The Effect of Credit on the Export Performance of Colombian Exporters

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Abstract

In this paper we use Colombian manufacturing data on exports and external financing for the period 1998 – 2006 to estimate the credit elasticity of exports. We use bank-firm linked data to construct a supply side instrument for a manufacturer's demand of credit, which we use to address the reverse causality between a manufacturer's export revenue and its demand for credit. We find that access to credit produces a significant increase on a manufacturer's export revenue explained by the positive effect of credit on an exporter's market reach - number of destinations -. Across manufacturers the effect of credit on a manufacturer's export revenue varies by size. While medium sized manufacturers use credit to increase their market reach, market penetration and product mix, large manufacturers only use credit to increase their market reach. Small manufacturers do not seem to benefit from bank credit.

JEL Classification: F14 and **G21**.
Keywords: *Trade, Export Margins and Bank Financing.*

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1 Introduction

In order to produce, manufacturers need working capital that is used to pay for upfront costs that are due ex-ante production and sales are realized. When pockets are deep upfront costs are paid with a manufacturer's internal resources, but when the available working capital is limited, an active manufacturer is left with two options: 1) downsize the scale of production until the upfront costs are fully paid with internal resources, or 2) use an external financing source (investor) to meet its capital needs. In the latter case, access to an external financing source not only enables a manufacturer to avoid the under-investment

Similar to Amiti and Weinstein (2011) and Paravisini, Rappoport, Schnabl, and Wolfenzon (2011), we take advantage of our matched firm-bank data and we construct a manufacturer-specific supply side instrument for credit demand. But, rather than using supply side variations of bank lending in times economic distress, our empirical estimation uses the variations in the supply side of bank credit to the firm.[7] The notion that supply side shocks matter for loan supply has been already established by previous literature. Using 1990s' data of Japanese banks, Peek and Rosengren(1997, 2000 and 2005) documented that financial health deterioration of Japanese banks led to a short supply of credit to construction firms in the US, with significant higher negative effects on the construction activity in the states that were heavily dependent on the financing provided by the affected Japanese banks. Using aggregate data, Ashcraft (2014) finds that the deterioration of the financial health of banks in Texas led to decrease of the country level output.

Our findings are also linked to the evidence found in the literature of finance and growth suggesting that countries with more developed financial systems have a comparative advantage in sectors with higher dependence on external sources of financing. While Rajan and Zingales (1998), Petersen and Rajan (1997) and Fisman and Love (2003) find that access to external financing has a positive and higher significant effect on the sectoral growth rates of financially dependent sectors,[8] recent evidence by Manova (2013) suggests that the sectoral growth rate of exports is higher for financially dependent sectors when located in financially developed countries. But in times of economic downturns, Braun and Larrain (2005), Kroszner, Laeven, and Klingebiel (2007) and Dell'Ariccia, Detragiache, and Rajan (2008) show that the short supply of credit has a higher real effect on the growth rates of financially dependent sectors.[9] In the period of the 2009 global economic crisis, evidence by Berman (2009), Iacovone and Zavacka (2009) and Chor and Manova (2012) confirms that most financially dependent exporters were more negatively affected by the short supply in external financing.

Our paper contributes to the current literature of trade and external sources of financing to the firm by finding that the positive and significant effect of bank financing on exports varies across manufacturers' size. In particular, we find that the effect of bank financing on a manufacturer's market penetration is significantly higher for small and medium-sized firms, while the effect of bank financing on a manufacturer's export market reach is significantly higher for medium and large-sized firms. The mixed results suggest that there is a clear distinction on bank financing strategy by firm size. Small and medium-sized manufacturers use bank financing to increase their product mix, while medium and large-sized manufac-

Feenstra, Li, and Yu (2014) develop a contract theory model of financing where manufacturer's endogenously choose their level of external financing and their optimal level of interest rates which enables the creditor to

turers prefer to use bank financing to increase their export market reach. We reconcile this finding with the prior evidence of Beck and Demirguc-Kunt (2006) and Beck, Demirgüç-Kunt, Laeven, and Maksimovic (2006) suggesting not only that access to finance is different by firm size, but these differences translate into growth outcomes that vary by firm size.

This paper is structured as follows: section 2 summarizes why external financing to firms is more important for exporting firms, and also describes the theoretical results embodied by previous models of international trade and firm credit constraints. Section 3 provides a description of our dataset and formulates our empirical estimation strategy. Section 4 discusses our results; and finally, section 5 concludes.

