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Foreign Acquisitions and Firm-Level Financial Risk

By

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## Foreign Acquisitions and Firm-Level Financial Risk

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#### **Abstract**

This paper examines the impact of foreign and domestic acquisitions on firm-level financial risk in Italy and Spain over the period 2002-2010. Our results indicate that foreign acquisition leads to a significant and steady reduction in financial risk. In contrast, the domestic acquisition effects are smaller and statistically less robust.

JEL classification: F23; O33; D24

Keywords: financial risk; acquisitions; foreign investment

#### **Outline:**

- 1. Introduction
- 2. Empirical Strategy and Data
- 3. Empirical Results
- 4. Conclusions

#### **Non-Technical Summary**

This paper examines the impact of foreign and domestic acquisitions on firm-level financial risk in Italy and Spain over the period 2002-2010. It examines the causal effect of both foreign and domestic acquisitions on two measures of firm-level financial risk: `Gearing' (short and long term debt to shareholders funds ratio) and `Leverage' (short term debt to total assets ratio). The higher the gearing ratio, the higher the dependence on borrowing and long term financing, and thus, the higher the level of financial risk due to the increased volatility of profits. In addition, a firm with high gearing is more vulnerable to recessions and poor investment decisions because it must continue servicing its debt regardless of how bad earnings are. Likewise, a high leverage ratio is associated with a worse balance sheet situation, which may increase moral hazard and adverse selection problems, lead to the inability of firms to obtain external finance at a reasonable cost, and decrease the probability of survival.

Our empirical analysis is based on data from two of the largest European economies, Italy and Spain. The choice of the two countries is also motivated by the fact that Italy and Spain were badly hit by the recent banking crisis and credit crunch (which soon evolved into a domestic sovereign debt crisis), and by the fact that, relative to the other major economies in Europe, they have a remarkably low cross-border takeover activity. It is therefore interesting to look at the nexus between foreign investment and firm-level financial health for these two countries.

Measuring the effect of acquisitions on financial risk raises issues of selection bias and reverse causality. There is suggestion in the literature that large and more productive firms are more likely to self-select into foreign investments and that foreign investors tend to "cherry pick" the best performing local firms as acquisition targets. To overcome this problem, we follow recent empirical work on the impacts of export, exits, and acquisitions and make use of propensity score matching in combination with difference-in-difference techniques.

We find that foreign acquisition leads to a significant reduction of acquired firms' financial risk. The corresponding effects become visible in the acquisition year and last for several years after acquisition. In contrast, the domestic acquisition effects are weaker, and in some cases, have the opposite direction. Overall, our findings suggest that foreign acquisitions should be welcomed, particularly when the target domestic firms experience financial difficulties, and shed doubts on the attitude of the Italian and Spanish governments to discourage foreign takeovers and encourage the emergence of "national champions".

## 1 Introduction

It is generally argued that foreign-owned firms have an advantage over domestically-owned firms due to large endowments of competitive assets, such as specialised knowledge about production, more advanced technologies, superior management and marketing capabilities, and better coordinated relationships with suppliers and customers (Aitken & Harrison, 1999). In addition, foreign-owned firms may achieve higher operational efficiency by servicing clients in more than one country, and face lower funding costs because of more diversified funding bases (including access to liquidity from parent firms). If these arguments are valid, then we would expect a change from domestic to foreign owners to improve the "performance" of target firms. The available empirical evidence, however, is not as conclusive as one might expect. Some studies provide evidence that acquired firms reap benefits from foreign ownership (Girma & Görg, 2007; Arnold & Javorcik, 2009; Hijzen et al., 2013), while others fail to reach the same conclusion (Harris & Robinson, 2003; Benfratello & Sembenelli, 2006; Almeida, 2007).

