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Essays On Financial Constraints, Export, And Entrepreneur Gender In Latin America

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ESSAYS ON FINANCIAL CONSTRAINTS, EXPORT, AND ENTREPRENEUR GENDER IN LATIN AMERICA

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Dedication

For my mother.

For all the sacrifices you have made on my behalf.

ESSAYS ON FINANCIAL CONSTRAINTS, EXPORT, AND ENTREPRENEUR GENDER IN LATIN AMERICA

by

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Abstract

This research focuses on financial constraints faced by firms in Latin America and the Caribbean and their financing patterns. Unique firm level survey data from World Bank Enterprise Survey (WBES) is leveraged for this study. The sample used in this research consists of over 22,000 firms from 31 Latin American and Caribbean (LAC) countries for the period between 2006 and 2010.

First, this author empirically estimates the effect of financial constraints on a firm's export behavior in terms of probability to export and export intensity. The analysis shows that older, larger firms with a share of foreign ownership, and those having a line of credit and an overdraft facility are more likely to export than smaller, younger, domestically-owned firms that are financially constrained. However, exporting firms feel as if they are more financially constrained. But younger, larger firms with a share of foreign ownership and those having no line of credit or overdraft facility are found to export more of their products and services than their older competitors that have access to a line of credit or an overdraft facility.

Secondly, this research evaluates the effect of different financing patterns on a firm's probability to export and the export intensity. After controlling for individuality of national economies and firm-level variables that may affect probability of export participation, this research shows that firms have a higher likelihood to participate in exporting activity if they use a larger (smaller) share of formal bank financing (internal financing) to fund their working capital. Also informal financing is found to have a significantly positive effect on export participation.

Additional findings indicate that increase in export intensity is associated with an increase in bank financing and decrease in a share of supplier credit and/or customer advances. And post-

delivery payment is associated with an increase in likelihood to export but a decrease in export amount; while payment before delivery has a significantly positive effect on export intensity.

Finally, this research analyzes differences in financing patterns between female and male entrepreneurs and if they face different financial constraints. Results show that male and female business owners have similar perceptions concerning financial constraints faced by their respective firms. However, female business owners are more likely than male business owners to have lines of credit at financial institution. Although female entrepreneurs are also more likely to apply for loans, the average size of the loans they receive is significantly smaller than that for men. Furthermore, female entrepreneurs finance a smaller portion of their working capital using bank loans or financial institutions.

Based on this author's research of the topic, this study appears to provide the first concrete evidence in a cross-section, cross-country setting that financially constrained firms are less likely to export and it is the first paper in the existing literature to examine the effects on financing patterns on export. Moreover, this study seems to be the first to test gender differences in terms of the number of sources of financing and different financial constraints.

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Chapter 1. Introduction

The global economy is facing difficult times: while the US economy is still recovering from the financial crisis of 2007-2008, many European countries are struggling and in deep recession. So it is not surprising that the developing countries "will continue to be the main engine of the global economy and trade"[1]. The second largest developing region after Europe and Central Asia, is Latin American and Caribbean (LAC).

According to International Monetary Fund, LAC contributes 8% of the world GDP which makes it the 4th largest region (Figure 1.1 and Appendix Table A.1). Given the size of the LAC market, it is surprising that only a few finance studies have researched the region.

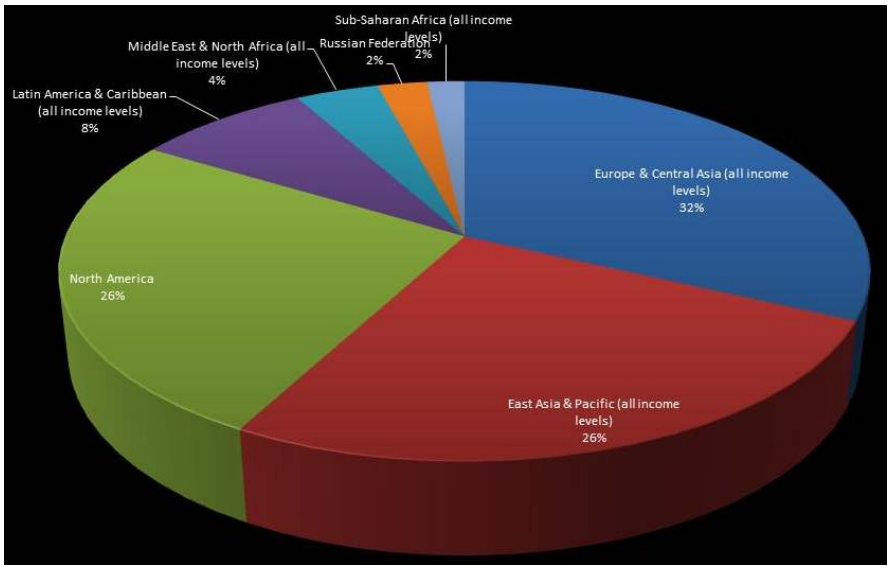

Figure 1.1. World GDP, 2013

The LAC has experienced an average of 5% economic growth over past years. It can be attributed to two factors: 1) its deepening engagement with Asia whose growing commodity demand supports the rise of the LAC economy, and 2) relatively low international interest rates.

[1] Latin America and the Caribbean in the World Economy, 2011-2012 briefing paper by United Nations ECLAC.

Experts predict no changes in either of these areas, so the LAC as a large contributor to the world trade is here to stay. Refer to Figure 1.2.

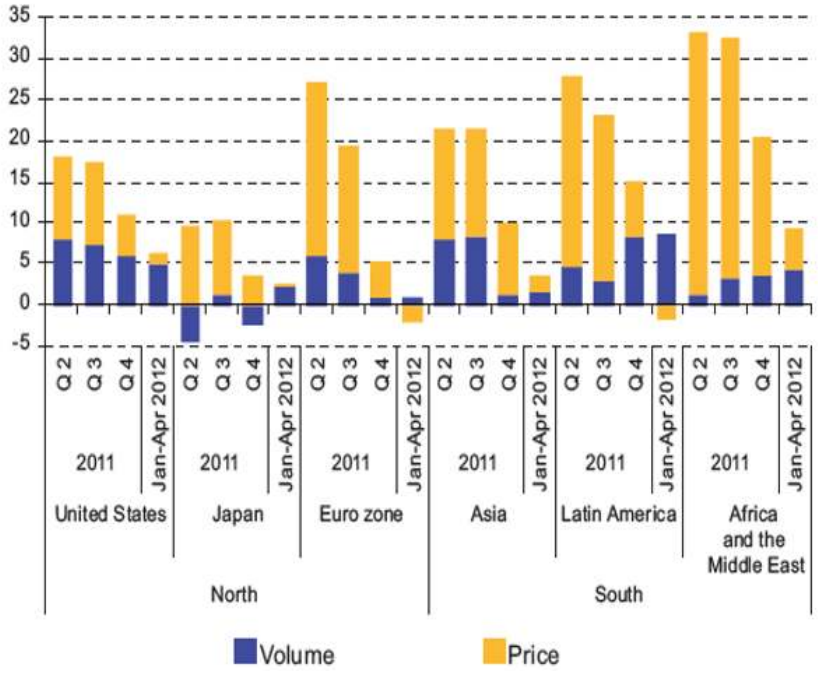

Figure 1.2. Countries and Regions of the World: Annual Export Growth, in %[2]

According to a United Nations report, export-related employment in LAC represents a significant and growing percentage of total employment (between 12% and 24%); consequently, export represents a large piece of the local economy. At the same time the World Bank reports that large firms in the LAC decreased their share of total employment. Most of it is attributed to the increased share of small firms[3]. This dissertation brings these two together by investigating the likelihood to export and the export intensity by focusing on small and medium firms in LAC.

[2] Source: Economic Commission for Latin America and the Caribbean (ECLAC) on the basis of Netherland Bureau of Economic Policy Analysis (CPB), World Trade Monitor.

[3] Assessing Private Sector Contributions to Job Creation: IFC Open Source Study, by World Bank Group

Chapter 2. Essay 1 - Financial Constraints and Firm Export in Latin American Countries

2.1. Introduction

The extant literature has established that financial constraints play an important role in various aspects of firm behavior, such as determining their investment in fixed capital, inventories, and R&D (Hubbard, 1998; Bond and Van Reenen, 2007). The literature also finds that firm credit or financial health is instrumental in its decision to enter into the exporting activity (Minetti and Zhu, 2011, Bellone, Musso, Nesta and Schiavo, 2010, Berman and Hericourt, 2010). Bernanke and Gertler (1990) and Clementi and Hopenhayn (2006) show that credit constraints reduce a firm's investment and growth. Export is a function of a firm's growth that requires large investments. Therefore, firms constrained by less credit tend to be more likely to export than their more constrained competitors (Muuls, 2008). This essay empirically estimates the effect of the financial constraints on LAC firms' export behavior.

When compared to selling to the domestic market, exporting involves higher entry costs. Exporting firms need to acquire information about foreign markets, customize products based on the local tastes, and establish distribution networks. Das et al. (2007) estimate that Colombian exporters experience average entry costs ranging from 344,000 to 430,000 U.S. dollars. As most of the entry costs must be paid up front, only firms in good financial health or having less financial constraints are able to meet these costs. These financial requirements are crucial constraints that dictate a firms' export activity.

As pointed out by Minetti and Zhu (2011), while a growing body of research formalized these arguments theoretically (Manova, 2010, and Chaney, 2005), the micro-level evidence on this issue remains scant possibly because of a dearth of data. This paper contributes to the general body

of knowledge by estimating the effect of the financial constraints on probability to export and export intensity in the LAC.

Unique firm level survey data from *World Bank Enterprise Survey (WBES)* is used in this research. The final sample consists of 22,259 unique firms from 31 LAC countries for the period between 2006 and 2010. The overall results suggest that older, larger firms with a share of foreign ownership, and those having a line of credit and an overdraft facility are more likely to export than smaller, younger, domestically-owned firms that are financially constrained. Despite having credit line and overdraft facility, exporting firms tend to feel financially constrained which may be a result of high exporting costs. However, none of the considered financial constraints have a significant effect on likelihood to export among the large firms. Also the findings of this study suggest that younger, larger firms with a share of foreign ownership, and those having no line of credit or overdraft facility export more of their products than their older competitors that have access to a line of credit or an overdraft facility.

This research contributes to the existing literature in a number of ways. First, in the existing literature related to firm financial constraints and export behavior, LAC countries have rarely been examined. The growing size of exporting market for LAC firms provides an excellent setting to investigate firm level issues related to exporting activity and financial constraints. Second, this study uses new financial constraint variables including perceptions of survey respondents. The responses are a firms' direct answer to the survey question related to its financial constraints. This avoids having to imperfectly infer financial constraints from financial statements of firms as in Fazzari et al. (1988), and Kaplan and Zingales (1997). Another key contribution of this research is that it provides the first evidence in a cross-section, cross-country setting that a firm's credit constraints increase the volume of foreign sales.

The rest of the paper is organized as follows: Section 2.2 reviews the prior literature, Section 2.3 describes the data and key variables, Section 2.4 defines the methodology and presents the results, and Section 2.5 offers conclusions.

2.2. Literature review

This paper is based on the theories related to the effects of credit imperfections on firm's investment, growth, and export (Bernanke and Gertler, 1990, Clementi and Hopenhayn, 2006, Antràs and Caballero, 2009, Manova, 2010; and Chaney, 2005). Bernanke and Gertler (1990) and Clementi and Hopenhayn (2006) show that credit constraints reduce firm's investment and growth. Export is a product of firm's growth that requires large investments. Consequently, less credit constrained firms tend to be more likely to export than their highly constrained competitors (Muuls, 2008). The trade model proposed by Melitz (2003) suggests two sides to the export and financing story that point out importance of firms' liquidity. First, exporting is associated with large fixed costs that are to be paid up front. Thus, a firm considering entering exporting market needs to be liquid. Second, as a firm cannot guarantee returns on foreign sales to its investors, a financier is less likely to support a firm in this type of project.

A number of finance papers examine the financial or credit constraints for exporting firms. Minetti and Zhu (2011) estimate the impact of credit rationing on firms' exporting decisions and foreign sales for 4,680 Italian firms for the year 2000. They find that the probability of exporting is 39% lower for financially constrained or rationed firms and that such constraints/rationing reduces foreign sales by more than 38%. Bellone et al. (2010) analyze the association between financial factors and firm export behavior (export participation and export intensity) for 25,000 French manufacturing enterprises over the period 1993–2005 and find that firms starting to export

display a significant financial advantage compared to their non-exporting counterparts, i.e. limited access to external financial funds may prevent firms from selling their products abroad.

Berman and Hericourt (2010) also examine how financial factors affect both firms' export decisions and the amount exported and investigate both the determinants of firm-level exporting behavior and the impact of financial development on trade for 5,000 firms in 9 developing and emerging economies over the period 1998-2004. They find that there is significant impact of a firms' access to finance on their entry decision into the export market. Muuls (2008) analyzes the interaction between credit constraints and exporting behavior for 8,926 Belgian manufacturing firms over the period 1999-2005. The study finds that firms are more likely to be exporting if they enjoy higher productivity levels and lower credit constraints. He also concludes that credit constraints are important in determining the extensive but not the intensive margin of trade.

Based on the existing literature, the first hypothesis of this research is formulated as following:

HYPOTHESIS 1: *Less financially constrained firms are more likely to enter into the exporting activity when compared to the financially constrained firms.*

The extant literature have drawn different conclusions about examining the association between a firm's credit constraints and its export intensity. According to Manova (2010), credit constraints should decrease export volume. However, Muuls (2008) and Chaney (2005) find no significant effect of credit constraints on export intensity. Exporting firms that have fewer financial constraints should be able to export more in terms of volume than the exporting firms having more financial constraints. This author proposes the second hypothesis for this study as follows:

HYPOTHESIS 2: Less financially constrained firms are more likely to export more than their financially constrained exporting counterparts.

2.3. Data and variables

Data from the *World Bank Enterprise Survey (WBES),* conducted in 2006 and 2010 across 31 LAC countries, is used in this study. The WBES database includes firms across multiple industries (such as manufacturing, services, agriculture, construction, and others) and of different sizes, with majority being small and middle size (refer to section 2.3.2.2.1 of this paper for more information regarding firm size.). The survey was conducted among business owners and top-management with a goal to evaluate obstacles in business environment around the globe. The survey questions are consistent across countries and years that allow us to conduct cross-country analysis. WBES provides qualitative and quantitative measures of firm characteristics, including evaluation of the constraints that a firm faces on a daily basis. The database also contains information on export participation status and export intensity, ownership concentration and foreign ownership, and limited measures of firm performance such as multiple years of historical data on sales and employment.

The final sample includes 22,259 firms from 31 LAC countries of which: 67.61% are micro and small (less than 50 employees), 27.9% are medium (50-499 employees), and only 4.49% are large (>499 employees). Some of the countries are presented by two subsamples from different survey years[4]; however, others have only one year of survey data available[5] (refer to Appendix Table A.2 for the complete list of countries and year of survey). The dataset includes firms from 33 industries classified by two-digit ISIC codes (refer to Appendix Table A.3). The final sample includes all firms from the database that have non-missing value for the exporter identifier (refer

[4] Argentina, Bolivia, Chile, Columbia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela

[5] Antigua and Barbuda, Bahamas, Barbados, Belize, Brazil, Costa Rica, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, and Trinidad and Tobago

to section 2.3.1 for full description). The relevant key variables are described in the following subsections.

2.3.1. Dependent variables

Two dependent variables were built based on the following survey question:

"In fiscal year, what percent of this establishment's sales were":

a. National Sales
b. Indirect Export
c. Direct Export

First, a dummy variable *Exporter* was constructed to measure export participation of a firm. Its value equals to 1 if a firm has less that 100% of total sales in national sales and/or indirect export (using WBES original data items: d3a and d3b), and 0 otherwise. Then a value of percent of total sales from direct export is used as a measure of export intensity – *Exporter2* (using WBES original data item: '*d3c'*).

Out of 22,259 firms in the sample, 21.85% (4,863) firms export some part of their products abroad (a part of their total sales is from direct export) (Table 2.1). However, distribution of exporting firms varies significantly among the countries: with Argentina setting a higher boundary in 2010 at 42.4% and with low 3.64% in Venezuela in 2006 (Appendix Table A.2).

2.3.2. Explanatory variables

2.3.2.1. Financial constraints

Following Ayyagari, Demirguc-Kunt, and Maksimovic (2010), four proxies are used to measure financial constraints faced by a firm. Each one of them is based on firm's direct answer to a question about different aspects of financial limitations.

2.3.2.1.1. Finance

The variable, Finance, is estimated using firm's answer to the following survey question (using WBES original data item: k.30):

> *"Is access to financing, which includes availability and cost [interest rates, fees and collateral requirements], No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?"*

The WBES scores the financing obstacles on the following scale: No obstacle=0, Minor obstacle =1, Moderate obstacle=2, Major obstacle =3, and Very severe obstacle=4.

This variable represents a subjective opinion of the respondent, his personal perception about firm's financing obstacles. And in this sample, an average firm sees financing obstacle as moderate: with mean 1.63 and median 2 (Table 2.1).

2.3.2.1.2. Finance Dummy

Finance dummy is constructed based on the Finance variable: Finance dummy equals 1 if a respondent feels that financing is an obstacle for his firm (they answered 1, 2, 3, or 4 to access to financing question of the survey (using WBES original data item: k.30)), and 0 otherwise.

In the total sample over 72.8% find themselves financially constrained to some extent. (Table 2.1)

2.3.2.1.3. Credit Line

Credit Line, another credit constraint proxy, is a dummy variable that takes a value of 1 if a respondent answered positively to the following question (using WBES original data item: k.8):

> *"At this time, does this establishment have a line of credit or loan from a financial institution?"*

The dummy takes a value of 0 if the firm states that it has no line of credit or loan from a bank, and 1 otherwise. In the sample, 56% of firms stated that they have a line of credit or a loan. (Table 2.1)

2.3.2.1.4. Overdraft

Overdraft is a dummy variable, and it is associated with the following WBES question (using WBES original data item: k.7):

"At this time, does this establishment have an overdraft facility?"

It takes the value of 1 if the firm states that it has a bank overdraft facility, and 0 otherwise. Almost 65% of firms in the sample have an overdraft facility. (Table 2.1)

2.3.2.2. Firm characteristics

2.3.2.2.1. Firm size

The extant literature discussed in the earlier section suggests that large firms are more likely to export than small firms. Large firms are also more likely to be less financially constrained than small firms (Schiffer and Weder, 2001, Beck, Demirgüç-Kunt, and Maksimovic, 2006, Beck et al., 2005). Beck et al. (2005) further showed that when growth obstacles are lowered, small firms benefit disproportionally more than large firms. Therefore, in the analysis of the effect of financial constraints on export participation and intensity, this author controls for firm size using a logarithm of the total sales at the end of the year previous to the year of the survey (using WBES original data item: d.2) with e as a logarithm base. The firms in this sample vary significantly in their total annual sales: the value of *Log Sales* ranges from 6.9 to 33.8 (approximately from 1000 to 5e+14). Refer to Table 2.1.

This study also uses the number of employees (WBES original data item: l.1) as an alternative firm size variable in the analysis and the results were consistent[6]. However, the number of employees is used to split the total sample into subsamples for additional analysis. WBES defines firm size category as follows: micro and small firms are those with 1-4 and 5-50 employees respectively; medium 51-499 employees; and large >499 employees.

2.3.2.2.2. Firm age

Evans (1987) and Dunne, Roberts, and Samuelson (1988) find that younger firms grow significantly faster than older firms. Anderson and Eshima (2011) find that younger firms can make up their lack of established routines and processes with being more flexible and reactive in the market places than older firms. Beck et al. (2006) find that older firms experience less financing obstacles. Therefore, this author expects that older, established LAC firms experience lower level of financial constraints than new, younger firms. They are also more likely to export than new firms. Firm age is controlled for by taking a logarithm of e base from subtracting the firm's founding year (WBES original data item: b.5) from the survey year. In the sample, the average firm has been in business for about 17 years and the oldest firm is 340 years of age. Refer to Table 2.1.

2.3.2.2.3. Ownership concentration

Extant empirical evidence on the relation between ownership concentration and firm performance has been mixed. Demsetz and Lehn (1985) and McConnell and Servaes (1990) find a nonlinear, U-shaped relation between ownership concentration and firm performance. Morck, Shleifer and Vishny (1988) and Wruck (1989), conversely, find a positive relation between

[6] Not reported here. Can be requested from the author.

ownership concentration and firm performance. Therefore, this study controls for ownership concentration using the fraction of the shares owned by the largest shareholder as ownership concentration (WBES original data item: b.3). As reported in Table 2.1, the average firm in the sample has highly concentrated ownership, with around 70 percent of the firm owned by the largest owner(s).

2.3.2.2.4. Foreign ownership

According to Manova et al. (2010) and Li and Yu (2009), foreign-owned firms perform better in export than private domestic firms. They are also less financially constrained because they can get access to additional internal funding from their foreign parent company. Fishman and Svensson (2007) suggest that firms with foreign ownership possess better access to markets and technical expertise, resulting in better financial performance than pure domestic firms. Beck et al. (2005) find that foreign ownership has largely positive effect on firm performance. Beck et al. (2006) showed that firms with foreign ownership face less financing obstacles than domestically-owned. Hence, this author controls for foreign ownership using a dummy variable, *Foreign*, to indicate if any foreign company or individual has a financial stake in the ownership of the firm (WBES original data item: b2b). As presented in Table 2.1, in the sample about 11.5% of all firms have foreign ownership stakes.

2.3.2.2.5. Industry effects, year effects, and country fixed effects

Like all cross-section and cross-country studies, both industry effects and country effects are controlled in the analysis of this study. Using the two-digit ISIC codes assigned to each firm in the WBES database, industry dummies were created to control for industry effects. Since the surveys were conducted in 2006 and in 2010, a dummy variable *Year dummy* was used to control for year effects.

Macroeconomic factors also influence firm level performance (Beck et al., 2005) and consequently the decision to export. Therefore, this paper controls for country level financial market development (credit to private sector by domestic banks scaled by GDP), *Rule of Law*, *GDP*, *GDP per capita*, *Inflation*, and *Corrupt* (Corruption Perception Index - CPI) using data from the *World Development Indicator (WDI)* database. According to the WDI, *Rule of Law* "reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, as well as likelihood of crime and violence". According to Transparency International, CPI reflects how corrupt country's public sectors are seen to be by the informed views of analysts, businesspeople and experts.

Table 2.1 shows that all these macro variables vary widely across the LAC. For example, the mean *Inflation* is 6.63% but its values range from the low of 1.25% to the high of 27.08%. Because sales values are reported in local currencies, inflation must be controlled for. Regression results are checked for robustness by controlling country fixed effects to address other unobservable country-specific factors that also affect a firm's financial constraints and performance.

2.4. Methodology and results

This section defines the steps of the analysis and presents empirical results of this study. The approach consists of two parts: 1) exploration of differences in financial constraints and characteristics of exporting and non-exporting firms, and 2) measuring of the effect of financial constraints and firm characteristics on the quantity of their export (export intensity). Each is described in the following subsections.

Table 2.1. Summary Statistics

N is the number of firms in the sample, except for country level macro variables which is the number of country level surveys studied. Detailed variable definitions and sources are given in Table A.6 in the Appendix.

Variable	N	Mean	Median	Std. Dev.	Min	Max
Exporter	22,259	0.2185	0	0.4132	0	1
Exporter2	4,863	31.9790	20	31.5318	1	100
Finance	22,034	1.6294	2	1.2996	0	4
Finance dummy	22,034	0.7288	1	0.4446	0	1
Creditline	22,082	0.5594	1	0.4965	0	1
Overdraft	21,553	0.6450	1	0.4785	0	1
Log sales	22,284	16.7165	16.2134	3.3509	6.9078	33.8456
# of Employees	22,242	119.7343	25	536.8802	1	21955
Log age	22,063	2.8497	2.8904	0.8321	0	5.8290
Ownership	18,545	69.8144	70	27.2706	0	100
Foreign	22,284	0.1143	0	0.3181	0	1
Rule of Law	46	-0.2735	-0.5101	0.7634	-1.5646	1.2755
pc2gdp	46	42.2595	35.5809	25.4596	11.2456	110.856
Per capita	46	4667.537	3982.311	3714.994	820.7829	20750.78
Inflation	46	6.6303	5.6912	4.4196	1.2520	27.0809
GDP	46	8.75e+10	1.51e+10	1.82e+10	4.07e+08	8.14e+11
Corrupt	46	3.8957	3.45	1.6051	2.1	7.15

2.4.1. Correlation matrix and Univariate test

The correlation matrix of the key variables is presented in Table 2.2. Most of the correlation coefficients are significant. The most important are the correlation coefficients of the main variables of interest *Exporter* and *Exporter2*. *Exporter* is significantly and positively correlated with the two financial constraint proxies: *Credit Line* and *Overdraft*. This supports the first hypothesis that less constrained firms are more likely to export. Furthermore, consistent with the previous literature *Exporter* has a significantly positive correlation with *Log Sales, Log Age,* and *Foreign*. This suggests that larger firms are more likely to export as well as older firms. Firms with a share of foreign ownership are more likely to become exporters. *Exporter* is significantly and negatively correlated with *Ownership*. Suggesting that less concentrated ownership has a positive effect of firm's likelihood to export.

Table 2.2. Correlation matrix of Variables

The table presents the Pearson correlation coefficients among key variables. Detailed variable definitions and sources are given in Table A.6 in the Appendix.

	Exporter	**Exporter2**	**Finance**	**Finance dummy**	**Creditline**	**Overdraft**	**Log sales**	**Log age**	**Owner ship**
Exporter2	0.6673***								
Finance	-0.0070	-0.0092							
Finance dummy	0.0042	-0.0089	0.7469***						
Creditline	0.1336***	0.0600***	0.0699***	0.1031***					
Overdraft	0.1268***	0.0565***	-0.0555***	-0.0074	0.3407***				
Log sales	0.2017***	0.1227***	-0.1158***	-0.0654***	0.2095***	0.2504***			
Log age	0.1451***	0.0341***	-0.0627***	-0.0479***	0.1008***	0.1085***	0.1607***		
Ownership	-0.0376***	-0.0170**	-0.0294***	-0.0432***	-0.0593***	- 0.0984***	-0.1702***	-0.0680***	
Foreign	0.2132***	0.2111***	-0.0793***	-0.0615***	-0.0120*	0.0618***	0.1536***	0.0051	0.0094

*, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

The correlation between *Exporter* and subjective measurements of financial constraints (*Finance* and *Finance dummy*) are insignificant.

