



# Do manufacturing firms in Bangladesh acquire ISO certificates to offset the handicap of credit constraints?

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## Abstract

Formal credit market imperfection scenarios in developing economies can very well impede firms as well as the country's productivity and growth. Then how does a manufacturing firm sustain in an emerging economy with an under-developed financial market? This paper tries to investigate how a severely financially constrained manufacturing firm of an emerging economy can survive, prosper, and enter the global market. This paper presents evidence that small manufacturing firm uses internationally recognized standards like ISO to condense the adverse effect of the premature credit market. Standardized small firms were also found to experience a significantly less negative effect on export compared to those without standards. The analysis also pointed out that firms tend to rely on ISO standards more when facing major to severe financial obstacles, especially small enterprises. Empirically, the predicted probability of getting standardized is 0.32 times greater for a firm facing major to severe financial constraint compared to the one with no constraint. Smaller firms with ISO standards have significantly higher evidence of experiencing increased export basket during the sample period.

**Keywords** Financial constraint · ISO certification · Export decision · Emerging economy · Small enterprise

**JEL Classification** F10 · G20 · L15

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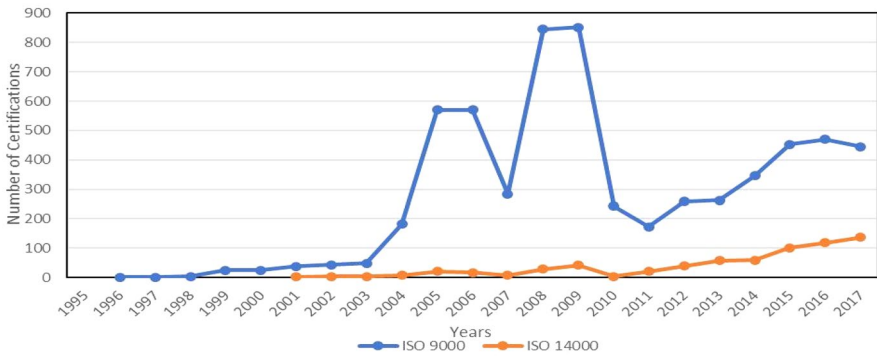
## Introduction

Access to finance is crucial for an enterprise's performance, growth, and in turn country's economic development (Caggese and Cuñat 2010). Steady and accelerated growth trends for a substantial period of time, especially for emerging economies, can very well promote, endorse, and increase bilateral trades between countries (Bhagwati and Hudec 1996). However, emerging economies almost always suffers from the underdeveloped capital market condition. Credit market imperfection can successfully preclude the growth trend (Andersen 2016; Easterly and Levine 2001), lower FDI, and standard technological progress (Manova et al. 2015; Andersen 2016). For LDCs, the scenarios are even worse as their economic growth is mostly export-driven (Manova et al. 2015).

Over the past 30 years, the *International Organization for Standardization* (ISO) standards, focusing on quality management, appears to be a success story, with evidence of certifying at least 1,519,952 enterprises located in more than 150 countries (ISO 2016). This is an organizational degree, widely recognized, and aimed to increase the trust and legitimating in Quality Management System (QMS) (Andersen 2016). Several empirical studies focused on the impact of standards on firms' performances; with an accent on the financial upshot, increasing labor productivity, environmental standards, safety, and quality management standards. While ISO 14000 focuses on the adoption of environmental management systems (EMS), ISO 9000 specializes in ensuring product quality (ISO, ISO/IEC TR 29110-1:2016, 2016). According to the handbook of ISO, EMS is a set of management processes and procedures that allows organizations to analyze, control, and reduce the environmental impact of their operations and services to save costs, improve efficiency and oversight, and to streamline regulatory compliance and QMS ensures product quality management and organizational standards (ISO 2002).

According to trade literature, standards like ISOs are increasingly becoming an important determinant for promoting bilateral trade flow between countries (Clougherty and Grajek 2008, 2014). Pekovic (2010) argued that ISO promises international standards and exporters are more likely to seek this standardization than non-exporters (Corbett et al. 2005; Shahbaz et al. 2016). Exporting firms are more relying on international standards like ISO, particularly when located in a developing country because standards have proven to reduce asymmetric information between buyers and sellers (Blind 2001; Minetti and Zhu 2011; Starke et al. 2012).

