Access to Banking Finance and Exporting

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Abstract

This paper uses firm-level data for the period 1995-2002 to examine whether access to finance increases the probability of exporting of Chilean manufacturing plants. We exploit information on firms´ access to banking debt and changes in the real exchange rate (RER) to identify the causal effect of finance on exporting. This is an interesting case to study. The Chilean economy experienced a sustained RER depreciation since 1999, which increased export profitability. We use these changes in RER as a quasi-experiment to study the impact of access to banking finance. Our results show that RER depreciations increase the probability of exporting for firms with access to banking finance and especially for firms in industries with higher financial needs. These results are robust to controlling for other firm characteristics affecting the probability of exporting and also for time varying industry-specific shocks that may affect export performance and banking finance.

Keywords: Exporting, Banking Finance, Credit Constraints, Firm-Level Data, Chile

JEL Classification: F14, O16, O54

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1. Introduction

From a theoretical point of view, there are several reasons for why exports may be more seriously affected by firms' access to credit than domestic sales. First, there are entry costs that need to be paid prior to exporting and before receiving any revenues from export activity.[1] Second, there is a larger lag between the producing date and receiving the payment for sales to international markets than domestic sales.[2] Third, there is a higher risk of not being paid for international sales. Theoretical models by Chaney (2005) and Manova (2013) extend the Melitz (2003) framework to study the relationship between firm export decisions and financial constraints. In these theories, limited access to financing can prevent the entry of firms into international markets. Recently, a model by Feenstra et al. (2011) analyzes differences in credit constraints faced by firms selling only in the domestic markets and exporters and show that that the longer time needed for export shipments induces a tighter financial constraint on exporters than on purely domestic firms. In addition, the authors find empirical support for this implication of the model using Chinese data.

Some empirical studies on the relationship between credit constraints and exports find support for the idea that firms with lower credit constraints are more likely to export (e.g., Berman and Héricourt, 2009; Bellone, et al., 2010; and Minetti and Zhu, 2011, Amiti and Weinstein, 2011), while others find that causality runs in the opposite direction, i.e., that exporting improves firms' financial health (e.g., Greenaway, et al., 2007). Other papers

[1] These costs arise because firms attempting to sell their products in foreign markets need to find potential customers, establish distribution channels, and adapt their products to foreign preferences and regulations. Several studies provide empirical evidence on the costs of exporting (e.g., Roberts and Tybout, 1997; Bernard and Jensen, 2004).

[2] A popular method of payment in international business is the letter of credit, a contract between the banks of the seller (the exporter) and the buyer (the importer) that ensures payment from the importer to the exporter upon receipt of the products shipped. Depending on the time elapsed between production and delivery, the payment make take significant more time than in a typical domestic transaction.

consider the role of financial development, an indirect and inverse measure of credit constraints. Berman and Héricourt (2009), for example, consider the role of financial development on export decisions using data for 5,000 firms from nine developing countries, and find that financial development disproportionally increases the probability of exporting of more productive firms. Jaud and Kukenova (2011) show that agri-food products that require more external finance survive longer in foreign markets if the exporting country is more financially developed. These papers have made an important contribution to the literature on credit constraints and export activity.

The empirical literature examining the role of credit constraints on exports faces two challenges. The first is how to measure financial constraints. Most papers use indirect measures of financial constraints at the firm-level,[3] or look at the impact of financial development on exporting to infer how increasing credit access at the country-level can improve firm (or products) export performance. The second challenge is how to establish the direction of the causality. Ideally, one would like to use an exogenous change in credit constraints or, alternatively, in export profitability to identify the effect of credit constraints on export activity. The only paper that uses this approach is Amiti and Weinstein (2011) which takes advantage of the Japanese financial crises from 1990 through 2010, and find that exogenous shocks to the health of financial institutions is an important determinant of firm-level exports during crises.

