Former Foreign Affiliates: Cast Out and Outperformed?

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Abstract The literature has documented a positive effect of foreign ownership on firm performance. But is this effect due to a one-time knowledge transfer or does it rely on continuous injections of knowledge? To shed light on this question we focus on divestments, that is, foreign affiliates that are sold to local owners. To examine the effect of the ownership change we combine a difference-in-differences approach with propensity score matching. We use plant-level panel data from the Indonesian Census of Manufacturing covering the period 1990-2009. We consider 157 cases of divestment, where a large set of plant characteristics is available two years before and three years after the ownership change and for which observationally similar control plants exist. The results indicate that divestment is associated with a drop in total factor productivity accompanied by a decline in output, markups as well as export and import intensity. The findings are consistent with the benefits of foreign ownership being driven by continuous supply of headquarter services from the foreign parent.

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1. Introduction

Countries around the world compete fiercely to attract foreign direct investment (FDI). Their interest in bringing FDI is motivated by the belief that foreign investors not only create jobs but are also a channel of knowledge transfer across international borders. Indeed many studies have documented superior performance of foreign affiliates with a few being able to establish a causal effect. Among the latter, Arnold and Javorcik (2009) found that foreign acquisitions of Indonesian plants resulted in a 13.5% productivity boost after three years under foreign ownership. The rise in productivity was a result of restructuring, as acquired plants increased investment outlays, employment and wages. Foreign ownership also enhanced the integration of acquired plants into the global economy through increased export and import intensity. A similar result was established in the Spanish context where Guadalupe et al. (2012) showed that foreign acquisitions resulted in more product and process innovation and adoption of foreign technologies, leading to higher productivity.[1] The superior performance of foreign affiliates is not surprising given that only the most productive firms are able to incur the fixed cost of undertaking FDI (see Helpman et al. 2004).

But how persistent are the benefits of foreign ownership? Is the superior performance of foreign affiliates due to a one-time knowledge and

[1] A positive, albeit much smaller, effect of foreign ownership was also found by Fons-Rosen et al. (2014). In contrast, Wang and Wang (2014), who compared foreign acquisitions to domestic ones, did not find a positive impact of foreign ownership on productivity, though they did document a positive impact on target firms' financial conditions, exports, output, employment and wages. A related literature has shown that foreign affiliates perform better in the times of crises (see Blalock et al. 2008; Alfaro and Chen 2012).

knowhow transfer or does it depend on the continuous flow of knowledge and headquarter services from the parent firm? These questions matter profoundly for policy. Foreign investors are often given tax incentives or tax holidays in the hope that their affiliates will become a source of knowledge spillovers to indigenous firms. How long they can remain such a source enters the cost-benefit calculation. The length of the tax incentives is usually prescribed by law, and tax incentives cannot be awarded after the foreign parent leaves. However, we know little about the horizon over which the benefits accrue. If foreign affiliates retain their productivity advantage even after the foreign parent leaves, the value proposition of such tax policies is much greater than if the advantage evaporates once the parent divests.

To shed light on these issues we examine developments in foreign affiliates that were sold by their parents to local owners. We use plant-level data from the Indonesian Census of Manufacturing covering the period 1990-2009 and consider cases of foreign affiliates whose ownership was transferred to Indonesian hands. More specifically, we focus on plants that were at least 50% foreign owned and whose foreign ownership dropped to less than 10% (a standard threshold used in the literature to denote foreign direct investment) and remained so for at least three years. We are able to consider 157 cases of divestment where a large set of plant characteristics are observed two years before and three years after divestment and for which observationally similar control plants exist.[2]

To examine the effect of the ownership change we combine a difference-in-differences approach with propensity score matching. To create a missing counterfactual of how foreign plants would have performed in the absence of divestment we use as a control group foreign affiliates similar in

[2] As we show in robustness checks, the same conclusions can be reached based on a larger sample of divestment cases.

terms of observable characteristics, operating in the same narrowly defined industry in the same year, which remain in foreign hands. Then we compare changes in various aspects of plant performance between the year prior to divestment and years following the ownership change among the treated (divested) plants and the control group.

If the divestment decision was driven by observable affiliate characteristics, it will be controlled for through our matching exercise. If it was driven by unobservable time-invariant heterogeneity related either to the parent or the affiliate, it will be controlled for through the difference-in-differences approach. As we consider a relatively short time horizon, the latter method will capture developments such as financial shocks or a permanent productivity increase experienced by the parent company.

Our variables of interest include the total factor productivity (TFP), output, markups, employment, average wage, export intensity and reliance on imported inputs. Markups are estimated following a method proposed by De Loecker and Warzynski (2012). The advantage of this method lies in allowing for markup estimation based on plant-level data without the need to specify how producers compete in the product market.

The results indicate that divestment is associated with a 0.038 log point productivity drop among divested plants relative to the control group. The decline is registered in the year of ownership change and persists over time. A large and growing gap in output emerges between the divested plants and the control group. It ranges from 0.35 log points in the year of divestment to 0.54 log points two years later. This gap is driven by export sales. The decline in output is accompanied by lower markups and lower reliance on imported inputs. Perhaps to compensate for the smaller scale of production, divested plants lower their employment by shedding production workers. Blue-collar employment goes down by 0.153 log points in the year of divestment relative to the control group, although in the subsequent years the difference between

the treated and the control plants ceases to be statistically significant. Interestingly, we do not find statistically significant effects of divestment on the probability of exit, investment or access to various sources used to finance investment (except for reinvested earnings). However, we do find that affiliates initially set up as greenfield projects experience a larger negative effect on their performance after divestment.

While transfer pricing is usually a concern in studies of foreign affiliates, our results are unlikely to be driven by this phenomenon. Transfer pricing could potentially affect outcomes such as the value of output, markups and the TFP, but it does not affect employment figures. Moreover, if transfer pricing were responsible for the patterns observed, we would expect to see larger effects of divestment on former fully foreign-owned affiliates than on other affiliates. No such difference is observed in the data.

A battery of robustness checks confirms our findings. The observed patterns are robust to considering a longer time horizon (of 5 years) after divestment. They are also robust to controlling for longer pre-trends in the matching procedure or addressing the issue of potential spillovers confounding the effects. Finally, by comparing the impact of foreign divestments to the impact of privatizations we address the concern that any ownership change (rather than the loss of the foreign parent) would have produced similar effects.

The observed pattern is consistent with sold affiliates being partially cut off from the distribution network of their former parent company which results in a negative demand shock. However, the negative effect of divestment on productivity and output is also present in affiliates that did not export prior to divestment. This suggests that the worsened performance may also be due to the loss of access to knowledge and know-how provided by the headquarters of the former parent as well as by possible departure of expatriate managers employed by the former foreign parent. In sum, our findings are broadly consistent with the view that the superior performance of foreign affiliates

observed around the world is driven by continuous injections of headquarter services from the parent company to their overseas affiliates. To the best of our knowledge, this is the first study to document this pattern.

The remainder of the paper is structured as follows. The next section presents the data. Section 3 focuses on determinants of divestments. Section 4 discusses the empirical strategy and variable definitions. Section 5 presents the OLS results, while Section 6 report the main matching results and interprets the findings. Section 7 shows the robustness checks. The last section contains the conclusions of the study.

2. Data

Our data come from the *Survei Manufaktur*, the Indonesian Census of Manufacturing conducted by the National Statistical Office (BPS) on annual basis since 1975. The census surveys all registered manufacturing plants with more than 20 employees. It contains detailed information on a large number of variables, including output, inputs, ownership and participation in international trade. Our dataset covers the period 1990-2009 and contains more than 432,215 plant observations, of which about seven percent belong to foreign-owned plants. The average spell a plant remains in our sample is about 12 years.

Indonesia is a suitable country for studying consequences of FDI. It has received large inflows of FDI, worth over 41 billion dollars during the period under consideration. It has also experienced exit of many foreign investors, notably in the aftermath of the Asian Crisis.[3] The high quality of the data collected by the BPS has also attracted many academics. For instance, the works of Arnold and Javorcik (2009) and Blalock et al. (2008) rely on the same data, although they focus on the earlier time period.

[3] Indonesia lost 14.7 billion dollar worth of FDI between 1998 and 2003 (this figure is expressed in 2005 USD, source: the *World Development Indicators*).

3. Determinants of Divestments

Why do divestments happen? There is wide range of factors that can potentially explain divestments. The first set of factors is related to the parent company and its home country. For instance, a negative shock experienced by the parent company may force it to liquidate its assets abroad to avoid bankruptcy. Alternatively, an increase in the costs of borrowing in the home country may force it to curb its operations abroad.[4] Based on recent theoretical developments, one can also argue that productivity *growth* enjoyed by the parent company may lead it to reverse its earlier decisions about undertaking FDI.[5]

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[4] Chen and Wu (1996) who study the survival rates of foreign affiliates in Taiwan find that affiliates of Japanese and US companies are less likely to exit or be divested relative to affiliates of parents originating from other countries. This finding is consistent with the view that home country conditions matter for divestment.

Denis et al. (1997) show that decreases in corporate diversification (often happening through divestment) are associated with external corporate control threats, financial distress, and management turnover, which is consistent with the view that shocks to the parent firm may drive sales of foreign affiliates.

[5] Helpman et al. (2004) show that more productive firms can increase profits by paying the fixed costs of setting up overseas operations and saving on transportation costs. They are, therefore, more likely to engage in FDI rather than exports to serve a foreign market. Mrázová and Neary (2013) show that this result holds only if variable costs of production and marginal cost of serving the market are complementary. Lower trade costs will then benefit low cost firms more than they benefit high cost firms, since the former firm will already sell more abroad. They show that if this does *not* hold (which itself depends on the preference structure for example), then it is possible that a very

The second (and related) set of factors pertains to the whole network of subsidiaries belonging to the parent company. As argued in a widely cited paper by Kogut and Kulatilaka (1994), a network of subsidiaries spread over multiple countries provides a multinational firm with an 'operating flexibility' that adds value to the firm. This flexibility can be thought of as owning the option to respond to uncertain events, such as government policies, competitors' decisions, or the arrival of new technologies, by relocating production and sales across the globe. For instance, strong growth in the home country may induce a multinational to expand in the home market while divesting from a host country with less enticing growth prospects. Thus what matters here are the relative changes in growth rates, production costs, regulation, etc. in all countries of operation.

The third set of factors pertains to the affiliate's characteristics and performance. For instance, Jovanovic (1982) models firm expansion as an adaptive learning process where firms only gradually learn about their efficiency and are induced to start small. In the context of our study, we can

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productive firm may have little to gain from engaging in FDI because its trade costs are already very low: paying an additional fixed cost to save on (small) trade costs may then not increase profits anymore. Similarly, very productive firms may choose not to invest directly in foreign markets if their productivity advantage over other firms is large enough that they have little to gain in terms of wage costs from offshoring to low wage countries. Their wage bill is too low to warrant paying the additional fixed cost of engaging in vertical FDI. Although this argument relates mostly to the cross-section productivity distribution of firms, it is possible to envisage that a growing multinational firm will reverse previous offshoring decisions once they become even more productive. For example, Yeaple (2009) shows that there is less evidence for FDI in US data than would be expected from the distribution of productivity.

think of parent firms facing uncertainty about whether their products or technology will be appropriate given the host country conditions, or uncertainty about the quality of the assets purchased if the entry happened through an acquisition (as opposed to setting up a greenfield project), or the quality and compatibility of the local partner in the case of joint venture projects (as opposed to fully foreign owned project). As the uncertainty reveals itself, successful affiliates grow while unsuccessful ones may be divested. Thus we would expect a negative correlation between the affiliate's size and the probability of divestment. Other affiliate-specific reasons for divestment may include expiration of tax holidays, actions of rivals, or low capital intensity which makes the affiliate unprofitable as a result of rising wages in the host country.

Finally, divestments may also be driven by shocks experienced by the potential buyers. For instance, a positive shock to an Indonesian company may encourage it to make a lucrative offer to the owners of a foreign affiliate that fits particularly well with the rest of its Indonesian business.

