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Foreign Institutional Investors and the Great Productivity Slowdown*

Jan Philip Schain†

February 2022

Abstract

This article analyzes the impact of institutional investors on firm productivity during the financial crisis 2008/09 across European manufacturing industries. Using propensity score matching combined with a difference in differences estimator I find a positive significant effect of 2% of foreign institutional ownership. Employing a variety of proxies for financial constraints, the article shows that the effect is driven by industries, countries, and firms that are more financially constrained indicating that foreign institutional ownership prevents the known productivity slowdown during the financial crisis by alleviating financial constraints.

JEL codes: *F61, G23, G32, G01, L25, D22, D24*
Keywords: *Institutional Investors, Financial Crisis, Productivity, Financial Constraints*

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1 Introduction

The presence of institutional investors in companies has grown enormously over the last decades from USD 3 trillion in 1980 to USD 85 trillion in 2014 (Monopolies Commission, 2016). The ten largest institutions manage assets equal to the annual GDP of the USA. There is no doubt that institutional investors are international key players in the global financial markets. However, the influence institutional investors have on companies has been criticized as it has been suggested that the interests of companies and institutional investors may be misaligned. Institutional investors have been accused of having a rather short-term view that may harm companies' long-term development. The OECD closely monitors institutional engagement internationally and has launched a program in 2012 aiming at fostering long-term investments by institutional investors. In an interview in 2005 the chairman of the social democratic party in Germany at that time labeled foreign institutional investors as locusts that disregard the lives of employees in the pursuit of profit[1]. Especially during the global financial crisis of 2008/09, the debate about institutional engagement in companies gained traction and also sparked worldwide protests.

The financial crisis caused a rapid downfall of productivity and companies have been recovering only slowly. Duval et al. (2020) show that especially companies that are likely to be financially constrained during the financial crisis experienced a more severe fall in productivity and the authors argue that financial frictions are a major determinant of the post-crisis productivity slowdown.

This article studies the impact of institutional investors on firm productivity during the financial crisis in Europe. I use balance sheet data of European manufacturing firms and detailed ownership information from the Amadeus database to estimate productivity using state-of-the-art production function estimation techniques. This data is combined with country-specific information on the financial impact of the financial crisis from Ali et al. (2009) and Ballester Miquel et al. (2016), and industry information on the cost of debt before and during the financial crisis to construct a unique data set to explore how the effect of institutional investors on productivity varies with different measures of financial constraints at the country, industry, and firm-level. To eliminate selection biases due to observable variables, I use propensity score matching to find a control group pre-financial crisis without institutional investment that proxies the counterfactual outcome during the financial crisis of firms that do have institutional investors pre-crisis and during the crisis. I estimate a difference in differences model on the matched sample to further control for time constant unobservable variables. I find a significant positive average treatment effect on the treated

[1]Interview in "Bild am Sonntag"April 17th 2005

of 2% of foreign institutional investment on firm productivity during the financial crisis. I use a variety of proxies to identify financially constrained samples in the data and show that foreign institutional investors prevent negative productivity shocks during the crisis in firms by alleviating financial constraints. The positive effect is mainly driven in eastern European countries that were impacted financially the most by the financial crisis, in industries that experienced a larger debt cost shock during the crisis, in industry-country combinations that had pre-crisis on average a larger fraction of total assets financed via current liabilities, and in firms that are relatively young and/or small. I do not find any evidence that the positive effect on productivity is driven by a downsizing mechanism by institutional investors, as I do not find any effects on sales, labor, capital, or patenting activity. Instead, I do find that during the financial crisis companies with foreign institutional investment can maintain larger firm markups of 2.3%. This effect is present in the same financially constrained samples as the effect on productivity is found.

The analysis is performed for foreign and domestic institutional investors separately. Domestic institutions do not have a particular meaningful economic or statistical effect on firm productivity during the financial crisis. As summarized by Bena et al. (2017) domestic institutions have shown to be different from foreign institutional investors, such that they may not serve as a monitoring entity as efficiently as foreign institutional investors do. Furthermore, foreign institutions may be better equipped to handle risk due to their international portfolios.

This article contributes to the literature in many ways. While it has been shown that institutional investment has a positive impact on innovation and capital investment (e.g. Aghion et al., 2013; Bena et al., 2017), these rather long term strategic variables may play only a minor role in the sudden productivity downfall during the financial crisis as pointed out by Duval et al. (2020) and instead the massive reduction in credit supply was likely a main driver of the great productivity slowdown. There is much less evidence on how institutional investors impact companies when sudden large-scale (financial) shocks occur.

The literature has shown that finance is a key channel through which institutional investors impact portfolio firms and the financial constraints channel of institutional investors is well established. For example, Amess et al. (2016) and Boucly et al. (2011) suggest that buyouts by private equity firms can cause firm growth and increase innovation activity by reducing financial constraints. Agca and Mozumdar (2008) find that institutional investors can reduce the sensitivity of investment to the availability of internal funds. Schain and Stiebale (2021) shows that institutional investors increase innovation in industries that are more dependent on external capital. Arguably overcoming financial frictions during the financial crisis is the most important and most salient channel how institutional investors may

impact firm productivity. There is a large literature that argues that information asymmetries in capital markets can lead to an adverse selection problem resulting in the rationing of finance and underinvestment (Hubbard, 1998; Stiglitz and Weiss, 1981). Institutional investment can lead to a decrease in information frictions and thus prevent credit rationing in a company. Allen (1990) argues that being invested in a company can serve as a signal to the market about special information on the asset. Costly monitoring is another channel through which a principal such as an institutional investor may reduce information asymmetries between the principal and an agent as suggested by Holmström (1979) which can prevent moral hazard problems. Diamond (1984) shows that security holders in a company can act as monitoring entities to acquire information on the agent on behalf of other debt providers.

This article closely relates to the literature that exploits the financial crisis as a sudden shock. In particular, this article is consistent with findings in Duval et al. (2020). The authors analyze the productivity slowdown following the financial crisis and argue that financial frictions are a key determinant that caused a sharp productivity drop during the financial crisis. They show that especially companies with a large share of short-term loans pre-crisis that expire within a year suffered a more severe productivity slowdown. I show that in exactly these companies that have a relatively large fraction of short-term liabilities over total assets, foreign institutional investors prevent a sharp fall in productivity. Consistent with the hypothesis that institutional investors can alleviate financial constraints during the financial crisis are the results in Ferreira and Matos (2012). They show that during the financial crisis companies received better credit terms if a bank is present in the company as an institutional investor or through board representation. The study by Giroud and Mueller (2017) shows that as a response to local demand shocks during the financial crisis firms with a larger pre-crisis leverage ratio decrease employment to a larger degree compared to firms with lower leverage ratios. Chodorow-Reich (2013) finds that companies linked to less healthy banks pre-crisis had more difficulties obtaining a new loan and paid a higher interest fee during the financial crisis leading to larger employment loss during the financial crisis.

Another strand of the literature focuses on the monitoring channel regarding the impact of institutional investors on companies. For example, Bena et al. (2017) analyzes the effect of foreign institutional ownership on investment outcomes and firm performance measures, such as sales and Tobin's Q. In the article, the author identifies a monitoring channel through which foreign institutional investors positively impact firm outcomes. Consistent with this work I also find no effect for domestic institutional investment on productivity. Aghion et al. (2013) also argues that a monitoring channel leads to an increase in innovation activity caused by institutional investors. As described above the monitoring channel is not in contrast to

the financial constraints hypothesis as active monitoring signals to the market that funds are used responsibly.

However, none of the mentioned articles analyzes institutional investors and firm outcomes in the context of a global financial shock. With the careful empirical matching design pre-crisis and by exploiting the financial crisis as a sudden exogenous event that caused a heavy tightening of credit supply, I shut down other channels on how institutional investors may impact firm productivity and isolate the immediate effect of institutional investors on productivity through financial channels. This article uses a variety of different measures to proxy financial constraints exploiting country, industry, and firm heterogeneity. Additionally, this article discusses the difference of foreign vs. domestic institutional ownership regarding the economic impact on companies during the financial crisis.

The rest of the article is structured as follows. Section 2 presents the data. Part 3 describes the production function estimation approach and presents first correlation results of institutional investors and productivity. Section 4 lays out the causal empirical framework including the matching strategy and sample balancing results, and difference in differences regression results on the matched sample. Section 5 summarizes the results and concludes.

2 Data

The main data source is the Bureau van Dijk Amadeus database.[2] It contains financial accounting data and detailed ownership information from European firms and due to data standardization, it allows for cross-country analyses. The raw sample consists of 41,261 manufacturing firms from 2005 until 2013.

For the production function estimation I use firm sales in thousand Euros as the firm outcome variable, tangible fixed assets in thousand Euros to proxy capital, material costs in thousand Euros as a measure for flexible input expenditures, and number of employees for worker input. Variables that are expressed in monetary values are deflated using country-industry-specific producer price indices from Eurostat.

Institutional ownership is defined as the total ownership in percent that includes direct and indirect holdings in a company. Institutional investors are defined as banks, insurance companies, hedge funds, mutual pension funds, private equity firms, venture capitalists, and other financial companies. Figures A.1a and A.1b show the distribution of foreign and domestic institutional investments across industries and countries, respectively. The distribution of institutional investors is more dispersed across countries than across industries.

[2]Amadeus has been used in many articles. See for instance Budd et al. (2005); Helpman et al. (2004); Konings and Vandenbussche (2005); Stiebale (2016)

Table 1 presents summary statistics of the main variables of interest. On average, a firm sells goods worth 60 million Euros, has a capital stock of fixed tangible assets of 12 million Euros, uses intermediate materials for 38 million Euros, employs 221 workers, and has 0.9 citations weighted patents.[3] The average holdings of foreign institutional investors is 1.75%. The average holdings of domestic institutional investors are far larger with 9.34%.

Table 1: Summary Statistics

Variable	mean	sd
Sales	60339.45	727306.9
Tangible Fixed Assets	11885.51	94288.74
Material Cost	38386.99	555246.3
Employees	221.27	1399.29
Foreign Institutional Ownership	1.75%	12.06
Domestic Institutional Ownership	9.34%	26.27
Citation Weighted Patents	0.91	49.30
Maturity Risk	0.46	0.23
Observations	205429	

Note: This table shows summary statistics of the main variables. Sales, Tangible Fixed Assets, Material Cost are denoted in thousand Euros. Employees is the number of employees. Maturity Risk is the fraction of current liabilities over total assets.

