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## Access to finance and exporting behavior in transition countries

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**Access to Finance and Exporting Behavior  
in Transition Countries**

by

Alex Bernard, Augusto Stabilito and Julien Donghoon Yoo

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# Access to Finance and Exporting Behavior in Transition Countries

Alex Bernard, Augusto Stabilito and Julian Donghoon Yoo\*

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## Abstract

We analyze the link between firms' access to finance and their decisions to enter and exit the export market. We employ the Business Environment and Enterprise Performance Survey (BEEPS) conducted in 2005 and 2008-2009 to 28 countries in Eastern Europe and Central Asia. We find that more productive, foreign owned and older firms are more likely to start exporting, while larger and more productive firms are less likely to exit the export market. With respect to ex-ante firm characteristics, our results confirm that larger and more productive, as well as foreign-owned, firms *self-select* into exporting. By contrast, there is no relationship between the decision of firms to enter or exit export markets and their access to finance. This may suggest that internal finance plays a greater role in Eastern European and CIS countries than in developed countries.

**Keywords:** Exports, Firm heterogeneity, Access to finance

**JEL classification:** F14, G32, L25, D92

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# 1 Introduction

Firms engagement in international trade and the determinants of trade participation has been widely discussed over recent years (Greenaway et al., 2007; Bernard and Jensen, 1999; Bernard and Wagner, 2001). One of the major determinants of firm heterogeneity in the trade literature are financial constraints at the firm level. A number of theoretical and empirical studies have verified the impact of the financial constraints of a firm on its export behavior. On the theoretical side, Chaney (2005) introduces liquidity constraints into the heterogeneous firm framework of Melitz (2003). On the empirical side, Greenaway et al. (2007) and other authors like Bellone et al. (2009) and Muûls (2008) analyze the link between the firms' financial health and their exporting behavior.

Our paper's contribution to the existing empirical literature is twofold. Firstly, we use a subjective variable of financial constraint, which measures the ease of access to finance for the firm. Secondly, our study is the first firm-level analysis of export and finance for a large cross-country dataset from transition economies in Eastern Europe and Central Asia. Previous empirical research, for example, Greenaway et al. (2007) and Bellone et al. (2009) used accounting variables as a proxy for financial health. Moreover, these studies focused on single countries; the UK in Greenaway et al. (2007), France in Bellone et al. (2009), and Belgium in Muûls (2008). In contrast, we use a subjective response of firm managers in a large-scale business enterprise survey conducted in 28 countries in Eastern Europe and Central Asia.

We find that more productive, foreign owned and older firms are more likely to start exporting. Concerning export exiters we find that larger and older firms are less likely to exit. However, we find that there is no relationship between access to finance and the decision of firms to enter or exit export markets. Hence, internal liquidity may be more relevant in influencing the export decision in the surveyed countries. With respect to ex-ante firm characteristics, our results confirm that more productive and foreign-owned firms are more likely to become exporters, while firm size seems to be less relevant. In line with previous research we find evidence that fixed-entry costs play a large role in influencing the exporting behavior of the firm. In addition, there is some evidence that exporting firms improve their access to finance.

The rest of the paper is organized as follows. Section 2 presents the review of relevant literature concerning the link between financial constraints and export behavior of firms. Section 3 focuses on empirical analysis, describing data and the empirical methodology, and presents the main results. Section 4 concludes.

## 2 Literature review

In recent years the international trade literature has growingly focused on firm heterogeneity and on departures from the traditional perfect competition paradigm. The parallel growing availability of micro-data sources has triggered new empirical research and validation in this field. For instance, in recent years a few studies have introduced a new source of heterogeneity in Melitz's (2003) heterogeneous-firm model: imperfect capital markets and financial constraints. In order to take credit constraints into account, Chaney (2005)<sup>1</sup> relaxes the assumption of perfect financial markets and diverges from the idea that all valuable industrial projects are financed.<sup>2</sup> Hence, firms may end up financially constrained for a number of reasons: banks might be unwilling to finance risky projects; hedging financial products might not be available; informational and non-tariff barriers might be too costly to the firm; the international contracting environment is traditionally weak; collateral is low some sectors (Chaney, 2005; Manova, 2008).

A growing number of studies have tackled the export and finance issue empirically, both at the firm- (Campa and Shaver, 2002; Bellone et al., 2009; Muûls, 2008) and at the country- and sector-level (Manova, 2008).

Campa and Shaver (2002), for instance, find that exporters have more cash flow than non-exporters and are hence more likely to access external finance. Greenaway et al. (2007) ask whether firms' financial health and exporting are linked and how. Their financial measures are a liquidity ratio and a leverage ratio.<sup>3</sup> By employing an unbalanced panel of 9,292 UK manufacturing firms, including balance-sheet data (FAME database), over the period 1993-2003, they estimate a reduced form model that is able to answer several empirical questions and find that: (i) more liquid and less leveraged firms are more likely to export; (ii) continuous exporters are financially healthier (more liquid and less leveraged) compared to starters, and financial health and export participation are positively linked; (iii) good ex-ante financial health does not necessarily lead to exporting, which is at odds with the theoretical literature emphasizing the role of fixed sunk-costs and other empirical studies (Bellone et al., 2009); (iv) there is strong

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<sup>1</sup>Chaney's model will be briefly described below, section 3.1.

<sup>2</sup>This is true under the Modigliani-Miller theorem (Modigliani and Miller, 1958). Furthermore, empirical evidence shows that firms finance their investments first and foremost by internal finance and to a minor extent by bank loans, bonds and stocks. There is also evidence that SMEs have lower access to bank financing.

<sup>3</sup>The liquidity ratio is defined as (current assets-current liabilities)/total assets; whereas the leverage ratio is defined as short-term debt/current assets.

evidence that being a continuous exporter leads to better financial health.