Exporter2 is significantly and positively correlated with *Credit Line*, *Overdraft*, *Log Sales*, *Log Age*, and *Foreign*. *Exporter2* is also significantly and negatively correlated with *Ownership*. There is no significant correlation between Export intensity (*Exporter2*) and Access to finance (*Finance* and *Finance dummy*).

Table 2.3 reports results of the univariate tests for the key variables to illustrate the differences between exporting and non-exporting firms in this sample. T-test and non-parametric test are used to test differences in means and medians, respectively. The results show that means and medians are significantly different among two subsamples for all of the key variables, other than *Finance* and *Finance dummy*. Consistent with the previous literature, on average exporting firms are bigger, older, with a higher concentration of foreign ownership than non-exporting. However, they seem to have less concentrated ownership.

Table 2.3. Univariate Tests for Exporting versus Non-Exporting firms

Table 2.3 presents univariate tests for the differences of relevant variables between exporting and non-exporting firms. *N* is the number of firms in the sample. A firm is considered Non-exporting if 100% of its Total Sales are from national sales and/or indirect export. A firm is considered Exporting if a part of its Total Sales is from Direct export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. T-tests and non-parametric tests are used to test mean and median differences, respectively. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

	Non-Exporting (0)			**Exporting (1)**			**Difference (1-0)**	
	N	**Mean**	**Median**	**N**	**Mean**	**Median**	**Mean**	**Median**
Finance	17,184	1.6345	2	4,822	1.6124	2	-0.0221	0**
Finance dummy	17,184	0.7279	1	4,822	0.7325	1	0.0045	0**
Creditline	17,224	0.5245	1	4,829	0.6848	1	0.1603***	0***
Overdraft	16,722	0.6126	1	4,803	0.7683	1	0.1457***	0***
Log sales	17,397	16.3594	15.83	4,862	17.9943	17.5	1.6351***	1.67***
Log age	17,196	2.7857	2.83	4,845	3.0772	3.14	0.2916***	0.31***
Ownership	14,097	70.3880	70	4,433	67.9871	66	-2.4041***	-4***
Foreign	17,397	0.0782	0	4,862	0.2423	0	0.1641***	0***

The main variables of interest, financial constraints, show that exporting is associated with having a loan or a line of credit, and an overdraft facility, which is consistent with the first hypothesis of this research. As mentioned earlier, *Finance and Finance dummy*, the most general financial constraint proxies, don't seem to vary significantly across two subsamples. Only the difference of medians turned out to be significant at 5% level.

In Table 2.4, three subsamples arranged by their size (micro and small, medium, and large) are compared using univariate tests to demonstrate their differences. Once again, t-test and non-parametric test are used to compare their means and medians. All three pairs show significant difference in means and medians of subsamples. As expected, micro and small firms are least likely to export – only 12.53% of a sample (1885 firms); while 38.65% (2400 firms) of medium firms and 57.7% (577 firms) of large firms are exporters. At the same time, small and micro firms feel more financially constrained (variables *Finance* and *Finance dummy*), followed by medium firms. Among large firms, over 84.5% have overdraft facility (*Overdraft*) and over 78% claim to have a line of credit (*Creditline*). Micro and small firms have the lowest rates in both categories (58.6% and 49.3%, respectively) and are characterized by higher ownership concentration and lower foreign owner present.

2.4.2. The extensive margin of export

In this section this author examines effects that different financial constraints have on the probability to export, *i.e.* the extensive margin of export. The following regression model was tested to identify the most important variables that affect export participation of a firm:

Table 2.4. Univariate Tests for Firm Size

Table 2.4 presents univariate test of key variables across subsamples of firms of different size: micro and small are with <50 employees, medium firms are defined as having 50-499 FTEs, and any firm with more than 499 employees is categorized as large. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *N* is the number of firms in the sample.

	Micro and Small (1)			**Medium (2)**			**Large (3)**			**Difference (1-2)**		**Difference (2-3)**		**Difference (1-3)**	
	N	**Mean**	**Med**	**N**	**Mean**	**Med**	**N**	**Mean**	**Med**	**Mean**	**Med**	**Mean**	**Med**	**Mean**	**Med**
Exporter	15,049	0.1253	0	6,210	0.3865	0	1,000	0.5770	1	-0.2612***	0***	-0.1905***	-1***	-0.4517***	-1***
Exporter2	1,886	31.2158	0	2,400	31.2729	0	1,000	37.4108	5	-0.0571	0*	-6.1378***	-5*	-6.1949***	-5***
Finance	14,864	1.7101	2	6,173	1.4887	1	997	1.2979	1	0.2214***	1***	0.1908***	0***	0.4122***	1***
Finance dummy	14,864	0.7440	1	6,173	0.7052	1	997	0.6479	1	0.0388***	0**	0.0572***	0**	0.0961***	0***
Creditline	14,935	0.4928	0	6,150	0.6852	1	997	0.7813	1	-0.1924***	-1***	0.0961***	0**	-0.2885***	-1**
Overdraft	14,481	0.5855	1	6,086	0.7540	1	986	0.8458	1	-0.1686***	0**	-0.0918***	0**	-0.2604***	0**
Log sales	15,064	15.7858	15.07	6,216	18.3999	17.82	1,004	20.2592	19.76	-2.6141***	-2.75***	-1.8592***	-1.94***	-4.4734***	-4.69***
Log age	14,925	2.7108	2.77	6,143	3.1048	3.18	995	3.3578	3.50	-0.3941***	-0.41***	-0.2529***	-0.32***	-0.6470***	-0.73***
Ownership	12,047	71.4847	75	5,593	66.4595	60	905	68.3138	70	5.0252***	15***	-1.8543*	-10**	3.1709***	5
Foreign	15,064	0.0627	0	6,216	0.1988	0	1,004	0.3636	0	-0.1361***	0***	-0.1647***	0***	-0.3008***	0***

*, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

$$Exporter = \beta_0 + \beta_1 Financial\ constraint + \beta_2 Log\ Sales + \beta_3 Log\ Age + \beta_4 Ownership + \beta_5 Foreign + \beta_6 Rule\ of\ Law + \beta_7 PC2GDP + \beta_8 Year\ dummy + Macro\ Variables + Industry\ dummies + Country\ dummies + \varepsilon \quad (2.1)$$

where the main explanatory variable, *Financial constraint*, is one of the following *Finance*, *Finance dummy*, *Creditline*, or *Overdraft*. According to the first hypothesis, financially constrained firms are less likely to export. Therefore, this researcher expects coefficients of objective financial constraints (*Creditline* and *Overdraft*) to be positive and significant. Following Angrist (2001) who argues that Linear Probability Model is just as good as Ordered Probit, equation 2.1 was estimated using LPM and results are presented in Tables 2.5.1 through 2.5.4. As a robustness test, this regression was tested using Logit, and the results are presented in Tables 2.6.1 through 2.6.4.

Table 2.5.1 presents the output of these four regressions for the full sample based on the linear probability model. In all four cases, *Log Sales*, *Log Age*, *Foreign,* and *Rule of Law* are significantly positive at 1%. These results suggest that older, larger firms with a share of foreign ownership in the countries with stronger governance performance are more likely to export their products and services. These results are consistent with the previous literature. *Creditline* and *Overdraft*, constraint proxies, are significantly positive at 1%, as firms which have loans and/or lines of credit and overdraft facilities are more likely to enter exporting market. This conclusion is consistent with previous literature (Manova, 2010, Chaney, 2005, Minetti and Zhu, 2011) where less credit constrained firms were found to be more likely to export, and supports the first hypothesis of this study.

However, the firms that feel more financially constrained (*Finance* and *Finance dummy* are significantly positive) tend to be more likely to export. This may seem counterintuitive, but

since these variables represent personal perception these results can be associated with the fact that due to the higher financial demands exporting firms may feel more constrained. However, it is important to note that coefficients for subjective financial constraints are significantly smaller than coefficients of *Creditline* and *Overdraft*, suggesting that objective measures of financial constraints have a significantly larger economic effect on firm's likelihood to export.

This analysis is repeated on subsamples to test if any of the above mentioned effects are due to specific firm group size. Table 2.5.2 presents results for the micro and small firms. Results are consistent with the overall sample, with the exception of Log Age: age loses its significance because most firms in this subsample are young.

Table 2.5.3 illustrates the likelihood to export by medium firms is dependent on the financial constraints and other variables. Firms in this subsample still strongly depend on credit line to support their exporting investments; however, overdraft facilities don't have any significant effect.

Results for a subsample of large firms are consistent with the expectations: neither of considered financial constraint proxies significantly affects export likelihood of a large firm. (Table 2.5.4) Large firms have a lot more access to different financial sources to support their large projects (such as exporting).

So the results reported in Table 2.5.1 are mostly reflective of the SMEs which is consistent with previous research from single country studies (Manova, 2010, Muuls, 2008, Minetti and Zhu, 2011). As a robustness check to LPM, the regression was tested using logit analysis, the results turned out to be consistent with LPM. Refer to Tables 2.6.1, 2.6.2, 2.6.3, 2.6.4.

Table 2.5.1. Export participation: LPM – Full Sample

Results of the full sample analysis. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-0.9795***	-0.9802***	-0.7563***	-0.8089***
	0.0000	0.0000	0.0000	0.0000
Finance	0.0042*			
	0.0630			
Finance dummy		0.0127**		
		0.0480		
Creditline			0.0314***	
			0.0000	
Overdraft				0.0210***
				0.0020
Log sales	0.0654***	0.0653***	0.0632***	0.640***
	0.0000	0.0000	0.0000	0.0000
Log age	0.0173***	0.0173***	0.0171***	0.0168***
	0.0000	0.0000	0.0000	0.0000
Ownership	0.0000	0.0000	0.0000	0.0000
	0.8840	0.8620	0.8410	0.7130
Foreign	0.1421***	0.1422***	0.1461***	0.1400***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.1726***	0.1761***	0.1884***	0.1825***
	0.0040	0.0030	0.0020	0.0020
pc2gdp	-0.0027	-0.0027	-0.0027	-0.0027
	0.1320	0.1250	0.1250	0.1310
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Adj R-sqr	0.2375	0.2375	0.2397	0.2380
N	18,166	18166	18,241	18,145

Table 2.5.2. Export participation: LPM – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-0.7597***	-0.7634***	-0.7431***	-0.7435***
	0.0010	0.0010	0.0030	0.0020
Finance	0.0027			
	0.2480			
Finance dummy		0.0134*		
		0.0550		
Creditline			0.0201***	
			0.0020	
Overdraft				0.0254***
				0.0000
Log sales	0.0416***	0.4149***	0.0397***	0.0396***
	0.0000	0.0000	0.0000	0.0000
Log age	0.0023	0.0024	0.0024	0.0017
	0.5570	0.5380	0.5330	0.6540
Ownership	-0.0001	-0.0000	-0.0000	0.0000
	0.7160	0.7450	0.8530	0.9990
Foreign	0.1234***	0.1237***	0.1251***	0.12225***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.1205*	0.1232*	0.1358**	0.1310**
	0.0690	0.0630	0.0400	0.0480
pc2gdp	-0.0025	-0.0025	-0.0027	-0.0025
	0.2290	0.2170	0.1870	0.2200
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Adj R-sqr	0.1323	0.1325	0.1313	0.1321
N	11,792	11,792	11,875	11,786

Table 2.5.3. Export participation: LPM – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-1.3751***	-1.3567***	-0.9566**	-1.3632***
	0.0010	0.0010	0.0320	0.0010
Finance	0.0148***			
	0.0030			
Finance dummy		0.0327**		
		0.0140		
Creditline			0.0519***	
			0.0000	
Overdraft				0.0140
				0.3690
Log sales	0.0588***	0.0581***	0.0550***	0.0559***
	0.0000	0.0000	0.0000	0.0000
Log age	0.0261***	0.0257***	0.0241***	0.0252***
	0.0010	0.0010	0.0020	0.0020
Ownership	0.0000	0.0000	0.0000	0.0000
	0.9120	0.9250	0.8940	0.9940
Foreign	0.1373***	0.1366***	0.1425***	0.1323***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.1212	0.1275	0.1443	0.1336
	0.3550	0.3300	0.2690	0.3070
pc2gdp	-0.0014	-0.0015	-0.0015	-0.0015
	0.6960	0.6800	0.6880	0.6720
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Adj R-sqr	0.2169	0.2165	0.2205	0.2164
N	5,484	5,484	5,474	5,469

Table 2.5.4. Export participation: LPM – Large firms

Results of the analysis of a subsample of large (>499 employees) firms. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-0.9142	-0.8948	-0.8256	-1.0527
	0.3910	0.4020	0.4330	0.3250
Finance	-0.0137			
	0.2650			
Finance dummy		-0.0316		
		0.2900		
Creditline			0.0208	
			0.5760	
Overdraft				-0.0451
				0.2990
Log sales	0.0230***	0.0233***	0.0240***	0.0249***
	0.0080	0.0070	0.0050	0.0040
Log age	0.0360*	0.0366**	0.0367**	0.0358*
	0.0530	0.0500	0.0480	0.0530
Ownership	0.0003	0.0002	0.0003	0.0002
	0.6150	0.6300	0.6160	0.6860
Foreign	0.0681**	0.0684**	0.0730**	0.0719**
	0.0260	0.0250	0.0170	0.0180
Rule of Law	0.7557**	0.7422**	0.7513**	0.7863**
	0.0190	0.0210	0.0180	0.0140
pc2gdp	-0.0153	-0.0150	-0.0149	-0.0169*
	0.1040	0.1110	0.1100	0.0720
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Adj R-sqr	0.3556	0.3556	0.3579	0.3598
N	890	890	892	890

Table 2.6.1. Export participation: A Logit Analysis – Full Sample

Results of the full sample analysis. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-13.1097***	-13.1103***	-12.7475***	-13.1099***
	0.0000	0.0000	0.0000	0.0000
Finance	0.0469***			
	0.0050			
Finance dummy		0.1332***		
		0.0050		
Creditline			0.2276***	
			0.0000	
Overdraft				0.1823***
				0.0000
Log sales	0.4981***	0.4965***	0.4820***	0.4846***
	0.0000	0.0000	0.0000	0.0000
Log age	0.0937***	0.0937***	0.0908***	0.0861***
	0.0010	0.0010	0.0010	0.0020
Ownership	-0.0012	-0.0012	-0.0011	-0.0010
	0.1290	0.1390	0.1760	0.2130
Foreign	0.7012***	0.7015***	0.7294***	0.6856***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	1.0565**	1.0910**	1.2406***	1.1603**
	0.0240	0.0200	0.0080	0.0130
pc2gdp	-0.0188	-0.0192	-0.0206	-0.0199
	0.1670	0.1570	0.1280	0.1420
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Likelihood ratio	5030.38	5030.32	5094.77	5033.27
Log Likelihood	-7516.6087	-7516.6426	-7521.1572	-7510.5188
Pseudo R2	0.2507	0.2507	0.2530	0.2510
N	18,166	18,166	18,241	18,145

Table 2.6.2. Export participation: A Logit Analysis – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-13.4087***	-13.4587***	-13.0543***	-13.2590***
	0.0000	0.0000	0.0000	0.0000
Finance	0.0324			
	0.1660			
Finance dummy		0.1509**		
		0.0350		
Creditline			0.1747***	
			0.0060	
Overdraft				0.2401***
				0.0010
Log sales	0.4846***	0.4838***	0.4672***	0.4651***
	0.0000	0.0000	0.0000	0.0000
Log age	0.0204	0.0221	0.0199	0.0121
	0.5910	0.5620	0.5990	0.7490
Ownership	-0.0015	-0.0014	-0.0012	-0.0011
	0.2010	0.2160	0.2880	0.3600
Foreign	0.7950***	0.7992***	0.8099***	0.7841***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.6872	0.7110	0.8756	0.8357
	0.3160	0.2990	0.2020	0.2240
pc2gdp	-0.0174	-0.0180	-0.0204	-0.0196
	0.3930	0.3770	0.3170	0.3380
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Likelihood ratio	1725.17	1727.76	1720.74	1717.14
Log Likelihood	-3895.3726	-3894.0749	-3913.5097	-3894.5614
Pseudo R2	0.1813	0.1816	0.1802	0.1806
N	11,676	11,676	11,757	11,668

Table 2.6.3. Export participation: A Logit Analysis – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-7.7440***	-7.5438***	-7.0644***	-7.4836***
	0.0010	0.0010	0.0020	0.0010
Finance	0.0855***			
	0.0010			
Finance dummy		0.1816**		
		0.0120		
Creditline			0.2971***	
			0.0000	
Overdraft				0.0943
				0.2650
Log sales	0.3445***	0.3394***	0.3228***	0.3262***
	0.0000	0.0000	0.0000	0.0000
Log age	0.1348***	0.1318***	0.1249***	0.1286***
	0.0020	0.0020	0.0040	0.0030
Ownership	0.0002	0.0002	0.0003	0.0001
	0.8690	0.8890	0.8260	0.9430
Foreign	0.7108***	0.7064***	0.7426***	0.6835***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.7004	0.7354	0.8694	0.7844
	0.3340	0.3100	0.2300	0.2770
pc2gdp	-0.0119	-0.0120	-0.0130	-0.0125
	0.5580	0.5530	0.5220	0.5340
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Likelihood ratio	1444.99	1441.15	1465.82	1435.22
Log Likelihood	-2972.4792	-2974.3946	-2960.8233	-2970.0282
Pseudo R2	0.1955	0.1950	0.1984	0.1946
N	5,484	5,484	5,474	5,469

Table 2.6.4. Export participation: A Logit Analysis – Large firms

Results of the analysis of a subsample of large (>499 employees) firms. The dependent variable, *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large **DV: Exporter**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-26.2262*	-26.1568*	-28.3054*	-31.1728**
	0.0840	0.0850	0.0630	0.0440
Finance	-0.0920			
	0.2510			
Finance dummy		-0.2244		
		0.2620		
Creditline			0.0852	
			0.7360	
Overdraft				-0.3341
				0.2600
Log sales	0.1613***	0.1630***	0.1688***	0.1751***
	0.0070	0.0060	0.0050	0.0040
Log age	0.2646**	0.2688**	0.2705**	0.2631**
	0.0370	0.0340	0.0330	0.0380
Ownership	0.0026	0.0025	0.0025	0.0023
	0.4350	0.457	0.4520	0.5000
Foreign	0.4612**	0.4623**	0.4962**	0.4947**
	0.0240	0.0230	0.0150	0.0160
Rule of Law	5.1697**	5.0949**	5.2401**	5.4712**
	0.0210	0.0230	0.0200	0.0160
pc2gdp	-0.1038	-0.1007	-0.1041	-0.1207*
	0.1050	0.1150	0.1060	0.0720
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
Likelihood ratio	384.51	384.46	387.58	388.77
Log Likelihood	-394.2442	-394.2705	-393.7659	-391.3853
Pseudo R2	0.3278	0.3278	0.3298	0.3318
N	866	866	868	866

2.4.3. The intensive margin of export

This section investigates the impact of different financial constraints on the export intensity, i.e. the intensive margin of export. Since this analysis focuses only on the firms that participate in export, the sample gets cut to 4,863 firms. The dependent variable (*Exporter2*) has negative binomial distribution, so Generalized Linear Model (GLM) for negative binomial distribution is used to test the following regression:

$$\begin{aligned} Exporter2 = {} & \beta_0 + \beta_1 Financial\ constraint + \beta_2 Log\ Sales + \beta_3 Log\ Age + \beta_4 Ownership \\ & + \beta_5 Foreign + \beta_6 Rule\ of\ Law + \beta_7 PC2GDP + \beta_8 Year\ dummy + Macro\ Variables \\ & + Industry\ dummies + Country\ dummies + \varepsilon \end{aligned} \qquad (2.2)$$

where *Financial constraint* is one of the following *Finance*, *Finance dummy*, *Creditline*, or *Overdraft*. Ordinary Least Square (OLS) is used as a robustness test for the GLM. The results are presented in Tables 2.7.1 through 2.7.4 (GLM) and 2.8.1 through 2.8.4 (OLS).

The results suggest that *Log Sales* and *Foreign* coefficients are significantly positive at 5% for all four models (in both OLS and GLM). Meaning larger firms that have foreign ownership export more than their smaller domestically-owned competitors. On the other hand, *Log Age* is negative and significant at 1%. Given a chance to export, younger firms tend to export larger volume. *Creditline* and *Overdraft* are also negative and significant at 5%. These results suggest that even though firms that have line of credit and overdraft (less financially constrained) are more likely to export, the percent of export in total sales decreases for the less constrained firms.

This conclusion is inconsistent with current literature: Manova (2010) predicts that credit constraints will depress the volume of foreign sales, while Muuls (2008) and Chaney (2005) find that constraints don't affect value or growth of exports. It also contradicts the second hypothesis of this paper. Research continues with analysis based on the firm size subsamples.

Table 2.7.1. Export intensity: GLM – Full Sample

Results of the full sample analysis. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	3.0162***	3.0491***	3.0406***	3.0324***
	0.0000	0.0000	0.0000	0.0000
Finance	0.0128			
	0.2890			
Finance dummy		-0.0070		
		0.8400		
Creditline			-0.0872**	
			0.0140	
Overdraft				-0.0787**
				0.0430
Log sales	0.0226**	0.0210**	0.0250***	0.0222**
	0.0110	0.0180	0.0050	0.0130
Log age	-0.1582***	-0.1591***	-0.1521***	-0.1513***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0005	-0.0006	-0.0006	-0.0006
	0.3370	0.3160	0.2690	0.2910
Foreign	0.2508***	0.2475***	0.2369***	0.2498***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.2241	0.2260	0.2251	0.1748
	0.5370	0.5330	0.5340	0.6300
pc2gdp	-0.0053	-0.0056	-0.0054	-0.0038
	0.6060	0.5870	0.5980	0.7160
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
AIC	8.7781	8.7783	8.7818	8.7773
Log Likelihood	-19146.6786	-19147.1824	-19216.2442	-19149.2403
N	4,379	4,379	4,393	4,380

Table 2.7.2. Export intensity: GLM – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	4.2339***	4.2797***	4.3142***	4.2773***
	0.0080	0.0070	0.0070	0.0070
Finance	0.0271			
	0.1750			
Finance dummy		0.0166		
		0.7910		
Creditline			-0.1002*	
			0.0660	
Overdraft				-0.0889
				0.1460
Log sales	-0.0260	-0.0278	-0.0235	-0.0271
	0.1760	0.1470	0.2260	0.1620
Log age	-0.1698***	-0.1704***	-0.1641***	-0.1634***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0006	-0.0006	-0.0007	-0.0008
	0.5160	0.5390	0.4900	0.4250
Foreign	0.2340***	0.2282***	0.2174***	0.2220***
	0.0020	0.0020	0.0040	0.0030
Rule of Law	0.4124	0.4446	0.4063	0.3811
	0.5160	0.4830	0.5240	0.5490
pc2gdp	-0.0035	-0.0045	-0.0045	-0.0028
	0.8510	0.8060	0.8070	0.8820
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
AIC	8.7473	8.7483	8.7406	8.7456
Log Likelihood	-7154.2694	-7155.1164	-7157.4852	-7144.1077
N	1,652	1,652	1,654	1,650

Table 2.7.3. Export intensity: GLM – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	0.3650	0.3659	0.4181	0.3113
	0.8300	0.8290	0.8050	0.8550
Finance	-0.0099			
	0.5710			
Finance dummy		-0.0459		
		0.3450		
Creditline			-0.0423	
			0.4330	
Overdraft				-0.0233
				0.6910
Log sales	0.0310*	0.0304*	0.0293	0.0273
	0.0860	0.0920	0.1030	0.1300
Log age	-0.1501***	-0.1502***	-0.1446***	-0.1423***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0005	-0.0005	-0.0004	-0.0003
	0.5620	0.5380	0.5800	0.6600
Foreign	0.2644***	0.2646***	0.2588***	0.2670***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	-0.0882	-0.0931	-0.1465	-0.2084
	0.8640	0.8560	0.7740	0.6850
pc2gdp	-0.0023	-0.0023	0.0006	0.0018
	0.8690	0.8720	0.9650	0.8970
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
AIC	8.7625	8.7623	8.7746	8.7627
Log Likelihood	-9583.3013	-9583.0343	-9640.4286	-9587.8651
N	2,204	2,204	2,214	2,205

Table 2.7.4. Export intensity: GLM – Large Firms

Results of the analysis of a subsample of large (>499 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-5.5559	-5.0929	-3.2580	-3.2938
	0.4640	0.5040	0.6680	0.6590
Finance	0.0629*			
	0.0780			
Finance dummy		0.1243		
		0.1780		
Creditline			-0.1477	
			0.2060	
Overdraft				-0.3440***
				0.0050
Log sales	-0.0137	-0.0159	-0.0174	-0.0025
	0.6390	0.5870	0.5510	0.9340
Log age	-0.2163***	-0.2203***	-0.2159***	-0.2157***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0013	-0.0012	-0.0014	-0.0011
	0.3990	0.4450	0.3740	0.4650
Foreign	0.1487*	0.1367	0.1198	0.1339
	0.0940	0.1240	0.1750	0.1260
Rule of Law	-0.0148	-0.0126	0.0785	-0.0901
	0.9880	0.9900	0.9370	0.9270
pc2gdp	-0.0141	-0.0141	-0.0175	-0.0093
	0.6410	0.6430	0.5630	0.7570
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
AIC	9.076	9.0779	9.0834	9.0685
Log Likelihood	-2310.3748	-2310.8602	-2321.39	-2317.4695
N	523	523	525	525

Table 2.8.1. Export intensity: OLS – Full Sample

Results of the full sample analysis. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	67.1143*	68.6115*	68.0361*	45.8832
	0.0690	0.0630	0.0650	0.1930
Finance	0.4180			
	0.2640			
Finance dummy		-0.4920		
		0.6400		
Creditline			-3.5918***	
			0.0010	
Overdraft				-2.5651**
				0.0350
Log sales	0.8660***	0.8003***	0.9254***	0.8463***
	0.0030	0.0050	0.0010	0.0030
Log age	-5.7156***	-5.7478***	-5.6388***	-5.5466***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0266	-0.0269	-0.0285*	-0.0281*
	0.1080	0.1040	0.0850	0.0900
Foreign	9.0388***	8.9332***	8.5567***	8.9226***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	11.6059	11.8807	12.3959	10.3044
	0.3010	0.2900	0.2690	0.3590
pc2gdp	-0.1903	-0.2028	-0.2099	-0.1381
	0.5630	0.5380	0.5230	0.6750
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
R-sqr	0.1839	0.1837	0.1857	0.1818
N	4,379	4,379	4,393	4,380

Table 2.8.2. Export intensity: OLS – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	115.4935**	116.8356**	115.9970**	153.9805***
	0.0250	0.0240	0.0230	0.0020
Finance	0.9545			
	0.1010			
Finance dummy		0.6778		
		0.7120		
Creditline			-3.1709**	
			0.0390	
Overdraft				-2.2483
				0.2160
Log sales	-0.3153	-0.3799	-0.2216	-0.4091
	0.6350	0.5670	0.7400	0.5400
Log age	-5.1768***	-5.1993***	-5.0769***	-5.0016***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0522*	-0.0503*	-0.0489*	-0.0534*
	0.0610	0.0710	0.0770	0.0550
Foreign	7.3905***	7.2638***	6.6387***	7.2491***
	0.0020	0.0020	0.0050	0.0020
Rule of Law	12.5085	13.9611	14.6452	11.6936
	0.5390	0.4930	0.4770	0.5720
pc2gdp	-0.1151	-0.1633	-0.2090	-0.0844
	0.8510	0.7910	0.7380	0.8930
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
R-sqr	0.2219	0.2206	0.2212	0.2207
N	1,652	1,652	1,654	1,650

Table 2.8.3. Export intensity: OLS – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	18.2190	20.4568	24.5372	13.8026
	0.6840	0.6470	0.5820	0.8000
Finance	-0.2979			
	0.5770			
Finance dummy		-1.6802		
		0.2460		
Creditline			-3.1364**	
			0.0430	
Overdraft				-1.7270
				0.3280
Log sales	0.6976	0.6545	0.7371	0.6517
	0.2260	0.2550	0.1950	0.2550
Log age	-5.6310***	-5.6420***	-5.4841***	-5.3690***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0127	-0.0133	-0.0155	-0.0119
	0.5810	0.5620	0.5010	0.6040
Foreign	9.7468***	9.7416***	9.4484***	9.6840***
	0.0000	0.0000	0.0000	0.0000
Rule of Law	5.2416	5.0705	3.4096	1.0104
	0.7370	0.7450	0.8270	0.9480
pc2gdp	-0.1895	-0.1923	-0.0802	-0.0391
	0.6570	0.6520	0.8500	0.9270
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
R-sqr	0.1851	0.1855	0.1856	0.1796
N	2,204	2,204	2,214	2,205

Table 2.8.4. Export intensity: OLS – Large Firms

Results of the analysis of a subsample of large (>499 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large **DV: Exporter2**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-148.3716	-164.2549	-230.2269	-22.0160
	0.6720	0.6380	0.5140	0.9500
Finance	1.4544			
	0.2230			
Finance dummy		3.0729		
		0.2820		
Creditline			-5.9976	
			0.1010	
Overdraft				-11.6740***
				0.0080
Log sales	-0.1991	-0.2348	-0.3084	0.1313
	0.8270	0.7970	0.7300	0.8830
Log age	-8.4035***	-8.5225***	-8.5832***	-8.4031***
	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0027	-0.0012	-0.0059	0.0022
	0.9560	0.9800	0.9010	0.9630
Foreign	4.0808	3.9507	3.4933	3.6350
	0.1420	0.1540	0.2050	0.1850
Rule of Law	6.3474	7.2405	13.1542	9.6965
	0.8600	0.8400	0.7100	0.7820
pc2gdp	-0.9635	-0.9715	-1.2617	-0.9225
	0.4060	0.3980	0.2660	0.4120
Year dummy	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes
R-sqr	0.4258	0.4253	0.4302	0.4358
N	523	523	525	525

Running subsample of medium size firms, predictions about export intensity of the financially constrained firms are consistent with Muuls (2008) and Chaney (2005) – neither *Creditline*, nor *Overdraft* are significant. In fact, *Overdraft* significance in the total sample seems to be caused by the large firms only. This can be associate with the fact that if a large firm is dependent on the overdraft facility for financing, this firm is in troubles and it can't afford to increase its export volume.