The goal of this paper is to examine the effect of access to credit on the probability of exporting of Chilean manufacturing plants for the period 1995-2002. We overcome the two challenges faced by the previous literature by employing a direct measure of credit access to analyze whether access to banking credit improves firm export performance in Chilean

[3] Exceptions are Greenaway et al. (2007) and Bellone et al. (2010), which include measures of leverage in their regression analyses.

manufacturing industry, and by taking advantage of an exogenous change in export profitability caused by a significant depreciation of the real exchange rate (RER) during the second part of the period under study (1999-2002). Unlike Amiti and Weinstein (2011), this paper focuses on the role of access to credit on the probability of exporting instead of the level of exports, making this study the first one to combine the use of an exogenous shock to export profitability and direct data on access to credit to examine the export decision at the micro level. The reason for focusing on the probability of exporting is twofold. First, most of previous literature indicates that sunk entry costs for exporting are important (Roberts and Tybout, 1997; Melitz, 2003) and need to be financed (Chaney, 2005; Chor and Manova, 2013). Second, there is evidence that Chilean plants entering export markets experience an increase in their productivity levels due to learning-by-exporting effects (Alvarez and López, 2005). In addition, an increase in the probability of exporting may induce firms to upgrade their technologies and increase productivity in anticipation to exporting (López, 2009). Thus, understanding the effect of access to credit on the probability of exporting is important for the case of less-developed country, like Chile. This is also an interesting setting considering that this economy, even though it has experienced high economic growth during the last decades and it is considered an early-reformer, it is one of the OECD countries with the lowest level of financial development, thus it is likely that access to credit may be an important determinant of export decisions in this country

Our identification strategy in based on the idea that an increase in RER should induce firms to enter international markets, but financial constraints can prevent some of them of taking advantage of the increased export profitability. In particular, we consider plants that did not export during the period preceding the RER depreciation episode and we identify those plants that had access to banking debt (we called these plants the treated plants) and those plants without access to banking debt (the control group). Our hypothesis is that those

plants that had access to banking debt should have been more likely to take advantage of the RER depreciation experienced by the economy between 1999 and 2002 and therefore to increase the probability of exporting during this period. We also exploit financial differences across industries by using a measure of external financial needs while employing the identification strategy pioneered by Rajan and Zingales (1998). We expect that an increase in the RER should raise the probability of exporting relatively more on firms with access to banking debt operating in industries more financially dependent. Our empirical methodology may be useful in cases where information on firm-bank specific relationships, in contrast to in Amiti and Weinstein (2011), is not available to researchers and they may need to rely on other plausible exogenous shocks to identify causal effects.

Our results show that RER depreciations increase the probability of exporting for firms with access to banking finance and, in particular, for firms in industries with higher financial needs. These results are robust to controlling for other firm characteristics affecting the probability of exporting and also for time varying industry-specific shocks that may affect export performance and banking finance. Our results, in general, are consistent with the theoretical literature showing that exporters may need more credit than firms selling purely in domestic markets because they face entry costs for exporting and there is a large delay between production and payment.

The paper is structured as follows. In the second section, we describe our data. In the third section, we present the econometric approach and discuss how we deal with endogeneity issues. In the fourth section, we show our main results and several robustness checks. In the fifth section, we conclude.

2. Data and Basic Patterns

The empirical analysis uses plant-level data from the manufacturing sector of Chile for the period 1995-2002. The data come from the National Annual Industrial Survey (carried out by the National Institute of Statistics of Chile), which covers all manufacturing plants with 10 or more workers. The survey contains information on plants' output, value added, sales, employment, export status, spending on foreign technology licenses, and industry affiliation. All monetary variables are expressed in constant prices of year 1996 using 3-digit level price deflators.

We use a direct measure of credit access by incorporating to this dataset information on the amount of commercial debt with banking institutions. This information allows us to identify which firms have access to formal credit, but not if the amount is at the desired level, which would be more consistent with the idea of financial constraints.

Table 1 shows basic information of the dataset for the years under study. The number of total of plants in the sample is between 4,000 and 5,000 per year. The percentage of exporting plants is about 20% with some fluctuations over time. At the beginning of the period, about 26% of plants were exporting, but at the end only 18% were exporters. This reduction in export participation can be explained by the Asian crisis that affected Chilean exporters at the end of the 90´s and it can also be result of the effect of the real exchange rate appreciation that we highlight below. In terms of banking credit, approximately 80% of them have some debt with banking institutions and this percentage looks very stable overtime. The average size of plants, measured in terms of employment, is about 80 workers, with a reduction in this average over time. The data show a positive association between exporting and access to banking debt. In fact, over this period more than 90% of exporters have banking debt. In contrast, only 75% of non-exporters had some debt with banking institutions (Table 1).