2 External Financing and Related Literature

Understanding how exporters use external financing to the firm allows us to determine how financing affects a manufacturer's export market performance. Depending on the financing need, external financing to the firm may only affect a manufacturer's decision to enter into foreign export markets (as in

highly financially dependent manufacturers are less likely to produce or export, as the endogenous entry conditions are set at a higher level. In this setup external financial dependence is only offset when a manufacturer draws a high productivity, or when the financially dependent manufacturer offers the investor a higher return to secure the external financing.[12] Across sectors, entry into exporting becomes more difficult as sectoral characteristics induce firms to become more dependent upon external sources of financing.

Credit dependence also affects the number of destination countries a firm chooses to serve and the number of products that a firm decides to trade. In terms of destinations, financially dependent firms choose which destinations to service, ranking them from most profitable to least profitable. Conditional on the external financing obtained by the firm, the number of destination markets it serves is directly related to how credit dependent the firm is. Highly financially dependent manufacturers are able to export to fewer destinations. Likewise, manufacturers facing external financing constraints will export only the most profitable products, and will ship fewer products to their foreign market destinations.

To summarize, credit constraints affect both a firm's extensive and the intensive margin of trade. These effects are more pronounced when firms are more dependent on external sources of financing. Understanding how a firm uses external sources of financing allows us to identify the financing sources that might be used to lessen the adverse effects of the cost of external financing on a firm's extensive and intensive margins of trade.

3 Data and Empirical Strategy

3.1 Data

To relate a manufacturer's current export outcomes to its current external financing sources, we constructed an unbalanced panel dataset using detailed information on exports, financial statements and bank-firm linked data for 2, 930 Colombian exporters, classified within the industrial sectors of Agriculture (sectors 1-5) and Manufacturing (sectors 15-39) as defined by the international standard industry classification, ISIC revision 3.1, for the period $1998 - 2006$.

Manufacturing export data was extracted from the Transactional Export Dataset (TED) processed by "Dirección de Impuestos y Aduanas Nacionales" (DIAN). TED contains the universe of transactions realized by Colombian exporters at the product level per destination country.[13] From this dataset we extracted annual information on the total value of exports, the market reach - number of export destinations -, product mix[14] - number of exported products - and the export market penetration - exports per destination - for the universe of Colombian exporters.

A manufacturer's financial information was extracted from the Financial Statement Database processed by the "Superintendencia de Sociedades" (SS). Although this dataset does not allow us to obtain

[12] Unfortunately, this type of setup does not take into account that higher returns imply an endogenous adjustment of the repayment probabilities. Since repayment probabilities are taken as given, the model does not capture the decrease in the probability of repayment caused by rise of a manufacturer's credit dependence, or when exporters accept higher interest rates in return of securing a loan disbursement.

[13] Eaton, Eslava, Kugler, and Tybout(2007,2008) use this data to provide firm level evidence on the patterns of market reach of Colombian exporters.

[14] For robustness purposes we performed this calculation defining a product line at the 10, 8 and 6 digit level of the harmonized system code product classification.

Export Outcomes and External Financing

Table 2 reports summary statistics for our firm-year unbalanced panel data set that we construct using firm-level export outcome data, firm-level balance sheet information, and bank-firm linked information. Our dataset includes 11, 191 observations, for a sample of 2, 930 manufacturing exporters classified within industrial sectors of Agriculture (sectors 1-5) and Manufacturing (sectors 15-39) as defined by the international standard industry classification, ISIC revision 3.1, for the period 1998 − 2006. The available information within the SS's database enable us to construct an unbalanced database containing 38.4% of the universe of Colombian exporters, which in turn represents on average 72.1% of Colombia's total export volume (per year results are reported in table 3).[20] This percentage corresponds to almost the country's total export share achieved by manufacturers classified in the economic sectors that are not related to the extraction of petroleum, gas and coal; which in the case of Colombia represents on average 28% of the country's yearly exports.

On average, a Colombian manufacturer exports a total volume of USD312, 000, with a reported export market penetration of USD82, 500, an average export market reach of six countries and an average product mix equal to 8 products.[21] A manufacturer's average size is around USD5.7 millions, with an asset tangibility equivalent to 20% of a manufacturer's average size and an average leverage ratio equal to 49% of a manufacturer's total assets. While a manufacturer's active financing is on average provided by three different financing institutions; our evidence suggests that a manufacturer's access to finance might be concentrated, as 25% of the sample of manufacturers obtains external financing from only one financing institution.[22]

Although a manufacturer can obtain external financing from different sources, (e.g. standard debt loans, supplier trade debt, equity and other financing sources), the empirical evidence for Colombian exporters reveals a concentration on the financing source type. Almost 61% of a manufacturer's total

