Financial Constraints and Internalization of SMEs in Post-transition Countries

Ramiz Rahmanov

Central Bank of the Republic of Azerbaijan
E-mail: rahmanovrr@gmail.com

Abstract

This paper examines the impact of financial constraints on the internalization of SMEs in post-transition countries. The regression analysis conducted over the cross-sectional sample of SMEs taken from the BEEPS III-V show that the financial constraints don't have a significant influence on the probability of exporting, while the availability of overdraft facilities produces a significantly positive effect on the likelihood of exporting. It is found that the availability of overdraft facilities increases the internalization probability by 2%. It is also found that more productive, innovative, and larger SMEs, SMEs using IT in business operations, SMEs receiving subsidies, and SMEs with international quality certificates and well-educated human capital are most likely to internalize. The results are robust to the functional form of the model, endogeneity, reverse causality, and inclusion of additional control variables. The heterogeneity analysis shows that there is significant heterogeneity across regions, industries, and years only in the effects of availability of overdraft facilities on the likelihood of exporting. The availability of overdraft facilities is significantly important only for the internalization of SMEs from post-transition countries of the European part of CIS and EU. The probability of exporting is more sensitive to the availability of overdraft facilities for SMEs from the manufacturing sector than for SMEs from the non-manufacturing sector. The availability of overdraft facilities was significantly important only for internalization of SMEs interviewed in 2008-2009.

Keywords: financial constraints, overdraft facility, exports, internalization, SMEs, post-transition countries, Balkans, Caucasus, Central Asia, CIS, EU

JEL classification: F10, G20

Introduction

Internalization incurs high fixed costs because before starting exporting, firms need to conduct marketing research, increase the stock of capital, adapt products to local tastes, organize distribution, and make advertising campaigns. Along with high entry costs, firms also incur higher variable costs as it additionally has to pay for cross-border transportation, duties, freight insurance, and trade credit insurance (e.g. Manova, 2013; Manova et al., 2015). Furthermore,

as delivery of products to foreign consumers takes much more time than delivery of products to domestic consumers, firms receive payments for exported products much later than for products sold internally (e.g. Manova, 2013). This in turn demands from exporters to store larger inventories relative to firms serving only domestic markets. Firms can finance entry costs and greater working capital needs either through retained earnings or loans. SMEs tend to have modest retained earnings which are unlikely to be enough to fund fixed and other related costs; therefore, to internalize their activities, SMEs need to borrow from banks (e.g. Manova, 2013). The ease with which SMEs can access external finance predetermines their decision to internalize or not.

A few firm-level studies have already examined the impact of financial constraints on the likelihood of exporting. For example, Minetti and Zhu (2011) examine the effect of credit constraints on the export participation and volume of exports using a sample of the Italian firms. The authors conclude that credit rationed firms are less likely to export and their export volumes are lower than those of the non-rationed entities. Nagaraj (2014) analyzes the relationship between the probability of firm internalization and financial constraints using data on the Indian firms. He concludes that financial constraints negatively affect the probability of exporting but have no effect on the extent of exports. Jinjarak and Wignaraya (2016) study the impact of financial constraints on the export participation and the share of exports in total sales using data on the Chilean, Israeli, Korean, Mexican, Thai, and Turkish SMEs. They find that the availability of overdraft facilities increases the probability of exporting and the share of exports in total sales, while the use of loans produces no significant effect.

This paper aims to investigate the impact of financial constraints and availability of overdraft facilities on the probability of exporting of SMEs in post-transition countries using firm-level data taken from the last three rounds of the BEEPS. The findings of the paper contribute to the scarce micro-level literature on the effects of financial constraints on firm internalization which uses a direct measure of financial constraints. The cross-section analysis shows that the financial constraints have no significant effect on the probability of exporting, while the availability of overdraft facilities has a significantly positive influence on the likelihood of exporting. Thus the availability of overdraft facilities raises the internalization probability by 2%. The regression results also show that more productive, innovative, and larger SMEs, SMEs using IT in business operations, SMEs receiving subsidies, and SMEs with international quality certificates and well-educated human capital are more likely to export. The results are robust to the functional form of the model, endogeneity, reverse causality, and inclusion of additional

control variables. Additionally, the heterogeneity analysis is conducted to find whether the results differ across country groups, industries, and periods. The analysis indicates that there is heterogeneity only in the effects of availability of overdraft facilities. It is found that the availability of overdraft facilities is of importance for the probability of exporting only for SMEs from post-transition countries of the European part of CIS and EU. Further, the internalization of SMEs in the manufacturing sector appears to be more sensitive to the availability of overdraft facilities than the internalization of SMEs in the non-manufacturing sector. Also, the availability of overdraft facilities is found to be significantly important only for SMEs interviewed in the period of financial crisis.

