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# Foreign market entry and exit: Performance dynamics of French Firms

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## **Foreign market entry and exit: Performance dynamics of French Firms**

**Abstract:** ‘Being international’ has nearly become an undisputed aim for firms in a globalized world. Often, however, we do not know much about the actual performance consequences of firms’ foreign market entries as well as exits. We apply a propensity score matching technique in combination with a difference-in-difference estimator to analyse the performance dynamics of French firms that have entered and left international markets during the period 2000-2007. Market entry has on average a positive home market effect in terms of productivity and turnover, whereas employment is hardly affected. Former exporters becoming engaged in FDI experience a strong export growth, indicating that FDI is rather complementing than substituting export activities. Overall, market exit has only limited effects on domestic performance, but industry differences reveal that low-tech firms are confronted with a remarkable decrease in labour productivity.

## **1. Introduction**

Policymakers worry that foreign investments imply a significant relocation of jobs from home to host countries. From a theoretical point of view, switching from exporting to FDI might substitute export activities to some extent which in turn can reduce the demand for labour at home. However, as the emerging empirical literature suggests there are no substantial negative effects of FDI on home employment (e.g. Barba Navaretti and Castellani 2008, Becker and Muendler 2008, Desai et al. 2009). It is probable that the empirical relationship between FDI and export is the key to understanding this finding. Empirical papers mostly fail to detect a significant negative correlation between FDI and export activities which might explain why FDI does not necessarily substitute jobs at home plants. To our knowledge there is no empirical study which analyses the FDI and export relationship in conjunction with firm's performance at home. This chapter aims to fill this research gap. Based on a large database for French firms and applying propensity score matching combined with a difference-in-difference estimator it can be shown that FDI and exporting are rather complementary and mutually reinforcing internationalization activities than substituting each other.

By analyzing both the effects of investing abroad and foreign divestments we provide a more comprehensive analysis on the effects of FDI decision. Moreover, this chapter is one of the first studies analysing the home performance of MNEs that cease all foreign operations. Policy makers may hope for home employment gains as firms transfer operations back home in case of foreign divesture. One may further expect that divesting firms aim at re-gaining their profitability by postponing investments, laying off employees and as a consequence, firms may even exit the domestic market. The theoretical predictions are not clear cut and thus, it remains an empirical question whether foreign divestures exhibit a positive or negative effect on home performance.

The remainder of the chapter is organized as follows: Section 2 contains a brief review of literature. Section 3 describes the economic strategy to identify causal effects. Section 4 informs about the data in our study. Section 5 presents and discusses the estimation results. Section 6 gives a final conclusion.

## 2. Background

### 2.1 *Effects of investing abroad on home enterprises*

The debate of home market effects from FDI is often linked to the actual type of FDI, namely horizontal and vertical FDI. Resource-seeking (vertical) FDI might affect home plant output and employment negatively and productivity positively in the short-term as some production processes are relocated to exploit cost advantages at the foreign location. In the long-term, however, positive backward effects on output and employment based on reducing the cost of production may dominate which then allows to decrease product prices and thus, could induce higher demand at home.

Market-driven (horizontal) FDI might not affect home employment if there is no other efficient opportunity to serve foreign markets otherwise. Moreover, extensive intra-firm trade between the headquarters and their foreign affiliates can even increase the number of employees at home. However, horizontal FDI might equally well substitute some export activities and therefore, employment at home declines. Moreover, MNEs with horizontal FDI are likely to exploit economies of scale by accessing new markets which in turn may have positive effects on the productivity at home. In sum, it is not only difficult to predict home plant effects, it is also difficult to differentiate between horizontal and vertical FDI as FDI decisions often follow complex integration strategies with investments being interdependent and benefiting from complementarities across locations (Yeaple, 2003).

Foreign market entry also opens the window for knowledge flows from foreign market players including buyers, competitors, intermediaries and venture partners to multinational firms which then can lead to improved products and production processes. The theoretical expectation is similar to the so-called *learning-by-exporting* hypothesis (see e.g., Wagner 2007 for details) whereby firms experience performance gains through their exposure in foreign markets.

Recent empirical studies analyses intensively the effects of investing abroad on home plant's performance. The power of any empirical test that evaluates the effects of changes in the mode of internationalization depends mainly on validity of the econometric approach and availability of key variables explaining different modes of foreign market entry and exit. The main question is whether the observed performance in the post-change period is driven by selection effects based on observable and unobservable characteristics and/or feedback effects of the change. The evaluation literature suggests several approaches to deal with the

identification of the latter one (see e.g. Heckman et al. 1998, 1999; Blundell and Costa-Dias 2000, 2002; Schmidt 2007).

Based on the extensive use of propensity score matching combined with a difference-in-differences (DiD) approach in the microeconomic program evaluation, this kind of estimator has also received increasing attention in the FDI literature. Barba Navaretti and Castellani (2008) apply this estimator and find significant positive feedback effects of outward FDI by Italian MNEs on turnover and productivity (TFP) at home but the effect on employment is insignificant. Based on a small sample of 47 German MNEs, Kleinert and Toubal (2007) also observe an insignificant effect on employment and a significant increase in TFP in the first year after investing abroad. Jäckle (2006) uses the same database and applies Heckman's (1978) parametric estimator for endogenous treatment effects. He finds significant positive effects of FDI on TFP for German MNEs in the first and third year after going abroad. Jäckle (2006) obtains insignificant estimates in a simple OLS model which, according to theoretical predictions, should be upward biased. Due to missing test statistics in the paper of Jäckle (e.g. F-test of instruments, partial  $R^2$ ), it is difficult to evaluate the validity of Jäckle's methodological approach. For Japanese MNEs, Hijzen et al. (2007) observe a weak significant positive effect on home plant TFP in the initial year and significant positive effects on output and employment in the following three years. Indeed, the evidence is rather mixed but a significant negative effect on employment is usually not observed in these studies. The study of Becker and Muendler (2008) combines German plant level data with data about foreign affiliates to estimate the effect of employment expansion in foreign affiliates on domestic employment. The authors detect that the probability of domestic worker separation is significantly reduced. In fact, the fear of policy makers that outward FDI relocates jobs from home to target countries suffers from a solid empirical confirmation.

A handful of papers consider the extent of market-seeking motives to estimate the effects of investing abroad for horizontal and vertical FDI. Head and Ries (2004) look at the host countries chosen by firms for their investments and classify them into low- and high-wage countries. The authors argue that firms with investment in low-wage countries only follow vertical FDI motives, whereas companies with investments in a wider range of low- and high-wage countries follow a more horizontal pattern of FDI. Barba Navaretti et al. (2009) adopt the basic idea to analyse the impact on TFP, turnover and employment at home for Italian and French MNEs. Interestingly, the findings do not differ remarkably for outward investments in low-wage and high-wage countries. TFP growth is significantly positive in Italy, whereas FDI of French firms does not matter for TFP growth at home. Employment is neither significantly

negative in France nor in Italy. Similarly, Becker and Muendler (2008) do not detect any remarkable differences across several host country locations. In sum, there is hardly any evidence of a negative effect of outward investments on home performance, in particular on home employment.

Given that MNEs pursue horizontal and vertical FDI simultaneously in the same host countries (Feinberg and Keane 2006), the lack of notable differences in the effects across low-wage and high-wage countries might not be surprising. In a recent study Hering et al. (2009) consider affiliates characteristics to better distinguish between horizontal and vertical FDI for Japanese MNEs. Affiliates with a high level of local purchases and high sales back to Japan are defined as vertical FDI. In line with theoretical predictions of the ‘proximity-concentration trade-off’ the authors observe that horizontal FDI substitutes exports from MNEs’ home in Japan. In contrast, imports increase for MNEs with vertical FDI. The study further points out that labour productivity in Japanese parent companies increases either when Japanese MNEs start horizontal FDI in high-income countries or vertical FDI in low-income countries. Many other papers explicitly address the relationship between FDI and export. Head and Ries (2004) summarize most of this literature and argue that complementarity between FDI and export occurs when investing abroad is linked with (i) vertical specialization (exports of intermediate goods between the parent company and its foreign affiliates) and/or (ii) home centralization of one product and foreign centralization of another product.

A comprehensive study, however, which analyses the “FDI – export” relationship and the “FDI – home performance” relationship simultaneously is still missing. Analyzing export activities, employment, turnover and productivity in the post-change period also offers useful insight for general understanding of changes in production processes.

We further expect that the complementarity between FDI and export would differ with respect to firm’s technology level. In general, products of firms in high-tech industries are based on remarkable achievements in R&D in order to create a sustainable technological advantage. Faced by the risk of product imitation firms may opt for home centralization of high-tech products and vertical specialization in order to reduce this risk. Therefore, one might assume that firms in high-tech industries are more inclined to opt for home centralization and vertical specialization than firms in low-tech industries. As a result, export activity of firms in high-tech industries might then be more sensitive to foreign market entry and exit via FDI than typical low-tech firms. Recent empirical findings of Stiebale (2009) strengthen this prediction. Applying an empirical framework which accounts for unobserved firm heterogeneity and the

possible endogeneity of cross-border acquisitions, he shows that R&D activity of acquirers in high-tech industries was intensified after an outward merger or acquisition compared to acquirers in low-tech industries. Thus, the concentration of R&D at home might be driven by realizing economies of scale as well as by the fact that knowledge spillover to competitors should be minimized.

## 2.2 *Effects of divesting from abroad*

The literature intensively discusses the effects of investing abroad (e.g. Farinas and Ruano 2005), less emphasis is placed on the determinants for corporate divestment (e.g. Haynes et. al 2003, Benito 1997, Bernard and Jensen 2007). However, there are even less studies which analyse the effects of foreign divestures on firm's home performance (e.g. Hanson and Song 2003). Analyzing these patterns needs an understanding of foreign market entry because sufficient resources are needed to adjust products and processes in order to meet domestic and foreign market demands and requirements. Foreign divestments are often driven by a failed internationalization strategy implying shutting down foreign affiliates or by a home concentration of activities leading to divestments of foreign affiliates. With respect to a failed internationalization strategy, significant resources have been invested to enter foreign markets and these expenditures are not compensated by sufficient revenues. Given the lost physical presence in foreign markets, one may expect that divesting firms postpone investments and lay off employees in home plants in order to quickly improve their financial performance. On the other hand, a deliberate focus on home centralization implies that foreign affiliates are shut down or sold and resources are shifted back home. It is obvious that the latter behaviour tends to promise greater growth opportunities at home whereas a failed internationalization reduces these opportunities. Yet, without any further information about cost and revenues of foreign market operations, theoretical predictions with respect to performance effects at home remain ambiguous.

## **3. Methodology: Evaluation problem and matching procedure**

In this section the methodological tools are presented which are needed in order to assess how the change in the mode of internationalization affects a company's *outcome* measures like employment, turnover and productivity. As an example, an upward change for a domestic company that becomes engaged in FDI is assumed. More precisely, the goal is to identify the



average treatment effect on the treated (ATT), i.e. the net effect of internationalization on this company which starts undertaking FDI (*treatment*).