Unfortunately, our data set is not ideally suited for examining the determinants of divestments. It does not include information on the parent companies of foreign affiliates. Therefore, we are unable to show that shocks experienced by the parents or other subsidiaries belonging to the same parent indeed determine divestments.

However, for a subsample of plants we have information on the nationality of foreign owners in 1996 and 2006.[6] This information is listed in Appendix Table A1. The table indicates that most of foreign investors within this subsample come from East Asia, followed by Europe (excluding the UK) and then Anglo-Saxon countries. This information allows us to examine the link between divestment and the economic conditions in the parent's home

[6] We are grateful to Joel Rodrigue for sharing the data with us.

country. We are also able to investigate the link between affiliate characteristics and the probability of divestment. As is evident from the left panel of Table 1 (the unmatched sample), there are large differences across a range of characteristics between affiliates that will be divested and those that will remain under foreign control. Almost all of these differences are statistically significant at the one percent level.

In Table 2, we present the results of a probit model where the dependent variable is equal to one if the affiliate in question was divested at time *t*, and zero otherwise. The sample includes only plants that were foreign owned at time *t – 1*.[7] It is not clear *a priori* whether the developments in the home country at time *t* or time *t – 1* are the most relevant to the divestment decision, so we estimate two alternative specifications, which nevertheless lead to the same conclusions. We find that proxies for an expanding domestic economy – GDP growth and Credit to private sector extended by banks expressed as a percentage of GDP – are positively correlated with the probability of divestment. A high lending rate in the home country also tends to induce divestments.[8] Moving on to project characteristics, we find that affiliates set up as greenfield projects are less likely to be divested.[9] The same

[7] Note that in order to remain consistent with the subsequent analysis we consider only divestment cases such that the divested affiliate is not re-acquired by foreign interests within the two years after divestment. For a detailed discussion of this issue, see Section 4.1.

[8] The data on all three home country variables come from the World Bank's *World Development Indicators* database.

[9] A greenfield dummy takes on a value of one for a foreign affiliate that appears in the data for the first time as 100% foreign owned and was not in the database in the year 1990 (which is the first year available in the data), and zero otherwise.

is true of larger affiliates (in terms of output) and affiliates participating in global value chains (as proxied by the share of imports in total intermediates used).[10] The affiliate age, 100% foreign ownership and export intensity do not appear to have a statistically significant impact on the probability of divestment.

While quite informative, the analysis in Table 2 has a downside related to the limited sample considered. Controlling for home country characteristics allows us to consider only between 100 and 111 divestments depending on the control variables included.[11] Therefore, in our next exercise we aim to use the largest possible number of divestment cases by considering possible affiliate-specific determinants of divestment one at the time. All the determinants pertain to the year prior to divestment. We also control for 4-digit-ISIC-industry-year fixed effects to account for time-varying industry-specific shocks taking place in Indonesia or global markets.[12] This allows us to consider between 509 and 707 divestment cases depending on the specification.

The results, presented in Table 3, confirm that affiliates established as greenfield projects, larger affiliates (in terms of employment) and those more reliant on imported inputs, as well as those with a higher export intensity, are less likely to be divested. In other words, affiliates that are more integrated into global value chains are more likely to continue operating under foreign ownership. The same is true for affiliates paying higher wages, investing more

[10] Our results with respect to size and greenfield entry confirm the finding of Li (1995) who investigated the entry and survival of foreign subsidiaries in the U.S. computer and pharmaceutical industries.

[11] This is because the data on parent nationality are available only for a subset of affiliates.

[12] Due to a large number of fixed effects we estimate a linear probability model instead of a probit.

and using more capital-intensive technology. The latter finding are in line with the view that rising labor costs may entice affiliates using more labor-intensive technologies to relocate to countries with lower labor costs. Finally, 100% foreign owned affiliates, affiliates charging lower markups and those experiencing a faster TFP and markup growth appear to have a slightly higher probability of divestment. That is also the case for older affiliates.[13]

4. Empirical Strategy and Variable Definitions

4.1 Empirical strategy

As discussed in the previous section and clearly visible in the left panel of Table 1, the affiliates that undergo divestment are quite different from those that do not in the year prior to the ownership change. These differences are visible in almost every dimension of plant operations pointing to the importance of addressing the selection issue.

[13] The positive link between the past TFP growth and probability of divestment is consistent with the private equity business model. Private equity acquires controlling stakes in mature but underperforming companies, implements some value-enhancing changes, including management change, and then quickly disposes of the overturned company. The lack of detailed information on the foreign ex-owners prevents us from investigating the possible role of private equity in depth. However, the data on investor nationality, which are available for a limited number of plants in 1996 and 2006, show that Anglo-Saxon countries (the UK, US, Australia, British Virgin Island), i.e., those with the most active private equity funds, represent less than 10% of parent companies (see Table A1). The majority parent companies are from Japan, Korea and Taiwan. This leads us to conclude that private equity firms are unlikely to be the main driver of divestments in our dataset.

In our analysis, we follow the approach of Arnold and Javorcik (2009), but rather than focusing on foreign acquisitions we consider cases of divestment. We examine changes from foreign to domestic ownership taking place within the same plant. More specifically, we consider plants in which initially at least 50% of equity belongs to foreign owners and where the foreign equity share drops to less than 10% and remains below this threshold for at least three years.[14]

To compare the performance of divested plants with the performance of plants remaining in foreign hands we follow a difference-in-differences approach. In this way, we eliminate the influence of all observable and unobservable non-random elements of the divestment decision that are constant or strongly persistent over time. More specifically, we compare the change in variables of interest taking place between the pre- and post-ownership-change years in the divested plants to those in the control group.

As this comparison is still vulnerable to problems of non-random sample selection, we combine the difference-in-differences approach with propensity score matching. The latter technique controls for the selection bias by restricting the comparison to differences within carefully selected pairs of plants with similar observable characteristics and similar pre-treatment trends prior to ownership change. Its purpose is to construct the missing counterfactual of how the divested plants would have behaved had they not been sold by their foreign owners. The underlying assumption for the validity of the procedure is that conditional on the observable characteristics that are relevant for the divestment decision, potential outcomes for the treated (divested) and non-treated plants (those remaining in foreign hands) are orthogonal to the treatment status.

[14] Note that changing the threshold from 10% to no foreign ownership at all leads to very similar results.

In the context of our exercise, the propensity score is the predicted probability of the foreign equity share in a plant changing from above 50% to under 10%. When constructing the pairs of observations matched on the propensity score (nearest neighbor matching), we make sure that the matched control observations are assigned only from the same year and the same 4-digit ISIC sector as the divested plants. This eliminates the possibility that differences in plant performance observed across sector-year combinations exert influence on our estimated effects. We impose the common support restriction. We also make sure that the matched pair's probability of divestment differs by at most three percentage points.

The combination of matching and a difference-in-differences approach means that we look for divergence in the paths of performance between the divested plants and the matched control plants that had similar characteristics prior to the ownership change. The analysis begins in the year prior to divestment and focuses on the (cumulative) change in performance over the following year and then each of the subsequent two periods.

In the raw data, we observe 1,709 cases of plants with foreign ownership of least 50% at time *t-1* which drops to less than 10% at time *t*. In 1,008 of these, foreign ownership remains below the 10% threshold in *t+1* and *t+2* as well. As we cannot distinguish coding errors from the situation in which a divested affiliate is reacquired, we choose to be conservative and focus only on the 1,008 cases.[15] Estimating the propensity score taking into account only levels of affiliate characteristics would reduce the number of divestments to 424 due to missing observations on control variables. Given the importance of common pre-trends, we also include in the propensity score changes in the TFP

[15] For instance, while a sequence of ownership shares of 80, 8, 80, 80 meets our definition of a divestment in the second period, it is most likely reflecting a key punch error rather than a true temporary divestment.

and markups in the pre-divestment period (i.e., changes between *t-2* and *t-1*). Doing so cuts the number of divestments to 348. As we match within industry-year cells, for obvious reasons we need to drop cases where the divested affiliate is the only affiliate in the cell. This brings the divestment number to 322. Dropping plants with missing outcome variables in the [*t*, *t+2*] period costs us further 17 divestments. Finally, restricting the caliper so that the difference in propensity score between the treated and the control group does not exceed three percentage points bring us to the final sample of 157 divestments.[16]

The percentage of foreign equity share prior to divestment is depicted in Figure 1. Our sample encompasses a large number of affiliates which are 100% foreign owned, a large number of affiliates with 50% foreign ownership as well as many cases in between.

The distribution of matched divested plants across ISIC 2-digit industries is presented in Table A2 in the Appendix. The largest number of divestments is found in food and beverages, apparel, textiles, furniture, and leather and leather products.

4.2 Propensity score matching

Our estimation of the propensity score (divestment decision) proceeds as follows. We estimate a probit model where the dependent variable takes on the value of one when plant *i*, which used to have at least 50% foreign equity at time *t-1*, sees a decline in its foreign equity share to less than 10% at time *t*. In all other cases, the dependent variable is equal to zero. We narrow our attention to the sample of foreign-owned plants in which foreign owners hold at least one half of the equity at *t-1*.

[16] In the robustness checks, we will show that our results are confirmed when we consider a larger sample of divestment cases.

The choice of explanatory variables is guided by the work of Arnold and Javorcik (2009). All explanatory variables are lagged one period and, where appropriate, they enter in a log form and are measured in constant Indonesian rupiahs (with base year 2000).[17] The level variables pertain to *t-1*, while variables expressed as growth rates capture pre-treatment trends and are expressed as changes between *t-2* and *t-1*.[18] The explanatory variables include TFP, TFP growth, markups, markups squared, cubed and their growth rate, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, loan-financed investment normalized by output, dummies for 100% foreign ownership and entry as greenfield investment, plant's age and some interaction terms between explanatory variables. The model also controls for the time trend and includes a dummy for the crisis years (the Asian crisis and the Great Recession).[19]

[17] Nominal values were deflated using producer price indices specific to 5-digit ISIC industries.

[18] Section 7.3 shows that all our results are robust to including longer pre-trends for a larger number of variables. To avoid shrinking the sample size further, we choose to include only TFP and markup trends between *t-2* to *t-1* in the baseline specification.

[19] The last year of divestment included in the sample is 2007, which was the first year of the Great Recession. The peak in divestments in the sample on which propensity score is calculated occurs in 1997 (with 37 cases), the first year of the Asian crisis. In 1998 and 1999 only 15 and 13 more divestments are made, respectively. In term of the number of divestments observed, 2007 was an average year (21 divestments). In the raw data the peak of divestments is actually in 2002, but for many of the plants we observe too little information to be able to include them in the analysis.

The probit results, presented in Table A3 in the Appendix, confirm the patterns found in Table 3 where we considered determinants of divestments one at the time. We find that foreign owners are more likely to sell smaller (though the relationship is nonlinear) and less skill-intensive affiliates as well as affiliates that are less reliant on imported inputs, pay lower wages and affiliates charging lower markups. While these findings point to less sophisticated affiliates being divested more frequently, we also find that the probability of divestment is also higher for affiliates experiencing a faster TFP growth. Affiliates which are 100% foreign owned are more likely to be divested as well. In contrast, affiliates set up as greenfield projects are less likely to be sold. Finally, fewer divestments take place during the years of the Asian crisis, potentially reflecting deteriorated financial health of potential domestic buyers.

Once we obtain the propensity score, we use the caliper-restricted nearest neighbor method to build the control group. Our matches come from the same 4-digit-ISIC-sector-year cell as the treated plants. Our matching procedure performs quite well as there is no statistically significant difference in terms of any plant characteristics between the treated and the control group (see the right panel of Table 1), implying that the groups are balanced.[20] This contrasts with the unmatched sample, shown in the left panel of Table 1, where the future divested affiliates and affiliates that do not experience divestments have different means across almost all the characteristics.