2.5. Robustness tests

The regression models (2.1 and 2.2) assume a firm's decisions to export and exporting amount to be exogenous to the financial constraints. However, these decisions may also be endogenous, i.e. there may be a reverse causality between financial constraints and exporting decision. Whether to export or not is a voluntary decision, and a firm must consider a lot of factors making it. For example, a firm may feel constrained (they have no access to credit line and overdraft facilities) and so they won't export. On the other hand, an exporting firm may decide to apply for a line of credit and overdraft facility because exporting suggests financial health so their application won't be rejected. The potential self-selection bias needs to be accounted for.

Endogeneity tests are conducted using the Heckman two-stage procedure.

2.5.1. Heckman two-stage selection model

Heckman (1979) argues that self-selection biases are akin to omitted variables biases that could result in endogeneity. He proposes a two-step procedure to correct the bias. In the first stage, a selection model is employed to estimate a firm's choice between entering exporting market and not. The second stage is the outcome model that corrects for the potential selection bias. For identification reasons, at least one variable that is in the first stage selection equation needs to be excluded from the second stage outcome equation. The country and industry average value for a

financial constraint (*Fin. Const. Mean*) was chosen to be excluded. The reasoning is that a firm's decision to export is influenced by the fraction of firms in its industry and its country who export. And so the argument is that country/industry average financial constraint won't affect exporting decision.

Two Heckman procedures are employed, the conventional Heckman procedure ("*heckman*" module in STATA) for the continuous dependent variable (*Exporter2*) and the Heckman probit procedure ("*heckprob*" module in STATA) for the dummy DV (*Exporter*). All the results are consistent with the previous findings. (Tables 2.9 and 2.10)

2.6. Conclusions

Using a sample of 22,259 LAC firms, this research analyzes what characterizes firm's export participation. This study finds that older, larger firms with a share of foreign ownership, and those having a line of credit and an overdraft facility are more likely to export than smaller, younger, domestically-owned firms that are financially constrained. However, exporting firms tend to feel more constrained. Another conclusion is that younger, larger firms with a share of foreign ownership, and those having no line of credit or overdraft facility export more of their products than their older competitors that have access to a line of credit or an overdraft facility.

Table 2.9. Endogeneity test: Two-stage Heckman Model

Column (1) presents the Heckman first-stage selection equation and column (2) is the outcome equation for *Exporter* with *Finance* as a proxy for financial constraint. Column (3) presents the Heckman first-stage selection equation and column (4) is the outcome equation for *Exporter* with *Finance dummy* as a proxy for financial constraint. Column (5) presents the Heckman first-stage selection equation and column (6) is the outcome equation for *Exporter* with *Creditline* as a proxy for financial constraint. Column (7) presents the Heckman first-stage selection equation and column (8) is the outcome equation for *Exporter* with *Overdraft* as a proxy for financial constraint. *Exporter*, is a dummy variable equal to 1 if a firm exports, and 0 otherwise. *Fin const. mean* are the country and industry mean values for the financial constraint variable of interest. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: Exporter	**(1) Selection**	**(2) Finance**	**(3) Selection**	**(4) Finance dummy**	**(5) Selection**	**(6) Creditline**	**(7) Selection**	**(8) Overdraft**
Intercept	-0.3737	-3.9560***	-0.2252	-3.9227***	0.5838	-3.8089***	0.9485	-3.8551***
	0.8150	0.0000	0.8850	0.0000	0.6070	0.0000	0.3940	0.0000
Fin const. mean	0.1750		0.4439		0.9238		0.3347	
	0.2830		0.3410		0.1070		0.4540	
Financial constraint		0.0400***		0.0894***		0.2698***		0.1734***
		0.0000		0.0000		0.0000		0.0000
Log sales	0.1012***	0.0874***	0.0970**	0.0863***	0.0523	0.0782***	0.0579	0.0802***
	0.0090	0.0000	0.0130	0.0000	0.1910	0.0000	0.1320	0.0000
Log age	-0.0935	0.2019***	-0.0979	0.2004***	0.0066	0.1917***	0.0003	0.1925***
	0.3440	0.0000	0.3230	0.0000	0.9480	0.0000	0.9980	0.0000
Ownership	-0.0004	0.0002	-0.0004	0.0010	-0.0006	0.0002	-0.0003	0.0003
	0.9070	0.7050	0.9120	0.7210	0.8660	0.6710	0.9330	0.4680
Foreign	-0.6617***	0.6854***	-0.6634***	0.6824***	-0.6271***	0.6997***	-0.6379***	0.6642***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	-2.4331***	-0.6750***	-2.3344***	-0.6645***	-1.9513***	-0.6285***	-1.7218***	-0.6524***
	0.0020	0.0000	0.0010	0.0000	0.0000	0.0000	0.0010	0.0000
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Athrho		-7.2978***		-6.5193		1.2074		0.9375
		0.0000		0.9090		0.5720		0.2990
N	18,180		18,180		18,255		18,159	

Table 2.10. Endogeneity test: Two-stage Heckman Model

Column (1) presents the Heckman first-stage selection equation and column (2) is the outcome equation for *Exporter2* with *Finance* as a proxy for financial constraint. Column (3) presents the Heckman first-stage selection equation and column (4) is the outcome equation for *Exporter2* with *Finance dummy* as a proxy for financial constraint. Column (5) presents the Heckman first-stage selection equation and column (6) is the outcome equation for *Exporter2* with *Creditline* as a proxy for financial constraint. Column (7) presents the Heckman first-stage selection equation and column (8) is the outcome equation for *Exporter2* with *Overdraft* as a proxy for financial constraint. *Exporter2* is a percentage of total sales from export. *Fin const. mean* are the country and industry mean values for the financial constraint variable of interest. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: Exporter2	**(1) Selection**	**(2) Finance**	**(3) Selection**	**(4) Finance dummy**	**(5) Selection**	**(6) Creditline**	**(7) Selection**	**(8) Overdraft**
Intercept	-0.5809***	-12.7719***	-0.5988***	-12.3110***	-0.5168***	-11.7577***	-0.5924***	-12.0185***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Financial const mean	4.95e-08***		2.02e-08***		1.65e-07***		1.15e-07***	
	0.0000		0.0070		0.0000		0.0000	
Financial constraint		0.2925**		0.3491		1.4214***		1.1819***
		0.0140		0.3100		0.0000		0.0000
Log sales	0.0318***	0.6354***	0.0314***	0.6266***	0.0290***	0.5801***	0.0303***	0.6059***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0175*	0.3490*	0.0166*	0.3314*	0.0155	0.3101	0.0173*	0.3462*
	0.0720	0.0710	0.0880	0.0870	0.1060	0.1050	0.0730	0.0720
Ownership	0.0001	0.0017	0.0001	0.0014	0.0001	0.0015	0.0001	0.0018
	0.7740	0.7740	0.8120	0.8120	0.8030	0.8030	0.7530	0.7530
Foreign	0.5780***	11.5444***	0.5758***	11.5028***	0.5852***	11.7028***	0.5701***	11.3915***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	-0.2703***	-5.3987***	-0.2676***	-5.3452***	-0.2566***	-5.1311***	-0.2713***	-5.4199***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Athrho		15.9011***		16.1880***		15.8774***		15.7741***
		0.0000		0.0000		0.0000		0.0000
N	18,180		18,180		18,255		18,159	
Lambda		19.9724		19.9754		19.9992		19.9806

Chapter 3. Essay 2 - Financing Patterns and Firm Export in Latin American Countries

3.1. Introduction

The extant literature has established the importance of both formal and informal financing for firms. The prominent view in this line of research is that firms heavily rely on formal sources of financing (such as financing from banks and other financial institutions) while informal financial institutions play a complementary role to the formal financial system by servicing the lower end of the market. This is especially true for the small firms (Beck et al., 2008, Bates 1997, Chavis et al., 2011). As pointed out by Beck, Demirguc-Kunt, and Maksimovic (2008), better understanding of the financing patterns of firms has important policy and resource implications. This paper examines the financing patterns of exporting firms located in LAC countries.

Financing is one of the major challenges faced by exporting firms. Exporting involves higher entry costs when compared to selling to the domestic market. Exporting firms need to acquire information about foreign markets, customize products based on the local tastes, and establish distribution networks. Das et al. (2007) estimate that for Colombian exporters average entry costs range from 344,000 to 430,000 U.S. dollars. As most of the entry costs must be paid up front, only firms with good financial health or having fewer financial constraints are able to cover them. These features render financial constraints crucial for firms' export activity.

This paper examines the financing patterns of 22,259 exporting firms in 31 LAC using survey data from 2006 and 2010. After controlling for individuality of national economies and firm-level variables that may affect probability of export participation, the main findings are as follows: 1) firms have a higher likelihood to participate in exporting activity if they use a larger (smaller) share of formal bank financing (internal financing) to fund their working capital and 2)

informal financing has a significantly positive effect on export participation. This research indicates that increased export intensity is associated with an increase in bank financing and a decrease in a share of supplier credit. Post-delivery payment is associated with an increase in likelihood to export but a decrease in export amount; while payment before delivery has a significantly positive effect on export intensity.

This study contributes to the existing literature in a number of ways. First, this research appears to be the first in the existing literature examining financing patterns of exporting firms and the effect of these financing patterns on export intensity. Second, LAC countries have rarely been examined in the extant export behavior literature. Given the large and constantly growing share of exporting activity in the region, LAC provides an excellent setting to investigate firm level issues related to a firms' exporting activity and financing patterns. Finally, this study uses new financing pattern variables, i.e. time of payment.

The rest of the paper organized as follows: Section 3.2 reviews prior literature, Section 3.3 describes the data and variable derivation, Section 3.4 defines the methodology, Section 3.5 provides results, and Section 3.6 concludes.

3.2. Literature review

While there are a significant number of papers that have contributed to the financing patterns body of research, after a rigorous literature investigation, it seems that this is the first study in the current literature that investigates the financing patterns of exporting firms.

A number of studies in the extant literature have focused on cross-country comparisons of financing patterns. Rajan and Zingales (1995) examined capital structure decisions of firms in seven developed countries and published that financial structure related variables commonly used in the United States are also correlated with leverage in their sample of international firms. Booth

et al. (2001) investigate a sample of 10 developing countries and found that their financing decisions are affected by the same variables as in developed countries. Demirguc-Kunt and Maksimovic (1999) explored capital structure in 30 developed and developing countries and show that differences in financing patterns are mostly due to the differences in the development of stock markets and banks, as well as differences in the underlying legal infrastructure. Fan, Titman, and Twite (2003) explored capital structure in 39 countries and confirm earlier findings that institutional differences between countries are much more important in determining capital structure choices of firms compared to other factors, such as industry affiliation.

Petersen and Rajan (1994) and Berger and Udell (1995) investigated the information in firm–creditor relationships in controlling access to bank loans. Hellman, Lindsey, and Puri (2008) examined the effect of private information in bank venture capital relationships on bank lending decisions. Garmaise and Moskowitz (2003) found that banks and brokers in the commercial real estate market rely on informal sources of financing. Tsai (2002), Allen, Qian, and Qian (2005), and Linton (2006) argue that Chinese private firms are the fastest growing because of their reliance on informal financing and governance mechanisms. Allen, Qian, and Qian (2005) further suggest that the fastest-growing Chinese firms rely on alternative financing channels rather than formal external finance.

Beck, Demirguc-Kunt, and Maksimovic (2008) looked at the effect of firm size of financing patterns in different countries. They find that small firms in developing countries have less access to external financing especially bank financing. They also find that there is a significantly positive relationship between an export dummy and bank financing variable. Based on the previous literature, this study proposes the first hypothesis as follows:

HYPOTHESIS 1: *Bank financing firms are more likely to start exporting.*

Ayyagari, Demirguc-Kunt, and Maksimovic (2010) use a sample of Chinese firms to investigate their patterns of formal and informal financing. They found that formal bank financing is common for larger high-growing firms that experience higher reinvestment rates, higher sales growth, and have higher productivity. In other words, these are more successful firms that are to expand their market share and are more likely to export.

Chavis, Klapper, and Love (2011) published that due to the asymmetric information young firms have less access to bank financing and have to rely more heavily on informal financing. But as a firm matures, more doors are being open so it increases a portion of formal bank financing. They found that this is true across countries and firm-sizes. While Bates (1997) stated that small Chinese and Korean businesses in the US rely heavily on financing from both informal sources and financial institutions (such as Rotating Credit Association). And using a sample of Belgian firms, Manigart and Struyf (1997) concluded that young firms rely heavily on both banks and informal financing. Based on these findings, the second hypothesis of this study is:

HYPOTHESIS 2: *Small firms that rely heavily on banks and informal financing are more likely to export.*

Berman and Hericourt (2010) examined how financial factors affect both firms' export decisions and the amount exported and investigated both the determinants of firm-level exporting behavior and the impact of financial development on trade for 5,000 firms in 9 developing and emerging economies over the period 1998-2004. They published that there is significant impact of firms' access to finance on their entry decision into the export market. Muuls (2008) analyzed the interaction between credit constraints and exporting behavior for 8,926 Belgian manufacturing firms over the period 1999-2005 and determined that firms are more likely to be exporting if they enjoy higher productivity levels and lower credit constraints.

There is not much research on export intensity and sources of financing. But based on the fact that more successful firms use more formal bank financing, it is proposed that bank financing is also associated with increase in export intensity.

HYPOTHESIS 3: *Firms tend to export more if they rely more heavily on bank financing.*

However, dependence on supplier credit and payment advances from the customers seems to be a last resort option for a firm that experiences financial troubles. Consequently, study associates supplier credit and customer advances with decrease in export intensity.

HYPOTHESIS 4: *Firms export less if supplier credit and customer advances are important sources of working capital financing.*

3.3. Data and variables

World Bank Enterprise Survey (WBES), conducted in 2006 and 2010 across 31 LAC countries, is used in this study. The WBES database includes firms across multiple industries (such as manufacturing, services, agriculture, construction, and others) and of different sizes, with majority being small and middle sized. The survey is conducted among business owners and top-management with a goal to evaluate obstacles in business environment around the globe. The survey questions are consistent across countries and years that allow us to conduct cross-country analysis. WBES provides qualitative and quantitative measures of firm characteristics, including evaluation of the constraints that a firm faces on a daily basis. The database also includes information on export participation status and export intensity, ownership concentration and foreign ownership, and limited measures of firm performance such as multiple years of historical data on sales and employment.

The final sample includes 22,259 firms from 31 LAC countries for the period between 2006 and 2010 of which: 67.61% are micro and small (less than 50 employees), 27.9% are medium

(50-499 employees), and only 4.49% are large (>499 employees). Some of the countries are presented by two subsamples from different survey years[7]; however, others have only one year of survey data available[8]. This dataset includes firms from 33 industries classified by two-digit ISIC codes. Sample includes all firms from the database that have non-missing value for an exporter identifier. Appendix Table A.2 provides distribution of exporting and non-exporting firms surveyed by country, Table A.3 – by industry. The relevant key variables are described below.

3.3.1. Dependent variables

Two dependent variables were built based on the following survey question:

D.3. In fiscal year, what percent of this establishment's sales were:

a. *National Sales*
b. *Indirect Export*
c. *Direct Export*

First, a dummy variable *Exporter* that measures export participation of a firm is constructed. Its value equals to 1 if a firm has less that 100% of total sales in national sales and/or indirect export (using WBES original data items: d3a and d3b); otherwise, it is 0. Then a value of percent of total sales from direct export is used as a measure of export intensity – *Exporter2* (using WBES original data item: d3c).

Out of 22,259 firms in this sample, 22% (4,863) export some part of their products and services abroad (a part of their total sales is from direct export) (Table 3.1). However, distribution of exporting firms varies significantly among the countries: with Argentina setting a higher boundary in 2010 at 42.4% and with low 3.64% in Venezuela in 2006 (Table A.2).

[7] Argentina, Bolivia, Chile, Columbia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela

[8] Antigua and Barbuda, Bahamas, Barbados, Belize, Brazil, Costa Rica, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, and Trinidad and Tobago

3.3.2. Explanatory variables

3.3.2.1. Financing patterns

This group of variables is our main independent variables. It consists of two subgroups: time of payment received and source of working capital financing.

3.3.2.1.1. Time of payment

Based on the following survey question three variables, each of them represents a share of total sales paid at a time in question, are constructed.

K.2 In fiscal year, what percent of this establishment's total annual sales of its goods or services were:

a. Paid for before the delivery?
b. Paid for on delivery?
c. Paid for after delivery?

The sum of these shares adds up to 100%. In this sample, an average company gets paid after delivery in 57.6% of cases. 32.2% of total annual sales are paid on delivery, and the remaining sales are paid beforehand (Table 3.1).

3.3.2.1.2. Source of working capital financing

Ayyagari, Demirguc-Kunt, and Maksimovic (2010) used survey data on sources of financing to study financing patterns in China. The following question provides us with a breakdown of sources of working capital financing. The five separate categories original data comes with are used to construct the variables.

K.3. Over fiscal year, please estimate the proportion of this establishment's working capital that was financed from each of the following sources?

a. Internal funds/Retained earnings

b. Borrowed from banks (private and state-owned)
e. Borrowed from non-bank financial institutions
f. Purchases on credit from suppliers and advances from customers
h. Other (moneylenders, friends, relatives, etc.)

The sum of these proportions adds up to 100%. Measurement scale of the survey question can be considered a limitation to this study as it only has proportions of financing, not their ratio to total assets.

Table 3.1 reports descriptive statistics for these variables. An average firm in the sample finances over 58.6% of its working capital through internal funds. Banks and non-bank financial institutions contribute almost 17% and 1.5%, respectively. On average only 3.45% of working capital is funded using informal financing and the rest (19.5%) is financed using supplier credit and advances from customers.

3.3.2.2. Firm characteristics

The following sections describe the characteristics of the firm.

3.3.2.2.1. Firm size

According to Kumar and Francisco (2005) sources of financing significantly vary by the firm size. Literature suggests that large firms are more likely to export than small firms mostly because large firms are likely to be less financially constrained than small firms (Schiffer and Weder, 2001, Beck, Demirgüç-Kunt, and Maksimovic, 2006, Beck et al., 2005). Ayyagari et al. (2010) show that in China, bank financing is more common among large firms. While Beck et al. (2008) using a sample from 48 countries find small firms use much less external finance, especially bank finance.

Therefore, studying effect of financing patterns on export participation and intensity, this author controls for firm size using a logarithm of e base of the total sales at the end of the year

previous to the year of the survey (using WBES original data item: d.2). The firms in this sample vary significantly in their total sales: the value of Log Sales ranges from 6.9 to 33.8 (approximately 1000 to 5e+14). (Table 3.1)

The number of employees (WBES original data item: l.1) is used as an alternative proxy for firm size. The results are consistent[9]. The number of employees is also used to identify three subsamples for further testing: micro and small firms are with fewer than 50 employees; medium firms have 50-499 employees; and large are those with over 499 employees.

3.3.2.2.2. Firm age

Evans (1987) and Dunne, Roberts, and Samuelson (1988) find that younger firms grow significantly faster than older firms. Anderson and Eshima (2011) find that younger firms can make up their lack of established routines and processes with being more flexible and reactive in the market places than older firms. The evidence on source of financing for a young firm is inconsistent. Manigart and Struyf (1997) find that for Belgian start-ups the most important sources of financing are informal and banking. Chavis et al. (2011) use a large sample of mostly small firms from 100 countries, and find that across all countries younger firms rely less on bank financing (probably due to information asymmetry) and more on informal financing.

Therefore, the expectation is that younger LAC firms that use more bank and informal financing will be more likely to export while intensity of export will be associated more with formal bank financing. Firm age (*Log Age*) is controlled for in this study using a logarithm of e base from subtracting the firm's founding year (WBES original data item: b.5) from the survey

[9] These results are not reported.

year. In the sample, the average firm has been in business for about 17 years and the oldest firm is 340 years of age. (Table 3.1)

3.3.2.2.3. Ownership concentration

Extant empirical evidence on the relation between ownership concentration and firm performance has been mixed. Demsetz and Lehn (1985) and McConnell and Servaes (1990) find a nonlinear, U-shaped relation between ownership concentration and firm performance. On the contrary, Morck, Shleifer and Vishny (1988) and Wruck (1989) find positive a relation between ownership concentration and firm performance. Thus, this research accounts for ownership concentration using the fraction of the shares owned by the largest shareholder as ownership concentration (*Ownership*) (WBES original data item: b.3). As reported in Table 3.1, the average firm in the sample has highly concentrated ownership, with around 70 percent of the firm owned by the largest owner(s).

3.3.2.2.4. Foreign ownership

According to Manova et al. (2010) and Li and Yu (2009), foreign-owned firms perform better in export than private domestic firms. They are also less financial constrained because they can get access to additional internal funding from their foreign parent company. Fishman and Svensson (2007) suggest that firms with foreign ownership possess better access to markets and technical expertise, resulting in better financial performance than pure domestic firms. Beck et al. (2005) find that foreign ownership has largely positive effect on firm performance. Therefore, this author controls for foreign ownership using a dummy variable, *Foreign*, to indicate if any foreign company or individual has a financial stake in the ownership of the firm (WBES original data item: b2b). As presented in Table 3.1, in this sample about 11.5% of all firms have foreign ownership stakes.

3.3.2.2.5. Industry effects, year effects and country fixed effects

Like all cross-section and cross-country studies, this research controls for industry effects and country effects. The two-digit ISIC codes (International Standard of Industrial Classification) assigned to each firm in the WBES database is used to create industry dummies to control for industry effects. Since the surveys were conducted in 2006 and in 2010, year dummy variable to control for year effects is applied.

Macroeconomic factors also influence firm level performance (Beck et al., 2005) and as a result decision to export. Therefore, this author controls for country level Financial Market Development (Private credit to GDP ratio), Rule of Law, GDP, GDP per capita, inflation, Corrupt (Corruption Perception Index) using data from World Development Indicator (WDI) database.

According to WDI, Rule of Law "reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, as well as likelihood of crime and violence".

Table 3.1. Summary Statistics

N is the number of firms in the sample, except for country level macro variables which is the number of country level surveys studied. Detailed variable definitions and sources are given in Table A.6 in the Appendix.