The rest of the paper is organized as follows. The following section describes the empirical methodology of the paper. The third section describes the data. In the next section, I report and discuss the results. Finally, the fifth section summarizes the main findings.

Methodology

The internalization probability of SMEs is modeled as a function of financial constraints faced by firms and other control variables which can also potentially affect the likelihood of internalization:

$$P(exp_i = 1|x) = \alpha_0 + finance_i + controls_i + \varepsilon_i, \quad (1)$$

where $finance_i$ can be either $financial\ constraints_i$ or $overdraft_i$. The former is a binary variable which is equal to one if a SME is financially constrained and zero, otherwise; the latter is also a binary variable which is equal to 1 if a SME has overdraft facility and zero, otherwise $Controls_i$ is a set of control variables which includes labor productivity, firm size, availability of quality certificates, firm age, human capital, innovation, foreign ownership, country, industry, and year dummies, and ε_i is the error term. To estimate the model, I will use the OLS estimator.

The presence of financial constraints is expected to decrease the probability of internalization as it limits the ability of firms to undertake necessary investments to begin exporting (e.g.Manova, 2013). The availability of overdraft facilities should have a positive effect on the probability of exporting as it increases the flexibility of firms to changes in foreign demand and payment delays through quick provision of financial resources needed to purchase working capital for production of export goods (Jinjarak and Wignaraja, 2016).The control variables are supposed to account for the firm-specific factors which can have effects both on the likelihood of exporting and the financial status of a SME. Thus, more productive firms are more likely to be successful in foreign markets; therefore, credit institutions are inclined to lend to such firms as there is higher probability that firms will pay back loans (Li and Yu, 2009). Larger firms are more likely to

internalize and tend to be less financially constrained than smaller ones because in contrast to small firms, large firms usually have greater production, marketing, R&D, and management capacity to succeed in foreign markets and have substantial assets to pledge as collateral for bank loans (Nagaraj, 2014). The probability of exporting and securing a bank loan can also depend on firm age. Young firms have less marketing and management experiences, so for them, it will be risky to internalize. Young firms also have a short record of history, so for banks, it becomes more difficult to estimate a probability of generating the necessary return to repay loans. In such situations, banks can prefer to ration young firms (Verani and Gross, 2012). Furthermore, the likelihood that firms gain a market share abroad depends on the quality of produced products. So, lenders are more willing to offer loans to firms capable of producing good quality products. Human capital is also an important factor affecting the probability of success since firms with qualified employees are more likely to make optimal decisions and be successful; therefore, creditors are more disposed to lend to firms with high human capital. Firms with foreign ownership are more likely to export and obtain loans from banks as they can benefit from advanced technology, managerial expertise, business reputation, and financial guarantees of foreign owners (Nagaraj, 2014). Finally, country and industry dummies are supposed to account for other comparative advantages which certain countries and industries can lay out for exporters, while year dummies are assumed to control for period specific circumstances which affect all SMEs regardless of the country of origin and industry of operation.

The main issues which can challenge estimation results include an inappropriate choice of model, endogeneity, reverse causality, and sensitivity to the inclusion of new control variables. The linear model can take values outside the 0-1 interval; therefore, for the robustness check purposes, I use a probit model to estimate the relationship. The probit imposes restrictions on the relationship between the export probability and explanatory variables to restrict the probabilities to lie inside the 0-1 interval. The regression includes a rich set of control variables; however, there is still a risk that some factors which affect both internalization and financial status of SMEs are omitted from the regression analysis and therefore the results may be biased. Further, the regression includes a labor productivity variable which is usually an endogenous factor. Additionally, it can be the case that not a financial status affects the likelihood of exporting, but an export status influences financial circumstances of a SME. To check the robustness of the results to endogeneity and reverse causality, I use the two-stage estimation procedure. Finally, to check the robustness of the results to the inclusion of new controls, I will add availability of websites, subsidies, and legal status variables to the headline

regression. Running websites can raise probability of receiving loans because it helps marketing products abroad and therefore improves business prospects in foreign markets. Additionally, a SME that is a recipient of subsidies can be less financially constrained and therefore more likely undertake investments necessary to start exporting. Legal status of SMEs can also affect the likelihood of exporting, for example, SMEs which are joint stock companies tend to be less financially constrained as they have much more opportunities to attract funds to cover sunk cost of exporting than sole proprietorship SMEs. Joint stock companies can raise funds in the stock markets and as they tend to be more transparent, they are more likely to receive positive decisions on bank loan applications.

