

Financial Factors and Manufacturing Exports: Firm-Level Evidence from Egypt

Yousseuf KIENDREBEOGO ^{(a) (*)} and Alexandru MINEA ^(b)

^(a) The World Bank, 1818 H Street, N.W. Washington, D.C. 20433, USA.

^(b) School of Economics & CERDI, University of Auvergne, Bd. Fr. Mitterrand, B.P. 320, 63009 Clermont-Ferrand Cedex 1, France.

E-mail addresses:

ykiendrebeogo@worldbank.org (Y. Kiendrebeogo); alexandru.minea@udamail.fr (A. Minea)

^(*) *Corresponding Author.*

Abstract: This paper focuses on the effects of financial factors on manufacturing firms' export participation in a panel of Egyptian manufacturing firms over the 2003-2008 period. Our main results show that financial constraints reduce export participation of Egyptian firms, while financial liquidity improves it. Moreover, financial constraints have a negative impact on alternative measures of export activity, namely, export intensity and the time the firm takes before starting to export. Consequently, adding to the scarce literature on developing countries, our results support an important impact of financial factors on Egyptian firms' participation in international trade.

Keywords: Financial Constraints, Exports, Sunk Costs.

JEL codes: D24, F10, D92.

Acknowledgements: We are indebted to the Editor (Oliver Morrissey) and to two anonymous referees for very helpful comments on a previous version of our paper. We thank the FERDI (Fondation pour les Etudes et Recherches sur le Développement International) and the ANR (Agence Nationale de la Recherche) for their support through the “Grand Emprunt” and the LABEX IDGM+ (ANR-10-LABX-14-01) mechanism. Usual disclaimers apply.

Financial Factors and Manufacturing Exports: Firm-Level Evidence from Egypt

Abstract

This paper focuses on the effects of financial factors on manufacturing firms' export participation in a panel of Egyptian manufacturing firms over the 2003-2008 period. Our main results show that financial constraints reduce export participation of Egyptian firms, while financial liquidity improves it. Moreover, financial constraints have a negative impact on alternative measures of export activity, namely, export intensity and the time the firm takes before starting to export. Consequently, adding to the scarce literature on developing countries, our results support an important impact of financial factors on Egyptian firms' participation in international trade.

Keywords: Financial Constraints, Exports, Sunk Costs.

JEL classification: D24, F10, D92

1. Introduction

The recent financial crisis and the ailing recovery in economic growth plunged the global economy into a dilemma: the need for developed countries to shrink current account deficits, particularly by reducing imports, and the urgency for developing countries to boost their exports to sustain growth (Rodrik, 2009). This context outlines the importance of the export activity for economic performance, both at the macroeconomic and the firm levels; indeed, exporters may perform better than non-exporters, particularly because of exposure to increased foreign competition.

However, export market participation may be constrained by a number of factors; in particular, some firms, although wishing to export, may not be able to participate in international markets. Firms' export participation may depend not only on their characteristics, those of the macroeconomic environment (for example, government export-enhancing expenditures), but also on sunk entry costs, i.e. fixed costs that cannot be recovered (Melitz, 2003). These costs cannot be supported by the least productive firms or by those firms that are not financially healthy. One of the policies designed for export promotion focuses on improving the liquidity of domestic firms that engage in exports, by making credit available for trade, setting up guarantee funds or subsidizing financial institutions. Furthermore, the problem of access to finance is more severe and represents a major barrier to firms' growth and investment in developing countries, where capital market imperfections are still important.

The literature on international trade shows that this problem is exacerbated for exporting activities, which involve relatively large sunk costs. This raises the question of the role of financial constraints in exporting decisions.¹ However, so far, there is still no commonly accepted evidence on the interaction between financial factors and firms' export market participation. For example, while Greenaway, Guariglia, and Kneller (2007) (for the UK) and Bellone, Musso, Nesta, and Schiavo (2010) (for France) emphasize a link between financial factors and exports, Stiebale (2011) (for France), Arndt, Buch, and Mattes (2012) (for Germany), Lancheros and Demirel (2012) (for India) and Akarim (2013) (for Turkey) find no evidence for such a relationship.²

Theoretically, only few studies highlight the role of financial constraints for firms' decision to participate in the export market (Chaney, *in press*; Manova, 2013; Muûls, 2015), in a "new-new trade theory" setup following Melitz (2003).³ Chaney (*in press*) expands Melitz (2003)'s model to take into account capital market imperfections and shows that sunk exporting costs are likely sensitive to financial variables. Subsequently, Manova (2013) explicitly models the role of credit constraints in the selection of firms into exporting. In the presence of credit constraints, the productivity threshold required for entry into exporting is relatively low in financially developed countries, and within each country this threshold is higher in financially constrained sectors. Muûls (2015) incorporates external financing into Chaney's (*in press*) model and shows that firms are more likely to be exporters when they enjoy higher productivity and lower credit constraints. In particular, financial constraints appear to be strongly associated with the extensive margin of trade in terms of destinations.⁴

The empirical relation between finance and exports is analyzed by two strands of literature. On the one hand, Campa and Shaver (2001), using a sample of Spanish firms, find that exports cause firms' financial health, due to export-related signalling and diversification effects. A similar conclusion arises from the analysis of Greenaway et al. (2007) and Bridges and Guariglia (2008), based on UK firms. In particular, Greenaway et al. (2007) show that, despite the absence of a significant difference in liquidity between firms that begin to export and firms that export permanently, the latter present better financial health. On the other hand, some recent studies find evidence of the central role of finance in influencing firms' export behaviour. Regarding developed countries, building on alternative indicators of financial

constraints on a sample of French firms, [Bellone et al. \(2010\)](#) conclude that financial constraints reduce firms' participation in export markets and export intensity.⁵ Similar results are found by [Minetti and Zhu \(2011\)](#) using data from Italian manufacturing firms. However, using a sample of French firms, [Stiebale \(2011\)](#) finds no evidence that financial constraints influence firms' export performance, suggesting that the finance-export link is still subject of debate. When it comes to developing countries, using firm-level data covering nine countries, [Berman and Héricourt \(2010\)](#) find that firms' financial health does matter for export performance. Focusing on China, [Manova, Wei, and Zhang \(2015\)](#) show that credit constraints restrict trade flows and influence the pattern of foreign direct investment.

The goal of our paper is to contribute to the scarce literature on the role of financial constraints for export activity in developing countries. Our focus on Egypt is motivated by the fact that African firms are (i) substantially more financially constrained, and (ii) less likely to export, compared to firms from more advanced regions (see Figures S1-2 in the Supplementary Material, hereafter SM).⁶ In this context, Egypt presents two appealing features: on the one hand, a wide time dimension for firm data (2003-2008).⁷ On the other hand, according to 2008 WBES indicators, compared to African countries Egypt has a higher share of financially constrained firms (roughly 43%, while only 19% for the entire Africa) and of exporting firms (roughly 23%, while only 12% for the entire Africa).⁸

Our empirical analysis shows that financial constraints negatively affect not only the decision to export, but also export intensity, and the time it takes a firm to start exporting. Our results are robust to a wide variety of sensitivity tests, including the use of alternative estimation techniques and the use of alternative measures of financial constraints. Although, given its particularities, Egypt's experience may not be transferable to the entire developing world in a straightforward way, our findings are particularly important for developing countries, which draw upon export activities as a crucial vector of economic development, present poor financial institutions, making firms financially constrained, and need to accelerate the process of liberalization after having experienced heavy trade restrictions in the recent past.

The rest of the paper is organized as follows. Section 2 describes the institutional setting of trade facilitation in Egypt, Section 3 highlights the methodology and the data, Section 4 presents our main results, Section 5 discusses robustness, and Section 6 concludes.

2. A snapshot of trade facilitation and manufacturing exports in Egypt

The Egyptian export sector is an attractive case for the trade determinants literature in many respects. Indeed, Egypt experienced one of the most spectacular external liberalization, but at the same time faces severe structural challenges impeding the internal private sector.

Egypt presents a particular situation making trading across borders easier than for other countries. Egypt enjoys one of world's best geographical advantages for trade, provided by the Suez Canal, and it has access to most main sea routes, through the Mediterranean and Red Seas. This unique geographical position, combined with multiple seaports and airports, makes Egypt an important hub for world trade. In addition, Egypt conducted one of the most spectacular recent external liberalizations: "The Opening", which began in 1973, and involved a set of new trade and exchange control regulations for trade liberalization. These trade reforms were strengthened by the economic stabilization program in the early 1990s, and Egypt's accession to WTO in 1995. An export promotion strategy was put in place, along with an upgrading of physical and trade-related rules and regulations, which boosted Egypt's rank in the Logistics Performance Index (LPI);⁹ as a result, Egypt outperforms the average LPI score of the developing world (see Figure S3 in SM). These policy reforms led to a substantial increase in both the number of exporting firms and export intensity. The share of exporting firms and the export intensity have substantially increased over our sample period,

moving respectively from 3.04% and 6.30% in 2003 to 7.76% and 16.01% in 2008 (see Table S1 in SM).¹⁰

However, despite efforts to improve the business environment, there subsist several structural challenges impeding the local private sector. Particularly regarding the financial sector, although Egypt is one of the rare countries with a development bank explicitly oriented toward export activities,¹¹ WBES data show that one major constraint faced by Egyptian firms is the access to finance. Indeed, only 17.4% of Egyptian firms have access to a bank loan or line of credit (compared to the global average of 37.1%). The proportion of loans requiring collateral (84.5%) and the proportion of investments financed internally (88.5%) remain at high levels. Still, with regard to financing and access to credit, Egypt has a score of 6 on the depth of credit information index and a score of 3 on the strength of legal rights index, with higher scores indicating more credit information and stronger legal rights for borrowers and lenders. In terms of the ease of getting credit, Egypt ranks 86 out of 189 economies.¹²

Last but not least, the choice of Egypt was guided by data availability in the WBES. Indeed, in contrast to most developing countries, Egypt has available data over a period of six years. The ES were conducted in 2004, 2006, and 2008; fortunately, the Productivity and the Investment Climate Private Enterprise Survey, which we use, provides, in the case of Egypt, information on firms' production accounts, and some other characteristics for the years prior to the survey year.¹³ As such, we were able to compile data on our key variables of interest over the 2003-2008 period.

3. The empirical strategy

3.1. The measure of financial constraints

A financially constrained firm can be defined as a firm that does not have access to sufficient external liquidity and is not productive enough to generate sufficient internal liquidity. However, measuring financial constraints has often been subject to controversy. Following the work of [Fazzari, Hubbard, Petersen, Blinder, and Poterba \(1988\)](#), an abundant empirical literature attempts to measure financial constraints using the sensitivity of investment to firm's cash flow, based on the assumption that external finance is more expensive than internal finance (due, for example, to information asymmetries and agency costs in the loanable funds market). However, this approach, assuming that higher sensitivity of investment to cash flow and financial constraint go hand in hand, was questioned by [Kaplan and Zingales \(1997\)](#), who show that less financially constrained firms exhibit a stronger sensitivity of investment to cash flow compared to firms that are financially more constrained. Alternative measures of the financial stance of the firm focus on information asymmetries and agency costs (see, for instance, [Chirinko and Schaller, 1995](#); [Cleary, 1999](#)). However, the use of such variables will require considering that only firms whose age or size is lower than the sample mean may be financially constrained, which may not always be valid (see [Cleary, 2006](#)).

One way to deal with this shortcoming is to use self-assessment of financial constraints by the firm itself.¹⁴ In addition, since these indicators vary little over time and might therefore be problematic in a dynamic setup, we draw upon a second measure of financial constraints, namely a composite indicator of financial health (its construction is detailed in Subsection 3.4).