A common feature of these studies is that they predominantly focus on productivity differences and wage premia, and pay little attention to the role of foreign acquisitions for measures of financial risk. The goal of this paper is to fill this gap. As shown in recent empirical work, financial health is highly important as it has implications for firms' exports (Manova et al., 2011), innovation (Efthyvoulou & Vahter, 2012), growth (Carpenter & Petersen, 2002) and survival (Musso & Schiavo, 2008). Hence, an enquiry in this direction sheds light on one of the most important channels through which foreign investment impacts on firm performance, and informs the ongoing debate of how a country's cross-border takeover activity may affect its resilience to financial shocks. Another limitation of most of the existing empirical studies is that they do not simultaneously test for the impact of domestic acquisitions, and thus, it is difficult to conclude whether the observed performance improvements stem from foreign investment per se or from ownership changes and acquisitions in general.

To address these issues, this paper examines the causal effect of both foreign and domestic acquisitions on two measures of firm-level financial risk: 'Gearing' (short and long term debt to shareholders funds ratio) and 'Leverage' (short term debt to total assets ratio). The higher the gearing ratio, the higher the dependence on borrowing and long term financing, and thus, the higher the level of financial risk due to the increased volatility of profits. In addition, a firm with high gearing is more vulnerable to recessions and poor investment decisions because it must continue servicing its debt regardless of how bad earnings are. Likewise, a high leverage ratio is associated with a worse balance sheet situation, which may increase moral hazard and adverse selection problems, lead to the inability of firms to obtain external finance at a reasonable cost,

and decrease the probability of survival (Görg & Spaliara, 2009).

Our empirical analysis is based on data from two of the largest European economies, Italy and Spain. The choice of the two countries is also motivated by the fact that Italy and Spain were badly hit by the recent banking crisis and credit crunch (which soon evolved into a domestic sovereign debt crisis), and by the fact that, relative to the other major economies in Europe, they have a remarkably low cross-border takeover activity (Martynova & Renneboog, 2006). It is therefore interesting to look at the nexus between foreign investment and firm-level financial health for these two countries.

Measuring the effect of acquisitions on financial risk raises issues of selection bias and reverse causality.<sup>1</sup> To overcome this problem, we follow recent empirical work on the impacts of export exits and acquisitions (see, for example, Girma *et al.*, 2003; Arnold & Javorcik, 2009; Hijzen *et al.*, 2013) and make use of propensity score matching in combination with difference-in-difference techniques.

# 2 Empirical Strategy and Data

The estimated effect of acquisition  $(\hat{\beta})$  in a given time period can be expressed as:

$$\hat{\beta} = E((Y_1 - Y_0)|Acq = 1) = E(Y_1|Acq = 1) - E(Y_0|Acq = 1)$$
(1)

where Y denotes the outcome of interest ('Gearing' or 'Leverage') and the subscript of Y represents the hypothetical circumstances under which the outcome is evaluated, taking the value one for foreign (domestic) acquisition and zero for non-acquisition. In other words, Eq. (1) represents the difference between the risk measure for an acquired firm and the analogous measure for the same firm had it not been acquired. The latter, however, is an unobserved counterfactual, and hence, we need to construct it using the matching procedure; that is, by identifying a match with similar observable characteristics  $\mathbf{X}$  for each acquired firm. The underlying assumption for the validity of this approach is that, conditional on  $\mathbf{X}$ , the treated (acquired firms) and the non-treated (non-acquired domestically-owned firms) would perform similarly under the same circumstances. To this end, we can re-write Eq. (1) as:

$$\hat{\beta} = \underbrace{E(Y_1|Acq = 1, \mathbf{X}) - E(Y_0|Acq = 0, \mathbf{X})}_{\text{casual effect of acquisition}} - \underbrace{[E(Y_0|Acq = 1, \mathbf{X}) - E(Y_0|Acq = 0, \mathbf{X})]}_{\text{selection bias}}$$
(2)

<sup>&</sup>lt;sup>1</sup>There is suggestion in the literature that large and more productive firms are more likely to self-select into foreign investments (Helpman *et al.*, 2004), and that foreign investors tend to "cherry pick" the best performing local firms as acquisition targets (Harris & Robinson, 2003).

where the selection bias term captures the difference between the outcome of acquired firms, under the hypothesis that they had not been acquired, and the outcome of non-acquired domestically-owned firms with similar observable characteristics. Our aim is to minimise the selection bias through the matching process so as to obtain a consistent estimate  $\hat{\beta}$ .