Data description

The data come from the third, fourth, and fifth rounds of the BEEPS conducted by the EBRD together with the World Bank in 29 countries of Eastern Europe and Central Asia and Turkey in years of 2005, 2008-2009, and 2012-2014 respectively. It is a firm-level survey based on face-to-face interviews with managers. The objective of the survey is to assess the quality of the business environment in the region. The sample includes observations for 33,523 firms, of which 27,235 are SMEs. In this study, following a conventional definition, a firm is considered to be a SME if the number of its employee does not exceed 99 people. However, in the regression analysis, I use a sample only of 16,652 SMEs as not all surveyed firms reported all necessary information.

The survey asks respondents to provide information about the share of national sales as a percentage of total sales. The response to this question allows determining whether a firm is an exporter or not. The survey results of three rounds which are reported in Table 1 show that in the post-transition countries, during 2005-2014, the share of exporters demonstrated a mixed pattern. Thus, in the third round, 19% of firms reported that they sold their goods or services abroad, in the fourth round, the share of exporters reached 20%, and in the fifth round, only 17% of firms exported. However when the data are disaggregated by region, the picture changes completely. The disaggregated data show that in fact in the Caucasian and European parts of CIS, the share of exporters showed a negative trend, while in post-transition countries which are EU members, the share of exporters instead demonstrated a positive trend. In Balkans and Central Asia, the share of exporters had a mixed pattern. Summarizing the disaggregated statistics, one can conclude that within the 2005-2014 period, the share of exporting firms in CIS countries decreased, whereas the share of exporters in Balkans and EU members increased.

Table 1. Exports and financial constraints in post-transition countries

Region[1]	Indicator	BEEPS III	BEEPS IV	BEEPS V
All	Share of exporters	19%	20%	17%
	Share of financially constrained firms	27%	29%	29%
	Share of firms with overdraft facility	.	40%	28%
Balkans	Share of exporters	27%	35%	33%
	Share of financially constrained firms	25%	25%	19%
	Share of firms with overdraft facility	.	58%	59%
CIS-Caucasus	Share of exporters	11%	7%	4%
	Share of financially constrained firms	30%	31%	28%
	Share of firms with overdraft facility	.	30%	16%
CIS-Central Asia	Share of exporters	9%	6%	7%
	Share of financially constrained firms	32%	37%	30%
	Share of firms with overdraft facility	.	21%	10%
CIS-Europe	Share of exporters	14%	12%	10%
	Share of financially constrained firms	34%	36%	39%
	Share of firms with overdraft facility	.	36%	16%
EU	Share of exporters	24%	27%	30%
	Share of financially constrained firms	22%	21%	20%
	Share of firms with overdraft facility	.	44%	39%

Furthermore, the survey contains a set of questions which enable to identify whether a firm is financially constrained or not. The first question asks if a firm applied for any loan in the last year. If a respondent gives a negative answer, an interviewer asks to tell a reason of non-applying. If a respondent replies that he did not apply because he had sufficient capital, a firm is not considered to be financially constrained. But if a respondent says that he did not apply

[1] **Balkans**: Albania, Bosnia, FYROM, Montenegro, Serbia; **CIS-Caucasus**: Azerbaijan, Armenia, Georgia; **CIS-Central Asia**: Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, Uzbekistan; **CIS-Europe**: Belarus, Moldova, Russia, Ukraine; **EU**: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Turkey

because he did not have enough collateral or interest rates were high or the application procedure was complex, a firm is considered to be financially constrained. In case, a respondent says that he applied for credit, an interviewer asks about the result of the application. A firm is considered a financially constrained if an application was rejected, and vice versa. Following the procedure for the identification of financially constrained firms, I find that on average, the share of financially constrained firms marginally increased from 27% in the third round to 29% in the fifth round (Table 1). The disaggregation of the financial constraint variable by region shows that in fact, in all regions but the European part of CIS, the access of firms to the financial resources improved. The most significant improvement is observed in Balkans, there the share of financial constrained firms decreased by 6%. In the European part of CIS, in contrast, the share of financially constrained firms increased by 5%.