In line with Chaney's model, Bellone et al. (2009) show that financial constraints act as a barrier to exporting. Their paper differs from Greenaway et al. (2007) by introducing a new measure of financial constraints and extending the analysis to export intensity (i.e. the export intensive margin). The empirical analysis makes use of an unbalanced panel of 25,000 French firms over the period 1993-2005. In contrast to Greenaway et al. (2007), Bellone et al. (2009) find that exporters enjoy better ex-ante financial health compared to non-exporters. The computed pre-entry premium of future exporters is statistically significant both one year before entry and three years before entry. According to their model, access to external finance is a significant determinant of the probability to start exporting due to the presence of sunk entry costs. Moreover, they show that the availability of financial resources significantly shortens the time leading to the entry of foreign markets. The authors also explore the learning-by-exporting effect. They do not find evidence of an improvement in firms' financial score after entering the export market.

Muûls (2008) using an unbalanced panel dataset of about 9,000 Belgian manufacturing firms in the period 1999-2005 argues that financial constraints positively affect the number of destinations but not the number of exported products. Thus, it seems that the intensive margin effect found by Bellone et al. (2009) is driven by the number of markets served by the firm (more markets, larger volumes). However, in Muûls (2008) financial constraints do not affect export volumes. Her financial constraint measure is the Coface score, which combines quantitative and qualitative measures on financial statements, industry- and firm-specific variables and legal judgements, which together form a measure of the firm's creditworthiness. The fixed effects regression confirms that having a higher score (i.e. "normal to strong confidence") makes it more likely to be an exporter. Muûls (2008) does not find a significant relationship between financial constraints and starting to export. Her explanation for this result is that firms starting to export may prefer internal financing or for Belgium –being a small open economy –the fixed entry costs for exporting are relatively small. In line with the previous literature, Muûls (2008) finds that the size of the firm and its productivity influence positively the decision to start exporting. This result might also explain why credit constraints matter in determining the number of destinations. If only large and more productive firms get access to credit, then these firms might be the one able to cope with the larger up-front fixed costs implied by multi-country exporting.

Manova (2008) extends the previous analyses in several directions. Her theoretical

model explicitly addresses the relationship between credit constraints and export volumes. Furthermore, she accounts for industry specific and country factors. Following the pathbreaking studies of Levchenko (2007) on the relationship between institutions and trade, Manova (2008) shows that the productivity cut-off is higher in financially vulnerable sectors<sup>4</sup> and in countries with lower financial development. The prediction of the model is that credit constraints re-distribute exports towards sectors with more tangible assets and lower reliance on outside funds, and towards more productive firms within a sector.

The structural estimation of the model employs a panel dataset of 107 countries and 27 industries (1985-1995). Her measure of financial contractibility (institutional quality) is the amount of credit extended to the private sectors as a share of GDP. She adopts two measures of sectorial financial vulnerability (credit constraints): "external finance dependence"<sup>5</sup> and "asset tangibility".<sup>6</sup>

The effect of credit constraints on bilateral exports is significant both in statistical and in economic terms, which means that the quality of the financial system increases bilateral trade flows.<sup>7</sup> Manova (2008) argues in favor of a causal effect running from credit constraints to exporting. In particular, this holds with respect to the relationship between private credit and asset tangibility.<sup>8</sup> Finally she argues that financially developed countries export larger volumes on average, in particular in financially more vulnerable sectors (Manova, 2008; Beck, 2003). To reconcile this with the theoretical model, Manova (2008) assumes that firms face credit constraints in financing both fixed and variable costs.

In conclusion, a growing number of empirical studies have analyzed the complex relationship between exporting and finance. Overall, firm characteristics and traditional comparative advantage forces like the quality of the financial system matter, influencing both the decision to export and (to a minor extent) the volume of exports and the number of served markets.

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<sup>4</sup>Defined as those sectors requiring a larger amount of external finance or collateral (Manova, 2008).

<sup>5</sup>Computed as the share of investment not financed by internal cash flow.

<sup>6</sup>Computed as the share of plant, property and equipment over total assets. The statistical unit is the median US firm for each sector.

<sup>7</sup>For instance, improving the financial system from the 1st to the 3rd quartile of country distribution, increases bilateral trade flows by roughly 19% in financially vulnerable sectors and 17% in low tangibility sectors.

<sup>8</sup>There may be some concern of reverse causality between external finance dependence and exporting when relative foreign demand for sectors intensive in external funds increases demand for loans in this sectors. This is not the case for asset tangibility which to some extent is independent from foreign demand fluctuations.

### 3 Empirical Analysis

#### 3.1 Economic Background

Exporting is a risky activity that implies large fixed entry costs, i. e. "up-front costs". Hence, firms might not be able to finance their international projects only by internal means (i.e. by the cash-flow generated from turnover of the domestic market) and might resort to external funding. In everyday business, access to financial instruments, either in the capital market or in the banking market, might influence the decision to export. The basic elements of the first theoretical contribution in the field, the Chaney model, are presented here (Chaney, 2005). In this model, liquidity constraints are exogenous and do not depend on current productivity. It is assumed that firms inherit a given amount of liquidity and are subject to a random liquidity shock  $A$  whose value is expressed in domestic wages:  $wA$  (numeraire). Entering the export market is equal to participating in a lottery.

The liquidity constraint (Equation 1) is expressed as:

$$\pi_d(x) + wA \geq w^*C_f \tag{1}$$

where  $\pi_d(x)$  are domestic profits,  $wA$  is the exogenous liquidity shock and  $w^*C_f$  is the fixed entry cost denominated in foreign wages.

One can define the lowest productivity level below which firms with liquidity  $A$  do not export.  $\hat{A}$  is the amount of liquidity the least productive firm would need to enter foreign markets. The usual Melitz-model prediction that more productive firms are more likely to export, holds.

Table 1: Productivity and exporting

Exit	Only dom. prod.	Domestic + export
$x < \bar{x}_d$	$x < \bar{x}_f$	$x > \bar{x}_f$
	$\pi_d(\bar{x}_d) = 0$	$\pi_f(\bar{x}_f) = 0$

The model produces two thresholds (Table 1):

1. firms with productivity above  $X_d$  produce domestically (or conversely, when productivity is below  $X_d$  firms exit the market);
2. firms with productivity above  $X_f$  are able to export.