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cation is determined by law 905 of 2004, the sample period of our database implies that 70% of the firm-year observations were subject to the size classification given by Law 590 of year 2000. Hence, we use the total asset thresholds as determined by Law 590 of year 2000 to classify a manufacturer within one of the following three size categories: 1) Small: when a manufacturer's level of total assets is lower than USD 2.5 millions. 2) Medium: when a manufacturer's level of total assets is between USD 2.5 millions and USD 5.1 millions, and 3) Large: when a manufacturer's level of total assets is greater than USD 5.1 millions.[25]

We not only find that export performance increases with size (see figure 1(a)), but we also find that there are also significant differences in the type and the terms upon which manufacturer's use external financing. Small manufacturer's have a higher percentage of tangible assets, they exhibit a higher leverage ratio despite having a lower level of bank debt, and having a lower number of financing ties. Though, the higher leverage ratio of small manufacturers seems to be explained by their higher use of supplier trade debt. In contrast, large manufacturers tend to rely more on bank financing, as their total debt ratio is 8 percentage points higher than the observed for small manufacturers. A manufacturer's different financing choice may be partially explained by the relative cost of bank debt. As reported in figure 1(c), credit interest rates are higher for small manufacturing firms than they are for large manufacturing firms.

dividual investors. In all of our specifications $bloan_{i,s,t}$ corresponds to the current total value of new loan disbursements given by banking institutions; $bloan_{i,s,t} = \sum_{b \in B} bloan_{b,i,s,t}$, where b identifies the bank providing the external financing and B is the set of banks in the database. The reason to only focus on current bank financing is based on the evidence that Colombian manufacturers use bank financing as their main external financing source, while the use of other financing sources represents less than 4% of a manufacturer's total liabilities.[26]

All of our estimates control for a manufacturer's ex-ante leverage ratio $levrat_{i,s,t-1}$ which we use to control for manufacturer specific credit constraints that limit its own current export performance and current bank credit access. We also include a set of firm fixed effects Λ_i and a set of year fixed effects Γ_t. The use of manufacturer fixed effects enables us to sweep all the manufacturer specific non-observable factors that do not vary through time and are related to a manufacturer's export performance and to a manufacturer's access to current bank financing. Year fixed effects control for non-observable macro factors that are known to affect a manufacturer's export performance and a manufacturer's demand for bank financing. As an alternative one may also would like to control for non-observable macro factors that are sector-year specific which in turn affect a manufacturer's export performance and credit demand. Hence, our results also include estimates that instead of including year fixed effects, include sector-year fixed effects. In addition, all of our estimates cluster standard errors using a manufacturer's industry classification - 4 digit level, ISIC revision 3.1-.

Even though the use of external financing implies an increase of a manufacturer's marginal cost that is equal to the cost of financing (credit interest rate), one should also take into account that external

We address these problems by re-setting the estimation of equation (1) as

$$\ln y_{i,s,t} = \beta_0 + \beta_1 \ln \text{bloan}_{i,s,t} + \beta_2 \text{levrat}_{i,s,t-1} + \Lambda_i \gamma + \Gamma_{s,t} \delta + \varepsilon_{i,s,t}, \quad (2a)$$

$$\ln \text{bloan}_{i,s,t} = \eta_0 + \eta_1 \ln sloan_{i,s,t} + \eta_2 \text{levrat}_{i,s,t-1} + \Lambda_i \theta + \Gamma_{s,t} \mu + \xi_{i,s,t} \quad \text{and} \quad (2b)$$

$$y_{1,i,s,t} = \mathbb{1}\{z_{i,s,t}\lambda + \Lambda_i \alpha + \Gamma_{s,t} \rho + \nu_{i,s,t} > 0\}. \quad (2c)$$

Equation (2*a*) is our equation of interest. Equation (2*b*) is the linear projection that we use to address the reverse causality problem of bank lending and equation (2*c*) is the selection equation that we use to correct for the non-random sampling of SS's dataset. The variables $\ln sloan_{i,s,t}$ and $z_{i,s,t}$ are the instruments that we use to address the reverse causality problem and the incidental truncation problem. While Λ_i and $\Gamma_{s,t}$ are a manufacturer and year/sector-year fixed effects, and $\varepsilon_{i,s,t}$, $\xi_{i,s,t}$ and $\nu_{i,s,t}$ are the corresponding error terms with $\nu_{i,s,t}$ N(0, 1).[27]