Conditioning on all variables in the treatment model is equivalent to conditioning on the propensity score (Rosenbaum & Rubin, 1983), which, in our case, is the conditional probability of acquisition given firm characteristics and past performance. We thus proceed in two stages. In the first stage, we estimate the propensity score, separately for each country, using the following probit model:

$$Acquisition'_{inrt} = \Phi\{\beta \mathbf{Z}_{inrt-1} + \lambda_n + \eta_r + \psi_t + error\}$$
(3)

where 'Acquisition' is a dummy variable that equals one in the year of a foreign (domestic) takeover<sup>2</sup>, and zero if the firm is not foreign-owned or multinational and has not been acquired during the sampled period (see Table 1);  $\Phi$  denotes the cumulative distribution function of a standard normally distributed random variable;  $\mathbf{Z}$  is a vector of control variables, taken in logarithms and lagged by one year to account for preacquisition characteristics; i, n, r, t index firm, industry, region and time. Specifically,  $\mathbf{Z}$  contains the following variables: 'Productivity' (turnover per employee), 'Employment' (number of employees), 'Age' (number of years since establishment) and 'K/L' or capital-to-labour ratio (tangible assets per employee). In addition,  $\mathbf{Z}$  contains the outcome variable and its square term to ensure that matches assigned on the basis of the propensity score will be homogeneous with respect to previous levels of risk. To capture unobserved heterogeneity, we also include industry  $(\lambda_n)$ , region  $(\eta_r)$  and year  $(\psi_t)$  fixed effects. Finally, to ensure that the sample is representative of the relevant population of firms in each industry, all regressions are weighted by size classes at the industry level.

In the second stage, we employ five-nearest neighbors matching<sup>3</sup> and compare the outcome variables within observations matched by the propensity score. We also impose the restriction that the matched control observations must come from the same industry, size class and productivity group<sup>4</sup> as the acquired firm. To examine whether the

<sup>&</sup>lt;sup>2</sup>Takeover is captured by any ownership stake over a threshold of 50% of total shareholding.

 $<sup>^{3}</sup>$ To reduce the likelihood of poor matches, the matching is carried out with replacement using a 0.005 caliper. In addition, we exclude observations outside the common support, bound by the lowest propensity score of a treated observation and the highest propensity score of a matched control observation.

<sup>&</sup>lt;sup>4</sup>Specifically, firms are divided in five size classes based on the median number of employees (categories are <10, 10-19, 20-49, 50-249,  $\geq$  500) and five productivity groups (quintiles) based on the median value of turnover per employee.

model for the propensity score is misspecified, we perform tests of the balancing property; that is, we test the significance of differences between acquired and matched firms for each variable entering the propensity score estimation. While the matching method accounts for the bias due to observable characteristics, its combination with difference-in-difference approach allows us to control for unobserved time-invariant characteristics (Blundell & Costa Dias, 2000). This is achieved by calculating the difference between treated and non-treated outcomes, as well as the difference over time within treated and non-treated outcomes. Our analysis begins in the pre-acquisition period and considers the change in outcome  $Y \in \{\text{`Gearing', `Leverage'}\}\)$  over the following four years. Formally, the average treatment effect (`ATT') of acquisition in the year of acquisition (when j = 0) and the subsequent three years (when j = 1, 2, 3) is calculated as:

$$ATT_{j} = \frac{1}{n} \sum_{1}^{n} \left( \ln Y_{\text{acquisition year}+j}^{\text{treated}} - \ln Y_{\text{acquisition year}+j}^{\text{matched controls}} \right) 
- \frac{1}{n} \sum_{1}^{n} \left( \ln Y_{\text{pre-acquisition year}}^{\text{treated}} - \ln Y_{\text{pre-acquisition year}}^{\text{matched controls}} \right) \quad j = 0, 1, 2, 3$$
(4)