Introducing liquidity constraints yields the following predictions:

- if  $A$  (the liquidity shock) is low, only high productivity firms are able to finance themselves;
- if  $A$  is high, also low productivity firms are able to enter the export market;
- the higher the entry fixed cost  $C_f$ , the higher the liquidity requirement in order to start exporting.

Chaney (2005) proves the existence of a non-empty set of liquidity constrained firms that could profitably export but do not because they are liquidity constrained. In other words, these firms would be productive enough to export profitably in the presence of perfect financial markets. Muûls (2008) and Manova (2008) extend the model by explicitly introducing endogenous credit constraints. The liquidity constraint (equation 2) is modified by an amount  $E$  that firms can borrow on financial markets (Muûls, 2008). In order to do so firms must pledge a collateral, which is proportional to the domestic fixed cost.

$$\pi_d(x) + wA + E \geq w^*C_f \quad (2)$$

This framework enriches the predictions of the model with respect to the relationship between export likelihood and the size of the firm (larger firms can pledge larger collateral). The link between productivity (i.e. domestic profits) and credit constraints is explicitly modeled (Muûls, 2008). In addition, the outcome of the lottery is shaped by the probability of default on the loan, which reflects "the level of financial contractibility", thus introducing the quality and strength of the financial institutions of the country Manova (2008).

## 3.2 Data Description and Summary Statistics

### 3.2.1 Variables description

The data used for the empirical analysis are from the EBRD-World Bank Business Environment and Enterprise Performance Survey (BEEPS).<sup>9</sup>

We selected three survey datasets for our estimations: one with firms that were surveyed only in 2005 (7,028 observations); a second dataset which includes firms surveyed

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<sup>9</sup>Details of the BEEPS database are included in the appendix.

only in 2008-9 (7,766 observations); and finally, a dataset with firms surveyed both in 2005 and 2009 (3,972 observations).

From the survey questionnaire, we selected a number of relevant variables for our empirical analysis. Regarding export status, we construct a dummy variable (EXP), which describes whether a firm participates in export markets, being equal to one if the firm exports and zero otherwise.<sup>10</sup>

Our financial constraint variable (AFIN) ranges from 0 (no obstacle for access to finance) to 4 (very severe obstacle for access to finance). Thus, low values of the variable correspond to the relative easiness to gain access to finance for a given firm, and vice versa. We chose this subjective financial variable because this can provide new insights into the existing literature on export and financial constraints.

To control for other economic determinants of exporting, we include a labor productivity variable (PROD) constructed as the firm's per-capita labor cost in US dollars<sup>11</sup>. In addition, SIZE corresponds to the log number of full-time employees for a firm in a given year. Age of the firm (AGE) is calculated by subtracting the year a firm is established from the year the survey is conducted. In addition, we also include a dummy variable concerning foreign ownership (FOWN) of a given firm. We consider a firm foreign owned if the share of ownership by foreign entities is more than 10 percent.

We also divide the countries into groups based upon income following the World Bank's categorization. The groups contain low-income countries (LOW), lower middle-income countries (LMED), upper middle-income countries (MED), high-income non-OECD countries (HMED), and high-income OECD countries (HIGH).

### 3.2.2 Summary statistics

Mean and standard deviations of the main variables, including the subjective response of the firm's access to finance are reported in the Table 2. Column 1 of Table 2 refers to the entire sample, column 2 to the sub-sample of non-exporting firms, column 3 to the sub-sample of exporting firms, column 4 to the sub-sample of export starters firms, and column 5 to the sub-sample of export exiters firms. In addition, column 6 and column

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<sup>10</sup>The original survey question deals with the percentage of the firm's sales on foreign markets (either direct or indirect exports). In this paper, we make no distinction between direct exports and indirect exports, and do not discriminate based on either amount of export (absolute values) or degree of export (percentage). Thus, any firm whose percentage of export is not zero is considered an exporter firm for the given year regardless of the amount and extent of export.

<sup>11</sup>Because more productive workers seek higher wages PROD is expected to have a positive relationship with the export activity of the firm.

7 are concerned with continuous non-exporters and continuous exporters, respectively.

As the summary shows, exporting firms are larger than non-exporting firms in terms of employment, sales, and productivity, as well as being older and more likely to be associated with foreign ownership. In addition, the labor cost per full-time worker is higher for exporting firms than non-exporting firms. A similar conclusion can be drawn if the comparison is made for continuous exporters and non-exporters, with more significant differences. These results are consistent with the previous findings in the literature (Bernard and Jensen, 1999; Greenaway et al., 2007; Roberts and Tybout, 1997).

Regarding the access to finance, we find that the variable is not significantly different across different samples. Both the sub-samples of non-exporting firm years (1.48) and exporting firm years (1.45) exhibit similar numbers for the financial variable. Also, we do not observe much difference in between the sub-sample of continuous exporters (1.48) and that of continuous non-exporters (1.46).<sup>12</sup> Turning to analyze the financial variable over different size groups in terms of sales and number of employees, Table 8 and Table 9 provide the summary statistics. They show that the larger the firms in terms of sales or number of employees, the less likely they are to be financially constrained.

In summary, it is shown that the link between access to finance and export status is weak while it is true that larger firms in terms of real sales, employment, and productivity are more likely to be exporters. Furthermore, although the link between the financial variable and the export status of the firm is weak, we find that access to finance and firm's size are linked, as large firms in terms of sales and number of employees are less likely to be financially constrained.

### 3.3 Research questions and empirical strategy

Our empirical model focuses on the factors that influence the decision to export. The empirical analysis is based on a firm-level dataset and exploits both the cross-section and the panel dimension (2005-2009). The idea behind our model is that the firm maximizes profits conditional on the decision to export. The explanatory variables influence the marginal cost of production faced by the firm and, hence, its expected profits generated from exporting.<sup>13</sup>

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<sup>12</sup>We also use a different scaling for the financial variable to see if the result is consistent over changes in scaling. The detailed results are provided in Table 7 in the Appendix.

