73)
Domestic subsidiaries	-0.000339 (0.65)	0.0000171** (2.27)	0.00112*** (3.49)
Financials			
Cash flow ratio	- 2.61*10 ⁻⁶ (0.47)	7.25*10 ⁻⁰⁸ (0.62)	0.0000176** (2.00)
Current liability ratio	0.000302 (0.39)	-0.0000754 (1.54)	-0.00292* (1.88)
Non-current liability ratio	-0.0456*** (11.58)	-0.0000336 (0.60)	0.00199** (2.24)
Basics			
Employees	- 1.91*10 ⁻⁰⁷ (0.15)	1.83*10 ⁻⁰⁸ *** (2.75)	2.78*10 ⁻⁰⁶ ** (2.04)
Age	0.000127*** (3.58)	2.79*10 ⁻⁰⁶ *** (2.99)	0.0000391* (1.86)
Capital intensity	0.00 (0.45)	- 2.03*10 ⁻⁰⁷ * (1.95)	- 1.42*10 ⁻⁰⁷ *** (2.64)
Number of observations	259,461		16,870
Pr(change)	0.0531	0.0002	0.0062

Notes: Reported are the marginal effects (ME), evaluated at the means, from a multinomial probit regression. D-D is the base group in the multinomial probit model. D-DX is the base group in the rare event logit model. Control dummies are included for the industry, region, sample year and legal type of the companies. The entry (d) indicates that we report the estimated effect of a discrete change of dummy variable from 0 to 1. Pr(change) reports the predicted probability to change from D to DX and DI, respectively. The z-statistics are reported in parentheses, * p<0.10, ** p<0.05, *** p<0.01.

percentage points if the corporate shareholder is foreign. A significant, albeit much lower marginal effect of 0.12 percentage points is observed for the decision to become a multinational. For this decision we do not find any additional evidence regarding foreign shareholders. In addition to corporate ownership, having a financial shareholder makes

moving from being a domestic company to being an exporter significantly more likely, by some 1.33 percentage points. We also find evidence suggesting that the number of domestic subsidiaries is a strong predictor of the likelihood that a company directly jumps from serving only the domestic market to being a multinational.

The findings for the financial indicators are mixed. Firms with a high non-current liability ratio exhibit a significantly lower likelihood to become exporters. This finding might indicate a disciplinary function of high debt levels as suggested by Jensen (1986). He argues that debt may have an important control function in high-leverage firms, since repayment of debts limits the free cash flow. While non-current liabilities are binding over a long period of time, business activities cannot expand very quickly. Yet, one should be cautious when interpreting this correlation in causal terms, since unobservable characteristics (e.g., international experience and orientation of the management) tend to influence both the mode of internationalization and firm's liquidity. For example, Stiebale (2010) detects a significantly positive estimate for liquidity in pooled Probit and Tobit models thus explaining the export behavior of French manufacturing firms. However, the estimates for cash flow lose their significance once he controls for time-invariant unobserved heterogeneity in a dynamic analysis. In summary, we conclude that in practical terms, problems of financial liquidity constitute a relative minor impediment for foreign market entry even though financial theories discuss them extensively.

Confirming recent findings of other scholars, size and age of a company display positive and significant effects on the probability to internationalize (e.g., Bernard and Jensen 1999, 2004). Interestingly, export starters are not larger in terms of numbers of employees than continuing domestic firms which indicates that exporting initially does not necessarily require a larger workforce. Finally, higher capital intensity even reduces the probability of a domestic company to become engaged in FDI, although the estimated effect is very small.

In a supplementary rare event logit regression (Tomz et al. 1999), reported in column (3), we explore the decision between the two internationalization modes in more detail. The dependent variable takes the value 1 if a domestic company has decided to become engaged in FDI and the value 0 if it has decided to become an exporter. Larger, older and more productive companies are more likely to enter foreign markets via FDI. Thus, the productivity ranking postulated by Helpman et al. (2004) is clearly confirmed. Firms with corporate and/or financial owners are generally more likely to internationalize via FDI

instead of exporting, but it is irrelevant, whether the corporate owner is foreign. Finally, the results confirm that a firm with a higher number of domestic subsidiaries favours internationalizing via FDI. The significant differences regarding firms size, age, and capital intensity suggest that firms investing abroad are a selective group compared to firms that merely become exporters.