For example, let  $Y_{t+k}^1$  denote company's outcome in a subsequent year  $s$  after the company has changed its mode of internationalization from a domestic company to become a MNE in year  $t$  ( $DI_t=1$ ) and let  $Y_{t+k}^c$  denote the outcome of this company if it were to remain in the domestic market. Obviously, the latter outcome is unobservable, and this so-called *counterfactual outcome* is noted with  $c$ . The ATT for all treatments then is given as follows:

$$ATT = E[Y_{t+k}^1 - Y_{t+k}^c \mid DI_t = 1] = E[Y_{t+k}^1 \mid DI_t = 1] - \underbrace{E[Y_{t+k}^c \mid DI_t = 1]}_{\text{counterfactual outcome}}. \quad (1)$$

The counterfactual outcome poses the main evaluation problem. One needs an adequate estimator for the counterfactual outcome of a treatment. A simplistic approach would be to take the outcome of a firm staying in the domestic market (*non-treatment*). This approach would only be valid if there is a random selection into the group of switchers. However, this is unlikely to be the case here. Therefore, the potential selection bias must be accounted for in order to arrive at valid estimates of the internationalization impact. A number of non-experimental techniques (e.g. instrumental variable (IV) approach, matching) exist to deal with the selection issue (see Heckman et al. 1999 for further explanations). In this paper we will combine the *propensity score matching* to construct the sample of adequate counterfactual firms with the *difference-in-difference* (DiD) estimator to estimate the *ATT*.

The method of matching follows the idea of selection on observables: For every firm in the treatment group a matching company from the non-treatment group needs to be found with very similar characteristics on the observables. However, for the matching to be valid, certain requirements have to be met. A fundamental identifying assumption is the conditional independence assumption (CIA). CIA states that conditional on matrix  $X_{t-1}$ , the observables in the period before treatment, the outcome of those who do not switch is independent of the actual treatment status. This implies that the outcome  $Y_{t+k}^0$  of a non-treatment is an adequate estimator for the counterfactual outcome  $Y_{t+k}^c$  of a treatment provided that no systematic differences in the matrix  $X_{t-1}$  between treatment and non-treatment exist:

$$E[Y_{t+k}^c \mid DI_t = 1, X_{t-1}] = E[Y_{t+k}^0 \mid DI_t = 1, X_{t-1}]. \quad (2)$$

The CIA implies that any difference in unobservables is trivial and that they do not affect outcomes in the absence of treatment (see Heckman et al. 1998). Keeping in mind that the

CIA is an untestable assumption, not only a rich dataset is needed for the CIA to hold, one also needs to be confident that the determinants of the outcome variable and the major determinants to explain the change of the mode of internationalization are observed.

As the number of observables used in the matching increases it becomes rather difficult to find a suitable match for every company and every unmatched company results in a loss of this observation. The propensity score method suggested by the pioneer work of Rosenbaum and Rubin (1983) constitutes a helpful solution by computing  $p(X_{t-1})$ , the probability of investing abroad conditional on observables  $X_{t-1}$  by applying a logit or probit estimation. Rosenbaum and Rubin (1983) demonstrate that it is sufficient to use this single index propensity score to obtain consistent estimates for the counterfactual situation instead of matching on all observable variables. We then postulate that:

$$E[Y_{t+k}^C \mid DI_t = 1, p(X_{t-1})] = E[Y_{t+k}^0 \mid DI_t = 1, p(X_{t-1})]. \quad (3)$$

The precondition is that the propensity score of non-treated firms to become MNEs is very close to the propensity score of treated firms. For an effective implementation of propensity score matching one often identifies companies that are poorly matched with respect to the propensity score and omits them from the estimation of the treatment effects. This so-called *common support* assumption guarantees a sufficient good match between the treated and non-treated companies. We apply propensity score matching with replacement to improve the fit of matches. This procedure implies that a non-treated company can be matched to more than one treated company. Therefore, a correction for standard errors to draw conclusion on statistical inference is required. We follow Lechner (2001) and apply his estimator for an asymptotic approximation of the standard errors. Based on this procedure we have a very small number of treatments that are off common support.<sup>1</sup> One has to bear in mind that the estimated treatment effect only measures the *ATT* of those falling within the common support.

Several matching methods are at the hands of the researcher (see Caliendo and Kopeinig 2008 for details). In this study we report the results of the nearest neighbour matching<sup>2</sup> and check for the robustness of the results with the Mahalanobis distance (MD) matching. The nearest neighbour method matches each treated company with a one non-treated company with the closest propensity score. The MD method is a propensity score based matching technique

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<sup>1</sup> Results are available on request.

<sup>2</sup> The matching procedure is carried out using software package *psmatch2* in STATA 11 (see Leuven and Sianesi 2003).

which allows to put additional weight on selected covariates (here the industries). While treated and non-treated firms are very similar to industry, this is especially useful to control for industry specific business cycle shocks.

The matching method in hand, we then compare the outcome of the switching with the matched control companies after the switch has taken place. In a simple case  $Y_{t+k}^I$  is operationalized with the outcome in the  $t+k$  year after the year of switching  $t$ . Instead, the DiD measure calculates the difference between the outcome  $Y_{t+k}$  in the years  $s$  after the change in the mode of internationalization is observed in  $t$  and pre-change outcome  $Y_{t-1}$  for both groups. The *ATT* based on DiD measure then is calculated as follows:

$$ATT_{DID} = E[Y_{t+k}^1 - Y_{t-1}^1 | DI_t = 1, p(X_{t-1})] - E[Y_{t+k}^0 - Y_{t-1}^0 | DI_t = 1, p(X_{t-1})] \quad (4)$$

The DiD measure eliminates potential effects of time-invariant unobservables on the outcome variable. It remains biases from two sources: First, time-variant unobservable firm characteristics may differ between treated and non-treated firms (e.g., organisational innovations, entry and exit of experts and management) and both groups response differentially to changes in markets and macroeconomic conditions. Therefore we compute Rosenbaum bounds (Rosenbaum 2002) to evaluate the sensitivity of DID measures to these potential biases.

## 4. Data

### 4.1 Panel structure

In the paper at hand the firm-level data are taken from the European AMADEUS database which is provided by Bureau van Dijk. Whereas companies' financial records are available for up to 10 years, information on their ownership and subsidiary structure is limited to the year of the data compilation. In this chapter, we focus on changes in the international status of companies *between* the years 2000 and 2002, 2002 and 2004, as well as 2005 and 2007. Consequently, we analyse the post-entry and post-exit home performance of French firms that change their status in 2001, 2003 or 2006. In specific, we differentiate between three main modes of internationalization, namely MNEs that are engaged in FDI, exporters and domestic companies that neither export nor have foreign affiliates.

**Table 1: Panel structure**

Pre-change	Change	Post-change					
<i>t-1</i>	<i>t</i>	<i>t+1</i>	<i>t+2</i>	<i>t+3</i>	<i>t+4</i>	<i>t+5</i>	<i>t+6</i>
2000	<b>2001</b>	2002	2003	2004	2005	2006	2007
2002	<b>2003</b>	2004	2005	2006	2007	-	-
2005	<b>2006</b>	2007	-	-	-	-	-

**Table 2: Number of observations**

Pre-change year (t-1)		2000	2002	2005	Total
<b>Foreign investment (FDI)</b>					
<b>DX-DI</b>	<b>Treated</b>	723	270	311	<b>1,304</b>
<b>DX</b>	<b>Control</b>	23,576	25,529	30,802	<b>79,907</b>
<b>D-DI</b>	<b>Treated</b>	240	106	143	<b>489</b>
<b>D</b>	<b>Control</b>	72,854	89,929	135,064	<b>297,847</b>
<b>Foreign divestment</b>					
<b>DI-DX</b>	<b>Treated</b>	125	184	97	<b>406</b>
<b>DI</b>	<b>Control</b>	284	1,030	1,233	<b>2,547</b>
<b>DI-D</b>	<b>Treated</b>	87	79	57	<b>223</b>
<b>DI</b>	<b>Control</b>	305	923	1,167	<b>2,395</b>

Notes: Changes in the internationalization status can occur between 2000 and 2002, 2002 and 2004, 2005 and 2007, where the first year refers to the pre-change period (*t-1*). For example, firms in the DX-DI group with the pre-change year 2000 were exporters (DX) in 2000 who became MNEs (DI) by 2004. The number of observations is obtained from probit models on pre-change variables. The control groups refer to the potential number of firms that can function as control observations in the matching procedure. *Total* refers to firm-year observations.

Our dataset is limited to unconsolidated firm-level accounts in order to analyse location and entity specific performance effects. The data set includes companies from a wide range of manufacturing and service industries.<sup>3</sup> The dataset is purged from outliers for key financial

<sup>3</sup> Excluded from the analysis are the following industries (with the industry codes (NACE) in parentheses): Agriculture, hunting and forestry (01, 02), fishing (05), mining and quarrying (10-14), management activities of

indicators. Table 1 provides an overview of the underlying panel structure. The matching is based on the probit model with variables taken from the pre-change period,  $t-1$ . The overall panel is unbalanced as the latest year for which key financial data are available is 2007. Given the underlying data structure, the short-term analysis in  $t+1$  is based on a larger sample of firms than the long-term analysis for  $t+5$  and  $t+6$ . The latter is restricted to firms that changed their internationalization status in 2001.

As in the chapters before, we differentiate between three company types, namely MNEs that are engaged in FDI (DI), exporters (DX) and domestic companies that neither export nor have any foreign affiliates. In the analyses we focus on the post-entry or post-exit performance of firms that change their international status and either became engaged in FDI or divested all their foreign operations. We differentiate between four types of changers. On the one hand, MNEs that divest all foreign affiliates can either become exporters (DI-DX) or domestic companies (DI-D). On the other hand, firms that become engaged in FDI (i.e. new MNEs), were either exporters (DX-DI) or domestic companies (D-DI) beforehand. Table 2 provides an overview of the number of MNEs with respect to the internationalization decision and change period. The number of observations are obtained from probit estimations with variables taken from the pre-change period,  $t-1$ . In sum, the number of firms going abroad is much larger (1,793) than the number of MNEs that cease all foreign operations (629). In the majority of cases a large pool of potential control firms (non-changers) exists which is a prerequisite for finding a suitable twin firm for each treated observation in the subsequent matching procedure.

It should be noted that the actual number of firms in the matching procedure and difference-in-difference analysis is further reduced if key performance variables are missing in the post-change period. Consequently, the final number of observations depends on the type of change, the year of change and the specific outcome variable.<sup>4</sup> Therefore, we report the final sample size together with the results for the difference-in-difference analysis in Table 8 to Table 11 in Section 5.2.

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holding companies (7415), public administration and defense, compulsory social security (75) and activities of membership organizations (91).

<sup>4</sup> In principle there are 72 different sample sizes due to 4 changing modes (DX-DI, D-DI, DI-DX and DI-D), 3 changing years (2001, 2003 and 2006) and 6 outcome variables (number of employees, operating turnover, export turnover, export share, labour productivity and TFP).

#### 4.2 Outcome and Control Variables

All firm-specific variables used in the probit model to explain the internationalization behaviour are taken from the pre-change period,  $t-1$ . Many theoretical and empirical papers (e.g. Roberts and Tybout 1997, Bernard and Jensen 2004, Helpman et al. 2004) emphasize the important role of basic firm characteristics like the number of *employees*, *operating revenue*, *age* and the *productivity* to bear the sunk costs of foreign market entry. The productivity measures used in this paper refer either to labour productivity, defined as operating revenue per employee, or total factor productivity (TFP). The latter is obtained by following the procedure of Levinsohn and Petrin (2003) which yields consistent estimates of firm-level TFP.<sup>5</sup> One further implication of the sunk cost model to explain foreign market participation is that prior export experience permits to lower sunk costs (see Roberts and Tybout 1997). The export activity is measured in absolute terms as *export turnover* and in relative terms as *export share* (export to total operating revenue).

Recently published studies point out that multi-unit and multinational characteristic as well as ownership characteristics can also affect firm's mode of internationalization (e.g. Roper et al. 2006, Bernard and Jensen 2007, Greenaway et al. 2007). Therefore, firm's ownership structure is used as a proxy for the underlying strategic interests of its owners and is captured by the dummy variables *corporate shareholder*, *financial shareholder*, *state shareholder*, *individual shareholder* and *foreign shareholder* for non-French investors. Only owners with an ownership share of 10% or more are taken into account in order to assure an effective voice in the management of a company. The organizational structure is further accounted for by the number of *domestic subsidiaries*.