3.2. The basic econometric model

Our benchmark model consists of regressing the export participation decision on the measure of financial constraints and a set of control variables expected to be determinants of the export

decision. This procedure, based on the methodology developed by [Bernard and Jensen \(1995\)](#), compares the performance of exporting and non-exporting firms successively before and after their first year of export (see also [Roberts and Tybout, 1997](#); [Bernard and Wagner, 2001](#); [Greenaway et al., 2007](#); [Bellone et al., 2010](#)). The basic econometric equation is

$$(1) \quad \text{Export}_{it} = \alpha + \beta_1 \text{Finance}_{i,t-1} + \beta_2 \text{Control}_{i,t-1} + \text{Industry} + \text{Ownership} + \text{Time} + \varepsilon_{it},$$

where Export stands for a dummy variable equal to 1 if in year t firm i is exporting and 0 otherwise, Finance captures firm's financial constraints, and Control is a vector of determinants of the decision to export (to be discussed below). Industry, Ownership, and Time are industry, ownership, and time dummies, respectively, and ε is an idiosyncratic error term.

3.3. The identification strategy

Several problems arise when estimating our benchmark model. First, the likely presence of unobserved characteristics that may affect firm's decision to export. We tackle this issue by considering, in addition to time, and, whenever possible, firm fixed effects, dummies for the industry sector of the firm and the structure of its shareholding.¹⁵ Second, in accordance with the empirical evidence (see, for example, [Roberts and Tybout, 1997](#)), we include the exporter status lagged by one period to control for hysteresis caused by exporting entry sunk costs. Finally, another issue is the likely endogeneity of financial constraints in explaining the export decision. To account for potential endogeneity in the absence of instrumental variables in microeconomic survey data, we follow [Baldwin and Gu \(2003\)](#) and [Bellone et al. \(2010\)](#) and introduce lagged, instead of current, values for all explanatory variables. Remark that, compared to other studies, the use of lagged regressors is particularly appealing for our analysis based on a wide time span.

3.4. The data

The WBES are surveys of random samples of firms operating in the non-agricultural private formal sector. The World Bank has developed a harmonized international survey questionnaire, thanks to an extensive experience of firm surveys. The cross-country standard methodology is as follows: random samples are stratified based on both industry and location. Industries are selected based on their contribution to GDP, whereas the selection of locations is based on their population size. The industries included are Food, Textiles, Garments, Chemicals, Plastics & rubber, Nonmetallic mineral products, Basic metals, Fabricate metal products, Machinery and equipment, Electronics, and Other manufacturing, for the Manufactures sector; and Construction, Wholesale, Retail, Hotel and restaurants, Transport, and Other services, for the Services sector. As for the location size, they include "Capital city", "city with Over 250,000 to 1 million population", "city with 50,000 to 250,000 population", and "city with Less than 50,000 population". Firms are then randomly drawn in each location-industry to construct the samples.

In this study, we use an unbalanced panel of 1655 Egyptian manufacturing firms, including 22.78% exporting firms, over the 2003-2008 period, taken from the WBES database.¹⁶ This survey primarily addresses issues related to the production of the firm and its business environment, i.e. access to finance, access to infrastructure, competition, corruption, etc. To clean up our database, we eliminated firms for which export variables, financial variables, production accounts, capital and labour were not informed.

Let us first discuss main variables, namely the export decision and financial constraints. Regarding the former variable, we consider in the benchmark model the export participation decision, which is a dummy variable indicating whether the firm is an exporter or not. In addition, we allow in the robustness section for two alternative measures, namely export intensity, defined as the ratio between the value of the production for export markets

and the total output of the firm, and the time elapsed before firms start exporting, computed based on a duration model (see Tables S4-5 in SM for the definition of variables and descriptive statistics).

Regarding the latter variable, we measure it in two ways. On the one hand, we use an index of self-assessment of financial constraints, ranging between 1 (absence of constraints) and 4 (strong financial constraints). We redefine this index such as to take the form of a dummy variable, equal to 0 in the absence of constraints (index equal to 1 initially) and to 1 in the presence of a constraint (index between 2 and 4 initially). On the other hand, we use a liquidity score, summarizing information on six financial variables: (i) total assets, (ii) the ratio of net income to total assets, (iii) the share of working capital financed with internal funds or retained earnings, (iv) the share of working capital financed with trade credit, (v) last loan over cash flow, and (vi) the cash flow-to-assets ratio. Using the method of [Musso and Schiavo \(2008\)](#), the liquidity score is built as follows: (a) each variable is taken as a ratio to the 3-digit ISIC industry average; (b) each transformed variable is then ordered increasingly; (c) next, for each variable, each firm receives a score equal to 1, if the firm is in the first quintile, and up to 5, if the firm is in the last quintile; (d) finally, for each firm, we sum these scores over all six variables to generate the liquidity score (this algorithm is repeated for each year). The liquidity score is then rescaled to range between 1 and 10. In computing our liquidity score, we tried to make it comparable to the ones used in previous studies, and particularly to [Bellone et al.'s \(2010\) Score A](#). Similar to [Bellone et al. \(2010\)](#), we use (i) to capture firm size, (ii) to measure profitability, (iii) to account for liquidity and solvency, (iv) as a proxy for trade credit, and (v) and (vi) to capture the solvency/repaying ability.¹⁷

Table S7 in SM presents several statistics for our exporting firms in 2008. Regarding the sectoral distribution of firms, most of them belong to the metal and textiles industries (roughly 1/3), while the least represented sectors are agro industries and machinery & equipment (see column 1). More than one fifth of firms are exporters, however with important heterogeneities across sectors (1 out of 15 and 1 out of 3 firms export in agro industries and chemicals, respectively, see column 2). On average, income from exports is around 8.5% of total output, but it can climb to roughly 1/5 of total income for garments (see column 3). On the whole, Table S7 emphasizes important heterogeneities among sectors, which may reflect differences in sectoral input costs on the export market, productivity, capital intensity, the possibility of achieving economies of scale, and transport costs (in addition, Table S8 in SM provides comparative statistics for exporting versus non exporting firms in 2008). Regarding financial factors, on average, more than 2 out of 5 firms from our sample are financially constrained, suggesting that access to financial services is indeed a major constraint in Egypt. At the sectoral level, the relatively low (high) share of export income might be explained by the relatively high (low) share of financially constrained firms in the agro industries (garments), as illustrated by columns 3 and 4. Table S6 in SM reports simple correlations between financial and export variables. The decision to export appears strongly and robustly inversely correlated with the variable measuring financial constraints, confirming our intuition. In addition, the liquidity score is positively correlated with the decision to export. Finally, correlations using export intensity confirm the intimate link between financial and export variables.

Regarding our control variables, we focus on the most important determinants of the export activity outlined by the related literature. To ease comparison with previous studies, we follow [Greenaway et al. \(2007\)](#) and [Bellone et al. \(2010\)](#) and consider employment (measured by the number of permanent workers of the firm), total factor productivity (TFP),¹⁸ the average wage (computed as firm's total wage spending divided by the number of permanent employees), and the age of the firm.

4. Financial constraints and exports: the main results

We estimate in the benchmark model the influence of financial constraints on firms' decision to export, when controlling for several key determinants of the decision to export. Since the explained variable, namely the export participation decision, is dichotomous, we use a conditional probability probit model, assuming a normal distribution to estimate this discrete choice model. Results are presented in Table 1, with standard errors in parentheses. According to regression (1), despite presenting the expected sign, lagged (log) TFP has no significant effect on the decision to export, as this was the case in previous work close to ours (see, for example, [Greenaway et al., 2007](#); [Bellone et al., 2010](#)). In line with [Berman and Héricourt \(2010\)](#), the absence of a significant effect of productivity can arise from the fact that financial constraints generate a disconnection between productivity and exports.¹⁹ Moreover, we find no significant impact for the age of the firm, while the size of the firm (measured by employment) fosters the probability to export, contrary to the average wage, which has a negative effect on the export decision, as high labour costs penalize firms' participation in international markets (see, for instance, [Greenaway et al., 2007](#); [Stiebale, 2011](#)).

Regarding our main variables, as illustrated by column (1), we find that financially constrained firms present a significantly lower probability of exporting, since the coefficient of this variable is negative and significant at the 1% level. Remark that this result is obtained when controlling, in addition to the variables detailed above, for time, industry and ownership fixed effects.

We analyze the sensitivity of our findings in many ways. First, we consider an alternative measure of financial constraints. According to regression (2), the lagged liquidity score exerts a positive and significant effect, confirming that firms with better financial health increase their chances of going into the export activity. Second, even though allowing correcting for industry-level clustering, pooled probit estimations do not account for unobserved firm heterogeneity; to overcome this shortcoming, we perform in regressions (3) and (4) static random effects probit estimations (RE Probit). Results confirm our previous findings, namely a less financially constrained or a more liquid firm has a higher probability of exporting. Third, our results still hold when using dynamic random effects probit estimations (Dynamic RE Probit) in columns (5) and (6), which control for the hysteresis phenomenon in export markets. Indeed, being an exporter in the previous period significantly increases the probability of being an exporter in the current period, as emphasized by the positive and significant coefficient of the lagged export decision, confirming the presence of sunk entry costs into foreign markets for the Egyptian firms in our sample. Finally, we present in columns (7)-(12) of Table 1 results based on three additional estimation methods. Since the RE Probit neglects the possible correlation between observed regressors and unobserved factors, we relax this assumption using [Mundlak's \(1978\)](#) estimator (see [Wooldridge, 2010](#)).²⁰ Next, we draw upon [Heckman's \(1981\)](#) estimator of RE Dynamic Probit models, allowing for autocorrelated errors (see [Stewart, 2006](#)). Last, we report results from a conditional maximum-likelihood estimator to handle the initial conditions problem for the case of serially independent errors (see [Wooldridge, 2005](#)). Columns (7)-(12) show, yet again, a significant role of financial factors for export market participation.

Let us now discuss the quantitative implications of our results. Based on columns 1 to 6, the coefficient of the financial constraint variable corresponds to a marginal effect between -0.066 and -0.058, while between 0.023 and 0.029 for the marginal effect of the liquidity score.²¹ Thus, on average, being financially constrained is associated with a 5.8 to 6.6% decrease in the probability of exporting. In addition, a marginal increase in the liquidity score raises by 2.3 to 2.9% the probability to export.

Our results might outweigh the conclusions of recent studies performed on developed countries. For example, the coefficients of [Bellone et al.'s \(2010\)](#) Score A for RE Probit and Dynamic RE Probit estimators are respectively 0.042 and 0.045, roughly half of our estimated coefficients for the variable close to their Score A, namely the liquidity score (our coefficients are 0.108 and 0.096, respectively). Although variations in the construction of the two scores ask for much caution when comparing coefficients, the larger values of our coefficients might suggest an important role of financial factors for promoting exports in developing countries. In such countries, firms are likely to be less productive, because more distant from their production-possibility frontier, and therefore more sensitive to the burden of export entry sunk costs.