4.2 Foreign Market Participation of Exporters

Based on our second sample of firms we now analyze the internationalization behaviour of French exporters in a multinomial probit model. They can either remain exporters (DX-DX) (reference group), become engaged in FDI (DX-DI) or retreat from exporting (DX-D). The regression results are presented in Table 4. We find that more productive exporters are significantly more likely to become engaged in FDI and significantly less likely to cease their export operations. Thus, our results suggest that productivity exerts a positive effect on export entry (Section 4.1) as well as on continuing or even expanding the export activity. Numerically, the marginal effect of an increase in productivity is larger, by an order of magnitude, on the decision to exit the foreign market. This is quite in line with the fact that exit decisions (downward) are much more frequent than exporters' decisions to move even further up in terms of internationalization mode.

Furthermore, our results suggest that exporters with corporate and financial shareholders are more likely to become engaged in FDI and less likely to stop their exporting operations. The latter result is by and large in line with other empirical studies (e.g., Roberts and Tybout 1997, Roper et al. 2006). Marginal effects are quantitatively more pronounced for the exit decision. For example, the existence of a financial owner increases the likelihood for exporters to become multinational by 1.07 percentage points whereas it decreases the likelihood to cease exporting by 4.26 percentage points. Overall, our findings document that both corporate and financial ownership correlate positively with the decision to start exporting (D-DX in Table 3) and negatively with the decision to leave the export market.

With respect to economic significance, the predicted transition probability to become engaged in FDI differs substantially from 0.72% for exporters without foreign corporate shareholders to 1.75% for exporters with corporate shareholders. Similarly, the predicted probability to exit the export market decreases considerably from 20.9% to 12.4% for exporters with foreign corporate owners. Thus, moving between domestic markets only and exporting is not only affected relatively symmetrically by corporate ownership, but –

Table 4: Foreign market entry and exit by exporters

Multinomial probit model base group DX-DX	DX-DI Marginal effect	DX-D Marginal effect
Productivity		
Total factor productivity	0.00184*** (5.13)	-0.0191*** (9.21)
Multi-unit and ownership structure		
Corporate shareholder (d)	0.00933*** (10.33)	-0.0400*** (10.56)
Corporate*foreign shareholder (d)	0.000949 (0.86)	-0.0455*** (5.42)
Financial shareholder (d)	0.0107*** (3.98)	-0.0426*** (4.54)
Domestic subsidiaries	0.00135*** (6.20)	-0.00256 (0.89)
Financials		
Cash flow ratio	- 1.59*10 ⁻⁰⁶ (0.20)	-0.000141* (1.88)
Current liability ratio	-0.00241** (2.37)	0.0271*** (4.00)
Non-current liability ratio	0.00362*** (4.03)	0.0369*** (3.88)
Basics		
Employees	3.70*10 ⁻⁰⁷ (1.57)	4.56*10 ⁻⁰⁶ (1.17)
Age	0.0000493*** (3.67)	-0.00118*** (10.74)
Capital intensity	1.75*10 ⁻⁰⁸ (0.15)	- 1.62*10 ⁻⁰⁷ (0.08)
Number of observations	73,084	
Pr(change)	0.0072	0.209

Notes: Reported are the marginal effects (ME), evaluated at the means, from a multinomial probit regression. DX-DX is the base group. Control dummies are included for the industry, region, sample year and legal type of the companies. The entry (d) indicates that we report the estimated effect of a discrete change of dummy variable from 0 to 1. Pr(change) reports the predicted probability to change from DX to DI and D, respectively. The z-statistics are reported in parentheses, * p<0.10, ** p<0.05, *** p<0.01.

in both directions – even more so by foreign corporate ownership. Taken together, ownership effects can make quite some difference to companies' internationalization behaviour.