Financial account data (unconsolidated) are obtained from Amadeus for the period 2002-2010. Information on acquisitions is retrieved from Zephyr and matched to the Amadeus data using firm identifiers.<sup>5</sup> Data on price indices and employment size classes at the country-industry level are collected from Eurostat. To be included in the final sample, firms must be classified as public and private limited firms and have employment data for at least one year. Financial institutions and insurance companies are excluded due to compatibility issues with the format of financial accounts. The extracted monetary variables for manufacturing firms are deflated using industry producer price indices at the two-digit NACE code level, whereas those for services firms are deflated using the GDP deflator. The final sample for the propensity score estimation is an unbalanced panel with more than 500,000 firm-year observations for each country.

# 3 Empirical Results

We start by estimating Eq. (3) separately for the two countries (see Table 2). As a first point, we can notice that highly productive firms are more attractive to foreign acquirers than to domestic acquirers: the coefficient on 'Productivity' is positive and statistically significant in the foreign acquisition equations only. This may be driven by

 $<sup>^5</sup>$ The availability of acquisition deals in Zephyr is relatively lower in 2010 (see Table 1). However, excluding the year 2010 does not change our results.

the fact that domestic investors have better knowledge of the local market, customers and business networks, and hence, rely less heavily on basic observable information, such as productivity, to select their targets. In line with previous studies, we also find a positive and statistically significant relationship between acquisition and size for both countries, and a negative and statistically significant relationship between acquisition and age for Italy; suggesting that larger and younger firms are more likely to be acquired. Turning now to capital intensity, we find heterogeneity between two countries: foreign acquirers of Italian firms tend to favour higher capital-labour ratios, whereas those of Spanish firms tend to favour lower capital-labour ratios. Finally, our results indicate that the acquisition decision is significantly influenced by industry, year and region specific effects (not reported).

We now proceed to discuss the results from five-nearest neighbors matching and difference-in-difference analysis. Panel (a) of Table 3 shows the ATT of foreign acquisition on 'Gearing'. The evidence obtained suggests that foreign acquisition leads to a significant and steady reduction in financial risk: while the treated and control groups start with very similar levels of 'Gearing' in the pre-acquisition period, the former exhibit lower levels of financial risk in the subsequent years. Specifically, during the year of acquisition, foreign-acquired Italian (Spanish) firms have 49% (40%) lower gearing ratio compared to their matched control observations. This advantage increases to 62% (54%) in the first year following the acquisition, reaches its peak at 67% (81%) in the second year, and declines moderately to 57% (78%) in the third year.<sup>6</sup> The relatively small impact of foreign acquisition in Year 0 suggests the presence of restructuring costs that increase the gearing ratio in the year of completion. Panel (b) of Table 3 shows the ATT of domestic acquisition on 'Gearing'. The results indicate that, when the firms are acquired by domestic investors, the financial risk difference is smaller and statistically less robust. More precisely, for Italian firms, the ATT of domestic acquisition is negative and statistically significant in all four years, but appears to be substantially lower in absolute value compared to that of foreign acquisition. For Spanish firms, the ATT of domestic acquisition is positive and marginally statistically significant in the year of completion, but fails to reach statistical significance in the three years thereafter.

The decrease in financial risk associated with foreign acquisition is verified when we use 'Leverage' as the outcome variable (panel (c) of Table 3). The lower risk advantage of foreign-acquired firms is both statistically and economically significant, starting from 60% and 24% in the acquisition year (for Italy and Spain, respectively) and reaching a peak at 89% and 84% in the second year after acquisition. In contrast, the effects of domestic acquisition are either weak and statistically insignificant or of the opposite

<sup>&</sup>lt;sup>6</sup>Since the ATT is calculated for the log of the gearing ratio, the percentages reported are obtained by taking the exponential of the ATT and subtracting one.

sign (panel (d) of Table 3).