[20] In all our results, we make sure that the two groups are balanced in terms of each of the characteristics included in the probit. We also require that balancing is achieved before matching within all blocks of the same propensity score range in the sample used for the probit regression. After matching, the median propensity score difference (probability of divestment) within matched pairs is only 0.46% points.

One may wonder whether the matched subsample is representative of the population of foreign affiliates in Indonesia. The left panel of Figure 2 plots the distribution of log TFP for the population of foreign plants not included in the matched sample and the foreign plants included in the matched sample. The figure suggests that the two distributions are very similar and thus our matched pairs in the pre-divestment period are representative of the sample of foreign plants.

The middle panel of the same figure plots the distribution of log TFP in the pre-treatment year for the treated and the control plants in the matched sample. The two distributions look very similar giving us confidence in our matching procedure.

Finally, to foreshadow our findings, the right panel shows the distribution of TFP growth between the year prior to divestment and the divestment year for the treated and the controls in the matched sample. We can clearly see from the graph that the distribution of productivity growth among the control plants is shifted to the right relative to the divested plants, indicating the negative effect of divestment on plant performance.

4.3 Estimating markups and TFP

When measuring markups (defined as the price-marginal-cost margin), we follow the method proposed by De Loecker and Warzynski (2012). These authors provide an empirical framework for estimating markups in the spirit of Hall (1986). The methodology builds on the insight that the output elasticity of a variable factor of production is equal to its expenditure share in total revenue only when price equals marginal cost of production. Under any form of imperfect competition, a markup will drive a wedge between the input's revenue share and its output elasticity and thus will be equal to

$$\mu_{it} = \theta_{it}^{X} / \alpha_{it}^{X} \quad (1)$$

where θ_{it}^{X} is the output elasticity of input X and α_{it}^{X} is the share of expenditures

on input X_{it} (in our case labor) in total sales of plant i at time t. The former is obtained by estimating a production function.

Given that this approach requires estimating output elasticities, ideally we would like to have a measure of physical output, rather than a revenue-based measure of output because the latter may reflect price differences across plants. While we do not have physical measures of output, De Loecker and Warzynski (2012) show that when relying on revenue data, only the level of the markups is potentially affected but not how markups change over time. This is fortunate for us because our analysis focuses on changes in outcomes, including the change in markups, and not levels.

To measure markups properly we need to obtain an unbiased estimate of the output elasticity of labor. The main challenge here is controlling for unobservable productivity shocks that could affect the choice of variable inputs. De Loecker and Warzynski (2012) advocate using the approach pioneered by Olley and Pakes (1996) and Levinsohn and Petrin (2003) and later extended by Ackerberg, Caves and Frazer (2006), which we follow.

For the methodological details of the TFP estimation we refer the reader to the Ackerberg et al. (2006) paper, noting only the key details of our implementation here. We estimate a separate translog production function for each 2-digit ISIC sector. The production function relates the log value added to (the log of) capital and labor (including squared terms and all interactions) and year and 4-digit ISIC industry fixed effects. We allow input coefficients to vary by exporter and foreign ownership status.[21] In the first step of the procedure,

[21] By treating exporter and foreign ownership status of plants as state variables, we allow for differences in optimal input demand and do not have to make further assumptions on the underlying model of competition in each sector.
We do recognize, however, that during restructuring that may be taking place at firms being divested some of the assumptions underlying the De Loecker

unobservable productivity shocks are proxied with the plant-specific demand for materials which enters as a second order polynomial including single and double interactions with the state variables. In the second step, we use the GMM approach and instrument current labor with lagged labor as suggested by Ackerberg et al. (2006).

Value added is defined as output net of material and energy inputs. Capital input is proxied with the value of fixed assets, labor with the number of employees. Value added, capital and material inputs are expressed in constant Indonesian rupiahs. Nominal values are deflated using producer price indices specific to 5-digit ISIC industries.

To calculate markups, we use the output elasticity of labor estimated in the production function. Dividing it by the ratio of the wage bill and expected output yields the markup.[22]

5. OLS Results

Before we delve into the matching results, we perform a difference-in-differences estimation on the unmatched sample ignoring the selection bias and controlling only for 4-digit ISIC industry-year fixed effects:

$$\Delta Outcome_{it+s} = Outcome_{it+s} - Outcome_{it-1} = \quad (2)$$
$$= \beta_s Divestment_{it} + \alpha_{sjt} + \varepsilon_{sit}$$

where outcome denotes various outcomes of interest, *i* denotes plant, *j* its

---

Warzynski methodology may not hold.

[22] The wage bill is divided by expected output rather than output to make sure that the price ratio is only driven by variation in variables that drive input demand.

industry of operation and *t* year, and $s \in \{0,1,2\}$. The dependent variables are expressed as differences between *t-1* (i.e., the year prior to divestment) and year *t* (column 1), *t+1* (column 2) and *t+2* (column 3). The sample includes all divested affiliates and all affiliates remaining under foreign ownership throughout. It corresponds to the summary statistics presented in the left panel of Table 1.[23]

The results, shown in Panel A of Table 4 show that divested affiliates experience a large, persistent and statistically significant drop in productivity, output and markups. This dip is accompanied by a decline in import intensity, total employment and the average wage. The employment effect is driven by a decline in the number production workers. There is also some indication that the ownership change leads to lower export intensity and lower domestic sales.

In Panel B, we additionally control for pre-divestment characteristics of divested affiliates (and lagged characteristics of affiliates remaining in foreign hands throughout their presence in the sample). The effects of divestment on TFP, output, export and import intensities, employment of non-production workers and wages become larger in magnitudes and statistically significant in some cases where they were not significant before. These patterns suggest that it is not random which affiliates were divested and thus indicate that it is important to address the selection bias in the analysis.

The direction of bias may be counterintuitive if one expects foreign parents to divest their worst performing plants first. As documented in Section 2 and also evident from Appendix Table A3, we find no evidence that the worst performing plants are more likely to be divested. This is consistent with the view that the decision to divest may also depend on many factors other than the

[23] For affiliates that are not divested we simply include changes of the corresponding length.

characteristics of the sold affiliate.[24]

In Panel C, we repeat the exercise from Panel B dropping the divestment cases that are not included in our matched sample from Section 6. Doing so makes the estimates slightly smaller and somewhat less significant. This is comforting for us as it indicates that there is little evidence of sample selection when it comes to which divestments are included in the final matching exercise. If anything, focusing on the smaller sample will lead us to underestimate the effects of interest.

6. Results from the Difference-in-Differences Analysis on the Matched Sample

6.1 Impact on the TFP, output and markups

After finding the control group through propensity score matching, we estimate the following regression:

$$\Delta Outcome_{it+s} = Outcome_{it+s} - Outcome_{it-1} = \quad (3)$$
$$= \alpha_s + \gamma_s Divestment_i + u_{sit}$$

where outcome denotes various outcomes of interest, *i* denotes plant and *t* year, and $s \in \{0,1,2\}$. A separate model is estimated for each value of *s*. In other words, we focus on the change in outcome between the year prior to divestment and the year of divestment or each of the two subsequent years. The coefficient γ captures the average treatment effect on the treated (ATT), that is, the effect

[24] In an earlier version of this study, we have also shown that divested plants outperform always domestic plants in many ways (at least in the year of divestment), suggesting that the divested plants are not especially poor performers.

of divestment. We bootstrap standard errors using 1000 replications.[25]

The first outcome we consider is the TFP (see the top panel of Table 5). We find that divested plants experience a drop in productivity relative to the control group. The TFP declines by 0.038 log points in the year of ownership change and the decline persists in the two subsequent years. The left panel of Figure 3 presents the average productivity trajectories of the two groups. Both groups display very similar paths in the two years leading up to divestment. While the control plants continue to experience steady productivity growth, the divested affiliates register a dip in the year of divestment and then recover a bit, but they do not manage to catch up with the control group. Thus our results suggest that had the divested affiliates remained in foreign hands, they would have become more productive.

The decline in performance is accompanied by a steep drop in output growth relative to the control group: 0.345 log points in the year of divestment and 0.537 log points two years later. As can be seen from the middle panel of Figure 3, output of divested plants drops in absolute terms in the year of divestment and keeps declining. By the second year after divestment the gap between treated and control plants widens even further. In other words, had the affiliates remained foreign owned, they would have seen a much faster increase in output.

We also observe a large drop in markups relative to the control group of 0.28 or 0.29 log points in the first two years after the ownership change. The difference between the two groups is somewhat smaller in the last period considered, but it remains statistically significant. Again Figure 3 (right panel) is quite informative here. It shows a relatively stable path of markups in the control group in the first two years after divestment and a very steep and

[25] Using heteroskedasticity-robust standard errors (instead of bootstrapped standard errors) would not affect our results.

persistent drop among the divested plants. After two years, markups converge a bit on average, but the difference between the two groups persists.[26]

6.2 Access to the former parent's production and distribution network

To get a better understanding of what leads to a lower output, in Table 6 we focus on international trade and domestic sales. We find that divested affiliates decrease the share of output that is exported. While this effect is not statistically significant in the year of divestment, it is significant at the one and five percent level one and two years later, respectively. The gap between the two groups widens over time and in the last year considered the difference reaches 12 percentage points. Figure 4 illustrates this point nicely. The control plants export a stable share of output (almost 43%) over time, while the divested plants see a steady decline in their reliance on exports to about 35% in the year of divestment, 28.8% a year later and 27.2% in the following year. This pattern is consistent with the divested affiliate losing access to the parent company's distribution networks abroad.

As the reliance on exports goes down in the divested plants, little seems to be happening to sales in the local market. There is no statistically significant difference between the two groups, and Figure 4 indicates that, if anything, the treated plants on average seem to increase their domestic sales by more than the control group. Apparently, divested plants cannot make up for the loss in exports by finding new domestic customers, which is why their output falls substantially.

In the bottom panel of Table 6, we examine the impact of divestments on the share of imported inputs (in total inputs). We find that divested plants register a 6.8 percentage point drop in their reliance on imported inputs already in the year of divestment. This drop seems to persist in subsequent years. It is

[26] There is, however, a lot of variation in terms of markups within each group.

another piece of evidence suggesting that divested affiliates lose their connection to the parent firm's production and distribution networks.[27]

6.3 Other aspects of plant performance

How do divested plants cope with the new circumstances? As illustrated in Figure 5, they cut their workforce in absolute terms in the divestment year. While they increase employment in the two subsequent years, its level remains below the original one. During the same timeframe, affiliates remaining under foreign control see a substantial increase in their workforce. When compared to the plants remaining in foreign hands, the treated plants cut their employment by about 0.12 log points in the first year under new ownership. The difference between the two groups declines in the subsequent year and ceases to be statistically significant (see Table 7). It is most likely this drastic cut in employment that allows the divested plants to limit the decline in productivity stemming from a lower scale of operations. When we consider separately employment of production and non-production workers, we find that the former group bears the brunt of the layoffs.

Finally, we find that divested plants register a slower growth in the average wage relative to the control group. The difference between the two groups is not statistically significant until the last year considered when it reaches 0.183 log points. The average wage declines in the divested plants in absolute terms, while wages keep increasing in the control group (see Figure 5).[28]

[27] Alternatively, this pattern is consistent with lower quality products, which do not require imported inputs, being sold on the domestic market.

[28] In the regressions not reported here, we find that the skill intensity increases in the divested plants, though the effect is statistically significant only weakly and only in the year of divestment.

We also consider the probability of exit as an outcome of interest (the results are not reported to save space) and find no statistically significant difference between the two groups.

In sum, most of our main results are qualitatively insensitive to the estimation method (matching vs the OLS estimator). However, the matching estimator produces larger effects and thus suggests upward biased OLS coefficients. This is most apparent in the case of imported inputs and the share of output exported. The bias decreases once we control in the OLS for pre-divestment characteristics that were used to construct the matched sample. This suggests that the OLS estimator fails to account for some unobserved characteristics of plants that are positively correlated with both divestment and import and export intensity.