To analyze heterogeneous effects additional data from various sources are used. A measure of how severely a country was hit financially by the financial crisis is obtained from Ali et al. (2009) that presents a country ranking that aggregates different country-specific financial information during the financial crisis into one final ranking. As an alternative country-specific measure I add information on spreads of credit default swaps of large national banks from Ballester Miquel et al. (2016). A direct measure of how a company is impacted by the financial crisis is the cost of debt it is exposed to in the lending market. I use aggregated industry-specific yearly data on cost of debt that was collected by Prof. Aswath Damodaran from Stern School of Business at New York University[4]. The final constructed unique data set allows me to explore the effect of institutional investors along many different dimensions of financial constraints.

[3]Innovation activity is highly clustered among a few innovative firms in the sample.

[4]For the important years before and during the financial crisis only data on US industries is available. I convert the industries into two-digit Nace codes via matching on industry names. His webpage can be found here http://people.stern.nyu.edu/adamodar/New_Home_Page

3 Production function estimation and correlation results

This section describes the production function estimation approach and shows correlation results of institutional ownership and productivity. For the estimation of productivity, I specify at the industry level j a production function where at time t firm's i log productivity ω_{it} is an unobserved factor of log output q_{it}. In particular, a firms production function in logs is given as

$$q_{it} = f_j(m_{it}, k_{it}, l_{it}) + \omega_{it} + \epsilon_{it}, \tag{1}$$

where m_{it} is log material expenditures, k_{it} is log tangible assets, and l_{it} denotes log of number of employees. In the baseline specification I use a Translog production function in which case $f_j(m_{it}, k_{it}, l_{it}) = \beta_0 + \beta_k k_{jt} + \beta_l l_{jt} + \beta_m m_{jt} + \beta_{kk} k_{jt}^2 + \beta_{ll} l_{jt}^2 + \beta_{mm} m_{jt}^2 + \beta_{mk} m_{jt} k_{jt} + \beta_{ml} m_{jt} l_{jt} + \beta_{kl} k_{jt} l_{jt} + \beta_{mkl} m_{jt} k_{jt} l_{jt}$. In a robustness check results of a standard Cobb Douglas production function are shown where the squared and interaction terms of the inputs drop out.

Further assumptions are required in the estimation process which consists of a two-step procedure. This article mainly follows Ackerberg et al. (2015) but allows for institutional ownership to endogenously impact productivity following the approach in De Loecker (2013), and the estimation procedure further corrects for measurement error in capital as suggested in Collard-Wexler and De Loecker (2016). The underlying production function estimation framework was first proposed by Olley and Pakes (1996) and further refinements followed by Levinsohn and Petrin (2003), and Ackerberg et al. (2015), De Loecker (2013) and Collard-Wexler and De Loecker (2016). First, one needs to proxy for productivity using the inversion of the material demand function as first proposed by Levinsohn and Petrin (2003). The key assumption for the inversion is that the demand for material is strictly increasing in productivity. Productivity can then be expressed as $\omega_{it} = h(m_{it}, k_{it}, l_{it}, For_{it-1}, Dom_{it-1}, X_{it})$ where For_{it-1} and Dom_{it-1} are lagged values of foreign and domestic institutional ownership and X_{it} contains year and country dummies. In a robustness check I follow De Loecker and Scott (2016) and De Loecker et al. (2020) and also include in X_{it} firm specific average wages and market shares to address identification concerns due to unobserved price data raised in Gandhi et al. (2017) and Bond et al. (2021) as discussed in De Loecker (2021). At this stage the coefficients from the production function are not separately identified from the productivity proxy. Output can be rewritten as

$$q_{it} = \phi(m_{it}, k_{it}, l_{it}, For_{it-1}, Dom_{it-1}, X_{it}) + \epsilon_{it}. \tag{2}$$

This is expression is used to obtain output net of the measurement error ϵ_{jt} by regressing output on a polynomial of all inputs and predicting $\hat{\phi}_{it}$. The second key assumption is that productivity evolves according to a first-order Markov process allowing for institutional ownership to endogenously impact productivity.

$$\omega_{it} = g(\omega_{i,t-1}, For_{it-1}, Dom_{it-1}, X_{it}) + \xi_{it} \tag{3}$$

The law of motion in 3 consists of an endogeneous part $g()$ and an exogeneous productivity innovation ξ_{it}. The exogenous part ξ_{it} is used to form moment conditions to identify the parameters of the production function as follows:

$$E[\xi_{it}(\beta) z_{it}] = 0 \tag{4}$$

where z_{it} is a vector of instruments. Material m_{it} is a flexible input and is therefore instrumented with its lagged values. Labour l_{it} is assumed to be a state variable and is thus instrumented with its current value. Even though capital k_{it} is considered a state variable it often suffers from measurement error (Collard-Wexler and De Loecker, 2016) such that I use lagged values of investment to instrument current capital. Estimated input elasticities are shown in Table A.1. The final productivity measure is calculated as

$$\hat{\omega}_{it} = \hat{\phi} - \hat{f}_j(m_{it}, k_{it}, l_{it}). \tag{5}$$

Under the assumption that firms minimize costs given a production technology and for given input prices the article follows De Loecker and Warzynski (2012) and I calculate firm markups using the flexible input elasticity and the firm specific ratio of material expenditures over revenue. The expression for markups is given by $\mu_{it} = (\frac{P_{it}Q_{it}}{P^M_{it}M_{it}})\frac{\partial Q_{it}M_{it}}{\partial M_{it}Q_{it}} = \frac{\theta^M_{it}}{\alpha_{it}}$.

In the following, baseline fixed effects regression results are presented showing the association between institutional ownership and total factor productivity and how it varies during and after the financial crisis as follows:

$$\omega_{it} = \gamma_0 + \gamma_1 For_{it} + \gamma_2 Dom_{it} + \Gamma W_{it} + \alpha_i + u_{it} \tag{6}$$

where W_{it} contains further control variables, such as log capital, log labor, log patent citations, age, and also year fixed effects. α_i denotes firm-specific time-invariant fixed effects.

Table 2 displays the results of the regression in (6) with different control variables and

with varying effects for institutional ownership during and after the financial crisis. Column 1 only includes firm- and year fixed effects. Column 2 adds to the model in column 1 control variables. Column 3 allows for country- and industry-specific year fixed effects in addition to model 2. In columns 1-3 one can see that foreign and domestic institutional ownership is highly significant with foreign institutional ownership being 2 to 3 times as large as domestic institutional ownership. A ten percentage point increase in foreign (domestic) institutional ownership is associated with an increase in productivity of 0.30 (0.016) percent. Columns 4-6 are the same specifications as in columns 1-3, respectively, but include interaction terms of foreign and domestic institutional ownership with a dummy variable taking the value 1 for the years during the financial crisis 2008 and 2009 and also with a dummy variable taking the value 1 for years after the financial crisis. In all columns, the positive correlation of foreign institutional ownership is entirely driven during and after the financial crisis and highly significantly different from the effect before the crisis. The effect of domestic institutional ownership does not vary significantly during the financial crisis relative to pre-crisis values. Domestic institutions show a small significant positive correlation in all years that increases post-crisis but remains smaller than the effect of foreign institutions.

Table 2: Baseline Regressions

Dep. Variable:	**Log Productivity** - ω_t					
	All Periods			**Financial Crisis**		
	(1)	(2)	(3)	(4)	(5)	(6)
Foreign Institutional Ownership	0.030***	0.031***	0.032***	0.003	0.007	0.006
	(0.004)	(0.004)	(0.004)	(0.009)	(0.008)	(0.008)
Domestic Institutional Ownership	0.016***	0.017***	0.013***	0.011***	0.009***	0.007***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Foreign Institutional Ownership X Crisis				0.026***	0.022***	0.022***
				(0.007)	(0.007)	(0.007)
Domestic Institutional Ownership X Crisis				-0.000	0.001	0.002
				(0.002)	(0.002)	(0.002)
Foreign Institutional Ownership X Post Crisis				0.036***	0.031***	0.035***
				(0.009)	(0.009)	(0.008)
Domestic Institutional Ownership X Post Crisis				0.009***	0.012***	0.009***
				(0.003)	(0.003)	(0.003)
Log Tangible Capital		-0.035***	-0.033***		-0.035***	-0.033***
		(0.002)	(0.002)		(0.002)	(0.002)
Log Labour		0.046***	0.047***		0.046***	0.047***
		(0.003)	(0.003)		(0.003)	(0.003)
Log Patent Citations		0.001	-0.000		0.001	-0.000
		(0.001)	(0.001)		(0.001)	(0.001)
Age		0.007	0.007		0.007	0.007
		(0.010)	(0.011)		(0.009)	(0.011)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	No	Yes	Yes	No
Country - Year FE	No	No	Yes	No	No	Yes
Nace4 - Year FE	No	No	Yes	No	No	Yes
Adj. R^2	0.997	0.998	0.998	0.997	0.998	0.998
N	140948	140798	140715	140948	140798	140715

Note: Standard errors in parentheses and clustered at the firm level. Significance levels are denoted as * p<0.10, ** p<0.05, *** p<0.01. The variable Foreign (Domestic) Institutional Ownership are percentages of ownership in a company held by foreign (domestic) institutional investors and ranges between zero and one. The variable Crisis is a dummy variable taking the value 1 for the years 2008 and 2009 and 0 otherwise. The variable Post Crisis is a dummy variable taking the value 1 for the years 2010 -2013 and 0 otherwise.

4 Identification strategy and empirical results

While the financial crisis was an exogenous event that hit both firms and investors unprepared, the selection of institutional investors pre-crisis into firms is in all likelihood non-random. Companies that institutional investors self select into could likely also be those firms that perform better during a sudden negative financial shock such as the financial crisis. In this case, the positive impact of foreign institutional investors during the financial crisis as estimated in equation (3) is not causal as these firms would have performed better than other firms regardless of institutional investment.

This section presents the matching approach and the results of the difference in differences regressions on the matched sample. Part 4.1 describes the empirical strategy and the matching results. Section 4.2 presents baseline results. Section 4.3 then explores how the treatment effect varies with different measures of financial frictions. Section 4.4 explores how companies evolved post-crisis, and section 4.5 shows the effect on other outcome variables. In Section 4.6 a variety of robustness checks are presented regarding foreign vs domestic institutional investors, the matching procedure, and production function estimation.

4.1 Empirical strategy

In this article, I employ propensity score matching combined with a difference in differences estimator to estimate the effect of foreign and domestic institutional investors on firm productivity during the financial crisis. This research design accounts for unobservable time constant factors and observable firm characteristics that institutional investors select into pre-crisis and that simultaneously may also enjoy a more favorable development during the financial crisis unrelated to institutional investment. The goal of this exercise is to understand how a firm with institutional investment would have performed during the financial crisis without institutional investors. I differentiate between the impact of foreign and domestic institutional investors and therefore the following exercise as described below is performed for both investor groups separately. In the baseline specification, the focus is on foreign institutional investment, and results for domestic investors are presented in the robustness section.