In line with previous findings for the D-DI decision, a larger network of domestic subsidiaries tends to increase exporter's likelihood to expand international activities further by establishing foreign subsidiaries. This might reflect learning effects, as firms with domestic subsidiaries might be more efficient in establishing foreign affiliates.

While the current cash flow seems to be quite irrelevant for an exporter's decision of whether to expand the international engagement even further, a low cash flow tends to significantly decrease the likelihood of ceasing export activities (DX-D). Quantitatively of a different order to magnitude, the current liability ratio significantly increases the likelihood to stop exporting and decreases the likelihood to intensify the engagement in foreign markets via FDI. Interestingly, a higher non-current liability ratio increases both the propensity to invest abroad as well as to stop exporting. It might well be that the inflow of external finance is important for an upward change from exporting to FDI in order to tackle the substantial increase in sunk costs associated with changing the mode of internationalization upwards. By contrast, the downward change might reflect poor financial performance, indicated by a high level of non-current liabilities.

Finally, while firm size and capital intensity seem irrelevant in these estimations, more mature firms are found to be more likely to retain their export activities or expand even further via FDI than younger firms.

4.3 Divestment Decisions by MNEs

Our final analysis concentrates on the 2,556 MNEs that either continue to be engaged in FDI (DI-DI) or that divest all their foreign affiliates in order to become exporters (DI-DX) or to fully retreat from international markets (DI-D). The regression results from a multinomial probit model are presented in Table 5. While our findings in Section 4.1 and 4.2 suggest that productivity is a strong driver for the internationalization of firms, productivity does not exhibit any significant impact on the decision of MNEs to reduce their international activities to exporting or to even exit international markets altogether. Thus, it seems that the decision to engage in FDI is influenced severely by the consideration that future profitability must be sufficient to recoup high sunk cost which have to be borne up-front. However, once that decision is taken, MNEs are obviously prepared to suffer through phases of low productivity before ceasing their international engagement. To probe this any further, one would need to observe a number of years directly after entry into the foreign market.

Table 5: Foreign divestments of MNEs

Multinomial probit model base group DI-DI	DI-DX Marginal effect	DI-D Marginal effect
Productivity (parent level)		
Total factor productivity	0.0046019 (0.81)	-0.0017777 (0.58)
Multi-unit and ownership structure		
Corporate shareholder (d)	-0.0144446 (0.89)	-0.0042734 (-0.47)
Corporate*foreign shareholder (d)	-0.0411269** (2.26)	-0.011332 (1.07)
Financial shareholder (d)	0.0760394*** (3.21)	0.0040351 (0.36)
Domestic subsidiaries	0.0019922* (1.74)	0.0019741*** (4.30)
Financial characteristics		
Cash flow ratio	$3.08*10^{-06}$ (0.28)	$5.95*10^{-07}$ (0.11)
Current liability ratio	-0.0047067 (0.17)	-0.0304243** (1.82)
Non-current liability ratio	-0.0221383 (0.44)	-0.0263727 (0.88)
Basics		
Employees	$-7.56*10^{-06}$ (1.32)	$5.20*10^{-08}$ (0.05)
Age	-0.0002841 (1.03)	-0.0003321** (1.99)
Capital intensity	-0.0002442* (1.72)	0.0000126 (0.27)
Number of observations	2,556	
Pr(change)	0.122	0.038

Notes: Reported are the marginal effects, evaluated at the means, from a multinomial probit regression. DI-DI is the base group. Control dummies are included for the industry, region, sample year and legal type of the companies. The z-statistics are reported in parentheses. Pr(change) reports the predicted probability to change from DI to DX and D, respectively. The entry (d) indicates that we report the estimated effect of a discrete change of dummy variable from 0 to 1, * p<0.10, ** p<0.05, *** p<0.01.