6.4 Access to the former parent's financing

If foreign affiliates rely heavily on access to financing from the foreign parent, divestments should hurt their performance. Investment is the most likely outcome where this effect should be visible. However, we did not find a statistically significant difference between the treated and the control group in terms of investment. We also examined in detail the sources of financing. More specifically, we considered the impact of the share of investment that is financed by private funding, reinvested earnings, stocks and bonds, domestic loans, foreign loans, and foreign investment. Each of these sources of financing was considered separately. The figures were normalized by total investment (see on-line Appendix Table W1).

The results were not statistically significant with two exceptions. First, the share of reinvested earnings appears to have gone down at $t+1$ and $t+2$, which may be a direct result of the drop in output. And indeed when we consider the ratio of reinvested earnings to output, it does not seem to be affected by divestment. Second, the share of investment financed by foreign

loans decreased in the year of divestment, but the effect was not statistically significant in the subsequent periods. This effect is still present when we considered investment financed by foreign funding normalized by output.

6.5 Transfer pricing

One may be concerned that our results are affected by transfer pricing. If tax rates faced by multinationals in Indonesia are lower than those in other countries either because of differences in statutory tax rates or because of tax holidays, multinationals may have an incentive to inflate their profits registered in Indonesia, thus artificially inflating the TFP, markups or value of output. Transfer pricing activities stop after divestment, which brings the value of the TFP, markups and output down, consistent with the patterns observed in the data.[29]

There are two reasons why we do not believe that transfer pricing can be the primary driver of our findings. First, the observed changes in employment suggest that the output decline is a real rather than an accounting phenomenon. Second, Indonesia has explicit regulation against transfer pricing in place since 1984, giving tax authorities the ability to adjust related party transactions (KPMG 2013). In 1999, Indonesia was among only 32 countries in the world to have such rules (Merlo et al. 2014). Thailand for example, introduced such rules only in 2002, and China did not have comprehensive rules on transfer pricing until 2008 (KPMG 2013).

[29] Of course, it is not obvious that on average the tax regime is more advantageous in Indonesia than in other countries. According to KMPG, the corporate tax rate in Indonesia is 25%, while the OECD average is 24% (https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online.html).

Nevertheless, to gain a better understanding of the issue we perform an additional exercise. We take advantage of the observation that the incentives to engage in transfer pricing are strong in the case of fully-owned foreign affiliates, but not in the case of partially-owned ones. This is because in the latter case the profits shifted to Indonesia would have to be shared with a local partner. In 49 out of 157 cases, foreign affiliates we consider were 100% foreign owned before divestment.

The results, presented in Table 8, suggest that the effects of divestment on the TFP, markups and output are not significantly different for the former fully-owned foreign affiliates. While our earlier conclusions about divestments leading to inferior performance are confirmed, we find no evidence of affiliates which were 100% foreign owned prior to being sold being more negatively affected. None of the interactions between the divested dummy and the full foreign ownership dummy is statistically significant and in most cases the coefficients bear a positive sign. These results attenuate our concerns about transfer pricing driving the patterns observed in the data.

6.6 Interpretation of the findings

What can we conclude about the mechanism responsible for the decline in the TFP experienced by divested affiliates? The most likely explanation is that a negative demand shock, in the form of being excluded from the former parent's global value chain, leads to losing economies of scale. There is ample evidence suggesting that improved access to foreign markets leads to product upgrading, product innovation and productivity improvements (see Verhoogen 2008, Bustos 2011, Guadalupe et al. 2012, and Iacovone and Javorcik 2012). Thus it is likely that loss of foreign markets will also result in less product and process innovation which over time will translate into a lower productivity growth. And indeed the earlier literature has shown that foreign acquisitions increase export intensity, output and TFP (Arnold and Javorcik 2009), export

intensity, output, labor productivity and innovation of the acquired targets (Guadelupe et al. 2012).

Another very likely explanation for the worsened performance includes the loss of headquarter services (such as, for instance, assistance with marketing, information about foreign markets, etc.) and the loss of expatriate managers. We can isolate this effect from the negative export demand shock by focusing on divested affiliates that did not export in the pre-divestment period.[30] More specifically, we perform the matching exercise and the difference-in-differences estimation on the subsample of plants that did not export at *t-1*. As before, we find a sizeable and statistically significant dip in the TFP, output and wages, which suggests that the explanation based on managerial inputs from the parent company is relevant (see Panel A of Table 9).

For completeness, in the second panel of the table we present the results for the subsample of exporters. Here again we find a negative effect of divestment on TFP, output and markups. The effect on markups is only relevant for exporters, which is consistent with the results of de Locker and Warzynski (2012). These authors find that markups are significantly higher for exporting firms than for non-exporters. They also find that markups increase for firms entering export markets. Thus it is not surprising that markups decline for firms scaling down their export intensity.

To shed further light on the importance of losing headquarter services we examine whether the effects of divestment are stronger for former affiliates that were originally set up as 100% foreign owned greenfield projects. It is widely believed that multinational firms tend to transfer more knowledge and know-how to their fully owned affiliates (Mansfield and Romero 1980, Ramacharandran 1993, and Javorcik and Saggi 2010). Moreover, greenfield affiliates are likely to be less embedded in the local economy, and thus in the event of

[30] We are grateful to an anonymous referee for suggesting this exercise.

expatriate management leaving less well positioned to replace them with local staff.

Indeed Table 10 suggests that the TFP decline is much larger (twice or three times as large) for former greenfield affiliates. This effect is statistically significant in the year following the ownership change and one year later. It is also robust to controlling for 100% foreign ownership in the year prior to divestment.[31]

Finally, while we cannot disprove that loss of access to the parent firm's financing and transfer pricing matter, the results we have presented suggest that their role (if any) would have been limited.

In sum, our results are suggestive of the change in ownership leading to a disruption in performance, most likely due to the loss of access to export markets previously provided by the foreign parent, loss of access to injections of knowledge and know-how from the headquarters of the former parents, management change, and possible departure of expatriate managers employed by the former foreign parent.[32]

[31] Additional analysis (not reported to save space) suggests that divested greenfield affiliates do not export a higher share of their output prior to divestment and do not experience a higher dip in export intensity post divestment. Thus the results showing a greater negative effect of divestment on greenfield affiliates cannot be explained by a negative export demand shock.

[32] Our results are consistent with the conclusions of Arnold and Javorcik (2009) suggesting that foreign acquisitions boost the performance of acquired plants in Indonesia through introduction of better management practices. Thus it is quite likely that departure of expatriate managers in the aftermath of divestment has a negative effect on performance. They are also consistent with the conclusions of the recent economics literature which has drawn attention to the importance of manager's quality and management practices for firm performance (see

7. Robustness checks

7.1 Longer time horizon

As the first robustness check, we consider a longer time horizon by narrowing our attention to divested plants observed for at least five years after the ownership change. This exercise is performed on a different sample of treated plants, so it involves a new estimation of the propensity score and a new choice of the control group.[33] Although focusing on the longer time horizon means considering only 103 cases of divestments, the results from this exercise are broadly consistent with those we have found earlier, but, as expected, they are less precisely estimated.

The results, presented in Table 11, confirm our earlier finding of a persistent decline in productivity among divested plants relative to the control group. We also find a persistent output gap between the divested and the control plants. The estimated coefficients in the markup regression bear a negative sign but reach conventional significance levels only two and four years after divestment.

In sum, we confirm our main message that losing foreign owners negatively affects the plant performance.

Bertrand and Schoar 2003, Bloom and Van Reenen 2007, Bloom et al. 2014). The literature has also documented that foreign firms transplant their management practices to host countries (Bloom et al. 2012) and that improvements in management practices translate into better performance within months (Bloom et al. 2013).

[33] For instance, we are unable to consider divestments during the last four years of the sample period, which means that we lose two years relative to the baseline exercise.

7.2 Loss of a foreign parent vs ownership change in general

An obvious question that can be raised in the context of our analysis is whether the effects we observe are due to the loss of foreign ownership *per se* or whether they would have been induced by *any ownership change.* Ideally, we would like to make a comparison between a foreign affiliate being divested into domestic hands and a domestic establishment being divested into domestic hands. Unfortunately, in our data it is not possible to observe divestment from domestic sellers to domestic buyers. However, we do observe public ownership, so we can investigate privatizations. We define privatization as a situation where the public ownership share drops from more than 50% to less than 10% (to mirror the thresholds we used for foreign divestments).

This exercise, however, poses some difficulties. For propensity score matching to work we need to find foreign affiliates (that will be divested in the future) that are very similar to state-owned establishments (that will be privatized in the future). The trouble is that foreign affiliates and state-owned entities tend to be very different. There are very few foreign plants that are similar enough to state-owned plants and that are both divested in the same sector-year cell.

To achieve a sample that meets these requirements and thus passes the balancing test we implement a less stringent matching procedure. We still match within 4-digit-ISIC-industry-year cells, but we match only on (the lag of logged) TFP, markups and output. We find matches in a sample of 474 plants. While we acknowledge the limitations on this exercise, we still believe that it is informative.

The results, presented in Table 12, indicate that compared to privatized plants, former foreign affiliates experience a greater loss in terms of the TFP, markups, the share of output exported and the reliance on imported inputs. The magnitudes of the effects are only slightly smaller than those found in the baseline table. These results suggest that it is the loss of foreign

ownership, and not just ownership change, that matters. We do not find a statistically significant effect on output, employment or wages. This is because former foreign affiliates seem to be replacing lost exports with domestic sales.

7.3 Alternative matching controlling for longer pre-treatment trends

In the next exercise, we aim to achieve two objectives: (i) test the robustness of our results to using a larger sample while still performing propensity score matching, and (ii) take into account a larger number and longer pre-divestment trends for the main outcomes of interest. The latter goal requires additional information and implies losing some divestment cases. To balance these objectives we include fewer variables in the propensity score regression and match within sectors (instead of sector-year cells). The propensity score controls include (the lag of logged, if appropriate) TFP, markup, output, employment and its square, investment, share of imported intermediates and share of output exported. Additionally, we control for longer pre-treatment trends by including the log (if appropriate) difference between *t-3* and *t-1* of all the variables mentioned. Finally, we control for (lagged) age, age squared, and a crisis dummy. This exercise yields 732 observations or 366 divestments, which is more than double the original sample size.

The results, shown in Table 13, paint a picture very similar to our baseline findings. We confirm that divested affiliates experience a large and statistically significant drop in productivity, output and markups. As before, this dip is driven by lower export intensity, which together with a decline in import intensity, suggests (at least partial) exclusion from the former parent's global value chains. Not surprisingly, the divested affiliates decrease their employment by laying off production workers.

7.4 Other robustness checks

We have also performed a robustness check by adding a crisis dummy taking on the value of one if the post-divestment year considered was a year of the Asian crisis or the recent Great Recession (i.e., 1997-99 and 2007-9), and zero otherwise, to equation (2). The augmented specification has produced very similar results.

Finally, we have addressed a concern that spillovers may be influencing our results.[34] For instance, redirecting exports to domestic market may mean that divested affiliates increase competitive pressures on the control group thus leading to the worsened performance of control plants. This would lead us to underestimate the effects of divestment on domestic sales and perhaps employment. At the same time, employee layoffs by divested affiliates may encourage the affiliates remaining in foreign hands (the control group) to increase employment, thus leading us to overestimate the effect on employment. These effects are most likely to be felt in the same geographic location.

To address this possibility we have adjusted the baseline matching procedure so that the matched and the control plant are located in different counties ('*kapubaten*'), although they are still from the same year and 4-digit industry cell. In this way, we avoid the effects of local layoffs and competition in the local market confounding the results. The estimates are presented in in the on-line Appendix Table W2. They are very similar to our baseline findings. The augmented procedure has mostly improved the precision of the estimates, even though it has somewhat diminished the sample size. The only exception is the average wage, where the previously found negative effect for $t+2$ ceased to be statistically significant.

[34] We are grateful to an anonymous referee for pointing out this possibility.