First I isolate the periods around the financial crisis and start with focusing the analysis on the two years before the financial crisis 2006 and 2007 and the main crisis years 2008 and 2009. Only firms are kept in the sample that are present at least during these four years.

In the second step, firms are classified as treatment group if they have a foreign institutional investor during the financial crisis in 2008 and 2009 and at least one year before the crisis in 2006 or 2007. I want to discard firms where foreign institutional investment

occurred for the first time during the crisis or where all foreign investors left the company when the crisis hit in 2008. The pool of potential control firms consists of all firms that do not have a foreign institutional investor in any of the 4 years under consideration.[5]

Third, the strategy is to use propensity score matching to find control firms that are pre-crisis equivalent to the treatment firms which have a foreign institutional investor before and during the crisis. Following this approach, based on observational characteristics, one obtains identical firms pre-crisis. Then, the financial crisis hits all firms and investors equally unexpectedly with the only difference being that the firms in the treatment group have foreign institutional investment and the control group does not.

Fourth, I estimate a difference in differences model on the matched sample where I compare how firms that had a foreign institutional investor evolved during the crisis compared to the matched control firms. Specifically, in the baseline specification, the following model is estimated

$$\omega_{it} = \text{treat}_i \times \text{crisis}_t + \nu_i + \tau_t + u_{it}, \tag{7}$$

where ν_i denotes firm specific time constant fixed effects, and τ_t are time fixed effects. crisis is a dummy variable taking the value 1 for the years 2008 and 2009.

The propensity score matching is performed using key firm characteristics, such as log markups, log productivity, age, patent citations, log tangible fixed assets, log number of employees, log sales, and maturity risk which is the ratio of current liabilities over total assets. Broad industry dummies at the two-digit level and country dummies are also included. The propensity score is estimated using these variables for both years pre-crisis 2006 and 2007 to also account for the trend. I use one-to-one nearest neighbor matching without replacement and enforce common support[6]. The matched sample consists of 1752 observations. Table 3 reports for the years 2006 and 2007 the differences of the means of the matching variables for the matched and unmatched sample. Columns 2 and 4 show that before the matching foreign institutional investors were significantly more present in firms with roughly 8 to 9 percent larger markups and around 14 percent lower productivity pre-crisis. These firms seem to be much larger than the average firm in the control pool. Firms with foreign institutional

[5]270 firms are labeled as treatment group. More than 75% of these firms have an institutional investor in all 4 years. All other companies except 1 have a foreign institutional investor in the years 2007, 2008, and 2009. One company has foreign institutional investment in the years 2006, 2008, and 2009. The pool of potential control firms consists of 8615 companies

[6]As a robustness check a caliper matching approach and a many to one matching procedure with replacement is also employed

investment have 72 to 74 percent more tangible fixed assets, 63 to 64 percent more employees, and 56 percent more sales. There is also strong evidence that these firms have a lower maturity risk pre-crisis. As shown by Duval et al. (2020) smaller firms and firms with a larger maturity risk experienced a larger downfall during the financial crisis. This confirms the initial intuition that foreign institutional investors select firms with characteristics that are also more resilient concerning financial macro shocks. This shows that correcting for these differences is necessary to identify the treatment effect of foreign institutional investment on productivity during the financial crisis.

After the matching, the matched sample does not show any significant differences anymore in both years as shown in columns 1 and 3 of Table 3. One can also see for almost all variables in both years that the absolute difference of the means between the treatment group and control group become smaller compared to the unmatched sample.

In addition to comparing means before and after the matching, it is also tested if between treatment group and control group the distributions of the matching variables are statistically different from each other. Similar to the means this is also done for the unmatched and matched sample. Table 4 reports p-values of a combined Kolmogorow-Smirnow-Test for the matching variables for the years 2006 and 2007. Columns 2 and 4 show that before the matching the distributions of almost all variables are highly statistically different for the treatment- and control group. The matched sample does not show any statistically significant difference between distributions anymore, except for log sales in the year 2006 that is weakly statistically different on the matched sample but not anymore in the year 2007.

Table 3: Matched vs Unmatched Means

Year	2006		2007	
Sample	Matched	Unmatched	Matched	Unmatched
Log(Markup)	.001	.081***	.008	.094***
	(.984)	(0)	(.749)	(0)
Log(Productivity)	-.037	-.141**	-.035	-.137*
	(.71)	(.048)	(.727)	(.056)
Age	-.598	-1.285	-.598	-1.285
	(.74)	(.325)	(.74)	(.325)
Patent Citations	.064	.389	-.146	-.019
	(.926)	(.444)	(.726)	(.926)
Log(Capital)	-.105	.724***	-.104	.76***
	(.484)	(0)	(.48)	(0)
Log(Employees)	-.091	.631***	-.088	.64***
	(.41)	(0)	(.422)	(0)
Log(Sales)	-.175	.561***	-.176	.56***
	(.134)	(0)	(.128)	(0)
Maturityrisk	-.002	-.038*	-.001	-.064***
	(.92)	(.07)	(.941)	(0)

Note: This table shows the differences of means for the matching variables between the treatment group and control group for the matched and unmatched samples for the years 2006 and 2007. P-values are displayed in brackets and significance levels are denoted as * p<0.10, ** p<0.05, ***

Table 4: Matched vs Unmatched Distributions

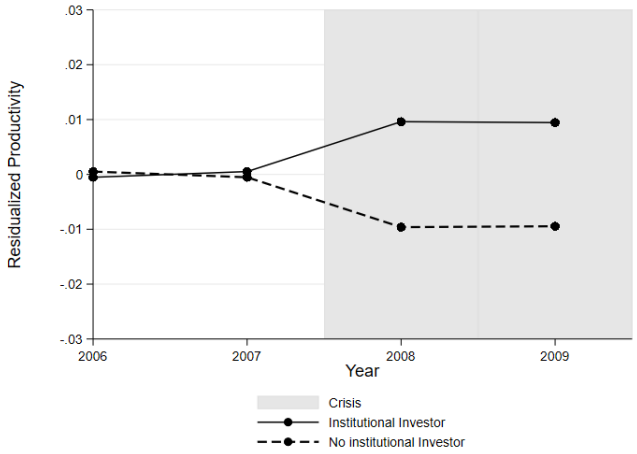
Year	2006		2007	
Sample	Matched	Unmatched	Matched	Unmatched
Log(Markup)	.683	.002***	.993	0***
Log(Productivity)	.945	0***	.897	0***
Age	.603	.088*	.603	.088*
Patent Citations	1	.952	1	1
Log(Capital)	.762	0***	.524	0***
Log(Employees)	.897	0***	.762	0***
Log(Sales)	.091*	0***	.115	0***
Maturityrisk	.524	.001***	.976	0***

Note: This table shows p-values of Kolmogorow-Smirnow-Tests for the matching variable distributions between the treatment group and control group for the matched and unmatched samples for the years 2006 and 2007. Significance levels are denoted as * p<0.10, ** p<0.05, ***

4.2 Baseline results

This section presents the baseline results of the difference in difference regression on the matched sample. The starting point is plotting average productivity per year and treatment group and control group in Figure 1. It shows at the firm level and year level demeaned average productivity and normalized with respect to average values before the crisis. First one can see that pre-crisis the lines proceed in a parallel manner. Then during the financial crisis, a gap between both lines appears with a distance of roughly 2 percent indicating a positive treatment effect for the treatment group.[7]

Figure 1



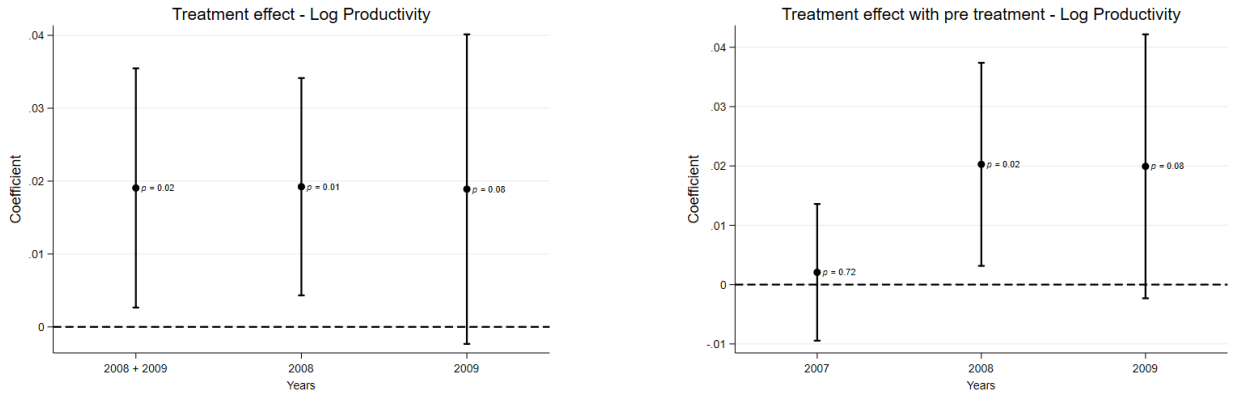
Note: This figure plots for treatment and control group the average of the residuals of a regression of log productivity on firm and year fixed effects. These residuals are then normalized with respect to the average values pre-crisis, such that the lines for the treatment group and control group cross between 2006 and 2007.

Next, the results of the difference in differences regressions are presented. Figure **??** displays the point estimates and 95% confidence intervals of two different models of the baseline regressions. The first coefficient is from a model estimating an average treatment effect on the treated averaged for both crisis years. The second and third coefficients are from a model with separate treatment effects for the years 2008 and 2009. The average treatment effect on the treated is statistically significant and roughly 2 percent. The treatment effect is the same size in both years but is only weakly significant in 2009. Table A.2 shows the regression results of both models in columns 1 and 2, respectively.

Successful matching implies that there is no treatment effect pre-crisis because we matched

[7]Due to the demeaning at year level the graph shows that for the treatment group productivity increases during the financial crisis. Figure A.2 in the appendix shows the same exercise without demeaning at the year level.

on values of both years before the crisis. This is checked by including an interaction term of the treatment group and dummy variable for the year 2007. By including this interaction term, in this model, we effectively have only 2006 as the pre-period and compare differences of 2007, 2008, and 2009 to the year 2006 between the treatment group and control group. Figure **??** shows the point estimates of this model. One can see that the treatment effect in the year 2007 is close to zero and statistically insignificant. The treatment effect in the years 2008 and 2009 remain almost unchanged. The regression output for this model is shown in column 3 of Table A.2. In the same table, columns 4 to 6 show the average treatment effect on the treated with industry-time fixed effects, country-time fixed effects, and industry-time and country-time fixed effects, respectively.