Variable	N	Mean	Median	Std. Dev.	Min	Max
Exporter	22,259	0.2185	0	0.4132	0	1
Exporter2	4,863	31.9790	20	31.5318	1	100
Before delivery	20,256	8.6233	0	19.8146	0	100
On delivery	20,256	32.1577	20	36.3077	0	100
After delivery	21,742	57.6482	70	38.6402	0	100
Internal funds	22,156	58.6782	60	37.9227	0	100
Banks	22,157	16.9804	0	26.2378	0	100
Non-bank	22,158	1.4666	0	8.2227	0	100
SupCred/CustAdv	21,718	19.4940	0	27.8710	0	100
Informal	21,719	3.4520	0	13.5602	0	100
Log sales	22,284	16.7165	16.2134	3.3509	6.9078	33.8456
# of Employees	22,242	119.7343	25	536.8802	1	21955
Log age	22,063	2.8497	2.8904	0.8321	0	5.8290

Ownership	18,545	69.8144	70	27.2706	0	100
Foreign	22,284	0.1143	0	0.3181	0	1
Rule of Law	46	-0.2735	-0.5101	0.7634	-1.5646	1.2755
Per capita	46	4667.537	3982.311	3714.994	820.7829	20750.78
cpc2gdp	46	42.2595	35.5809	25.4596	11.2456	110.856
Inflation	46	6.6303	5.6912	4.4196	1.2520	27.0809
GDP	46	8.75e+10	1.51e+10	1.82e+10	4.07e+08	8.14e+11
Corrupt	46	3.8957	3.45	1.6051	2.1	7.15

According to Transparency International, CPI reflects how corrupt country's public sectors are seen to be by the informed views of analysts, businesspeople and experts.

Table 3.1 shows that all these macro variables vary widely across LAC countries. For example, the mean *Inflation* is 6.63% but it varies widely across countries, from the low of 1.25% to the high of 27.08%. Because sales values are reported in local currencies, inflation must be controlled for. As a robustness check to the regression results, this author controls for country fixed effects to address other unobservable country-specific factors that also affect a firm's financial constraints and performance.

3.4. Methodology and results

In this section, the steps of the analysis are defined and empirical results of this study are presented. The followed approach consists of two parts: 1) exploration of differences in financing patterns and characteristics of exporting and non-exporting firms, and 2) measuring effect of financing patterns and firm characteristics on the quantity of their export. Each is described in the following subsections.

3.4.1. Univariate test and Correlation matrix

The correlation matrix is presented in Table 3.2. The main interest is on the correlations of the variables of interest *Exporter* and *Exporter2*. *Exporter* is significantly and negatively correlated with the *Before Delivery* and *On Delivery*, and significantly positively correlated with *After*

Delivery. This suggests that exporting firms are less likely to get paid before or on delivery, which seems logical considering the extra risk for the customer associated with export. *Exporter* is significantly negatively correlated with *Internal, Non-Bank Financial Institution,* and *Informal Financing* suggesting that firms lacking external financing are less likely to export. The correlation is significant and positive for *Exporter* with *Bank* and *Supplier Credit/Customer Advances Financing*, which supports the previous conclusion about sources of financing. When it comes to other firm characteristics, *Exporter* is significantly and positively correlated with *Log Sales, Log Age,* and *Foreign Ownership*, which is consistent with previous studies. As well, *Exporter* is significantly and negatively correlated with *Ownership Concentration.*

Exporter2 is consistent with *Exporter*. It is significantly and positively correlated with *After Delivery*, *Bank Financing*, *Firm Size*, *Firm Age*, and *Foreign Ownership* which is consistent with the ideas formulated in the 3rd hypothesis of this study. *Exporter2* is also significantly and negatively correlated with *On Delivery*, *Internal Financing*, and *Ownership Concentration*. However, *Exporter2* has not showed significant relationship with *Before Delivery* and *Non-Bank Financial Institution Financing* and it has an opposite (significantly negative) correlation with *Supplier Credit/Customer Advances*, which supports the 4th hypothesis of this paper.

Table 3.3 presents results of the univariate tests to illustrate the differences of the variables between exporting and non-exporting firms in the sample. T-test and non-parametric test are used to test differences in means and medians, respectively. The results show that means and medians are significantly different among two subsamples for all of the key variables. Consistent with the previous literature, on average, exporting firms are bigger, older, with a higher concentration of foreign ownership than non-exporting. However, they seem to have less concentrated ownership. The main variables of interest, *Time of Payment* and *Source of Financing*, show that exporting is

associated with a significantly larger share of post-delivery payments (it is risky for the customer to pay in advance when the product is exported), as well as less reliance on internal funds and non-bank financial institutions to finance working capital. Exporting firms get a significantly larger portion of their working capital from banks.

In Table 3.4 three subsamples arranged by their size (micro and small, medium, and large) are compared using univariate tests to demonstrate their differences. Once again, t-test and non-parametric test are used to compare their means and medians. All three pairs show significant difference in means and medians of subsamples. As expected, micro and small firms are least likely to export – with only 12.5% of the sample; while 38.7% of medium and 57.7% of large firms are exporters. All three pairs show significant differences for the time of the payment variables. Micro, small, and medium firms get paid before delivery more often than large firms.

This may be associated with the fact that these smaller firms depend much more on the early payments from the customers so they insist on them. When it comes to sources of financing, the largest percentage of working capital financed by internal funds (over 60%) is among micro and small firms. While large firms finance over 24% using bank financing, small and micro firms receive only about 14.8% of their working capital financing from banks. Not surprisingly, among the three categories of firms micro and small has the highest rate of informal financing, over 4%.

Table 3.2. Correlation matrix of Variables

Table 3.2 presents the Pearson correlation coefficients among key variables. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

	Exporter	**Exporter2**	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**	**Log sales**	**Log age**	**Ownership**
Exporter2	0.6673***												
Before delivery	-0.0249***	-0.0068											
On delivery	-0.2062***	-0.1220***	-0.1555***										
After delivery	0.1901***	0.1010***	-0.3674***	-0.8616***									
Internal funds	-0.0693***	-0.0337***	0.0227***	0.1473***	-0.1561***								
Banks	0.0802***	0.0721***	-0.0355***	-0.0971***	0.1073***	-0.5755***							
Non-banks	-0.0111*	-0.0056	0.0103	-0.0190***	0.0194***	-0.1846***	-0.0216***						
SupCred/CustAdv	0.0288***	-0.0202***	-0.0033	-0.1123***	0.1132***	-0.6257***	-0.1158***	-0.0281***					
Informal	-0.0224***	-0.0091	0.0040	0.0190***	-0.0157**	-0.2634***	-0.0774***	0.0020	-0.0587***				
Log sales	0.2017***	0.1227***	-0.0802***	-0.1495***	0.1959***	-0.0657***	0.0826***	0.0040	0.0677***	-0.0760***			
Log age	0.1451***	0.0341***	-0.0154**	-0.0668***	0.0801***	-0.0155**	0.0359***	-0.0132**	0.0237***	-0.0732***	0.1607***		
Ownership	-0.0376***	-0.0170**	0.0273***	0.0615***	-0.0524***	0.0230***	-0.0217***	0.0052	-0.0417***	0.0496***	-0.1702***	-0.0680***	
Foreign	0.2132***	0.2111***	-0.0128*	-0.0649***	0.0574***	0.0295***	-0.0285***	-0.0172**	-0.0038	-0.0146**	0.1536***	0.0051	0.0094

Table 3.3. Univariate Tests for Exporting versus Non-Exporting firms

Table 3.3 presents univariate tests for the differences of relevant variables between subsamples of exporting and non-exporting firms. *N* is the number of firms in the sample. A firm is considered Non-exporting if 100% of its Total Sales are from national sales and/or indirect export. A firm is considered Exporting if a part of its Total Sales is from Direct export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. T-tests and non-parametric tests are used to test mean and median differences, respectively. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

	Non-Exporting (0)			**Exporting (1)**			**Difference (1-0)**	
	N	**Mean**	**Median**	**N**	**Mean**	**Median**	**Mean**	**Median**
Before delivery	15,770	8.8866	0	4,474	7.6960	0	-1.1906***	0***
On delivery	15,770	36.1437	20	4,474	18.0992	5	-18.0445***	-15***
After delivery	16,898	53.7405	55	4,825	71.4068	85	17.6663***	30***
WC: Internal funds	17,296	60.0631	70	4,838	53.7044	55	-6.3587***	-15***
WC: Banks	17,297	15.8627	0	4,838	20.9556	10	5.0929***	10***
WC: Non-banks	17,298	1.5161	0	4,838	1.2941	0	-0.2219*	0
WC: SupCred/CustAdv	16,874	19.0766	0	4,822	21.0075	10	1.9309***	10
WC: Informal	16,875	3.6116	0	4,822	2.8801	0	0.7315***	0**
Log sales	17,397	16.3594	15.83	4,862	17.9943	17.50	1.6349***	1.67***
Log age	17,196	2.7857	2.83	4,845	3.0772	3.14	0.2915***	0.31***
Ownership	14,097	70.3880	70	4,433	67.9871	66	-2.4009***	-4***
Foreign	17,397	0.0782	0	4,862	0.2423	0	0.1641***	0***

3.4.2. The extensive margin of export

This section examines the effects that different financing patterns have on the probability to export, *i.e.* the extensive margin of export. The following two regression models were tested to identify the variables most statistically significant that affect export participation of a firm:

$$Exporter = \beta_0 + \beta_1 Time\ of\ Payment + \beta_2 Log\ Sales + \beta_3 Log\ Age + \beta_4 Ownership + \beta_5 Foreign + \beta_6 Rule\ of\ Law + \beta_7 PC2GDP + \beta_8 Year\ dummy + Macro\ Variables + Industry\ dummies + Country\ dummies + \varepsilon. \quad (3.1)$$

where *Time of Payment* is a percentage of total annual sales of goods and services paid for *Before delivery, On delivery*, or *After delivery* (WBES original data item: k.2). The results of estimation of equation 3.1 are presented in Tables 3.5.1 through 3.5.4 and 3.6.1 through 3.6.4.

Table 3.4. Univariate Tests for Firm Size

Table 3.4. presents univariate test of key variables across samples of firms of different sizes: micro and small are with <50 employees, medium firms are defined as ones having 50-499 FTEs, and any firm with more than 499 employees is categorized as large. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *N* is the number of firms in the sample. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

	Micro and Small (1)			**Medium (2)**			**Large (3)**			**Difference (1-2)**		**Difference (2-3)**		**Difference (1-3)**	
	N	**Mean**	**Med**	**N**	**Mean**	**Med**	**N**	**Mean**	**Med**	**Mean**	**Med**	**Mean**	**Med**	**Mean**	**Med**
Exporter	15,049	0.1253	0	6,210	0.3865	0	1,000	0.5770	1	-0.2612***	0***	-0.1905***	-1***	-0.4517***	-1***
Exporter2	1,886	31.2158	0	2,400	31.2729	0	1,000	37.4108	5	-0.0571	0*	-6.1378***	-5*	-6.1949***	-5***
Before delivery	13,436	8.9948	0	5,844	8.2509	0	976	5.7398	0	0.7439**	0	2.5111***	0	3.2550***	0
On delivery	13,436	35.6368	20	5,844	25.3232	10	976	25.1865	5	10.3136***	10	0.1367	5	10.4503***	15
After delivery	14,632	53.7158	55	6,121	65.2629	80	989	68.6987	85	-11.5470***	-25	-3.4358***	-5	-14.9830***	-30
WC: Internal funds	14,986	60.3787	70	6,176	55.5304	60	994	52.5986	50	4.8483***	10	2.9318**	10	7.7802***	20
WC: Banks	14,987	14.8645	0	6,176	20.9312	10	994	24.3380	15	-6.0668***	-10	-3.4068***	-5	-9.4737***	-15
WC: Non-banks	14,987	1.4441	0	6,177	1.5017	0	994	1.5865	0	-0.0576	0	-0.0848	0	-0.1424	0
WC: SupCred/CustAdv	14,621	19.2094	0	6,112	20.1121	5	985	19.8833	10	-0.9027**	-5	0.2288	-5	-0.6739	-10
WC: Informal	14,621	4.1882	0	6,113	1.9745	0	985	1.6934	0	2.2137***	0	0.2811	0	2.4948***	0
Log sales	15,064	15.7858	15.07	6,216	18.3999	17.82	1,004	20.2592	19.76	-2.6141***	-2.75***	-1.8592***	-1.94***	-4.4734***	-4.69***
Log age	14,925	2.7108	2.77	6,143	3.1048	3.18	995	3.3578	3.50	-0.3941***	-0.41***	-0.2529***	-0.32***	-0.6470***	-0.73***
Ownership	12,047	71.4847	75	5,593	66.4595	60	905	68.3138	70	5.0252***	15***	-1.8543*	-10**	3.1709***	5
Foreign	15,064	0.0627	0	6,216	0.1988	0	1,004	0.3636	0	-0.1361***	0***	-0.1647***	0***	-0.3008***	0***

$$Exporter = \beta_0 + \beta_1 Source\ of\ Financing + \beta_2 Log\ Sales + \beta_3 Log\ Age + \beta_4 Ownership + \beta_5 Foreign + \beta_6 Rule\ of\ Law + \beta_7 PC2GDP + \beta_8 Year\ dummy + Macro\ Variables + Industry\ dummies + Country\ dummies + \varepsilon. \quad (3.2)$$

where Source of Financing is a proportion of working capital financed from Internal sources, Banks, Non-bank financial institutions, Supplier credit and/or Customer advances, and Informal sources (WBES original data item: k.3). According to the first hypothesis, firms that rely more of bank financing are more likely to export. So the coefficient for *Bank* is expected to be positive and significant. Following Angrist (2001) who argues that Linear Probability Model is just as good as Ordered Probit, equations 3.1 and 3.2 were estimated using LPM and results are presented in Tables 3.5.1 through 3.5.4. As a robustness test, this regressions were tested using Logit, and the results are presented in Tables 3.6.1 through 3.6.4.

Table 3.5.1 presents the output of these regressions estimated on the full sample. Across all columns (1)-(8), *Log Sales, Log Age, Foreign Ownership, and Rule of Law* are significantly positive at 1%. These results suggest that older, larger firms with a share of foreign ownership in the countries with stronger governance performance are more likely to export their products and services. When it comes to variables related to time of payment, *Before Delivery* is not significant. But *On Delivery* turned out to be significantly negative; suggesting a firm that is paid less at the time of delivery is more likely to export. On the other hand, *After Delivery* payment has a significantly positive effect on the likelihood to export. Suggesting that a firm that is financially stable enough it can wait for the post-delivery payment, is more likely to export. In case of effect of sources of working capital financing on probability to export, *Internal Financing* has a strong negative effect, while *Banks* and *Informal Financing* are associated with significantly positive influence on likelihood to export. Reliance of exporting firms on external financing is consistent

with the previous literature (Beck, Demirguc-Kunt, and Maksimovic, 2008, Chavis, Klapper, and Love, 2011) and this research's hypothesis. *Export* is associated with higher working capital revealing the fact that firms that finance larger portion of their working capital using internal funds (borrowing from banks) are less (more) likely to export. This finding is consistent with the previous literature. However, the relationship of *Informal Financing* and *Export* likelihood may be affected by the younger firms in the sample as due to asymmetric information these young firms are less likely to borrow from banks (consistent with Chavis, Klapper, and Love, 2011).

Sources of finance vary by firm size (Kumar and Francisco, 2005), so next LPM is tested on three subsamples: micro and small, medium, and large firms. According to the second hypothesis, SMEs that use more of Bank and Informal financing are more likely to export. So coefficients of variables *Bank* and *Informal* are expected to be positive and significant.

All the significance of source of financing captured in the full sample comes from the micro, small, and medium firms. Likelihood of the large firms to export is not dependent on the sources of financing they use. However, tests of SMEs subsamples show that use of bank and informal financing has a significantly positive effect on firm's decision to export, which is consistent with previous literature (Bates, 1997) and the second hypothesis of this study. Micro and small firms are also more likely to export if they are paid before delivery which is consistent with small firms being more financially restricted.

Results of a robustness test using logit analysis are consistent with LPM. Refer to Tables 3.6.1 through 3.6.4.

Table 3.5.1. Export participation: LPM – Full Sample

Results of the full sample analysis. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All DV: Exporter	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-1.1361***	0.0152	-0.7732***	-0.9826***	-0.9963***	-0.8101***	-0.8088***	-0.8310***
	0.0000	0.9480	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Financing pattern	0.0002	-0.0010***	0.0009***	-0.0004***	0.0007***	-0.0001	0.0000	0.0007***
	0.2500	0.0000	0.0000	0.0000	0.0000	0.8790	0.9460	0.0000
Log sales	0.0655***	0.0628***	0.0623***	0.0646***	0.0639***	0.0651***	0.0651***	0.0657***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0196***	0.0197***	0.0174***	0.0179***	0.0174***	0.0173***	0.0173***	0.0177***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.9460	0.8140	0.7490	0.9110	0.8500	0.8650	0.8690	0.9440
Foreign	0.1438***	0.1413***	0.1388***	0.1442***	0.1457***	0.1419***	0.1419***	0.1413***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.1849***	0.1819***	0.1758***	0.1758***	0.1859***	0.1778***	0.1785***	0.1759***
	0.0020	0.0020	0.0030	0.0030	0.0020	0.0030	0.0030	0.0030
pc2gdp	-0.0029*	-0.0022	-0.0019	-0.0025	-0.0027	-0.0026	-0.0026	-0.0026
	0.0960	0.2190	0.2800	0.1550	0.1320	0.1380	0.1380	0.1420
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.2441	0.2502	0.2424	0.2389	0.2393	0.2376	0.2376	0.2381
N	17,508	17,508	18,312	18,285	18,286	18,287	18,287	18,288

Table 3.5.2. Export participation: LPM – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small DV: Exporter	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	0.6839**	0.7234**	-0.1048	-7499***	-0.1410	-0.1418	-0.1460	-0.1563
	0.0150	0.0100	0.6540	0.0010	0.5470	0.5450	0.5330	0.5050
Financing pattern	0.0004***	-0.0007***	0.0005***	-0.0003***	0.0004***	-0.0002	0.0001	0.0006***
	0.0040	0.0000	0.0000	0.0000	0.0000	0.6250	0.4240	0.0010
Log sales	0.0410***	0.0387***	0.03911***	0.0409***	0.0407***	0.0413***	0.4123***	0.0419***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0041	0.0042	0.0025	0.0029	0.0025	0.0024	0.0024	0.0029
	0.2870	0.2830	0.5150	0.4400	0.5200	0.5420	0.5290	0.4540
Ownership	-0.0001	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	0.7430	0.8740	0.8750	0.7590	0.7870	0.8180	0.8200	0.7500
Foreign	0.1280***	0.1262***	0.1202***	0.1221***	0.1227***	0.1211***	0.1211***	0.1207***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.1273**	0.1282**	0.1251*	0.1238*	0.1323**	0.1254*	0.1236*	0.1216*
	0.0490	0.0470	0.0580	0.0610	0.0450	0.0570	0.0610	0.0650
pc2gdp	-0.0025	-0.0020	-0.0020	-0.0023	-0.0025	-0.0024	-0.0024	-0.0023
	0.2190	0.3220	0.3220	0.2530	0.2270	0.2380	0.2460	0.2520
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.1284	0.1325	0.1337	0.1320	0.1316	0.1310	0.1310	0.1317
N	11,335	11,335	11,923	11,906	11,907	11,907	11,908	11,908

Table 3.5.3. Export participation: LPM – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium DV: Exporter	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-1.4035***	-1.2489***	-1.0455**	-0.9788**	-1.0418**	-1.0094**	-1.0050**	-1.0253**
	0.0000	0.0010	0.0180	0.0270	0.0190	0.0230	0.0240	0.0210
Financing pattern	-0.0003	-0.0016***	0.0015***	-0.0006***	0.0010***	-0.0002	0.0000	0.0010*
	0.3730	0.0000	0.0000	0.0000	0.0000	0.7530	0.9120	0.0820
Log sales	0.0574***	0.0530***	0.0524***	0.0560***	0.0555***	0.0562***	0.0562***	0.0567***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0264***	0.0267***	0.0247***	0.0261***	0.0260***	0.0254***	0.0254***	0.0255***
	0.0010	0.0010	0.0020	0.0010	0.0010	0.0010	0.0010	0.0010
Ownership	-0.0000	-0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.9020	0.8510	0.9960	0.9640	0.8700	0.9970	0.9920	0.9730
Foreign	0.1281***	0.1247***	0.1291***	0.1404***	0.1422***	0.1364***	0.1364***	0.1355***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.1403	0.1324	0.1231	0.1370	0.1362	0.1340	0.1394	0.1411
	0.2840	0.3090	0.3430	0.2940	0.2960	0.3050	0.2860	0.2800
pc2gdp	-0.0017	-0.0010	-0.0005	-0.0017	-0.0018	-0.0017	-0.0018	-0.018
	0.6400	0.7820	0.8850	0.6480	0.6270	0.6470	0.6300	0.6290
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.2167	0.2262	0.2267	0.2197	0.2206	0.2177	0.2178	0.2183
N	5,292	5,292	5,498	5,491	5,491	5,492	5,491	5,492

Table 3.5.4. Export participation: LPM – Large Firms

Results of the analysis of a subsample of large (>499 employees) firms. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large **DV: Exporter**	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-0.3312	-0.5104	-1.2996	-1.0080	-1.0622	-1.0748	-1.0151	-1.0024
	0.7840	0.6730	0.2210	0.3380	0.3130	0.3070	0.3350	0.3400
Financing pattern	-0.0001	-0.0011**	0.0011**	-0.0003	0.005	0.0013	0.0001	-0.0013
	0.9440	0.0130	0.0130	0.4750	0.3640	0.4630	0.8060	0.3430
Log sales	0.0236***	0.0241***	0.0236***	0.0261***	0.0259***	0.0262***	0.0259***	0.0248***
	0.0070	0.0050	0.0060	0.0020	0.0020	0.0020	0.0020	0.0040
Log age	0.0389**	0.0371**	0.0370**	0.0340*	0.0340*	0.0351*	0.0348*	0.0347*
	0.0370	0.0460	0.0460	0.0670	0.0660	0.0570	0.0600	0.0600
Ownership	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	0.5710	0.6190	0.6880	0.6910	0.6940	0.6990	0.6830	0.7010
Foreign	0.0724**	0.0689**	0.0706**	0.0753**	0.0776**	0.0741**	0.0731**	0.0757**
	0.0180	0.0240	0.0200	0.0140	0.0120	0.0150	0.0160	0.0130
Rule of Law	0.7888**	0.7796**	0.7984**	0.7168**	0.1248**	0.7226**	0.7199**	0.7255**
	0.0140	0.0150	0.0130	0.0240	0.0230	0.0230	0.0240	0.0230
pc2gdp	-0.0165*	-0.0162*	-0.0171*	-0.0151	-0.0153*	-0.0153*	-0.0151	-0.0150
	0.0820	0.0860	0.0690	0.1050	0.1000	0.1000	0.1040	0.1070
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.3528	0.3576	0.3594	0.3600	0.3603	0.3600	0.3597	0.3603
N	881	881	891	888	888	888	888	888

Table 3.6.1. Export participation: A Logit Analysis – Full Sample

Results of the full sample analysis. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All **DV: Exporter**	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-4.6482	-5.1205	-13.2386***	-12.8485***	-12.9099***	-13.0026***	-13.0088***	-13.1327***
	0.1400	0.1060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Financing pattern	0.0013	-0.0094***	0.0072***	-0.0030***	0.0042***	-0.0010	0.0003	0.0060***
	0.2570	0.0000	0.0000	0.0000	0.0000	0.7080	0.6470	0.0000
Log sales	0.5035***	0.4861***	0.4784***	0.4908***	0.4864***	0.4944***	0.4944***	0.4995***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.1092***	0.1113***	0.0918***	0.0961***	0.0932***	0.0915***	0.0918***	0.0937***
	0.0000	0.0000	0.0010	0.0000	0.0010	0.0010	0.0010	0.0010
Ownership	-0.0013*	-0.0012	-0.0011	-0.0012	-0.0012	-0.0012	-0.0012	-0.0012
	0.1000	0.1250	0.1550	0.1280	0.1380	0.1280	0.1270	0.1080
Foreign	0.7054***	0.6838***	0.6716***	0.7182***	0.7260***	0.6988***	0.6991***	0.6947***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	1.1865**	1.2283***	1.1991***	1.1368**	1.1897**	1.1213**	1.1230**	1.1254**
	0.0110	0.0090	0.0100	0.0150	0.0110	0.0160	0.0160	0.0160
pc2gdp	-0.0221	-0.0172	-0.0154	-0.0188	-0.0199	-0.0191	-0.0191	-0.0193
	0.1050	0.2090	0.2580	0.1650	0.1410	0.1570	0.1590	0.1550
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Likelihood ratio	4963.61	5127.01	5191.63	5088.20	5089.57	5060.37	5061.09	5074.92
Log Likelihood	-7129.5485	-7047.8486	-7504.9112	-7538.8473	-7538.4348	-7553.3106	-7552.9509	-7546.3097
Pseudo R2	0.2582	0.2667	0.2570	0.2523	0.2524	0.2509	0.2510	0.2516
N	17,508	17,508	18,312	18,285	18,286	18,287	18,287	18,288

Table 3.6.2. Export participation: A Logit Analysis – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small DV: Exporter	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-10.6959***	-9.9586***	-13.5586***	-13.1706***	-13.1760***	-13.2727***	-13.3381***	-13.5191***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Financing pattern	0.0048***	-0.0087***	0.0055***	-0.0030***	0.0031***	-0.0029	0.0009	0.0071***
	0.0020	0.0000	0.0000	0.0000	0.0070	0.4900	0.4070	0.0000
Log sales	0.4942***	0.4674***	0.4607***	0.4769***	0.4748***	0.4802***	0.4798***	0.4887***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0408	0.0371	0.0178	0.0250	0.0211	0.197	0.0207	0.0244
	0.3040	0.3540	0.6370	0.5070	0.5760	0.6020	0.5840	0.5180
Ownership	-0.0014	-0.0013	-0.0013	-0.0013	-0.0013	-0.0013	-0.0013	-0.0014
	0.2270	0.2730	0.2600	0.2460	0.2410	0.2450	0.2520	0.2130
Foreign	0.8408***	0.8267***	0.7655***	0.7915***	0.7939***	0.7760***	0.7767***	0.7744***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.6872	0.7824	0.7870	0.7558	0.8247	0.7321	0.7112	0.7060
	0.3160	0.2560	0.2500	0.2700	0.2280	0.2840	0.2980	0.3020
pc2gdp	-0.0151	-0.0115	-0.0142	-0.0167	-0.0183	-0.0170	-0.0164	-0.0163
	0.4600	0.5770	0.4870	0.4140	0.3710	0.4050	0.4220	0.4250
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Likelihood ratio	1594.47	1655.85	1763.16	1736.18	1729.88	1723.14	1723.35	1736.02
Log Likelihood	-3623.3675	-3592.6792	-3917.3685	-3921.6540	-3924.9535	-3928.3233	-3928.3731	-3922.0348
Pseudo R2	0.1803	0.1873	0.1837	0.1812	0.1806	0.1799	0.1799	0.1812
N	11,206	11,206	11,803	11,790	11,791	11,791	11,792	11,792