Formal paired t-tests between acquired and matched control firms fail to reject the balancing hypothesis for all variables entering the propensity score estimation, confirming that our matching procedure has grouped together relatively homogeneous firms (see Table 4). The reported results are invariant to tests of robustness, such as adding profitability ratios and square terms of employment and age in the propensity score equation, restricting the sample to include only the period preceding the recent financial crisis, and using the one-to-one nearest neighbour matching and Epanechnikov kernel matching as alternative matching techniques. Finally, our results largely persist when we consider two alternative measures of financial health, namely the solvency ratio and the liquidity ratio (results available upon request).

## 4 Conclusions

We find that foreign acquisition leads to a significant reduction of acquired firms' financial risk. The corresponding effects become visible in the acquisition year and last for several years after acquisition. In contrast, the domestic acquisition effects are weaker, and in some cases, have the opposite direction. Overall, our findings suggest that foreign acquisitions should be welcomed, particularly when the target domestic firms experience financial difficulties, and shed doubts on the attitude of the Italian and Spanish governments to discourage foreign takeovers and encourage the emergence of "national champions".

Table 1: Counts of acquisitions and controls by year  $\,$ 

	Italy			Spain				
Year	Foreign	Domestic	Controls	Foreign	Domestic	Controls		
	Acquisitions	Acquisitions		Acquisitions	Acquisitions			
2002	108	315	118204	117	315	112264		
2003	108	234	123488	117	495	117783		
2004	126	342	129424	198	306	123000		
2005	279	342	135380	297	369	127805		
2006	297	351	141238	234	666	131990		
2007	324	468	146106	423	810	134802		
2008	378	567	149368	567	1260	136249		
2009	180	342	149388	216	837	136551		
2010	54	90	149395	54	198	136553		

Table 2: Propensity score estimation

	Italy		Spain		
	Foreign	Domestic	Foreign	Domestic	
	Acquisition	Acquisition	Acquisition	Acquisition	
Control for Gearing Ratio	•	-			
ln(Productivity)	0.276***	-0.004	0.253**	0.022	
·	(0.045)	(0.111)	(0.103)	(0.052)	
ln(Employment)	0.325***	0.221***	0.255***	0.274***	
( 1 0 /	(0.025)	(0.063)	(0.055)	(0.030)	
ln(Age)	-0.045***	-0.055***	0.074	-0.012	
( 0 /	(0.018)	(0.014)	(0.090)	(0.015)	
$\ln(K/L)$	0.067**	0.028	-0.114*	0.071*	
( / /	(0.027)	(0.032)	(0.060)	(0.036)	
ln(Gearing)	0.258	0.320*	-0.010	-0.005	
( 0)	(0.241)	(0.183)	(0.015)	(0.010)	
Square of ln(Gearing)	-0.032	-0.039*	-0.012***	-0.003	
2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	(0.028)	(0.023)	(0.003)	(0.002)	
Constant	-12.412***	-5.861***	-8.591***	-4.458***	
	(1.094)	(1.452)	(1.593)	(0.723)	
Industry, time, region dummies	yes	yes	yes	yes	
Number of observations	573171	636119	607160	694528	
Pseudo-R <sup>2</sup>	0.231	0.182	0.306	0.164	
Control for Leverage Ratio					
ln(Productivity)	0.267***	-0.012	0.208**	0.046	
(	(0.044)	(0.096)	(0.101)	(0.046)	
ln(Employment)	0.344***	0.222***	0.248***	0.237***	
(2p10)(2p10)	(0.020)	(0.061)	(0.056)	(0.039)	
ln(Age)	-0.038**	-0.046***	0.112	-0.030	
m(1180)	(0.016)	(0.013)	(0.080)	(0.020)	
$\ln(K/L)$	0.064***	0.026	-0.089*	0.044	
(11/12)	(0.024)	(0.030)	(0.049)	(0.034)	
ln(Leverage)	-0.019	0.018	0.042***	-0.064*	
(	(0.026)	(0.018)	(0.016)	(0.036)	
Square of ln(Leverage)	-0.003	-0.001	0.005**	-0.014**	
Equate of In(Ecverage)	(0.004)	(0.003)	(0.002)	(0.006)	
Constant	-9.230***	-5.194***	-8.417***	-4.462***	
	(0.757)	(1.320)	(1.501)	(0.727)	
Industry, time, region dummies	yes	yes	yes	yes	
Number of observations	640313	697837	715897	791181	
Pseudo-R <sup>2</sup>	0.227	0.179	0.271	0.185	