While corporate ownership, taken by itself, is quite irrelevant for MNEs divestment decisions, MNEs with foreign corporate shareholders display a significantly lower propensity to change their mode of internationalization downward from FDI to exporting only. Thus, foreign corporate owners play a key role for firms' global market integration by enhancing the probability of entry and lowering the exit probability. This finding contradicts the view that foreign-owned parent companies have larger possibilities to shift resources from one affiliate to another and thus, the probability to divest should be higher. One possible explanation could be that foreign affiliates of foreign-owned parent companies already fit the trans-national strategy of the foreign owners. It is probable that ownership changes on the parent company level imply changes in the global strategy and thus, the existing firm network of the parent company might not fully fit the strategy of the new owner. Consequently, the probability to divest from abroad should be higher in case of ownership changes. However, due to the small number of observations we are not able to empirically analyze the effects of ownership changes at the parent company level.

In contrast, having a financial owner increases the likelihood of a MNE to become a pure exporter by some 7.6 percentage points. This finding would support the argument that financial investors are more interested in higher returns on their investments than in a sustainable and long-term business development of the target firm. The estimated effects of the ownership variables in the DI-D case, however, are all insignificant.

The existence of domestic subsidiaries increases the likelihood of a downward change for MNEs for both divestment modes. While Bernard and Jensen (2007) detect a significant positive effect of domestic plant closure, we confirm this finding for divestment of foreign affiliates. Specifically, evaluated at the sample mean, the predicted divestment probability increases by 0.2 percentage points for each additional domestic subsidiary.

The estimated effects of the financial variables are mainly insignificant. Thus, while we and other scholars find mixed empirical results for the entry decision, our data also reveal that MNE's financial performance at home has little predictive power regarding complete foreign divestments. Similarly, the size of the company, measured by the number of employees at the headquarters, does not allow differentiation between continuing and exiting MNEs. Finally, older MNEs are less likely to fully stop their foreign market engagement although the absolute effect of age on the predicted divestment probability is rather small.

5. Conclusion

In this paper we analyze the internationalization behavior of more than 300,000 French MNEs, exporters and domestic companies between 2000 and 2007. Our data depicts a rather balanced situation of companies increasing or decreasing their international engagement. If anything, we observe a slight tendency to increasing internationalization over time. Given that the population at risk is larger, by orders of magnitude, for those who only serve domestic markets, as compared to exporting companies or even multinationals, transition probabilities are relatively high regarding the exit decisions. Yet, there are important symmetries in the economic explanation of upward and downward decisions, in particular regarding ownership. But we also observe a significant asymmetry with respect to the role of productivity for these decisions.

First, based on the Hopenhayn (1992) model our results clearly confirm that productivity has a strong and positive effect on export participation. Moreover, high-productivity companies are more likely to start and continue exporting. In line with other recent empirical findings, we do not find that the financial performance has a significant influence on the export decision. Furthermore, given that the ownership structure and corporate governance is key for the internationalization of a company, we find that firms with financial, domestic and foreign corporate shareholders are more likely enter the export market as well as less likely to exit this market. Thus, new and existing exporters do seem to profit from the financial resources and the existing international networks of their owners.

The FDI participation deserves a special focus as we observe that key determinants affect FDI and export decisions differently. In line with economic theory and empirical findings for the export decision, productivity enhances the likelihood of domestic companies and exporters to become engaged in FDI. However, apparently productivity does not have a significant influence on the divestment decision. This result contradicts the view that productivity affects foreign market entry and exit rather symmetrically. While high-productivity firms become export starters and continue exporting, high-productivity firms who invest abroad are generally tolerant of low productivity performance, before reversing their investment decision. It is probable that high levels of sunk cost, potential re-entry cost related to FDI as well as knowledge spillover from foreign affiliates to the parent company might prevent an immediate market exit even if MNEs or their affiliates are underperforming.

Analogously to the export participation, the findings for the financial indicators remain mixed for explaining FDI participation. Finally, domestic companies and exporters are more likely to start FDI operations if they have corporate or financial shareholders. With respect to the decision to divest all foreign affiliates, corporate shareholders increase the likelihood of retaining these international operations. In contrast, financial owners increase the probability of divestiture. The latter finding might partially illustrate the underlying strategic interest of corporate investors often assumed to be mainly interested in the business development of their affiliated companies whereas the concentration of core competences is key for financial investors like banks and insurances.