Table 1: Financial constraints and export decision

Dependent variable: Export decision	Pooled Probit		RE Probit		Dynamic RE Probit		Mundlak		Autocorr. errors RE Probit		Conditional MLE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Export decision (-1)					0.431*** (0.110)	0.441*** (0.102)			0.442*** (0.113)	0.449*** (0.109)	0.423*** (0.103)	0.406*** (0.104)
Financial constraint (-1)	-0.161*** (0.047)		-0.229*** (0.067)		-0.186*** (0.047)		-0.168*** (0.049)		-0.168*** (0.043)		-0.138*** (0.036)	
Liquidity score (-1)		0.111*** (0.030)		0.108*** (0.027)		0.096*** (0.023)		0.103*** (0.028)		0.088*** (0.025)		0.059*** (0.016)
Log Employment (-1)	0.208*** (0.063)	0.284*** (0.069)	0.299*** (0.096)	0.309*** (0.073)	0.287*** (0.075)	0.194*** (0.055)	0.195*** (0.059)	0.264*** (0.062)	0.278*** (0.067)	0.199*** (0.051)	0.281*** (0.073)	0.274*** (0.074)
Log TFP (-1)	0.141 (0.172)	0.161 (0.202)	0.119 (0.130)	0.139 (0.216)	0.098 (0.104)	0.125 (0.184)	0.137 (0.159)	0.148 (0.192)	0.103 (0.092)	0.127 (0.159)	0.093 (0.117)	0.099 (0.117)
Log Average wage (-1)	-0.109*** (0.035)	-0.094*** (0.032)	-0.099*** (0.029)	-0.096*** (0.030)	-0.106*** (0.036)	-0.090*** (0.031)	-0.112*** (0.027)	-0.098*** (0.025)	-0.111*** (0.029)	-0.119*** (0.032)	-0.106*** (0.025)	-0.101** (0.036)
Log Firm age (-1)	0.011 (0.116)	0.011 (0.095)	0.014 (0.126)	0.015 (0.103)	0.017 (0.105)	0.021 (0.097)	0.023 (0.107)	0.014 (0.083)	0.041 (0.049)	0.034 (0.046)	0.042 (0.083)	0.029 (0.073)
M(Financial constraint (-1))							-0.168*** (0.049)					
M(Liquidity score (-1))								0.103*** (0.028)				
M(Log Employment (-1))							0.195*** (0.059)	0.264*** (0.062)				
M(Log TFP (-1))							0.137 (0.159)	0.148 (0.192)				
M(Log Average wage (-1))							-0.112*** (0.027)	-0.098*** (0.025)				
M(Log Firm age (-1))							0.023 (0.107)	0.014 (0.083)				
Constant	-2.118*** (0.460)	-1.304*** (0.334)	-2.072*** (0.505)	-1.063*** (0.231)	-1.049*** (0.223)	-1.538*** (0.320)	-2.104*** (0.438)	-1.292*** (0.341)	-1.096*** (0.332)	-1.306*** (0.318)	-0.909*** (0.252)	-0.880** (0.266)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3983	5320	3983	5320	3983	5320	3983	5320	2303	3146	3983	5320
Log likelihood	-964.081	-836.635	-680.784	-964.007	-714.196	-833.190	-644.272	-817.916	-728.082	-815.728	-644.109	-680.931

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”.

5. Financial constraints and exports: robustness

We showed in the previous section that financial constraints decrease the probability for a firm to export. The goal of the present section is to explore the robustness of this effect with respect to alternative measures of the main dependent variable (i.e. export activity, first subsection), and to further look at the issue of potential endogeneity (second subsection).

5.1. Financial constraints and alternative measures of the export activity

Compared to the benchmark model, which analyzes the effect of financial constraints on the export decision, we consider in this subsection two alternative measures of the latter variable, namely export intensity and the time firms take before entering the export market.

5.1.1. Financial constraints and export intensity

To explore the way financial constraints affect export intensity, defined as export income divided by total income, we estimate equation (1) with export intensity as the dependent variable. As emphasized by the ordinary least square with firm fixed effects (OLS-FE) regression (1) in Table 2, financially constrained firms present a significantly lower share of export income compared to non-financially constrained ones. As this was the case when using the decision to export as the dependent variable, this result is established when controlling for time, industry and ownership structure dummies, as well as for employment (which positively influences export intensity), TFP and the age of the firm (which still have no significant effect), and for the negative effect of average wage. Moreover, we equally introduce firm fixed effects, and control for the experience in exporting, defined as the number of years since the firm started exporting (relative to each considered period). As expected, a higher experience in exporting, denoting the importance of export activities for the firm, significantly increases the share of export income in the total output of the firm.

We question the relevance of our results as follows. First, we consider in regression (2) the liquidity score as a proxy for financial constraints. Not only control variables conserve their sign and (degree of) significance, but the liquidity score exerts a positive and significant effect on export intensity, suggesting that financial liquidity promotes exports, consistent with the effect of the financial constraint dummy (see regression (1)). Second, to take into account the left-side censoring of the dependent variable, we employ in regressions (3) and (4) the tobit with firm fixed effects estimator (Tobit-FE). As emphasized by both regressions, the coefficients of variables measuring financial constraints remain remarkably robust in sign and significance, confirming that less financially constrained and more liquid firms are associated with stronger shares of export income in their total output. Third, in the absence of valuable instrumental variables, we use a system GMM estimator in regressions (5) and (6), which allows controlling for individual heterogeneity and mitigating a possible endogeneity bias.²² Finally, in our pooled sample, there is an important proportion of observations with no exports (77%). Since OLS-FE and Tobit-FE may not adequately deal with this problem of probability mass at zero, we also report in regressions (7) and (8) results based on a fractional logit estimator suggested by [Papke and Wooldridge \(1996\)](#).²³ Interest variables reveal, yet again, a damaging effect of financial constraints on the share of the export income for our sample of Egyptian firms.

Table 2: Financial constraints and export intensity

Dependent variable:	OLS-FE		Tobit-FE		System GMM		Fractional logit	
Export intensity	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export intensity (-1)					0.404*** (0.093)	0.375*** (0.098)		
Financial constraint (-1)	-0.196*** (0.067)		-0.182*** (0.053)		-0.260*** (0.081)		-0.199*** (0.056)	
Liquidity score (-1)		0.074*** (0.023)		0.029* (0.012)		0.016*** (0.005)		0.071*** (0.019)
Log Employment (-1)	0.429*** (0.104)	0.492*** (0.126)	0.188*** (0.052)	0.096*** (0.028)	0.122*** (0.029)	0.130*** (0.037)	0.212*** (0.055)	0.284*** (0.069)
Log TFP (-1)	0.105 (0.073)	0.085 (0.060)	0.156 (0.179)	0.062 (0.159)	0.117 (0.168)	0.099 (0.188)	0.044 (0.089)	0.061 (0.092)
Log Average wage (-1)	-0.107** (0.046)	-0.083** (0.037)	-0.111*** (0.033)	-0.089*** (0.030)	-0.130** (0.059)	-0.182* (0.105)	-0.062*** (0.015)	-0.044*** (0.015)
Log Firm age (-1)	0.090 (0.111)	0.118 (0.183)	0.107 (0.139)	0.106 (0.129)	0.048 (0.138)	0.135 (0.187)	0.128 (0.196)	0.149 (0.203)
Log Export Experience (-1)	0.431*** (0.110)	0.257*** (0.088)	0.316*** (0.092)	0.178** (0.077)	0.386*** (0.104)	0.395*** (0.118)	0.338** (0.146)	0.327* (0.189)
Constant	-1.184*** (0.348)	-1.170*** (0.285)	-2.313*** (0.514)	-1.814*** (0.465)	-1.327*** (0.323)	-1.633*** (0.418)	-1.939*** (0.461)	-2.117*** (0.622)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3983	5320	3983	5320	3466	4650	3983	5320
R-squared	0.533	0.569					0.324	0.351
Wald (p-value)			0.000	0.000				
Hansen (p-value)					0.306	0.291		
AR(2) (p-value)					0.203	0.238		

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”. Hansen (p-value) is the p-value of the Hansen test of overidentifying restrictions. AR(2) is the Arellano and Bond test of second order autocorrelation.

Consistent with results for the decision to export (see Table 1), our analysis shows that being financially constrained or a decrease in the liquidity score significantly reduces export intensity. On average, export intensity for financially constrained firms is lower by 3.3 percentage points (Fractional logit) and up to 26 percentage points (System GMM). In addition, the effect of the liquidity ratio is also statistically significant: a marginal increase in the liquidity score would increase export intensity by 1.6 percentage points (System GMM) and up to 12.8 percentage points (Tobit-FE).

This latter result contributes to the ongoing debate on the effect of firms' financial health on export intensity,²⁴ and can be explained by the role played by learning-by-exporting and economies of scale in the export process, particularly in developing countries (see, for instance, [Bigsten et al., 2004](#); [Blalock and Gertler, 2004](#)).

5.1.2. Financial constraints and the hazard rate of exporting

Let us now focus on the second alternative measure for the export activity, namely the length of the period before starting to export, captured through the hazard rate of starting to export, which measures the probability for a firm to start exporting for the first time. Following [Prentice and Gloeckler \(1978\)](#) and [Jenkins \(1995\)](#), we estimate a duration model that allows controlling for unobserved heterogeneity among firms. A common and important problem in duration models concerns the censorship: the presence of firms of different ages can cause a left censoring for the period during which the firm does not export.

Following [Bellone et al. \(2010\)](#), we control for this censorship through the inclusion of year fixed effects and of the variable (log of) time, computed as the difference between the year when the firm started to export and its birth year, in all our estimated duration models reported in Table 3.²⁵ In particular, remark that our strategy is supported, for both Gamma RE and Normal RE estimators, by the values of the log-likelihood ratio test, indicating the relevance of unobserved frailty (see columns (3) to (6)).

Table 3: Estimating the hazard rate of entering the export market

Dependent variable:	Pooled data		RE Probit		Dynamic RE Probit	
Hazard rate	(1)	(2)	(3)	(4)	(5)	(6)
Log Time	-0.018*** (0.005)	-0.017*** (0.003)	-0.028*** (0.001)	-0.008*** (0.007)	-0.015** (0.004)	-0.006*** (0.001)
Financial constraint	-0.017*** (0.004)		-0.053** (0.012)		-0.085** (0.025)	
Liquidity score		0.011*** (0.003)		0.010** (0.004)		0.010*** (0.003)
Log Employment	0.138*** (0.041)	0.175*** (0.046)	0.107*** (0.032)	0.194*** (0.064)	0.130** (0.041)	0.143*** (0.040)
Log TFP	0.128 (0.164)	0.092 (0.129)	0.075 (0.108)	0.106 (0.152)	0.109* (0.063)	0.094* (0.054)
Log Average wage	-0.148*** (0.042)	-0.160*** (0.051)	-0.096*** (0.028)	-0.077** (0.033)	-0.119** (0.054)	-0.099*** (0.028)
Log Firm age	0.006 (0.073)	0.017 (0.095)	0.008 (0.106)	0.046 (0.127)	0.094 (0.104)	0.058 (0.169)
Year dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES
Observations	1056	1116	1056	1116	1056	1116
LR test	-	-	29.06***	31.82***	34.62***	29.09***

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. LR test represents the statistic of the likelihood ratio test for unobserved frailty.

Regression (1) in Table 3 tests the effect of financial constraints on the time firms take before starting to export. To ease up comparison with our previous results, we control for time, industry and ownership structure, and we also include employment (positive effect), TFP and firm's age (not significant), and average wage (negative effect), as control variables. In addition, observe that the coefficient of the log of time is negative and significant, supporting that the longer the absence from foreign markets, the lower the probability for a firm to enter export markets.²⁶ Finally, and more importantly, we show that being financially constrained significantly decreases the probability to start exporting, a result in accordance with the effect of financial constraints on the decision to export and on export intensity.