Explanatory variables lagged by one year. Columns report estimated coefficients. Robust p-values in parentheses. Regressions are weighted by country-industry sampling weights. \*\*\*,\*\*,\* Statistically significant at the 1%, 5% and 10% confidence level, respectively.

Table 3: The impact of acquisitions on firm-level financial risk: ATT

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Panel (a	): Foreign ac	equisition	ng ratio						
3.7	Italy		NT.	Spain		N.T.			
Year	ATT		N	ATT		N			
0	-0.683***	(0.170)	137	-0.516*	(0.270)	155			
1	-0.980***	(0.226)	123	-0.767**	(0.308)	135			
2	-1.121***	(0.246)	110	-1.644***	(0.341)	110			
3	-0.855***	(0.240)	84	-1.525***	(0.425)	76			
Panel (b	): Domestic	acquisitio	n / Gea	ring ratio					
	Italy			Spain					
Year	ATT		N	ATT		N			
0	-0.552***	(0.120)	208	0.284*	(0.171)	323			
1	-0.274**	(0.113)	183	0.224	(0.190)	281			
2	-0.268**	(0.106)	151	-0.142	(0.247)	208			
3	-0.393**	(0.198)	112	-0.348	(0.329)	136			
Panel (c): Foreign acquisition / Leverage ratio									
	Italy			Spain					
Year	ATT		N	ATT		N			
0	-0.904**	(0.398)	147	-0.269	(0.309)	168			
1	-1.743***	(0.485)	123	-0.940***	(0.303)	139			
2	-2.199***	(0.546)	99	-1.857***	(0.430)	97			
3	-1.814**	(0.747)	75	-1.720***	(0.574)	62			
Panel (d	l): Domestic	acquisitio	n / Lev	erage ratio					
	Italy			Spain					
Year	ATT		N	ATT		N			
0	-0.467	(0.345)	219	0.939***	(0.199)	391			
1	-0.423	(0.339)	177	1.192***	(0.269)	300			
2	-0.418	(0.442)	134	0.676**	(0.335)	197			
3	-0.266	(0.484)	94	-0.611	(0.406)	135			
			ect on th	e treated. N de					

ATT denotes average treatment effect on the treated. N denotes the number of matched targets. Bootstrap standard errors in parenthesis. \*\*\*, \*\*, \* Statistically significant at the 1%, 5% and 10% confidence level, respectively.