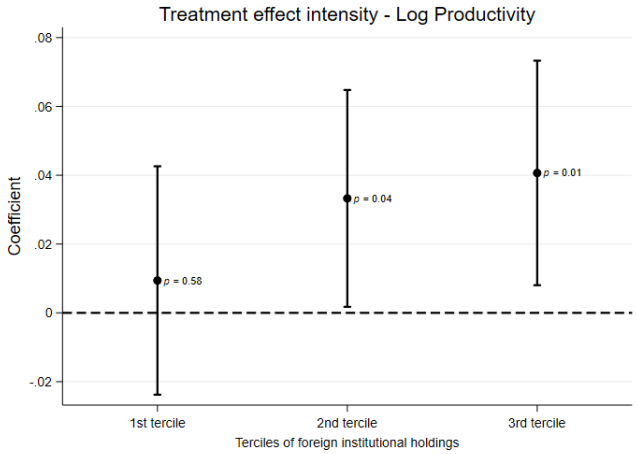


Note: Both figures show point estimates and 95% confidence intervals resulting from difference in differences regressions on the matched sample. The figure on the left side shows the treatment effect during the financial crisis combined and for both years separately. The figure on the right side shows the effect for both years separately and also for the pre crisis year 2007.

In the analysis, a binary treatment is defined as companies having a foreign institutional investor before and after the crisis. One could argue that the percentage in equity held by foreign institutional investors should have an impact on the size of the treatment effect. If the investors have more stake in a company incentives to take actions to prevent a slump in productivity are larger. I analyze treatment intensity by dividing treated firms into terciles of their average equity held by foreign institutional investors and then I split up the treatment indicator into these three groups. In this regression one also has to account for heterogeneous post trends of the control firms in each bucket. As a 1 to 1 matching without replacement was performed each control firm appears in exactly one bucket. Figure 3 shows the point estimates and 95% confidence intervals of this regression. There are three coefficients from one regression as described above. First, the figure shows that the

treatment effect is increasing in size from the first tercile to the third tercile. Firms in the first tercile do not show a significant treatment effect. The effects in the second and third tercile are statistically significant and 3.3 and 4.1 percent in size, respectively. Table A.3 in the appendix shows the regression output of this model in column 1. Columns two to three show the same model with industry-time fixed effects, country-time fixed effects, and industry-time and country-time fixed effects, respectively.

Figure 3



Note: This figure shows point estimates and 95% confidence intervals resulting from a difference in differences regression on the matched sample. The treatment group is split into terciles according to their average foreign institutional investments. Then heterogeneous treatment effects are estimated. The model controls for different post periods for the matched control companies within each tercile.

4.3 Financial frictions

This section explores how the effect of foreign institutional investors varies with different measures of financial frictions during the financial crisis. If foreign institutional investment alleviates financial constraints one would expect a larger positive effect on firm productivity especially in subsamples that are more affected by the financial crisis. In the following different measures that proxy financial frictions at the country-, industry-, and firm-level are discussed, and then it is shown that indeed the positive effect of foreign institutional investors during the crisis is driven by more severely affected firms. For each of the presented measures the matched sample is split into a more and less affected group. Then it is shown how average productivity evolves for treatment and control group for affected and unaffected samples of each measure. Then, I run difference in differences regressions on both samples for each of the measures.

4.3.1 Measures of financial frictions

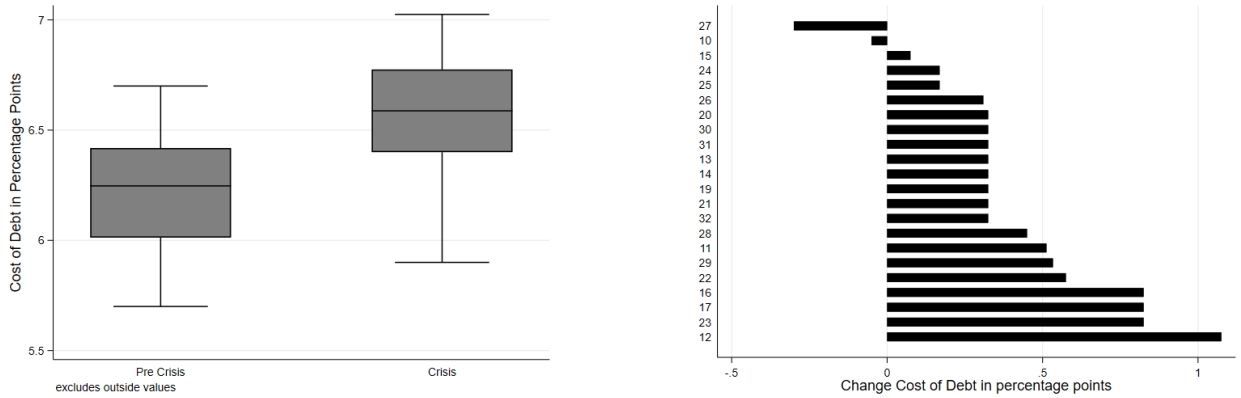
Rollover risk

The starting point of this analysis is the pre-crisis fraction of short-term debt measured as current liabilities over total assets. It reflects to which degree a firm's total assets are financed via short-term credit and represents a proxy for how likely a firm is to require financing sources relatively short term during the financial crisis. The measure is constructed as the average across firms at the country-industry level using pre-crisis values for calculating this measure. Duval et al. (2020) show that firms that had pre-crisis a larger amount of short-term debt that was to mature within a year, experienced a more severe downfall in total factor productivity during the crisis. One would expect that in firms that were pre-crisis exposed to a larger degree to balance sheet vulnerabilities that suffered more severely foreign institutional investors have a larger positive effect on firm productivity if the financial constraints hypothesis is true. The sample is split by the median of the industry-country measure.

Cost of debt

A very natural measure for how severe an industry is impacted by financial frictions due to the financial crisis is the change of cost of debt during the financial crisis with respect to pre-crisis levels. I use the average cost of debt at the two-digit industry level and calculate averages before and during the crisis at the industry level, and take then differences post and pre-crisis. Then the sample is split according to the median of this measure. Figure 4a shows the distribution as a box plot of the cost of debt before and during the crisis. The y-axis denotes cost of debt in percentage points. The distribution during the crisis is shifted upwards indicating an increase in financing costs. Figure 4b shows by two-digit industry the change of cost of debt in percentage points in ascending order. Most of the industries experienced an increase in financing costs. The average increase of cost of debt is around half a percentage point.

Figure 4: Cost of Debt



(a) Pre vs Post

(b) Change by Industry

Note: The figure on the left side shows the distribution of industry average cost of debts before and during the financial crisis. The figure on the right side depicts for each two digit industry the change of cost of debt during the crisis with respect to pre crisis values.

Country heterogeneity

There is large heterogeneity among countries regarding the degree the financial crisis affected a given country. The Carnegie Endowment for International Peace published a study by Ali et al. (2009) where they rank 38 countries by how severe the countries were hit by the financial crisis through financial channels according to 3 different measures. They analyze currency depreciation, bond spreads, and equity market declines and present one final ranking aggregating the information of these 3 measures. I exploit the ranking to split the sample into severely affected and not severely affected countries[8]. Figure 5 shows the result of this classification. Following Ali et al. (2009) especially eastern European countries were affected in terms of financial matters. Alternatively, I use information on average CDS spreads of national banks at the country level from Ballester Miquel et al. (2016) to classify countries as severely and non severely affected[9].

[8]The ranking given in the article by Ali et al. (2009) only analyze countries where the data is readily available. Some eastern European countries in this sample do not show up in the study but are categorized as severely affected following the main conclusion that especially eastern European countries were mostly affected by the financial crisis.

[9]The countries covered in Ballester Miquel et al. (2016) are only a fraction of the countries that are present in this article.

Table 5: Affected Countries

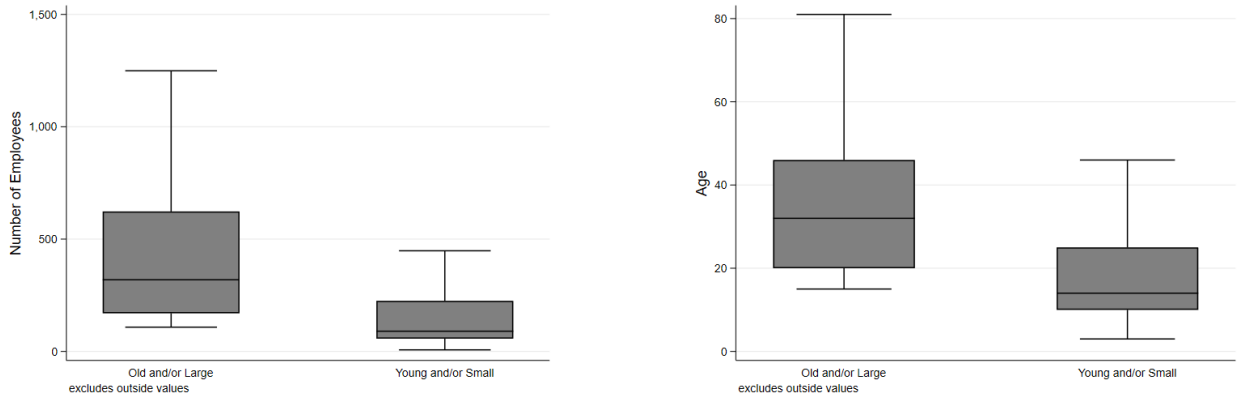
More Affected	Less Affected
Bulgaria	Belgium
Croatia	Finland
Czech Republic	France
Estonia	Germany
Italy	Spain
Poland	Sweden
Romania	
Serbia	
Slovakia	
Slovenia	
Ukraine	

Note: This table shows the classification in most and least affected countries in terms of financial channels during the financial crisis. The classification uses the ranking and conclusions in the article Ali et al. (2009).

Firm size and age

It is widely known that especially small and young companies are likely to be financially constrained. Whereas younger companies have a shorter credit history, small companies have fewer collateral to offer for a loan. For example, Erel et al. (2013) shows that especially small firms benefit financially from being acquired. I split the sample according to age and number of employees in the year 2007. A company is classified as young or small if it is either in the first tercile of age or number of employees in the year 2007. Figures 5a and 5b show the distribution of employees and age for both samples in the year 2007, respectively. The median age is 14 and the median number of employees is 90 in the young or small sample, compared to 32 years and 319 employees in the old or large sample.