We perform two robustness checks of our results. On the one hand, we consider an alternative measure for financial constraints. Regression (2) supports the results from (1), since a higher liquidity score significantly increases the probability of start exporting. On the other hand, to account for unobserved individual heterogeneity, we consider two random effects (RE) duration models, namely with Gamma (regressions (3) and (4)) and Normal (regressions (5) and (6)) distributed error terms. The coefficients of interest presented in regressions (3)-(6) are comparable with those in regressions (1)-(2): weaker (higher) financial constraints (liquidity scores) enhance the likelihood of start exporting, confirming our previous findings regarding the decision to export and export intensity. Consequently, access to finance negatively impacts the time between the birth of the firm and its internationalization, confirming the presence of sunk entry costs in exports market for the Egyptian firms in our sample.

To summarize, our results strongly support that the absence of financial constraints and better liquidity significantly increases export intensity and the time duration before exporting of Egyptian firms, adding to their effect on Egyptian firms' export decisions established in the previous section.²⁷ In the next subsection, we take a further look at the issue of potential endogeneity.

5.2. Exploiting cross-industry variation in external financial dependence to further account for endogeneity

This last robustness subsection further explores the potential issue of endogeneity. To this end, we follow the procedure of [Berman and Héricourt \(2010\)](#), which consists of exploiting cross-industry variation in external financial dependence. The underlying idea is that the effect of financial constraints on exporting varies across industries with different degrees of financial dependence. To allow for this variation, we make use of [Rajan and Zingales' \(1998\)](#) industry-level index of financial dependence.²⁸ The sample is split into two sub-samples (high and low) with respect to external financial dependence across industries. High and low refer respectively to firms above and below the median of the distribution of the external financial dependence index.

Table 4 presents the results for our benchmark measure of the export activity, namely export decision. For comparison with our previous findings, we conserve the specification of the benchmark estimation, namely the same vector of control variables (which conserve their significance and sign), dummies (namely, year, industry, and ownership), and methods of estimation.²⁹ As illustrated by regression (1) and (3), the financial constraint dummy has a negative and significant effect on the probability of exporting, for industries with both high and low external financial dependence. In addition, the coefficient of financial constraints is roughly 1.5 times higher when financial dependence is higher.

We explore the robustness of this finding as follows. First, we consider an alternative measure of the financial stance, namely the liquidity score. Regressions (2) and (4) show that higher liquidity increases more the probability of exporting for industries with high financial dependence. Second, we use alternatively a RE probit model (regressions (5)-(8)) and a

Dynamic RE probit model (regressions (9)-(12)). Consistent yet again with our benchmark results, being more financially constrained lowers the export market participation decision, and this effect is stronger at higher, compared to lower, degrees of industry financial dependency.

Finally, Tables S15-16 in SM illustrate the effect of financial constraints on the export intensity and the hazard rate of entering the export market, respectively, when accounting for financial dependence at the industry level. Irrespective of the measure of export activity, of financial constraints, or the method used, estimations in Tables S15-16 show that financial constraints have a detrimental effect on the export activity of Egyptian firms, and that this effect is stronger in financially-dependent industries. Thus, our benchmark results are robust to exploiting cross-industry variations in financial dependence to further account for endogeneity.

Table 4: Financial constraints and export decision: accounting for financial dependence at the industry level

Dependent variable: Export decision	Pooled Probit				RE Probit				Dynamic RE Probit			
Financial dependence	High		Low		High		Low		High		Low	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Export decision (-1)									0.502*** (0.128)	0.526*** (0.114)	0.486*** (0.124)	0.519*** (0.101)
Financial constraint (-1)	-0.142*** (0.039)		-0.097*** (0.028)		-0.139*** (0.039)		-0.101*** (0.026)		-0.133*** (0.039)		-0.097*** (0.024)	
Liquidity score (-1)		0.118*** (0.034)		0.085*** (0.036)		0.120*** (0.052)		0.059** (0.026)		0.123*** (0.053)		0.067*** (0.029)
Log Employment (-1)	0.359*** (0.097)	0.309*** (0.080)	0.299*** (0.064)	0.307*** (0.071)	0.288*** (0.084)	0.247*** (0.060)	0.323*** (0.093)	0.296*** (0.089)	0.319*** (0.093)	0.359*** (0.105)	0.329*** (0.099)	0.296*** (0.087)
Log TFP (-1)	0.098 (0.105)	0.140 (0.179)	0.100 (0.196)	0.096 (0.149)	0.062 (0.111)	0.105 (0.186)	0.097 (0.128)	0.128* (0.073)	0.113 (0.119)	0.092 (0.129)	0.103 (0.128)	0.106 (0.153)
Log Average wage (-1)	-0.091*** (0.026)	-0.107*** (0.025)	-0.103*** (0.027)	-0.103*** (0.035)	-0.109*** (0.047)	-0.106*** (0.030)	-0.119*** (0.037)	-0.104*** (0.033)	-0.094*** (0.028)	-0.117*** (0.035)	-0.117*** (0.037)	-0.095*** (0.032)
Log Firm age (-1)	0.059 (0.140)	0.105 (0.183)	0.106 (0.111)	0.038 (0.104)	0.107 (0.118)	0.107 (0.135)	0.103 (0.148)	0.108 (0.130)	0.094 (0.152)	0.094 (0.107)	0.103 (0.095)	0.101 (0.148)
Constant	-1.419*** (0.460)	-1.209*** (0.281)	-1.118*** (0.266)	-1.163*** (0.283)	-1.016*** (0.247)	-1.106*** (0.230)	-1.053*** (0.228)	-1.105*** (0.156)	-1.197*** (0.272)	-1.173*** (0.286)	-1.824*** (0.424)	-1.083*** (0.200)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2303	3064	1641	2183	2303	3064	1641	2183	2303	3064	1641	2183
Log likelihood	-956.038	-984.285	-1059.91	-1194.01	-970.295	-914.106	-979.821	-817.207	-969.718	-928.183	-792.716	-894.195

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”.

6. Conclusion

We tested the possible existence of a positive effect running from better financial conditions to stronger export activity using a sample of Egyptian firms. We found that stronger (less) financial constraints (liquidity) reduce the likelihood of exporting, export intensity, and the hazard rate of exporting. These findings are robust to several sensitivity checks.

Consequently, this paper adds to the scarce literature on developing countries (see, for instance, [Berman and Héricourt, 2010](#); [Lancheros and Demirel, 2012](#); [Akarim, 2013](#); [Manova et al., 2015](#)), by providing firm-level empirical support for a negative impact of financial constraints on firms' participation in international trade in Egypt. While the trade facilitation situation in Egypt may seem somehow particular, some lessons can be drawn for other developing countries. The strong association between financial factors and export participation is the reflection of both capital market imperfections and important sunk costs of exporting in developing countries. One implication of our results is that financial constraints act as a trade barrier that is likely to slow growth and private sector development in developing countries. Ultimately, capital market imperfections may lead to a decline in trade participation, which is a key engine for economic development in poor countries.

Future research could focus on the use of more detailed measures of the export activity. For example, the analysis of export intensity could be deepened and completed in an extensive way, by accounting for the number of foreign markets served or the number of products exported. In addition, subsequent work could review and break down the concept of sunk entry costs, in order to investigate the extent to which these costs may present the characteristics of public goods, as well as how policy can help decrease the fixed costs of exporting.

¹ This is a way to link two strands of literature usually considered in isolation. On the one hand, the impact of financial constraints is often limited to their effect on firms' investment and growth (see, for instance, [Ayyagari, Demircuc-Kunt, and Maksimovic, 2005](#); [Beck and Demircuc-Kunt, 2006](#); [Beck, Demircuc-Kunt, Laeven, and Levine, 2008](#)), with no reference to export activities. On the other hand, recent studies that investigated the determinants of firms' export behaviour focused on firms' productivity (see, for example, [Aw and Hwang, 1995](#); [Delgado, Farinas, and Ruano, 2002](#); [Aw, Roberts, and Winston, 2007](#); [Kiendrebeogo, 2012](#)), with little reference to financial constraints.

² Wagner (2014) provides a comprehensive and excellent survey of finance-export empirical studies using firm-level data. He concludes that although the empirical literature so far broadly suggests that financial constraints are important for the firm-export behaviour, these results cannot be used to guide policy.

³ Building on the new trade theory developed by [Krugman \(1979\)](#), [Melitz \(2003\)](#) discusses the relevance of the "love of variety" hypothesis and highlights the importance of sunk entry costs for heterogeneous firms in export markets ([Greenaway and Kneller, 2007](#)).

⁴ At the macroeconomic level, several studies, including [Beck \(2002\)](#), [Svaleryd and Vlachos \(2005\)](#), or [Becker, Chen, and Greenberg \(2013\)](#), highlight a positive impact of financial development on international trade, a result consistent with the findings of [Manova \(2013\)](#).

⁵ Unlike [Campa and Shaver \(2001\)](#) and [Greenaway et al. \(2007\)](#), they do not detect an ex-post improvement of the financial health of exporting firms.

⁶ There is little empirical evidence on the finance-export relationship in Arab and Middle East countries. For instance, [Fakih and Ghazalian \(2013\)](#) study the determinants of manufacturing firms' export behaviour in eight Arab and Middle-East countries, including Egypt, using data from the World Bank's Enterprise Surveys (WBES). To capture the effect of financial factors on firms' export participation, they include the level of financial development instead of a measure of firms' financial constraint as a covariate. [Akarim \(2013\)](#) finds no evidence that financial factors play a role in influencing firms' export decision in Turkey.

⁷ For example, the data used by [Berman and Héricourt \(2010\)](#) covers three years.

⁸ Section 2 further elaborates on why Egypt is an attractive case for studying the finance-exports relationship.

⁹ The LPI is provided by the World Bank, and is available at: <http://lpi.worldbank.org/>.

¹⁰ Even so, these shares remain lower than in OECD countries (see: <http://www.enterprisesurveys.org/data/exploretopics/trade>).

¹¹ The well-known Export Development Bank of Egypt (EDBE) provides short- and medium-term loans to finance capital assets of exporting firms, as well as bank guarantees required for financing exports. For example, the Export Credit and Guarantee Company, established in 1992 by the EDBE, supports exporters by issuing export credit insurance covering up to 80% of any incurred losses.

¹² In addition to these stylized facts, supporting the particularities in terms of trade and of access to finance for Egyptian firms among African countries (as emphasized in introduction), it is valuable to take a look at Egypt's performances among MENA countries. According to the Doing Business assessment, Egypt outperforms the average score of the Middle East and North Africa (MENA) region on starting a business and trading across the borders. For example, starting a business in Egypt takes 7 procedures and 8 days, while 8 procedures and 19.9 days on average in MENA (see Table S2 in SM). Trading across borders requires 8 documents and 12 days for exporting, and 10 documents and 15 days for importing, while the corresponding averages for MENA are 6 and 20 for exports, and 8 and 24 for imports. Regarding trade costs, on average, exports and imports require US\$625 and US\$790, respectively in Egypt, as opposed to the regional average for which exports and imports require US\$1127 and US\$1360, respectively.

¹³ Contrary to the Productivity and the Investment Climate Private Enterprise Survey, the classical questionnaire of WBES only focuses on the information in the current year.

¹⁴ Such a self-assessment is provided by an index in the Enterprise Surveys. Furthermore, [Becchetti and Trovato \(2002\)](#) used a similar self-assessment to analyze the determinants of firms' growth for a sample of Italian small and medium firms, or by [Chaffai, Plane, and Landivar \(2011\)](#), to assess the link between financial constraints and productivity for a sample of Moroccan firms. In addition, [Minetti and Zhu \(2011\)](#) employed a comparable measure from the *VIII Indagine sulle Imprese Manifatturiere*, a survey conducted by an Italian banking group to explore the impact of credit constraints on firms' export.