Table 4: Balancing tests for matched sample

			Italy			Spain				
			Mean		t-test		Mean		t-test	
			Treated	Control	t	p >  t	Treated	Control	t	p >  t
Foreign acquisition /	Year 0	ln(Productivity)	12.775	12.708	0.57	0.567	12.254	12.231	0.19	0.848
Gearing ratio		ln(Employment)	3.933	3.796	0.93	0.351	4.098	3.997	0.71	0.480
		ln(Age)	2.710	2.713	0.03	0.980	2.832	2.759	0.73	0.467
		$\ln(K/L)$	3.050	3.231	0.92	0.360	2.754	2.648	0.51	0.610
		ln(Gearing)	4.352	4.534	1.12	0.266	2.294	2.804	1.21	0.226
		Square of ln(Gearing)	20.782	22.351	1.14	0.253	21.641	18.654	1.30	0.194
	Year 1	In(Productivity)	12.760	12.685	0.63	0.532	12.282	12.270	0.09	0.926
		ln(Employment)	3.929	3.791	0.93	0.355	4.134	4.013	0.80	0.423
		ln(Age)	2.686	2.725	0.29	0.771	2.864	2.749	0.99	0.322
		$\ln(K/L)$	2.994	3.195	0.96	0.339	2.798	2.760	0.17	0.866
		ln(Gearing)	4.298	4.504	1.19	0.237	2.282	2.732	0.94	0.346
		Square of ln(Gearing)	20.375	22.075	1.17	0.242	23.308	19.832	1.35	0.179
Domestic acquisition /	Year 0	ln(Productivity)	12.466	12.390	0.81	0.416	11.984	11.998	0.14	0.888
Gearing ratio	1001 0	ln(Employment)	3.913	3.821	0.69	0.491	3.641	3.584	0.57	0.567
Goaring ratio		$\ln(\text{Age})$	2.663	2.695	0.33	0.745	2.603	2.585	0.18	0.854
		$\ln(K/L)$	2.863	2.938	0.43	0.670	3.110	3.167	0.40	0.690
		ln(Gearing)	4.565	4.600	$0.45 \\ 0.27$	0.784	2.933	2.616	1.07	0.285
		Square of ln(Gearing)	22.548	$\frac{4.000}{22.815}$	$0.27 \\ 0.25$	0.805	$\frac{2.955}{22.055}$	21.739	0.19	0.285 $0.846$
	Year 1	In(Productivity)	12.462	12.415	0.23	0.632	11.958	11.980	0.19	0.844
	rear r		$\frac{12.402}{3.927}$	3.816	0.48 $0.81$	0.032 $0.420$	3.655	3.605	0.20 $0.49$	0.621
		ln(Employment)	$\frac{3.927}{2.702}$	2.754		0.420 $0.595$	$\frac{3.033}{2.599}$	2.574	$0.49 \\ 0.23$	0.621 $0.815$
		ln(Age) $ ln(K/L)$	2.702	2.734	0.53	0.595 $0.591$		3.165	0.23	0.815 $0.999$
				4.570	0.54		3.165			
		ln(Gearing)	4.558		0.09	0.927	2.785	2.629	0.49	0.627
		Square of ln(Gearing)	22.447	22.569	0.11	0.915	22.074	21.473	0.34	0.732
Foreign acquisition /	Year 0	ln(Productivity)	12.809	12.708	0.89	0.376	12.206	12.185	0.18	0.855
Leverage ratio		ln(Employment)	3.907	3.771	0.95	0.341	4.138	4.012	0.94	0.346
		$\ln(\text{Age})$	2.653	2.640	0.10	0.924	2.792	2.715	0.81	0.418
		$\ln(K/L)$	3.070	3.265	1.00	0.316	2.721	2.633	0.41	0.683
		ln(Leverage)	-0.488	-0.671	0.31	0.758	-2.368	-2.760	0.63	0.527
		Square of ln(Leverage)	24.787	27.779	0.79	0.431	37.409	39.933	0.60	0.547
	Year 1	ln(Productivity)	12.789	12.665	0.99	0.322	12.245	12.233	0.10	0.918
		ln(Employment)	3.987	3.852	0.90	0.371	4.123	4.018	0.74	0.463
		ln(Age)	2.640	2.581	0.36	0.720	2.820	2.684	1.31	0.190
		$\ln(K/L)$	3.032	3.272	1.12	0.265	2.790	2.665	0.55	0.585
		ln(Leverage)	-0.635	-0.773	0.21	0.836	-2.733	-3.133	0.59	0.559
		Square of ln(Leverage)	25.733	28.857	0.74	0.461	38.989	42.629	0.78	0.435
Domestic acquisition /	Year 0	ln(Productivity)	12.453	12.363	0.98	0.327	11.964	11.959	0.05	0.958
Leverage ratio		ln(Employment)	3.967	3.825	1.11	0.266	3.666	3.609	0.62	0.538
9		ln(Age)	2.663	2.663	0.00	0.999	2.515	2.482	0.32	0.749
		$\ln(K/L)$	2.804	2.961	-0.96	0.339	3.022	2.993	0.22	0.826
		ln(Leverage)	-0.123	-0.629	1.06	0.289	-3.230	-3.578	0.85	0.396
		Square of ln(Leverage)	22.885	27.128	-1.38	0.170	43.299	45.394	-0.75	0.456
	Year 1	In(Productivity)	12.445	12.387	0.58	0.564	11.956	11.982	-0.24	0.808
		ln(Employment)	3.981	3.855	0.91	0.361	3.692	3.604	0.84	0.400
		ln(Age)	2.670	2.680	-0.09	0.925	2.442	2.474	-0.27	0.790
		ln(K/L)	2.776	2.992	-1.23	0.219	3.053	3.007	0.31	0.754
		ln(Leverage)	-0.291	-0.557	0.50	0.619	-3.859	-4.092	0.50	0.618
		Square of ln(Leverage)	24.067	26.666	-0.75	0.019 $0.454$	47.829	49.067	-0.39	0.618
		oquare or in(neverage)	24.007	20.000	-0.75	0.404	41.049	43.001	-0.59	0.099