8. Conclusions

To gain a better understanding of the contribution multinationals make to their foreign subsidiaries, and thus indirectly to the economy of the host country, this paper considers developments in divested foreign affiliates.

Our analysis uses plant-level panel data from the Indonesian Census of Manufacturing covering the period 1990-2009 and focuses on 157 cases of divested foreign affiliates for whom information on a large set of plant characteristics is available for two years prior and three years after the ownership change and for whom we find observationally equivalent control plants. Our empirical strategy combines propensity score matching with a difference-in-differences approach.

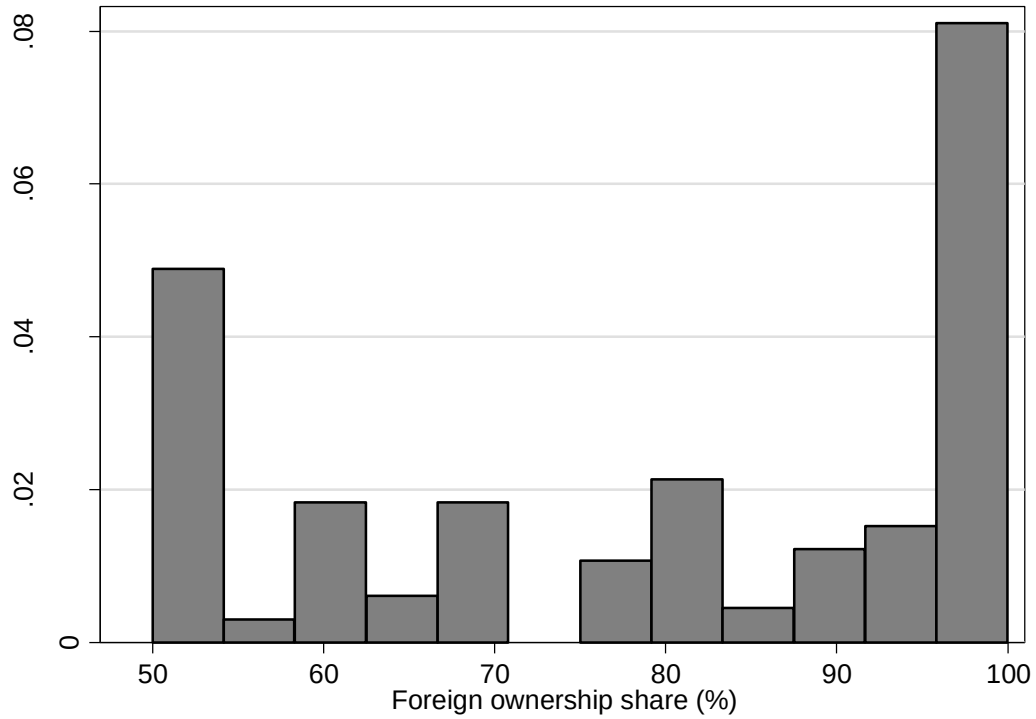
We find that divested plants experience a large drop in productivity relative to the affiliates remaining in foreign hands. The TFP declines by 0.038 log points in the year of divestment and the decline persists in the two subsequent years. Similarly, divested affiliates see a large decline in their output, markups, export and import intensity. These developments are accompanied by a decline in employment driven by production workers being laid off and a decline in wages, though these effects are less pronounced.

These results are consistent with the parent company providing distribution networks and thus allowing their affiliates to benefit from scale economies. They are also in line with foreign affiliates benefiting from the superior management practices, possibly reinforced by the presence of expatriate managers, and access to knowledge and know-how transfers from the parent's headquarters. In sum, we conclude that the benefits of foreign ownership, which manifest themselves in a superior performance of foreign affiliates (relative to indigenous plants) around the world, are due to continuous injections of knowledge and access to headquarter services.

Our findings have implications for the design of FDI incentives. They suggest that any externalities associated with the presence of foreign affiliates

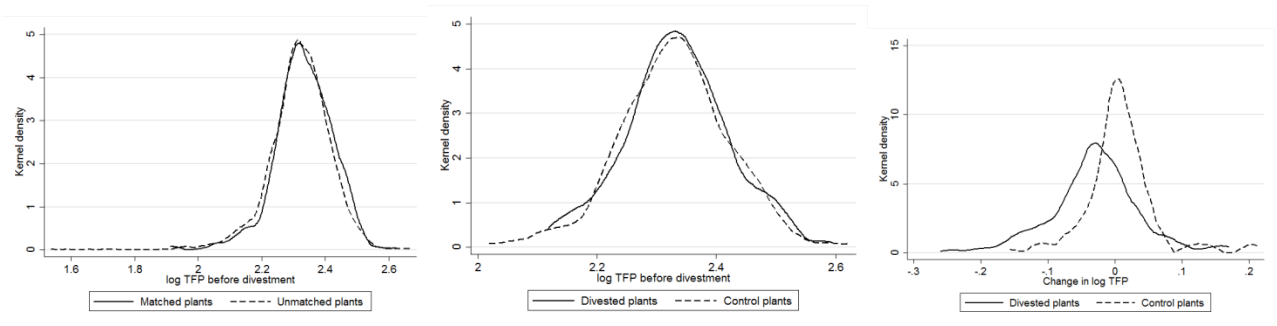
are likely to fade away after foreign owners leave. More future research is, however, needed to examine the developments in productivity spillovers in the aftermath of foreign divestments.

Figure 1. Distribution of foreign equity share prior to divestment



Notes: The sample pools all matched treated plant prior to the year of divestment.

Figure 2. Pre-divestment TFP level of the matched sample and the population of foreign owned plants (left panel). Pre-divestment TFP level of the treated and the control plants in the matched sample (middle panel). Distribution of TFP growth between the year before and the year of divestment among the matched divested and control plants (right panel)



Notes: The left panel depicts the distribution of log TPF for all foreign affiliates included in the unmatched sample but not the matched sample (dashed line) and for all foreign affiliates in the matched sample (solid line). The middle panel depicts the distribution of log TFP for the matched divested affiliates (solid line) and the matched control affiliates (dashed line). The right panel depicts the change in log TFP growth between *t-1* and *t* for the matched treated (solid line) and the matched control plants (dashed line). The procedure used to obtain the matched sample is described in Section 4.2 of the paper.

Table 1. Summary statistics for the full and the matched sample

	Panel A				Panel B			
	Unmatched sample (N=12,472)				Matched sample (N=314)			
	Treated	Control	t-test	p-value	Treated	Control	t-test	p-value
log TFP $_{t-1}$	2.312	2.346	-7.210	0.000	2.334	2.329	0.500	0.618
Δlog TFP $_{t-1}$	0.017	0.005	3.850	0.000	0.004	0.006	-0.460	0.649
log Markup $_{t-1}$	1.580	1.828	-5.970	0.000	1.782	1.800	-0.160	0.870
Δlog Markup $_{t-1}$	0.157	0.031	3.130	0.002	0.074	0.002	0.720	0.473
100% foreign owned $_{t-1}$	0.532	0.353	8.950	0.000	0.312	0.325	-0.240	0.809
Entered as greenfield $_{t-1}$	0.101	0.169	-4.340	0.000	0.076	0.064	0.440	0.660
log Employment $_{t-1}$	5.098	5.607	-10.060	0.000	5.800	5.802	-0.020	0.987
Skilled labor share $_{t-1}$	0.182	0.217	-4.570	0.000	0.195	0.183	0.630	0.528
log Average wage $_{t-1}$	8.511	8.978	-12.770	0.000	8.747	8.742	0.050	0.957
Imported input share $_{t-1}$	0.244	0.450	-12.340	0.000	0.325	0.341	-0.390	0.698
Age $_{t}$	13.580	12.442	2.170	0.030	13.197	12.019	0.850	0.397
log Capital per worker $_{t-1}$	9.798	10.681	-10.080	0.000	10.227	10.258	-0.140	0.886
Loan-financed investment$_{t-1}$/Output $_{t-1}$	0.128	0.470	-0.950	0.340	0.141	0.081	1.030	0.304
log Output $_{t-1}$	16.009	17.319	-17.770	0.000	17.250	17.257	-0.050	0.963
Share of output exported $_{t-1}$	0.277	0.349	-4.050	0.000	0.403	0.421	-0.350	0.723
log(Investment +1)$_{t-1}$	6.478	7.444	-2.810	0.005	7.944	7.986	-0.050	0.962
Crisis $_{t-1}$	0.131	0.200	-4.130	0.000	0.178	0.178	0.000	1.000

Notes: Treated foreign affiliates are those that will be divested next period and will remain domestic for at least two more years, while control foreign affiliates are those that will not be divested during the sample period. The matched sample in Panel B was obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables which are listed in Table A3. All the variables listed in the table pertain to the pre-divestment period.

Table 2. Determinants of divestments

	Divestment					
	[1]	[2]	[3]	[4]	[5]	[6]
GDP growth $_{t}$	0.028*					
	(0.015)					
Credit to private sector by banks (% GDP) $_{t}$	0.003**					
	(0.001)					
Lending interest rate $_{t}$	0.058***					
	(0.015)					
GDP growth $_{t-1}$		0.050**	0.055***	0.057***	0.057***	0.057***
		(0.016)	(0.016)	(0.017)	(0.017)	(0.017)
Credit to private sector by banks (% GDP) $_{t-1}$		0.003**	0.003**	0.003**	0.003**	0.003**
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lending interest rate $_{t-1}$		0.047**	0.044**	0.047**	0.047**	0.046**
		(0.016)	(0.017)	(0.017)	(0.017)	(0.018)
Fully foreign owned $_{t-1}$			0.001	0.001	0.001	0.001
			(0.001)	(0.001)	(0.001)	(0.001)
Greenfield			-0.355**	-0.285*	-0.290*	-0.260
			(0.148)	(0.161)	(0.159)	(0.161)
log Output $_{t-1}$				-0.096***	-0.093***	-0.082**
				(0.027)	(0.027)	(0.028)
Age				0.002	0.002	0.000
				(0.004)	(0.004)	(0.004)
Loan-financed investment $_{t-1}$ /Output $_{t-1}$				-0.006	-0.007	-0.005
				(0.023)	(0.026)	(0.021)
Share of output exported $_{t-1}$					-0.110	-0.105
					(0.105)	(0.105)
Share of imported inputs $_{t-1}$						-0.269**
						(0.117)
Year fixed effects	yes	yes	yes	yes	yes	yes
Pseudo R-squared	0.06	0.06	0.07	0.08	0.08	0.09
No of obs	5080	5100	5100	4767	4767	4750
No of divestments	111	110	110	100	100	100

Notes: The table presents estimates of a probit model where the dependent variable is the probability that foreign affiliate *i* is divested at time *t*, and zero otherwise. Only plants that are foreign affiliates at *t-1* are included in the sample. The sample includes only foreign affiliates for which information on the nationality of the foreign parent company is available. Country specific variables pertain to the home country of the foreign parent. Plant specific characteristics pertain to the affiliate itself. Standard errors are listed in parentheses.
*, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 3. Affiliate characteristics as determinants of divestment

	100% foreign owned lag	Greenfield	TFP lag	ΔTFP lag	Markup lag	ΔMarkup lag	Employment lag
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Estimate	0.0004***	-0.014**	-0.021	0.076**	-0.010***	0.005*	-0.022***
	(0.00004)	(0.005)	(0.024)	(0.032)	(0.002)	(0.003)	(0.002)
Industry-year FE	yes	yes	Yes	yes	yes	yes	yes
R-squared	0.07	0.06	0.06	0.07	0.07	0.11	0.07
No of obs	14470	14470	13042	11339	13033	11323	14470
No of divestments	707	707	638	525	637	524	707