<sup>13</sup>The aim of the empirical estimation is to determine the direction of the relationship (the sign) between certain firm characteristics and the probability of exporting (the so called “response proba-

Table 2: Summary statistics of the key variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>SIZE<sub>t</sub></i>	116.25 (12.01)	76.08 (15.25)	195.68 (19.05)	179.09 (40.27)	194.61 (45.81)	56.61 (4.25)	198.45 (23.17)
	3870	2570	1300	155	158	2255	987
<i>AGE<sub>t</sub></i>	17.50 (.27)	15.32 (.28)	21.66 (.56)	18.98 (1.52)	18.16 (1.54)	14.93 (.28)	22.6 (.65)
	3941	2587	1354	152	167	2267	1035
<i>PROD<sub>t</sub></i>	615445 (136999)	247004 (53464)	1318927 (384481)	154808 (47608)	262816 (206640)	218275 (54850)	1642420 (495077)
	3081	2022	1059	119	120	1773	820
<i>FOWN<sub>t</sub></i>	.094 (.0046)	.064 (.0048)	.15 (.0097)	.10 (.025)	.15 (.028)	.06 (.005)	.16 (.011)
	3972	2606	1366	155	167	2284	1044
<i>AFIN<sub>t</sub></i>	1.47 (.021)	1.48 (.026)	1.46 (.036)	1.41 (.110)	1.48 (.096)	1.48 (.028)	1.46 (.042)
	3833	2505	1328	150	160	2195	1018

Note: Standard errors in parentheses.

No. Observation in third row for each var in each sub-sample.

(1) Total sample, (2) Firms for which  $EXP_t=0$ , (3) Firms for which  $EXP_t=1$

(4) Firms starting to export, (5) Firms exiting from export market

(6) Continuous non-exporter, (7) Continuous exporter

*SIZE<sub>t</sub>*: Number of full-time employees in the previous fiscal year.

*AGE<sub>t</sub>*: Subtracting the year of establishment from the year of survey.

*PROD<sub>t</sub>*: Per capita labor cost in USD.

*FOWN<sub>t</sub>*: If foreign ownership of equity is more than 10 percent.

*AFIN<sub>t</sub>*: From 0 (no obstacle) to 4 (very severe obstacle to access to finance).

## Is there a link between exporting and access to finance?

Our first model addresses the question of whether there is a relationship between the export status (EXP) and access to finance (AFIN) at time  $t$ , controlling for other determinants of exporting. This is a static model, which does not take into account sunk costs. In other words we show how current firm characteristics are linked to the export status of the firm. The empirical strategy is represented by the following reduced-form equation for the population of firms:

$$EXP_{it} = \alpha AFIN_{it} + \beta SIZE_{it} + \delta PROD_{it} + \gamma X_{it} + e \quad (3)$$

where  $X$  is a vector of control variables, and  $e$  the stochastic error term which encompasses all firm-specific and time-specific determinants of profits.

It is assumed that the likelihood to be an exporter increases non-linearly with access to finance, size of the firm and productivity. Hence, we estimate a logit model by Maximum Likelihood (ML). Before going in detail into results, it is important to mention that we are not analyzing in this section how financial constraints affect the decision to enter or exit foreign markets. Instead, we perform a simple cross-section regression to analyze the relationship between variables in 2005 and 2009.

Table 3 reports results of the relationship between exporter firms, financial constraints and other firm characteristics in 2005 (column 1-3). Results suggest that access to finance affects the export activity of firms, as the sign of the coefficient is positive and significant (column 1). Furthermore, we find that larger, older, more productive and foreign owned firms are more likely to sell goods in foreign markets.

Table 3 also shows results for 2009 (column 4-6). Results regarding size, age and ownership are in line with the ones in 2005. However, we find no relationship between the export dummy and access to finance in 2009.

We also performed the cross-section analysis for 2005 and 2009 controlling for fixed effects concerning industries or countries income. As can be seen in Table 3 for 2005, once we control for industry dummies and income level dummies,<sup>14</sup> the relationship is still significant and positive (column 2-3). Results indicate that firms in low income countries are less likely to export than firms in high income countries.

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bility"). The dependent variable  $Y$  is a discrete variable so that the focus is on the probability of  $Y$  being 1 (i.e. the firm is an exporter, an entrant or an exiter). This probability  $[P(Y = 1)]$  is then a function of the vector of regressors and it can be expressed as a conditional probability:  $P(Y = 1|X)$ , where  $X$  is a vector of firm characteristics including the firm's "access to finance".

<sup>14</sup>Income levels are constructed using the World Bank classification.

Table 3: The determinants of exporting: cross-section regressions

Dependent Variable:	$EXP_{t=2005}$	$EXP_{t=2005}$	$EXP_{t=2005}$	$EXP_{t=2009}$	$EXP_{t=2009}$	$EXP_{t=2009}$
Independent Variable:	(1) Logit (MLE)	(2) Logit (MLE)	(3) Logit (MLE)	(4) Logit (MLE)	(5) Logit (MLE)	(6) Logit (MLE)
$AFIN_t$ (0-4)	.211*** (.033)	.110*** (.036)	.115*** (.036)	-.025 (.022)	-.052** (.024)	-.006 (.025)
$PROD_t$	1.57e-07*** (4.59e-08)	2.04e-07*** (4.98e-08)	5.93e-08 (5.84e-08)	2.85e-09 (1.57e-07)	-2.96e-08 (1.61e-07)	-3.61e-07 (4.98e-07)
$SIZE_t$	.494*** (.089)	.553*** (.096)	.609*** (.097)	.926*** (.103)	.729*** (.112)	.712*** (.114)
$SIZE2_t$	-.021* (.012)	-.028** (.013)	-.035*** (.013)	-.060*** (.012)	-.039*** (.013)	-.038*** (.013)
$FOWN_t$	1.604*** (.154)	1.585*** (.170)	1.618*** (.172)	.973*** (.122)	1.025*** (.133)	.964*** (.139)
$AGE_t$	.010*** (.002)	.009*** (.002)	.009*** (.002)	.006*** (.001)	.004** (.002)	.003* (.002)
$FOWN * AFIN_t$	-.281*** (.104)	-.206* (.117)	-.192 (.118)	-.058 (.065)	-.056 (.070)	-.001 (.073)
$Ind. dummies_t$	no	yes	yes	no	yes	yes
$LOW_t$ •			-.845*** (.216)			-1.340*** (.156)
$LMED_t$			-.148 (.125)			-.756*** (.092)
$HMED_t$			-.890*** (.193)			1.456*** (.127)
$HIGH_t$			.462*** (.114)			.502*** (.111)
Constant	-2.931*** (.162)	-2.290*** (.648)	-2.162*** (.659)	-3.508*** (.253)	-3.461*** (.500)	-3.790*** (.527)
# of observations	4246	4242	4242	6908	6908	6908
Log-likelihood value	-2198.33	-1928.93	-1898.54	-3610.21	-3172.41	-2994.86
F / LR(Chi <sup>2</sup> )	551.55	1079.84	1140.61	700.93	1576.54	1931.64
R <sup>2</sup> / Pseudo R <sup>2</sup>	.115	.218	.088	.075	.199	.243