We further include some financial performance indicators as financially constrained firms might be less likely to enter (Chaney 2005) and more likely to leave foreign markets. Following recent empirical papers on foreign market participation (Greenaway et al. 2007, Stiebale 2008), we include a *liquidity ratio* defined as the difference of current assets and current liabilities to total assets. Companies can fail to finance their internationalization because of a liquidity shortage. Moreover, debt obligations also influence the cost for external

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<sup>5</sup> 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 logarithmised Cobb-Douglas production function. In contrast to labour productivity, TFP has no obvious scaling or natural base values thereby impeding a direct interpretation.

credit. Thus, long-term debt obligations are reflected in the *leverage ratio*, defined as non-current liabilities to total assets.

Some papers point out the dynamic comparative advantage of innovative firms and the majority of studies find a positive correlation between innovation and export activities (e.g., Aw et al. 2008). Moreover, we attempt to control for technological differences by including *capital intensity*, measured as total assets over the number of employees. The ratio of intangible fixed assets to tangible fixed assets is used as a proxy for the *R&D* and innovation intensity because no direct information is available on corporate R&D expenses. Finally, up to 28 *industry dummies* based on the two-digit NACE classification and *legal form dummies* capture remaining firm-specific heterogeneity. Several *regional dummies* based on the first-level NUTS<sup>6</sup> classification control for effects of firm's local environment.

In contrast to the probit estimations which include all of the above variables, we concentrate on six outcome variables for the post-entry and post-exit performance. The selection of these variables is based on theoretical expectations regarding the bi-directional relationship as well as recent empirical evidence. Specifically, we take into account the growth in employment, operating revenue and productivity. In addition, we focus on export activity as outcome variable in order to analyse the extent to which exports serve as substitutes and/or complements of FDI.

## 5. Results

### 5.1 Propensity Score Matching

In a first step of the matching procedure, we acquire the propensity score for each firm by estimating the probability of changing the international status in a probit model. We run separate probit estimations for each switching mode and year. Table 3 provides an overview of the probit estimations for the year 2002.<sup>7</sup>

In general, larger firms are more likely to enter foreign markets while MNEs are less likely to exit those markets. Similarly, firms that already exhibit a high export share are more likely to become engaged in FDI while it decreases the likelihood for MNEs to divest all their foreign

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<sup>6</sup> 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.

<sup>7</sup> The probit estimations for 2000 and 2005 yield similar results and are available on request.

**Table 3: Probit estimations for all internationalization changes in 2002**

	Base group DX	D	DI	DI
	Treatment group <b>DX-DI</b>	<b>D-DI</b>	<b>DI-DX</b>	<b>DI-D</b>
Employees (in logs)	0.0435 (1.11)	-0.0532 (1.14)	0.0230 (0.29)	0.171* (1.66)
Operating turnover (in logs)	0.201*** (5.33)	0.222*** (4.90)	0.0620 (0.81)	-0.218** (2.19)
Age	-0.00349** (2.28)	0.000713 (0.33)	0.0000234 (0.01)	0.00285 (0.90)
Export turnover	-0.00000106** (2.08)		-0.000000121 (0.31)	0.000000937** (2.05)
Export share	0.650*** (6.99)		0.264 (1.41)	-1.397*** (3.85)
Labour productivity	0.00000370 (0.26)	-0.00000625 (0.44)	-0.00000408 (0.17)	0.0000542*** (2.71)
Corporate shareholder (d)	0.109* (1.83)	0.263*** (3.12)	-0.0897 (0.73)	-0.262 (1.55)
Financial shareholder (d)	0.328*** (3.83)	0.205* (1.72)	0.342*** (2.68)	-0.0497 (0.24)
State shareholder (d)	0.0419 (0.19)	0.311 (1.54)	-0.321 (1.11)	0.228 (0.70)
Individual shareholder (d)	0.173*** (3.05)	-0.0630 (0.68)	0.244** (2.36)	-0.245 (-1.52)
Foreign shareholder (d)	-0.103 (1.13)	0.438*** (3.53)	-0.244 (1.58)	0.246 (1.14)
Domestic subsidiaries	0.0319*** (2.79)	0.0337*** (3.66)	0.00369 (0.35)	0.0176* (1.68)
Liquidity ratio	0.129 (1.19)	0.0465 (0.41)	-0.0548 (0.30)	0.346 (1.30)
Leverage ratio	-0.0134 (0.07)	0.00697 (0.04)	0.116 (0.35)	-0.248 (0.52)
Capital intensity	-0.0000527 (0.29)	-0.000388* (1.75)	-0.00176 (1.49)	-0.000298 (0.86)
R&D	-0.00348 (0.96)	-0.000264 (0.26)	0.00237 (0.94)	-0.0109 (1.30)
Constant	-9.805 .	-10.27 .	-1.242 (1.61)	1.099 (1.36)
N	25,779	90,035	1,214	1,002

Notes: Reported are the coefficients from probit estimations for the four internationalization samples from 2002. The treatment variable takes the value 1 if a switch occurs, 0 otherwise. Control dummies are included for the industry, region and legal type of the companies. (d) for discrete change of dummy variable from 0 to 1. The z-statistics are in parentheses. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

operations. The ownership structure constitutes an important indicator for changes in the internationalization status. Corporate and financial shareholders increase the probability that a firm starts to invest abroad. Finally, the larger the network of domestic subsidiaries the more likely firms will become engaged in FDI. Most interestingly, labour productivity increases the



likelihood of MNEs to completely cease all foreign operations whereas it displays no significant effect on the probability for upward changes. Using, however, a more parsimonious specification reveals that productivity significantly increases the likelihood to change upwards while it has no effect on changing downwards.

The obtained propensity scores from the probit estimations are used to match each changing firm (treated) to a non-changing firm (control) with the nearest propensity score. Table 4 to Table 6 (see Section 7 (Appendix)) show the balancing test for the treated and control groups before and after the matching. The tables refer to the year 2002 (*t-1*) and to one of the four switching modes DX-DI, D-DI, DI-DX and DI-D, respectively.<sup>8</sup> Reported are the means of variables used in the probit estimation which then allows to compare the ex-ante mean difference between changers and non-changers in the unmatched and matched samples. Before the matching firms differ substantially with respect to the means of the reported covariates. For example, exporters that become new MNEs (DX-DI, Table 4) are on average larger, older and have a higher share of export (twice as large) with corporate, foreign (both, twice as many) and financial (four times higher) investors. Moreover, new MNEs are on average twice as productive. However, no significant differences exist with respect to financial indicators. At this point we can easily compare how both upward changing types differ from each other: Domestic companies that become directly engaged in FDI (D-DI), without an interim step of becoming exporter first, have on average more domestic subsidiaries and a higher capital and innovation intensity than firms in the DX-DI group. Given that differences in other characteristics are much less pronounced, it might well be the case that a larger national network and a higher innovativeness enable those domestic firms to skip this interim internationalization step.

Before the matching, MNEs that become pure exporters (DI-DX, Table 6) are similar to continuous MNEs in terms of size, age, export extensity, liquidity and ownership. However, the labour productivity and capital intensity are on average lower for the former. Comparing both types of downward changing MNEs, reveals that future domestic companies (DI-D) have on average more domestic subsidiaries and exhibit an export share which is about three times smaller than for MNEs that become exporters (DI-DX).

Overall, the large ex-ante difference which exists between the treated and control firms in the unmatched samples can be alleviated through the matching process. Large bias reductions are achieved (column 6) and the t-tests (columns 7 and 8) show that for all variables (with the

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<sup>8</sup> The balancing tests for 2000 and 2005 yield similar results and are available on request

exception of capital intensity in Table 4 and financial ownership in Table 5, but including the propensity scores), no significant differences in the mean values are discernible between changers and non-changers. The fit of the match can further be evaluated by examining the underlying density distribution of the propensity score for both groups. Whereas the density distribution for the upward changing samples is nearly identical (Figure 1 and Figure 2), the overlap of the entire distributions in the downward cases is large but not identical (Figure 3 and Figure 4).

## 5.2 *Difference-in-difference estimation*

The results from the difference-in-difference estimation for the various performance indicators and internationalization modes are presented in Table 8 to Table 11. The three year samples for each internationalization mode are pooled.<sup>9</sup> Consequently, the short-term analysis in  $t+1$  is based on a larger sample of firms than the long-term analysis for  $t+5$  and  $t+6$  (see Table 1: Panel structure). Furthermore, the results from the difference-in-difference estimation are presented for firms which might not have a complete outcome record across all periods (e.g. operating revenue is missing in one period). The samples of firms with full post-change information are used to check for robustness of the results.

With the exception of the export share outcome all results from the difference-in-difference estimations measure differences between annual average growth rates in the outcome variable for treated and non-treated firms.<sup>10</sup> The computation of the growth rate follows Evan's (1987) approach by assuming an exponential growth trend.<sup>11</sup> Annual average growth rates are calculated as difference between the logarithm of outcome variables in any year  $t+k$  (with  $k \geq 1$ ) and the pre-switching year  $t-1$  divided by the number of years between  $t+k$  and  $t-1$ . Table 8 shows the results for the home performance of exporters that have become engaged in FDI (DX-DI) and Table 9 for formerly domestic firms that become MNEs (D-DI). While exporters follow the step-wise internationalization suggested by the Uppsala-model (see

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<sup>9</sup> The pooling should increase the robustness of the results. Results for the ex-post performance analysis for each internationalization mode and year sample are available on request.

<sup>10</sup> While the export share is already measured in percent it is neither necessary nor formally correct to calculate a growth rate according to Evan's approach.

<sup>11</sup> Alternatively, a constant growth trend can be assumed. However, for analyzing average employment growth based on N-firms with consideration of positive and negative growth rates, the error is lower if an exponential growth trend is assumed.

Johanson and Vahlne 1977)<sup>12</sup>, domestic firms seem to follow a fast-track internationalization strategy. It is probable that the latter differs in several observable and unobservable characteristics which allow entering foreign markets more quickly.

Starting with findings for exporters in Table 8 our main variables of interest are at first export turnover and export to total operating turnover (export share). Switching firms display a significant increase in export turnover in the second and fourth year after switching compared to exporters that, at the same time, did not become engaged in FDI. The growth rate is about 4.5 percentage points higher for switching firms compared to exporters that did not invest abroad in the same period.

In addition, exporters starting to invest abroad display a significantly higher growth in the export share in all post-change periods. In the first year after switching the difference in the export share is around 1.77 percentage points between treated and non-treated firms. This difference increases to 5.58 percentage points six years after switching. Again, the change is remarkably high because treated firms display an initial ratio of exports to total sales of around 31 per cent (see Table 4). These findings suggest that exporting and FDI are rather complements than substitutes in international trade. This conclusion is in line with the theoretical predictions and empirical findings of other scholars (e.g. Head and Ries 2004, Krautheim 2009).

The difference-in-difference measures show positive signs in all periods for employment and turnover growth. However, these differences are only significant at conventional levels for employment growth in the third and for operating turnover in the first and second year after the change. It is likely that the occasional increase in export turnover is not sufficient to raise overall employment and total sales significantly. In addition, the results show no permanent and significant increase in the two productivity measures. This finding suggests that productivity gains at home through feedback effects and economies of scale are rather limited. As displayed in columns (6) to (8), the results are confirmed for the sample of firms with full post-change information.<sup>13</sup>

The results for pure domestic firms that become engaged in FDI (D-DI) are depicted in Table 9. Switching firms achieve a slightly higher export share than domestic firms that, at the same time, did not opt for FDI. The difference, however, is always insignificant at the

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<sup>12</sup> Based on limited knowledge to enter foreign markets successfully, the Uppsala-model suggests that firms start first with exporting to acquire foreign market knowledge before switching to FDI later on.