A key issue in our identification strategy is the evolution of the RER during this period.[4] Figure 1 shows the evolution of the monthly RER between 1995 and 2002. As it can be seen, there are two well-defined periods of significant changes in the RER that we use to exploit the effect of changes in export profitability. During the first period, 1995-1997, there was a continuous reduction in the RER. Between January of 1995 and December of 1997 the RER decreased (appreciated) by 16%. The second period, that we call the depreciation episode 1998-2002, showed a significant increase in the RER. Compared to the level of January 1998, the RER had increased (depreciated) by more than 28% by the end of 2002.

Since the dramatic changes in the aggregate RER are exogenous from the point of view of an individual Chilean plant, we can use this episode as a quasi-experiment and examine if the significant real depreciation affected the decision to export depending on previous access to banking debt.

3. Econometric Approach

In our empirical analysis we use RER variations during the period as a "quasi-experiment" to study how firms with access to banking can take advantage of increases in the RER. To do that, we define a group of treated firms as those non-exporters with access to banking debt in the previous period to the ER depreciation (1995-1997), and the control group as those non-exporters with no access to banking credit. Our main hypothesis is that treated firms should increase – relative to the control group – the probability of exporting during the ER depreciation. Moreover, the effects should be more pronounced in financially dependent industries.

We estimate the following linear probability model (LPM):

[4] We define the RER as the ratio between the international price and the domestic price of a basket of goods, expressed in the same currency. Thus, an increase in the RER represents a real depreciation of the Chilean currency.

$$P(X_{ijt}=1)=\alpha_i+\alpha_t+\delta D_t D_{bi}+\lambda D_t D_{bi} FN_j+\beta Z_{ijt}+\varepsilon_{ijt},$$

where X_{ijt} is a dummy variable equal to one if plant i operating in sector j exported at time t, α_i are firm-fixed effects, α_t are year fixed effects, D_t is a dummy variable for the period of RER depreciation (1998-2002), D_{bi} is a dummy variable for firms with banking debt in any previous year to the period of RER depreciation (1995-1997), FN_j is a variable measuring external financing dependence of industries taken from Rajan and Zingales (1998), and Z_{ijt} is a vector of plant characteristics such as size, productivity, skills and foreign technology licenses. These variables are measured as follows: size is employment (in log), productivity is real value-added per worker (in log), foreign technology licenses is a dummy variable for firms that purchase foreign technical licenses or spend on foreign technical assistance, and skills is the ratio of white-collar wages bill over total wage bill.

The triple interaction follows the identification strategy pioneered by Rajan and Zingales (1998). Specifically, we use their measures of external dependence for U.S. plants at 3-digit industries, and analyze whether firms with previous access to banking debt increase the probability of exporting disproportionately more in those in industries where external financing is more important.[5] Rajan and Zingales (1998) discuss at length the argument that this measure calculated using data for U.S. firms can serve as a useful measure at the industry level for other countries as well. They assume that this indicator reflects some technological reasons for why some industries depend more on external finance than others, and they argue that these technological differences persist across countries. In our context, we are assuming that the ranking of the industries does not differ too much between the U.S. and Chile.

[5] This variable is defined as the fraction of capital expenditures not financed with cash flow operations, and it is computed for the median of U.S. firms at 3-digit ISIC industries (some at 4-digit). To be consistent, we only use information at 3-digit level.

However, if this were not the case, these would be the differences that would prevail if Chile had financial markets with no significant restrictions, as in the case of the U.S.

One concern with this strategy is the endogeneity of banking access even we measure this variable before the period of RER depreciation. There may be time-variant and time-invariant firm characteristics that can affect the probability of having banking debt. The first source of endogeneity attributable to unobserved time-invariant characteristics is less problematic because we use panel data information and we can differentiate out this unobserved heterogeneity.[6] In the second case, introducing several controls variables, such as size and productivity, that can be positively correlated to access to banking credit, reduces the endogeneity bias. However, to be sure that our results are not affected by endogeneity, we use a propensity score matching techniques to select a control group similar to our treated firms. Then, we present a robustness check with estimations only for firms in the common support of the probability of having banking debt.

4. Results

Our basic results are presented in Table 2. In the first column we include only the interaction between the period dummy and the dummy for previous access to banking debt (D_t*D_b). In the following columns, we add other covariates and the triple interaction for the period dummy, banking debt and industry financing needs. Finally, in column (4), we replace the industry and time dummy variables for and industry*year dummy variables to be sure that our results are not driven by industry specific shocks.[7]

[6] This is the main reason for using a LPM instead of non-linear models such as a Probit or Logit.

[7] In appendix A we show descriptive statistics for all variables used in this regression and additional covariates discussed in the following paragraphs.