Figure 5: Size & Age



(a) Number of employees

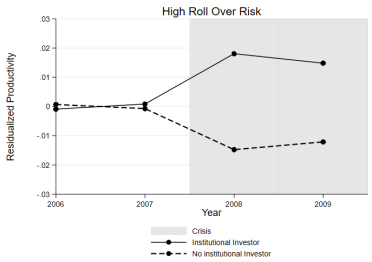
(b) Age

Note: The figure on the left side shows the distributions of number of employees pre crisis and the figure on the right shows the distributions of age pre-crisis. Both figures show the distribution of the respective variable for two samples which are the "old and/or large" sample and the "young and/or small" sample.

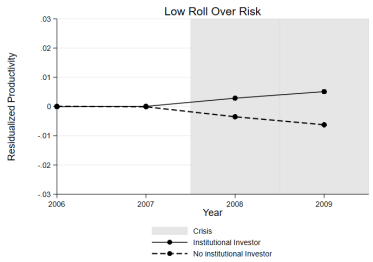
4.3.2 Results financial frictions

First in the graphs below, the average productivity per year for treatment- and control group is plotted for more and less affected firms for each of the financial friction measures as described above. Figure 6 shows for each of the financial frictions measures two graphs. Each of which plots at the firm level and year level demeaned average productivity and normalized with respect to average values before the crisis for more affected companies on the left and less affected companies on the right. In all more financially constrained samples shown in the graphs on the left side one can see a much larger widening gap between treatment and control group appearing during the financial crisis indicating a larger treatment effect compared to the lesser affected samples on the right.

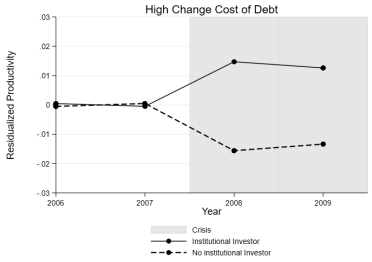
Figure 6: Productivity by financial friction and treatment and control group



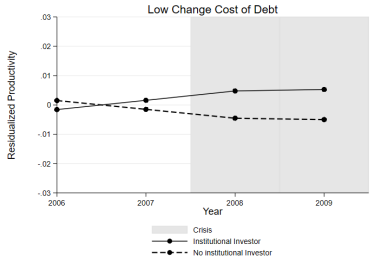
(a)



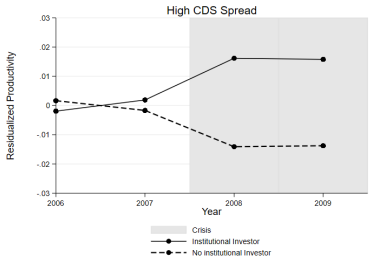
(b)



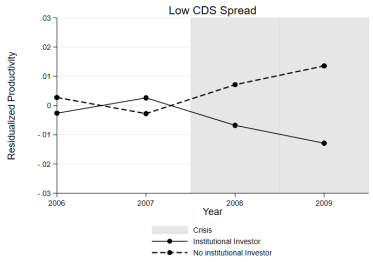
(c)



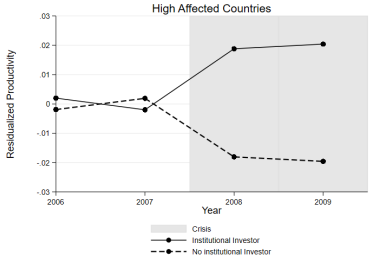
(d)



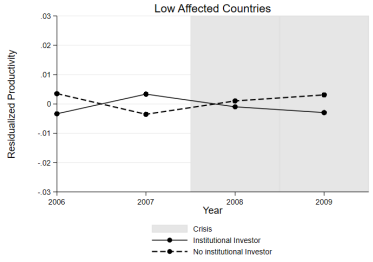
(e)



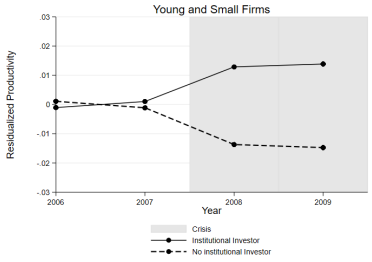
(f)



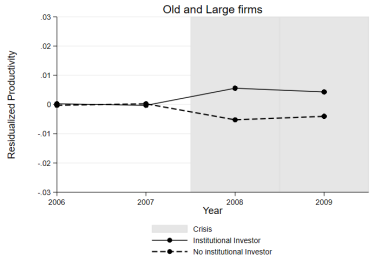
(g)



(h)



(i)

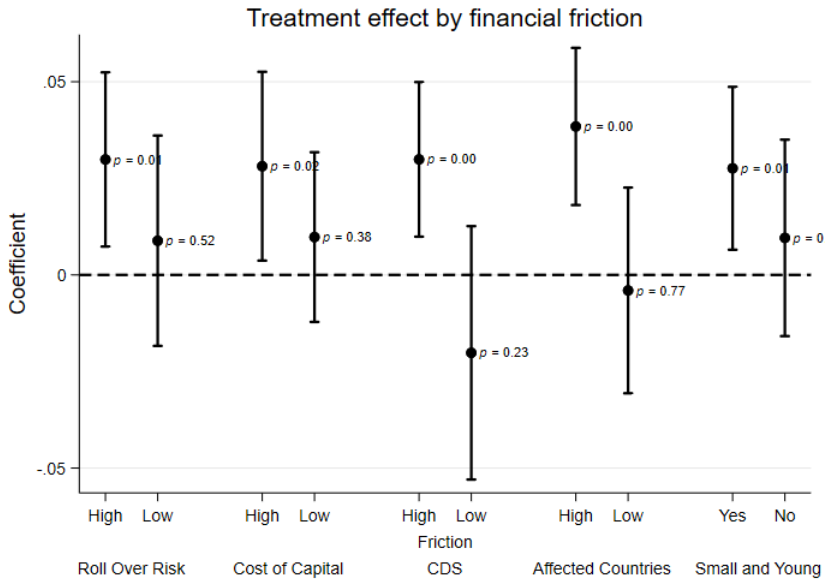


(j)

Then, for each measure the treatment effect for the more and less affected sample is estimated separately. The point estimates with 95% confidence intervals are displayed in Figure 7. The respective regression output is given in Table A.4 in the appendix. The treatment effect in the more affected samples is positive and significant for every measure of financial constraints and ranges between 2.8% and 3.8% and is always larger than the treatment effect for the whole sample. All treatment effects in the lesser financially constrained samples are insignificant and closer to zero.

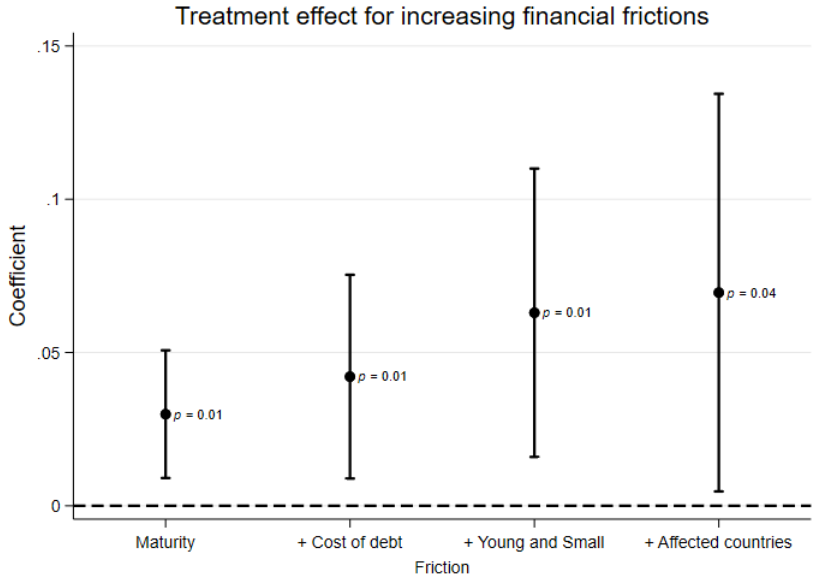
In the next step, I combine the measures for financial frictions by adding different layers of financial frictions. This way the sample is successively reduced to firms that are the most negatively impacted by the financial crisis. One would expect that foreign institutional investment has the largest positive effect on these firms. Figure 8 shows the result of this exercise. The starting point is the high rollover risk sample which is the same model and same point estimate of 3% as above. This sample consists now only of industry country combinations with a relatively large average fraction of current liabilities over total assets before the crisis. Then this high maturity sample is further reduced to such 2 digit industries that experienced a relatively large increase of costs of debts. The treatment effect in this sample is 4.2% and significant. Then to constrain the high maturity and high change of costs of debt sample further only small and young firms of this sample are considered. Focusing on only small and young firms in this sample the treatment effect increases to 6.3% and is still significant. Then as a last step this already highly financially constrained sample is further reduced to only contain severely affected countries. This results in a sample consisting of young and small firms in eastern European countries in industries that experienced a large increase in cost of debts and that also had a relatively large fraction of total assets financed with current liabilities pre-crisis. In this sample, the treatment effect of foreign institutional investors is almost 7% and remains statistically significant.

Figure 7



Note: This figure shows point estimates and 95% confidence intervals resulting from difference in differences regressions on different samples that are split using the proxies of financial constraints as described in Section 4.3.1. The sample is divided into a high and low financially constrained sample for each measure.

Figure 8



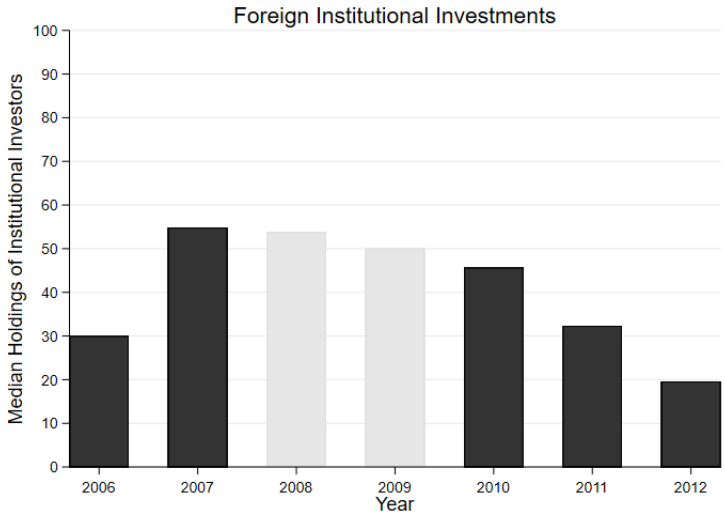
Note: This figure shows point estimates and 95% confidence intervals resulting from difference in differences regressions on different samples that are split using the proxies of financial constraints as described in Section 4.3.1. The sample is successively reduced from left to right to contain more financially constrained companies by adding layers of financial frictions.