Table 3.6.3. Export participation: A Logit Analysis – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium DV: Exporter	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-3.6401	-3.8872	-7.6975***	-7.0844***	-7.4026***	-7.2775***	-7.2384***	-7.2738***
	0.4360	0.4080	0.0010	0.0020	0.0010	0.0010	0.0010	0.0010
Financing pattern	-0.0020	-0.0100***	0.0086***	-0.0033***	0.0051***	-0.0018	0.0002	0.0061**
	0.2830	0.0000	0.0000	0.0000	0.0000	0.6610	0.8500	0.0480
Log sales	0.3352***	0.3133***	0.3120***	0.3281***	0.3253***	0.3292***	0.3293***	0.3333***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.1333***	0.1391***	0.1319***	0.1357***	0.1338***	0.1303***	0.1304***	0.1310***
	0.0020	0.0020	0.0020	0.0020	0.0020	0.0030	0.0030	0.0020
Ownership	-0.0001	-0.0000	0.0001	0.0001	0.0002	0.0000	0.0000	0.0000
	0.9290	0.969	0.9010	0.9300	0.8590	0.9660	0.9770	0.9990
Foreign	0.6550***	0.6330***	0.6669***	0.7323***	0.7402***	0.7076***	0.7082***	0.7032***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.8328	0.8953	0.8615	0.8265	0.7952	0.7931	0.8222	0.8422
	0.2490	0.2200	0.2380	0.2520	0.2710	0.2720	0.2540	0.2430
pc2gdp	-0.0137	-0.0116	-0.0084	-0.0135	-0.0138	-0.0134	-0.0139	-0.0143
	0.4970	0.5700	0.6790	0.5030	0.4940	0.5060	0.4920	0.4810
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Likelihood ratio	1380.97	1452.34	1518.04	1464.15	1468.33	1450.25	1450.30	1454.98
Log Likelihood	-2882.5954	-2846.9129	-2947.5081	-2970.0604	-2967.9669	-2977.5227	-2976.9809	-2975.1593
Pseudo R2	0.1932	0.2032	0.2048	0.1977	0.1983	0.1958	0.1959	0.1965
N	5,292	5292	5,498	5,491	5,491	5,492	5,491	5,492

Table 3.6.4. Export participation: A Logit Analysis – Large Firms

Results of the analysis of a subsample of large (>499 employees) firms. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large DV: Exporter	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-29.0245*	-31.6931**	-32.0877**	-30.5238**	-31.3238**	-30.6395**	-30.0792**	-29.4946*
	0.0550	0.0380	0.0360	0.0460	0.0410	0.0450	0.0500	0.0540
Financing pattern	-0.0012	-0.0076**	0.0074**	-0.0016	0.0029	0.0060	0.0011	-0.0110
	0.8480	0.0110	0.0100	0.5510	0.4090	0.5900	0.7690	0.2280
Log sales	0.1647***	0.1663***	0.1660***	0.1808***	0.1804***	0.1825***	0.1799***	0.1728***
	0.0060	0.0060	0.0060	0.0030	0.0030	0.0020	0.0030	0.0040
Log age	0.2818**	0.2679**	0.2701**	0.2508**	0.2503**	0.2559**	0.2543**	0.2528**
	0.0260	0.0350	0.0340	0.0480	0.480	0.0430	0.0450	0.0460
Ownership	0.0028	0.0026	0.0023	0.0022	.0022	0.0022	0.0023	0.0021
	0.4130	0.4480	0.4920	0.5130	0.5140	0.5200	0.5040	0.540
Foreign	0.4878**	0.4780**	0.4923**	0.5126**	0.5281**	0.5057**	0.5009**	0.5303**
	0.0160	0.0190	0.0160	0.0130	0.0110	0.0140	0.0140	0.0100
Rule of Law	5.4993**	5.4885**	5.6585**	4.9754**	5.0286**	4.9294**	4.9685**	5.0389**
	0.0150	0.0150	0.0120	0.0270	0.0110	0.0280	0.0270	0.0260
pc2gdp	-0.1168*	-0.1125*	-0.1208*	-0.1055	-0.1064*	-0.1053	-0.1049	-0.1038
	0.0730	0.0820	0.0630	0.1030	0.1000	0.1020	0.1040	0.1100
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Likelihood ratio	379.77	386.19	390.47	387.96	388.29	387.91	387.69	389.03
Log Likelihood	-393.5707	-390.3605	-391.4320	-391.0991	-390.9344	-391.1256	-391.2341	-390.5678
Pseudo R2	0.3254	0.3309	0.3328	0.3315	0.3318	0.3315	0.3313	0.3325
N	863	863	867	864	864	864	864	864

3.4.3. The intensive margin of export

This section investigates the impact of different financing patterns on the export intensity, i.e. the intensive margin of export. Since this analysis focuses only on the firms that participate in export, the sample gets reduced to 4,397 firms. The dependent variable (*Exporter2*) has negative binomial distribution, so Generalized Linear Model (GLM) for negative binomial distribution is used to test the following regression:

$$Exporter2 = \beta_0 + \beta_1 Time\ of\ Payment + \beta_2 Log\ Sales + \beta_3 Log\ Age + \beta_4 Ownership + \beta_5 Foreign + \beta_6 Rule\ of\ Law + \beta_7 PC2GDP + \beta_8 Year\ dummy + Macro\ Variables + Industry\ dummies + Country\ dummies + \varepsilon. \quad (3.3)$$

where *Time of Payment* is a percentage of total annual sales of goods and services paid for *Before delivery, On delivery,* or *After delivery* (WBES original data item: k.2).

$$Exporter2 = \beta_0 + \beta_1 Source\ of\ Financing + \beta_2 Log\ Sales + \beta_3 Log\ Age + \beta_4 Ownership + \beta_5 Foreign + \beta_6 Rule\ of\ Law + \beta_7 PC2GDP + \beta_8 Year\ dummy + Macro\ Variables + Industry\ dummies + Country\ dummies + \varepsilon. \quad (3.4)$$

where *Source of Financing* is a proportion of working capital financed from Internal sources, Banks, Non-bank financial institutions, Supplier credit and/or Customer advances, and Informal sources (WBES original data item: k.3).

Ordinary Least Square (OLS) is used as a robustness test for the GLM. The results are presented in Tables 3.7.1 through 3.7.4 (GLM) and 3.8.1 through 3.8.4 (OLS).

Firm Size (*Log Sales*) and *Foreign Ownership* coefficients are significantly positive at 5% for all the models (in both OLS and GLM). This result suggests that larger firms that have foreign ownership export more than their smaller domestically-owned competitors. On the other hand, Firm Age (*Log Age*) is negative and significant at 1%. Younger firms tend to export more.

Table 3.7.1. Export intensity: GLM – Full Sample

Results of the full sample analysis *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All **DV: Exporter2**	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	2.5435	2.5598	3.0557***	3.0743***	3.1205***	3.1047***	3.1832***	3.0944***
	0.3090	0.3050	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Financing pattern	0.0033***	0.0003	-0.0010**	0.0002	0.0024***	0.0019	-0.0031***	0.0000
	0.0000	0.6230	0.0470	0.5700	0.0000	0.3600	0.0000	0.9770
Log sales	0.0238***	0.0202**	0.0221**	0.0204**	0.0146*	0.0200**	0.0195**	0.0201**
	0.0080	0.0250	0.0120	0.0200	0.0980	0.0220	0.0260	0.0220
Log age	-0.1521***	-0.1539***	-0.1443***	-0.1559***	-0.1585***	-0.1558***	-0.1557***	-0.1558***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0005	-0.0005	-0.0006	-0.0005	-0.0005	-0.0005	-0.0006	-0.0005
	0.3450	0.3850	0.3200	0.3540	0.4040	0.3550	0.3160	0.3590
Foreign	0.2556***	0.2513***	0.2507***	0.2473***	0.2679***	0.2494***	0.2503***	0.2492***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	0.2789	0.2450	0.2087	0.2299	0.2454	0.2507	0.2540	0.2331
	0.4430	0.5020	0.5630	0.5240	0.4980	0.4880	0.4800	0.5180
pc2gdp	-0.0081	-0.0067	-0.0056	-0.0045	-0.0057	-0.0051	-0.0056	-0.0046
	0.4340	0.5160	0.5860	0.6600	0.5790	0.6170	0.5860	0.6530
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	8.7419	8.7447	8.7818	8.7831	8.7795	8.7830	8.7769	8.7832
Log Likelihood	-18164.7483	-18170.6383	-19264.4144	-19227.8359	-19219.8673	-19227.5845	-19214.1911	-19227.9847
N	4,170	4,170	4,404	4,395	4,395	4,395	4,395	4,395

Table 3.7.2. Export intensity: GLM – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small DV: Exporter2	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	4.0685**	4.5261***	4.0981**	4.6689***	4.4083***	4.3270***	4.3884***	4.3626***
	0.0100	0.0040	0.0100	0.0060	0.0050	0.0060	0.0050	0.006
Financing pattern	0.0041***	-0.0001	-0.0009	-0.0001	0.0034***	-0.0009	-0.0031***	0.0011
	0.0050	0.9510	0.2420	0.8770	0.0010	0.8180	0.0010	0.5120
Log sales	-0.0165	-0.0253	-0.0245	-0.0299	-0.0400**	-0.0296	-0.0270	-0.0289
	0.4140	0.2070	0.2040	0.1190	0.0380	0.1210	0.1570	0.1290
Log age	-0.1606***	-0.1626***	-0.1677***	-0.1662***	-0.1697***	-0.1660***	-0.1619***	-0.1647***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0002	-0.0002	-0.0006	-0.0006	-0.0004	-0.0006	-0.0005	-0.0007
	0.8150	0.8590	0.5550	0.5430	0.6560	0.5380	0.5910	0.5050
Foreign	0.2621***	0.2497	0.2245***	0.2299***	0.2463***	0.2302***	0.2357***	0.2306***
	0.0010	0.0020	0.0030	0.0020	0.0010	0.0020	0.0020	0.0020
Rule of Law	0.4835	0.4798	0.4214	0.4349	0.5597	0.4163	0.4151	0.4484
	0.4520	0.4570	0.5060	0.4940	0.3780	0.5120	0.5110	0.4790
pc2gdp	-0.0106	-0.0087	-0.0048	-0.0044	-0.0082	-0.0040	-0.0062	-0.0044
	0.5730	0.6450	0.7950	0.8120	0.6590	0.8300	0.7390	0.8120
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	8.6723	8.6776	8.7448	8.7458	8.7407	8.7468	8.7404	8.7465
Log Likelihood	-6466.9407	-6470.9152	-7204.7456	-7188.8250	-7183.7526	-7188.8114	-7183.5591	-7188.6270
N	1,505	1,505	1,664	1,660	1,660	1,660	1,660	1,660

Table 3.7.3. Export intensity: GLM – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium DV: Exporter2	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	0.2509	0.0291	0.4848	0.4448	0.4383	.4838	0.5052	0.4609
	0.9390	0.9930	0.7740	0.7930	0.7960	0.7750	0.7670	0.7850
Financing pattern	0.0034**	0.0010	-0.0017**	0.0002	0.0018**	0.0019	-0.0027***	0.0001
	0.0160	0.2380	0.0190	0.7050	0.0190	0.5350	0.0010	0.9720
Log sales	0.0290	0.0286	0.0299*	0.0271	0.0222	0.0267	0.0270	0.0265
	0.1080	0.1120	0.0930	0.1280	0.2140	0.1330	0.1280	0.1340
Log age	-0.1404***	-0.1422***	-0.1437***	-0.1497***	-0.1503***	-0.1496***	-0.1515***	-0.1491***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0005	-0.0005	-0.0004	-0.0003	-0.0003	-0.0003	-0.0004	-0.0003
	0.4990	0.4980	0.5920	0.6950	0.7280	0.6960	0.6350	0.7060
Foreign	0.2675***	0.2683***	0.2720***	0.2608***	0.2788***	0.2640	0.2628***	0.2629
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	-0.1184	-0.1745	-0.1973	-0.1014	-1.1434	-0.0896	-0.1106	-0.1067
	0.8170	0.7330	0.6990	0.8420	0.7790	0.8600	0.8280	0.8340
pc2gdp	-0.0010	0.0003	0.0003	0.0006	0.0002	0.0002	0.0007	0.006
	0.9430	0.9850	0.9810	0.9650	0.9860	0.9900	0.9610	0.9660
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	8.7359	8.7379	8.7713	8.7675	8.7651	8.7673	8.7629	8.7675
Log Likelihood	-9311.5667	-9313.7314	-9641.2644	-9628.1858	-9625.6570	-9628.0683	-9623.1808	9628.2512
N	2,146	2,146	2,215	2,213	2,213	2,213	2,213	2,213

Table 3.7.4. Export intensity: GLM – Large Firms

Results of the analysis of a subsample of large (>499 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large DV: Exporter2	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	-4.8212	-4.6999	-5.5536	-4.8540	-5.8159	-4.7398	-5.2768	-4.3451
	0.5280	0.5180	0.4720	0.5220	0.4450	0.5280	0.4880	0.5670
Financing pattern	-0.0034	-0.0006	0.0011	-0.0009	0.00031**	0.0080*	-0.0037**	-0.0027
	0.3530	0.6940	0.4390	0.5040	0.0480	0.0860	0.0400	0.5560
Log sales	-0.0222	-0.0202	-0.0207	-0.0206	-0.0227	-0.0158	-0.0229	-0.0228
	0.4510	0.4920	0.4820	0.4790	0.4360	0.5880	0.4370	0.4350
Log age	-0.2254***	-0.2247***	-0.2226***	-0.2286***	-0.2338***	-0.2201***	-0.2200***	-0.2255***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0012	-0.0012	-0.0014	-0.0015	-0.0014	-0.0018	-0.0015	-0.0015
	0.4370	0.4270	0.3740	0.3400	0.3660	0.2380	0.3240	0.3280
Foreign	0.1164	0.1158	0.1298	0..1381	0.1559*	0.1403	0.1304	0.1364
	0.1880	0.1900	0.1430	0.1200	0.0820	0.1100	0.1410	0.1240
Rule of Law	0.1952	0.2542	0.3627	0.0406	0.1183	0.0794	0.1452	0.0488
	0.8450	0.8050	0.7240	0.9670	0.9050	0.9350	0.8830	0.9600
pc2gdp	-0.0228	-0.0252	-0.0267	-0.0167	-0.0192	-0.0177	-0.0189	-0.0157
	0.4610	0.4240	0.3960	0.5780	0.5230	0.5540	0.5300	0.6020
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	9.0646	9.0656	9.0755	9.1029	9.0978	9.0989	9.0977	9.1031
Log Likelihood	-2293.2613	-2293.5173	-2319.3205	-2312.8593	-2311.5320	-2311.8172	-2311.4925	-2312.9037
N	519	519	525	522	522	522	522	522

Table 3.8.1. Export intensity: OLS – Full Sample

Results of the full sample analysis *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: All DV: Exporter2	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	70.4423*	69.3986*	42.9872	47.0412	43.0573	46.6835	47.9286	47.1081
	0.0830	0.0870	0.2220	0.1810	0.2190	0.1840	0.1710	0.1810
Financing pattern	0.0915***	0.0017	-0.0204	0.0075	0.0739***	0.1061*	-0.0978***	0.0078
	0.0020	0.9350	0.2310	0.5530	0.0000	0.0870	0.0000	0.8380
Log sales	0.8191***	0.7579***	0.8256***	0.7971***	0.6383**	0.7930***	0.7551***	0.7965***
	0.0050	0.0090	0.0040	0.0050	0.0260	0.0050	0.0080	0.0050
Log age	-5.6295***	-5.6731***	-5.6869***	-5.7316***	-5.6912***	-5.7139***	-5.7734***	-5.7087***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0248	-0.0246	-0.0265	-0.0265	-0.0249	-0.0272*	-0.0292*	-0.0264
	0.1390	0.1440	0.1080	0.1090	0.1300	0.1000	0.0760	0.1100
Foreign	9.2164***	9.1056***	8.9913***	8.9555***	9.5408***	9.0444***	9.0475***	9.0027***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	14.1914	13.4444	12.8817	12.0968	12.9810	12.5320	12.6498	12.2763
	0.2030	0.2270	0.2490	0.2790	0.2430	0.2610	0.2540	0.2720
pc2gdp	-0.2807	-0.2577	-0.2266	-0.1763	-0.2072	-0.1875	-0.2138	-0.1777
	0.3920	0.4320	0.4900	0.5900	0.5250	0.5660	0.5120	0.5870
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sqr	0.1830	0.1809	0.1823	0.1833	0.1868	0.1838	0.1896	0.1832
N	4,170	4,170	4,404	4,395	4,395	4,395	4,395	4,395

Table 3.8.2. Export intensity: OLS – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Micro & Small DV: Exporter2	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	163.6806*	163.4192*	137.7636**	154.6994***	151.9562***	153.2148***	158.3803***	155.8648***
	0.0760	0.0750	0.0050	0.0020	0.0030	0.0020	0.0010	0.0020
Financing pattern	0.1054**	0.0034	-0.0255	-0.0045	0.1063***	0.0834	-0.0957***	0.0550
	0.0200	0.9140	0.3270	0.8240	0.0010	0.4560	0.0000	0.3220
Log sales	0.0856	-0.0535	-0.2196	-0.4159	-0.6063	-0.4056	-0.3292	-0.3564
	0.9000	0.9380	0.7410	0.5300	0.3600	0.5410	0.6150	0.5930
Log age	-4.8138***	-4.8738***	-5.1631***	-5.0702***	-5.0281***	-5.0611***	-5.1250***	-5.0321***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0362	-0.0357	-0.0466*	-0.0481*	-0.0458*	-0.0479*	-0.0502*	-0.0509*
	0.2010	0.2100	0.090	0.0810	0.0940	0.0820	0.0670	0.0650
Foreign	8.0839***	7.9963***	6.9210***	7.2370***	7.8769***	7.1795***	7.3682***	7.2443***
	0.0020	0.0020	0.0030	0.0020	0.0010	0.0020	0.0020	0.0020
Rule of Law	16.0487	15.1634	15.5221	14.3255	17.8792	14.4451	16.2492	14.8971
	0.4310	0.4550	0.4460	0.4810	0.3750	0.4770	0.4240	0.4650
pc2gdp	-0.3053	-0.2882	-0.2037	-0.1625	-0.2415	-0.1761	-0.2504	-0.1585
	0.6240	0.642	0.7420	0.7920	0.6920	0.7750	0.6820	0.7970
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sqr	0.2233	0.2198	0.2210	0.2195	0.2256	0.2198	0.2260	0.2201
N	1,505	1,505	1,664	1,660	1,660	1,660	1,660	1,660

Table 3.8.3. Export intensity: OLS – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. *Exporter2,* the Dependent variable, is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Medium DV: Exporter2	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	20.4999	15.1542	16.2533	19.9397	14.8792	19.9326	15.7066	20.8871
	0.7310	0.7990	0.7650	0.6530	0.7380	0.6530	0.7220	0.6380
Financing pattern	0.1134***	0.0102	-0.0384	0.0170	0.0499**	0.0842	-0.0916***	-0.0249
	0.0070	0.7460	0.1310	0.3460	0.0340	0.2890	0.0000	0.6410
Log sales	0.6555	0.6313	0.7574	0.6388	0.5267	0.6295	0.6068	0.6071
	0.2520	0.2750	0.1870	0.2610	0.3540	0.2690	0.2850	0.2870
Log age	-5.4342***	-5.5138***	-5.5181***	-5.6812***	-5.6034***	-5.6522***	-5.6856***	-5.6714***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0168	-0.0166	-0.0127	-0.0116	-0.0097	-0.0119	-0.0140	-0.0108
	0.4680	0.4740	0.5800	0.6140	0.6720	0.6050	0.5380	0.6360
Foreign	9.7338***	9.5816***	9.9587***	9.6475***	10.1727***	9.8335***	9.7867***	9.7917***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	5.2627	3.8784	2.9286	3.8547	3.2514	4.3627	2.9708	3.8726
	0.7320	0.8020	0.8500	0.8040	0.8340	0.7780	0.8470	0.8030
pc2gdp	-0.1714	-0.1300	-0.1229	-0.0839	-0.1075	-0.1001	-0.0921	-0.0900
	0.6830	0.7580	0.7720	0.8420	0.7990	0.8120	0.8270	0.8310
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sqr	0.1783	0.1754	0.1828	0.1840	0.1855	0.1840	0.1893	0.1837
N	2,146	2,146	2,215	2,213	2,213	2,213	2,213	2,213

Table 3.8.4. Export intensity: OLS – Large Firms

Results of the analysis of a subsample of large (>499 employees) firms. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Sample: Large DV: Exporter2	**Before delivery**	**On delivery**	**After delivery**	**WC: Internal funds**	**WC: Banks**	**WC: Non-banks**	**WC: SupCred/ CustAdv**	**WC: Informal**
Intercept	103.9950	99.4026	-207.7969	-140.3384	-111.8039	-110.7325	-166.6215	-154.5263
	0.4460	0.4700	0.5490	0.6870	0.7410	0.7510	0.6230	0.6560
Financing pattern	-0.0902	0.0219	-0.0024	-0.0052	0.1096**	0.2319	-0.1454***	-0.1311
	0.4130	0.6850	0.9620	0.8960	0.0370	0.1910	0.0080	0.4200
Log sales	-0.4501	-0.4295	-0.4326	-0.3873	-0.4243	-0.2618	-0.4609	-0.4347
	0.6260	0.6410	0.6390	0.6710	0.6390	0.7700	0.6120	0.6350
Log age	-85326***	-8.4660***	-8.4616***	-8.7674***	-8.9152***	-8.6827***	-8.5662***	-8.7432***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ownership	-0.0047	-0.0050	-0.0061	-0.0112	-0.0111	-0.0166	-0.0087	-0.0118
	0.9230	0.9170	0.9000	0.8170	0.8180	0.7300	0.8570	0.8070
Foreign	3.8583	3.8482	3.9772	3.9344	4.7280*	4.2010	3.9072	4.1093
	0.1590	0.1610	0.1470	0.1540	0.0860	0.1250	0.1530	0.1380
Rule of Law	19.8966	17.4532	18.0667	11.3715	13.9419	11.1533	14.8347	11.5620
	0.5770	0.6240	0.6130	0.7500	0.6930	0.7560	0.6710	0.7460
pc2gdp	-1.4896	-1.4462	-1.4483	-1.1791	-1.2548	-1.1637	-1.2497	-1.1661
	0.1900	0.2040	0.2050	0.3050	0.2740	0.3130	0.2800	0.3110
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sqr	0.4161	0.4156	0.4235	0.4267	0.4328	0.4300	0.4354	0.4275
N	519	519	525	522	522	522	522	522

Paying before delivery has a significantly positive effect on the exporting amount, while post-delivery payment is associated with exporting less (however, this result is true only for GLM). Firms are able to increase their exporting volume as paying beforehand is associated with less risk. Having a larger share of working capital financed by borrowing from bank has a significantly positive effect on the exporting amount (supports the third hypothesis). However, increase in a share of supplier credit/customer advance is associated with significantly negative change in the exporting amount (supports the forth hypothesis). As this source of financing is considered the last resort and a firm is unlikely to choose it to depend on unless it has no other options. Both of these findings support hypotheses of this study.

Based on this author's literature review, there seem to be no conclusive results in the previous literature regarding the export intensity and source of financing. Consequently, this analysis continues with firm-size subsamples. An interesting finding is that all three subsamples show significant positive effect of *Bank* financing and significantly negative effect of *Supplier credit/Customer advances* on export intensity. Time of the payment doesn't affect export size of the large firms; while *Before delivery* has a significantly positive coefficients for micro, small, and medium firms.

3.5. Robustness tests

The regression models (3.1 through 3.4) assume a firm's decisions to export and exporting amount to be exogenous to the financial constraints. However, these decisions may also be endogenous, i.e. there may be a reverse causality between financing patterns and exporting decision. Whether to export or not is a voluntary decision, and a firm must consider several factors when making the decision. For example, a firm may choose to increase its portion of bank

financing as a result of their exporting expansion. On the other hand, it may be that in order to raise necessary capital to cover costs associated with opening an exporting market a firm goes to a bank. Therefore, potential self-selection bias needs to be accounted for.

Endogeneity tests are conducted using the Heckman two-stage procedure.

3.5.1. Heckman two-stage selection model

Heckman (1979) argues that self-selection biases are akin to omitted variables biases that could result in endogeneity. He proposes a two-step procedure to correct the bias. In the first stage, a selection model is employed to estimate a firm's choice between entering exporting market and not. The second stage is the outcome model that corrects for the potential selection bias. For identification reasons, at least one variable in the first stage selection equation needs to be excluded from the second stage outcome equation. The country and industry average value for a financing pattern (*Fin. Pattern Mean*) was chosen to be excluded. The reasoning is that a firm's decision to export is influenced by the fraction of firms in its industry and its country of export. However, an argument can be made that country/industry average financing pattern won't affect exporting decision. There are 2 Heckman procedures employed, including: the conventional Heckman procedure ("*heckman*" module in STATA) for the continuous dependent variable (*Exporter2*) and the Heckman probit procedure ("*heckprob*" module in STATA) for the dummy DV (*Exporter*). The financing pattern variables have signs consistent with all the previous findings, as well as level of significance (with the exception of Informal financing on likelihood to Export). For the export intensity, the signs are consistent with the initial findings. Refer to Tables 3.9 and 3.10.