An intriguing question is, although ISO certification can be expensive, why the firms in LDCs are bearing the cost with the least support from financial markets? Although, standards can significantly treat as a "checklist" for bilateral trade (Pekovic 2010), but is it also possible that standards like ISOs help financially constrained small firms to sustain? If yes, how? Can ISOs serve as an orientation for a financially constrained firm into the open market? Also, can standards support firms enhancing



Source: The ISO Survey Data. Retrieved from <https://www.iso.org/the-iso-survey.html>

**Fig. 1** Growth of ISO Certification of Bangladesh over Time. Source: The ISO Survey Data. Retrieved from <https://www.iso.org/the-iso-survey.html>

export bundles? Do firms with ISO standards experience a positive increase in their export proportion during the survey period?

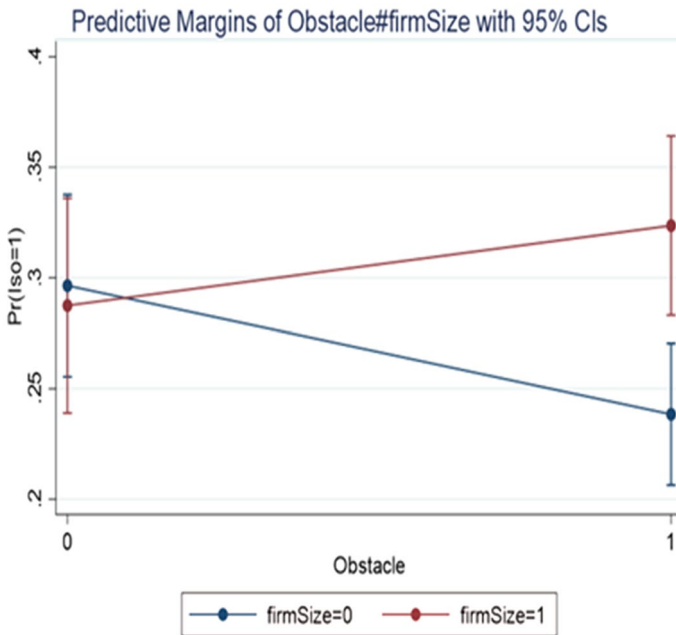
This paper is using an emerging economy like Bangladesh as a reference country because of its unique ongoing transition status.<sup>1</sup> Also being a member of an emerging economy, an underdeveloped capital market is one of the major issues for firms' productivity and growth (Khandker et al. 2013). Like most emerging economies, its growth is mainly export-driven with a premature capital market. According to the *World Bank Doing Business Index 2018*, Bangladesh has ranked 161 on the "Getting Credit" criterion<sup>2</sup> and by Yale's *Environmental Performance Index 2018 Report*, Bangladesh ranked 179.<sup>3</sup> However, over the years, there is a noticeable growth in the popularity of ISO certification among Bangladesh enterprises. Figure 1 shows steady growth in both ISO 9000 & 14000 from the year 1995. The research question is to identify, "why severely financially constrained small manufacturing firms of Bangladesh are undertaking expensive standards like ISO with the least possible support from the formal credit market?"

The rest of the paper is organized as follows. Section 2 discusses methodology including a brief description of the data and variables. Section 3 presents estimation results including discussions. Section 4 points out some econometric issues related to the analysis and Sect. 5 presents an alternative method for robustness check. The last section concludes with policy recommendations tailored to emerging economies (Fig. 2).

<sup>1</sup> Bangladesh is currently on the verge of graduation to an upper-mid income country by 2025. Details of this graduation and fulfilling conditions can be found, <https://www.worldbank.org/en/country/bangladesh/overview>.

<sup>2</sup> Detailed country report is freely available here: <http://www.doingbusiness.org/en/rankings?region=south-asia>.

<sup>3</sup> Detailed discussion and report can be found freely here: <https://epi.envirocenter.yale.edu/epi-topline>.