	Avg wage lag	Imported inputs lag	Age	K/L lag	Loan/output lag	Share of output exported lag	Investment lag
	[8]	[9]	[10]	[11]	[12]	[13]	[14]
Estimate	-0.021***	-0.054***	0.0004***	-0.009***	-0.0002	-0.038***	-0.001**
	(0.002)	(0.006)	(0.0001)	(0.001)	(0.0001)	(0.005)	(0.0003)
Industry-year FE	yes	yes	Yes	yes	yes	yes	yes
R-squared	0.06	0.07	0.06	0.07	0.06	0.06	0.06
No of obs	14460	13884	14470	9813	13466	14470	13461
No of divestments	705	675	707	509	674	707	677

Notes: The table presents estimates of a linear probability model where the dependent variable is the probability that foreign affiliate *i* is divested at time *t*, and zero otherwise. Only plants that are foreign affiliates at *t-1* are included in the sample. The sample includes only foreign affiliates for which information on the nationality of the foreign parent company is available. Plant specific characteristics pertain to the affiliate. Standard errors are listed in parentheses. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 4. Difference-in-difference analysis. Unmatched sample

	Panel A			Panel B			Panel C		
Sample =	Always foreign + all divested plants			Always foreign + all divested plants			Always foreign + matched divested plants		
s =	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
$\Delta_s$log(TFP)	-0.032***	-0.030***	-0.030***	-0.036***	-0.039***	-0.036***	-0.031***	-0.037***	-0.032***
$\Delta_s$log(Output)	-0.212***	-0.245***	-0.293***	-0.335***	-0.403***	-0.444***	-0.266***	-0.343***	-0.315***
$\Delta_s$log(Markup)	-0.267***	-0.289***	-0.271***	-0.267***	-0.299***	-0.240***	-0.212***	-0.236***	-0.162**
Δ_s(Share of output exported)	0.019	-0.022	-0.029*	-0.045**	-0.109***	-0.096***	-0.048*	-0.094***	-0.082***
$\Delta_s$log(Domestic sales +1)	-0.979***	-0.264	-0.052	-0.532	0.926**	0.317	-0.588	0.484	0.252
Δ_s(Share of imported inputs)	-0.042***	-0.043***	-0.033**	-0.044***	-0.042***	-0.042**	-0.057**	-0.038	-0.040*
$\Delta_s$log(Employment)	-0.070**	-0.092***	-0.100***	-0.124***	-0.115***	-0.088**	-0.098**	-0.058	-0.014
$\Delta_s$log(Employment of production workers)	-0.067**	-0.082***	-0.084***	-0.135***	-0.102**	-0.065	-0.134**	-0.083	-0.025
$\Delta_s$log(Employment of non-production workers)	-0.038	-0.042	-0.059	-0.069	-0.097*	-0.122**	-0.025	-0.043	-0.056
$\Delta_s$log(Average wage)	-0.068*	-0.06	-0.072**	-0.084**	-0.132***	-0.162***	-0.088	-0.120**	-0.140***
Controls	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Sector-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	12452-14470			6745-7120			6582-6929		

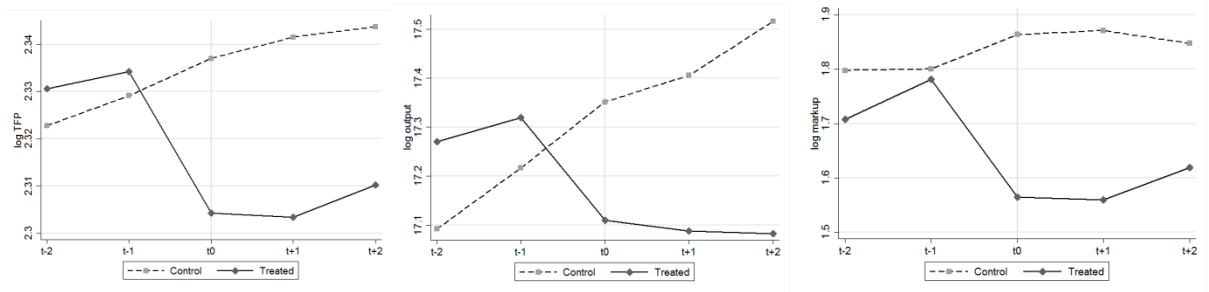
Note: Each cell represents a separate regression where the variable in the first column is the dependent variable and the main explanatory variable is divestment. $\Delta_s = s-(t-1)$. The dependent variables are expressed as differences between *t-1* (i.e., the year prior to divestment) and year *t* (year of divestment in columns 1, 4 and 7), year *t+1* (columns 2, 5 and 8), year *t+2* (columns 3, 6 and 9). Panels A and B use a sample of all foreign owned non-divested plants and all divested plants. Panel C uses a sample of all foreign owned non-divested plants and the matched divested plants. 4-digit-sector-year fixed effects always included. Robust standard errors are not reported to save space. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 5. Results for TFP, output and markups. Matched sample

	[1]	[2]	[3]
Panel A		**$\Delta_s$log(TFP)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.038***	-0.043***	-0.038***
	(0.007)	(0.007)	(0.008)
Observations	314	314	314
R-squared	0.090	0.095	0.065
Panel B		**$\Delta_s$log(Output)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.345***	-0.421***	-0.537***
	(0.101)	(0.126)	(0.131)
Observations	328	328	328
R-squared	0.033	0.032	0.047
Panel C		**$\Delta_s$log(Markup)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.280***	-0.293**	-0.210*
	(0.107)	(0.119)	(0.120)
Observations	314	314	314
R-squared	0.021	0.019	0.010

Notes: Δ_s=*s-(t-1)*. The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables.
The dependent variables are expressed as differences between t-1 (i.e., the year prior to divestment) and year *t* (column 1), *t+1* (column 2) and *t+2* (column 3). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Figure 3. Trajectories of divested and control plants: TFP, output and markups



Notes: *t0* refers to the year of divestment. Each panel depicts the average trajectory of the relevant outcome variable in levels in the two years leading up to divestment and two years after divestment for the treated (solid line) and the control group (dashed line). The following outcomes are depicted: log TFP (left panel), log output (middle panel) and log markup (right panel). The samples are the same as those used in the corresponding regressions in Table 5.

Table 6. Results for export share, domestic sales and imported inputs. Matched sample

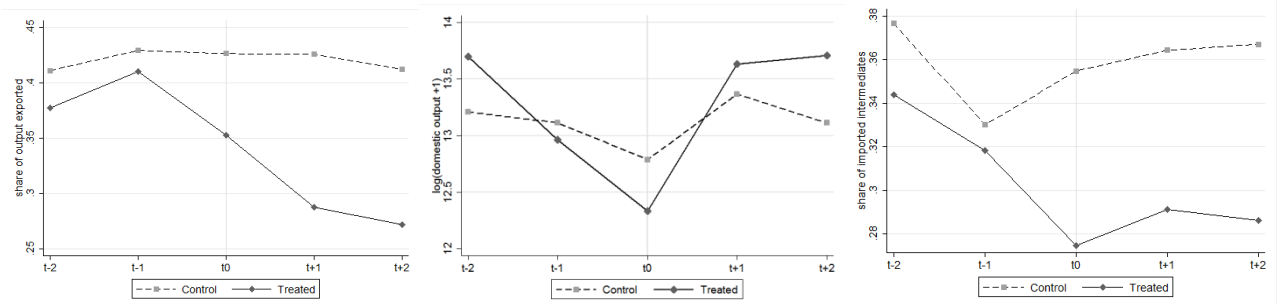
	[1]	[2]	[3]
Panel A		**Δ_s Share of output exported**	
s =	t (year of divestment)	t+1	t+2
Divestment			
	-0.055	-0.119***	-0.121**
	(0.040)	(0.046)	(0.049)
Observations	344	344	344
R-squared	0.005	0.019	0.018

Panel B		**$\Delta_s$log(Domestic sales +1)**[35]	
s =	t (year of divestment)	t+1	t+2
Divestment			
	-0.304	0.416	0.749
	(0.714)	(0.772)	(0.856)
Observations	344	344	344
R-squared	0.001	0.001	0.002

Panel C		**Δ_s Share of imported inputs**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.068**	-0.061*	-0.069**
	(0.029)	(0.033)	(0.034)
Observations	338	338	338
R-squared	0.017	0.010	0.013

Notes: Δ_s=*s-(t-1)*. The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables.
The dependent variables are expressed as differences between t-1 (i.e., the year prior to divestment) and year *t* (column 1), *t+1* (column 2) and *t+2* (column 3). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Figure 4. Trajectories of divested and control plants: export share, domestic sales and imported inputs



Notes: *t0* refers to the year of divestment. Each panel depicts the average trajectory of the relevant outcome variable in levels in the two years leading up to divestment and two years after divestment for the treated (solid line) and the control group (dashed line). The following outcomes are depicted: the share of output exported (left panel), log domestic sales (middle panel) and the share of imported intermediates (right panel). The samples are the same as those used in the corresponding regressions in Table 6.

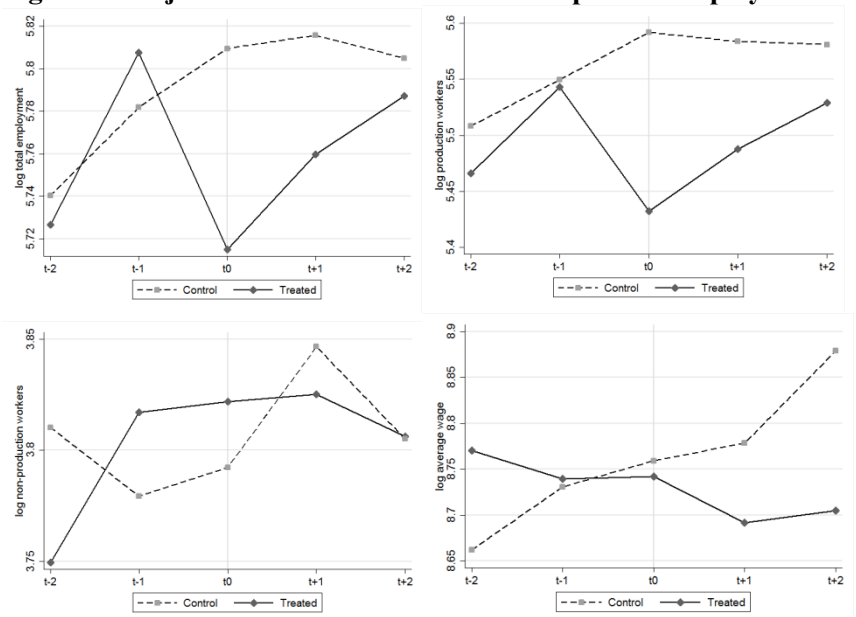
[35] We added one before taking a log to avoid losing pure exporters from the sample.

Table 7. Results for employment and wages. Matched sample

	[1]	[2]	[3]
Panel A		**$\Delta_s$log(Employment)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.120**	-0.082	-0.043
	(0.051)	(0.051)	(0.052)
Observations	344	344	344
R-squared	0.016	0.007	0.002
Panel B		**$\Delta_s$log (Employment of production workers)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.153***	-0.089	-0.045
	(0.059)	(0.063)	(0.067)
Observations	344	344	344
R-squared	0.020	0.006	0.001
Panel C		**$\Delta_s$log(Employment of non-production workers)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.008	-0.059	-0.037
	(0.078)	(0.089)	(0.094)
Observations	322	322	322
R-squared	0.000	0.001	0.000
Panel D		**$\Delta_s$log(Average wage)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.026	-0.095	-0.183**
	(0.082)	(0.096)	(0.092)
Observations	344	344	344
R-squared	0.000	0.003	0.011

Notes: Δ_s=*s-(t-1).* The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables.
The dependent variables are expressed as differences between t-1 (i.e., the year prior to divestment) and year *t* (column 1), *t+1* (column 2) and *t+2* (column 3). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Figure 5. Trajectories of divested and control plants: Employment and wages



Notes: *t0* refers to the year of divestment. Each panel depicts the average trajectory of the relevant outcome variable in levels in the two years leading up to divestment and two years after divestment for the treated (solid line) and the control group (dashed line). The following outcomes are depicted: log total employment (top left panel), log production workers (top middle panel), log non-production workers (right panel) and log average wage (bottom panel). The samples are the same as those used in the corresponding regressions in Table 7.