4.4 Post Crisis

This part shows how the effect of foreign institutional ownership evolved post-crisis. The identification strategy hinges on the assumption that the financial crisis was unexpected by all market participants in the years 2006 and 2007 and were caught off guard during the crisis. The initial idea of the matching approach was to have identical firms pre-crisis except that half of the firms have foreign institutional investment before and during the crisis and then the financial crisis hits all firms with the only difference being foreign institutional investment. While this assumption may hold to estimate the effect in the immediate period during the crisis, the more time passes the less robust the estimates become. Another concern for the reliability of the results post-crisis is the European sovereign debt crisis that followed the financial crisis in 2010 and 2011.

Figure 9 shows median values of foreign institutional ownership over time. The grey bars show the financial crisis. One can see that especially in 2008 but also in 2009 there is no change in comparison to 2007. Then starting from 2010 and especially 2011 foreign institutional investments declined. This is in line with the assumption that market players did not react immediately during the crisis but conditioned their investments of the crisis in the time following the crisis.

Figure 9

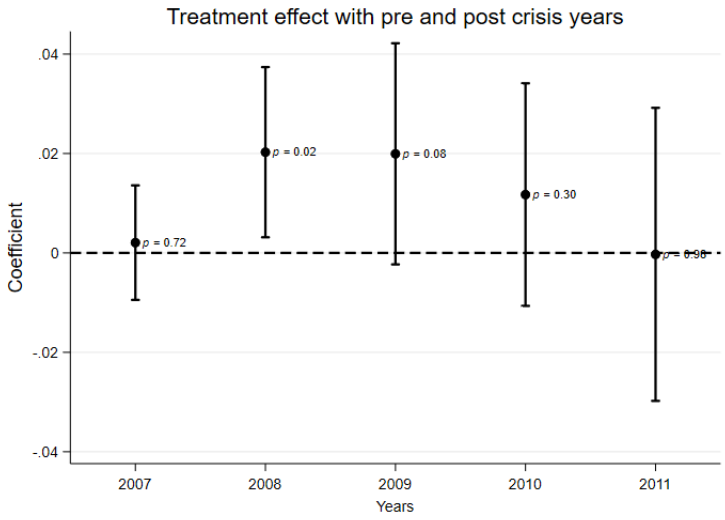


Note: This figure shows median values over time of foreign institutional ownership of the firms that do have foreign institutional investment. The grey shaded bars mark the financial crisis.

Figure 10 below shows the treatment effect over time on the entire matched sample including pre-and post-crisis estimates. The treatment effect is close to zero and nonsignificant pre-crisis. During the crisis, there is a significant positive effect which then declines again

post-crisis and becomes nonsignificant and is close to zero. With a declining degree of foreign institutional investment as shown above in figure 9, one would expect a smaller treatment effect post-crisis. However, as discussed the results post-crisis have to be interpreted with caution. Table A.5 in the appendix shows the treatment effect during and post-crisis in the subsamples of the financial frictions as defined in section 4.3. The conclusion regarding the effect for financially entrenched companies and the effect post-crisis remains unchanged. The table shows a significant treatment effect during the crisis in all samples that are likely to be relatively more financially constrained. This effect then vanishes post-crisis.

Figure 10



Note: This figure shows point estimates and 95% confidence intervals resulting from a difference in difference regression on the matched sample including one pre-crisis period 2007 and post-crisis periods until 2011.

4.5 Other Outcomes

While the estimated positive effects of foreign institutional ownership in this article suggest that financial constraints play a key role in explaining the effect, this does not rule out that institutional investors employ a downsizing strategy to prevent the productivity downfall. For this matter, I estimate the effect on other key outcomes variables such as markups, sales, labor, tangible fixed assets, and patent citations. Table 6 shows the average treatment effect on the matched sample effect for these variables. I do not find any evidence for the downsizing channel as the estimates are close to zero and nonsignificant for sales, labor, tangible fixed assets, and patent citations. Table A.6 in the appendix presents the results for each subsample for all financial constraints proxies. Also there I do not find any significant effect in any sample for these variables.

I do find a highly significant effect on markups. Companies with foreign institutional investment show 2.3% larger markups on average in comparison to the matched control group. The results in the subsamples are consistent with the findings on productivity. The effect on markups is mainly driven in financially constrained samples as shown in Table A.6. Firms with foreign institutional investments are able to maintain larger profit margins keeping them relatively afloat in comparison.

Table 6: Treatment Effect: Other Outcomes

Dep. Variable:	**Log Markup**	**Log Sales**	**Log Capital**	**Log Labor**	**Log Patent Citations**
	(1)	(2)	(3)	(4)	(5)
Treatment Effect	0.023***	0.002	-0.007	0.014	0.017
	(0.006)	(0.026)	(0.049)	(0.019)	(0.036)
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.956	0.969	0.951	0.983	0.504
N	1752	1752	1752	1752	1752

Note: Treatment Effect is a dummy variable that takes value 1 during and after the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

4.6 Robustness checks

4.6.1 Domestic institutional ownership

The previous analysis focuses on the impact of foreign institutional ownership only. Regarding domestic institutional ownership in the following, there are two aspects presented. First, I replicate the analysis for domestic institutional investments and it is shown that there is no impact on firm productivity during the financial crisis. For this, the matching process is repeated but now companies that have domestic institutional investment during the financial crisis 2008 and 2009 and at least one year before the financial crisis are classified as the treatment group. Respectively, Tables A.7 and A.8 show the results for the average treatment effect on the treated and the results for the sample splits using the diverse measures for financial constraints. For none of the models in Table A.7, there is an economic meaningful or statistically significant average effect of domestic institutional ownership. Table A.8 shows that in almost all sample splits the effect is close to zero and statistically insignificant. For industries that experienced a large increase in average cost of debt, there is a positive significant effect of 0.8% which is relatively small compared to the effect of foreign institutional

ownership in these industries which is 2.8%. More affected countries also show a similar effect for domestic institutional ownership but only weakly significant. The effect of 0.7% is also relatively small compared to 3.8% for foreign institutional investment in these countries.

Second, even though domestic institutional investment does not have a meaningful effect on productivity during the financial crisis as discussed above one may be worried that it confounds the effect of foreign institutional ownership. This is addressed in two ways as follows. First, it is simply added as a control variable in the difference in differences regressions. The results for this approach are presented in Tables A.9 and A.10 for the average treatment effect on the treated and the results for the sample splits according to financial friction proxies, respectively. Adding domestic institutional ownership and an interaction term with the crisis does not change the effect of foreign institutional ownership in any way. Also, the impact of domestic institutional ownership is mostly insignificant and small. Then, instead of controlling for domestic institutional ownership, it is added as a matching variable in the matching process. This way the treatment group has on average the same degree of domestic institutional investment as the control group pre-crisis. The regression results of this approach are shown in Tables A.11 and A.12. Also here, one can see that it does not change the impact of foreign institutional ownership in any of the samples.

4.6.2 Alternative matching

The next set of robustness checks focuses on the matching procedure. In the baseline analysis, a one-to-one nearest neighbor matching without replacement is used based on propensity scores where common support is enforced. First, the precision is increased when finding the closest neighbor. I use a caliper matching and enforce that the closest neighbor has a max distance of 0.1 percentage points. This reduces the number of observations as now some firms in the treatment group are not matched to a control company and are left out of the analysis. Tables A.13 and A.14 show the results of this approach for the average treatment effect on the treated and the financial friction analysis, respectively.

Second, I increase the number of matched control firms to two and four and also allow for the replacement of the matched control firms. The results of this exercise are shown in Tables A.15, A.16 for two neighbors and Tables A.17, A.18 for four neighbors. The conclusions regarding the effect of foreign institutional investment on productivity do not change in any of the models. There is still a significant average treatment effect on the treated for all matching approaches and also for each measure of financial frictions the effect is larger and significant in the more financially impacted samples.

4.6.3 Production function estimation

The baseline model uses productivity estimated by a Translog production function using revenue data. As mentioned in section 3 the lack of firm-specific output price data leads to a biased estimation of input elasticities[10]. First, note that I deflate all monetary variables using industry-country-specific deflators. This removes country and industry-specific average price trends. However, in the case of nonhomogeneous goods, this alone does not solve the price bias problem. As a robustness check, I present the following two alternatives.

First I repeat the exercise with a Cobb Douglas production function. In this case the production function is reduced to $f_j(m_{it}, k_{it}, l_{it}) = \beta_0 + \beta_k k_{jt} + \beta_l l_{jt} + \beta_m m_{jt}$. This approach is less flexible but does have the property that input elasticities are the same for each company within an industry and constant over time. Thus the resulting bias of using revenue data is the same for all companies within the same industry and would be canceled out in the difference in differences estimation. Second, I estimate a Translog production function but include firm-specific average wages and market shares in the first stage regression in equation 2. This approach tackles the identification concerns of gross output production functions directly via adding factors that control for the transmission of input prices to output prices as discussed in De Loecker and Scott (2016), De Loecker et al. (2020), and De Loecker (2021).

The results using the Cobb Douglas production function are presented in Table A.19 and A.20 and the results with additional control variables in the first stage regression are presented in Table A.21 and A.22. The conclusion regarding the effects of foreign institutional ownership remains unchanged. The average treatment effect on the treated is roughly the same size and also including a pre-crisis treatment effect shows that also here there is no effect pre-crisis as it should be by design through the matching process. Also, the subsamples of financial frictions show mostly the same results except for the measures on country level in the Cobb Douglas case, which show that there is also a significant effect in lesser affected countries. However, considering all measures it does not change the conclusion that the positive effect of foreign institutional investors during the financial crisis is driven by firms that are more financially impacted by the crisis which indicates that foreign institutional investors alleviate financial constraints.

[10]For a discussion on the price bias in production function estimation with revenue data please refer to De Loecker and Scott (2016), De Loecker et al. (2020), and De Loecker (2021).

5 Conclusion

This article analyzes the impact of institutional investors on firm productivity during the financial crisis 2008/09. For this purpose, I use accounting data at the firm level and detailed firm ownership data from European manufacturing firms. A unique data set is constructed adding further information such as cost of debt at the industry level and information about how severe a country was impacted by the financial crisis. I estimate a production function accounting for endogenous flexible inputs and obtain a measure for total factor productivity.

To address observational biases this article utilizes propensity score matching to identify observationally equivalent firms before the crisis that do not have institutional investment before and during the crisis that serve as a proxy for the counterfactual outcome of firms during the crisis that do have institutional investment before and during the crisis. Then a difference in difference model is estimated on the matched sample. The results show a positive significant average treatment effect on the treated of 2% for foreign institutional investment on firm productivity during the financial crisis. Domestic investors do not have any meaningful economic or statistical impact during the financial crisis.