As proposed by equation (2*b*), in all of our specifications we instrument a manufacturer's current bank lending with a manufacturer specific supply side instrument of bank credit that we construct using the bank-firm matched data set. Provided that this data set contains information on the financial institutions that have a lending relationship with a manufacturer, and given that from a bank's balance sheet information we extract a bank's total loan disbursements $sloan_{b,s,t}$, we use these data to construct a supply side instrument of bank credit $sloan_{i,s,t}$ that is equal to the sum of the loan disbursements executed by the banking institutions that have a commercial banking relationship with the manufacturing firm; i.e. $sloan_{i,s,t} = \sum_{b \in B} sloan_{b,s,t}$ banks lending. Since one may think that the credit demand of big c9Tf 2073 10.8338(one)-338(n

instrument as reported in column (2). The first stage results on the significance of our instrument not only suggests that our supply side instrument is relevant, but the reported magnitude of the estimated F-statistic suggests that our estimation strategy does not suffer from a weak instrument problem as the estimated value of the F-statistic is in all cases greater than 10 (Stock, Wright, and Yogo (2002)). Results in column (4) show that the sample selection bias of the SS's data set is not statistically different from zero as the significance of the inverse mills ratio fails to be different from zero. One may wonder if this is because the instruments in the selection equation are not significant. Although we do not report the estimates of the probit estimate, we report the F-statistic associated to the joint test on the significance of the instruments that we use to characterize the sample selection into the SS's data. The term in office instruments in the probit specification are jointly significantly different from zero. Hence, the lack of significance of the inverse mills ratio in column (4) implies that estimating equation (1) following the

financing does not have any significant effect in affecting these export margins.

4.2 Evidence by Manufacturing Size

Since our data reveals that there are significant differences on the financing sources used by manufacturing firms when characterized by size, we extended our benchmark estimates by testing whether the effect of bank financing on a manufacturer's export outcomes vary by firm size. Following the same estimation approach that we lay out in equations (2*a*) − (2*c*), we first test whether bank financing has a different effect on a manufacturer's export revenue when exporters are characterized by size. Second, we continue to test whether the effect of bank financing operates throughout a particular export margin, and if so, we test if there are significant differences of the effect across manufacturer's size.

Following Law 590 of year 2000, we classified manufacturers in our database within three groups: 1) Small: Manufacturers with a level of total assets lower than USD2.5 millions. 2) Medium: Manufacturers with a level of total assets between USD2.5 millions and USD5.1 millions, and 3) Large: Manufacturers with a level of total assets that is higher than USD5.1 millions.

Although we know that estimating equation (1) under the standard IV procedure provides consistent estimates of the bank financing parameter, in tables 9 − 12 we continue to report the results obtained even when we control for the sample selection bias. In all tables columns (1) − (3) correspond to the effect of bank financing when we only address the reverse causality problem while columns (4) − (6) correspond to the results when we include the inverse mills ratio in the estimates. In all tables we confirm that omitting the sample selection correction parameter (inverse mills ratio) does not produce a bias on the $\hat{\beta}_1$. Hence, we focus our analysis on the results reported in columns (1) − (3).

As reported in table 9, bank financing has a differential effect on the export revenue of medium-size manufacturers. The estimates in column (2) suggest that increasing bank financing from the sample average up to the level observed at the 75th percentile produces an export increase of 63%. The differential export increase of medium-size manufactures is not only explained by an increase in market reach, but it is also explained by an increase on market penetration and product mix. Reported results in column (2) - tables 9 through 12 - show that an increasing bank financing from the sample average up to the level observed at the 75th percentile produces a market reach increase equivalent to 1.5 destinations; produces an increase of market penetration equivalent to 37.6%, and produces an increase on its product mix equivalent to 2 new products.

Our results only find that bank credit has a significant effect on the market reach of large manufacturing firms. In the case of small manufacturers, we do not find significant differential benefits of access to credit.

5 Conclusions

Recent theoretical and empirical research on international trade provides evidence of the importance of external financing for exporters. As explained by Chaney (2005), Muûls (2008), Paravisini, Rappoport, Schnabl, and Wolfenzon (2011), Manova (2013) and Feenstra, Li, and Yu (2014), financing fixed costs of exporting with external financing sources only affects the entry decision into exporting, while the pricing, and export revenue are not affected. However, when variable costs are financed with external

References

ALVAREZ, R., AND R. LOPEZ (2012): "Financial Development, Exporting and Firm Heterogeneity in Chile," .

AMITI, M., AND D. WEINSTEIN (2011): "Exports and Financial Shocks," *The Quarterly Journal of Economics*, 126(4), 1841–1877.

ARKOLAKIS, C. (2010): "Market Penetration Costs and the New Consumers Margin in International Trade Costas Arkolakis," *Journal of Political Economy*, 118(6), 1151–1199.

ASHCRAFT, A. (2014): "Are Banks Really Special ? New Evidence from the Failure of Healthy Banks," *The American Economic Review*, 95(5), 1712–1730.

BECK, T., AND A. DEMIRGUC-KUNT (2006): "Small and medium-size enterprises: Access to finance as a growth constraint," *Journal of Banking & Finance*, 30(11), 2931–2943.