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6. Appendix

Extended Table 2: Definition and summary statistics of the explanatory variables

Variable	Definition	Parent companies		
		D	DX	DI
Productivity				
Productivity	Total factor productivity (TFP) (in logs)	2.57	2.87	3.36
		1.00	1.06	1.33
	Labour productivity (in logs)	4.71	5.23	5.54
		0.76	0.87	0.96
Ownership structure				
Corporate shareholder (d)	= 1, if at least one corporate shareholder with ownership share >10%	0.105	0.292	0.760
		0.31	0.45	0.43
Corporate*foreign shareholder (d)	= 1, if foreign corporate shareholder with ownership share >10%	0.006	0.043	0.136
		0.08	0.20	0.34
Financial shareholder (d)	= 1, if at least one financial shareholder with ownership share >10%	0.011	0.027	0.128
		0.10	0.16	0.33
Individual shareholder (d)	= 1, if at least one individual shareholder with ownership share >10%	0.275	0.358	0.282
		0.45	0.48	0.45
State shareholder (d)	= 1, if at least one state shareholder with ownership share >10%	0.001	0.004	0.062
		0.03	0.06	0.24
Other shareholders (d)	= 1, if e.g. cooperative	0.002	0.005	0.042
		0.04	0.07	0.20
Missing shareholder (d)	= 1, if no shareholder information is provided	0.638	0.396	0.079
		0.48	0.49	0.27
Domestic subsidiaries	Number of domestic subsidiaries	0.07	0.22	2.46
		0.80	0.96	6.29
Financial characteristics				
Cash flow ratio	Cash flow / tangible fixed assets	1.22	1.28	1.66
		28.4	15.2	3.3
Current liability ratio	Current liabilities / total assets	0.562	0.508	0.524
		0.22	0.15	0.21
Non-current liability ratio	Non-current liabilities / total assets	0.125	0.079	0.101
		0.16	0.10	0.10
Basics				
Employees	Number of employees	18.96	54.51	663.65
		490.4	871.2	4149.3
Age	Age of company	17.23	23.88	34.08
		12.6	17.6	25.6
Capital intensity	Total assets / employees	23.32	20.61	28.84
		611.0	502.2	78.7
Control dummies				
Legal type dummies				
SA (d)	= 1, if company is a SA (Société en action simple)	0.068	0.164	0.366
		0.25	0.37	0.48
SA Directoire (d)	= 1, if company is an SA Directoire	0.006	0.020	0.063
		0.08	0.14	0.24
SAS (d)	= 1, if company is a SAS (Société anonyme)	0.138	0.338	0.484
		0.35	0.47	0.50
SARL (d)	= 1, if company is a SAS (Société anonyme)	0.776	0.459	0.052
		0.42	0.50	0.22
Regional dummies				
Île de France (d)	= 1, if company is located in Île de France (Greater Paris)	0.163	0.254	0.437
		0.37	0.44	0.50
Bassin Parisien (d)	= 1, if company is located in Champagne-Ardenne, Picardie, Normandy, Centre or Burgundy	0.158	0.147	0.114
		0.36	0.35	0.50
Nord-Calais (d)	= 1, if company is located in Nord-Pas-de-Calais	0.047	0.054	0.034
		0.21	0.23	0.18
East (d)	= 1, if company is located in Lorraine, Alsace or Franche-Comté	0.066	0.086	0.062
		0.25	0.28	0.24
East-Central (d)	= 1, if company is located in Rhône-Alpes or Auvergne	0.166	0.162	0.131
		0.37	0.37	0.34
Mediterranean (d)	= 1, if company is located in Languedoc-Roussillon, Provence-Alpes-Côte d'Azur or Corsica	0.146	0.112	0.064
		0.35	0.32	0.24
South-West (d)	= 1, if company is located in Aquitaine, Midi-Pyrénées, Limousin	0.130	0.104	0.070
		0.34	0.32	0.25
West (d)	= 1, if company is located in Pays de la Loire, Brittany or Poitou-Charentes	0.122	0.080	0.088
		0.33	0.27	0.03

Extended Table 2 (continued): Definition and summary statistics of the explanatory variables