<sup>13</sup> These results have been confirmed for the DX-DI sample when using the Mahalanobis distance matching. In addition the Rosenbaum bounds have been calculated for this sample. Result are available upon request.

conventional levels. The growth in turnover is significantly positive in the first three years after switching. One reason for this rise in turnover might be that foreign investments based on cross-border mergers and acquisitions (M&As) increase the opportunity to exploit economies of scale within the enlarged corporate network (e.g. Röller et al. 2001). An alternative interpretation focuses on unobservable differences in the pre-switching period. Serving foreign markets directly via foreign affiliates suggests that formerly domestic firms may have remarkable comparative advantages in the pre-switching period in order to ‘jump’ other modes of internationalization, like exporting, with lower sunk costs. It cannot be excluded that unobservable differences in the growth path of switching firms compared to non-switching firms may exist and thus, the significantly higher growth is not causally driven by the FDI decision. Finally, new MNEs experience in some periods a significantly higher growth in labour productivity and TFP compared to domestic firms that did not enter foreign markets at that time. The growth in TFP is even more pronounced in the sample of firms with complete post-change records (columns (6) to (8)). These findings are line with Mayer and Ottaviano (2007) who find a U-shaped relationship for Norwegian firms with changers slightly underperforming in the first three years and overperforming in the fourth post-change year.

A comparison of the two upward-changing samples (DX-DI and D-DI) suggests that domestic companies profit more in terms of productivity growth than exporters. Domestic companies display a lower average productivity than exporters before switching (see Table 4 and Table 5) but the former display a larger productivity growth in post-switching periods. This productivity improvement might be explained by the sharp increase in competition that domestic firms face when going abroad which in turn requires product and quality adjustments. In fact, exporters which become engaged in FDI have been confronted with slightly more competition since they already serve foreign markets. Thus, the need to increase productivity might matter to a lesser extent for switching exporters.

In sum, our findings for firms which become engaged in FDI for the first time are mainly in line with previous empirical studies. The positive effect on TFP in the first year after investing abroad as well as the very limited effect on home employment is also observed by Jäckle (2006), Hijzen et al. (2007) and Kleinert and Toubal (2007). In addition, we find that these results hold for both initial starting states i.e. for domestic firms and for exporters that become engaged in FDI. However, investing abroad affects export activity of former exporters to a larger extent than those of former domestic companies.

Table 10 reports the difference-in-difference measures for the situation that MNEs divest all foreign operations to become pure exporters (DI-DX) and Table 11 shows the results for MNEs which decided to serve domestic markets only (DI-D). Starting with Table 10 we find that a downward change from FDI to exporting results in a significant short-term increase in the export share for treated firms. In the medium- and long-run, however, these switching firms do not display higher export intensity than MNEs that did not change. The short-term effect is in line with the prediction that divesting from abroad implies a concentration of production at home and serving foreign markets by exporting. Losing the affiliate in foreign markets might reduce in the long-term, however, the chance to export home-centred products to foreign markets at lower costs (see Krautheim 2009 for detail).

Export turnover, operating revenue and employment are not significantly affected by changing the internationalization mode. In contrast, MNEs that cease all foreign activities (DI-D) exhibit an obvious reduction in their export share whereas employment and overall turnover are not significantly influenced as depicted in Table 11.<sup>14</sup> Thus, a retreat from international markets is neither linked to performance losses nor gains at home. After divestment, companies can (re)focus on their domestic activities and streamline processes to the demand of their home market. Robustness checks in columns (6) to (8) confirm these results.

The findings show that FDI and export are rather positively than negatively linked. Investing abroad implies an increase in export intensity and divesting abroad correlates negatively with export intensity. As we point out in Section 2, home centralization of several products or components to serve foreign markets from home may explain these findings. By differentiating between firms in high-tech and those in low-tech industries we provide deeper insight in the role of home centralization. Hence, Table 12 to Table 15 repeat the above analysis by splitting the sample into high- and low-technology firms to account for heterogeneity in the underlying technology profile of enterprises. While we do not have data about expenditures for research and development we apply the NIW/ISI list of high-tech industries in manufacturing (Legler and Frietsch 2007) and the list of high-tech service industries suggested by Nerlinger (1998). Table 12 reports the findings from the difference-in-difference estimation of exporters that become engaged in FDI (DX-DI). Firms in high-tech industries display a significant growth in the export share of about 2 to 8 percentage points in the post-switching periods compared to exporters that did not become engaged in FDI. In

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<sup>14</sup> While export turnover remains almost zero in periods after switching, we cannot calculate the logarithm of zero outcomes and thus, the number of observations is very low for the 'export turnover' outcome variable.

contrast, firms in low-tech industries attain an export share growth of 2 to 4 percentage points only. Moreover, firms in high-tech industries experience a significant growth of operating revenue, whereas low-tech firms show no long-term growth in this outcome variable.

In Table 13, the results for domestic companies that start foreign operations are depicted (D-DI). Again firms in high-tech industries exhibit a strong growth in their export share of around 6 to 11 percentage points compared to non-treated high-tech firms, whereas companies in low-tech industries do not achieve any significant growth in export share related to non-treated low-tech firms. In contrast to exporters which become MNEs, the increase in export activity for former domestic companies is not sufficient to improve overall sales. Most interestingly, switching firms in high-tech industries realize more often significant improvements in productivity than non-switching high-technology firms.

Results for the home performance of MNEs that either become pure exporters (DI-DX) or change status to domestic companies (DI-D) are displayed in Table 14 and Table 15, respectively. No significant performance changes are found for downward switching MNEs from high-technology industries that become pure exporters (Table 14). In contrast, downward switching MNEs in low-technology industries experience growth in their export intensity, which, however, is restricted to the short-term only. Moreover, the latter also display a negative and significant reduction in their productivity growth in the short- to medium-term.

Downward switching MNEs in low-technology industries which serve domestic markets only (DI-DX) exhibit a negative export performance in the short- and medium term (Table 15), whereas downward changers in high-tech industries can realize increasing productivity in some post-change periods. The number of observations is small and thus, results for downward switching MNEs should be interpreted with care. Overall, the findings suggests that low-tech MNEs which become pure exporters or domestic firms are displaying a lower home performance after ceasing their foreign operations compared to non-switching firms. In contrast, downward changers in high-tech industries do not exhibit a substantial performance loss.

## **6. Conclusion**

This paper empirically analyses for French firms the feedback effects on home enterprise's performance when investing or divesting abroad. A propensity score matching combined with a difference-in-difference estimator is applied to derive empirical findings.

The annual growth in operating revenue exceeds 2 to 7 percentage points for firms that become engaged in FDI compared to firms that, at the same time, did not become engaged in FDI. TFP growth increases only the first year after switching and growth in home employment is hardly affected. These findings are well in line with those of other authors. In addition, we find a rising export intensity exporters becoming engaged in outward FDI. The positive cross-fertilization between FDI and export also fits empirical findings of other recent studies and thus, our findings clearly support the export-enhancing effect of FDI.

In sum we detect a positive relation between FDI and exporting and at the same time an insignificant relationship between FDI and home employment. It is quite likely that the former result is the key for understanding the latter. Head and Ries (2004) argue that foreign market entry may at home imply centralization of know-how sensitive products or components which are supplied to both, domestic and foreign markets. When differentiating between firms in high-tech and low-tech industries our findings strengthen the view of centralization at home. The positive association between FDI and exporting is very strong for switching firms in high-tech industries compared to non-switching firms and moderate for switching firms in low-tech industries. In fact, the risk and consequences of product imitation might be higher for firms in high-tech industries and thus, these firms prefer to centralize knowledge-driven production processes at home.

Not many studies have analysed whether and how divesting from abroad affects home enterprise' performance, although divestments, like investments, are a central part in global business dynamics. Contrary to public wisdom, home employment and operating revenue are not substantially affected by foreign divestures. It is likely that the decision to divest from abroad is rather driven by strategic considerations than by deteriorating firm performance. The results further point out that divesting firms in low-tech industries rather than in high-tech industries are confronted with a remarkable reduction in labour productivity compared to non-switching MNEs. Therefore one major policy implication might be: The home country does not need not to fear negative repercussion from firms coming back home, but neither can it gain from foreign divestments.

## 7. Appendix

**Table 4: Balancing test for nearest neighbour matching, DX-DI and DX group in 2002**

Variable	Sample	Treated	Control	Bias (%)	Bias reduction (%)	t	p >  t
Employees (in logs)	Unmatched	4,068	2,572	100,6		17,21	0,000
	Matched	4,068	4,196	-8,6	91,4	-0,90	0,367
Operating turnover (in logs)	Unmatched	9,611	7,776	113,1		19,06	0,000
	Matched	9,611	9,649	-2,3	98,0	-0,25	0,800
Age	Unmatched	26,4	23,8	15,0		2,51	0,012
	Matched	26,4	27,4	-5,8	61,4	-0,66	0,509
Export turnover	Unmatched	19254	3125	27,3		6,56	0,000
	Matched	19254	17077	3,7	86,5	0,39	0,693
Export share	Unmatched	0,308	0,166	54,8		9,57	0,000
	Matched	0,308	0,288	7,8	85,7	0,81	0,421
Labour productivity	Unmatched	636,2	326,4	16,8		3,28	0,001
	Matched	636,2	459,6	9,6	43,0	1,22	0,223
Corporate shareholder (d)	Unmatched	0,574	0,280	62,3		10,70	0,000
	Matched	0,574	0,544	6,3	89,9	0,69	0,489
Financial shareholder (d)	Unmatched	0,137	0,036	36,5		8,75	0,000
	Matched	0,137	0,100	13,4	63,3	1,33	0,184
State shareholder (d)	Unmatched	0,019	0,006	10,9		2,44	0,015
	Matched	0,019	0,022	-3,3	69,3	-0,30	0,761
Individual shareholder (d)	Unmatched	0,356	0,306	10,6		1,77	0,078
	Matched	0,356	0,367	-2,4	77,7	-0,27	0,789
Foreign shareholder (d)	Unmatched	0,115	0,048	24,7		5,10	0,000
	Matched	0,115	0,096	6,8	72,4	0,70	0,485
Domestic subsidiaries	Unmatched	0,967	0,201	40,0		12,44	0,000
	Matched	0,967	0,837	6,8	83,1	0,64	0,520
Liquidity ratio	Unmatched	0,230	0,209	7,2		1,03	0,303
	Matched	0,230	0,245	-4,9	32,5	-0,71	0,477
Leverage ratio	Unmatched	0,088	0,085	1,8		0,29	0,773
	Matched	0,088	0,076	8,0	-341,5	1,15	0,253
Capital intensity	Unmatched	26,4	34,6	-0,7		-0,08	0,935
	Matched	26,4	17,0	0,8	-14,8	2,10	0,036
R&D	Unmatched	1,472	2,769	-3,7		-0,43	0,667
	Matched	1,472	1,033	1,2	66,2	1,02	0,307
Propensity score	Unmatched	0,045	0,010	102,0		28,92	0,000
	Matched	0,045	0,045	-0,1	99,9	-0,01	0,996

Notes: Reported are the mean values of the treated (DX-DI) and control (DX) group, before and after the matching for the year 2002 (pre-change year,  $t-1$ ). The t-test are used to test for the equality of those means. The corresponding results for the industry, region and legal type variables are not reported but they are available on request.