BECK, T., A. DEMIRGÜÇ-KUNT, L. LAEVEN, AND V. MAKSIMOVIC (2006): "The determinants of financing obstacles," *Journal of International Money and Finance*, 25(6), 932–952.

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DJANKOV, S., C. FREUND, AND C. PHAM (2010): "Trading on time," *The Review of Economics and Statistics*, 92(1), 166–173.

EATON, J., M. ESLAVA, M. KUGLER, AND J. TYBOUT (2007): "Export Dynamics in Colombia: Firm-Level Evidence.," .

EATON, J., M. ESLAVA, M. KUGLER, AND J. R. TYBOUT (2008): "Exports Dynamics in Colombia: Transactions Level Evidence," .

FEENSTRA, R., Z. LI, AND M. YU (2014): "Exports and Credit Constraints under Incomplete Information : Theory and Evidence from China," *Review of Economics and Statistics*, Forthcomin(Forthcoming).

FISMAN, R., AND I. LOVE (2003): "Trade Credit , Financial Intermediary Development and Industry Growth," *The Journal of Finance*, LVIII(1), 353–374.

FORMAI, S. (2013): "Heterogeneous firms and credit frictions: a general equilibrium analysis of market entry decisions," .

FREUND, C., AND M. PIEROLA (2012): "Export Superstars," .

GREENAWAY, D., A. GUARIGLIA, AND R. KNELLER (2007): "Financial factors and exporting decisions," *Journal of International Economics*, 73, 377 – 395.

GUISO, L., P. SAPIENZA, AND L. ZINGALES (2004): "Does Local Financial Development Matter?," *The Quarterly Journal of Economics*, 119(3), 929–969.

IACOVONE, L., AND V. ZAVACKA (2009): "Banking Crises and Exports Lessons from the Past," .

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PETERSEN, M., AND R. RAJAN (1997): "Trade Credit:Theories and Evidence," *The Review of Financial Studies*, 10(3), 661–691.

RAJAN, R., AND L. ZINGALES (1998): "Financial Dependence and Growth," *American Economic Review*, 88(3), 559–586.

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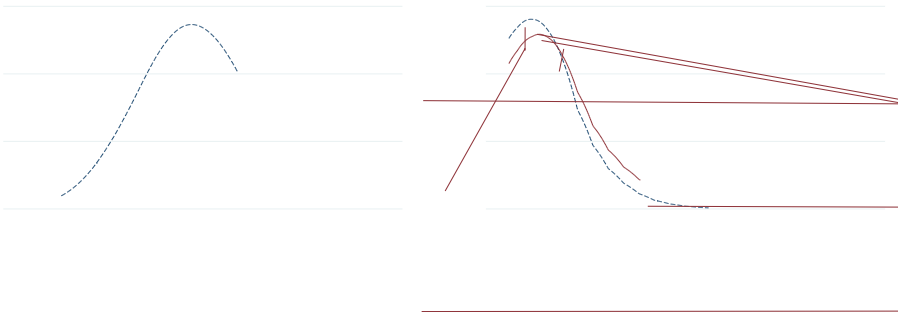
Figures

Figure 1: Financing Terms by Manufacturer Size.



(a) Total Exports (ln) (b) # of Financing Ties

(c) Interest Rate (d) Collateral as % of Debt

Source: Own authors' Calculations. Note: Data on a manufacturer's export volume was extracted from TED. Data on a manufacturer's number of financing ties, loan interest rates and collateral size by financing need were extracted from SS's format 341. A manufacturer's size classification corresponds to the asset size criteria determined by Law 590 of 2000.