In general, our results are consistent with the hypothesis that firms with previous access to banking debt increased the probability of exporting during the period of RER depreciation. The parameter for the interaction between banking debt and the dummy for the episode of increase in the RER is always positive and significant. Moreover, as indicated for the positive parameter for the triple interaction (columns 3 and 4), this positive effect on the probability of exporting is larger for firms in industries with larger financing needs. Regarding the other explanatory variables, we find that larger and more productive firms are more likely to export and that other characteristics such as purchases of licenses and skill-intensity do not affect the probability of exporting.

The results are also significant economically. Using regressions in columns (4) and (5), we calculate that during the depreciation episode non-exporters increased the probability of exporting close to 3%, which compares with an unconditional probability of about 20% during this period.[8] The positive and significant parameter of the triple interaction term indicates that this effect is more important for firms in industries with higher financial needs. In fact, evaluated at the bottom 25% of the distribution of this variable, the increase in the probability of exporting is about 2%, but for firms in industries in the top 25% is 4%.

To check the robustness of our previous results to endogeneity issues, we run the same estimations using firms in the common support of the probability of having banking debt in the previous period.[9] In Table 3, we show the results for the Logit model where the dependent variable is equal to 1 if the firm had banking debt any year of the period 1995-1997. The explanatory variables are size, labor productivity, licenses and skills measured at the year

[8] As we have the triple interaction in these regressions, the marginal effect of D_t*D_b is evaluated at the mean of the financial dependence variable.

[9] To select the common support, we follow the procedure by Becker and Ichino (2002) in which observations are stratified in blocks such that in each block the estimated propensity scores (probability of having banking debt) for the treated and the controls are not statistically different.

1995 and dummy variables for industries and regions. In this sample of non-exporters, we find that larger, more productive, and more skill-intensive firms are more likely to obtain banking loans.

Before turning to the results, it is important then to evaluate the quality of the matching procedure to be sure that we were able to obtain treatment and control groups that are similar before the treatment. For this purpose, for each variable included in the Logit model, we computed the average values for the treated and control groups of the matched and unmatched samples and tested for differences in their respective means. This information is summarized in Table 4 reporting the standardized differences in the means of all the variables included in the estimation. For each variable, the first row displays the mean differences between the treatment and the control groups before matching and their statistical significance. Additionally, the second row shows the same information computed with the sub-sample of matched observations. We find that before matching, firms with access to banking credit are more productive, larger, more intensive in human capital and more likely to purchase licenses than firms without banking credit. The differences are statistically significant and large in magnitude. In fact, firms in the treatment group are about 50% more productive and larger than those in the control group. After the matching procedure, the differences in productivity are smaller (about 1% en favor of the treatment group) and not statistically significant. In terms of the other characteristics, the matching procedure reduces the differences between both groups of firms, but we reject the hypothesis that, on average, both groups are equal. However, for the most of these variables the average is higher for firms in the control group than treated firms, meaning that we are considering a sample of firms that, before the treatment, had superior characteristics in terms of size and labor skills. Then, if there is some remaining bias, this would be against our hypothesis because “better” firms would be more likely to having access to banking credit and exporting. Moreover, in

additional regressions, we control for contemporaneous values of productivity, size, skills and licenses to be sure that our results are not driven by omitted variables.

We present the estimations using the sample of firms in the common support in Table 5. The results with this new sample of more similar firms confirm the previous ones. We find that firms with access to banking credit have a higher probability of exporting during the period of increase in the RER and that this positive effect is magnified for firms in industries with higher financing needs. Thus, we are confident that our results are not driven by previous firm differences correlated with positive exposure to RER increases. For the rest of the explanatory variables, we also find similar results to previous estimations: larger and more productive firms are more likely to export while the other characteristics such as purchases of licenses and skill-intensity are not correlated with exporting.

Next, we extend these results in two main dimensions. First, we include interactions of additional firm characteristics with the period dummy for RER depreciation. Following Greenaway et al. (2010), we test whether a higher share of imported intermediate inputs on total sales reduces the effect of RER depreciations on the probability of exporting. In this case, an increase of the RER would reduce the gains of exporting by increasing the costs of production for firms that use a larger proportion of imported inputs that are more expensive after depreciation. Also, in the case that foreign-owned firms were potentially less financially constrained (Manova et al., 2009), we should find that these firms are more likely to export during the period of increasing RER in the case that access to credit is important for exporting.