**Fig. 2** The predicted margins of ISO and interaction between Financial Constraints and Small Firms. For Major to Severe financial constraints, small firms have a higher probability of getting standards than unconstrained larger firms

### Methodology

This paper aims to find why financially constrained Bangladeshi manufacturing firms are seeking ISO standards. But at first, it analyzes the determinants of firm-level exports for Bangladeshi manufacturing firms. The aim is to identify whether ISO standards show a positive impact on bilateral trades. In particular, examine if the unavailability of credits harms exports, and can the presence of ISO standards help exports. The goal is to answer when the formal authority is unable to address the credit issues, can the firms offset that handicap situation by acquiring ISO certificates. Empirically, Eqs. (1) and (2) are estimated.

$$Export_{it} = \omega_{21}ISO_{it} + \omega_{22}Obstacle_{it} + \omega_{23}Small + \omega_{24}X + \epsilon_{2it} \tag{1}$$

$$ISO_{(it)} = Pr(\beta_{11}Obstacle_{it} + \beta_{12}Export_{it} + \beta_{13}Small + \beta_{14}X + \epsilon_{1it}) \tag{2}$$

where  $Export_{it}$  is the proportion of output exported either directly or indirectly for the  $i$ th entity at time  $t$ .  $ISO_{it}$  is a binary variable taking the value 1 if the  $i$ th firm has ISO standard and 0 otherwise.  $Small$  is also a dummy variable.<sup>4</sup>  $X$  is the matrix of firm-level attributes used as control variables.

<sup>4</sup> More detailed description of each variable and how they are created are given in the appendix.

The focus of this paper is magnifying the financial situation for small business entities. Larger firms can manage external funds through different regional and external sources. Usually, small firms do not have that opportunity, e.g. relationship with financial sectors (Boot 2000). It also examines if ISO standards are helping financially constrained firms to increase export bundles. To do so, differences in the proportion of export are calculated when a particular firm has an ISO standard and do not have one.

## Data

The standardized firm-level data collected by the World Bank's Enterprise Surveys for 2007 to 2013 are used by this article. During that period World Bank conducted 3 surveys on randomly selected firms in different locations of Bangladesh, in 2007, 2011, and 2013.<sup>5</sup> The data is collected from face-to-face interviews with managing directors, accountants, human resource managers, and other relevant firm staff by private contractors on behalf of the World Bank. The survey covered all 6 divisions of Bangladesh. Some firms were surveyed in all the 3 periods and some were newly added in each of the survey years. Depending on the survey structure, our data set comprises a pseudo panel data of around 3200 firms of 2007, 2011, and 2013. The data includes information on firms' demographic characteristics along with sales, inputs, labor force and their characteristics, capital stock, investment, innovation, relationship with competitors and financial institutions, and many more (Rashid 2019). Information is dominated by domestic currency (BDT). Salient features and detailed description of the variables are reported in Tables A1 and A2 in the supplementary material.

## Variables

**ISO:** ISO 9000 or 14000 standardization is employed here as a symbol of good environmental performance and product quality assurance. ISO, the main dependent variable takes the value 1 if a firm has either ISO 9000 or 14000 certificate and 0 otherwise. 955 firms of the samples were certified, 1756 firms were certificated. 8 were labeled as "does not know", and 11 firms were still in the process. Firms labeled "unclear" and "applying" is deleted from the sample.

$$ISO_{it} = \begin{cases} 1; & \text{if the firm has either ISO 9000 or 14000 certificate in that year} \\ 0, & \text{otherwise} \end{cases}$$

**Financial constraints:** During the survey, the firms were asked to *rank to what degree access to finance is an obstacle*. These responses were classified into five categories, labeled as; no obstacles, minor obstacles, moderate obstacles, major obstacles, and severe obstacles. According to the response, firms are reclassified into 5 categories and assigned values 0 to 4 based on severity and 0 being no obstacle.

<sup>5</sup> Detailed report on survey structure and data can be found here: <http://www.enterprisesurveys.org/>

**Table 1** Detailed description of firm size and financial constraints

Firm size	Financial constraints					Total
	No	Minor	Moderate	Major	Severe	
Small	165 (15.86)	336 (26.58)	395 (31.25)	231 (17.96)	151 (11.16)	1278 (100.00)
Large	215 (15.86)	365 (26.92)	441 (32.52)	211 (15.56)	124 (9.14)	1356 (100.00)
Total	380 (14.50)	701 (26.76)	836 (31.91)	438 (16.72)	265 (10.11)	2634 (100.00)

Source: Enterprise's firm-level survey data of Bangladesh from 2007–2013

Firms with moderate, major, and severe obstacle responses are assigned as 1, 2, 3, and 4, respectively. In this study, initially, financial obstacles are divided into two categories; minor and major. Firms who responded to financial constraints as no and minor are assigned as 0. And firms with moderate, major, and very severe obstacle responses are assigned as 1. Firms labeled 0 (zero) are treated as the control group.