Table 3.9. Endogeneity test: Two-stage Heckman Model

Column (1) presents the Heckman first-stage selection equation and column (2) is the outcome equation for *Exporter* with sales paid *Before delivery* as a proxy for financing pattern. Column (3) presents the Heckman first-stage selection equation and column (4) is the outcome equation for *Exporter* with sales paid *After delivery* as a proxy for financing pattern. Column (5) presents the Heckman first-stage selection equation and column (6) is the outcome equation for *Exporter* with WC financing from *Internal funds* as a proxy for financing patterns. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. *Fin pattern mean* are the country and industry mean values for the financing pattern variables of interest. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: Exporter	(1) Selection	(2) Before delivery	(3) Selection	(4) After delivery	(5) Selection	(6) WC: Internal funds
Intercept	-0.6840	-4.2691***	0.8196	-3.7975***	2.2289*	-3.6638***
	0.7480	0.0000	0.4730	0.0000	0.0810	0.0000
Fin pattern mean	-0.0233***		0.0035		-0.0136**	
	0.0000		0.4040		0.0200	
Financing pattern		-8.06e-06		0.0058***		-0.0020***
		0.9890		0.0000		0.0000
Log sales	0.1179	0.0946***	0.0561	0.0747***	0.0519	0.0840***
	0.1010	0.0000	0.1480	0.0000	0.1990	0.0000
Log age	-0.1280	0.2147***	-0.0016	0.1894***	-0.0014	0.2004***
	0.2510	0.0000	0.9880	0.0000	0.9900	0.0000
Ownership	0.0050	0.0004	-0.0003	0.0000	-0.0002	0.0001
	0.1810	0.3880	0.9400	0.9350	0.9570	0.7500
Foreign	-0.7800***	0.6835***	-0.6309***	0.6571***	-0.6190***	0.6854***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	-2.8098***	-0.8251***	-1.8607***	-0.5885***	-1.6310***	-0.6352***
	0.0020	0.0000	0.0000	0.0000	0.0010	0.0000
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes
Athrho		-3.4554*		4.4600***		0.8262
		0.0780		0.0000		0.6060
N	17,519		18,326		18,299	

Table 3.9. (cont.) Endogeneity test: Two-stage Heckman Model

Column (7) presents the Heckman first-stage selection equation and column (8) is the outcome equation for *Exporter* with WC financing from *Banks* as a proxy for financing patterns. Column (9) presents the Heckman first-stage selection equation and column (10) is the outcome equation for *Exporter* with WC financing from *Non-bank financial institutions* as a proxy for financing patterns. Column (11) presents the Heckman first-stage selection equation and column (12) is the outcome equation for *Exporter* with WC financing from *Supplier credit and Customer advances* as a proxy for financing patterns. Column (13) presents the Heckman first-stage selection equation and column (14) is the outcome equation for *Exporter* with WC financing from *Informal sources* as a proxy for financing patterns. *Exporter, the Dependent Variable,* is a dummy variable equal to 1 if a firm exports, and 0 otherwise. *Fin pattern mean* are the country and industry mean values for the financing pattern variables of interest. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: Exporter	(7) Selection	(8) WC: Banks	(9) Selection	(10) WC: Non-banks	(11) Selection	(12)WC: SupCred/ CustAdv	(13) Selection	(14) WC: Informal
Intercept	0.7623	-3.8927***	0.4556	-3.8376***	1.3095	-3.8578***	0.3685	-3.8450***
	0.4810	0.0000	0.7330	0.0000	0.2420	0.0000	0.7710	0.0000
Fin pattern mean	0.0157**		-0.0172		0.0274***		0.0036	
	0.0300		0.7150		0.0010		0.8900	
Financing pattern		0.0039***		-0.0011		0.0002		0.0006
		0.0000		0.4120		0.6300		0.4920
Log sales	0.0600	0.0838***	0.0945**	0.0858***	0.0467	0.0861***	0.0943**	0.0859***
	0.1410	0.0000	0.0190	0.0000	0.2330	0.0000	0.0190	0.0000
Log age	-0.0030	0.1967***	-0.1032	0.1980***	-0.0021	0.1988***	-0.0990	0.1987***
	0.9770	0.0000	0.2960	0.0000	0.9840	0.0000	0.3070	0.0000
Ownership	-0.0003	0.0002	-0.0001	0.0001	-0.0003	0.0001	-0.0003	0.0001
	0.9270	0.7130	0.9680	0.7380	0.9400	0.7320	0.9400	0.7580
Foreign	-0.6248***	0.6895***	-0.6737***	0.6764***	-0.6329***	0.6716***	-0.6671***	0.6772***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	-1.7873***	-0.6548***	-2.1220***	-0.6635***	-1.5432***	-0.6738***	-2.1534***	-0.6638***
	0.0000	0.0000	0.0010	0.0000	0.0020	0.0000	0.0010	0.0000
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Athrho		0.8408		-4.2891		1.1876		-4.6315
		0.3860		0.5370		0.5980		0.6670
N	18,300		18,301		18,301		18,302	

Table 3.10. Endogeneity test: Two-stage Heckman Model

Column (1) presents the Heckman first-stage selection equation and column (2) is the outcome equation for *Exporter2* with sales paid *Before delivery* as a proxy for financing pattern. Column (3) presents the Heckman first-stage selection equation and column (4) is the outcome equation for *Exporter2* with sales paid *On delivery* as a proxy for financing pattern. Column (5) presents the Heckman first-stage selection equation and column (6) is the outcome equation for *Exporter2* with sales paid *After delivery* as a proxy for financing pattern. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. *Fin pattern mean* are the country and industry mean values for the financing pattern variables of interest. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: Exporter2	**(1) Selection**	**(2) Before delivery**	**(3) Selection**	**(4) On delivery**	**(5) Selection**	**(6) After delivery**
Intercept	-0.7464***	-15.3700***	-0.5586***	-10.9567***	-0.3734***	-11.3533***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fin pattern mean	3.21e-09		1.04e-09***		9.81e-10***	
	0.6940		0.0010		0.0000	
Financing pattern		0.0102		-0.0523***		0.0392***
		0.1710		0.0000		0.0000
Log sales	0.0351***	0.6920***	0.0310***	0.6088***	0.0269***	0.5349***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0275***	0.5412***	0.0235**	0.4606**	0.0134	0.2670
	0.0050	0.0050	0.0160	0.0160	0.1640	0.1630
Ownership	0.0003	0.0050	0.0003	0.0067	0.0001	0.0013
	0.3880	0.3880	0.2470	0.2460	0.8270	0.8270
Foreign	0.5727***	11.4010***	0.5671***	11.1246***	0.5676***	11.2983***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	-0.3473***	-6.4176***	-0.2988***	-5.8606***	-0.2391***	-4.7599***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes
Athrho		15.7198***		15.7148***		16.2783***
		0.0000		0.0000		0.0000
N	17,519		17,519		18,326	
Lambda		19.6994		19.616		19.9071

Table 3.10. (cont.) Endogeneity test: Two-stage Heckman Model

Column (7) presents the Heckman first-stage selection equation and column (8) is the outcome equation for *Exporter2* with WC financing from *Internal funds* as a proxy for financing patterns. Column (9) presents the Heckman first-stage selection equation and column (10) is the outcome equation for *Exporter2* with WC financing from Banks as a proxy for financing patterns. Column (11) presents the Heckman first-stage selection equation and column (12) is the outcome equation for *Exporter2* with WC financing from *Non-bank financial institutions* as a proxy for financing patterns. Column (13) presents the Heckman first-stage selection equation and column (14) is the outcome equation for *Exporter2* with WC financing from *Informal sources* as a proxy for financing patterns. *Exporter2,* the Dependent variable*,* is a percentage of total sales from export. *Fin pattern mean* are the country and industry mean values for the financing pattern variables of interest. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: Exporter2	(7) Selection	(8) WC: Internal funds	(9) Selection	(10) WC: Banks	(11) Selection	(12) WC: Non-banks	(13) Selection	(14) WC: Informal
Intercept	-0.5457***	-10.8966***	-0.3662***	-12.2845***	-0.6061***	-12.1045***	-0.6060***	-12.1022***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fin pattern mean	-3.72e-09***		0.0009***		5.38e-09		1.41e-08	
	0.0000		0.0000		0.3940		0.1400	
Financing pattern		-0.0120***		0.0532***		4.49e-08***		4.52e-08***
		0.0020		0.0000		0.0020		0.0040
Log sales	0.0306***	0.6107***	0.0299***	0.5925***	0.0312***	0.6240***	0.0312***	0.6235***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0176*	0.3519*	0.0148	0.3054	0.0172*	0.3431*	0.0172*	0.3432*
	0.0670	0.0660	0.1250	0.1100	0.0740	0.0730	0.0740	0.0730
Ownership	0.0001	0.0011	0.0001	0.0014	0.0001	0.0011	0.0001	0.0011
	0.8570	0.8570	0.6600	0.8110	0.8490	0.8490	0.8510	0.8510
Foreign	0.5822***	11.6254***	0.5792***	11.7345***	0.5788***	11.5591***	0.5788***	11.5602***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rule of Law	-0.2580***	-5.1518***	-0.2740***	-5.0754***	-0.2704***	-5.3997***	-0.2705***	-5.4014***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Athrho		15.8445***		16.0245***		15.8407***		15.9931***
		0.0000		0.0000		0.0000		0.0000
N	18,299		18,300		18,301		18,302	
Lambda		19.9673		19.9228		19.9715		19.9711

3.6. Conclusions

This paper examines the financing patterns of 22,259 exporting firms in 31 LAC using survey data from 2006 and 2010. There are 2 key findings: 1) firms have a higher likelihood to participate in exporting activity if they use a larger (smaller) share of formal bank financing (internal financing) to fund their working capital, and 2) informal financing has a significantly positive effect on export participation.

This paper indicates that an increase in export intensity is associated with an increase in bank financing and decrease in a share of supplier credit/customer advances. Post-delivery payment is associated with an increase in likelihood to export but a decrease in export amount; while payment before delivery has a significantly positive effect on export intensity.

Chapter 4. Essay 3 - Financial Constraints and Financing Patterns: Male versus Female Entrepreneurs in Latin America

4.1. Introduction

Over the past few years as the financial crisis passed and the world economy started to stabilize, many[10] have asked a question if it was preventable. Adams and Funk (2012) suggest that the answer can be as easy as having more women in charge. And there are a number of studies showing that women are more risk averse than men (Byrnes et al., 1999, Barber and Odean, 2001). They also require a more precise monitoring (Adams and Ferreira, 2009) and frequent auditing (Gul et al., 2008).

Given this body of research, this author considers how these behavioral patterns may impact financing decisions and in response, how financial institutions respond to the initiatives of female entrepreneurs.

According to the 2014 report from the International Finance Corporation (World Bank), even though women-owned SMEs represent about 34% of the global SME, women business-owners around the globe cite access to finance as a major or severe constraint on their business operations.

Using a sample of 20,925 firms from 31 countries of Latin America and the Caribbean (LAC) this research investigates two dimensions: 1) the difference in financing patterns between

[10] For example, Fields, L. 2010. Let's Face The Truth: An Outsider's View of the 2009 Great Recession

male- and female-entrepreneurs, and 2) analyzes if there is a difference in the level of financial constraints between the two.

The rest of the paper organized as follows: Section 4.2 reviews prior literature, Section 4.3 describes the data and variables derivation, Section 4.4 defines the methodology and provides results, and Section 4.5 offers conclusions.

4.2. Literature review

Recently the area of gender-related research has been accelerating. Literature seems to concur that despite the fact that female business owners are significantly more likely to feel financially constrained than male business owners, their firms grow at the same rate. In other words, women manage to succeed in spite of all the barriers.

In a working paper, Allison and Wei (2013) used a sample from 23 Latin American countries and found that despite the fact that women face significantly higher level of obstacles that are related to crime and theft, corruption, financing, infrastructure, and anticompetitive practices; their firms experience the same level of growth as male-owned.

This paper is offered in order to extend current research by focusing on the financial constraints and further investigating associated issues.

HYPOTHESIS 1: *Female business owners are more financially constrained than male business owners.*

A number of studies looked at difference in what financing sources a business owner uses depending on their gender. Zimmerman Treichel and Scott (2007) published that there is a significant relationship between the gender of a business owner and their relationship with a bank.

Their research focused on three gender questions: 1) likelihood to apply for loan, 2) likelihood for the loan application to be rejected, and 3) the size of the approved loan. They find that women are less likely to apply for a bank loan; which might been caused by fear of rejection but the study shows that WBO's application is as likely to be approved as MBO's. Nevertheless, the amount of the approved loan is significantly lower for women-business owners. This is consistent with the report of International Finance Corporation that states that aggregate loan amount borrowed by formal women-owned SMEs is significantly less than the loan amount borrowed by formal men-owned SMEs even though no other notable differences between applications were identified.

Watson (2007) found that even though female-controlled firms in Australia are as profitable as male-controlled, it is achieved despite a lack of external financing. Manolova et al. (2007) suggest that male business owners rely more heavily on external financing because of their ability to successfully build and navigate a social business network.

Arenius and Autio (2007) published that women and men business owners in Finland are similar in their financing patterns. Their results suggest that women and men are equally likely to use external financing, even more so bank financing. Their loans are comparable in their characteristics (including the size of a loan). Both groups feel equally unconstrained in terms of their access to finance. The only real difference in FBO's financing is stronger dependence on informal financing.

HYPOTHESIS 2: *Female entrepreneurs are more likely to rely on external financing (especially Bank) as a source of working capital financing.*

The credit gap for women-owned SMEs across all regions is about 30% of the total credit gap for SMEs, with LAC countries having the largest – over 36% (based on the data from 2003-

2010 by the 2014 World Bank report). A lot of new forms of financial institutions try to meet financial interests of this large market segment.

HYPOTHESIS 3: *Female entrepreneurs are more likely to rely on external financing (especially Non-bank financial institutions) as a source of capital expenditure financing.*

4.3. Data and variables

The main source of the data for this research is *World Bank Enterprise Survey (WBES)*. This data have been collected mostly in 2006 and 2010 across 31 LAC countries. It covers a wide range of industries including manufacturing, services, agriculture, construction and others (see Appendix Table A.5 for the complete list) across firms of different sizes, focusing on small and medium sized firms. The survey is conducted among business owners and top-management with a goal to evaluate obstacles in business environment around the globe. The survey questions are consistent across countries and years that allow us to conduct cross-country analysis. WBES provides qualitative and quantitative measures of firm characteristics, including evaluation of the constraints that a firm faces on a daily basis. The database also includes information on export participation status and export intensity, ownership concentration and foreign ownership, and limited measures of firm performance such as multiple years of historical data on sales and employment.

The final sample consists of 20,925 unique firms; more than a 36% of which are solo- or partially owned by women. Some of the countries are presented by two subsamples from different

survey years[11]; however, others have only one year of survey data available[12] (see Appendix Table A.4 for the complete list of countries and years of survey). Sample includes all firms from the database that have non-missing value for the survey question about the gender composition of the firm owners. Next part discusses all the key variables.

4.3.1 Dependent variables

There are two groups of dependent variables. The first group represents financial constraints that a firm and its owner may face and the second group includes a number of variables that provide us with different financing patterns to investigate.

4.3.1.1. Financial Constraints

Based on the data from the surveys, five variables that define financial constraints faced by a firm are constructed: two of them (*Finance* and *Finance dummy*) illustrate an individual's personal perception about being financially constrained, while the other four (*Creditline, Overdraft, Apply4Loan,* and *LogLoanSize*) are objective. These variables are described below.

4.3.1.1.1. Finance

This variable is estimated using firm's answer to the following question (using WBES original data item: k.30):

[11] Argentina, Bolivia, Chile, Columbia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Uruguay

[12] Antigua and Barbuda, Bahamas, Barbados, Belize, Brazil, Costa Rica, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, Trinidad and Tobago, and Venezuela

"Is access to financing, which includes availability and cost [interest rates, fees and collateral requirements], No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?"

The WBES scores the financing obstacles on the following scale: No obstacle=0, Minor obstacle =1, Moderate obstacle=2, Major obstacle =3, and Very severe obstacle=4. An average firm in the sample views the financing obstacle as moderate: with mean 1.62 and median 2 (Table 4.1).

4.3.1.1.2. Finance Dummy

Finance dummy is constructed based on the Finance variable: Finance dummy equals 1 if a respondent feels that financing is an obstacle for his firm (they answered 1, 2, 3, or 4 to access to financing question of the survey (using WBES original data item: k.30)), and 0 otherwise. In the total sample over 72.8% find themselves financially constrained to some extent. (Table 4.1)

4.3.1.1.3. Line of Credit

Creditline, a credit constraint proxy, is a dummy variable that takes a value of 1 if a respondent answered positively to the following question (using WBES original data item: k.8):

"At this time, does this establishment have a line of credit or loan from a financial institution?"

The dummy takes a value of 0 if the firm states that it has no line of credit or loan from a bank, and 1 otherwise. In this sample, almost 56% of firms stated that they have a line of credit or loan. (Table 4.1)

4.3.1.1.4. Overdraft

Overdraft is another dummy variable, and it is associated with the following WBES question (using WBES original data item: k.7):

"At this time, does this establishment have an overdraft facility?"

It takes the value of 1 if the firm states that it has a bank overdraft facility and 0 otherwise. 64.5% of firms in the sample have an overdraft facility. (Table 4.1)

4.3.1.1.5. Apply4Loan

Apply4Loan is a straightforward dummy variable, which is defined by the following survey question (using WBES original data item: k.16):

"Did this establishment apply for loans or lines of credit?"

The variable takes a value of 1 if a firm applied for a loan or a line of credit in the past fiscal year and 0 otherwise. 44% of the firms in this sample have applied for a loan or line of credit in the last fiscal year. (Table 4.1)

4.3.1.1.6. Log Loan Size

The size of the most recent loan that has been approved is the final financial constraint variable of this research. Based on the following survey question (using WBES original data item: k.11) this author constructs the following variable:

"Referring only to this most recent loan or line of credit, what was the value at the time of approval?"

The sample is diverse in terms of the loan size. As such the logarithm of loan size (e is the base) ranges from 5 to 27.5 (from approximately 150 to 9e+11 local currency units (LCUs)).

4.3.1.2. Financing Patterns

Two distinct subgroups of questions are identified two subgroups that deal with financing patterns of a firm. The first category focuses on the financing of working capital, while the latter explains sources of fixed assets financing.

K.3. Over fiscal year, please estimate the proportion of this establishment's working capital that was financed from each of the following sources?

a. Internal funds/Retained earnings
bc. Borrowed from banks (private and state-owned)
e. Borrowed from non-bank financial institutions
f. Purchases on credit from suppliers and advances from customers
hd. Other (moneylenders, friends, relatives, etc.)

K.5. Over fiscal year, please estimate the proportion of this establishment's purchase of fixed assets that was financed from each of the following sources?

a. Internal funds/Retained earnings
bc. Borrowed from banks (private and state-owned)
e. Borrowed from non-bank financial institutions
f. Purchases on credit from suppliers and advances from customers
hd. Other (moneylenders, friends, relatives, etc.)

In both cases, the sum of the proportions adds up to 100%.

Table 4.1 outlines descriptive statistics on these variables. When it comes to the source of financing the largest portion comes from internal funds/retained earnings: 58.7% of working capital and 60.3% of fixed assets. Banks finance about 17% of working capital and over 24% of fixed assets. While Supplier Credit and Customer advances cover 19.5% of working capital and only 9% of fixed assets. The opposite ratio for the Informal financing is observed: only 3.5% of working capital and 6.5% of fixed assets.

4.3.2. Explanatory variables

4.3.2.1. Main variable of interest – Female

This research attempts to identify the differences in financial constraints and financing patterns observed from the firms whose owners are males only versus those where at least one of the owners is a female. Based on the following question the variable of interest, *Female*, was constructed (using WBES original data item: b.4):

"Amongst the owners of the firm, are there any females?"

Over 36% of the sample answered positively to this question (Table 4.1). In other words, over a third of firms in this sample have at least one female owner which is consistent with statistics for LAC from the 2014 International Finance Corporation report.

4.3.2.2. Firm characteristics

Below is the overview of the firm characteristics used in the analysis as control variables.

4.3.2.2.1. Firm size

According to Kumar and Francisco (2005) sources of financing significantly vary by the firm size. And firm size significantly affects the constraint of a firm (Schiffer and Weder, 2001, Beck, Demirgüç-Kunt, and Maksimovic, 2006, Beck et al., 2005).

Therefore, this author controls for firm size using a logarithm of e base of the total sales at the end of the year previous to the year of the survey (using WBES original data item: d.2). The firms in the sample vary significantly in their total sales; therefore, the value of *Log Sales* ranges from 6.9 to 33.8 (approximately from 1000 to 5e+14). (Table 4.1)

The number of employees (WBES original data item: l.1) was tested as an alternative proxy for firm size. The results remain consistent[13].

4.3.2.2.2. Firm age

Evans (1987) and Dunne, Roberts, and Samuelson (1988) found that younger firms grow significantly faster than older firms. Anderson and Eshima (2011) published that younger firms can make up their lack of established routines and processes with being more flexible and reactive in the market places than older firms. Beck et al. (2006) stated that older firms experience less financing obstacles. Consequently, the older, established LAC firms are expected to experience a lower level of financial constraints than new, younger firms. Chavis et al. (2011) found that younger firms rely less on bank financing and more on informal. While Manigart and Struyf (1997) states that for Belgian startups the most important sources of financing are informal and banking.

Firm age is controlled by taking a logarithm of e base of difference between the firm's founding year (WBES original data item: b.5) and the survey year. In the sample, the average firm has been in business for about 17 years and the oldest firm is 340 years of age. (Table 4.1)

4.3.2.2.3. Ownership concentration

Extant empirical evidence on the relation between ownership concentration and firm performance has been mixed. Demsetz and Lehn (1985) and McConnell and Servaes (1990) found a nonlinear, U-shaped relation between ownership concentration and firm performance. Morck, Shleifer and Vishny (1988) and Wruck (1989) research found the reverse: a positive relation between ownership concentration and firm performance. Thus, this author controls for ownership concentration in this analysis using the fraction of the shares owned by the largest shareholder as

[13] These results are not presented.

ownership concentration (*Ownership*) (WBES original data item: b.3). As reported in Table 4.1, the average firm in the sample has highly concentrated ownership, with around 70 percent of the firm owned by the largest owner(s).

4.3.2.2.4. Top manager experience

More experience in the sector provides not only knowledge of laws and regulations, but more importantly, an experienced manager has an established network that may help in fast access to external financing. Cooper, Gimenco-Gascon and Woo (1994) and Fairlie and Robb (2009) suggest that women may not have the same prior business experience as men. Until recently, women in many LAC countries have had no access to top management positions and as a result they may lack a network. Therefore, top manager experience is controlled for using the number of years the top manager has been working in the same sector as managerial experience, denoted as *Experience* (WBES original data item: b.7). The average top manager has 22 years of working in the same sector (Table 4.1).

4.3.2.2.5. Foreign ownership

According to Manova et al. (2010) and Li and Yu (2009), foreign-owned firms are less financially constrained due to the access to additional internal funding from their foreign parent company. Fishman and Svensson (2007) suggest that firms with foreign ownership possess better access to markets and technical expertise, resulting in better financial performance than pure domestic firms. Beck et al. (2005) find that foreign ownership has largely positive effect on firm performance. Beck et al. (2006) showed that firms with foreign ownership face less financing obstacles than domestically owned.

This author controls for foreign ownership using a dummy variable, *Foreign*, to indicate if any foreign company or individual has a financial stake in the ownership of the firm (WBES original data item: b2b). As presented in Table 4.1, about 11.5% of all firms have foreign ownership stakes in the sample.

4.3.2.2.6. Exporter

Exporter is a dummy variable that measures export participation of a firm, and was built based on the answer to the following question:

D.3. In fiscal year, what percent of this establishment's sales were:

a. *National Sales*
b. *Indirect Export*
c. *Direct Export*

Its value equals to 1 if a firm has less that 100% of total sales in national sales and/or indirect export (using WBES original data items: d3a and d3b); otherwise, it is 0. Over 21% of firms in this sample export some percentage of their sales (Table 4.1).

4.3.2.2.7. Industry effects, year effects and country fixed effects

Like all cross-section and cross-country studies, this author controls for industry effects and country effects. The two-digit ISIC codes (International Standard of Industrial Classification) assigned to each firm in the WBES database is used to create industry dummies to control for industry effects. Since the surveys were conducted in 2006 and in 2010, year dummy variable is used to control for year effects.

Macroeconomic factors also influence firm level performance (Beck et al., 2005) and as a result decision to export. Therefore, this study controls for country level Financial Market Development (Private credit to GDP ratio), Rule of Law, GDP, GDP per capita, inflation, Corrupt

(Corruption Perception Index - CPI) using data from World Development Indicator (WDI) database.

According to WDI, the Rule of Law "reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, as well as likelihood of crime and violence". According to Transparency International, CPI reflects how corrupt country's public sectors are seen by the informed views of analysts, businesspeople and experts.

Table 4.1 outlines that all these macro variables vary widely across LAC countries. For example, the mean *Inflation* is 6.63% but it varies widely across countries, from the low of 1.25% to the high of 27.08%. Because sales values are reported in local currencies, inflation must be controlled. As a robustness check to the regression results, this author controls for country fixed effects to address other unobservable country-specific factors that also affect a firm's financial constraints and performance.

4.4. Methodology and results

This section defines the steps of the analysis and present empirical results of the study. This approach consists of two parts: 1) exploration of the differences in financial constraints faced by male-owned firms versus those with female ownership, and 2) investigation of the effect a female owner may have on financing pattern of a firm.

4.4.1. Univariate test and Correlation matrix

Correlation matrix is presented in Table 4.2. The main variable of interest, *Female*, is highly correlated with all but one (*Finance dummy*) credit constraints, suggesting: women are more likely to feel financially constrained (*Finance*), they are more likely to have a credit line

(*Creditline*) or overdraft facility (*Overdraft*), and WBO are more likely to apply for loan (*Apply4Loan*).

Table 4.1. Summary Statistics

N is the number of firms in the sample, except for country level macro variables which is the number of country level surveys studied. Detailed variable definitions and sources are given in Table A.6 in the Appendix.

Variable	N	Mean	Median	Std. Dev.	Min	Max
Female	20,925	0.3633	0	0.4810	0	1
Exporter	22,259	0.2185	0	0.4132	0	1
Finance	22,034	1.6294	2	1.2996	0	4
Finance dummy	22,034	0.7288	1	0.4446	0	1
Creditline	22,082	0.5594	1	0.4965	0	1
Overdraft	21,553	0.6450	1	0.4785	0	1
Apply4Loan	21,643	0.4403	0	0.4964	0	1
LogLoanSize	11,245	14.5767	14.1520	3.3552	5.0106	27.5411
Before delivery	20,256	8.6233	0	19.8146	0	100
On delivery	20,256	32.1577	20	36.3077	0	100
After delivery	21,742	57.6482	70	38.6402	0	100
WC: Internal funds	22,156	58.6782	60	37.9227	0	100
WC: Banks	22,157	16.9804	0	26.2378	0	100
WC: Non-bank	22,158	1.4666	0	8.2227	0	100
WC: SupCred/CustAdv	21,718	19.4940	0	27.8710	0	100
WC: Informal	21,719	3.4520	0	13.5602	0	100
CapEx: Internal funds	12,754	60.3793	80	42.4781	0	100
CapEx: Banks	12,753	24.2865	0	37.1557	0	100
CapEx: Non-bank	12,752	2.1946	0	12.7162	0	100
CapEx: SupCred/CustAdv	12,601	9.1704	0	24.6176	0	100
CapEx: Informal	5,237	6.5100	0	21.7335	0	100
Experience	21,509	21.8286	20	11.9443	0	70
Log sales	22,284	16.7165	16.2134	3.3509	6.9078	33.8456
# of Employees	22,242	119.7343	25	536.8802	1	21955
Log age	22,063	2.8497	2.8904	0.8321	0	5.8290
Ownership	18,545	69.8144	70	27.2706	0	100
Foreign	22,284	0.1143	0	0.3181	0	1
Rule of Law	46	-0.2735	-0.5101	0.7634	-1.5646	1.2755
Per capita	46	4667.537	3982.311	3714.994	820.7829	20750.78
cpc2gdp	46	42.2595	35.5809	25.4596	11.2456	110.856
Inflation	46	6.6303	5.6912	4.4196	1.2520	27.0809
GDP	46	8.75e+10	1.51e+10	1.82e+10	4.07e+08	8.14e+11
Corrupt	46	3.8957	3.45	1.6051	2.1	7.15

However, correlation between *Female* and *LogLoanSize* is significantly negative. Suggesting that women get smaller loans, which is consistent with previous research.