Variable	Definition	Parent companies		
		D	DX	DI
Industry dummies				
NACE 15-16	= 1, if manufacture of food products, beverages and tobacco	0.037 0.19	0.034 0.18	0.053 0.22
NACE 17-19	= 1, if manufacture of textiles and leather products	0.005 0.07	0.033 0.18	0.056 0.23
NACE 20	= 1, if manufacture of wood and wood products	0.008 0.09	0.018 0.13	0.008 0.09
NACE 21-22	= 1, if manufacture of pulp, paper and paper products; publishing and printing	0.016 0.13	0.042 0.20	0.030 0.17
NACE 23-24	= 1, if manufacture of chemicals, chemical products and refined petroleum products	0.002 0.05	0.020 0.14	0.067 0.25
NACE 25	= 1, if manufacture of rubber and plastic products	0.004 0.65	0.025 0.16	0.033 0.18
NACE 26	= 1, if manufacture of other non-metallic mineral products	0.008 0.87	0.010 0.10	0.016 0.13
NACE 27-28	= 1, if manufacture of basic metals and fabricated metal products	0.032 0.18	0.083 0.28	0.072 0.26
NACE 29	= 1, if manufacture of machinery and equipment	0.013 0.11	0.042 0.20	0.092 0.29
NACE 30-33	= 1, if manufacture of electrical and optical equipment	0.015 0.12	0.039 0.19	0.090 0.29
NACE 34-35	= 1, if manufacture of transport equipment	0.004 0.06	0.014 0.12	0.028 0.16
NACE 36	= 1, if manufacture of furniture	0.009 0.09	0.021 0.14	0.018 0.13
NACE 37	= 1, if recycling	0.002 0.05	0.007 0.08	0.002 0.04
NACE 40-41	= 1, if electricity, gas and water supply	0.010 0.03	0.000 0.02	0.002 0.05
NACE 45	= 1, if construction industry	0.220 0.41	0.035 0.18	0.031 0.17
NACE 50	= 1, if sale, maintenance & repair of motor vehicles and motorcycles	0.073 0.260	0.056 0.230	0.006 0.079
NACE 51	= 1, if wholesale trade & commission trade, except of motor vehicles & motorcycles	0.083 0.28	0.259 0.44	0.173 0.38
NACE 52	= 1, if retail trade, except of motor vehicles and motorcycles	0.160 0.37	0.097 0.30	0.029 0.17
NACE 55	= 1, if hotels and restaurants	0.117 0.32	0.010 0.10	0.007 0.01
NACE 60-64	= 1, if transport, storage and communication	0.020 0.14	0.041 0.20	0.030 0.17
NACE 65-67	= 1, if financial intermediation	0.002 0.05	0.001 0.03	0.006 0.08
NACE 70	= 1, if real estate activities	0.022 0.15	0.008 0.09	0.009 0.09
NACE 71	= 1, if renting of machinery and equipment	0.006 0.08	0.005 0.07	0.009 0.09
NACE 72	= 1, if computer services	0.013 0.11	0.023 0.15	0.044 0.20
NACE 73-74	= 1, if R&D and other business activities	0.051 0.22	0.052 0.22	0.075 0.20
NACE 80	= 1, if education	0.005 0.07	0.003 0.05	0.001 0.03
NACE 85	= 1, if health and social work	0.020 0.14	0.003 0.05	0.000 0.02
NACE 90-93	= 1, if other community, social and personal service activities	0.052 0.22	0.017 0.13	0.013 0.11
Year dummies				
y2000 (d)	= 1, if company is observed in the 2000-2002 period	1.000 0.240 0.43	1.000 0.300 0.46	1.000 0.133 0.34
y2002 (d)	= 1, if company is observed in the 2002-2004 period	0.296 0.46	0.326 0.47	0.412 0.49
y2005 (d)	= 1, if company is observed in the 2005-2007 period	0.464 0.50	0.374 0.48	0.456 0.50

Note: D, DX and DI represent the initial internationalization status of firms in 2000, 2002 or 2005. Reported is the mean and standard deviation (in italics) of the explanatory variables. Due to low number of observations in some groups were further merged those into larger groups (e.g. industries). Dummy variables are indicated by (d).