**Export:** This is a logarithm of the total proportion of production exported in that given year. Total export is categorized into *Direct Export*: who are exporting goods directly to the foreign buyers and *Indirect Export*: selling to an intermediary, who in turn sells products either directly to customers or to importing wholesalers.

**Small:** Number of employees and sales amounts are often used as a proxy variable of the firm's scale. In this analysis, the number of employees as a proxy for firm size. We classified firm size into two categories: Micro & small firms in one group and medium and large firms into another. If the number of employees is between 0 to 20, then that firm is classified as *small* and otherwise a *large* one. Firm size is a dummy variable that takes value 1 if the firm is classified as a small one and otherwise 0. Salient features of firm size and credit constraints are presented in Table 1.

Various firm-level attributes suggested by peer literature are also used as control variables in this study. For example but not limited to age, total asset value, ownership status, legal status, total annual sale, labor productivity (for this analysis, we divided labor productivity by 10,00,000), technological innovation, the total amount of annual profit, relationship status with the financial institution, the outstanding debt amount, top manager's experience and sex, etc.

**Other control variables:** Industry sector and time fixed effects in our analysis to capture any unobserved heterogeneous effects presented in the system. The location of a firm is also controlled, as the economic heterogeneity is obvious among different regions of Bangladesh.

## Estimation results

To test the anticipated hypothesis, the empirical analysis is organized in several subsections. At first, the firm-level determinants of export and credit constraints are estimated. The aim is to figure out how much negative impact credit constraints impose on firms' export decisions. Also, identify the firm-level attributes that can help increasing export bundles.

**Table 2** Determinants of firm-level financial constraints & export proportion

	Obstacle	Export (Proportion of output)	
	ME	Coeff	Coeff
ISO		7.569** (0.014)	7.936*** (0.001)
Small	0.029239* (0.083)	- 7.276*** (0.007)	- 6.168*** (0.001)
Obstacle (binary)		- 3.9072*** (0.007)	- 4.439** (0.051)
ISO * Small		- 5.3155*** (0.000)	
Obstacle * Small			3.715 (0.140)
Labor productivity	- 0.00213* (0.063)	2.369*** (0.004)	2.1446*** (0.010)
Annual sale (log)	0.03093 (0.303)	4.404*** (0.000)	4.729*** (0.000)
Female	0.02404* (0.075)		
Fixed effects	Yes	Yes	Yes
N	2022	1847	1847

*P* values are presented in the parenthesis. \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01. ME is marginal effect

Column (1)–(3) in Table 2 presents the determinants of the predicted probability of financial constraints and firm-level export proportion, respectively. According to column (1), smaller firms and facilities under female leadership face higher financial constraints. But with increased productivity and higher annual sales firms can reduce the probabilities of financial obstacles. The next step is to identify the firm-level determinants of export decisions. Column (2)–(3) used the dependent variable as the proportion of total output exported either directly or indirectly is used as the variable “Export”. Results suggest that firms with ISO standards significantly export more than those with no standards. Financial constraints negatively affect firms’ export proportion. Specifically, severe financial hindrance can significantly decrease the total export proportion for firms compared to those who face no or minor financial obstacles.

Similar results are found for small firms. But the interaction effect between ISO standards and small firms tells a slightly different story. Large firms with no standards have 7.59 times positive and significant effect on export whereas small firms with no ISO have 7.23 times significantly negative effect. But small firms with ISO standards face (7.5–7.28–5.32) = - 5.1 times negative and significant effect on export, which is lower than the adverse effect small firms face without standards. The coefficient of the interaction effect between Obstacle and small firms is 3.715. This means severely constrained small firms face (- 6.168–4.439 + 3.75) = - 6.85

**Table 3** ISO, export and financial constraints

ISO	(1)	(2)
Export (binary)	0.366** (0.011)	0.05321** (0.042)
Obstacle	0.122* (0.109)	- 0.01734* (0.082)
Small	- 0.0910 (0.468)	0.04548** (0.049)
Obstacle * Small		0.323632*** (0.000)
Age (log)	0.0405 (0.683)	0.00907 (0.631)
Annual sale (log)	- 0.0963 (0.124)	- 0.00862 (0.410)
Labor Productivity	0.271*** (0.000)	0.0253*** (0.010)
Legal Stat	-0.297** (0.040)	-0.0515* (0.063)
Female (owner)	0.190 (0.183)	0.0768*** (0.003)
Control variables	Yes	Yes
Fixed effects	Yes	Yes
<i>N</i>	2175	2175

effect on export. But this is not statistically significant. Female-headed facilities tend to face a significantly higher degree of financial hindrance and the results are consistent with the literature (Treichel and Scott 2006; Hansen and Rand 2014).