¹⁵ Several subsequent variables that could have been used to control for heterogeneity, such as managerial ability, product features, technology or foreign experience, are unfortunately not available.

¹⁶ This period was obtained by exploiting the information provided for the year preceding each survey year (2004, 2006, and 2008). However, given the lack of information, the self-assessment indicator is assumed to be constant between the year preceding the survey and the survey year. Table S3 in SM reports the detailed structure of our panel.

¹⁷ Our score is not immune to the main limitation of comparable scores, namely the method of aggregation, which may seem arbitrary; an alternative strategy would consist of counting the number of times for which the values of two individual scores are in the first two quintiles of the distribution. However, [Bellone et al. \(2010\)](#) remark that the different composite scores obtained by different methods of aggregation are strongly correlated. In addition, Table S6 in SM shows that the correlation coefficient between the financial constraint dummy and our liquidity score equals 0.786 and is statistically significant at 1%, suggesting that firms facing financial constraints are likely less liquid.

¹⁸ TFP is defined as the difference between actual and predicted output, and we measure it based on a semi-parametric approach following [Levinsohn and Petrin \(2003\)](#). Compared to [Olley and Pakes \(1996\)](#), who use investment to control for the correlation between input levels and unobserved productivity shocks, [Levinsohn and Petrin \(2003\)](#) use intermediate inputs to tackle this simultaneity issue. This is done by setting intermediate input as a function of firm's state variable, the capital input, and productivity. Table S9 in SM presents the results of the [Levinsohn and Petrin \(2003\)](#) productivity estimator.

¹⁹ Besides, the literature on sunk costs and hysteresis suggests that negative productivity shocks do not necessarily lead to firm's exit from export markets (see, for instance, [Baldwin, 1988](#); [Baldwin and Krugman, 1989](#); [Dixit, 1989](#)). We discuss more in detail the lack of a significant effect of TFP in the robustness section.

²⁰ We thank an anonymous Referee for suggesting this robustness test.

²¹ All along the paper, reported marginal effects refer to partial effects computed at sample average.

²² To perform GMM estimations we follow [Greenaway et al. \(2007\)](#) and [Bellone et al. \(2010\)](#) and consider as instruments all right-hand side variables lagged twice or more, and time dummies.

²³ [Wagner \(2001\)](#) uses this estimator to investigate the firm size-export relation using a sample of German firms.

²⁴ For example, [Bellone et al. \(2010\)](#) find a negative impact of financial health on export intensity, while [Berman and Héricourt \(2010\)](#) outline a non significant effect of financial constraints on the ratio of exports to sales.

²⁵ Compared to the analysis performed for the decision to export, which takes into account all firms (see Section 4), the duration analysis focuses on never-exporters and export-starters only, which reduces the number of firms to 1056 (1116 when we use the liquidity score as the measure of financial conditions).

²⁶ Our finding is in line with the conclusions of [Bellone et al. \(2010\)](#), outlining that firms intending to internationalize seek to do so as soon as possible after their birth.

²⁷ In addition, to further explore the lack of statistical significance of TFP in Tables 1-3, we performed several robustness tests. First, we used the [Aw, Chen, and Roberts' \(2001\)](#) index and the procedure of [Wooldridge \(2009\)](#) to compute alternative measures of TFP, and the results remain unchanged (these results are available

upon request). Second, comparable conclusions arise when using labour productivity as another TFP alternative measure (see Table S10 in SM), consistent with the findings of [Greenaway et al. \(2007\)](#) and [Berman and Héricourt \(2010\)](#). Third, we considered in Tables S11-13 in SM interaction terms between TFP and financial constraints; since the effect of both TFP and these interaction terms is not significant, we conclude that the TFP-exports disconnection holds for any level of access to finance for the Egyptian firms in our sample, thus extending the findings of [Berman and Héricourt \(2010\)](#). Finally, Table S14 in SM provides results when excluding financial variables. The fact that the effect of TFP becomes now significant suggests that, once we account for financial constraints, the favourable effect of productivity vanishes, which supports, yet again, the TFP-exports disconnection in the presence of financial variables for our sample of Egyptian firms.

²⁸ Recall that this financial dependence index is computed at industry level using the ISIC classification. The data we use comes from Enterprise Surveys, which also use the ISIC classification. Thus, we were able, for each firm in our sample, to make the correspondence with the RZ index for the industry to which this firm belongs.

²⁹ To save space, only the results from some of the estimators used so far are reported.

References

- Akarim, Y. D. (2013). The impact of financial factors on export decisions: The evidence from Turkey. *Economic Modelling*, 35, 305—308.
- Arndt, C., Buch, C. M., & Mattes, A. (2012). Disentangling Barriers to Internationalization. *Canadian Journal of Economics*, 45, 41—63.
- Aw, B. Y., Chen, X., & Roberts, M. J. (2001). Firm-level Evidence on Productivity Differentials and Turnover in Taiwanese Manufacturing. *Journal of Development Economics*, 66, 51—86.
- Aw, B. Y., & Hwang, A. R. (1995). Productivity and the export market: a firm-level analysis. *Journal of Development Economics*, 47, 313—332.
- Aw, B. Y., Roberts, M. J., & Winston, T. (2007). Export market participation, investments in R&D and worker training, and the evolution of firm productivity. *The World Economy*, 30, 83—104.
- Ayyagari, M., Demirguc-Kunt, A., & Maksimovic, V. (2005). How important are financing constraints? The role of finance in business environment. *The World Bank Economic Review*, 22, 483—516.
- Baldwin, J. R., & Gu, W. (2003). Export-market participation and productivity performance in Canadian manufacturing. *Canadian Journal of Economics*, 36, 634—657.
- Baldwin, R. (1988). Hysteresis in import prices: the Beachhead Effect. *American Economic Review*, 78, 773—785.
- Baldwin, R., & Krugman, P. (1989). Persistent trade effects of large exchange rate shocks. *Quarterly Journal of Economics*, 104, 635—654.
- Becchetti, L., & Trovato, G. (2002). The Determinants of Growth of Small and Medium Sized Firms: The Role of the Availability of External Finance. *Small Business Economics*, 19, 291—306.
- Beck, T. (2002). Financial Development and International Trade: Is there a Link? *Journal of International Economics*, 57, 107—131.
- Beck, T., & Demirguc-Kunt, A. (2006). Small and Medium-size Enterprises: Access to Finance as a Growth Constraint. *Journal of Banking and Finance*, 30, 2931—2943.
- Beck, T., Demirguc-Kunt, A., Laeven, L., & Levine, R. (2008). Finance, Firm Size, and Growth. *Journal of Money, Credit and Banking*, 40, 1379—1405.
- Becker, B., Chen, J., & Greenberg, D. (2007). Financial Development, Fixed Costs and International Trade. *Review of Corporate Finance Studies*, 2, 1—28.

Bellone, F., Musso, P., Nesta, L., & Schiavo, S. (2010). Financial constraints and firm export behaviour. *The World Economy*, 33, 347—373.

Berman, N., & Hericourt, J. (2010). Financial factors and the margins of trade: Evidence from cross-country firm-level data. *Journal of Development Economics*, 93, 206—217.

Bernard, A. B., & Jensen, J. B. (1995). Exporters, Jobs and Wages in US Manufacturing 1976-87. *Brookings Papers on Economic Activity. Microeconomics*, 67—119.

Bernard, A. B., & Wagner, J. (2001). Export Entry and Exit by German Firms. *Review of World Economics*, 137, 105—123.

Bigsten, A., Collier, P., Decron, S., Fafchamps, M., Gauthier, B., Gunning, J., Habarurema, J., Oduro, A., Oostendrop, R., Pattililo, C., Soderbom, M., Teal, F., & Zeufack, A. (2004). Do African Manufacturing Firms Learn from Exporting? *Journal of Development Studies*, 40, 115—141.

Blalock, G., & Gertler, P. J. (2004). Learning from exporting revisited in a less developed setting. *Journal of Development Economics*, 75, 291—306.

Bridges, S., & Guariglia, A. (2008). Financial Constraints, Global Engagement, and Firm Survival in the United Kingdom: Evidence from Micro Data. *Scottish Journal of Political Economy*, 55, 444—464.

Campa, J. M., & Shaver, J. M. (2001). *Exporting and Capital Investment: On the Strategic Behavior of Exporters*. New York University.

Chaffai, M., Plane, P., & Landivar, D. (2011). *Financial Constraints and Productivity under Unobserved Heterogeneity of the Technology: An Application to the Moroccan Garment Sector Using Latent Class Stochastic Frontier Models*. Paper presented at the 2nd International Workshop Firm, Trade and Development, Aix-en-Provence.

Chaney, T. (in press). Liquidity constrained exporters. *Journal of Economic Dynamics and Control*, <http://dx.doi.org/10.1016/j.jedc.2016.03.010>.

Chirinko, R., & Schaller, H. (1995). Why does Liquidity Matter in Investment Equations? *Journal of Money, Credit and Banking*, 27, 527—548.

Cleary, S. (1999). The Relationship between Firm Investment and Financial Status. *Journal of Finance*, 54, 673—692.

Cleary, S. (2006). International Corporate Investment and the Relationships between Financial Constraint Measures. *Journal of Banking and Finance*, 30, 1559—1580.

Delgado, M. A., Farinas, J. C., & Ruano, S. (2002). Firm productivity and export markets: a non-parametric approach. *Journal of International Economics*, 57, 397—422.

- Dixit, A. (1989). Hysteresis, import penetration, and exchange rate pass-through. *Quarterly Journal of Economics*, 104, 205—228.
- Fakih, A., & Ghazalian, P. L. (2013). *Why Some Firms Export? An Empirical Analysis for Manufacturing Firms in the MENA Region* (Working Paper 7172), IZA.
- Fazzari, S. M., Hubbard, R. G., Petersen, B. C., Blinder, A. S., & Poterba, J. M. (1988). Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity*, 1988(1), 141—206.
- Greenaway, D., Guariglia, A., & Kneller, R. (2007). Financial factors and exporting decisions. *Journal of International Economics*, 73, 377—395.
- Greenaway, D., & Kneller, R. (2007). Firm Heterogeneity, Exporting and Foreign Direct Investment. *Economic Journal*, 117, F134—F161.
- Heckman, J. (1981). The incidental parameters problem and the problem of initial conditions in estimating a discrete time-discrete data stochastic process, in Manski, C. F., & McFadden, D. (Eds.), *Structural Analysis of Discrete Data with Econometric Applications*. MIT Press, Cambridge, MA.
- Jenkins, S. (1995). Easy Ways to Estimate Discrete Time Duration Models. *Oxford Bulletin of Economics and Statistics*, 57, 129—136.
- Kaplan, S., & Zingales, L. (1997). Do Investment-Cash Flow Sensitivities provide Useful Measures of Financing Constraints? *Quarterly Journal of Economics*, 112, 169—215.
- Kiendrebeogo, Y. (2012). *Export Activity and Productivity: New Evidence from the Egyptian Manufacturing Industry* (Working paper 201220), CERDI, University of Auvergne.
- Krugman, P. R. (1979). Increasing Returns, Monopolistic Competition, and International Trade. *Journal of International Economics*, 9, 469—479.
- Lancheros, S., & Demirel, P. (2012). Does Finance Play a Role in Exporting for Service Firms? Evidence from India. *The World Economy*, 35, 44—60.
- Levinsohn, J., & Petrin, A. (2003). Estimating production functions using inputs to control for unobservables. *Review of Economic Studies*, 70, 317—341.
- Manova, K. (2013). Credit Constraints, Heterogeneous Firms, and International Trade. *Review of Economic Studies*, 80, 711—744.
- Manova, K., Wei, S. J., & Zhang, Z. (2015). Firm exports and multinational activity under credit constraints. *Review of Economics and Statistics*, 97, 574—588.
- Melitz, M. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71, 1695—1725.