**Table 5: Balancing test for nearest neighbour matching, D-DI and D group in 2002**

Variable	Sample	Treated	Control	Bias (%)	Bias reduction (%)	t	p >  t
Employees (in logs)	Unmatched	3,694	1,834	117,9		16,18	0,000
	Matched	3,694	3,585	6,9	94,2	0,42	0,672
Operating turnover (in logs)	Unmatched	9,025	6,526	151,2		18,90	0,000
	Matched	9,025	8,819	12,5	91,8	0,76	0,450
Age	Unmatched	25,9	18,4	41,1		6,24	0,000
	Matched	25,9	25,6	1,5	96,4	0,10	0,919
Export turnover	Unmatched	0	0	0		0	0
	Matched	0	0	0	0	0	0
Export share	Unmatched	0	0	0		0	0
	Matched	0	0	0	0	0	0
Labour productivity	Unmatched	563,1	170,8	25,1		4,36	0,000
	Matched	563,1	345,5	13,9	44,5	1,06	0,290
Corporate shareholder (d)	Unmatched	0,585	0,106	116,2		15,99	0,000
	Matched	0,585	0,557	6,9	94,1	0,41	0,679
Financial shareholder (d)	Unmatched	0,160	0,016	52,4		11,81	0,000
	Matched	0,160	0,283	-44,5	15,1	-2,16	0,032
State shareholder (d)	Unmatched	0,057	0,002	32,3		11,20	0,000
	Matched	0,057	0,057	0,0	100,0	0,00	1,000
Individual shareholder (d)	Unmatched	0,179	0,205	-6,4		-0,65	0,516
	Matched	0,179	0,142	9,6	-48,3	0,75	0,456
Foreign shareholder (d)	Unmatched	0,170	0,008	59,0		18,36	0,000
	Matched	0,170	0,217	-17,2	70,8	-0,87	0,387
Domestic subsidiaries	Unmatched	2,113	0,085	53,8		28,68	0,000
	Matched	2,113	1,311	21,2	60,5	1,28	0,201
Liquidity ratio	Unmatched	0,136	0,088	7,6		0,62	0,533
	Matched	0,136	0,197	-9,5	-24,7	-1,26	0,210
Leverage ratio	Unmatched	0,117	0,120	-1,4		-0,13	0,897
	Matched	0,117	0,134	-8,2	-501,3	-0,54	0,587
Capital intensity	Unmatched	42,6	39,9	0,4		0,03	0,975
	Matched	42,6	56,5	-2,1	-395,1	-0,57	0,572
R&D	Unmatched	3,749	3,139	2,8		0,22	0,823
	Matched	3,749	1,320	11,1	-298,2	1,83	0,068
Propensity score	Unmatched	0,030	0,001	85,8		44,15	0,000
	Matched	0,030	0,030	-1,0	98,8	-0,05	0,958

Notes: Reported are the mean values of the treated (D-DI) and control (D) group, before and after the matching for the year 2002 (pre-change year,  $t-1$ ). The t-test are used to test for the equality of those means. The corresponding results for the industry, region and legal type variables are not reported but they are available on request.

**Table 6: Balancing test for nearest neighbour matching, DI-DX and DI group in 2002**

Variable	Sample	Treated	Control	Bias (%)	Bias reduction (%)	t	p >  t
Employees (in logs)	Unmatched	4.846	4.720	7.4		0.90	0.367
	Matched	4.849	4.668	10.7	-43.3	1.04	0.301
Operating turnover (in logs)	Unmatched	10.36	10.26	5.6		0.68	0.500
	Matched	10.36	10.27	4.8	13.6	0.46	0.645
Age	Unmatched	33.48	32.63	3.7		0.45	0.656
	Matched	33.65	33.72	-0.3	92.2	-0.03	0.980
Export turnover	Unmatched	38807	34895	2.9		0.36	0.721
	Matched	39284	33312	4.4	-52.7	0.53	0.599
Export share	Unmatched	0.292	0.262	10.5		1.30	0.194
	Matched	0.290	0.316	-9.7	7.7	-0.87	0.384
Labour productivity	Unmatched	613.5	804.7	-5.6		-0.59	0.554
	Matched	618.6	507.4	3.2	41.9	0.59	0.558
Corporate shareholder (d)	Unmatched	0.728	0.760	-7.3		-0.93	0.354
	Matched	0.729	0.718	2.5	65.4	0.23	0.815
Financial shareholder (d)	Unmatched	0.212	0.136	20.1		2.69	0.007
	Matched	0.204	0.215	-2.9	85.5	-0.26	0.797
State shareholder (d)	Unmatched	0.022	0.038	-9.5		-1.09	0.276
	Matched	0.022	0.006	9.7	-2.8	1.35	0.178
Individual shareholder (d)	Unmatched	0.386	0.301	17.9		2.29	0.022
	Matched	0.381	0.376	1.2	93.5	0.11	0.914
Foreign shareholder (d)	Unmatched	0.092	0.155	-19.2		-2.23	0.026
	Matched	0.094	0.122	-8.4	56.1	-0.85	0.398
Domestic subsidiaries	Unmatched	2.35	2.22	2.8		0.33	0.743
	Matched	2.39	1.95	9.4	-235.1	0.97	0.334
Liquidity ratio	Unmatched	0.169	0.167	0.9		0.11	0.912
	Matched	0.171	0.186	-5.5	-535.9	-0.58	0.560
Leverage ratio	Unmatched	0.108	0.108	-0.2		-0.02	0.985
	Matched	0.110	0.094	11.1	-6935.9	1.27	0.204
Capital intensity	Unmatched	20.37	94.12	-8.2		-0.79	0.430
	Matched	20.30	18.81	0.2	98.0	0.47	0.638
R&D	Unmatched	4.169	2.332	9.3		1.39	0.164
	Matched	4.238	7.242	-15.2	-63.5	-0.93	0.354
Propensity score	Unmatched	0.211	0.141	70.9		9.77	0.000
	Matched	0.206	0.206	0.0	99.9	0.00	0.997

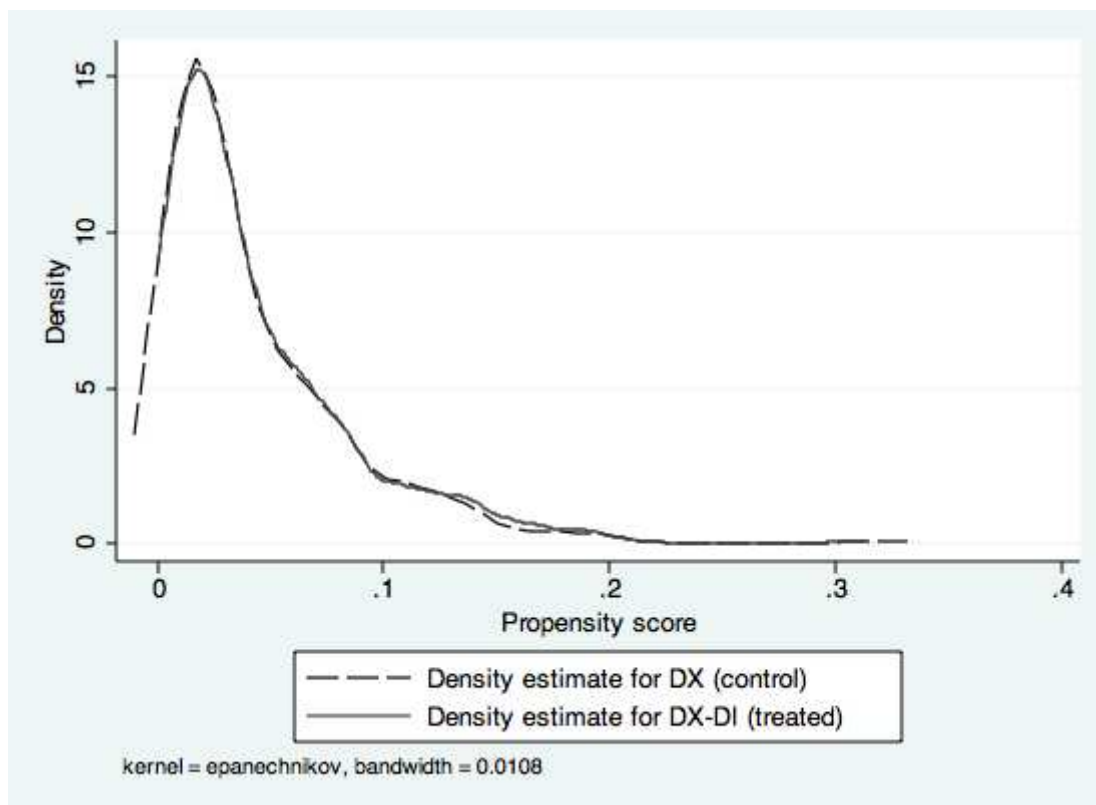
Notes: Reported are the mean values of the treated (DI-DX) and control (DI) group, before and after the matching for the year 2002 (pre-change year,  $t-1$ ). The t-test are used to test for the equality of those means. The corresponding results for the industry, region and legal type variables are not reported but they are available on request.