Estimation results show that financial constraints have an adverse effect on firms' export proportion, but ISO standards help to increase export and small firms experience a less adverse effect on export with standards. So, the next logical steps are to answer the question, "Do the firms with no access to credit are more likely to obtain ISO? And does getting ISO to increase export?" For that ISO equation with export, financial constraint, firm size, and other firm-level attributes are regressed (Eq. (2)). In this section, we have used "export" as a binary variable as the positive coefficient of the export variable will precisely answer our 2nd question.

$$Export_{it} = \begin{cases} 1, & \text{if the } i\text{th firm exported in } t\text{ period} \\ 0, & \text{otherwise} \end{cases}$$

Results in *MERGEFORMAT* Table 5 suggest that severely financially constrained firms have a higher probability of seeking standards. The predicted probability of severely constrained firms getting ISO standards is 0.122 times higher than unconstrained ones. Similarly, exporting firms have significantly 0.37 times higher chances of standardizations. Column (2) of Table 3 represents, large firms have a significantly 0.0173 times lower probability for ISO standards. The interaction term



**Table 4** Estimation of export differences between 2007 and 2013

Export <sub>diff</sub>	(1)	(2)	(3)
	ME	ME	ME
ISO <sub>2007</sub>	0.27694** (0.012)	0.1912*** (0.000)	0.2989* (0.057)
Obstacle	- 0.1332* (0.089)	- 0.693*** (0.000)	- 0.1227** (0.0204)
Small	0.1828* (0.082)	0.2672** (0.0481)	0.15275 (0.20)
Obstacle * Small		0.3751*** (0.000)	
ISO <sub>2007</sub> * Small			0.53828** (0.041)
Age (log)	0.26484*** (0.006)	0.0156 (0.72)	0.2127 (0.271)
Labor productivity	0.07156*** (0.001)	0.03516*** (0.000)	0.0546* (0.066)
Female (Owner)	0.2518** (0.027)	0.2497*** (0.000)	0.2023 (0.160)
Fixed effects	Yes	Yes	Yes
N	555	555	554

*P*-values are presented in the parenthesis. \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01. ME is marginal effect

in column (2) expresses that even though small firms have less probability (0.09) of getting standards like ISO but they seek ISO in case of severe financial constraints.

If financially constrained firms are getting standards to enter the export market is true, then empirically there is a positive gap between firms’ export margin because of ISO standards. This can be addressed by concentrating on the firms that have exported in both 2007 and 2013. Empirically, if a firm is standardized in 2007; does it experience a higher export proportion in 2013 than in 2007. The variable *Export difference* is computed by taking the difference in firms’ export bundles between the years 2007 and 2013.

$$Export_{diff} = \begin{cases} 1; & \text{if the firm has positive export difference from 2007 to 2013} \\ 0; & \text{otherwise} \end{cases}$$

A dummy variable ISO<sub>2007</sub> takes 1 if the firm was standardized in the year 2007 and zero otherwise.

$$ISO_{2007} = \begin{cases} 1; & \text{if the firm was certified in 2007} \\ 0; & \text{otherwise} \end{cases}$$

And firms that were not certified in 2007 or got certified after 2007, were excluded from the analysis. All the firm-level attributes, industry, location, and time fixed effects were added to capture any unobserved heterogeneous effects presented in the system. The estimated equation can be written as;

$$Export\_diff_{it} = \alpha_{21}ISO_{2007} + \alpha_{22}fcons_{it} + \alpha_{23}Small + \alpha_{24}X + \epsilon_{2it} \quad (3)$$

Predicted margins of having positive export difference in the year 2013 are significantly higher when firms are ISO certified in 2007. Columns (1)–(3) of Table 4 shows firms have at least 0.2 times higher probability of having a positive export gap if they had an ISO standard in 2007. In column (2), the predicted margins severely constrained small firms to have 0.37 significant chances of increased export proportion. Since severely constrained small firms seek standards more than unconstrained large firms, the interaction between ISO2007 and small firms has a positive and significant marginal effect.