Note: \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%;  
Standard errors in parentheses. • : the reference group is MED.

In 2009 (column 5) controlling for industry dummies *AFIN* shows up negative and significant. Controlling for additional income level dummies shows the same pattern as the one found in 2005, that is, firms from more developed countries have better chances to be exporters than those in lower income countries, but *AFIN* becomes insignificant.

On the whole, we found that there is no clear relationship between exporting firms and their access to finance in 2005 and 2009. Firm characteristics have the expected influence on the firm's export activity. The following sections will go into greater depth concerning firms' decisions to export.

### Fixed entry costs and selection into exporting

Exporter firms may signal to banks a competitive advantage and higher creditworthiness (see e.g. Campa and Shaver (2002)). Thus, potential endogeneity may flaw a simple cross-section estimation. Moreover, this way of modelling does not answer the question whether financial constraints and other firm characteristics influence the export decision of a firm. Indeed, theoretical studies suggest that only the most productive firms are able to cover the large fixed costs associated with export market entry. In order to test this assumption empirically and to mitigate the potential endogeneity problem arising from the positive influence of exports on access to finance, we exploit our full set of observations for 2005 and 2009, and run the same regression with lagged explanatory variables:

$$EXP_{it} = \alpha AFIN_{it-1} + \beta SIZE_{it-1} + \delta PROD_{it-1} + \gamma X_{it-1} + e \quad (4)$$

where *t* refers to 2009 and *t-1* to 2005 and the subscript *i* refers to the firm. *EXP* is a dummy variable which is equal to one if the firm exports in 2009 and zero otherwise. Results are presented in Table 4.

We find that firms that consider access to finance a serious problem in 2005 are more likely to be an exporter in 2009. This result holds through the various specifications also controlling for industry effects (column 2) and for the income level of the country of origin of the firm (column 3). Hence, firms that feel more financially constrained or have worse access to external finance are more likely to become or be exporters.<sup>15</sup>

Our variables and (*SIZE* and *PROD*) display the expected sign and are statistically significant. Other firm characteristics like foreign ownership and age display also positive and statistically significant coefficients. These findings confirm the *self-selection*

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<sup>15</sup>For a more detailed analysis of export starters see below.

Table 4: The decision to export and self-selection

Dependent Variable:	$EXP_t$			
Independent Variable:	(1) Logit (MLE)	(2) Logit (MLE)	(3) Logit (MLE)	(4) Logit (MLE)
$AFIN_{t-1}$ (0-4)	.264*** (.053)	.139** (.059)	.136** (.061)	.149** (.066)
$EXP_{t-1}$				3.013*** (.161)
$PROD_{t-1}$	4.18e-07*** (8.65e-08)	5.04e-07*** (1.02e-07)	4.06e-07*** (1.13e-07)	3.50e-07*** (1.08e-07)
$SIZE_{t-1}$	.273* (.158)	.268 (.174)	.372** (.179)	.158 (.196)
$SIZE2_{t-1}$	-.010 (.021)	-.010 (.023)	-.018 (.024)	-.018 (.026)
$FOWN_{t-1}$	1.289*** (.278)	1.293*** (.314)	1.461*** (.324)	.743 ** (.352)
$AGE_{t-1}$	.010*** (.004)	.008 ** (.004)	.007 (.004)	.010 ** (.004)
$FOWN * AFIN_{t-1}$	-.304* (.178)	-.368* (.195)	-.362* (.200)	-.256 (.225)
$Ind. dummies_{t-1}$	no	yes	yes	no
$LOW_{t-1} \bullet$			-1.101*** (.263)	
$LMED_{t-1}$			-.673*** (.211)	
$HMED_{t-1}$			.465 (.335)	
$HIGH_{t-1}$			1.253*** (.312)	
Constant	-2.250*** (.293)	17.01*** (1.55)	-16.97*** (1.555)	-2.81*** (.361)
# of observations	1283	1276	1276	1283
Log-likelihood value	-749.70	-643.27	-616.36	-531.48
F / LR(Chi <sup>2</sup> )	120.15	324.58	378.41	556.59
R <sup>2</sup> / Pseudo R <sup>2</sup>	.007	.201	.235	.340

Note: \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%;  
Standard errors in parentheses.

All explanatory variables are lagged.  $\bullet$  : the reference group is MED.



hypothesis that only those firms that are ex-ante more productive, foreign owned and older select into exporting<sup>16</sup> (Bernard and Jensen, 1999; Greenaway et al., 2005; Roberts and Tybout, 1997). In addition, the interaction term between foreign ownership and access to finance is negative and significant at the 10%. This suggests that financially constrained foreign owned firms in 2005, are less likely to become exporters in 2009.