The gender variable is significantly negatively correlated with financing working capital and fixed assets from Internal funds (*WC: Internal Funds* and *CapEx: Internal Funds*), and significantly positively with financing working capital from Banks (*WC: Banks*) and fixed assed from Non-bank financial institutions (*CapEx: Non-banks*) which supports this paper's hypotheses. *Female* is significantly correlated with all other firm level variables: positively with *Experience* and *Log Age,* and negatively with *Log Sales, Ownership, Exporter,* and *Foreign*.

This section presents a simple univariate analysis to compare two subsamples of firms: firms with male-only owners and firms that have at least one female owner. (Table 4.3) T-test and non-parametric tests are used to test differences in means and medians, respectively. Results show that means and medians are significantly different between key variables of the two subsamples consistent with the observations from the correlation matrix.

4.4.2. Analysis of financial constraints

Using 6 dependent variables described above (namely *Finance, Finance dummy, Creditline, Overdraft, Apply4Loan,* and *LogLoanSize*), the following regression equations are constructed:

$$\begin{aligned} Financial\ Constraint = {} & \beta_0 + \beta_1\, Female + \beta_2\, Log\ Sales + \beta_3\, Log\ Age + \beta_4\, Ownership \\ & + \beta_5\, Foreign + \beta_6\, Experience + \beta_7\, Exporter + \beta_8\, Rule\ of\ Law \\ & + \beta_9\, PC2GDP + + \beta_8\, Year\ dummy + Macro\ Variables \\ & + Industry\ dummies + Country\ dummies + \varepsilon. \end{aligned} \qquad (4.1)$$

According to the hypothesis, women business owners are more financially constrained than male business owners.

Table 4.2. Correlation matrix of Variables

Table 4.2 presents the Pearson correlation coefficients among key variables. Detailed variable definitions and sources are given in Table A.6 in the Appendix. .

	Female	Exporter	Finance	Finance Dummy	Creditline	Overdraft	Apply 4 Loan	Log loansize
Exporter	-0.0385***							
Finance	0.0233***	-0.0070						
Finance Dummy	0.0102	0.0042	0.7469***					
Creditline	0.0261***	0.1336***	0.0699***	0.1031***				
Overdraft	0.0160**	0.1267***	-0.0555***	-0.0074	0.3407***			
Apply4Loan	0.0205***	0.1167***	0.0877***	0.1068***	0.5470***	0.2677***		
LogLoanSize	-0.0632***	0.1733***	-0.1299***	-0.0755***	-0.0009	0.1497***	0.1113***	
WC: Internal funds	-0.0249***	-0.0693***	-0.1521***	-0.1417***	-0.3228***	-0.1439***	-0.3428***	-0.0279***
WC: Banks	0.0240***	0.0802***	0.0695***	0.0764***	0.4150***	0.2170***	0.4126***	0.0301***
WC: Non-banks	0.0001	-0.0111*	0.0629***	0.0431***	0.0678***	-0.0240***	0.0777***	-0.0079
WC: SupCred/CustAdv	0.0102	0.0288***	0.0772***	0.0802***	0.0541***	0.0366***	0.0680***	0.0339***
WC: Informal	0.0050	-0.0224***	0.0767***	0.0459***	-0.0633***	-0.0670***	-0.0314***	-0.0372***
CapEx: Internal funds	-0.0169*	-0.0368***	-0.1089***	-0.1230***	-0.3205***	-0.1056***	-0.3577***	0.0084
CapEx: Banks	0.0093	0.0458***	0.0439***	0.0686***	0.3584***	0.1538***	0.3647***	0.0336***
CapEx: Non-banks	0.0193**	-0.0055	0.0386***	0.0380***	0.0619***	-0.0092	0.0812***	0.0155
CapEx: SupCred/CustAdv	0.0063	-0.0111	0.0632***	0.0594***	-0.0145	-0.0239***	0.0142	-0.0505***
CapEx: Informal	-0.0110	0.0424***	0.0796***	0.0634***	0.0267*	0.0108	0.0172	-0.0774***
Experience	0.0125*	0.0504***	-0.0319***	-0.0503***	0.0588***	0.0556***	0.0486***	0.0381***
Log sales	-0.0391***	0.2017***	-0.1158***	-0.0654***	0.2095***	0.2504***	0.2055***	0.8998***
Log age	0.0292***	0.1451***	-0.0627***	-0.0479***	0.1008***	0.1085***	0.0624***	0.1398***
Ownership	-0.1003***	-0.0376***	-0.0294***	-0.0432***	-0.0593***	-0.0984***	-0.0390***	-0.1338***
Foreign	-0.0984***	0.2132***	-0.0793***	-0.0615***	-0.0120*	0.0618***	-0.0208***	0.1412***

*, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

	WC: Internal funds	WC: Banks	WC: Non-banks	WC: SupCred/ CustAdv	WC: Informal	CapEx: Internal funds	CapEx: Banks	CapEx: Non-banks	CapEx: SupCred/ CustAdv	CapEx: Informal
WC: Banks	-0.5755***									
WC: Non-banks	-0.1846***	-0.0216***								
WC: SupCred/CustAdv	-0.6257***	-0.1158***	-0.0281***							
WC: Informal	-0.2634***	-0.0774***	0.0020	-0.0587***						
CapEx: Internal funds	0.4862***	-0.3741***	-0.0801***	-0.2150***	-0.1041***					
CapEx: Banks	-0.3148***	0.4602***	-0.0089	-0.0006	-0.0467***	-0.6985***				
CapEx: Non-banks	-0.0810***	0.0008	0.2365***	0.0343***	0.0117	-0.1887***	-0.0957***			
CapEx: SupCred/CustAdv	-0.2338***	-0.0369***	0.0329***	0.3384***	0.0174*	-0.3953***	-0.1853***	-0.0408***		
CapEx: Informal	-0.1561***	0.0047	-0.0087	0.0672***	0.2696***	-0.3199***	-0.1592***	-0.0235*	-0.0777***	
Experience	-0.0284***	0.0194***	0.0051	0.0373***	-0.0338***	0.0036	0.0217*	0.0105	-0.0150*	-0.0093
Log sales	-0.0657***	0.0826***	0.0040	0.0677***	-0.0760***	-0.0225**	0.0396***	0.0217**	-0.0228**	-0.0177***
Log age	-0.0155**	0.0359***	-0.0132**	0.0237***	-0.0732***	0.0090	0.0297**	-0.0124	-0.0240***	-0.0238***
Ownership	0.0230***	-0.0217***	0.0052	-0.0417***	0.0496***	0.0087	-0.0250*	-0.0135	0.0141	0.0209***
Foreign	0.0295***	-0.0285***	-0.0172**	-0.0038	-0.0146**	0.0717***	-0.0698***	-0.0178**	-0.0023	0.0027

	Experience	Log sales	Log age	Ownership
Log sales	0.0723***			
Log age	0.3778***	0.1607***		
Ownership	-0.0307***	-0.1702***	-0.0680***	
Foreign	-0.0723****	0.1536***	0.0051	0.0094

*, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

Table 4.3. Univariate Tests for Female- versus Male-managed firms

Table 4.3 presents univariate tests for the differences of relevant variables between subsamples of female- and male-managed firms. A firm is assigned to Female category if one of its owners is a female. A firm is assigned to Male category if no female owners were reported. Detailed variable definitions and sources are given in Table A.6 in the Appendix. T-tests and non-parametric tests are used to test mean and median differences, respectively. *N* is the number of firms in the sample. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

	Female (1)			**Male (0)**			**Difference (1-0)**	
	N	**Mean**	**Med**	**N**	**Mean**	**Med**	**Mean**	**Med**
Exporter	7,590	0.2001	0	13,312	0.2333	0	-0.0332***	0***
Finance	7,514	1.6652	2	13,177	1.6024	2	0.0627***	0***
Finance dummy	7,514	0.7358	1	13,177	0.7264	1	0.0094	0
Creditline	7,546	0.5812	1	13,208	0.5543	1	0.0270***	0**
Overdraft	7,515	0.6498	1	13,150	0.6338	1	0.0159**	0**
Apply4Loan	7,540	0.4533	0	13,214	0.4321	1	0.0212***	-1***
LogLoanSize	4,045	14.3414	13.82	6,655	14.7732	14.40	-0.4318***	-0.58***
Before delivery	6,930	8.2465	0	12,432	8.9477	0	-0.7013**	0**
On delivery	6,930	33.4847	20	12,432	32.0779	20	1.4068**	0*
After delivery	7,560	56.6384	65	13,266	57.3844	67.50	-0.7461	-2.50
WC: Internal funds	7,557	56.9536	60	13,256	58.9132	65	-1.9596***	-5***
WC: Banks	7,558	17.7560	0	13,256	16.4505	0	1.3055***	0***
WC: Non-bank	7,558	1.4581	0	13,257	1.4566	0	0.0015	0
WC: SupCred/CustAdv	7,558	19.9149	0	13,257	19.3259	0	0.5890	0
WC: Informal	7,558	3.6171	0	13,258	3.4758	0	0.1413	0**
CapEx: Internal funds	4,328	59.2976	70	7,675	60.7917	80	-1.4941*	-10***
CapEx: Banks	4,327	24.7409	0	7,652	24.0186	0	0.7223	0
CapEx: Non-bank	4,327	2.5489	0	7,674	2.0357	0	0.5132**	0*
CapEx: SupCred/CustAdv	4,327	9.2822	0	7,675	8.9592	0	0.3230	0
CapEx: Informal	1,825	6.2400	0	3,293	6.6140	0	-0.3740	0
Experience	7,492	22.0746	20	13,120	21.7646	20	0.3101*	0
Log sales	7,603	16.4994	15.93	13,322	16.7698	16.3	-0.2703***	-0.37***
Log age	7,549	2.8939	2.94	13,192	2.8441	2.89	0.0499***	0.05***
Ownership	6,734	66.1856	60	11,542	71.8470	75	-5.6614	-15***
Foreign	7,603	0.0710	0	13,322	0.1356	0	-0.0645***	0***

So coefficient for *Female* is expected to be positive for subjective financial constraint proxies (*Finance* and *Finance dummy*), and negative for the objective measures (*Creditline*, *Overdraft, Apply4Loan*, and *LogLoanSize*). The results of estimation of equation 4.1 are presented in Tables 4.4.1 through 4.5.

Results in Tables 4.4.1 through 4.4.4 are based on the linear probability model (LPM) and OLS (for *Finance* and *LogLoanSize*). Angrist (2001) argues that LPM is just as good as Ordered Probit. Using full sample (Table 4.4.1) main explanatory variable *Female* has a significantly positive effect on *Creditline* and *Apply4Loan*, suggesting that women are more likely to apply for loan and to have a line of credit (contradicts to the findings of Zimmerman Treichel and Scott, 2007, and to the first hypothesis of this paper). However, coefficient for *LogLoanSize* is significantly negative. Women are more constrained in terms of the loan size (supports hypothesis 1 of this paper). Consequently, women get approved for lower loan amounts than men do which contradicts to the results of Arenius and Autio (2007) and this contradiction must be associated with the development level of the countries of the samples.

These results are in line with Watson (2007) who found that women get lower levels of external funding and Zimmerman Treichel and Scott (2007) whose results suggest lower loan amounts for women entrepreneurs. As expected there is a significantly positive relationship between size of a loan and likelihood to export, suggesting that women are highly constrained against exporting due to limited loan amount.

When tested on a sample of micro and small firms (Table 4.4.2), *Female* turns out to be significant only for *Apply4Loan*. Suggesting that women in small companies are more likely to apply for a loan. However, their loan size is not significantly different from male business owners as small firms tend to have a loans of comparable size.

Table 4.4.1. LPM and OLS – Full Sample

The following are the dependent variables*: Finance* is a survey response as specified in the survey questionnaire. It takes values between 0 and 4, where 0 indicates no financing obstacle and 4 a very severe financing obstacle. *Finance dummy* is a dummy variable that takes value of 0 when respondents indicated having no financing obstacles, and 1 otherwise. *Creditline* is a dummy variable defined by the survey response. It takes a value of 1 if a firm states it has a bank credit line and 0 otherwise. *Overdraft* is a dummy variable defined by a survey response. It takes a value of 1 if a firm states it has a bank overdraft facility and 0 otherwise. *Apply4Loan* is a dummy variable defined by a survey response. It takes a value of 1 if a firm applied for a loan or a line of credit in the past fiscal year and 0 otherwise. *LogLoanSize* is a Log of the size of the most recent approved loan/line of credit. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: **Sample: All**	**Finance**	**Finance dummy**	**Creditline**	**Overdraft**	**Apply 4 Loan**	**Log Loansize**
Intercept	0.6997	0.3448	-1.2810***	-0.5407**	-0.4469*	0.9486
	0.2920	0.1400	0.0000	0.0140	0.0710	0.4580
Female	-0.0069	0.0008	0.0179**	0.0103	0.0174**	-0.0815***
	0.7300	0.9060	0.0140	0.1190	0.0200	0.0060
Experience	-0.0027***	-0.0018***	0.0001	-0.0001	-0.0000	0.0001
	0.0020	0.0000	0.8280	0.8020	0.9480	0.9140
Log sales	-0.0692***	-0.0130***	0.0607***	0.0547***	0.0504***	0.7066***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	-0.0617***	-0.0155***	0.0016	0.0178***	-0.0048	0.0790***
	0.0000	0.0010	0.7370	0.0000	0.3160	0.0000
Ownership	-0.0010***	-0.0006***	-0.0003	-0.0005***	-0.0000	0.0001
	0.0080	0.0000	0.1430	0.0000	0.8630	0.9190
Foreign	-0.1716***	-0.0600***	-0.1388***	-0.0133	-0.1132***	0.3183***
	0.0000	0.0000	0.0000	0.1980	0.0000	0.0000
Exporter	0.0440*	0.0171*	0.0451***	0.0254***	0.0639***	0.2870***
	0.0780	0.0520	0.0000	0.0020	0.0000	0.0000
Rule of Law	0.6671***	-0.0583	-0.1964***	-0.0740	-0.2911***	0.0010
	0.0010	0.4110	0.0070	0.2670	0.0000	0.9970
pc2gdp	-0.0099*	0.0011	0.0001	-0.0005	0.0012	0.0038
	0.1000	0.5880	0.9690	0.7890	0.5920	0.7010
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.0840	0.0429	0.1708	0.2567	0.1451	0.8390
N	17,682	17,682	17,762	17,662	17,770	9,527

Table 4.4.2. LPM and OLS – Micro and Small Firms

Results of the analysis of a subsample of micro (<5 employees) and small (<50 employees) firms. The following are the dependent variables*: Finance* is a survey response as specified in the survey questionnaire. It takes values between 0 and 4, where 0 indicates no financing obstacle and 4 a very severe financing obstacle. *Finance dummy* is a dummy variable that takes value of 0 when respondents indicated having no financing obstacles, and 1 otherwise. *Creditline* is a dummy variable defined by the survey response. It takes a value of 1 if a firm states it has a bank credit line and 0 otherwise. *Overdraft* is a dummy variable defined by a survey response. It takes a value of 1 if a firm states it has a bank overdraft facility and 0 otherwise. *Apply4Loan* is a dummy variable defined by a survey response. It takes a value of 1 if a firm applied for a loan or a line of credit in the past fiscal year and 0 otherwise. *LogLoanSize* is a Log of the size of the most recent approved loan/line of credit. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: **Sample: Micro & Small**	**Finance**	**Finance dummy**	**Creditline**	**Overdraft**	**Apply 4 Loan**	**Log Loansize**
Intercept	0.2198	0.1856	-1.4455***	-0.9427***	-0.8633**	2.6078*
	0.8210	0.5720	0.0000	0.0040	0.0150	0.0660
Female	-0.0298	-0.0067	0.0149	0.0050	0.0219**	-0.0070
	0.2300	0.4240	0.1020	0.5490	0.0160	0.8440
Experience	-0.0035***	-0.0020***	-0.0001	-0.0006	-0.004	0.0034**
	0.0020	0.0000	0.7220	0.1200	0.3070	0.0390
Log sales	-0.0434***	-0.0021	0.0630***	0.0603***	0.0485***	0.5846***
	0.0000	0.4710	0.0000	0.0000	0.0000	0.0000
Log age	-0.0462***	-0.0102*	-0.0060	0.0197***	-0.0133**	0.0117
	0.0050	0.0710	0.3270	0.0000	0.0280	0.6340
Ownership	-0.0003	-0.0004**	0.0002	-0.0004**	0.0003*	-0.0005
	0.4940	0.0140	0.3050	0.0190	0.0860	0.4360
Foreign	-0.1566***	-0.0579***	-0.1535***	-0.0140	-0.0875***	0.4395***
	0.0010	0.0010	0.0000	0.4000	0.0000	0.0000
Exporter	0.0410	0.0247**	0.0408***	0.0440***	0.0628***	0.2561***
	0.2590	0.0450	0.0020	0.0000	0.0000	0.0000
Rule of Law	0.9506***	-0.0074	-0.2755***	-0.1662*	-0.2889***	0.2279
	0.0000	0.9330	0.0040	0.0580	0.0020	0.5440
pc2gdp	-0.0060	0.0037	0.0035	0.0030	0.0029	0.0084
	0.4540	0.1700	0.2340	0.2650	0.3300	0.4940
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.0735	0.0399	0.1416	0.2516	0.1138	0.8425
N	11,594	11,594	11,680	11,586	11,688	5,577

Table 4.4.3. LPM and OLS – Medium Firms

Results of the analysis of a subsample of medium (50-499 employees) firms. The following are the dependent variables*: Finance* is a survey response as specified in the survey questionnaire. It takes values between 0 and 4, where 0 indicates no financing obstacle and 4 a very severe financing obstacle. *Finance dummy* is a dummy variable that takes value of 0 when respondents indicated having no financing obstacles, and 1 otherwise. *Creditline* is a dummy variable defined by the survey response. It takes a value of 1 if a firm states it has a bank credit line and 0 otherwise. *Overdraft* is a dummy variable defined by a survey response. It takes a value of 1 if a firm states it has a bank overdraft facility and 0 otherwise. *Apply4Loan* is a dummy variable defined by a survey response. It takes a value of 1 if a firm applied for a loan or a line of credit in the past fiscal year and 0 otherwise. *LogLoanSize* is a Log of the size of the most recent approved loan/line of credit. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: **Sample: Medium**	**Finance**	**Finance dummy**	**Creditline**	**Overdraft**	**Apply 4 Loan**	**Log Loansize**
Intercept	4.6661***	1.6680***	-1.0085**	0.9550**	0.1055	2.8314
	0.0000	0.0000	0.0190	0.0170	0.8220	0.1340
Female	0.0264	0.0146	0.0368***	0.0200*	0.0127	-0.2370***
	0.4740	0.2880	0.0050	0.0910	0.3770	0.0000
Experience	-0.0028*	-0.0022***	0.0006	0.0001	0.0008	-0.0002
	0.0520	0.0000	0.2800	0.8600	0.1520	0.9410
Log sales	-0.1093***	-0.0293***	0.0402***	0.0321***	0.0315***	0.7048***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	-0.0753***	-0.0193**	0.0108	0.0220***	0.0081	0.0608*
	0.0010	0.0250	0.1870	0.0030	0.3710	0.0720
Ownership	-0.0014**	-0.0005**	-0.0009***	-0.0004**	-0.0007***	0.0010
	0.0210	0.0280	0.0000	0.0460	0.0070	0.2540
Foreign	-0.1410***	-0.0408**	-0.1361***	-0.0047	-0.1239***	0.0682
	0.0020	0.0150	0.0000	0.7420	0.0000	0.3150
Exporter	0.1084***	0.0340**	0.0514***	0.0108	0.0536***	0.1498***
	0.0040	0.0160	0.0000	0.3720	0.0000	0.0050
Rule of Law	-0.0468	-0.1811	-0.2189*	0.0197	-0.3500**	0.1160
	0.8980	0.1820	0.0890	0.8650	0.0130	0.8200
pc2gdp	-0.0071	-0.0010	0.0024	-0.0002	0.0022	-0.0062
	0.4900	0.7920	0.5130	0.9460	0.5890	0.6770
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.0911	0.0514	0.1501	0.2141	0.1385	0.8068
N	5,256	5,256	5,248	5,243	5,247	3,366

Table 4.4.4. LPM and OLS – Large Firms

Results of the analysis of a subsample of large (>499 employees) firms. The following are the dependent variables*: Finance* is a survey response as specified in the survey questionnaire. It takes values between 0 and 4, where 0 indicates no financing obstacle and 4 a very severe financing obstacle. *Finance dummy* is a dummy variable that takes value of 0 when respondents indicated having no financing obstacles, and 1 otherwise. *Creditline* is a dummy variable defined by the survey response. It takes a value of 1 if a firm states it has a bank credit line and 0 otherwise. *Overdraft* is a dummy variable defined by a survey response. It takes a value of 1 if a firm states it has a bank overdraft facility and 0 otherwise. *Apply4Loan* is a dummy variable defined by a survey response. It takes a value of 1 if a firm applied for a loan or a line of credit in the past fiscal year and 0 otherwise. *LogLoanSize* is a Log of the size of the most recent approved loan/line of credit. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV: **Sample: Large**	**Finance**	**Finance dummy**	**Creditline**	**Overdraft**	**Apply 4 Loan**	**Log Loansize**
Intercept	2.1781	1.2434	-0.5662	1.4445	0.3807	-4.0370
	0.5070	0.3560	0.5960	0.1210	0.7520	0.4990
Female	0.1292	0.0512	-0.0004	0.0099	0.0229	0.0005
	0.1740	0.1900	0.9890	0.7120	0.5130	0.9980
Experience	0.0006	-0.0007	0.0014	0.0013	0.0032**	-0.0103*
	0.8700	0.6430	0.2160	0.2030	0.0150	0.0900
Log sales	-0.0797***	-0.0247**	0.0263***	0.0358***	0.0260***	0.4804***
	0.0020	0.0170	0.0010	0.0000	0.0050	0.0000
Log age	-0.0506	-0.0044	0.0397**	0.0227	0.0201	0.2580**
	0.3680	0.8490	0.0310	0.1500	0.3300	0.0110
Ownership	-0.0020	-0.0011*	-0.0002	0.0002	0.0001	-0.0015
	0.1830	0.0630	0.7240	0.5700	0.8470	0.5640
Foreign	-0.1539*	-0.0642*	-0.0593**	-0.0239	-0.1184***	0.4273***
	0.0930	0.0880	0.0480	0.3560	0.0000	0.0090
Exporter	-0.1098	-0.0432	-0.0032	-0.0332	0.0622	0.1920
	0.2880	0.3090	0.9240	0.2570	0.1050	0.2920
Rule of Law	0.0903	-0.3746	0.2084	-0.02329	-0.3863	0.0369
	0.9230	0.3320	0.4970	0.3780	0.2650	0.9820
pc2gdp	-0.0120	0.0048	-0.0151*	0.0176**	-0.0034	-0.0581
	0.6650	0.6730	0.0950	0.0250	0.7400	0.2570
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sqr	0.1427	0.0837	0.1750	0.1792	0.2209	0.7624
N	832	832	834	833	835	584

Table 4.5. Logit and Ordered Probit Results

The following are the dependent variables*: Finance* is a survey response as specified in the survey questionnaire. It takes values between 0 and 4, where 0 indicates no financing obstacle and 4 a very severe financing obstacle. *Finance dummy* is a dummy variable that takes value of 0 when respondents indicated having no financing obstacles, and 1 otherwise. *Creditline* is a dummy variable defined by the survey response. It takes a value of 1 if a firm states it has a bank credit line and 0 otherwise. *Overdraft* is a dummy variable defined by a survey response. It takes a value of 1 if a firm states it has a bank overdraft facility and 0 otherwise. *Apply4Loan* is a dummy variable defined by a survey response. It takes a value of 1 if a firm applied for a loan or a line of credit in the past fiscal year and 0 otherwise. *LogLoanSize* is a Log of the size of the most recent approved loan/line of credit. Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV:	Finance	Finance dummy	Creditline	Overdraft	Apply 4 Loan
Intercept	---	1.5796*	-7.6570***	-3.4557***	-6.5533***
	---	0.0630	0.0000	0.0000	0.0000
Female	-0.0071	0.0072	0.0854**	0.0537	0.0778**
	0.6810	0.8480	0.0180	0.1770	0.0270
Experience	-0.0024***	-0.0093***	0.0000	-0.0014	-0.0000
	0.0010	0.0000	0.9830	0.4050	0.9720
Log sales	-0.0595***	-0.0691***	0.3072***	0.3363***	0.2387***
	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	-0.0523***	-0.0836***	0.0127	0.1241***	-0.0214
	0.0000	0.0010	0.5860	0.0000	0.3480
Ownership	-0.0001***	-0.0030***	-0.0009	-0.0025***	-0.0001
	0.0050	0.0000	0.1650	0.0010	0.8260
Foreign	-0.1529***	-0.2936***	-0.6929***	-0.0647	-0.5445***
	0.0000	0.0000	0.0000	0.3140	0.0000
Exporter	0.0398*	0.0893*	0.2390***	0.1665***	0.2893***
	0.0640	0.0570	0.0000	0.010	0.0000
Rule of Law	0.5241***	-0.2994	-1.0097***	-0.4573	-1.4259***
	0.0020	0.4280	0.0050	0.2880	0.0000
pc2gdp	-0.0072	0.0040	0.0023	0.0058	0.0042
	0.1620	0.7090	0.8220	0.6100	0.6810
Year dummy	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes
Likelihood ratio	1582.37	852.41	3388.05	5003.35	2871.55
Log Likelihood	-26518.948	-9883.8522	-10371.542	-8829.4999	-10825.136
Pseudo R2	0.0290	0.0413	0.1404	0.2208	0.1171
N	17,682	17,682	17,762	17,662	17,770

On the other hand, results in Table 4.4.3 suggest that women managing medium firms are more likely to have a line of credit and an overdraft facility. However, their loan size is significantly smaller than men's.