## Endogeneity issue

ISO certification is used as the main variable as an index of a firm's product quality and environmental performance. Exporting firms tend to choose international certification to showcase positive signals. Again, firms with major financial constraints might use these international certifications as a gateway to enter export markets. Several inherent features might be responsible for the degree of financial constraints. Thus, the dependent variable and independent variables may suffer from two-way causality. Severe endogeneity might produce bias results. To overcome this problem, we applied the structural equation model as an estimation methodology. Estimated the following simultaneous equation;

$$ISO_{(it)} = \Pr(\beta_{11}fcons_{it} + \beta_{12}Export_{it} + \beta_{13}X_1 + \epsilon_{1it}) \quad (4)$$

$$Export_{it} = \omega_{21}ISO_{it} + \omega_{22}fcons_{it} + \omega_{23}X_2 + \epsilon_{2it}$$

Here both ISO and Export are binary variables and separately estimable using conditional logit or probit model. But as ISO and Export appear to be both dependent and independent variables in Eqs. (1) and (2), to overcome these potential endogeneity and selectivity concerns, we propose to run Eqs. (1)–(2) as a structural system. At present, the most appropriate econometric model to implement this kind of a mixed structural model with different observations for the various models is the Conditional Mixed Process (CMP) model developed by David Roodman. CPM is a relatively new and more efficient multistage procedure for fitting mixed models than the maximum likelihood process (Roodman 2011).

To be noted, the list of control variables for each equation may be different depending on their effect on the dependent variable and suggested by the literature. For example, availability of bank credit (Levenson and Willard 2000; Cagese and Cufiat 2010), relationship with financial institutions (Boot 2000; Hanley and Girma 2006; Berman and Héricourt 2010), the experience of top manager (Boot 2000; Minetti and Zhu 2011), etc. are added as controls in 2nd equation only. Again female ownership status is only included in the 3rd equation, as female-headed enterprises are often empirically found to have weaker financial conditions (Thakor 1989; Treichel and Scott 2006; Hansen and Rand 2014).

**Table 5** Conditional mixed process modeling

Variables	(1)		(2)
	ISO		Export
	Coeff	ME	ME
Obstacle	- 0.0316** (0.044)	- 0.012** (0.039)	- 0.0228* (0.058)
ISO			0.794* (0.061)
Export	0.3962*** (0.000)	0.312*** (0.001)	
Small firm	- 0.1853** (0.030)	- 0.088*** (0.001)	- 0.2390** (0.037)
Obstacle * Small	0.05939* (0.072)		
Age (log)	0.14177 (0.14)	0.082 (0.121)	0.2938* (0.089)
Labor productivity			0.006052 (0.167)
Annual sale (log)			0.0217* (0.058)
Observation	1835		1835

*P*-values are presented in the parenthesis. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . ME is marginal effect

The results in Table 5 reports the econometric estimation of Eqs. (1)–(2) using the CMP modeling approach. Columns 1–2, respectively, present the determinants of ISO standards and Export. The coefficient of ISO in the export model is 0.794 and significant. This suggests that firms who have standards are more likely to export than those without ISO. The export coefficient in the ISO equation also gives a similar story. Small firms have a lower probability to seek standards than large ones. Also, in the export equation, small firms were found to have a negative and significant effect on export.

The coefficient of the interaction effect between financial obstacles and small firms is positive and significant. Both financial constraints and small firms have a significantly negative effect on ISO standards. But since the interaction coefficient is positive means the predicted probability of getting standards is higher when a small firm is highly financially constrained compared to a large unconstrained one.