- Minetti, R., & Zhu, C. (2011). Credit constraints and firm export: Microeconomic evidence from Italy. *Journal of International Economics*, 83, 109—125.
- Mundlak, Y. 1978. On the Pooling of Time Series and Cross Section Data, *Econometrica*, 46, 69—85.
- Musso, P., & Schiavo, S. (2008). The Impact of Financial Constraints on Firm Survival and Growth. *Journal of Evolutionary Economics*, 18:135—149.
- Muûls, M. (2015). Exporters, importers, and credit constraints. *Journal of International Economics*, 95, 333—343.
- Olley, S., & Pakes, A. (1996). The dynamics of Productivity in the Telecommunications equipment industry. *Econometrica*, 64, 1263—1298.
- Papke, L. E., & Wooldridge, J. M. (1996). Econometric Methods for Fractional Response Variables with an Application to 401(K) Plan Participation Rates. *Journal of Applied Econometrics*, 11, 619—632.
- Prentice, R., & Gloeckler, L. (1978). Regression Analysis of Grouped Survival Data with Application to Breast Cancer Data. *Biometrics*, 34, 57—67.
- Rajan, R., & Zingales, L. (1998). Financial dependence and growth. *American Economic Review*, 88, 559—586.
- Roberts, M., & Tybout, J. (1997). The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs. *American Economic Review*, 87, 545—564.
- Rodrik, D. (2009). *Growth After the Crisis* (Working paper), Commission on Growth and Development.
- Stewart, M. (2006). Maximum Simulated Likelihood Estimation of Random-effects Dynamic Probit Models with Autocorrelated Errors. *The Stata Journal*, 6, 256—272.
- Stiebale, J. (2011). Do financial constraints matter for foreign market entry? A firm-level examination. *The World Economy*, 34, 123—153.
- Svaleryd, H., & Vlachos, J. (2005). Financial Markets, the Pattern of Industrial Specialization and Comparative Advantage: Evidence from OECD Countries. *European Economic Review*, 49, 113—144.
- Wagner, J. (2001). A Note on the Firm Size-Export Relationship. *Small Business Economics*, 17:229—237.
- Wagner, J. (2014). Credit Constraints and Exports: A Survey of Empirical Studies using Firm-level Data. *Industrial and Corporate Change*, 23, 1477—1492.

Wooldridge, J. M. (2005). Simple Solutions to the Initial Conditions Problem in Dynamic, Nonlinear Panel Data Models with Unobserved Heterogeneity. *Journal of Applied Econometrics*, 20, 39—54.

Wooldridge, J. M. (2009). On Estimating Firm-level Production Functions using Proxy Variables to Control for Unobservables. *Economics Letters*, 104, 112—114.

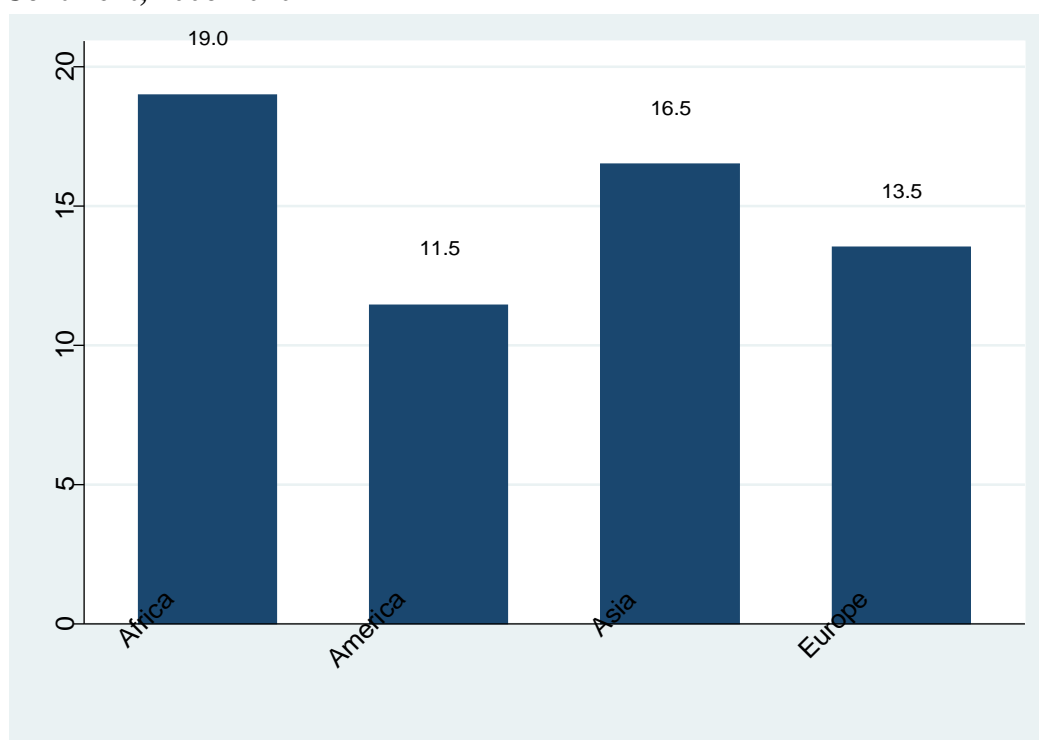
Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data*, 2nd edition, The MIT Press.

Acknowledgments:

We are indebted to the Editor (Oliver Morrissey) and to two anonymous referees for very helpful comments on a previous version of our paper. We are grateful to participants at the IXth North American Productivity Workshop (NAPW) for valuable discussions. The data used in this paper come from World Bank Enterprise Surveys, available at: <http://www.enterprisesurveys.org/>. These data and the replication code are available upon request. We thank the FERDI (Fondation pour les Etudes et Recherches sur le Développement International) and the ANR (Agence Nationale de la Recherche) for financial support through the “Grand Emprunt” and the LABEX IDGM+ (ANR-10-LABX-14-01) mechanism. Usual disclaimers apply.

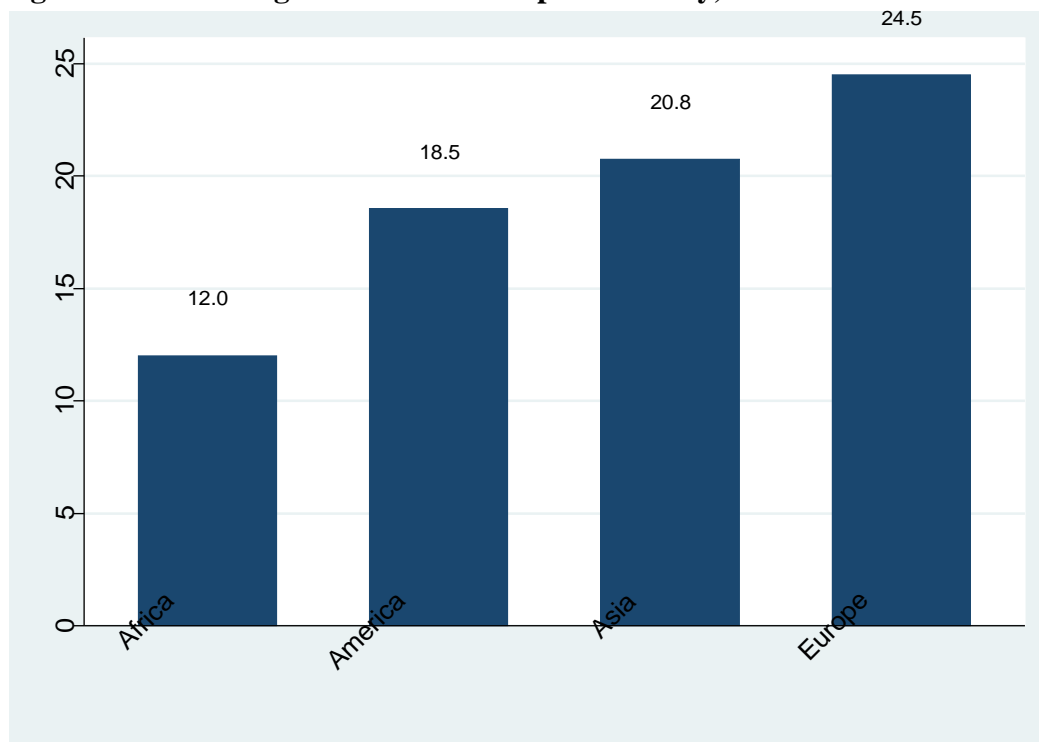
Supplementary Material

Figure S1: Percentage of Firms Identifying Access to Finance as a Major Constraint by Continent, 2006-2010



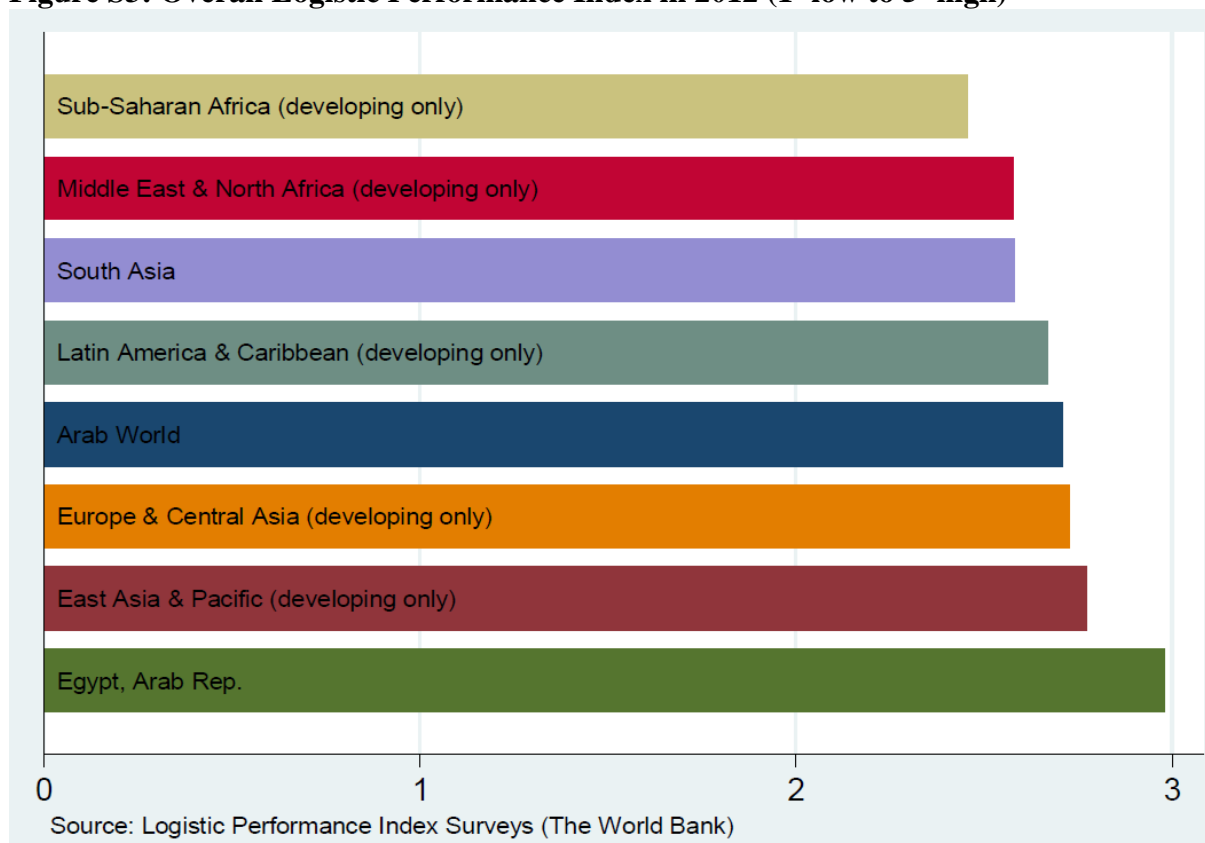
Comment: African firms are more financially constrained than firms in other regions.