Table 1: **Yearly Minimum Wage in Colombia and**

Table 2: **Summary Statistics**

Panel A: Summary Statistics All Manufacturers

Variable	Obs.	Avg.	Std. Dev.	Min.	Max.	Perc. 25	Perc. 75
Tot Value of Exports (ln)	11,191	12.651	2.613	4.605	20.703	10.874	14.550
Export Market Penetration (ln)	11,191	11.320	2.010	3.912	19.150	10.026	12.640
Export Market Reach	11,191	6.070	6.187	1.000	57.000	2.000	9.000
Product Mix (hs 6 digit level)	11,191	8.215	13.710	1.000	208.000	1.000	9.000
Product Mix (hs 8 digit level)	11,191	8.784	14.690	1.000	217.000	2.000	9.000
Product Mix (hs 10 digit level)	11,191	8.902	14.750	1.000	217.000	2.000	10.000
Total Assets (ln)	11,191	15.563	1.555	10.164	22.422	14.474	16.540
Total Bank Financed Debt (ln)	11,191	12.892	4.455	0.000	20.657	12.398	15.356
Asset Tangibility Ratio[a]	11,190	0.201	0.157	0.000	0.931	0.081	0.283
Leverage Ratio[a]	11,191	0.494	0.258	0.006	4.499	0.327	0.634
# of Active Financing Relations	11,191	2.786	2.595	0.000	19.000	1.000	4.000
# of Historical Financing Relations	11,191	3.980	3.173	1.000	25.000	2.000	5.000
Ratio Total Debt with Banks[b]	11,191	0.324	0.235	0.000	0.988	0.113	0.511
Ratio Total Debt with Domestic Banks[b]	11,191	0.305	0.229	0.000	0.988	0.097	0.486
Ratio Total Debt with Foreign Banks[b]	11,191	0.019	0.081	0.000	0.940	0.000	0.000
Ratio Total Debt with Suppliers[b]	11,191	0.281	0.197	0.000	0.997	0.132	0.393
Ratio Total Debt with Domestic Suppliers[b]	11,191	0.181	0.163	0.000	0.975	0.058	0.259
Ratio Total Debt with Foreign Suppliers[b]	11,191	0.100	0.165	0.000	0.997	0.000	0.130
Ratio Other Debt[b]	11,191	0.032	0.086	0.000	0.928	0.000	0.014
Ratio Equity Debt[b]	11,191	0.003	0.029	0.000	0.532	0.000	0.000
Ratio Short Term Debt[b]	11,191	0.522	0.244	0.000	1.000	0.334	0.721
Ratio Long Term Debt[b]	11,191	0.119	0.174	0.000	1.000	0.000	0.194
Ratio Short Term Bank Financing[b]	11,191	0.225	0.205	0.000	0.945	0.039	0.369

Panel B: Summary Statistics External Financing by Manufacturing Size[c]

Variable	Obs.	Avg.	Std. Dev.	Min.	Max.	Perc. 25	Perc. 75
Asset Tangibility Ratio - Large Size[a]	5,982	0.200	0.152	0.000	0.931	0.086	0.274
Asset Tangibility Ratio - Medium Size[a]	2,191	0.189	0.148	0.000	0.865	0.070	0.277
Asset Tangibility Ratio - Small Size[a]	3,017	0.213	0.171	0.000	0.916	0.077	0.306
Leverage Ratio - Large Size[a]	5,982	0.459	0.226	0.006	3.867	0.299	0.596
Leverage Ratio - Medium Size[a]	2,191	0.518	0.291	0.033	4.499	0.337	0.660
Leverage Ratio - Small Size[a]	3,018	0.547	0.283	0.015	3.878	0.380	0.672
Total Bank Financed Debt (ln) - Large Size	5,982	13.911	4.619	0.000	20.657	13.802	16.285
Total Bank Financed Debt (ln) - Medium Size	2,191	12.325	3.971	0.000	15.940	12.527	14.329
Total Bank Financed Debt (ln) - Small Size	3,018	11.283	3.873	0.000	15.503	11.323	13.341
# of Historical Financing Relations - Large Size	5,982	4.622	3.518	1.000	25.000	2.000	6.000
# of Historical Financing Relations - Medium Size	2,191	3.759	2.885	1.000	17.000	2.000	5.000
# of Historical Financing Relations - Small Size	3,018	2.868	2.165	1.000	15.000	1.000	4.000
Ratio Total Debt with Suppliers - Large Size[b]	5,982	0.270	0.195	0.000	0.984	0.120	0.377
Ratio Total Debt with Suppliers - Medium Size[b]	2,191	0.291	0.190	0.000	0.965	0.148	0.398
Ratio Total Debt with Suppliers - Small Size[b]	3,018	0.297	0.203	0.000	0.997	0.144	0.420
Ratio Total Debt with Banks - Large Size[b]	5,982	0.356	0.246	0.000	0.971	0.129	0.558
Ratio Total Debt with Banks - Medium Size[b]	2,191	0.303	0.221	0.000	0.988	0.105	0.480
Ratio Total Debt with Banks - Small Size[b]	3,018	0.276	0.210	0.000	0.929	0.094	0.425

Sample: 1998 – 2006. [a] Measured as a ratio to Total Assets. [b] Measured as a ratio to Total Liabilities. [c] A manufacturer's size is determined by the entry thresholds given by Law 590 of 2000. Small manufacturers are those who have a total level of assets lower than 15, 000 times Colombia's yearly minimum wage (ymw). Medium sized manufacturers are those who have a total level of assets between 15, 001 and 30, 000 times Colombia's ymw. Large sized manufacturers are those who have a total level of assets higher than 30, 001 times Colombia's ymw. See table 2 for a by year reference of the implied ymw in US dollars.