**Table 7: Balancing test for nearest neighbour matching, DI-D and DI group in 2002**

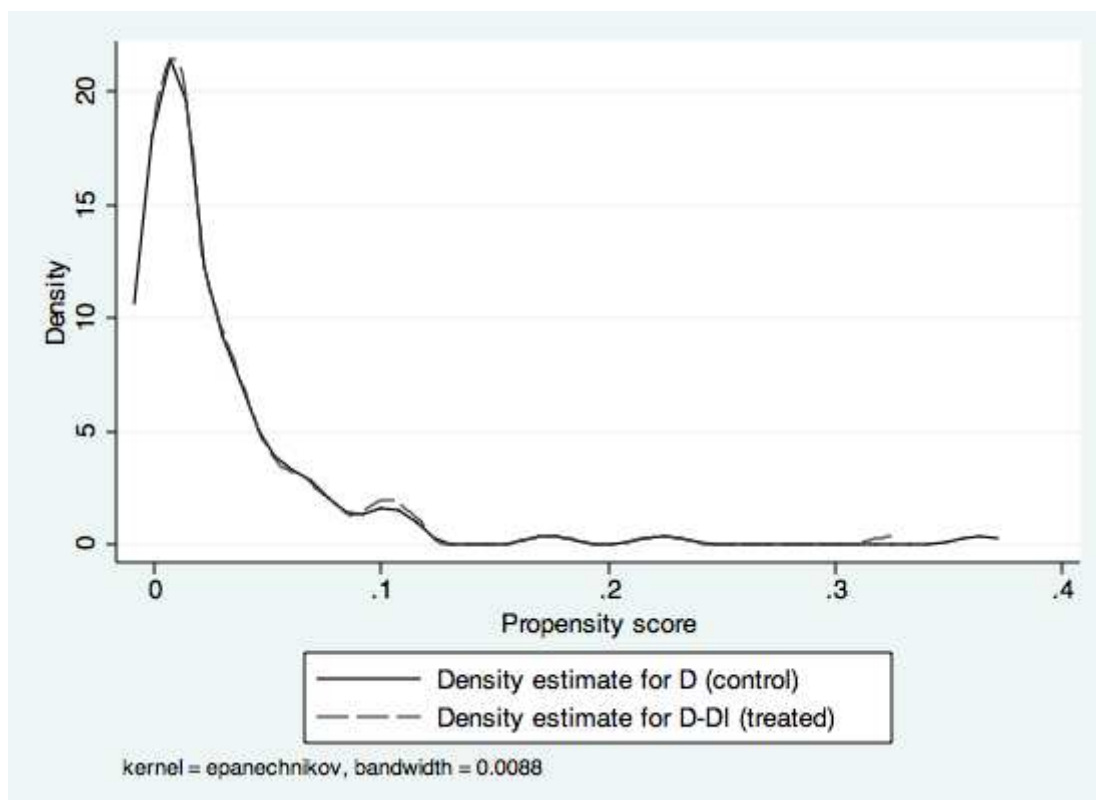
Variable	Sample	Treated	Control	Bias (%)	Bias reduction (%)	t	p >  t
Employees (in logs)	Unmatched	4.521	4.583	-3.2		-0.29	0.768
	Matched	4.506	4.675	-8.7	-173.4	-0.54	0.593
Operating turnover (in logs)	Unmatched	9.886	10.201	-15.0		-1.40	0.160
	Matched	9.799	9.806	-0.3	97.7	-0.02	0.984
Age	Unmatched	32.28	31.73	2.5		0.20	0.843
	Matched	31.42	30.42	4.5	-82.4	0.29	0.770
Export turnover	Unmatched	35988	37133	-0.6		-0.07	0.947
	Matched	36923	17805	9.8	-1570.2	0.68	0.500
Export share	Unmatched	0.085	0.263	-71.4		-5.48	0.000
	Matched	0.087	0.094	-2.8	96.1	-0.21	0.832
Labour productivity	Unmatched	1352.6	842.5	8.9		0.99	0.325
	Matched	684.1	220.5	8.1	9.1	1.11	0.270
Corporate shareholder (d)	Unmatched	0.620	0.746	-27.3		-2.45	0.014
	Matched	0.610	0.584	5.6	79.4	0.33	0.744
Financial shareholder (d)	Unmatched	0.152	0.139	3.7		0.32	0.745
	Matched	0.156	0.130	7.3	-96.5	0.46	0.648
State shareholder (d)	Unmatched	0.063	0.035	13.2		1.29	0.196
	Matched	0.065	0.104	-18.0	-36.1	-0.87	0.388
Individual shareholder (d)	Unmatched	0.253	0.307	-11.9		-0.99	0.321
	Matched	0.260	0.273	-2.9	75.7	-0.18	0.856
Foreign shareholder (d)	Unmatched	0.127	0.126	0.3		0.02	0.981
	Matched	0.117	0.130	-3.9	-1334.8	-0.24	0.808
Domestic subsidiaries	Unmatched	5.443	2.156	34.0		4.81	0.000
	Matched	4.195	3.065	11.7	65.6	1.08	0.282
Liquidity ratio	Unmatched	0.125	0.158	-12.5		-1.04	0.297
	Matched	0.127	0.136	-3.3	73.8	-0.21	0.836
Leverage ratio	Unmatched	0.098	0.103	-3.9		-0.30	0.762
	Matched	0.096	0.088	6.1	-57.0	0.48	0.633
Capital intensity	Unmatched	52.69	107.88	-5.7		-0.36	0.718
	Matched	31.43	32.26	-0.1	98.5	-0.07	0.944
R&D	Unmatched	1.702	3.337	-10.6		-0.76	0.450
	Matched	1.745	1.763	-0.1	98.9	-0.01	0.990
Propensity score	Unmatched	0.217	0.067	112.0		13.17	0.000
	Matched	0.204	0.205	-0.3	99.7	-0.02	0.986

Notes: Reported are the mean values of the treated (DI-D) and control (D) group, before and after the matching for the year 2002 (pre-change year,  $t-1$ ). The t-test are used to test for the equality of those means. The corresponding results for the industry, region and legal type variables are not reported but they are available on request.

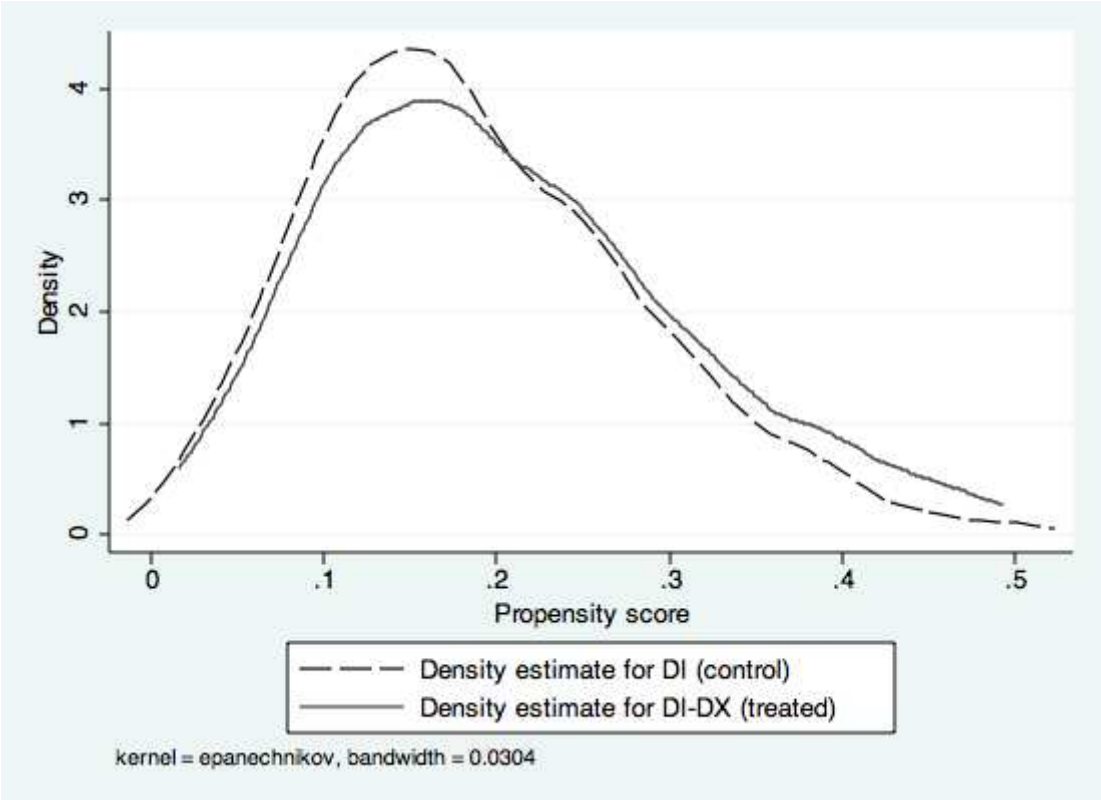
**Figure 1 Propensity score densities for DX-DI and DX (in 2002)**



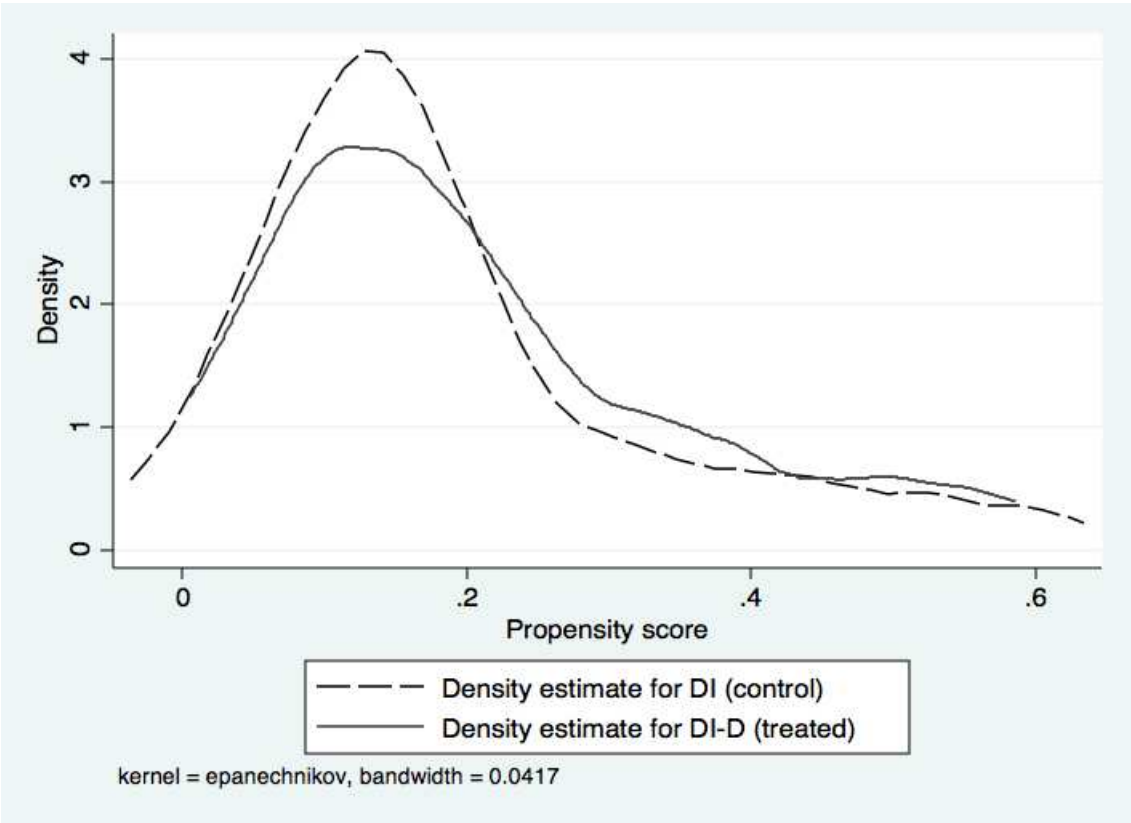
**Figure 2: Propensity score densities for D-DI and D (in 2002)**



**Figure 3: Propensity score densities for DI-DX and DI (in 2002)**



**Figure 4: Propensity score densities for DI-D and DI (in 2002)**



**Table 8: The effect of becoming engaged in FDI on firm's home performance (DX-DI)**

Outcome variable	$x_{t+k} - x_{t-1}$	Treated firms		Treated firms		t	
		(no restriction)	Diff-in-diff	t	(full restriction)		Diff-in-diff
Employment	$t+1$	1157	0,0103	1,133	756	0,0181 *	1,68
	$t+2$	816	0,0134	1,537	513	0,0208 *	1,93
	$t+3$	787	0,0147 *	1,796	489	0,0182 *	1,92
	$t+4$	828	0,0106	1,490	514	0,0134	1,50
	$t+5$	553	0,0083	0,831	323	0,0084	0,71
	$t+6$	657	0,0082	0,947	375	0,0058	0,54
Operating turnover	$t+1$	1303	0,0302 ***	2,770	1257	0,0325 ***	3,03
	$t+2$	984	0,0193 **	2,005	948	0,0226 **	2,30
	$t+3$	975	0,0076	0,877	941	0,0099	1,13
	$t+4$	981	0,0117	1,477	944	0,0131	1,61
	$t+5$	706	0,0172	1,625	679	0,0193 *	1,79
	$t+6$	723	0,0130	1,382	694	0,0147	1,53
Export turnover	$t+1$	1200	0,0259	0,983	932	0,0234	0,85
	$t+2$	890	0,0450 *	1,727	685	0,0293	1,04
	$t+3$	883	0,0323	1,614	672	0,0280	1,29
	$t+4$	883	0,0353 **	2,083	662	0,0186	1,00
	$t+5$	619	0,0283	1,428	464	0,0135	0,63
	$t+6$	639	0,0246	1,404	478	0,0098	0,51
Export share	$t+1$	1303	0,0177 **	2,356	1255	0,0167 **	2,25
	$t+2$	983	0,0236 **	2,246	947	0,0211 **	2,03
	$t+3$	974	0,0321 ***	2,734	940	0,0318 ***	2,71
	$t+4$	981	0,0377 ***	3,192	944	0,0376 ***	3,17
	$t+5$	705	0,0386 **	2,241	678	0,0370 **	2,16
	$t+6$	723	0,0558 ***	3,218	694	0,0585 ***	3,34
Labour productivity	$t+1$	1156	0,0152	1,535	753	0,0105	1,03
	$t+2$	816	0,0048	0,554	510	-0,0022	0,23
	$t+3$	786	0,0006	0,080	486	-0,0012	0,14
	$t+4$	828	0,0005	0,080	511	-0,0042	0,54
	$t+5$	553	0,0111	1,310	320	0,0068	0,62
	$t+6$	657	0,0044	0,597	372	0,0076	0,83
TFP	$t+1$	1086	0,0197 **	2,337	659	0,0178 **	2,08
	$t+2$	759	0,0020	0,286	474	0,0077	1,07
	$t+3$	789	0,0032	0,511	492	0,0046	0,72
	$t+4$	767	0,0038	0,801	473	0,0064	1,34
	$t+5$	519	0,0056	0,954	308	0,0084	1,32
	$t+6$	616	0,0010	0,192	363	0,0003	0,06