Figure S2: Percentage of Firms that Export Directly, 2006-2010



Comment: African firms export less than firms in other regions.

Figure S3: Overall Logistic Performance Index in 2012 (1=low to 5=high)



Comment: Egypt outperforms the average LPI score of the developing world.

Table S1: Direct exports in Egypt in the aftermath of the 1990s trade reform

Year	Exporting firms (%)	Export intensity (%)
2003	3.04	6.30
2004	3.16	6.69
2005	5.58	7.18
2006	6.45	6.92
2007	6.04	9.14
2008	7.76	16.01

Source: World Bank Enterprise Surveys.

Comment: The share of exporting firms and the export intensity have substantially increased over our sample period, moving respectively from 3.04% and 6.30% in 2003 to 7.76% and 16.01% in 2008.

Table S2: Trade facilitation in Egypt

	Egypt	MENA
Starting a business (procedures)	7	8
Starting a business (time)	8 days	19.9 days
Trading across the borders (documents): exports	8	6
Trading across the borders (time): exports	12 days	20 days
Trading across the borders (documents): imports	10	8
Trading across the borders (time): imports	15 days	24 days
Export costs (USD per container)	625	1127
Import costs (USD per container)	790	1360

Comment: According to the Doing Business assessment, Egypt outperforms the average score of the Middle East and North Africa (MENA) region on starting a business and trading across the borders. For example, starting a business in Egypt takes 7 procedures and 8 days, while 8 procedures and 19.9 days on average in MENA.

Table S3: The panel structure

Number of firms	Pattern	Percent
554	XXXXXX	33.47
377XX	22.78
280	XX....	16.92
223	..XXXX	13.47
141	XXXX..	8.52
78	..XX..	4.71
2	XX..XX	0.12
1655	XXXXXX	100

Comment: The detailed panel structure of our data.

Table S4: List and definition of variables

Variable	Definition
Decision to export	Dummy variable equal to 1 if the firm is exporter, and 0 otherwise
Export intensity	The firm's share of export income in total output
Export experience	The number of years since the firm started exporting relative to each considered period
Financial constraint	Dummy variable equal to 1 if the firm is financially constrained, and 0 otherwise
Liquidity score	Index in the range from 1 to 10, 10 being the situation of the most liquid firm
Total assets	Real value of firm's total assets in thousands Egyptian pounds as of end of the fiscal year
Ratio of net income to total assets	Net income over total assets
Share of working capital finances with internal funds	Internal funds or retained earning as a % of working capital
Share of working capital finances with trade credit	Trade credit as a % of working capital
Last loan over cash flow	Real value of last loan in Egyptian currency as a % of cash flow
Cash flow to total assets ratio	Cash flow over total assets
Employment	Firm size measured by the number of permanent workers
TFP	Total factor productivity calculated based on the Levinsohn & Petrin (2003)'s method
Average wage	Wage per permanent worker
Firm age	Number of years of operations

Comment: List and definition of variables used in our analysis.

Table S5: Descriptive statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Decision to export	0.227	0.419	0	1
Export intensity	8.560	22.121	0	100
Log Export experience	2.226	0.904	0	4.189
Financial constraint	0.420	0.493	0	1
Liquidity score	4.623	14.160	1	10
Total assets	10590.34	217484.9	2.01	9312190
Ratio of net income to total assets	28.744	239.395	0	78518.11
Share of working capital finances with internal funds	55.125	29.5	0	100
Share of working capital financed with trade credit	16250	18.568	0	100
Last loan over cash flow	1826.549	5507.858	0.030	54166.67
Cash flow to total assets ratio	17.621	22.647	0	98.34
Log TFP	4.441	1.578	-2.591	12.603
Log Employment	3.938	1.582	1.098	10.351
Log Average wage	1.639	1.273	0.278	10.008
Log Firm age	2.858	0.812	0	5.062
RZ index of financial external dependence	0.261	0.339	-0.45	1.14
Time before starting to export	10.785	16.271	0	79

Note: Monetary values are expressed in thousands of Egyptian pounds.

Comment: Descriptive statistics of variables used in our analysis.

Table S6: Correlations between financial and export variables

	Decision to export	Export intensity	Time before starting to export	Financial constraint	Liquidity score
Decision to export	-	-	-	-	-
Export intensity	0.691***	-	-	-	-
Time before starting to export	-0.512***	-0.435***	-	-	-
Financial constraint	-0.701***	-0.630***	-0.816***	-	-
Liquidity score	0.686***	0.753***	0.618***	-0.786***	-

Note: *** shows statistical significance at 1%.

Comment: The decision to export appears strongly and robustly inversely correlated with the variable measuring financial constraints, confirming our intuition. In addition, the liquidity score is positively correlated with the decision to export. Finally, correlations using export intensity confirm the intimate link between financial and export variables.

Table S7: Exports and sectoral distribution of exporting firms in 2008

Description	Firms (%)	Exporters (%)	Export intensity (%)	Financially constrained firms (%)
Agro industries	1.31	6.67	6.66	62.50
Chemicals	7.57	32.18	6.65	34.48
Garments	11.31	25.78	18.85	39.43
Machinery & Equipment	3.31	31.58	7.31	34.78
Metal industries	16.45	20.74	5.69	45.21
Non metal industries	11.58	21.05	6.85	39.50
Textiles	16.80	22.40	10.54	46.77
Other industries	31.68	20.66	6.73	44.66
	100.00	22.50	8.53	42.49

Comment: Most firms belong to the metal and textiles industries (roughly 1/3), while the least represented sectors are agro industries and machinery & equipment (see column 1). More than one fifth of firms are exporters, however with important heterogeneities across sectors (1 out of 15 and 1 out of 3 firms export in agro industries and chemicals, respectively, see column 2). On average, income from exports is around 8.5% of total output, but it can climb to roughly 1/5 of total income for garments (see column 3). On the whole, there exist important heterogeneities among sectors, which may reflect differences in sectoral input costs on the export market, productivity, capital intensity, the possibility of achieving economies of scale, and transport costs. Regarding financial factors, on average, more than 2 out of 5 firms from our sample are financially constrained, suggesting that access to financial services is indeed a major constraint in Egypt. At the sectoral level, the relatively low (high) share of export income might be explained by the relatively high (low) share of financially constrained firms in the agro industries (garments), as illustrated by columns 3 and 4.

Table S8: Comparison of exporters and non-exporters in 2008

Mean	Exporters (N=259)	Non-exporters (N=892)	T-test (p-value)*
Financial constraint	0.344	0.532	0.000
Liquidity score	6.048	3.199	0.000
Firm age	23.984	23.314	0.114
Log TFP	0.706	0.403	0.000
Log Employment	9.440	4.634	0.000
Log Average wage	2.015	3.409	0.007

Note: (*) Mean comparison t-test for H0: difference of means=0.

Comment: These simple tests show that exporting firms are less financially constrained, more liquid, have greater access to overdraft facilities and credit, are slightly younger, have higher TFP, employ more, and pay lower wages on average compared to non-exporting firms.

Table S9: Levinsohn & Petrin (2003) productivity estimator

Dependent variable	Value added
Log Employment	0.624*** (0.141)
Log Capital	0.217*** (0.038)
Year dummies	YES
Industry dummies	YES
Ownership structure dummies	YES
Observations	6185

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. The Log of Employment is taken as the free input, whereas the Log of Capital, which is the endogenous input, is instrumented by the Log of Raw material and intermediate goods.

Comment: The results of the regression used to estimate Levinsohn & Petrin (2003) productivity estimator.

Table S10: Regressions using LP instead of TFP

Dependant variable:	Pooled Probit		RE Probit		Dynamic RE Probit	
Export Decision	(1)	(2)	(3)	(4)	(5)	(6)
Export Decision (-1)					0.483*** (0.123)	0.497*** (0.121)
Financial constraint (-1)	-0.149*** (0.046)		-0.215*** (0.059)		-0.194*** (0.049)	
Liquidity score (-1)		0.102*** (0.032)		0.101*** (0.029)		0.098*** (0.033)
Log Employment (-1)	0.196*** (0.057)	0.271*** (0.066)	0.287*** (0.079)	0.298*** (0.090)	0.284*** (0.081)	0.198*** (0.061)
Log Labour Productivity (-1)	0.080 (0.127)	0.105 (0.117)	0.083 (0.105)	0.099 (0.119)	0.081 (0.094)	0.108 (0.103)
Log Average wage (-1)	-0.093*** (0.029)	-0.079*** (0.027)	-0.107*** (0.033)	-0.083*** (0.028)	-0.111*** (0.035)	-0.088*** (0.027)
Log Firm age (-1)	0.041 (0.101)	0.019 (0.104)	0.038 (0.093)	0.009 (0.078)	0.013 (0.089)	0.030 (0.104)
Constant	-2.205*** (0.537)	-1.402*** (0.368)	-2.189*** (0.625)	-1.108*** (0.270)	-1.116*** (0.286)	-1.603*** (0.433)
Year dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES
Observations	4177	5538	4177	5538	4177	5538
Log likelihood	-996.227	-893.018	-721.672	-982.914	-780.912	-861.094

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”.

Table S11: Financial constraints and export decision, including interactions between financial variables and TFP

Dependant variable:	Pooled Probit		RE Probit		Dynamic RE Probit	
Export Decision	(1)	(2)	(3)	(4)	(5)	(6)
Export Decision (-1)					0.384*** (0.083)	0.416*** (0.118)
Financial constraint (-1)	-0.158*** (0.054)		-0.218*** (0.046)		-0.189*** (0.048)	
Liquidity score (-1)		0.131*** (0.042)		0.159*** (0.048)		0.129*** (0.043)
Log Employment (-1)	0.424*** (0.092)	0.341*** (0.089)	0.299*** (0.078)	0.416*** (0.122)	0.257*** (0.075)	0.187*** (0.052)
(Log TFP)(Financial constraint) (-1)	0.457 (0.410)		0.459 (0.604)		0.386 (0.306)	
(Log TFP)(Liquidity score) (-1)		-0.025 (0.072)		-0.047 (0.784)		-0.042 (0.154)
Log Average wage (-1)	0.096*** (0.026)	0.066** (0.028)	0.101*** (0.026)	0.206*** (0.071)	0.094*** (0.029)	0.104*** (0.034)
Log Firm age (-1)	3.39e-04 (9.94e-04)	0.002 (0.003)	0.008 (0.011)	0.004 (0.006)	4.19e-04 (4.48e-04)	0.001 (3.25e-04)
Constant	-9.028*** (1.962)	-2.773*** (0.676)	-4.863*** (1.105)	-2.954*** (0.686)	-2.114*** (0.556)	-2.876*** (0.959)
Year dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES
Observations	3983	5320	3983	5320	3983	5320
Log likelihood	-948.184	-1095.372	-983.019	-1104.049	-937.001	-988.934

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”.