Second, we introduce other triple interactions to analyze whether financial dependence is capturing the effect of comparative advantage. It may be the case that industry financial needs are highly correlated with measures of comparative advantage of the Chilean economy. We use two indicators: the Balassa index of relative comparative advantage and net exports measured in the previous period.

As it can be appreciated in Table 6 none of these additional variables affect our main results. As expected, the parameter for the interaction between foreign ownership and the depreciation period is positive, and in some regressions significant, suggesting that foreign-owned firms were more able to take advantage of increases in RER. Unexpectedly, the interaction with the importance of imported inputs is negative and significant, indicating that firms with a larger share of imported inputs were more likely to export during the period of RER depreciation. We interpret this result as suggesting that firms more involved in international transactions, possibly with lower exporting entry costs, compensate the disadvantage of more expensive inputs.

In the case of the interactions with other industry characteristics, the results show that the inclusion of both measures of comparative advantage does not affect the negative and significant effect of the interaction with financing needs. In sum, our previous results are not sensitive to the inclusion of additional variables and seem to be very robust.

We also check if our results are sensitive to use of a LPM with fixed effects, by re-estimating our basic specification using a probit model and a logit model. Unfortunately, these models don't allow us to control for the role of unobserved characteristics at the plant level. The results are presented in appendix B. As we can see, the results are qualitatively similar than those using the LPM. We have also estimated the basic specification using a random effects probit model and a random effects logit model, although the assumption that the random effects are uncorrelated with the error term is likely to be violated. The results, available upon request, are also similar to what we obtain with the LPM, which gives us confidence that the results of this paper are not driven by the use of a LPM.

We have also checked the robustness of our results to alternative definitions of access to credit banking. First, we allow the dummy for access to banking credit to vary over time and not only considering firms that had banking credit before the depreciation period. The effect

is lower in magnitude, but it is always positive and significant in most of our regressions. This is expected because increases in export profitability may induce banks to give credit to potential exporters, confounding the pure effect of RER depreciations on exporting. For this reason, we prefer our definition of access to banking credit because it is predetermined to changes in RER. Second, we use a continuous variable of debt over sales looking at how the level of indebtedness can affect the impact of RER depreciation on the probability of exporting. In this case and also including the squared term of indebtedness to check for non-linear effects, we do not find a significant impact of RER depreciations.[10]

5. Conclusions

This paper used firm-level data from the manufacturing sector of Chile for the period 1995-2002 to examine whether access to finance increases the probability of exporting. Unlike previous papers, we exploited direct information on firms' access to banking debt and an exogenous change in export profitability associated with variations RER to identify the causal effect of finance on exporting. This is an interesting setting given that the Chilean economy experienced a sustained RER depreciation since 1999, increasing export profitability. We used these changes in RER as a quasi-experiment to study the impact of access to banking finance. We investigated whether these increases in the RER raised the probability of exporting for firms that, previous to RER depreciation, had access to banking finance. We also exploited differences across industries using a measure of external financial needs and the identification strategy pioneered by Rajan and Zingales (1998). We tested the hypothesis that an increase in RER increases the probability of exporting relatively more for firms with access to banking debt in those industries more financially dependent.

[10] Both set of results are available upon request.

Our results show that RER depreciations increase the probability of exporting for firms with access to banking finance and especially for firms in industries with higher financial needs. These results are robust to several robustness checks such as to control for other firm characteristics affecting the probability of exporting and also to time varying industry-specific shocks that may affect export performance and banking finance. Our results, in general, are consistent with the theoretical literature showing that exporters may need more credit than firms selling purely in domestic markets because they face entry costs for exporting and there is a large delay between production and payment.

This evidence can have some relevant policy implications for developing countries where credit access is a relevant problem. First, increasing participation of firms in export markets may need additional support for improving access to financial markets. Second, this can explain why it is hard to find robust evidence that exports respond significantly to increases in RER. As we documented in this paper, a RER depreciation has heterogeneous effects depending whether firms have access to credit. This opens the possibility of additional research in other sources of heterogeneity of firms' responses to changes in export profitability.