Notes: Reported are the results for the difference-in-difference estimations with  $x_{t+k} - x_{t-1}$ , where  $t$  = change period and  $k$  takes the values 1 to 6. "Full restriction" implies that variable information must be available in all post-change periods. "No restriction" imposes no restriction on the information availability. The  $t$  values are reported and \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 9: The effect of becoming engaged in FDI on firm's home performance (D-DI)**

Outcome variable	$x_{t+k} - x_{t-1}$	Treated firms		Treated firms		t	t
		(no restriction)	Diff-in-diff	t	(full restriction)		
Employment	$t+1$	418	0,0291	1,394	253	0,0091	0,37
	$t+2$	272	0,0176	0,817	163	0,0176	0,83
	$t+3$	270	0,0090	0,484	157	0,0063	0,30
	$t+4$	284	0,0087	0,511	168	0,0019	0,11
	$t+5$	176	-0,0042	0,179	109	0,0085	0,36
	$t+6$	211	0,0014	0,073	122	0,0049	0,24
Operating turnover	$t+1$	485	0,0711 ***	2,894	462	0,0737 ***	3,11
	$t+2$	339	0,0413 *	1,667	319	0,0416 *	1,79
	$t+3$	338	0,0377 *	1,768	319	0,0361 *	1,83
	$t+4$	341	0,0255	1,369	322	0,0225	1,31
	$t+5$	237	0,0163	0,747	223	0,0141	0,67
	$t+6$	238	0,0080	0,402	224	0,0049	0,26
Export turnover	$t+1$	0			0		
	$t+2$	0			0		
	$t+3$	0			0		
	$t+4$	0			0		
	$t+5$	0			0		
	$t+6$	0			0		
Export share	$t+1$	485	0,0149	1,345	459	0,0120	1,19
	$t+2$	338	0,0144	0,851	315	0,0162	1,03
	$t+3$	337	0,0222	1,221	315	0,0204	1,18
	$t+4$	340	0,0280	1,368	318	0,0245	1,29
	$t+5$	235	0,0359	1,279	221	0,0329	1,25
	$t+6$	238	0,0257	0,982	223	0,0225	0,92
Labour productivity	$t+1$	416	0,0289	1,132	253	0,0171	0,55
	$t+2$	271	0,0257	1,217	163	0,0311	1,26
	$t+3$	269	0,0241	1,499	157	0,0226	1,32
	$t+4$	283	0,0292 *	1,835	168	0,0288 *	1,70
	$t+5$	176	0,0399 **	2,101	109	0,0200	1,35
	$t+6$	211	0,0239	1,597	122	0,0100	0,72
TFP	$t+1$	296	0,0472 *	1,731	137	0,0408 *	1,70
	$t+2$	184	0,0105	0,47	99	0,0146	0,82
	$t+3$	202	0,0207	1,29	102	0,0256 *	1,90
	$t+4$	191	0,0094	0,662	101	0,0160	1,29
	$t+5$	132	0,0142	0,947	74	0,0280 *	1,95
	$t+6$	155	0,0135	1,019	78	0,0226 *	1,90

Notes: Reported are the results for the difference-in-difference estimations with  $x_{t+k} - x_{t-1}$ , where  $t$  = change period and  $k$  takes the values 1 to 6. "Full restriction" implies that variable information must be available in all post-change periods. "No restriction" imposes no restriction on the information availability. The  $t$  values are reported and \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 10: The effect of foreign divestment on firm's home performance (DI-DX)**

Outcome variable	$x_{t+k} - x_{t-1}$	Treated firms (no restriction)		t	Treated firms (full restriction)		t
		Diff-in-diff			Diff-in-diff		
Employment	$t+1$	361	0,0316	1,088	239	0,0303	0,86
	$t+2$	259	0,0362	1,403	158	0,0439	1,21
	$t+3$	243	0,0251	0,857	149	0,0274	0,65
	$t+4$	271	0,0208	0,794	163	0,0139	0,42
	$t+5$	60	0,0473	0,449	38	0,0257	0,24
	$t+6$	110	0,0187	0,386	69	0,0130	0,23
Operating turnover	$t+1$	389	-0,0038	0,154	372	-0,0031	0,12
	$t+2$	289	0,0030	0,134	277	0,0016	0,07
	$t+3$	288	-0,0124	0,511	277	-0,0166	0,67
	$t+4$	290	-0,0164	0,683	278	-0,0217	0,91
	$t+5$	110	-0,0243	0,481	105	-0,0279	0,52
	$t+6$	112	-0,0151	0,325	106	-0,0185	0,37
Export turnover	$t+1$	354	0,0388	0,588	183	-0,0199	0,28
	$t+2$	238	0,0412	0,516	120	0,0194	0,24
	$t+3$	230	-0,0130	0,231	116	-0,0104	0,17
	$t+4$	233	-0,0179	0,398	117	-0,0429	0,90
	$t+5$	75	-0,0123	0,057	19	0,0335	0,06
	$t+6$	82	-0,0002	0,001	18	0,0388	0,06
Export share	$t+1$	389	0,0561 **	2,410	372	0,0535 **	2,19
	$t+2$	289	0,0435	1,211	277	0,0402	1,09
	$t+3$	288	0,0210	0,562	277	0,0210	0,54
	$t+4$	290	0,0247	0,662	278	0,0256	0,66
	$t+5$	109	0,0188	0,158	104	0,0175	0,14
	$t+6$	112	0,0260	0,212	106	0,0322	0,25
Labour productivity	$t+1$	359	-0,0358	1,275	236	-0,0345	1,04
	$t+2$	258	-0,0351	1,398	156	-0,0544	1,53
	$t+3$	242	-0,0397	1,472	146	-0,0562	1,44
	$t+4$	268	-0,0414 *	1,795	158	-0,0628 **	2,14
	$t+5$	60	-0,0598	0,760	38	-0,0931	1,00
	$t+6$	109	-0,0310	0,838	66	-0,0451	0,98
TFP	$t+1$	332	-0,0042	0,210	168	0,0030	0,12
	$t+2$	213	-0,0186	0,898	96	-0,0085	0,28
	$t+3$	214	-0,0192	1,090	99	-0,0192	0,77
	$t+4$	224	-0,0207	1,287	107	-0,0255	1,27
	$t+5$	49	-0,0172	0,285	16	-0,0101	0,12
	$t+6$	92	-0,0116	0,459	33	-0,0145	0,42

Notes: Reported are the results for the difference-in-difference estimations with  $x_{t+k} - x_{t-1}$ , where  $t$  = change period and  $k$  takes the values 1 to 6. "Full restriction" implies that variable information must be available in all post-change periods. "No restriction" imposes no restriction on the information availability. The  $t$  values are reported and \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



**Table 11: The effect of foreign divestment on firm's home performance (DI-D)**

Outcome variable	$x_{t+k} - x_{t-1}$	Treated firms (no restriction)			Treated firms (full restriction)		
		Diff-in-diff	t	Diff-in-diff	t	Diff-in-diff	t
Employment	$t+1$	184	-0,0770	1,124	106	-0,0356	0,78
	$t+2$	127	-0,0645	0,860	69	-0,0273	0,49
	$t+3$	118	-0,0166	0,262	66	-0,0240	0,58
	$t+4$	127	-0,0080	0,165	70	-0,0111	0,25
	$t+5$	31	-0,0502	0,235	15	0,0377	0,38
	$t+6$	71	-0,0289	0,396	37	0,0026	0,05
Operating turnover	$t+1$	206	-0,0567	1,189	199	-0,0447	0,94
	$t+2$	151	0,0103	0,190	148	0,0166	0,31
	$t+3$	152	0,0071	0,198	147	0,0101	0,28
	$t+4$	152	0,0058	0,183	147	0,0089	0,28
	$t+5$	75	0,0111	0,199	72	0,0095	0,17
	$t+6$	76	-0,0215	0,338	73	-0,0240	0,37
Export turnover	$t+1$	0			0		
	$t+2$	0			0		
	$t+3$	0			0		
	$t+4$	0			0		
	$t+5$	0			0		
	$t+6$	0			0		
Export share	$t+1$	206	-0,1203 ***	5,483	198	-0,1250 ***	5,56
	$t+2$	151	-0,0590 **	1,972	147	-0,0582 *	1,93
	$t+3$	151	-0,0887 **	2,504	145	-0,0901 **	2,47
	$t+4$	150	-0,0855 **	2,295	146	-0,0884 **	2,33
	$t+5$	72	-0,1110	1,230	69	-0,1135	1,21
	$t+6$	76	-0,0944	1,098	72	-0,0957	1,06
Labour productivity	$t+1$	184	0,0284	0,568	106	-0,0100	0,22
	$t+2$	127	0,0852	1,382	69	0,0361	1,05
	$t+3$	118	0,0429	1,037	66	0,0364	1,34
	$t+4$	126	0,0334	0,956	70	0,0369	1,07
	$t+5$	31	0,0637	0,431	15	0,0190	0,29
	$t+6$	71	0,0310	0,614	37	0,0330	0,97
TFP	$t+1$	118	-0,0118	0,278	46	0,0241	0,75
	$t+2$	79	0,0005	0,010	36	0,0410	1,22
	$t+3$	82	-0,0196	0,565	33	0,0159	0,58
	$t+4$	72	-0,0191	0,610	30	0,0208	0,82
	$t+5$	20	-0,0470	0,536	8	0,0317	0,65
	$t+6$	46	-0,0285	0,886	15	0,0015	0,05

Notes: Reported are the results for the difference-in-difference estimations with  $x_{t+k} - x_{t-1}$ , where  $t$  = change period and  $k$  takes the values 1 to 6. "Full restriction" implies that variable information must be available in all post-change periods. "No restriction" imposes no restriction on the information availability. The  $t$  values are reported and \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 12: Performance of high- and low technology firms (DX-DI)**