Table 8. Former fully versus partially foreign owned affiliates. Matched sample

	[1]	[2]	[3]
Panel A		**$\Delta_s$log(TFP)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.039***	-0.041***	-0.039***
	(0.009)	(0.010)	(0.010)
Divestment * 100% foreign owned	0.005	-0.006	0.002
	(0.014)	(0.015)	(0.016)
100% foreign owned	0.005	-0.000	0.006
	(0.008)	(0.010)	(0.011)
Observations	314	314	314
R-squared	0.094	0.095	0.066
Panel B		**$\Delta_s$log(Markup)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.292**	-0.314**	-0.229
	(0.143)	(0.153)	(0.146)
Divestment * 100% foreign owned	0.037	0.064	0.057
	(0.219)	(0.235)	(0.246)
100% foreign owned	-0.030	-0.095	-0.084
	(0.122)	(0.133)	(0.153)
Observations	314	314	314
R-squared	0.021	0.020	0.011
Panel C		**$\Delta_s$log(Output)**	
s =	t (year of divestment)	t+1	t+2
Divestment	-0.372***	-0.512***	-0.674***
	(0.125)	(0.163)	(0.169)
Divestment * 100% foreign owned	0.096	0.291	0.424
	(0.213)	(0.264)	(0.283)
100% foreign owned	0.047	-0.077	-0.168
	(0.127)	(0.169)	(0.195)
Observations	328	328	328
R-squared	0.036	0.036	0.053

Notes: Δ_s=*s-(t-1).* The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables.
The dependent variables are expressed as differences between t-1 (i.e., the year prior to divestment) and year *t* (column 1), *t+1* (column 2) and *t+2* (column 3). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. 100% foreign owned is a time-invariant dummy taking on the value of one for foreign affiliates that were fully foreign owned at time *t-1*, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 9. Is it only about access to export markets?

	Panel A			Panel B		
Sample=	Non-exporters at t-1			Exporters at t-1		
s=	t	t+1	t+2	t	t+1	t+2
Outcome	[1]	[2]	[3]	[5]	[6]	[7]
$\Delta_s$log(TFP)	-0.034***	-0.050***	-0.040***	-0.044***	-0.040***	-0.031***
$\Delta_s$log(Output)	-0.342**	-0.333	-0.596***	-0.393***	-0.392**	-0.333*
$\Delta_s$log(Markup)	-0.128	-0.087	0.031	-0.427**	-0.466***	-0.262
$\Delta_s$log(Domestic sales +1)	-1.540**	-0.138	-0.569	0.360	0.498	1.620
Δ_s(Share of imported inputs)	-0.034	0.025	-0.002	-0.040	-0.040	-0.075
$\Delta_s$log(Employment)	-0.038	0.026	-0.064	-0.224**	-0.144	-0.051
$\Delta_s$log(Employment of production workers)	-0.117	0.038	-0.049	-0.198**	-0.146	-0.040
$\Delta_s$log(Employment of non-production workers)	0.053	-0.053	-0.107	-0.169	-0.151	0.018
$\Delta_s$log(Average wage)	-0.214*	-0.328**	-0.465***	0.096	0.114	0.016
Observations	134-146			142-156		

Notes: Δ_s=*s-(t-1)*. Each cell represents a separate regression where the variable in the first column is the dependent variable and the main explanatory variable is divestment. The dependent variables are expressed as differences between *t-1* (i.e., the year prior to divestment) and year *t* (year of divestment, columns 1 and 5), *t+1* (column 2 and 6) and *t+2* (column 3 and 7). Panel A contains the results of a matching exercise on the subsample of plants that did not export at t-1. Panel B contains the results for the subsample of plants that exported at t-1. Matching has been performed within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables. Bootstrapped standard errors are not reported to save space. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 10. Are former greenfield affiliates affected more?

	[1]	[2]	[3]	[4]	[5]	[6]
			Δ_s**log(TFP)**			
s =	t (year of divestment)		t+1		t+2	
Divestment	-0.035***	-0.039***	-0.040***	-0.041***	-0.033***	-0.039***
	(0.007)	(0.009)	(0.008)	(0.010)	(0.008)	(0.011)
Divestment * Greenfield	-0.031	-0.040	-0.045*	-0.048	-0.078**	-0.091***
	(0.027)	(0.028)	(0.027)	(0.029)	(0.033)	(0.033)
Divestment * 100% foreign owned		0.013		0.005		0.021
		(0.013)		(0.014)		(0.018)
Greenfield	0.003	-0.001	-0.001	-0.001	0.044*	0.046**
	(0.010)	(0.011)	(0.014)	(0.016)	(0.023)	(0.023)
100% foreign owned		0.006		0.000		-0.003
		(0.009)		(0.010)		(0.012)
Observations	314	314	314	314	314	314
R-squared	0.098	0.107	0.110	0.111	0.082	0.087

Notes: Δ_s*=s-(t-1).* The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables.

The dependent variables are expressed as differences between t-1 (i.e., the year prior to divestment) and year *t* (columns 1 and 2), *t+1* (columns 3 and 4) and *t+2* (column 5 and 6). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. 100% foreign owned is a time-invariant dummy taking on the value of one for foreign affiliates that were fully foreign owned at time *t-1*, and zero otherwise. Greenfield is a time-invariant dummy taking on the value of one for foreign affiliates that were set up as greenfield projects, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 11. Results for TFP, output and markups. Matched sample. Longer time horizon

	[1]	[2]	[3]	[4]	[5]
Panel A			**$\Delta_s$log(TFP)**		
s =	t (year of divestment)	t+1	t+2	t+3	t+4
Divestment	-0.032***	-0.054***	-0.039***	-0.048***	-0.043***
	(0.010)	(0.011)	(0.011)	(0.011)	(0.012)
Observations	206	206	206	206	206
R-squared	0.047	0.101	0.054	0.085	0.066
Panel B			**$\Delta_s$log(Output)**		
s =	t (year of divestment)	t+1	t+2	t+3	t+4
Divestment	-0.063	-0.313**	-0.381**	-0.367**	-0.318*
	(0.119)	(0.142)	(0.154)	(0.162)	(0.173)
Observations	214	214	214	214	214
R-squared	0.001	0.022	0.026	0.022	0.016
Panel C			**$\Delta_s$log(Markup)**		
s =	t (year of divestment)	t+1	t+2	t+3	t+4
Divestment	-0.158	-0.307**	-0.188	-0.264*	-0.224
	(0.115)	(0.131)	(0.136)	(0.143)	(0.149)
Observations	206	206	206	206	206
R-squared	0.009	0.027	0.010	0.017	0.011

Notes: Δ_s=*s-(t-1).* The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables.
The dependent variables are expressed as differences between t-1 (i.e., the year prior to divestment) and year *t* (column 1), *t+1* (column 2) and *t+2* (column 3) and year *t+3* (column 4) and year *t+4* (column 5). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 12. Matching results on a sample of divested foreign owned and privatized publicly owned plants

	[1]	[2]	[3]
Panel A	**$\Delta_s$log(TFP)**		
s=	t	t+1	t+2
Divestment	-0.027***	-0.031***	-0.033***
	(0.005)	(0.006)	(0.006)
Observations	474	474	474
R-squared	0.048	0.052	0.057

	[4]	[5]	[6]
Panel B	**$\Delta_s$log(Output)**		
s=	t	t+1	t+2
Divestment	0.178	0.139	0.126
	(0.108)	(0.103)	(0.111)
Observations	480	480	480
R-squared	0.006	0.004	0.002

	[7]	[8]	[9]
Panel C	**$\Delta_s$log(Markup)**		
s=	t	t+1	t+2
Divestment	-0.193**	-0.212***	-0.213***
	(0.076)	(0.074)	(0.073)
Observations	472	472	472
R-squared	0.013	0.017	0.018

Panel D	**Δ_s(Share of output exported)**		
s=	t	t+1	t+2
Divestment	-0.094***	-0.149***	-0.114***
	(0.033)	(0.033)	(0.037)
Observations	514	514	514
R-squared	0.016	0.037	0.019

Panel E	**$\Delta_s$log(Domestic sales +1)**		
s=	t	t+1	t+2
Divestment	1.683***	1.893***	0.841
	(0.548)	(0.547)	(0.580)
Observations	514	514	514
R-squared	0.019	0.023	0.004

Panel F	**Δ_s(Share of imported inputs)**		
s=	t	t+1	t+2
Divestment	-0.043*	-0.023	-0.042*
	(0.023)	(0.023)	(0.023)
Observations	484	484	484
R-squared	0.007	0.002	0.007

Panel G	**$\Delta_s$log(Employment)**		
s=	t	t+1	t+2
Divestment	-0.046	-0.014	0.036
	(0.053)	(0.058)	(0.062)
Observations	514	514	514
R-squared	0.001	0.000	0.001

Panel H	**$\Delta_s$log(Employment of production workers)**		
s=	t	t+1	t+2
Divestment	-0.079	-0.017	0.005
	(0.059)	(0.063)	(0.068)
Observations	504	504	504
R-squared	0.004	0.000	0.000

Panel I	**$\Delta_s$log(Employment of non-production workers)**		
s=	t	t+1	t+2
Divestment	-0.020	-0.072	-0.088
	(0.091)	(0.091)	(0.103)
Observations	416	416	416
R-squared	0.000	0.001	0.002

Panel J	**$\Delta_s$log(Average wage)**		
s=	t	t+1	t+2
Divestment	-0.045	-0.070	-0.068
	(0.067)	(0.069)	(0.065)
Observations	512	512	512
R-squared	0.001	0.002	0.002

Notes: Δ_s=*s-(t-1)*. The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of logged TFP, markup and output. The dependent variables are expressed as differences between *t-1* (i.e., the year prior to divestment) and year *t* (year of divestment, columns 1, 4 and 7), *t+1* (column 2, 5, and 8) and *t+2* (column 3, 6, and 9). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table 13. Matching results controlling for longer pre-treatment trends

	[1]	[2]	[3]
Panel A	**$\Delta_s$log(TFP)**		
s=	t	t+1	t+2
Divestment	-0.036***	-0.031***	-0.036***
	(0.006)	(0.006)	(0.007)
Observations	732	732	732
R-squared	0.051	0.030	0.034

	[4]	[5]	[6]
Panel B	**$\Delta_s$log(Output)**		
s=	t	t+1	t+2
Divestment	-0.292***	-0.306***	-0.425***
	(0.086)	(0.095)	(0.102)
Observations	738	738	738
R-squared	0.014	0.023	0.016

	[7]	[8]	[9]
Panel C	**$\Delta_s$log(Markup)**		
s=	t	t+1	t+2
Divestment	-0.296***	-0.286***	-0.343***
	(0.069)	(0.074)	(0.076)
Observations	732	732	732
R-squared	0.026	0.019	0.027

Panel D	**Δ_s(Share of output exported)**		
s=	t	t+1	t+2
Divestment	-0.009	-0.058**	-0.069**
	(0.027)	(0.028)	(0.030)
Observations	768	768	768
R-squared	0.000	0.006	0.007

Panel E	**$\Delta_s$log(Domestic sales +1)**		
s=	t	t+1	t+2
Divestment	-0.734	-0.211	-0.535
	(0.450)	(0.488)	(0.493)
Observations	768	768	768
R-squared	0.004	0.000	0.002

Panel F	**Δ_s(Share of imported inputs)**		
s=	t	t+1	t+2
Divestment	-0.045***	-0.067***	-0.069***
	(0.016)	(0.018)	(0.019)
Observations	742	742	742
R-squared	0.010	0.018	0.019

Panel G	**$\Delta_s$log(Employment)**		
s=	t	t+1	t+2
Divestment	-0.078**	-0.127***	-0.126***
	(0.037)	(0.040)	(0.043)
Observations	768	768	768
R-squared	0.006	0.012	0.011