Test of the large firms sample suggest that gender of the member of top management has no significant effect on financial constraints faced by the firm. (Table 4.4.4)

The results of Logit analysis (*Finance Dummy, Creditline, Overdraft,* and *Apply4Loan*) and OProbit (*Finance*) presented in Table 4.5 are consistent with those in Table 4.4.1.

4.4.3. Analysis of financing patterns

The second part of this analysis focuses on financing patterns of firms in the LAC and how they are affected by the gender of the top management. The dependent variables have non-normal distribution, so Generalized Linear Model (GLM) is performed using the following regression as a base:

$$\begin{aligned} \textit{Financing Pattern} \quad &= \beta_0 + \beta_1\, \textit{Female} + \beta_2\, \textit{Log Sales} + \beta_3\, \textit{Log Age} + \beta_4\, \textit{Ownership} \\ &+ \beta_5\, \textit{Foreign} + \beta_6\, \textit{Experience} + \beta_7\, \textit{Exporter} + \beta_8\, \textit{Rule of Law} \\ &+ \beta_9\, \textit{PC2GDP} + + \beta_8\, \textit{Year dummy} + \textit{Macro Variables} \\ &+ \textit{Industry dummies} + \textit{Country dummies} + \varepsilon. \qquad (4.2.) \end{aligned}$$

where a dependent variable, *Financing Pattern*, represents all of the working capital variables and then all of the fixed assets variables were tested one by one. The results of estimation of equation 4.2 are presented in Table 4.6.

Female has a significant effect on most of the financing pattern variables. It has a significantly positive effect on financing working capital by borrowing from banks (supports Hypothesis 2), supplier credit/customer advances, and informal sources.

Table 4.6. GLM

The following are the dependent variables: The following variables represent a percentage of working capital financed by different sources, specifically: WC: Internal funds – by Internal funds/Retained earnings, WC: Banks – borrowed from banks (private and state-owned), WC: Non-bank fin – borrowed from non-bank financial institutions, WC: SupCred/CustAdv – purchases on credit from suppliers and advances from customers, and WC: Informal – by other (moneylenders, friends, relatives, etc.). The following variables represent a percentage of the purchase of fixed assets financed by different sources, specifically: CapEx: Internal funds – by Internal funds/Retained earnings, CapEx: Banks – borrowed from banks (private and state-owned), CapEx: Non-bank fin – borrowed from non-bank financial institutions, CapEx: SupCred/CustAdv – purchases on credit from suppliers and advances from customers, and CapEx: Informal – by other (moneylenders, friends, relatives, etc.). Detailed variable definitions and sources are given in Table A.6 in the Appendix. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively.

DV:	WC: Internal funds	WC: Banks	WC: Non-banks	WC: SupCred/ CustAdv	WC: Informal	CapEx: Internal funds	CapEx: Banks	CapEx: Non-banks	CapEx: SupCred/ CustAdv	CapEx: Informal
Intercept	3.3838***	-0.1982**	23.1064	3.9521***	6.1774***	4.0046***	0.4238***	-3.1421***	7.8158***	4.1791***
	0.0000	0.0290	0.9880	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Female	-0.0090***	0.0103***	-0.1593***	0.0348***	0.0369*	-0.0100***	0.0039	0.1422***	0.0313***	-0.0430***
	0.0000	0.0070	0.0000	0.0000	0.0570	0.0000	0.3590	0.0000	0.0000	0.0000
Experience	-0.0002**	0.0004**	0.0031***	0.0008***	-0.0043***	0.0010***	-0.0006***	0.0053***	-0.0055***	-0.0039***
	0.0110	0.0260	0.0000	0.0000	0.0000	0.0000	0.0010	0.0000	0.0000	0.0000
Log sales	-0.0196***	0.0944***	-0.0246***	0.0204***	-0.2564***	-0.0157***	0.0691***	-0.0177***	-0.0445***	-0.0641***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log age	0.0246***	-0.0100***	-0.1677***	-0.0175***	-0.1176***	0.0224***	0.0069**	-0.1236***	-0.0404***	-0.1134***
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0130	0.0000	0.0000	0.0000
Ownership	-0.0002***	-0.0002***	0.0006***	-0.0001	0.0035***	0.0000	-0.0007***	0.0006**	0.0012***	0.0017***
	0.0000	0.0020	0.0080	0.2170	0.0000	0.6770	0.0000	0.0240	0.0000	0.0000
Foreign	0.0922***	-0.3130***	-0.3898***	-0.0125**	0.3745***	0.1632***	-0.4255***	-0.2585***	0.1164***	-0.1895***
	0.0000	0.0000	0.0000	0.0280	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Exporter	-0.0735***	0.1538***	0.0010	-0.0041	0.2292***	-0.0515***	0.0906***	0.0395**	-0.0221***	0.1949***
	0.0000	0.0000	0.9560	0.3580	0.0000	0.0000	0.0000	0.0190	0.0070	0.0000
Rule of Law	-0.2439***	-0.9372***	-1.7128***	0.6683***	0.4536**	-0.0484*	-0.6496***	-1.5236***	1.2948***	0.6646***
	0.0000	0.0000	0.0000	0.0000	0.0180	0.0890	0.0000	0.0000	0.0000	0.0000
pc2gdp	0.0057***	0.0016	0.0086**	-0.0187***	-0.0081	0.0023***	0.0067***	-0.0032	-0.0331***	-0.0046**

	0.0000	0.1950	0.0170	0.0000	0.1670	0.0030	0.0000	0.3750	0.0000	0.0350
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	37.0805	33.9541	9.0987	38.3895	4.4533	46.6239	51.9261	14.4156	35.0951	28.6364
Log Likelihood	-329867.5656	-302065.3490	-80895.2782	-341553.2515	-39556.8340	-248057.1059	-276249.4858	-76630.2425	-186683.6182	-70803.5197
N	17,796	17,797	17,798	17,798	17,799	10,644	10,643	10,642	10,643	4,948

However, when it comes to financing fixed assets, significantly positive effect remains present on supplier credit/customer advances variable, and also gains a non-bank source (consistent with micro finance research; supports Hypothesis 3). Internal financing is always associated with significantly negative coefficient of Female. And finally there is a significantly negative effect of Female on financing working capital from non-banks and financing fixed assets from the informal sources.

4.5. Conclusions

This paper uses survey data from LAC countries to test the effect women-owners may have on financial patterns of their firms and on the financial constraints the firm faces. The results suggest that women are more likely to apply for a loan and to have a credit line to support their business. However, women do experience significant financial constraints when it comes to the approved amount of a loan. And as a result they are less likely to afford exporting. Women are more likely to finance working capital borrowing from banks and fixed assets from non-bank financial institutions. Considering the issue that women are not homogeneous (Constantinidis, Cornet, and Asandei, 2007, Hill, Leitch, and Harrison, 2007) is a focus of future research. This author may perform segmentation analysis to identify groups within female entrepreneur category.

Chapter 5. Summary and Conclusions

This dissertation presents new evidence on a large but understudied market of LAC countries. The first part focuses of the effect that financial constraints have on the firm's likelihood to export and on the export intensity. The findings suggest that financially constrained firms are less likely to export. However, having an overdraft facility and/or lines of credit is associated with lower export intensity.

Secondly, this paper investigates the impact of different sources of working capital financing on the likelihood to export and export intensity in LAC. After controlling for individuality of national economies and firm-level variables that may affect probability of export participation, this author finds that firms have a higher likelihood to participate in exporting activity if they use a larger (smaller) share of formal bank financing (internal financing) to fund their working capital. Another finding suggests that informal financing has a significantly positive effect on export participation. Increase in export intensity is found to be associated with an increase in bank financing and decrease in a share of supplier credit. Post-delivery payment is associated with an increase in the likelihood to export but a decrease in export amount; while payment before delivery has a significantly positive effect on export intensity.

Finally, this research contributes to the gender research by studying differences in financial constraints and financing patterns of firms with gender diverse ownership. Results show that male and female entrepreneurs have similar perceptions concerning financial constraints faced by their respective firms. However, female business owners are more likely than male business owners to have lines of credit in financial institution. Although female entrepreneurs are also more likely to apply for loans, the average size of the loans they receive is significantly smaller than that for men.

The paper further documents that female entrepreneurs finance a smaller portion of their working capital using bank loans or other financial institutions.

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Appendix

Table A.1. World GDP vs. LAC GDP

The data is collected from International Monetary Fund. Two groups are considered: world and Latin America and the Caribbean. Two variables are considered: GDP in constant prices (measured in percentage change) and GDP in current prices (measured in US dollars, in billions).

Group	Subject	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
World	GDP, cnst. P	5.056	4.657	5.249	5.349	2.698	-0.38	5.192	3.905	3.177	2.871	3.588	3.964
World	GDP, cur. P	42,743.73	46,248.26	50,044.88	56,424.91	61,823.45	58,601.60	63,990.73	70,782.36	72,216.37	73,454.49	76,888.00	81,347.01
LAC	GDP, cnst P	6.028	4.667	5.618	5.743	4.234	-1.223	5.994	4.593	2.934	2.681	3.111	3.53
LAC	GDP, cur. P	2,211.72	2,686.07	3,146.33	3,717.70	4,317.44	4,052.70	4,924.15	5,625.21	5,628.99	5,774.08	5,926.23	6,255.52
LAC GDP as a % of World GDP		5.17%	5.81%	6.29%	6.59%	6.98%	6.92%	7.70%	7.95%	7.79%	7.86%	7.71%	7.69%

Table A.2. Distribution of exporting and non-exporting firms by the country

Country	Exporter = 0		Exporter = 1		Total
	N	%	N	%	N
Antigua and Barbuda 2010	104	77.61%	30	22.39%	134
Argentina 2006	591	58.51%	419	41.49%	1,010
Argentina 2010	560	57.61%	412	42.39%	972
Bahamas 2010	106	83.46%	21	16.54%	127
Barbados 2010	78	60.47%	51	39.53%	129
Belize 2010	113	76.35%	35	23.65%	148
Bolivia 2006	422	84.23%	79	15.77%	501
Bolivia 2010	183	86.73%	28	13.27%	211
Brazil 2009	1,414	84.82%	253	15.18%	1,667
Chile 2006	697	77.79%	199	22.21%	896
Chile 2010	695	73.31%	253	26.69%	948
Colombia 2006	778	84.02%	148	15.98%	926
Colombia 2010	632	70.69%	262	29.31%	894
Costa Rica 2010	313	72.79%	117	27.21%	430
Dominica 2010	101	71.63%	40	28.37%	141
Dominican Republic 2010	280	86.15%	45	13.85%	325
Ecuador 2006	438	81.26%	101	18.74%	539
Ecuador 2010	300	89.02%	37	10.98%	337
El Salvador 2006	468	71.78%	184	28.22%	652
El Salvador 2010	204	69.62%	89	30.38%	293
Grenada 2010	125	88.65%	16	11.35%	141
Guatemala 2006	367	74.75%	124	25.25%	491
Guatemala 2010	306	70.18%	130	29.82%	436
Guyana 2010	101	71.13%	41	28.87%	142
Honduras 2006	344	86.22%	55	13.78%	399
Honduras 2010	248	91.18%	24	8.82%	272
Jamaica 2010	273	88.93%	34	11.07%	307
Mexico 2006	1,187	89.58%	138	10.42%	1,325
Mexico 2010	1,091	78.15%	305	21.85%	1,396
Nicaragua 2006	386	89.35%	46	10.65%	432
Nicaragua 2010	265	89.83%	30	10.17%	295
Panama 2006	365	83.33%	73	16.67%	438
Panama 2010	174	95.08%	9	4.92%	183
Paraguay 2006	352	85.02%	62	14.98%	414
Paraguay 2010	272	86.62%	42	13.38%	314
Peru 2006	439	73.78%	156	26.22%	595
Peru 2010	617	67.36%	299	32.64%	916
St. Kitts and Nevis 2010	102	79.69%	26	20.31%	128

St. Lucia 2010	92	66.19%	47	33.81%	139
St. Vincent and Grenadines 2010	104	77.04%	31	22.96%	135
Suriname 2010	128	84.21%	24	15.79%	152
Trinidad and Tobago 2010	256	79.50%	66	20.50%	322
Uruguay 2006	364	74.74%	123	25.26%	487
Uruguay 2010	349	72.56%	132	27.44%	481
Venezuela 2006	424	96.36%	16	3.64%	440
Venezuela 2010	185	94.87%	10	5.13%	195
Total	17,393	78.15%	4,862	21.85%	22,255

***** *Sources of Data: WBES = World Bank Enterprise Survey (WBES).*

Table A.3. Distribution of exporting and non-exporting firms by the industry

ISIC	Industry	Exporter=0		Exporter=1		Total
		N	%	N	%	N
15	Manufacturing: Food	2,426	74.81%	817	25.19%	3,243
16	Manufacturing: Tobacco products	10	35.71%	18	64.29%	28
17	Manufacturing: Textiles	893	71.27%	360	28.73%	1,253
18	Manufacturing: Garments	1,348	74.48%	462	25.52%	1,810
19	Manufacturing: Tanning & leather	237	69.50%	104	30.50%	341
20	Manufacturing: Wood	191	77.96%	54	22.04%	245
21	Manufacturing: Paper & paper products	76	63.87%	43	36.13%	119
22	Manufacturing: Recorded media	365	77.33%	107	22.67%	472
23	Manufacturing: Coke & refined petroleum	9	64.29%	5	35.71%	14
24	Manufacturing: Chemicals	1,143	64.72%	623	35.28%	1,766
25	Manufacturing: Plastic & rubber	479	64.30%	266	35.70%	745
26	Manufacturing: Mom metallic mineral products	524	80.62%	126	19.38%	650
27	Manufacturing: Basic metals	146	68.54%	67	31.46%	213
28	Manufacturing: Fabricated metal products	888	73.39%	322	26.61%	1,210
29	Manufacturing: Machinery and equipment	569	66.24%	290	33.76%	859
31	Manufacturing: Electronics	142	66.05%	73	33.95%	215
32	Manufacturing: Communication equipment	43	66.15%	22	33.85%	65
33	Manufacturing: Precision instruments	25	62.50%	15	37.50%	40
34	Manufacturing: Motor vehicles	119	72.12%	46	27.88%	165
35	Manufacturing: Other transport equipment	25	71.43%	10	28.57%	35
36	Manufacturing: Furniture	594	80.71%	142	19.29%	736
37	Manufacturing: Recycling	15	75.00%	5	25.00%	20
45	Other services: Construction	830	90.41%	88	9.59%	918
50	Other services: Services of motor vehicles	1,077	89.45%	127	10.55%	1,204
51	Other services: Wholesale	641	85.58%	108	14.42%	749
52	Retail: Retail	3,032	94.28%	184	5.72%	3,216
55	Other services: Hotel & restaurants	472	79.33%	123	20.67%	595
60	Other services: Transport	175	95.11%	9	4.89%	184
61	Other services: Transport	12	60.00%	8	40.00%	20
62	Other services: Transport	12	70.59%	5	29.41%	17
63	Other services: Supporting transport activities	153	73.56%	55	26.44%	208
64	Other services: Post & telecommunications	44	84.62%	8	15.38%	52
72	Other services: IT	682	80.05%	170	19.95%	852
	Total	17,397	78.16%	4,862	21.84%	22,259

* *Sources of Data: WBES = World Bank Enterprise Survey (WBES).*

Table A.4. Distribution of female- and male- managed firms by the country

Country	Female= 0		Female = 1		Total
	N	%	N	%	N
Antigua and Barbuda 2010	109	81.34%	25	18.66%	134
Argentina 2006	681	69.42%	300	30.58%	981
Argentina 2010	673	70.69%	279	29.31%	952
Bahamas 2010	51	41.13%	73	58.87%	124
Barbados 2010	79	61.72%	49	38.28%	128
Belize 2010	108	72.97%	40	27.03%	148
Bolivia 2006	277	56.53%	213	43.47%	490
Bolivia 2010	130	62.50%	78	37.50%	208
Brazil 2009	517	45.63%	616	54.37%	1,133
Chile 2006	568	64.47%	313	35.53%	881
Chile 2010	678	72.28%	260	27.72%	938
Colombia 2006	489	53.15%	431	46.85%	920
Colombia 2010	507	57.48%	375	42.52%	882
Costa Rica 2010	266	62.15%	162	37.85%	428
Dominica 2010	88	62.41%	53	37.59%	141
Dominican Republic 2010	206	64.17%	115	35.83%	321
Ecuador 2006	366	68.16%	171	31.84%	537
Ecuador 2010	235	70.57%	98	29.43%	333
El Salvador 2006	384	59.91%	257	40.09%	641
El Salvador 2010	170	58.42%	121	41.58%	291
Grenada 2010	58	43.94%	74	56.06%	132
Guatemala 2006	323	67.01%	159	32.99%	482
Guatemala 2010	290	67.29%	141	32.71%	431
Guyana 2010	60	42.25%	82	57.75%	142
Honduras 2006	249	63.04%	146	36.96%	395
Honduras 2010	163	60.37%	107	39.63%	270
Jamaica 2010	179	59.67%	121	40.33%	300
Mexico 2006	965	75.69%	310	24.31%	1,275
Mexico 2010	1,011	73.42%	366	26.58%	1,377
Nicaragua 2006	247	58.12%	178	41.88%	425
Nicaragua 2010	150	51.55%	141	48.45%	291
Panama 2006	255	60.00%	170	40.00%	425
Panama 2010	145	79.67%	37	20.33%	182
Paraguay 2006	233	56.69%	178	43.31%	411
Paraguay 2010	163	52.08%	150	47.92%	313
Peru 2006	390	66.21%	199	33.79%	589
Peru 2010	665	72.92%	247	27.08%	912
St. Kitts and Nevis 2010	50	40.00%	75	60.00%	125

St. Lucia 2010	94	67.63%	45	32.37%	139
St. Vincent and Grenadines 2010	34	24.46%	105	75.54%	139
Suriname 2010	124	81.58%	28	18.42%	152
Trinidad and Tobago 2010	173	58.05%	125	41.95%	298
Uruguay 2006	272	58.87%	190	41.13%	462
Uruguay 2010	328	70.54%	137	29.46%	465
Venezuela 2010	119	65.38%	63	34.62%	182
Total	13,322	63.67%	7,603	36.33%	20,925

***** *Sources of Data: WBES = World Bank Enterprise Survey (WBES).*

Table A.5. Distribution of female- and male- managed firms by the industry

ISIC	Industry	Female=0		Female=1		Total
		N	%	N	%	N
15	Manufacturing: Food	1,901	61.74%	1,178	38.26%	3,079
16	Manufacturing: Tobacco products	18	66.67%	9	33.33%	27
17	Manufacturing: Textiles	700	59.52%	476	40.48%	1,176
18	Manufacturing: Garments	928	53.77%	798	46.23%	1,726
19	Manufacturing: Tanning & leather	159	54.64%	132	45.36%	291
20	Manufacturing: Wood	147	61.51%	92	38.49%	239
21	Manufacturing: Paper & paper products	78	69.64%	34	30.36%	112
22	Manufacturing: Recorded media	282	64.24%	157	35.76%	439
23	Manufacturing: Coke & refined petroleum	11	78.57%	3	21.43%	14
24	Manufacturing: Chemicals	1,065	63.39%	615	36.61%	1,680
25	Manufacturing: Plastic & rubber	477	67.66%	228	32.34%	705
26	Manufacturing: Mom metallic mineral products	444	70.81%	183	29.19%	627
27	Manufacturing: Basic metals	149	77.60%	43	22.40%	192
28	Manufacturing: Fabricated metal products	802	69.56%	351	30.44%	1,153
29	Manufacturing: Machinery and equipment	561	71.83%	220	28.17%	781
31	Manufacturing: Electronics	144	74.61%	49	25.39%	193
32	Manufacturing: Communication equipment	46	77.97%	13	22.03%	59
33	Manufacturing: Precision instruments	23	63.89%	13	36.11%	36
34	Manufacturing: Motor vehicles	87	63.50%	50	36.50%	137
35	Manufacturing: Other transport equipment	25	86.21%	4	13.79%	29
36	Manufacturing: Furniture	434	65.46%	229	34.54%	663
37	Manufacturing: Recycling	12	70.59%	5	29.41%	17
45	Other services: Construction	561	64.93%	303	35.07%	864
50	Other services: Services of motor vehicles	732	67.16%	358	32.84%	1,090
51	Other services: Wholesale	465	64.85%	252	35.15%	717
52	Retail: Retail	1,828	60.43%	1,197	39.57%	3,025
55	Other services: Hotel & restaurants	323	54.65%	268	45.35%	591
60	Other services: Transport	134	73.63%	48	26.37%	182
61	Other services: Transport	15	78.95%	4	21.05%	19
62	Other services: Transport	10	62.50%	6	37.50%	16
63	Other services: Supporting transport activities	132	66.67%	66	33.33%	198
64	Other services: Post & telecommunications	34	72.34%	13	27.66%	47
72	Other services: IT	595	74.28%	206	25.72%	801
	Total	13,322	63.67%	7,603	36.33%	20,925

***** *Sources of Data: WBES = World Bank Enterprise Survey (WBES).*

Table A.6. Variable Definitions and Data Sources

Variable	Definition - t is the survey year	Original Source
Apply4Loan	"Going back to the past, in fiscal year, did this establishment apply for loans or lines of credit?" (WBES data item '*k16*')	WBES
After delivery	Percentage of total sales paid for after delivery (using WBES data item 'k2c')	WBES
Before delivery	Percentage of total sales paid for before the delivery (using WBES data item 'k2a')	WBES
CapEx: Internal funds	Percentage of firm's purchase of fixed assets that was financed from internal funds/retained earnings financed from owner's contribution or issue of new equity shares (using WBES data item 'k5a' and 'k5i))	WBES
CapEx: Banks	Percentage of firm's purchase of fixed assets that was financed by borrowing from banks (private and state-owned) (using WBES data item 'k5bc')	WBES
CapEx: Non-bank fin	Percentage of firm's purchase of fixed assets that was financed by borrowing from non-bank financial institution (using WBES data item 'k5e')	WBES
CapEx: SupCred/CustAdv	Percentage of firm's purchase of fixed assets that was financed from purchases on credit from suppliers and advances from customers (using WBES data item 'k5f')	WBES
CapEx: Informal	Percentage of firm's purchase of fixed assets that was financed from other sources such as moneylenders, friends, relatives, etc. (using WBES data item 'k5hd')	WBES
Corrupt	An average for Corruption Perceptions Index.	WDI
Creditline	"At this time, does this establishment have a line of credit or loan from a financial institution?" (WBES data item '*k8*')	WBES
Experience	"How many years of experience working in this sector does the top manager have?" (WBES data item 'b7')	WBES
Exporter	Dummy variable equal to 1 if firm exports (using WBES data item s'*d3a*', '*d3b*' and '*d3c*'), 0 otherwise.	WBES
Exporter2	Percentage of total sales from direct export (using WBES data item 'd3c')	WBES
Female	Dummy variable equal to 1 if a firm is owned by a female, and zero if it is owned by a male (original WBES data item '*b4*')	WBES
Finance	"How problematic is access to finance for the current operations of a business?" No Obstacle =0, Minor Obstacle =1, Moderate Obstacle=2, Major Obstacle =3, and Very Severe Obstacle=4.	WBES
Finance dummy	Dummy variable equal to 0 if access to finance is not an obstacle, and 1 otherwise.	WBES
Foreign	Dummy variable equal to 1 if any foreign company or individual has a financial stake in the ownership of the firm (WBES data item '*b2b'*), 0 otherwise.	WBES
GDP	GDP in current US$, the average over year (t-3), (t-2) and (t-1).	WDI
Industry dummies	Two-digit ISIC codes are used for industry classification	WBES
Inflation	Log difference of consumer prices, the average over year (t-3), (t-2), and (t-1).	WDI
Log Age	Logarithm of a firm's actual age, age=survey year – firm founding year (WBES data item '*b5'*).	WBES
LogLoanSize	"Referring only to this most recent loan or line of credit, what was the value at the time of approval?" (WBES data item '*k11'*)	WBES

Log Sales	Logarithm of the total sales at the end of year (t-1) (WBES data item '*d2*').	WBES
On delivery	Percentage of total sales paid for on delivery (using WBES data item 'k2b')	WBES
Overdraft	"At this time, does this establishment have an overdraft facility?" (WBES data item '*k7*')	WBES
Ownership	Percentage of firm owned by the largest owner(s) (WBES data item '*b3*').	WBES
PC2GDP	A private credit to GDP ratio to account for financial market development.	WDI
Per Capita	Real per capita in US$, the average real GDP per capita over year (t-3), (t-2) and (t-1).	WDI
Regulatory Quality	Index reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development/	WDI
Rule of Law	Index measures how the rule of law is experienced in a country's everyday life. Reflects perception of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	WDI
WC: Internal funds	Percentage of firm's working capital financed from internal funds/retained earnings (using WBES data item 'k3a')	WBES
WC: Banks	Percentage of firm's working capital financed by borrowing from banks (private and state-owned) (using WBES data item 'k3bc')	WBES
WC: Non-banks	Percentage of firm's working capital financed by borrowing from non-bank financial institutions (using WBES data item 'k3e')	WBES
WC: SupCredit/CustAdv	Percentage of firm's working capital financed from purchases on credit from suppliers and advances from customers (using WBES data item 'k3f')	WBES
WC: Informal	Percentage of firm's working capital financed from other sources such as moneylenders, friends, relatives, etc. (using WBES data item 'k3hd')	WBES

***** *Sources of Data:* ***WDI*** *= World Development Indicators;* ***WBES*** *= World Bank Enterprise Survey (WBES).*

Curriculum Vita

Maria Barulina was born in Leningrad, USSR. The only child of Natalia Barulina, she graduated from Saint Petersburg State University of Information Technologies, Mechanics, and Optics in 2007 where she earned Bachelor of Business Administration and Master of Science in Management Information Systems. In the course of her studies she worked full-time as a senior credit manager in Russian Standard Bank. After graduation she worked as a financial analyst for one of the largest logistics company in the region, Piteravto.

In the fall of 2008, Maria Barulina joined the Doctoral Program in International Business with concentration in Finance at the University of Texas at El Paso. While pursuing her Ph. D., she worked as a research assistant and assistant instructor for the department of Economics and Finance. Her papers were presented at DSI and IFC conferences. And she has earned a number of professional certifications. She taught various courses in Economics and Finance in the undergraduate level including Portfolio Analysis, Managerial Finance, and Principles of Economics.

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