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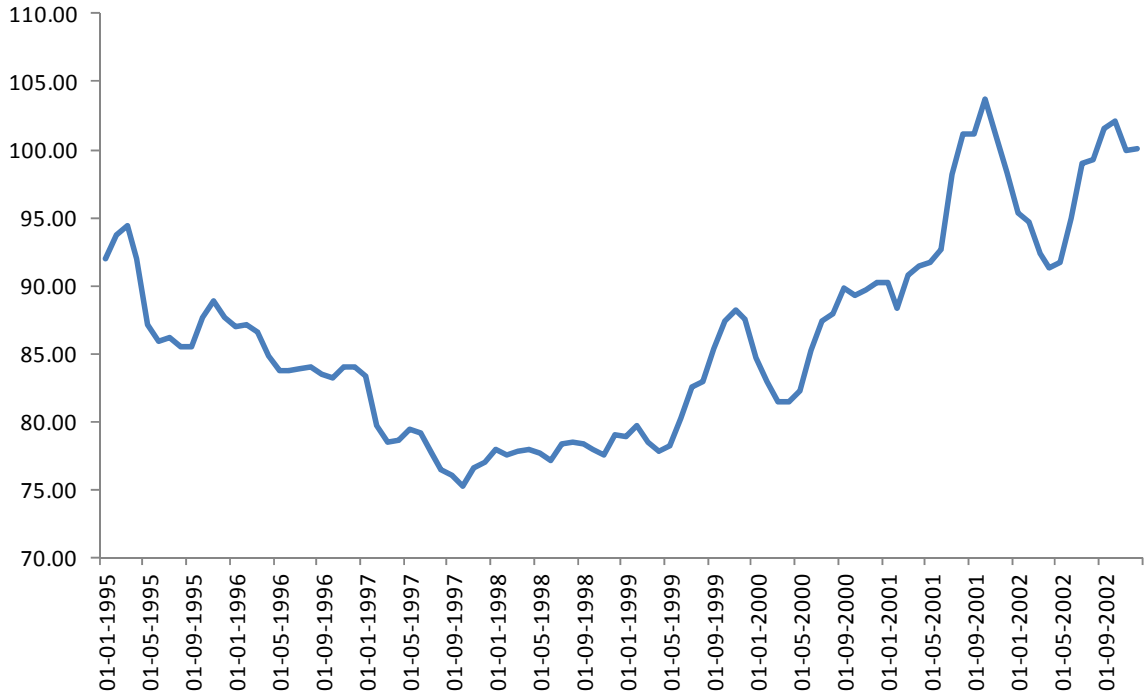
Figure 1: Evolution of the RER - 1992-2003



(Source: Central Bank of Chile)

Table 1: Number of Plants, Exporters, and Plants with Banking Debt

Year	Plants	Exporters	Banking Debt	Employment	Non-Exporters		Exporters	
					No Debt	With Debt	No Debt	With Debt
1995	4,784	26.1%	79.7%	86	24.3%	75.7%	5.9%	94.1%
1996	5,127	25.4%	80.5%	81	23.3%	76.7%	5.4%	94.6%
1997	4,905	25.3%	80.3%	82	23.2%	76.8%	6.9%	93.2%
1998	4,542	24.4%	79.6%	82	24.1%	75.9%	7.1%	92.9%
1999	4,423	22.5%	78.8%	76	24.1%	75.9%	9.5%	90.5%
2000	4,234	21.5%	79.9%	74	23.0%	77.0%	7.5%	92.5%
2001	4,304	20.4%	79.5%	76	23.3%	76.7%	8.7%	91.3%
2002	4,656	18.4%	79.7%	72	23.0%	77.0%	8.5%	91.5%
Average	4,622	23.0%	79.7%	79	23.5%	76.5%	7.4%	92.6%

Table 2: Basic Results – LPM with Plant Fixed Effects

	(1)	(2)	(3)	(4)
Dt*Db	0.037	0.034	0.019	0.015
	(5.28)**	(6.41)**	(3.41)**	(2.47)*
Licenses		0.002	0.002	0.002
		(0.16)	(0.21)	(0.19)
Log(Employment)		0.027	0.026	0.029
		(2.87)**	(2.77)*	(3.20)**
Log(Productivity)		0.030	0.028	0.029
		(4.37)**	(4.30)**	(4.77)**
Skills		0.000	-0.001	0.001
		(0.06)	(0.18)	(0.29)
Dt*Db*Financial Dependence			0.053	0.045
			(4.03)**	(3.12)**
Constant	0.000	-0.374	-0.357	-0.364
	(0.07)	(4.14)**	(4.14)**	(4.68)**
Year fixed effects	Yes	Yes	Yes	No
Industry*Year fixed effects	No	No	No	Yes
Observations	20,919	20,885	20,628	20,628
Plants	3,559	3,553	3,511	3,511

Absolute value of t-statistics in parentheses. Standard errors were clustered at the industry level. * significant at 5% level; ** significant at 1% level. LPM: Linear Probability Model. Dt is a dummy variable equal to 1 for the period 1998-2002. Db is a dummy variable equal to 1 for plants that had banking debt in any year during the period 1995-1997. Licenses is a dummy variable equal to 1 for plants that purchase foreign technologies through licenses. Productivity is real value added per worker. Skills is the ratio of white-collar wages to total wages. Financial dependence measures external financial dependence at the sector level (from Rajan and Zingales, 1998).