## Robustness check

A different methodology is applied to check for the robustness of econometric outcomes. In this section, the original definition of financial constraints i.e. 5 categories of financial constraints, is used. The empirical methodology is similar to before. The reduced-form equation can be written as;

**Table 6** Determinants of financial constraints & export

	Predicted Probability with reference to "no" financial obstacle			
	"Minor" obstacle	"Moderate" obstacle	"Major" obstacle	"Severe" obstacle
Minor				
Moderate				Export
Major				– 2.413 (0.291)
Severe				– 3.3425 (0.108)
ISO				– 8.1907*** (0.001)
Small firm				– 5.4859** (0.047)
Age (log)				8.3620*** (0.000)
Annual sale (log)				– 8.2834*** (0.000)
Labor productivity				(0.000)
Female (owner)				2.0639 (0.176)
Fixed effect				4.9437*** (0.000)
N				2.1595*** (0.000)
				(0.000)
				1.734 (0.120)
				Yes
				2022

*P*-values are presented in the parenthesis. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table 7** ISO & financially constrained small firms

ISO	(1)	(2)
Export	0.00765*** (0.000)	0.00483*** (0.000)
Financial obstacle (Ref. category: No Obstacle)		
Minor	0.43205 (0.346)	0.7976 (0.212)
Moderate	- 0.22776 (0.611)	- 0.4951 (0.417)
Major	- 0.1149 (0.816)	0.1823 (0.789)
Severe	2.153*** (0.001)	0.9952 (0.268)
Small firm	- 0.5346* (0.104)	- 0.4473* (0.11)
Financial obstacle (Ref. category: No Obstacle)		
Minor * Small Firm		- 0.861 (0.370)
Moderate * Small Firm		0.5501 (0.547)
Major * Small Firm		0.5528 (0.581)
Severe * Small Firm		0.0301* (0.089)
Fixed effects	Yes	Yes
Number of firms	1835	1835

*P*-values are presented in the parenthesis. \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01

$$\Pr(ISO_{it} = 1) = \Pr(\beta_1 fcons + \beta_2 Export_{it} + \beta_3 X + \lambda_k + \gamma_t + \delta_l + \epsilon_{it} > 0)$$

where X is the vector of all firm-level control variables. Industry, period, and location fixed effects are added to caption all the unobserved heterogeneous effects that can influence the regression results.

Our baseline results are consistent with a different definition of credit constraint. Table 6 shows that firms facing financial constraints are less willing to export and ISO enhances export. Small firms face more financial obstacles than a large one and thus are less willing to enter the open market. Severely financially constrained small firms are seeking standards like ISO to enter the export market (Table 7).

## Conclusion

Bangladesh has made a great growth achievement in the past several decades, despite its under-developed credit market. Since the economy is currently on the verge of graduation, the current growth trend has to be maintained for a longer period. In this

situation, the simultaneous analysis of credit constraint, trade, and firm size should undoubtedly act as a landmark to sustain the prevailing growth trend.

In the data, around 32% of firms reported that financial constraint is a “major” and 16% reported as a “severe” obstacle. Data also suggested that more than 35% of sampled enterprises have either ISO 9000 or 14000 standardization and 2% is in the process. Empirical results showed that the severe the financial obstacles faced by the firms, the higher the probability of getting ISO certification. Results also suggest that severely constrained smaller firms are more interested in getting certified to either start a new export partnership or increase the export basket. The development path for developing and least developing nations are mainly export-oriented. Moreover, many LDCs suffer from similar credit market imperfection scenarios. Thus, the results of this paper are easily comparable to other nations like Bangladesh. Facilities located in emerging economics are most likely using ISO standards as a vehicle to enter the international markets.

The findings of the study have implications for both the academic and policy analyses on firms’ behavior. For academic analyses, our study demonstrates that the impact of international standardizations like ISO on firms as well as the overall economy’s growth. Results evidenced that financially constrained smaller enterprises are using international standardization as a vehicle towards the global market. Moreover, from the policy analysis perspective, the findings from this type of study will increase our understanding of the determinants and access to finance of smaller firms; which offer opportunities for evidence-based policies.

Moderate to severe financially constrained firms with higher productivity, regardless of the size, should be able to seek national and international support to sustain their growth.

Smaller exporting firms should be given priority and government support in getting ISO standards.

The certification process should be expedited, and the costs of operating ISO should be reduced for small firms. The government can play a vital role to achieve this goal.

More emphasis should be given to female-headed enterprises as those are found to experience a higher degree of financial obstacles, in general.

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**Data availability** A link of data is provided in the manuscript.

## **Compliance with ethical standards**

**Conflict of interest** In accordance with SN Business & Economics policy and my ethical obligation as a researcher, I am reporting that I, Sungida Rashid, am the sole contributor to this article. It is to specifically state that “No Competing interests are at stake and there is No Conflict of Interest” with other people or organizations that could inappropriately influence or bias the content of the paper.

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