# References

- Aitken, B.J., & Harrison, A.E. 1999. Do domestic firms benefit from direct foreign investment? *American Economic Review*, **89**(3), 605–618.
- Almeida, R. 2007. The labor market effects of foreign owned firms. *Journal of International Economics*, **72**(1), 75–96.
- Arnold, J.M., & Javorcik, B.S. 2009. Gifted kids or pushy parents? Foreign acquisition and plant performance in Indonesia. *Journal of International Economics*, **79**(1), 42–53.
- Benfratello, L., & Sembenelli, A. 2006. Foreign ownership and productivity: is the direction of causality so obvious? *International Journal of Industrial Organization*, **24**(4), 733–751.
- Blundell, R., & Costa Dias, M. 2000. Evaluation methods for non-experimental data. *Fiscal Studies*, **21**(4), 427–468.
- Carpenter, R.E., & Petersen, B.C. 2002. Is the growth of small firms constrained by internal finance? The Review of Economics and Statistics, 84(2), 298–309.
- Efthyvoulou, G., & Vahter, P. 2012. Financial constraints, innovation performance, and sectoral disaggregation. Sheffield Economic Research Paper Series, No. 2012030.
- Girma, S., & Görg, H. 2007. Multinationals' productivity advantage: scale or technology? Economic Inquiry, 45(2), 350–362.
- Girma, S., Greenaway, D., & Kneller, R. 2003. Export market exit and performance dynamics: a causality analysis of matched firms. *Economics Letters*, **80**(2), 181–187.
- Görg, H., & Spaliara, M-E. 2009. Financial health, exports and firm survival: a comparison of British and French firms. Kiel Working Papers, No. 1568.
- Harris, R., & Robinson, C. 2003. Foreign ownership and productivity in the United Kingdom: estimates for U.K. manufacturing using the ARD. *Review of Industrial Organization*, **22**(3), 207–223.
- Helpman, E., Melitz, M.J., & Yeaple, S.R. 2004. Export versus FDI with heterogeneous firms. *American Economic Review*, **94**(1), 300–316.
- Hijzen, A., Martins, P.S., Schank, T., & Upward, R. 2013. Foreign-owned firms around the world: A comparative analysis of wages and emloyment at the micro-level. *European Economic Review*, 60, 170–188.
- Manova, K., Wei, S-J., & Zhang, Z. 2011. Firm exports and multinational activity under credit constraints. National Bureau of Economic Research Working Papers, No. 16905.
- Martynova, M., & Renneboog, L. 2006. *Mergers and acquisitions in Europe*. Tilburg University Discussion Papers, No. 200606.
- Musso, P., & Schiavo, S. 2008. The impact of financial constraints on firm survival and growth. *Journal of Evolutionary Economics*, **18**(2), 135–149.
- Rosenbaum, P., & Rubin, D. 1983. The central role of propensity score in observational studes for causal effects. *Biometrika*, **70**(1), 41–55.