Table 3: Logit Model for Propensity Score

Log(Productivity)	1.163
	(10.70)**
Log(Employment)	0.962
	(9.69)**
Licenses	0.774
	(1.22)
Skill	0.940
	(2.78)**
Metropolitan region	-0.933
	(2.24)*
Constant	-12.562
	(11.79)**
Observations	2497

Absolute value of z-statistics in parentheses * significant at 5% level; ** significant at 1% level. Industry and other regions dummy variables were included but not reported. Licenses is a dummy variable equal to 1 for plants that purchase foreign technologies through licenses. Productivity is real value added per worker. Skills is the ratio of white-collar wages to total wages.

Table 4: Matching Quality and Firm Characteristics

Variable		Treated	Control	Difference	t-test	p>|t|
Log(Productivity)	Unmatched	9.5314	9.0725	0.46	11.64	0.00
	Matched	9.5314	9.5184	0.01	0.62	0.53
Log(Employment)	Unmatched	3.4118	2.8881	0.52	11.53	0.00
	Matched	3.4118	3.4849	-0.07	-2.71	0.01
Skill	Unmatched	0.4366	0.3776	0.06	3.40	0.00
	Matched	0.4366	0.4836	-0.05	-5.24	0.00
Licenses	Unmatched	0.0246	0.0131	0.01	1.40	0.16
	Matched	0.0246	0.0144	0.01	2.63	0.01

Table 5: Results with Common Support Sample – LPM with Plant Fixed Effects

	(1)	(2)	(3)	(4)
Dt*Db	0.038	0.036	0.019	0.011
	(4.98)**	(5.85)**	(2.99)**	(1.90)
Licenses		-0.004	-0.003	-0.002
		(0.43)	(0.30)	(0.27)
Log(Employment)		0.028	0.025	0.030
		(2.77)*	(2.62)*	(3.13)**
Log(Productivity)		0.029	0.026	0.028
		(3.33)**	(3.33)**	(3.79)**
Skills		0.002	0.001	0.003
		(0.52)	(0.31)	(0.84)
Dt*Db*Financial Dependence			0.062	0.062
			(4.78)**	(4.12)**
Constant	0.000	-0.368	-0.340	-0.341
	(0.01)	(3.35)**	(3.38)**	(3.73)**
Year fixed effects	Yes	Yes	Yes	No
Industry*Year fixed effects	No	No	No	Yes
Observations	16,285	16,277	16,099	16,099
Plants	2,497	2,497	2,470	2,470

Absolute value of t-statistics in parentheses. Standard errors were clustered at the industry level. * significant at 5% level; ** significant at 1% level. LPM: Linear Probability Model. Dt is a dummy variable equal to 1 for the period 1998-2002. Db is a dummy variable equal to 1 for plants that had banking debt in any year during the period 1995-1997. Licenses is a dummy variable equal to 1 for plants that purchase foreign technologies through licenses. Productivity is real value added per worker. Skills is the ratio of white-collar wages to total wages. Financial dependence measures external financial dependence at the sector level (from Rajan and Zingales, 1998).