The article uses a variety of measures for financial constraints to estimate heterogeneous treatment effects on samples that are more and less affected by the financial crisis. The positive average effect of foreign institutional investors on productivity is driven by industries, countries, and firms that are more severely impacted by the financial crisis indicating that foreign institutional investors impact firm productivity positively by alleviating financial constraints. Especially in eastern European countries, in industries that experienced a larger debt cost shock during the crisis, and in young and small firms that had a relatively large fraction of assets financial via short term loans foreign institutional investors have the largest effect on firm productivity up to 6%. I provide evidence that companies with foreign institutional investors remain more profitable during the financial crisis by having larger markups of 2.3% on average. This effect is driven in the same financially constrained samples as the effect on productivity. I do not find evidence for a downsizing mechanism during the financial crisis by institutional investors via reducing the labor force, sales, capital, or innovation activity.

The results presented in this paper have broad policy implications. This article does not find any negative effects of institutional investors on firm performance. Foreign institutional investors can soften the negative impact of macro-financial shocks by alleviating financial constraints and thereby avoiding a productivity slowdown. Authorities may want to consider financial matters regarding foreign institutional investors when designing policy measures aiming at regulating institutional investments.

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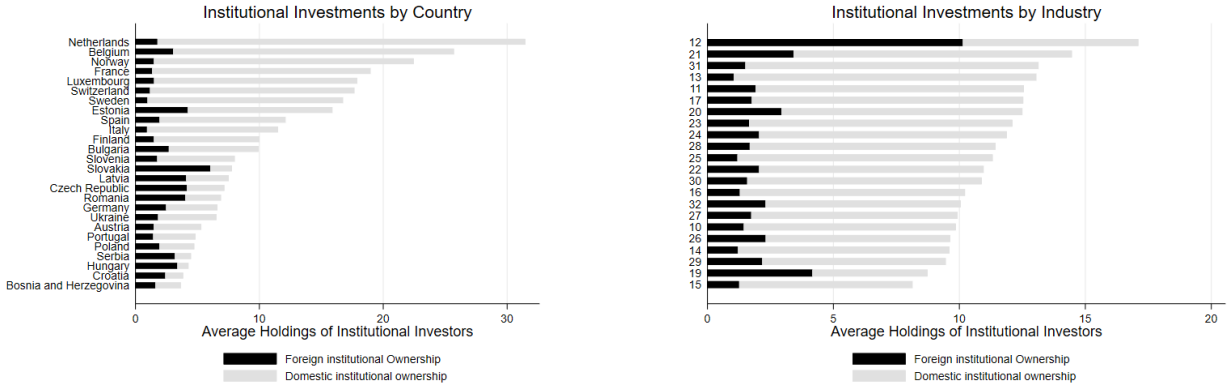
A Appendix

Figure A.1: Institutional Ownership



(a) by country

(b) by industry

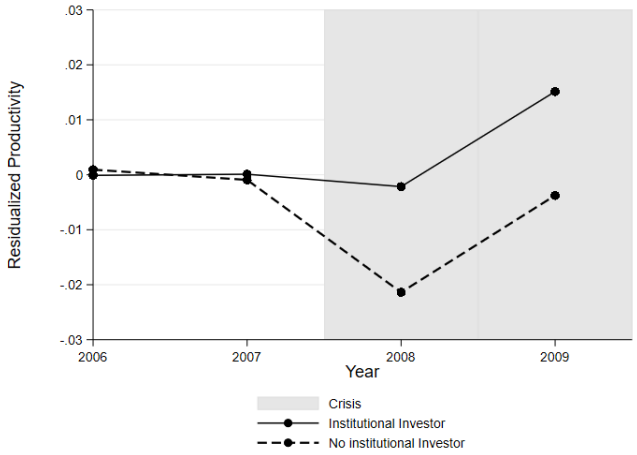
Note: The figure on the left (right) side shows the average holdings of foreign and domestic institutional investors by country (industry).

Table A.1: Production Function by Industry

	Labor	Capital	Material
Food, Beverages, Tobacco	.08	.156	.788
Textiles, Apparel, Leather	.182	.026	.448
Wood, Paper, Print	.033	.052	.712
Coke	.1	.203	.748
Chemicals, Pharmaceuticals	.378	.121	.85
Rubber, Plastic, Minerals	.161	.125	.783
Basic, Fabricated Metals	.148	.025	.518
Computer, Electronic, Electrical eq.	.128	.121	.809
Machinery, Motor, Transport	.017	.078	.9
Furniture	.137	.017	.766
Other Manufacturing	.237	.072	.641

Note: This table shows average estimated elasticities for labor, capital, and material by industry.

Figure A.2



Note: This figure plots for treatment and control group the average of the residuals of a regression of log productivity on firm fixed effects only. These residuals are then normalized with respect to the average values pre-crisis, such that the lines for the treatment group and control group cross between 2006 and 2007.

Table A.2: Treatment Effect

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.019**			0.018**	0.018**	0.017*
	(0.008)			(0.008)	(0.009)	(0.009)
TE x 2008		0.019**	0.020**			
		(0.008)	(0.009)			
TE x 2009		0.019*	0.020*			
		(0.011)	(0.011)			
TE x 2007			0.002			
			(0.006)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.996	0.996	0.996	0.996	0.996	0.996
N	1752	1752	1752	1748	1752	1748

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variable taking the value 1 for the respective year. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.3: Treatment Intensity

Dep. Variable:	**Log Productivity**			
	(1)	(2)	(3)	(4)
TE 1st Tercile	0.009	0.011	0.005	0.005
	(0.017)	(0.018)	(0.018)	(0.020)
TE 2nd Tercile	0.033**	0.035**	0.035**	0.036**
	(0.016)	(0.016)	(0.016)	(0.017)
TE 3rd Tercile	0.041**	0.035**	0.036*	0.029
	(0.017)	(0.017)	(0.019)	(0.020)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	No
Country - Year	No	No	Yes	Yes
Nace2 - Year	No	Yes	No	Yes
Adj. R^2	0.996	0.996	0.996	0.996
N	1752	1748	1752	1748

Note: TE is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have a foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The 1st, 2nd, and 3rd tercile are dummy variables taking value 1 if the firm is in the respective tercile of average foreign institutional investment holding. All regressions control tercile specific post-crisis time effects for the control group. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.4: Financial Frictions

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.030**	0.009	0.028**	0.010	0.030***	-0.020	0.038***	-0.004	0.028**	0.010
	(0.011)	(0.014)	(0.012)	(0.011)	(0.010)	(0.017)	(0.010)	(0.014)	(0.011)	(0.013)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.996	0.996	0.995	0.997	0.997	0.995	0.996	0.996	0.996	0.996
N	864	888	848	904	748	616	956	796	940	812

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.5: Financial Frictions: Post Crisis

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
TE x 2008	0.033***	0.006	0.030***	0.009	0.030***	-0.014	0.037***	-0.002	0.027***	0.011
	(0.009)	(0.012)	(0.011)	(0.011)	(0.009)	(0.015)	(0.009)	(0.012)	(0.009)	(0.012)
TE x 2009	0.027*	0.011	0.026	0.010	0.030**	-0.026	0.040***	-0.006	0.029**	0.008
	(0.014)	(0.017)	(0.017)	(0.013)	(0.013)	(0.020)	(0.014)	(0.017)	(0.014)	(0.016)
TE x 2010	0.014	0.008	0.017	0.004	0.026*	-0.025	0.025*	-0.006	0.018	0.002
	(0.014)	(0.017)	(0.015)	(0.015)	(0.014)	(0.020)	(0.014)	(0.016)	(0.015)	(0.015)
TE x 2011	-0.003	0.004	0.002	-0.005	-0.009	-0.036	0.009	-0.014	-0.004	0.003
	(0.019)	(0.021)	(0.021)	(0.020)	(0.021)	(0.024)	(0.021)	(0.020)	(0.020)	(0.021)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.994	0.995	0.994	0.996	0.995	0.995	0.995	0.995	0.994	0.996
N	1236	1253	1212	1277	1058	876	1357	1132	1337	1152

Note: Treatment Effect is a dummy variable that takes value 1 during and after the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and possibly onwards and at least one year before the crisis. The year variables are dummy variables taking the value 1 for the resepctive year. The samples are defined as described in section 4.3. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.6: Financial Frictions: Other Outcomes

Dep. Variable:	**Log Markup**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.029**	0.022***	0.035***	0.015**	0.016*	0.007	0.036***	0.009	0.035***	0.015*
	(0.014)	(0.007)	(0.013)	(0.007)	(0.008)	(0.009)	(0.010)	(0.008)	(0.011)	(0.008)
Adj. R^2	0.955	0.956	0.921	0.963	0.965	0.970	0.945	0.971	0.946	0.961
N	424	1328	608	1144	748	616	956	796	736	1016
Dep. Variable:	**Log Sales**									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment Effect	0.020	-0.001	0.022	-0.005	0.016	0.019	0.004	0.001	-0.005	0.008
	(0.051)	(0.029)	(0.045)	(0.032)	(0.033)	(0.048)	(0.034)	(0.040)	(0.043)	(0.032)
Adj. R^2	0.951	0.973	0.960	0.973	0.969	0.969	0.968	0.970	0.951	0.972
N	424	1328	608	1144	748	616	956	796	736	1016
Dep. Variable:	**Log Tangible Fixed Assets**									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment Effect	0.008	-0.007	-0.029	0.005	-0.011	0.028	-0.008	-0.002	-0.015	-0.003
	(0.124)	(0.052)	(0.090)	(0.059)	(0.083)	(0.087)	(0.066)	(0.074)	(0.089)	(0.055)
Adj. R^2	0.922	0.958	0.948	0.952	0.935	0.955	0.949	0.952	0.929	0.958
N	424	1328	608	1144	748	616	956	796	736	1016
Dep. Variable:	**Log Number of Employees**									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment Effect	0.059	0.004	0.001	0.021	0.004	0.039	0.016	0.013	0.035	-0.002
	(0.049)	(0.020)	(0.036)	(0.023)	(0.022)	(0.032)	(0.027)	(0.028)	(0.034)	(0.022)
Adj. R^2	0.972	0.986	0.976	0.986	0.987	0.981	0.983	0.982	0.980	0.977
N	424	1328	608	1144	748	616	956	796	736	1016
Dep. Variable:	**Log 1 + Number of Patent Citations**									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment Effect	-0.015	0.030	0.048	0.000	-0.008	0.057	0.000	0.040	-0.005	0.034
	(0.032)	(0.046)	(0.061)	(0.046)	(0.010)	(0.098)	(0.011)	(0.078)	(0.051)	(0.051)
Adj. R^2	-0.010	0.519	0.609	0.421	0.220	0.507	0.120	0.492	0.555	0.481
N	424	1328	608	1144	748	616	956	796	736	1016