Panel H	**$\Delta_s$log(Employment of production workers)**		
s=	t	t+1	t+2
Divestment	-0.082**	-0.127***	-0.124**
	(0.041)	(0.042)	(0.048)
Observations	762	762	762
R-squared	0.005	0.010	0.008

Panel I	**$\Delta_s$log(Employment of non-production workers)**		
s=	t	t+1	t+2
Divestment	0.003	-0.066	-0.094
	(0.052)	(0.067)	(0.075)
Observations	698	698	698
R-squared	0.000	0.001	0.002

Panel J	**$\Delta_s$log(Average wage)**		
s=	t	t+1	t+2
Divestment	-0.015	-0.045	-0.040
	(0.061)	(0.073)	(0.067)
Observations	768	768	768
R-squared	0.000	0.000	0.000

Notes: Δ_s=*s-(t-1)*. The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industries on the lagged value of (logged if appropriate) following variables: TFP, markup, output, employment and its square, investment, share of imported intermediates and share of output exported. Additionally, it controls for longer pre-treatment trends by including the log (if appropriate) difference between *t-3* and *t-1* of all the variables mentioned. Finally, it controls for (lagged) age, age squared, and a crisis dummy. Matching is done within sectors. The dependent variables are expressed as differences between *t-1* (i.e., the year prior to divestment) and year *t* (year of divestment, columns 1, 4 and 7), *t+1* (column 2, 5, and 8) and *t+2* (column 3, 6, and 9). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year t, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

APPENDIX

Table A1. Distribution of nationalities of foreign parents

Sample:	Propensity score probit		Matched pairs	
	Freq.	Percent	Freq.	Percent
East Asia	467	6.56	14	4.46
Europe excluding UK	71	1.00	0	0.00
Anglo-Saxon countries	59	0.83	3	0.96
ROW	7	0.10	0	0.00
Missing	6,516	91.52	297	94.59
Total	7,120	100.00	314	100.00

Notes: East Asian investors come from Japan, Korea, Taiwan, Singapore, Hong Kong, Malaysia, China, Philippines, India, Thailand, Myanmar and North Korea. European investors include those from Belgium, Germany, Netherlands, Switzerland, France, Italy, Austria, Ireland, Norway, Sweden, and Denmark. Anglo-Saxon investment source countries encompass the United States, Australia, United Kingdom, and British Virgin Islands. The rest of the world (ROW) includes Afghanistan, United Arab Emirates, Liberia, Libya, and Tanzania. The order of countries mentioned within each group reflects their frequency in the data. Nationality is only observed for some plants and only in 1996 and 2006.

Table A2. Distribution of divestments across industries. The matched sample

Sector	Freq.	Percent
Food and beverages	23	14.65
Apparel	23	14.65
Textiles	19	12.1
Furniture	17	10.8
Leather and leather products	11	7.01
Chemicals and chemical products	10	6.37
Rubber and plastics products	9	5.73
Wood and wood products	7	4.46
Electrical machinery and apparatus n.e.c.	7	4.46
Fabricated metal products	6	3.82
Machinery and equipment n.e.c.	6	3.82
Other non-metallic mineral products	4	2.55
Basic metals	3	1.91
Motor vehicles	3	1.91
Publishing and printing	2	1.27
Other transport equipment	2	1.27
Paper and paper products	1	0.64
Coke, refined petroleum products	1	0.64
Radio, TV and communications equipment	1	0.64
Total	157	100

Notes: n.e.c. stand for not elsewhere classified.

Table A3. Predicting divestments

	[1]
log TFP $_{t-1}$	0.017
	(0.028)
Δlog TFP $_{t-1}$	0.053*
	(0.029)
log markup $_{t-1}$	-0.033*
	(0.017)
Δlog markup $_{t-1}$	0.001
	(0.003)
100% foreign owned $_{t-1}$	0.031***
	(0.004)
Entered as greenfield $_{t-1}$	-0.050***
	(0.008)
log Employment $_{t-1}$	-0.254***
	(0.057)
log Employment $_{t-1}^2$	0.033***
	(0.010)
log Employment $_{t-1}^3$	-0.002***
	(0.001)
Skilled labor share $_{t-1}$	-0.464***
	(0.103)
log Average wage $_{t-1}$	-0.022***
	(0.006)
Imported input share $_{t-1}$	-0.030***
	(0.005)
Age $_t$	-0.000
	(0.001)
Age $_t^2$	-0.000
	(0.000)
Age $_t^3$	0.000
	(0.000)
log Capital per worker $_{t-1}$	-0.004**
	(0.002)
log Capital per worker $_{t-1}$ * Age	0.000**
	(0.000)
Loan-financed investment$_{t-1}$/Output $_{t-1}$	-0.002
	(0.002)
log Output $_{t-1}$	-0.033***
	(0.007)
Share of output exported $_{t-1}$	-0.077
	(0.098)
log(Investment +1)$_{t-1}$	0.002*
	(0.001)
Share of output exported $_{t-1}$ * TFP $_{t-1}$	0.023
	(0.043)
log Average wage $_{t-1}$ * Markup $_{t-1}$	0.001
	(0.002)
Share of output exported $_{t-1}$ * Markup $_{t-1}$	-0.001
	(0.005)
log Output $_{t-1}$ * Skilled labor share $_{t-1}$	0.027***
	(0.006)
Crisis $_{t-1}$	-0.012**
	(0.005)
log Markup^2 $_{t-1}$	0.003*
	(0.002)
log Markup^3 $_{t-1}$	-0.000
	(0.000)
log(Investment +1) $_{t-1}$ * log Employment $_{t-1}$	-0.000**
	(0.000)
log Output $_{t-1}$ * log Employment $_{t-1}$	0.004***
	(0.001)
Time trend	-0.001**
	(0.000)
Observations	7,120
Pseudo R2	0.200

Notes: Probit model. The results are presented in terms of marginal effects evaluated at the sample mean. Standard errors are listed in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

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ON-LINE APPENDIX

Table W1. Matching results using baseline specification. Additional outcome variables

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Δ_s=s-(t-1)	Δ_s(loan financed investment / output)			Δ_s(private financed / investment)			Δ_s(reinvested earnings / investment)		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	-0.035	-0.011	0.048	-0.155	-0.077	-0.071	-0.130	**-0.081***	**-0.090***
	(0.054)	(0.056)	(0.089)	(0.214)	(0.109)	(0.100)	(0.085)	(0.048)	(0.048)
Observations	332	332	332	288	288	288	288	288	288
R-squared	0.001	0.000	0.001	0.002	0.002	0.002	0.008	0.009	0.012
Δ_s=s-(t-1)	Δ_s(stocks and bonds / investment)			Δ_s(domestic loans / investment)			Δ_s(foreign loans / investment)		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	0.022	0.027	0.018	0.044	0.040	0.013	**-0.047***	-0.013	-0.026
	(0.019)	(0.020)	(0.020)	(0.032)	(0.034)	(0.035)	(0.025)	(0.021)	(0.023)
Observations	288	288	288	288	288	288	288	288	288
R-squared	0.005	0.006	0.003	0.007	0.005	0.000	0.011	0.001	0.004
Δ_s=s-(t-1)	Δ_s(foreign funding / investment)			Δ_s(reinvested earnings / output)			Δ_s(foreign loans / output)		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	0.283	0.132	0.103	0.291	0.341	0.344	**-0.094***	-0.074	-0.040
	(0.286)	(0.150)	(0.142)	(0.311)	(0.309)	(0.305)	(0.049)	(0.049)	(0.053)
Observations	288	288	288	278	278	278	278	278	278
R-squared	0.003	0.003	0.002	0.003	0.004	0.004	0.013	0.008	0.002

Notes: Δ_s=*s-(t-1)*. The estimation is performed on the matched sample obtained by matching within 4-digit-ISIC-industry-year cells on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables.
The dependent variables are expressed as differences between t-1 (i.e., the year prior to divestment) and year *t* (year of divestment, columns 1, 4 and 7), *t+1* (column 2, 5, and 8) and *t+2* (column 3, 6, and 9). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year *t*, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.

Table W2. Baseline matching with treated and control plants located in different counties

	[1]	[2]	[3]
Panel A	**$\Delta_s$log(TFP)**		
s=	t	t+1	t+2
Divestment	-0.038***	-0.044***	-0.038***
	(0.007)	(0.008)	(0.008)
Observations	308	308	308
R-squared	0.088	0.096	0.064

	[4]	[5]	[6]
Panel B	**$\Delta_s$log(Output)**		
s=	t	t+1	t+2
Divestment	-0.316***	-0.433***	-0.440***
	(0.104)	(0.131)	(0.145)
Observations	296	296	296
R-squared	0.028	0.037	0.033

	[7]	[8]	[9]
Panel C	**$\Delta_s$log(Markup)**		
s=	t	t+1	t+2
Divestment	-0.300***	-0.319***	-0.235**
	(0.111)	(0.120)	(0.118)
Observations	308	308	308
R-squared	0.024	0.022	0.012

Panel D	**Δ_s(Share of output exported)**		
s=	t	t+1	t+2
Divestment	-0.055	-0.128***	-0.132***
	(0.041)	(0.049)	(0.051)
Observations	308	308	308
R-squared	0.006	0.022	0.021

Panel E	**$\Delta_s$log(Domestic sales +1)**		
s=	t	t+1	t+2
Divestment	-0.330	0.517	0.772
	(0.724)	(0.823)	(0.857)
Observations	308	308	308
R-squared	0.001	0.001	0.003

Panel F	**Δ_s(Share of imported inputs)**		
s=	t	t+1	t+2
Divestment	-0.076***	-0.068*	-0.076**
	(0.029)	(0.036)	(0.034)
Observations	306	306	306
R-squared	0.023	0.012	0.016

Panel G	**$\Delta_s$log(Employment)**		
s=	t	t+1	t+2
Divestment	-0.091*	-0.036	-0.010
	(0.052)	(0.050)	(0.049)
Observations	308	308	308
R-squared	0.010	0.002	0.000

Panel H	**$\Delta_s$log(Employment of production workers)**		
s=	t	t+1	t+2
Divestment	-0.122**	-0.047	-0.006
	(0.062)	(0.062)	(0.065)
Observations	308	308	308
R-squared	0.014	0.002	0.000

Panel I	**$\Delta_s$log(Employment of non-production workers)**		
s=	t	t+1	t+2
Divestment	-0.011	-0.039	-0.048
	(0.081)	(0.093)	(0.100)
Observations	292	292	292
R-squared	0.000	0.001	0.001

Panel J	**$\Delta_s$log(Average wage)**		
s=	t	t+1	t+2
Divestment	-0.015	-0.067	-0.140
	(0.089)	(0.104)	(0.105)
Observations	308	308	308
R-squared	0.000	0.001	0.006

Notes: Δ_s=*s-(t-1)*. The estimation is performed on the matched sample obtained by matching on the lagged value of (logged if appropriate) following variables: TFP, TFP growth, markup, its square, cube and growth, employment, its square and cube, share of output exported, share of imported inputs, skill intensity (ratio of non-production workers to total workers), capital intensity, output (value of goods produced), average wage, plant's age, its square and cube, share in output of investment financed by loans, investment, time trend, dummy for crisis years, dummy for 100% foreign ownership, dummy for greenfield investment, and the interaction terms between some of the explanatory variables. The matched and the control plant were required to operate in the same year and 4-digit industry cell but be located in different counties ('kapubaten').
The dependent variables are expressed as differences between *t-1* (i.e., the year prior to divestment) and year *t* (year of divestment, columns 1, 4 and 7), *t+1* (column 2, 5, and 8) and *t+2* (column 3, 6, and 9). Divestment is a time-invariant dummy taking on the value of one for foreign affiliates divested in year t, and zero otherwise. Bootstrapped standard errors are listed in parentheses. A constant is included in all specifications, but not reported. *, **, and *** represent significance at the 10, 5, and 1 percent levels, respectively.