Furthermore, in order to highlight the importance of fixed market entry costs a dynamic model is estimated by including a lagged dependent variable:

$$EXP_{it} = \theta EXP_{i,t-1} + \alpha AFIN_{i,t-1} + \beta SIZE_{i,t-1} + \delta PROD_{i,t-1} + \gamma X_{i,t-1} + e \quad (5)$$

The lagged export status ( $EXP_{t-1}$ ) is economically and statistically significant. This finding backs the idea that fixed entry costs play an important role in influencing the export decision. Indeed, moving from specification (1) to (4) the coefficient on AFIN becomes smaller and less significant.<sup>17</sup>

Controlling for past export status, productivity, foreign ownership and age remain significant determinants of exporting (column 4). Consequently, size and productivity drive the firm's ability to generate profits from export participation. Both coefficients become smaller in size, which means that they play a role in financing the upfront market entry costs.<sup>18</sup>

### **Does access to finance influence the decision to start or exit exporting?**

In this section we address a model to study the relationship between financial constraints of firms and their decision to enter or exit the export market. Our main question is whether firms that start exporting are different from non-exporters and whether firms that exit the export market are different from continuous exporters. To answer this question we first analyze if less financially constrained firms have a higher probability of becoming exporters in the next period. We call these firms export starters. Second, we perform the opposite analysis, that is, whether firms who are exporters are likely to

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<sup>16</sup>SIZE is significant only in two out of four specifications, which casts some doubt on the structural relationship between size and export entry; on the firm size and export relationship see e.g. Wagner (2001).

<sup>17</sup>Note that if entry costs would be the only cause for a firm to be financially constrained then the coefficient on AFIN should not be significant in column 4.

<sup>18</sup>Bellone et al. (2009) highlight an important caveat in this analysis. Indeed, once the endogenous covariate is included a potential endogeneity bias arises. Correcting for this would require a GMM estimator or an IV approach.

stop doing so in the next period because of obstacles to access external finance.

To perform this analysis, we first select from the BEEPS dataset those firms who were surveyed both in 2005 and 2009, in order to have a consistent sample of firms. We then split the whole population of firms into two sub-samples, *a* and *b*. Sub-sample *a* gathers firms that did not export in either of the two periods (continuous non-exporters) and those who did not export in  $t-1=2005$  but did export in  $t=2009$  (export starters). Sub-sample *b*, comprises the firms that exported both in  $t-1$  and  $t$  (continuous exporters), and those firms who exported in  $t-1$  but not in  $t$  (export exiters). Once the two sub-samples are identified, we created two switch variables for each respective sub-sample, in order to identify the export starters in sub-sample *a* and the export exiters in sub-sample *b*, as follows:

$$SWITCH_a = EXP_{t,a} - EXP_{t-1,a} \quad (6)$$

$$SWITCH_b = EXP_{t-1,b} - EXP_{t,b} \quad (7)$$

The switch variable is a dummy variable, which is built as the difference of the export dummies variables ( $EXP_t$  and  $EXP_{t-1}$ ). We use these two variables to answer the question if a switch in the export status of a firm (starter or exiter) between  $t-1$  and  $t$ , is related to the firm's capacity to access financial markets. To do this, we regress the following equations:

$$SWITCH_a = \alpha AFIN_{i,t-1} + \beta SIZE_{i,t-1} + \delta PROD_{i,t-1} + \gamma X_{i,t-1} + e \quad (8)$$

$$SWITCH_b = \alpha AFIN_{it} + \beta SIZE_{it} + \delta PROD_{it} + \gamma X_{it} + e \quad (9)$$

Equation (8) uses the first sub-sample *a*, and estimates the link between entering the export market and access to finance, with respect to firms characteristics in  $t-1$ ; equation (9) uses the second sub-sample *b* to determine the relationship between export exiters and access to finance with respect to firm characteristics in time  $t$ .

Results presented in Table 5 indicate that there is no relationship between new exporters and financial constraints for firms in the surveyed countries, as effects are not significant. This means the decision of firms to start exporting is independent from their access to credit. This result is in line with the findings of Muûls (2008) for Belgian firms. Although it may be unexpected at first sight, some reasonable explanations can be found for this finding.

Table 5: Entrants and exiters

Dependent Variable:	ENTRANTS		EXITERS	
	$SWITCH_a$	$SWITCH_a$	$SWITCH_b$	$SWITCH_b$
Independent Variable:	(1) Logit (MLE)	(2) Logit (MLE)	(3) Logit (MLE)	(4) Logit (MLE)
$AFIN_{t-1,t}$ (0-4)	.091 (.092)	.032 (.100)	.068 (.076)	.100 (.082)
$PROD_{t-1,t}$	3.32e-07** (1.39e-07)	4.50e-07*** (1.59e-07)	-.00002** (.00001)	-.00002* (.00001)
$SIZE_{t-1,t}$	.180 (.280)	.212 (.300)	-.787*** (.227)	-.649** (.272)
$SIZE2_{t-1,t}$	-.020 (.039)	-.012 (.042)	.059** (.026)	.060** (.031)
$FOWN_{t-1,t}$	1.01*** (.347)	.845** (.382)	-.210 (.296)	-.243 (.316)
$AGE_{t-1,t}$	.013** (.006)	.015** (.006)	-.006 (.006)	-.011 (.007)
$Ind. dummies_{t-1,t}$	no	yes	no	yes
Constant	-2.887*** (.485)	15.42*** (1.21)	-1.198** (.484)	-16.25*** (1.78)
# of observations	852	835	588	575
Log-likelihood value	-292.80	-257.48	-306.58	-277.87
F / LR(Chi <sup>2</sup> )	18.45	80.85	43.71	84.83
R <sup>2</sup> / Pseudo R <sup>2</sup>	.0305	.0135	.0066	.0132

Note: \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%;

Standard errors in parentheses.

Explanatory variables are at time t-1=2005 for  $SWITCH_a$  and time t=2009 for  $SWITCH_b$

First, we are not analyzing the financial health of firms but their constraints to access credit. Therefore, a firm can be financially constrained but have good internal financial health indicators, such as liquidity and leverage ratios, which means that firms could rely on internal liquidity to bear start-up costs.

Second, we are analyzing firms in transition countries, where financial development may differ from that in more advanced countries, where credit markets work more efficiently. In fact, Konings et al. (2003) argue that in transition economies, capital markets are inefficient and are subject to asymmetric information problems. Hence, credit to private sector tends to be more expensive and probably less available for firms in transition countries as compared to high income countries.