Table 6: Results with Common Support Sample and Additional Covariates – LPM with Plant Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)
Dt*Db	0.033	0.031	0.017	0.009	0.011	0.010
	(4.73)**	(5.48)**	(2.82)**	(1.79)	(2.03)	(1.80)
Dt*Foreign Ownership	0.089	0.083	0.076	0.072	0.072	0.072
	(2.35)*	(2.26)*	(1.97)	(1.75)	(1.75)	(1.75)
Dt*Importer	0.398	0.395	0.356	0.384	0.383	0.383
	(3.18)**	(3.42)**	(3.00)**	(3.07)**	(3.06)**	(3.06)**
Licenses		-0.002	-0.001	-0.001	-0.001	-0.001
		(0.19)	(0.09)	(0.09)	(0.09)	(0.09)
Log(Employment)		0.027	0.025	0.029	0.029	0.029
		(2.86)**	(2.71)*	(3.21)**	(3.20)**	(3.20)**
Log(Productivity)		0.027	0.026	0.027	0.027	0.027
		(3.28)**	(3.27)**	(3.71)**	(3.71)**	(3.70)**
Skill		0.003	0.002	0.004	0.004	0.004
		(0.67)	(0.46)	(0.95)	(0.95)	(0.95)
Dt*Db*Financial Dependence			0.054	0.053	0.052	0.050
			(3.99)**	(3.15)**	(3.10)**	(2.67)*
Dt*Db*Comp. Adv. (Balassa)					-0.001	
					(0.36)	
Dt*Db*Comp. Adv. (NX)						-0.002
						(0.26)
Constant	0.000	-0.355	-0.331	-0.333	-0.332	-0.332
	(0.01)	(3.35)**	(3.36)**	(3.70)**	(3.71)**	(3.72)**
Year fixed effects	Yes	Yes	Yes	No	No	No
Year*Industry fixed effects	No	No	No	Yes	Yes	Yes
Observations	16,204	16,196	16,018	16,018	16,018	16,018
Plants	2,416	2,416	2,389	2,389	2,389	2,389

Absolute value of t-statistics in parentheses. Standard errors were clustered at the industry level. * significant at 5% level; ** significant at 1% level. LPM: Linear Probability Model. Dt is a dummy variable equal to 1 for the period 1998-2002. Db is a dummy variable equal to 1 for plants that had banking debt in any year during the period 1995-1997. Licenses is a dummy variable equal to 1 for plants that purchase foreign technologies through licenses. Productivity is real value added per worker. Skills is the ratio of white-collar wages to total wages. Financial dependence measures external financial dependence at the sector level (from Rajan and Zingales, 1998). Comp. Adv. is the Balassa index of comparative advantage. NX is next exports of the sector. Foreign Ownership is a dummy variable equal to 1 for plants with foreign ownership. Importer is a dummy variable equal to one for plants that import intermediate inputs.

Appendix A: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Exporter (dummy)	0.022	0.146	0.000	1.000
Access to banking credit	0.780	0.414	0.000	1.000
Log (productivity)	9.482	0.769	4.374	13.339
Log (employment)	3.267	0.892	0.000	7.476
Skills	0.436	0.316	0.000	1.000
Licenses (dummy)	0.025	0.157	0.000	1.000
Financial dependence	0.261	0.276	-0.150	1.140
Imports over sales	0.008	0.031	0.000	0.790
Foreign (dummy)	0.022	0.148	0.000	1.000
Balassa index	1.366	1.565	0.023	18.265
Net exports (dollars)	-22,271	836,990	-2,555,055	4,215,501

Appendix B: Results Using Probit and Logit Models – Marginal Effects

	All Plants		Common Support Sample	
	Probit	Logit	Probit	Logit
	(1)	(2)	(3)	(4)
Dt*Db	0.018	0.014	0.020	0.014
	(10.20)**	(11.37)**	(8.01)**	(4.03)**
Licenses	0.005	0.003	0.002	0.002
	(1.69)	(1.71)	(0.84)	(0.86)
Log(Employment)	0.008	0.006	0.006	0.005
	(13.40)**	(11.53)**	(6.16)**	(4.44)**
Log(Productivity)	0.007	0.005	0.005	0.004
	(8.66)**	(8.03)**	(3.24)**	(2.26)*
Skills	0.002	0.001	0.002	0.001
	(1.20)	(0.58)	(0.77)	(0.43)
Dt*Db*Financial Dependence	0.014	0.011	0.012	0.010
	(6.91)**	(6.90)**	(4.09)**	(6.92)**
Observations	20,628	20,628	16,099	16,099

Absolute value of z-statistics in parentheses. Standard errors were clustered at the industry level. * significant at 5% level; ** significant at 1% level. Dt is a dummy variable equal to 1 for the period 1998-2002. Db is a dummy variable equal to 1 for plants that had banking debt in any year during the period 1995-1997. Licenses is a dummy variable equal to 1 for plants that purchase foreign technologies through licenses. Productivity is real value added per worker. Skills is the ratio of white-collar wages to total wages. Financial dependence measures external financial dependence at the sector level (from Rajan and Zingales, 1998). Marginal effects at the mean values of the variables.