Starting from the fourth round of BEEPS, the data on the availability of overdraft facilities have been collecting. The statistics shows that in the fifth round relative to the fourth round, in the post-transition economies, on average, the share of firms with the overdraft facilities declined significantly from 40% to 28%. The disaggregated statistics shows that the decline occurred in all regions but Balkans. The largest decline of 20% in the share of firms with overdraft facilities is observed in the European part of CIS.

Along with financial constraints, other factors such as labor productivity, size, age, human capital, availability of internationally-recognized quality certification, innovation, and ownership can affect the likelihood of exporting (Table 2). Therefore, in the regression analysis, as control variables, I include labor productivity, firm size, firm age, human capital, innovation, and foreign ownership showing. For the robustness check, I also add binary variables indicating whether a firm possesses a website, employs foreign technology, and has a status of sole proprietorship. Finally, I also use perception of access to finance as an obstacle to business to instrument endogenous finance variables and sales and employment three years ago to instrument labor productivity.

Table 2. Definition of variables

Variable	Description	Source
Financial constraints	1 if an SME is financially constrained, 0 otherwise	BEEPS
Overdraft facility	1 if an SME has an overdraft facility, 0 otherwise	BEEPS
Employment	Number of permanent, full-time employees	BEEPS
Sales	Total annual sales in USD, thousands	BEEPS

Labor productivity	The ratio of sales to employment, USD thsd./ per employee	BEEPS
Quality certificate	1 if a SME has an internationally-recognized quality certification, 0 otherwise	BEEPS
Age	Firm ages, years	BEEPS
University	Percentage of the employee who has a university degree	BEEPS
Innovation	1 if a SME introduced new products or services in the last three years, 0 otherwise	BEEPS
Website	1 if a SME communicates with clients and suppliers via its website, 0 otherwise	BEEPS
Subsidy	1 if a SME received any subsidies from the national, regional or local governments or European Union sources over the last three years, 0 otherwise	BEEPS
Legal status	1 if a SME is sole proprietorship, 0 otherwise	BEEPS
Financial obstacle	0 if access to finance (it reflects availability and cost, interest rates, fees and collateral requirements) is not an obstacle, 1 if access to finance is a minor obstacle, 2 if access to finance is a moderate obstacle, 3 if access to finance is a major obstacle, and 4 if access to finance is a severe obstacle to the current business operations	BEEPS
Exchange rate	Official exchange rate (LCU per US$, period average)	World Bank
CPI of US	Consumer price index (2010 = 100)	World Bank

Table 3 provides information on means of control variables disaggregated by export status and presents results of the t-tests on the equality of means between exporters and non-exporters. Exporters are less financial constrained and more like to have overdraft facilities than non-exporters. Exporters also tend to be larger, older, more productive and innovative than non-exporters. Furthermore, exporters are more likely to have an internationally-recognized quality certification, run websites, and receive subsidies than non-exporters. However, interestingly, exporters tend to have less educated employees than non-exporters. Regards of the perception of financial obstacles, the t-test shows that the difference between exporters and non-exporters is statistically insignificant. Finally, exporters are less likely to be a sole proprietorship than non-exporters.

Table 3. Descriptive statistics

Variable	Total		Non-exporters		Exporters		t-test
	N	Mean	N	Mean	N	Mean	
Financial constraints	16652	0.29	13384	0.31	3268	0.21	10.63***
Overdraft facility	13356	0.34	10757	0.30	2599	0.52	-21.00***
Employment	16652	22.61	13384	20.52	3268	31.20	-26.10***
Sales	16652	3.21	13384	2.44	3268	6.38	-2.67***
Labor productivity	16652	0.19	13384	0.13	3268	0.44	-2.37**
Quality certificate	16652	0.17	13384	0.12	3268	0.35	-31.57***
Age	16652	12.24	13384	11.77	3268	14.16	-11.48***
University	16652	29.82	13384	30.81	3268	25.75	8.66***
Innovation	16652	0.32	13384	0.29	3268	0.45	-17.27***
Website	16617	0.54	13354	0.49	3263	0.78	-30.99***
Subsidy	16591	0.07	13336	0.05	3255	0.15	-19.36***
Legal status	16643	0.16	13378	0.17	3265	0.13	5.27***
Financial obstacle	16250	1.35	13042	1.35	3208	1.32	1.51