We also find that productivity, foreign ownership and the age of the firms positively affect the likelihood of a firm to become an exporter. Consistent with the previous literature, more productive and older firms have higher chances of entering foreign markets. Moreover, in line with Greenaway et al. (2005) and Kneller and Pisu (2004) we find that firms that are foreign-owned are more likely to enter export markets. In line with the results presented in the previous paragraph, more productive firms as well as foreign owned firms, do not have to rely on external finance. First, more productive firms may be expected to have better financial ratios than less productive firms. Second, firms with foreign owners could eventually be financed by the headquarters of the firm abroad, diminishing the need of the firm to access the credit market. Both variables positively affect the likelihood of a firm to export and tend to make firms less dependent on external finance.

Table 5 also shows results for exiters firms. Again, we find no link between the financial constraint of firms and their decision to stop exporting. However, we find that size is a significant determinant of firms export exit decisions. In fact, larger firms are more likely to continue exporting, while smaller firms are more likely to exit the export market. In addition, we find evidence that less productive firms are more likely to exit the export market. In sum, results suggest that firms that become exporters are not different in their financial constraints from non-exporters, and firms that exit the export market are not different from those that continue exporting.

### **Does exporting improve access to finance?**

In this section we ask whether exporting improves access to finance, i.e. if there is a learning-by-exporting effect (see e.g. Van Biesebroeck (2005); Bernard and Jensen

Table 6: Exporting effects on the access to finance

Dependent Variable:	AFIN		$\Delta AFIN$	
Independent Variable:	(1)	(2)	(3)	(4)
	Ordered	Ordered	Ordered	Ordered
	Logit	Logit	Logit	Logit
	(MLE)	(MLE)	(MLE)	(MLE)
$EXP_t$ (all)	-0.351*** (.091)		-0.3514*** (.086)	
$EXP_{t,t-1}$ (cont. exporters)		-0.418*** (.097)		-0.503*** (.097)
Constant	-	-	-	-
# of observations	1902	1594	1829	1528
Log-likelihood value	-2876.82	-2413.32	-3679.702	-3064.91
F / LR(Chi <sup>2</sup> )	16.58	18.65	16.53	26.64
R <sup>2</sup> / Pseudo R <sup>2</sup>	.0029	.0039	.0022	.0043

Note: \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%;  
Standard errors in parentheses.

(1999)). We follow a specification close to that in Bernard and Jensen (1999) and Bellone et al. (2009). First, we consider the following equation:

$$AFIN_{it} = \theta EXP_{i,t-1} + e \quad (10)$$

where  $e$  is a stochastic error term. Because the dependent variable is an ordered variable that ranges from zero to four, we estimate this equation by means of an ordered logit model. The model relates access to finance (AFIN) at time  $t$  ( $t=2009$ ) to the export status dummy (EXP) in the previous period ( $t-1=2005$ ). Our analysis focuses on the whole sample and on a sub-sample made of continuous exporters only (with non-exporters as reference group).

The coefficient on EXP is expected to be significantly negative if being a continuous exporter (i.e. exporting in both 2005 and 2009) makes access to finance in the last year easier. The results are shown in Table 6. The sign of  $\theta_i$  is indeed negative and significant. This finding is robust<sup>19</sup> to both including only continuous exporters and pooling together all exporters at time  $t$ .

Second, we construct a variable that considers the perceived change in access to

<sup>19</sup>Including also export exiter firms makes the result more robust because we expect that failing firms have more problems to access finance.

finance<sup>20</sup> ( $\Delta AFIN$ ) between 2005 and 2009.

$$\Delta AFIN_{t,t-1} = \theta EXP_{t,t-1} + e \quad (11)$$

where  $e$  is a stochastic error term.

We again find a negative relationship between being a continuous exporter and deterioration in access to finance. Hence, continuous exporters are more likely to improve their access to finance compared to non-exporters<sup>21</sup>.

Is this finding calling for a learning-by-exporting effect? Not unambiguously. On the one hand, exporters which have already met the entry costs may no longer need further external finance, in particular because exporting may provide them with more liquidity. On the other hand, they may show up as less constrained because their demand for external funds is now negligible. Hence, our approach does not allow us to separate the causal effect running from exports to a better access to finance. However, because the survey was conducted toward the end of 2008 and in the first quarter 2009, and because respondents reported how their access to finance impacts on *current* business activities, this finding emphasizes the role of exporting as a way of reducing the impact on the firm's solidity also during systemic crises. In other words, during the crisis and the credit crunch continuous exporters seem to have better access to finance than non-exporters.

## 4 Concluding remarks

This paper analyzes the relationship between the exporting behavior of firms and access to finance in transition countries.

We find that there is no relationship between the decision of firms to enter or exit export markets and their access to external finance. This suggests that internal finance may play a more important role for export decisions in transition economies. Indeed, more productive, foreign owned and older firms are more likely to start exporting. In addition, size and experience (i.e. age) matter in keeping the firm in the export market.

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<sup>20</sup>We subtract the AFIN score in 2005 from the AFIN score in 2009. Hence, we get a score which is zero when there are no changes, -1 to -4 when access to finance improved and +1 to +4 when access to finance worsened. To perform the regression we then assign to each variation in access to finance a value from 0 to 8. The resulting variable is 8 when the firm's access to finance worsened and vice versa is 0 when access to finance improved the most. We then run an ordered logit regression.

<sup>21</sup>Exiters and entrants were dropped from the sample.

With respect to ex-ante firm characteristics, our results confirm that larger and more productive firms, as well as foreign-owned firms, *self-select* into exporting. We also find evidence that fixed-entry costs play an important role in influencing the exporting decision. Moreover, we find evidence that firms in low-income countries are less likely to become exporters compared to firms in high-income countries.

Finally, there is some evidence that exporting firms are able to improve their access to external finance.

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## Appendix A

### *Business Environment and Enterprise Performance Survey (BEEPS)*

The database for the empirical analysis builds on the Business Environment and Enterprise Performance Survey (BEEPS). Regarding the geographical dimension, the surveys are performed for the vast majority of transition countries of Eastern Europe and Central Asia.