Outcome variable	$X_{t+k} - X_{t-1}$	Treated firms			Treated firms		
		high technology	Diff-in-diff	t	low technology	Diff-in-diff	t
Employment	$t+1$	362	0,0133	0,853	795	0,0092	0,890
	$t+2$	252	0,0241	1,626	564	0,0086	0,886
	$t+3$	241	0,0124	0,867	546	0,0157 *	1,756
	$t+4$	260	0,0135	1,148	568	0,0092	1,150
	$t+5$	175	0,0063	0,375	378	0,0092	0,834
	$t+6$	209	0,0083	0,665	448	0,0081	0,799
Operating turnover	$t+1$	408	0,0457 **	2,520	895	0,0232 *	1,905
	$t+2$	301	0,0321 **	2,073	683	0,0137	1,260
	$t+3$	297	0,0264 **	1,966	678	-0,0007	0,070
	$t+4$	300	0,0265 **	2,146	681	0,0053	0,576
	$t+5$	220	0,0317 *	1,654	486	0,0106	0,960
	$t+6$	226	0,0235	1,607	497	0,0083	0,772
Export turnover	$t+1$	377	0,0554	1,224	823	0,0119	0,409
	$t+2$	277	0,0296	0,703	613	0,0519 *	1,788
	$t+3$	272	0,0584 *	1,703	611	0,0206	0,945
	$t+4$	280	0,0498 *	1,755	603	0,0285	1,532
	$t+5$	204	0,0257	0,911	415	0,0293	1,274
	$t+6$	203	0,0351	1,398	436	0,0197	0,970
Export share	$t+1$	408	0,0276 **	2,196	895	0,0132	1,585
	$t+2$	301	0,0381 *	1,944	682	0,0173	1,583
	$t+3$	297	0,0497 **	2,419	677	0,0244 *	1,934
	$t+4$	300	0,0556 ***	2,831	681	0,0299 **	2,293
	$t+5$	220	0,0732 **	2,570	485	0,0229	1,220
	$t+6$	226	0,0816 ***	2,871	497	0,0441 **	2,326
Labour productivity	$t+1$	361	0,0361 **	2,149	795	0,0054	0,493
	$t+2$	252	0,0122	0,839	564	0,0015	0,156
	$t+3$	240	0,0087	0,718	546	-0,0030	0,377
	$t+4$	260	0,0037	0,340	568	-0,0009	0,120
	$t+5$	175	0,0202	1,267	378	0,0070	0,807
	$t+6$	209	0,0122	1,019	448	0,0008	0,095
TFP	$t+1$	325	0,0200	1,173	761	0,0198 **	2,382
	$t+2$	219	0,0166	1,267	540	-0,0037	0,502
	$t+3$	230	0,0126	1,288	559	-0,0006	0,093
	$t+4$	225	0,0157 *	1,802	542	-0,0011	0,210
	$t+5$	159	0,0137	1,315	360	0,0020	0,319
	$t+6$	184	0,0080	0,923	432	-0,0020	0,372

Notes: Reported are the results for the difference-in-difference estimations with  $X_{t+k} - X_{t-1}$ , where  $t$  = change period and  $k$  takes the values 1 to 6. The  $t$  values are reported and \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 13: Performance of high- and low technology firms (D-DI)**

Outcome variable	$x_{t+k} - x_{t-1}$	Treated firms		t	Treated firms		t
		high technology	Diff-in-diff		low technology	Diff-in-diff	
Employment	$t+1$	100	0,0223	0,642	318	0,0312	1,315
	$t+2$	62	-0,0091	0,204	210	0,0254	1,159
	$t+3$	62	-0,0138	0,402	208	0,0156	0,791
	$t+4$	60	-0,0125	0,353	224	0,0146	0,824
	$t+5$	38	-0,0251	0,524	138	0,0016	0,068
	$t+6$	49	-0,0317	1,000	162	0,0116	0,541
Operating turnover	$t+1$	114	0,0485	1,390	371	0,0781 ***	2,733
	$t+2$	76	0,0525	1,245	263	0,0381	1,387
	$t+3$	77	0,0362	1,098	261	0,0381	1,588
	$t+4$	77	0,0291	0,967	264	0,0245	1,176
	$t+5$	56	0,0177	0,567	181	0,0159	0,638
	$t+6$	56	0,0104	0,357	182	0,0072	0,320
Export turnover	$t+1$	0			0		
	$t+2$	0			0		
	$t+3$	0			0		
	$t+4$	0			0		
	$t+5$	0			0		
	$t+6$	0			0		
Export share	$t+1$	114	0,0629 **	2,226	371	0,0001	0,011
	$t+2$	76	0,0567	1,593	262	0,0021	0,124
	$t+3$	77	0,0749 *	1,841	260	0,0066	0,368
	$t+4$	76	0,0986 **	2,272	264	0,0077	0,372
	$t+5$	55	0,0846	1,231	180	0,0214	0,861
	$t+6$	56	0,1156 **	2,098	182	-0,0020	0,076
Labour productivity	$t+1$	100	0,0309	0,922	316	0,0282	0,926
	$t+2$	62	0,0683 *	1,850	209	0,0129	0,553
	$t+3$	62	0,0442	1,483	207	0,0180	1,046
	$t+4$	60	0,0459	1,542	223	0,0248	1,452
	$t+5$	38	0,0389	1,204	138	0,0397 *	1,935
	$t+6$	49	0,0455 **	2,038	162	0,0174	1,038
TFP	$t+1$	73	0,0883 **	2,127	223	0,0338	1,105
	$t+2$	45	0,0180	0,433	139	0,0079	0,340
	$t+3$	49	0,0438	1,388	153	0,0134	0,789
	$t+4$	43	0,0486 *	1,713	148	-0,0020	0,139
	$t+5$	31	0,0434	1,350	101	0,0056	0,366
	$t+6$	40	0,0409 *	1,832	115	0,0041	0,282

Notes: Reported are the results for the difference-in-difference estimations with  $x_{t+k} - x_{t-1}$ , where  $t$  = change period and  $k$  takes the values 1 to 6. The  $t$  values are reported and \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 14: Performance of high- and low technology firms (DI-DX)**

Outcome variable	$x_{t+k} - x_{t-1}$	Treated firms		t	Treated firms		t
		high technology	Diff-in-diff		low technology	Diff-in-diff	
Employment	<i>t+1</i>	132	0,0090	0,282	229	0,0448	1,429
	<i>t+2</i>	86	0,0009	0,033	173	0,0537 *	1,932
	<i>t+3</i>	83	0,0322	1,225	160	0,0214	0,663
	<i>t+4</i>	94	0,0159	0,776	177	0,0230	0,781
	<i>t+5</i>	16	0,0384	0,279	44	0,0505	0,523
	<i>t+6</i>	38	0,0265	0,469	72	0,0145	0,301
Operating turnover	<i>t+1</i>	136	-0,0045	0,177	253	-0,0034	0,124
	<i>t+2</i>	96	0,0114	0,396	193	-0,0011	0,050
	<i>t+3</i>	94	0,0235	0,905	194	-0,0298	1,175
	<i>t+4</i>	98	0,0068	0,269	192	-0,0282	1,106
	<i>t+5</i>	37	-0,0063	0,143	73	-0,0334	0,612
	<i>t+6</i>	37	0,0078	0,150	75	-0,0265	0,572
Export turnover	<i>t+1</i>	130	0,0844	1,141	224	0,0133	0,191
	<i>t+2</i>	80	0,0760	0,754	158	0,0237	0,312
	<i>t+3</i>	73	0,0630	0,783	157	-0,0473	0,920
	<i>t+4</i>	77	0,0384	0,830	156	-0,0450	0,939
	<i>t+5</i>	23	0,0461	0,239	52	-0,0381	0,176
	<i>t+6</i>	24	0,0778	0,233	58	-0,0339	0,192
Export share	<i>t+1</i>	136	0,0427	1,576	253	0,0635 ***	2,738
	<i>t+2</i>	96	0,0194	0,393	193	0,0557 *	1,714
	<i>t+3</i>	94	0,0334	0,647	194	0,0151	0,445
	<i>t+4</i>	98	-0,0071	0,143	192	0,0409	1,164
	<i>t+5</i>	36	-0,0479	0,322	73	0,0525	0,475
	<i>t+6</i>	37	-0,0648	0,427	75	0,0716	0,629
Labour productivity	<i>t+1</i>	130	-0,0113	0,358	229	-0,0498 *	1,686
	<i>t+2</i>	85	-0,0003	0,010	173	-0,0523 *	1,945
	<i>t+3</i>	82	-0,0088	0,383	160	-0,0554 *	1,885
	<i>t+4</i>	93	-0,0176	0,976	175	-0,0535 **	2,074
	<i>t+5</i>	16	0,0341	0,275	44	-0,0959	1,459
	<i>t+6</i>	37	-0,0170	0,373	72	-0,0384	1,059
TFP	<i>t+1</i>	114	0,0188	0,753	218	-0,0167	0,817
	<i>t+2</i>	60	0,0277	1,034	153	-0,0388 **	1,995
	<i>t+3</i>	67	0,0231	1,016	147	-0,0402 **	2,496
	<i>t+4</i>	69	0,0125	0,614	155	-0,0359 **	2,344
	<i>t+5</i>	13	0,0194	0,208	36	-0,0307	0,602
	<i>t+6</i>	32	0,0136	0,519	60	-0,0250	0,964

Notes: Reported are the results for the difference-in-difference estimations with  $x_{t+k} - x_{t-1}$ , where t = change period and k takes the values 1 to 6. The t values are reported and \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table 15: Performance of high- and low technology firms (DI-D)**

Outcome variable	$x_{t+k} - x_{t-1}$	Treated firms		Treated firms			
		high technology	Diff-in-diff	t	low technology	Diff-in-diff	t
Employment	$t+1$	52	-0,1357	1,131	132	-0,0521	0,838
	$t+2$	40	-0,1655	1,471	87	-0,0138	0,197
	$t+3$	37	-0,1136	1,247	81	0,0349	0,571
	$t+4$	37	-0,0730	0,926	90	0,0240	0,531
	$t+5$	8	-0,1442	0,392	23	0,0099	0,059
	$t+6$	27	-0,0921	0,966	44	0,0119	0,180
Operating turnover	$t+1$	59	0,0109	0,199	147	-0,0838	1,468
	$t+2$	47	-0,0234	0,464	104	0,0254	0,379
	$t+3$	47	-0,0058	0,144	105	0,0128	0,300
	$t+4$	47	-0,0005	0,014	105	0,0088	0,234
	$t+5$	29	-0,0081	0,128	46	0,0230	0,349
	$t+6$	29	-0,0259	0,437	47	-0,0188	0,219
Export turnover	$t+1$	0			0		
	$t+2$	7	-0,0539	0,101	12	0,1161	0,245
	$t+3$	8	0,1302	0,335	9	-0,0256	0,039
	$t+4$	8	-0,0999	0,306	9	-0,0519	0,099
	$t+5$	4	-0,0489	0,115	2	-0,0318	0,014
	$t+6$	5	0,0225	0,067	4	0,0798	0,071
Export share	$t+1$	59	-0,1361 ***	4,045	147	-0,1140 ***	4,467
	$t+2$	47	-0,0566	1,309	104	-0,0601 *	1,711
	$t+3$	46	-0,0294	0,664	105	-0,1147 ***	2,695
	$t+4$	47	-0,0286	0,661	103	-0,1115 **	2,399
	$t+5$	28	-0,0878	0,944	44	-0,1258	1,029
	$t+6$	29	-0,0425	0,523	47	-0,1264	1,068
Labour productivity	$t+1$	52	0,1446 *	1,748	132	-0,0186	0,376
	$t+2$	40	0,1368 *	1,725	87	0,0597	0,884
	$t+3$	37	0,0970	1,490	81	0,0134	0,371
	$t+4$	37	0,0758	1,257	89	0,0123	0,396
	$t+5$	8	0,1621	0,631	23	0,0101	0,089
	$t+6$	27	0,0674	1,049	44	0,0072	0,144
TFP	$t+1$	36	0,0475	0,932	82	-0,0376	0,736
	$t+2$	29	0,0355	0,951	50	-0,0200	0,305
	$t+3$	28	0,0148	0,652	54	-0,0376	0,771
	$t+4$	23	0,0434 *	1,708	49	-0,0485	1,199
	$t+5$	5	0,0241	0,198	15	-0,0744	0,762
	$t+6$	19	0,0016	0,056	27	-0,0488	1,087

Notes: Reported are the results for the difference-in-difference estimations with  $x_{t+k} - x_{t-1}$ , where  $t$  = change period and  $k$  takes the values 1 to 6. The  $t$  values are reported and \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

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