Table 3: **Per Year Export Sample Representation**

Year	% Number of Exporters in Sample	% Value of Total Exports in Sample
1998	37.16	63.92
1999	43.96	64.15
2000	41.61	66.81
2001	39.50	73.13
2002	39.37	73.30
2003	38.29	74.48
2004	35.11	75.06
2005	35.58	79.70
2006	34.63	79.09
Sample Avg.	38.36	72.18

Sample: 1998 – 2006

Table 5: **Credit Elasticity of Total Value of Exports**

Dependent Variable:	**(1)**	**(2)**	**(3)**	**(4)**
Total Value of Exports in *t* (ln)	**No IV**	**IV**	**IV**	**IV**
Total Bank Financed Debt in t (ln)	.008	.051	.059	.049
	(.003)□□	(.023)□□	(.026)□□	(.023)□□
Leverage Ratio in t-1	-.241	-.286	-.319	-.278
	(.199)	(.202)	(.227)	(.198)
Inverse Mills Ratio				.583
				(.611)
Observations	11,191	11,191	11,191	11,191
R^2	.887	.882	.91	.883
First Stage: Credit Supply in t		.743	.682	.743
First Stage: F-statistic		46.294	30.415	47.136
Test Instruments Selection Equation				800.798
P-value				0.000
Manufacturer Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	Yes
Sector-Year Fixed Effects	No	No	Yes	No

Sample: 1998 − 2006. Number of exporters: 2, 930

Table 7: **Credit Elasticity of Market Penetration**

Dependent Variable: **Market Penetration in *t* (ln)**[a]	**(1)** **No IV**	**(2)** **IV**	**(3)** **IV**	**(4)** **IV**
Total Bank Financed Debt in t (ln)	.006 (.003)□□	.027 (.020)	.032 (.024)	.026 (.020)
Leverage Ratio in t-1	-.174 (.164)	-.196 (.166)	-.217 (.186)	-.193 (.164)
Inverse Mills Ratio				.214 (.509)
Observations	11191	11191	11191	11191
R^2	.85	.848	.884	.848
First Stage: Credit Supply in t		.743	.682	.743
First Stage: F-statistic		46.294	30.415	47.136
Test Instruments Selection Equation				800.798
P-value				0.000
Manufacturer Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No	Yes
Sector-Year Fixed Effects	No	No	Yes	No

[a] Market Penetration is measured as the ln of a manufacturer's exports per destination. Sample: 1998 − 2006. Number of exporters: 2, 930. We only include manufacturers within economic sectors of Agriculture (1 − 5) and Manufacturing (15 − 39)

Table 8: **Credit Elasticity of Product Mix**

Panel A: Product Mix at 6 digits HS

Dependent Variable: Product Mix in t (ln)[a]	**(1)**	**(2)**	**(3)**	**(4)**
Total Bank Financed Debt in t (ln)	.004 (.002)**	.018 (.010)*	.016 (.010)	.018 (.010)*
Leverage Ratio in t-1	-.090 (.081)	-.105 (.085)	-.107 (.092)	-.104 (.085)
Inverse Mills Ratio				.080 (.284)
Observations	11,191	11,191	11,191	11,191
R^2	.838	.835	.874	.835
First Stage: Credit Supply in t		.743	.682	.743
First Stage: F-statistic		46.294	30.415	47.136
Test Instruments Selection Equation				800.798
P-value				0.000

Panel B: Product Mix at 8 digits HS

Dependent Variable: Product Mix in t (ln)[a]	**(1)**	**(2)**	**(3)**	**(4)**
Total Bank Financed Debt in t (ln)	.005 (.002)***	.019 (.010)*	.016 (.010)	.019 (.010)*
Leverage Ratio in t-1	-.066 (.088)	-.082 (.092)	-.089 (.098)	-.081 (.091)
Inverse Mills Ratio				.052 (.284)
Observations	11,191	11,191	11,191	11,191
R^2	.83	.827	.868	.827
First Stage: Credit Supply in t		.743	.682	.743
First Stage: F-statistic		46.294	30.415	47.136
Test Instruments Selection Equation				800.798
P-value				0.000

Panel C: Product Mix at 10 digits HS

Dependent Variable: Product Mix in t (ln)[a]	**(1)**	**(2)**	**(3)**	**(4)**
Total Bank Financed Debt in t (ln)	.005 (.002)***	.020 (.010)**	.015 (.010)	.020 (.010)**
Leverage Ratio in t-1	-.059 (.091)	-.075 (.095)	-.083 (.100)	-.074 (.094)
Inverse Mills Ratio				.126 (.280)
Observations	11,191	11,191	11,191	11,191
R^2	.828	.825	.867	.825
First Stage: Credit Supply in t		.743	.682	.743
First Stage: F-statistic		46.294	30.415	47.136
Test Instruments Selection Equation				800.798
P-value				0.000
Manufacturer Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	No	Yes
Sector-Year Fixed Effect	No	No	Yes	No

[a] Product Mix is measured as the ln of the head count of products exported, given the corresponding hs category. Sample: 1998 – 2006. Source: Authors' own calculations. Notes: All specifications cluster standard errors by industry classification. , and means significant at 1%, 5% and 10% respectively.