Table S12. Financial constraints and export intensity, including interactions between financial variables and TFP

Dependant variable:	OLS-FE		Tobit-FE		System GMM	
Export intensity	(1)	(2)	(3)	(4)	(5)	(6)
Export intensity (-1)					0.397*** (0.098)	0.380*** (0.116)
Financial constraint (-1)	-0.196*** (0.052)		-0.153*** (0.040)		-0.343** (0.138)	
Liquidity score (-1)		0.107*** (0.033)		0.094** (0.041)		0.151*** (0.048)
Log Employment (-1)	0.128*** (0.029)	0.173*** (0.052)	0.119*** (0.033)	0.265*** (0.083)	0.201*** (0.055)	0.267*** (0.078)
(Log TFP)(Financial constraint) (-1)	0.104 (0.151)		0.119 (0.188)		0.179 (0.355)	
(Log TFP)(Liquidity score) (-1)		0.047 (0.033)		0.063 (0.442)		-0.054 (0.113)
Log Average wage (-1)	-0.102*** (0.029)	-0.050* (0.029)	-0.095*** (0.026)	-0.055*** (0.017)	-0.196* (0.100)	-0.179*** (0.054)
Log Export Experience (-1)	0.199*** (0.068)	0.243** (0.105)	0.221*** (0.069)	0.158*** (0.056)	0.382*** (0.131)	0.155*** (0.042)
Log Firm age (-1)	0.124 (0.108)	0.243 (0.328)	0.083 (0.103)	0.011 (0.010)	0.089 (0.194)	0.040 (0.174)
Constant	-1.981*** (0.449)	-1.426*** (0.256)	-1.563*** (0.325)	-1.087*** (0.200)	-1.242*** (0.318)	-1.840*** (0.573)
Year dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	NO	NO
Ownership structure dummies	YES	YES	YES	YES	NO	NO
Observations	3983	5320	3983	5320	3466	4650
Adjusted R-squared	0.562	0.592	-	-	-	-
Wald (p-value)	-	-	0.000	0.000	-	-
Hansen (p-value)	-	-	-	-	0.238	0.263
AR(2) (p-value)	-	-	-	-	0.195	0.201

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”. Hansen (p-value) is the p-value of the Hansen test of overidentifying restrictions. AR(2) is the Arellano and Bond test of second order autocorrelation.

Table S13. Estimating the hazard rate of entering the export market, including interactions between financial variables and TFP

Dependent variable: Hazard Rate	Pooled data		RE Probit		Dynamic RE Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
Log Time	-0.028*** (0.008)	-0.019*** (0.004)	-0.010*** (0.002)	-0.008*** (0.002)	-0.009** (0.002)	-0.010*** (0.003)
Financial constraint	-0.056*** (0.016)		-0.048** (0.020)		-0.033** (0.015)	
Liquidity score		0.107*** (0.036)		0.083*** (0.025)		0.053*** (0.017)
Log Employment	0.175*** (0.042)	0.169*** (0.048)	0.105*** (0.036)	0.114*** (0.035)	0.109*** (0.037)	0.093*** (0.027)
(Log TFP)(Financial constraint)	0.084 (0.128)		0.108 (0.113)		0.079 (0.157)	
(Log TFP)(Liquidity score)		0.006 (0.199)		0.010 (0.172)		0.005 (0.160)
Log TFP	0.108 (0.083)	0.084 (0.056)	0.089 (0.063)	0.104 (0.069)	0.184* (0.106)	0.093 (0.071)
Log Average wage	-0.071*** (0.023)	-0.083*** (0.028)	-0.102*** (0.049)	-0.109*** (0.034)	-0.065** (0.022)	-0.094*** (0.031)
Log Firm age	2.106*** (0.448)	2.481*** (0.576)	7.604*** (1.949)	5.300*** (1.472)	7.381*** (2.108)	6.119*** (1.456)
Year dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES
Observations	1056	1116	1056	1116	1056	1116
LR test	-	-	20.06***	21.65***	22.77***	23.59***

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. LR test represents the statistic of the likelihood ratio test for unobserved frailty.

Table S14: Regressions excluding financial variables

Dependant variable:	Pooled Probit		RE Probit		Dynamic RE Probit	
Export Decision	(1)	(2)	(3)	(4)	(5)	(6)
Export Decision (-1)					0.510*** (0.124)	0.498*** (0.127)
Log Employment (-1)	0.227*** (0.059)	0.302*** (0.086)	0.310*** (0.091)	0.293*** (0.071)	0.311*** (0.079)	0.213*** (0.047)
Log TFP (-1)	0.182** (0.079)	0.194* (0.112)	0.163** (0.070)	0.171* (0.099)	0.116* (0.067)	0.139* (0.081)
Log Average wage (-1)	-0.090*** (0.027)	-0.097*** (0.031)	-0.087*** (0.025)	-0.101*** (0.032)	-0.098*** (0.033)	-0.103*** (0.032)
Log Firm age (-1)	0.037 (0.101)	0.028 (0.086)	0.039 (0.095)	0.019 (0.084)	0.026 (0.111)	0.030 (0.102)
Constant	-1.816*** (0.442)	-1.297*** (0.332)	-2.005*** (0.556)	-1.018*** (0.231)	-0.892*** (0.270)	-1.370*** (0.326)
Year dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES
Observations	4208	5596	4208	5596	4208	5596
Log likelihood	-1078.307	-918.004	-759.899	-1107.728	-815.803	-972.991

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”.

Table S15: Financial constraints and export intensity: accounting for financial dependence at the industry level

Dependant variable: Export Intensity	OLS-FE				Tobit-FE				System-GMM			
Financial dependence	High		Low		High		Low		High		Low	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Export Intensity (-1)									0.551*** (0.153)	0.554*** (0.135)	0.582*** (0.157)	0.573*** (0.163)
Financial constraint (-1)	-0.169*** (0.052)		-0.099*** (0.031)		-0.159*** (0.042)		-0.116*** (0.034)		-0.169*** (0.049)		-0.048*** (0.020)	
Liquidity score (-1)		0.129*** (0.039)		0.040*** (0.011)		0.130*** (0.030)		0.052** (0.016)		0.166*** (0.044)		0.104*** (0.035)
Log Employment (-1)	0.151*** (0.044)	0.138*** (0.033)	0.195*** (0.052)	0.144*** (0.035)	0.297*** (0.084)	0.273*** (0.061)	0.275*** (0.076)	0.194*** (0.059)	0.110*** (0.047)	0.148*** (0.036)	0.118*** (0.030)	0.094*** (0.022)
Log TFP (-1)	0.121** (0.052)	0.192** (0.087)	0.139 (0.120)	0.238*** (0.103)	0.281*** (0.122)	0.101** (0.043)	0.148* (0.085)	0.040 (0.058)	0.067** (0.029)	0.051 (0.082)	0.128* (0.073)	0.094* (0.054)
Log Average wage (-1)	0.133*** (0.041)	0.128*** (0.037)	0.192*** (0.061)	0.063* (0.036)	0.118*** (0.035)	0.170*** (0.050)	0.159*** (0.044)	0.121*** (0.039)	0.117** (0.035)	0.131** (0.056)	0.154** (0.037)	0.141** (0.061)
Log Export Experience (-1)	0.394*** (0.101)	0.505*** (0.117)	0.594*** (0.152)	0.536*** (0.148)	0.606*** (0.126)	0.520*** (0.123)	0.466*** (0.139)	0.518*** (0.120)	0.482*** (0.109)	0.405*** (0.094)	0.507*** (0.220)	0.499*** (0.138)
Log Firm age (-1)	0.098 (0.122)	0.094 (0.112)	0.104 (0.179)	0.120 (0.164)	0.103 (0.138)	0.116 (0.219)	0.194 (0.168)	0.158 (0.185)	0.159 (0.201)	0.140 (0.195)	0.165 (0.184)	0.093 (0.160)
Constant	-1.108*** (0.157)	-1.528*** (0.311)	-1.018*** (0.216)	-1.401*** (0.412)	-1.093*** (0.287)	-1.206*** (0.280)	-1.319*** (0.366)	-1.012*** (0.235)	-1.193*** (0.384)	-1.237*** (0.294)	-1.618*** (0.475)	-1.390*** (0.365)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO
Ownership structure dummies	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO
Observations	2303	3064	1641	2183	2303	3064	1641	2183	2004	2688	1428	1916
Adjusted R-squared	0.539	0.619	0.560	0.611	-	-	-	-	-	-	-	-
Wald (p-value)	-	-	-	-	0.000	0.000	0.000	0.000	-	-	-	-
Hansen (p-value)	-	-	-	-	-	-	-	-	0.637	0.604	0.563	0.599
AR(2) (p-value)	-	-	-	-	-	-	-	-	0.303	0.286	0.292	0.230

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. (-1) denotes the lagged value of the corresponding variable. Ownership structure dummies indicate legal status of the firm that is either “Individual ownership”, “Partnership”, “Limited Partnership”, “Stock Partnership”, “Stock Company”, “Limited Liability Company”, “Affiliate of a Foreign Company”, “Public Sector Company”, or “Other”.

Table S16: Estimating the hazard rate of entering the export market: accounting for financial dependence at the industry level

Dependant variable: Hazard rate	Pooled data				Gamma RE				Normal RE			
Financial dependence	High		Low		High		Low		High		Low	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log Time	-0.019*	-0.023*	-0.061**	-0.070**	-0.081***	-0.053**	-0.082***	-0.072***	-0.090***	-0.081***	-0.097***	-0.102***
	(0.010)	(0.013)	(0.026)	(0.031)	(0.027)	(0.023)	(0.024)	(0.021)	(0.031)	(0.026)	(0.030)	(0.028)
Financial constraint	-0.439***		-0.105***		-0.497***		-0.130***		-0.349***		-0.102***	
	(0.118)		(0.030)		(0.121)		(0.039)		(0.112)		(0.027)	
Liquidity score		0.201***		0.084***		0.179***		0.104**		0.171***		0.095***
		(0.059)		(0.027)		(0.061)		(0.045)		(0.041)		(0.028)
Log Employment	0.128***	0.141***	0.120***	0.152***	0.119***	0.147***	0.173***	0.148***	0.154***	0.126***	0.139***	0.124***
	(0.038)	(0.048)	(0.030)	(0.024)	(0.037)	(0.040)	(0.055)	(0.050)	(0.048)	(0.030)	(0.037)	(0.040)
Log TFP	0.113	0.094	0.084	0.085	0.104	0.116	0.059	0.101*	0.084*	0.126	0.092	0.107*
	(0.184)	(0.126)	(0.127)	(0.083)	(0.148)	(0.138)	(0.121)	(0.058)	(0.036)	(0.151)	(0.119)	(0.061)
Log Average wage	-0.109*	-0.117***	0.094	-0.108**	-0.103*	-0.132**	-0.091*	-0.113**	-0.098***	-0.120***	-0.088***	-0.104***
	(0.063)	(0.050)	(0.137)	(0.049)	(0.059)	(0.057)	(0.052)	(0.049)	(0.031)	(0.036)	(0.030)	(0.045)
Log Firm age	0.029	0.008	0.093	0.103	0.093	0.105	0.093	0.128	0.083	0.114	0.091	0.122
	(0.102)	(0.075)	(0.108)	(0.141)	(0.112)	(0.128)	(0.110)	(0.140)	(0.119)	(0.195)	(0.102)	(0.139)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Ownership structure dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	617	650	439	466	617	650	439	466	617	650	439	466
LR test	-	-	-	-	105.06***	97.07***	89.49***	118.23***	126.04***	95.18***	101.26***	165.11***

Note: ***, **, and * denote significance at the 1-percent, 5-percent, and 10-percent levels, respectively. Standard errors are reported in parentheses. LR test represents the statistic of the likelihood ratio test for unobserved frailty.