The BEEPS is a joint initiative between the European Bank for Reconstruction and Development (EBRD) and the World Bank Group. Since the first round of the BEEPS survey in 1999-2000, and through its subsequent rounds since then, the BEEPS increased its coverage in terms of firms and countries. Indeed, while in the first round 4,000 firms were surveyed in 26 countries, in the second round of 2002 the firms administered reached 6,500, and this number rose to 9,500 firms in the third round of 2005. In the last round of 2008-2009, 11.800 enterprises were surveyed in 29 countries.

The scope of the BEEPS is gathering information at the firm level to assess the business environment for private enterprises and the state of business development in the countries surveyed. In this sense, the Enterprise Surveys collect information about the various constraints to firm performance and growth, including different questions on financial constraints of firms and export decisions.

The samples are selected using stratified random sampling. The universe of firms surveyed can be grouped in three broad sectors: manufacturing, services and IT<sup>22</sup> with at least five full-time employees. The manufacturing and service sectors<sup>23</sup> were classified according to the ISIC Rev 3.1 classification. The public sector<sup>24</sup> and the primary sector enterprises were excluded from the survey, so the universe of firms surveyed belongs to the private non-agricultural economy.

The structure of the survey is composed by three different types of questionnaires. The Core Module, includes questions asked to all firms from all sectors. The Manufacturing Module, which is derived from the Core Module adds specific-sectoral questions, and finally, the Service Module, which is also based on the Core Module, adds specific question related to the IT service sector. The implementation of the surveys is done in a two stage process. Firstly, a questionnaire is performed over the telephone in order

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<sup>22</sup>Even though IT firms belong to the service sector, they were separated and treated as a new sector

<sup>23</sup>The service sector excludes financial intermediation, real estate and renting activities and all public or utility sectors

<sup>24</sup>Military, police, education, health, and other government departments

to determine if the firm is eligible for the next stage. In the second stage, a face to face interview takes place with a representative of the firm, such as managing directors, accountants, human resource managers and other company staff.

### *Scaling of access to finance*

For the analysis of financial constraints, the BEEPS asks the question “how much of an obstacle is access to finance?”, and starting from this question we construct the variable “access to finance”, which ranges from 0 (no obstacle) to 4 (very severe obstacle). Access to finance includes “availability and cost, interest rates, fees and collateral requirements”. In order to see whether the summary statistics is independent of different scaling, we decompose this variable by grouping it into a smaller range. Table A-1 shows the result of this analysis. We employ four different scaling measures of access to finance by varying the original scaling of the variable. All the different scaling measures bring the same conclusion such that the “access to finance” is not significantly different from each other for all the sub-samples we are to examine (continuous exporters, continuous non-exporters, switchers, exiters, etc.).

### *Income classes*

Following the EBRD-World Bank classification, countries in the survey are divided among income classes. Table A-4 presents an overview of the classification. LOW=Low income countries, LMED=Lower middle income countries, MED=Upper middle income countries, HMED=High income non-OECD countries, HIGH=High income OECD countries.

Table A-1: Analysis of the access to finance variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)*
** $AFIN_t$	1.47 (.021)	1.48 (.026)	1.46 (.036)	1.41 (.110)	1.48 (.096)	1.48 (.028)	1.46 (.042)
$AFIN(2)_t$	.24 (.007)	.24 (.008)	.24 (.012)	.23 (.334)	.25 (.034)	.25 (.009)	.25 (.013)
$AFIN(3)_t$	.71 (.013)	.71 (.016)	.70 (.023)	.67 (.066)	.72 (.065)	.71 (.017)	.70 (.026)
$AFIN(4)_t$	.46 (.008)	.47 (.009)	.46 (.013)	.45 (.040)	.47 (.039)	.47 (.010)	.45 (.015)
$AFIN(5)_t$	.68 (.007)	.68 (.009)	.67 (.013)	.64 (.039)	.72 (.035)	.68 (.009)	.67 (.105)
OBS	3833	2505	1328	150	160	2195	1018

Note: Standard errors in parentheses.

\*(1) Total sample, (2) Observation such that  $EXP_T=0$

(3) Observation such that  $EXP_T=1$ , (4)  $SWITCHER_{T-1}$

(5)  $EXITER_{T-1}$ , (6) Continuous Non-Exporter, (7) Continuous Exporter

\*\* $AFIN_t$ : (0=No, 1=Min, 2=Mod, 3=Maj, 4=Very Severe)

$AFIN(2)_t$ : (0=No,Min,Mod, 1=Maj,Very Severe)

$AFIN(3)_t$ : (0=No,Min, 1=Mod, 2=Maj,Very Severe)

$AFIN(4)_t$ : (0=No,Min, 1=Mod,Maj,Very Severe)

$AFIN(5)_t$ : (0=No, 1=Otherwise)

Table A-2: Financial variable in different size samples (in terms of real sales)

	1st Quantile	2nd Quantile	3rd Quantile	4th Quantile	5th Quantile
$AFIN_t$	1,52 (.053)	1,54 (.054)	1,59 (.054)	1,48 (.053)	1,27 (.053)
Obs	598	600	616	613	614

Note: Standard errors in parentheses.

Table A-3: Financial variable in different size samples (in terms of employment)

	1st Quantile	2nd Quantile	3rd Quantile	4th Quantile	5th Quantile
$AFIN_t$	1,54 (.046)	1,54 (.050)	1,58 (.048)	1,38 (.047)	1,24 (.045)
Obs	850	658	723	749	756

Note: Standard errors in parentheses.

Table A-4: Country Classification

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	Income Classification
Albania	LMED
Belarus	MED
Georgia	LMED
Tajikistan	LOW
Turkey	MED
Ukraine	LMED
Uzbekistan	LOW
Russia	MED
Poland	MED
Romania	MED
Serbia	MED
Kazakhstan	MED
Moldova	LMED
Bosnia	MED
Azerbaijan	LMED
FYROM	MED
Armenia	LMED
Kyrgyz	LOW
Estonia	HMED
Czech	HIGH
Hungary	HIGH
Latvia	MED
Slovakia	HIGH
Slovenia	HMED
Bulgaria	MED
Croatia	HMED
Montenegro	MED

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