Table 9: **Credit Elasticity of Total Value of Exports by Size**[a]

Dependent Variable:	Manufacturer Size[a]			Manufacturer Size[a]		
	(1)	(2)	(3)	(4)	(5)	(6)
Total Value of Exports in t (ln)	Small					

Table 10: **Credit Elasticity of Market Reach by Size**

Dependent Variable:	**Manufacturer Size**[b]			**Manufacturer Size**[b]		
Market Reach in t (ln)[a]	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Small[c]	**Medium**[d]	**Large**[e]	**Small**[c]	**Medium**[d]	**Large**[e]
Total Bank Financed Debt in t (ln)[f]	.001	.041	.030	.002	.040	.030
	(.017)	(.016)□□	(.011)□□□	(.018)	(.016)□□	(.011)□□□
Leverage Ratio in t-1	-.181	-.080	-.058	-.192	-.058	-.052
	(.148)	(.175)	(.117)	(.151)	(.177)	(.121)
Inverse Mills Ratio				-.194	1.776	1.736
				(.268)	(1.658)	(1.488)
Observations	3,018	2,191	5,982	3,018	2,191	5,982
R^2	.848	.811	.853	.848	.812	.853
First Stage: Credit Supply in t	.693	.885	.665	.677	.884	.665
First Stage: F-statistic	14.285	23.276	25.421	13.452	23.024	25.235
Test Instruments Selection Equation				1195.897	38.01	13.334
P-value				0.000	0.000	.01
Manufacturer Fixed Effects	Yes	Yes	Yes	Yes Y	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

[a] A manufacturer's size is determined by the entry thresholds given by Law 590 of 2000 described in detailed in table 2.82Numb of

Table 11: **Credit Elasticity of Market Penetration by Size**

Dependent Variable:	**Manufacturer Size**[b]			**Manufacturer Size**[b]		
Market Penetration in t (ln)[a]	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Small[c]	**Medium**[d]	**Large**[e]	**Small**[c]	**Medium**[d]	**Large**[e]
Total Bank Financed Debt in t (ln)[f]	.079	.059	-.006	.082	.058	-.006
	(.035)□□	(.027)□□	(.026)	(.037)□□	(.026)□□	(.026)
Leverage Ratio in t-1	-.547	-.387	.180	-.576	-.362	.180
	(.335)	(.200)□	(.191)	(.321)□	(.201)□	(.192)
Inverse Mills Ratio				-.515	2.005	.062
				(.577)	(3.194)	(3.582)
Observations	3,018	2,191	5,982	3,018	2,191	5,982
R^2	.846	.798	.825	.844	.799	.825
First Stage: Credit Supply in t	.693	.885	.665	.677	.884	.665
First Stage: F-statistic	14.285	23.276	25.421	13.452	23.024	25.235
Test Instruments Selection Equation				1195.897	38.01	13.334
P-value				0.000	0.000	.01
Manufacturer Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

[a] A manufacturer's size is determined by the entry thresholds given by Law 590 of 2000 described in detailed in table 2. Number of exporters: 2, 930 distributed as follows: 5, 982 Large, 2, 191 Medium and 3, 018 Small. The database only includes manufacturers classified within economic sectors of Agriculture (1 − 5) and Manufacturing (15 − 39) as defined by the international standard industry classification, ISIC revision 3.1. Source: Authors' own calculations. Notes: New Bank Financing in *t* (ln) corresponds to the logarithm of the new bank financing obtained in *t*. Columns (2), (3) and (4) instrument a manufacturer's demand for bank credit with the total bank supply of banking credit net of a manufacturer's own credit supply. Column (4) includes a control for the sample selection bias of SS's database. Instruments for entry into the SS's database are obtained from the terms in office reported in table 4. All specifications cluster standard errors by industry classification. , and means significant at 1%, 5% and 10% respectively.

Table 12: **Credit Elasticity of Product Mix by Size**

Panel A. Product Mix - 6 **digits HS**

Dependent Variable:	**Manufacturer Size**[b]			**Manufacturer Size**[b]		
Product Mix in t (ln)[a]	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Small[c]	**Medium**[d]				