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. All models include firm and year fixed effects. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.7: Treatment Effect: Domestic Ownership Treatment

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.002			0.002	0.002	0.002
	(0.003)			(0.002)	(0.003)	(0.002)
TE x 2008		0.001	0.002			
		(0.002)	(0.003)			
TE x 2009		0.004	0.005			
		(0.003)	(0.004)			
TE x 2007			0.002			
			(0.002)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.998	0.998	0.998	0.998	0.998	0.998
N	11384	11384	11384	11384	11384	11384

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have domestic institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variable taking the value 1 for the respective year. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.8: Financial Frictions: Domestic Ownership Treatment

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.001	0.003	0.008**	-0.003	0.002	0.001	0.007*	-0.003	0.004	-0.001
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.996	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.997	0.998
N	5744	5640	5388	5996	6472	4020	5796	5588	6160	5224

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have domestic institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.9: Treatment Effect: Controlled for Domestic Ownership

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.020**			0.020**	0.020**	0.019**
	(0.009)			(0.009)	(0.009)	(0.009)
Domestic	0.011	0.011	0.011	0.008	0.010	0.006
	(0.014)	(0.014)	(0.014)	(0.013)	(0.014)	(0.014)
Domestic x post	0.004	0.004	0.004	0.010	0.008	0.015
	(0.013)	(0.013)	(0.013)	(0.014)	(0.013)	(0.014)
TE x 2008		0.020**	0.022**			
		(0.008)	(0.009)			
TE x 2009		0.020*	0.021*			
		(0.011)	(0.012)			
TE x 2007			0.002			
			(0.006)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.996	0.996	0.996	0.996	0.996	0.996
N	1752	1752	1752	1748	1752	1748

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variable taking the value 1 for the respective year. In addition to the baseline model it is controlled domestic institutional ownership. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.10: Financial Frictions: Controlled for Domestic Ownership

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.029**	0.012	0.031**	0.010	0.032***	-0.022	0.041***	-0.005	0.029**	0.010
	(0.012)	(0.015)	(0.013)	(0.012)	(0.011)	(0.018)	(0.011)	(0.015)	(0.011)	(0.014)
Domestic	0.026	-0.009	-0.013	0.031*	0.012	0.023	0.005	0.022	0.019	0.001
	(0.019)	(0.022)	(0.022)	(0.017)	(0.016)	(0.031)	(0.016)	(0.029)	(0.017)	(0.021)
Domestic x post	-0.016	0.029*	0.022	-0.008	0.004	-0.018	0.014	-0.011	0.004	0.005
	(0.019)	(0.017)	(0.019)	(0.019)	(0.016)	(0.025)	(0.017)	(0.020)	(0.018)	(0.020)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.996	0.996	0.995	0.997	0.997	0.995	0.996	0.996	0.996	0.996
N	864	888	848	904	748	616	956	796	940	812

Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. In addition to the baseline model it is controlled domestic institutional ownership. The samples are defined as described in section 4.3. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.11: Treatment Effect: Matched on Domestic Ownership

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.026***			0.024***	0.025***	0.024***
	(0.008)			(0.008)	(0.008)	(0.008)
TE x 2008		0.026***	0.027***			
		(0.007)	(0.008)			
TE x 2009		0.027**	0.028**			
		(0.010)	(0.011)			
TE x 2007			0.003			
			(0.006)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.996	0.996	0.996	0.996	0.996	0.996
N	1752	1752	1752	1748	1748	1744

Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variables taking the value 1 for the respective year. In addition to the baseline model in the matching process domestic institutional ownership is included as a matching variable. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.12: Financial Frictions: Matched on Domestic Ownership

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.032**	0.021*	0.029***	0.017	0.024**	-0.007	0.046***	0.005	0.032***	0.018*
	(0.013)	(0.011)	(0.011)	(0.010)	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.996	0.995	0.995	0.997	0.997	0.996	0.996	0.995	0.995	0.997
N	876	876	1012	740	672	704	876	876	984	768

Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. In addition to the baseline model, it is controlled domestic institutional ownership. The samples are defined as described in section 4.3. In addition to the baseline model in the matching process domestic institutional ownership is included as a matching variable. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.13: Treatment Effect: Matching Caliper 1 N

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.019**			0.019**	0.018**	0.017*
	(0.008)			(0.008)	(0.009)	(0.009)
TE x 2008		0.020***	0.024***			
		(0.008)	(0.009)			
TE x 2009		0.019*	0.023**			
		(0.011)	(0.011)			
TE x 2007			0.008			
			(0.005)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.996	0.996	0.996	0.996	0.996	0.996
N	1680	1680	1680	1676	1680	1676

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variables taking the value 1 for the respective year. The matching is performed using a one-to-one caliper matching without replacement. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.14: Financial Frictions: Matching Caliper 1 N

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.037***	0.001	0.025**	0.012	0.032***	-0.019	0.038***	-0.002	0.031***	0.004
	(0.012)	(0.014)	(0.012)	(0.011)	(0.010)	(0.017)	(0.010)	(0.014)	(0.011)	(0.013)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.995	0.996	0.995	0.997	0.997	0.995	0.996	0.995	0.995	0.997
N	836	844	808	872	740	596	908	772	932	748

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. The matching is performed using a one to one caliper matching without replacement. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.15: Treatment Effect: Matching 2 N

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.017**			0.017**	0.015**	0.016**
	(0.007)			(0.007)	(0.007)	(0.007)
TE x 2008		0.018***	0.020***			
		(0.006)	(0.007)			
TE x 2009		0.015	0.016			
		(0.009)	(0.010)			
TE x 2007			0.003			
			(0.005)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.996	0.996	0.996	0.996	0.996	0.996
N	2480	2480	2480	2476	2480	2476

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variables taking the value 1 for the respective year. The matching is performed using a one to two matching with replacement. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.16: Financial Frictions: Matching 2 N

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.022**	0.010	0.018*	0.014	0.019*	-0.018	0.035***	-0.005	0.025**	0.005
	(0.009)	(0.011)	(0.011)	(0.009)	(0.010)	(0.012)	(0.010)	(0.011)	(0.010)	(0.010)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.996	0.995	0.995	0.997	0.996	0.996	0.996	0.996	0.995	0.996
N	1248	1232	1220	1260	1008	920	1332	1148	1348	1132

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. TThe matching is performed using a one to two matching with replacement. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.17: Treatment Effect: Matching 4 N

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.022***			0.021***	0.020***	0.021***
	(0.006)			(0.006)	(0.006)	(0.006)
TE x 2008		0.020***	0.022***			
		(0.005)	(0.006)			
TE x 2009		0.024***	0.026***			
		(0.008)	(0.009)			
TE x 2007			0.004			
			(0.005)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.996	0.996	0.996	0.996	0.996	0.996
N	3856	3856	3856	3856	3852	3852

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variables taking the value 1 for the respective year. The matching is performed using a one to four matching with replacement. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.18: Financial Frictions: Matching 4 N

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.027***	0.015*	0.024**	0.017**	0.028***	-0.009	0.035***	0.004	0.025***	0.016*
	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)	(0.011)	(0.008)	(0.009)	(0.009)	(0.009)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.996	0.996	0.995	0.996	0.997	0.996	0.996	0.996	0.995	0.997
N	1924	1932	1900	1956	1572	1448	2020	1836	2080	1776

Note: Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. TThe matching is performed using a one to four matching with replacement. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.19: Treatment Effect: Cobb Douglas

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.017***			0.014***	0.017***	0.014***
	(0.006)			(0.005)	(0.005)	(0.005)
TE x 2008		0.015***	0.016***			
		(0.005)	(0.006)			
TE x 2009		0.019***	0.020***			
		(0.007)	(0.008)			
TE x 2007			0.004			
			(0.005)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.998	0.998	0.998	0.998	0.998	0.998
N	1760	1760	1760	1760	1756	1756

Note: The outcome variable is log productivity estimated using a Cobb Douglas production function instead of a Translog specification as in the baseline model. Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variables taking the value 1 for the respective year. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.20: Financial Frictions: Cobb Douglas

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.020**	0.013	0.023***	0.011	0.003	0.014*	0.018**	0.014**	0.028***	0.002
	(0.008)	(0.009)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.007)	(0.008)	(0.007)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.998	0.997	0.998	0.998	0.998	0.999	0.997	0.999	0.997	0.998
N	840	920	804	956	688	688	896	864	972	788

Note: The outcome variable is log productivity estimated using a Cobb Douglas production function instead of a Translog specification as in the baseline model. Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.21: Treatment Effect: Translog with Wages and Market Shares

Dep. Variable:	**Log Productivity**					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment Effect	0.016***			0.014**	0.015**	0.013**
	(0.006)			(0.006)	(0.006)	(0.006)
TE x 2008		0.017***	0.018***			
		(0.005)	(0.006)			
TE x 2009		0.016*	0.017*			
		(0.008)	(0.009)			
TE x 2007			0.002			
			(0.004)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Country - Year	No	No	No	No	Yes	Yes
Nace2 - Year	No	No	No	Yes	No	Yes
Adj. R^2	0.998	0.998	0.998	0.998	0.998	0.998
N	1720	1720	1720	1716	1720	1716

Note: The outcome variable is log productivity estimated using a Translog production function where firm-specific average wages and market shares at the three-digit-country level are included in the first stage regression. Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The Year variables 2007, 2008, and 2009 are dummy variables taking the value 1 for the respective year. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

Table A.22: Financial Frictions: Translog with Wages and Market Shares

Dep. Variable:	**Log Productivity**									
	Roll Over Risk		**Cost of Capital**		**CDS**		**Affected Countries**		**Size & Age**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample	High	Low	High	Low	High	Low	High	Low	Low	High
Treatment Effect	0.020**	0.012	0.018**	0.015	0.022***	0.000	0.028***	0.003	0.024**	0.007
	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.011)	(0.008)	(0.009)	(0.010)	(0.007)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.998	0.997	0.998	0.997	0.998	0.998	0.998	0.998	0.997	0.999
N	880	840	876	844	716	628	916	804	928	792

Note: The outcome variable is log productivity estimated using a Translog production function where firm-specific average wages and market shares at the three-digit-country level are included in the first stage regression. Treatment Effect is a dummy variable that takes value 1 during the financial crisis for the treatment group defined as companies that have foreign institutional investment during the financial crisis 2008 and 2009 and at least one year before the crisis. The samples are defined as described in section 4.3. Standard errors are in parentheses and clustered at the company level and significance is denoted as * p<0.10, ** p<0.05, *** p<0.01.

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