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Empirical analysis

Table 4 reports the results of the regression analysis conducted to examine the impact of financial constraints on the likelihood of internalization of SMEs in post-transition countries. The first column shows the OLS estimates for the bivariate relationship between financial constraints and the probability of SME internalization. The coefficient of the financial constraint binary variable is negative and significant at the 5% level. Quantitatively, the magnitude of the coefficient implies that a financially constrained SME is 7% less likely to internalize than a financially non-constrained SME. However, these estimation results might be biased due to omission of important controls which can affect not only the likelihood of exporting but also the financial situation of a SME. Therefore, to address this shortcoming, I add firm-level characteristics such as labor productivity, size, quality certificate, age, human capital, innovation activity, and foreign ownership into the next regression. The second column reports the results of the augmented regression. The coefficient of the financial constraint remained negative and significant, albeit the magnitude of the coefficient decreased from 0.07 to 0.02. The coefficients of the controls are also of significant interest. All of them are statistically significant at the 1%

level. For example, they show that more productive, larger, and older SMEs are more likely to export than less productive, smaller and younger SMEs. Furthermore, the results show that SMEs which introduce new goods and services and SMEs with international quality certificates and foreign capital are more prone to export. All these results accord with the initial hypothesis. However, there is a result which is not in line with my expectations. Thus, the coefficient of human capital suggest that SMEs which employ more educated labor are less probable to export than SMEs with less educated employees; however, its magnitude is almost zero. As the following step, I add industry and country dummies to the second specification to account for industry-specific and country-specific time-invariant factors and year dummies to capture the effect of time-varying factors which affect all SMEs in particular years. The third column reports the estimation results of the extended regression. The coefficient of the financial constraint variable became statistically insignificant at the conventional levels. This result shows that after controlling for industry-specific, country-specific, and period-specific factors, financial constraints as such produce no significant effect on the likelihood of SMEs to engage in international trade. The inclusion of country, industry, and period dummies also affected the significance levels and magnitudes of firm-specific control variables. For example, the coefficient of age became statistically insignificant; the coefficients of labor productivity, international quality certificate, and innovation albeit remained significant declined in magnitude and significance levels.

The estimates presented in Columns 1-3 were obtained using the standard OLS estimator as the linear probability model are easy to estimate and interpret. However, the linear probability model has a few shortcomings. The most serious complication is that it is difficult to ensure that the linear probability model will produce predictions falling into the 0-1 range. For this reason, it is proposed to use either the probit or logit models because they constrain the model prediction to the 0-1 interval. To check the sensitivity of the results to the choice of the functional form, the specification of the third column is re-estimated using the probit model. The estimated coefficients of the probit are reported in the fourth column. The results show that our main results are robust to the choice of the functional form. In the probit model, the average partial effect of the financial constraints on the probability is close to zero and statistically insignificant as in the case of linear probability model. Regards the control variables, the average partial effects are equal to the OLS estimates for labor productivity, size, age, human capital, and foreign ownership. For international quality certification and innovation, the average partial effects are smaller.

Table 4. Estimation results

(Dependent variable: Pr(exp=1))

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	**OLS**	**OLS**	**Probit**	**2SLS**	**OLS**
Financial constraints	-0.07***	-0.02***	0.00	-0.01	0.01	0.00
	(-10.12)	(-4.03)	(-0.30)	(-0.41)	(0.66)	(0.09)
Log(productivity)	-	0.03***	0.01***	0.08***	0.02***	0.01***
		(15.76)	(6.21)	(6.20)	(4.26)	(5.36)
Log(employment)	-	0.05***	0.06***	0.29***	0.06***	0.05***
		(16.09)	(18.81)	(18.80)	(16.22)	(15.73)
Quality certificate	-	0.17***	0.12***	0.39***	0.12***	0.11***
		(17.76)	(12.95)	(11.86)	(11.95)	(11.91)
Log(age)	-	0.03***	0.00	0.02	0.00	0.00
		(7.98)	(0.54)	(0.99)	(0.84)	(0.40)
Human capital	-	-0.00***	0.00***	0.01***	0.00***	0.00***
		(-6.58)	(8.21)	(8.99)	(7.60)	(6.56)
Innovation	-	0.07***	0.06***	0.27***	0.06***	0.05***
		(10.80)	(8.96)	(9.30)	(8.61)	(7.64)
Foreign ownership	-	0.00***	0.00***	0.01***	0.00***	0.00***
		(12.52)	(10.43)	(9.96)	(9.83)	(10.42)
Websites	-	-	-	-	-	0.05***
						(8.72)
Subsidy	-	-	-	-	-	0.09***
						(6.80)
Legal status	-	-	-	-	-	0.00
						(-0.23)
Constant	0.21***	0.07***	0.17***	-1.19***	0.19***	0.17***
	(51.25)	(4.70)	(5.80)	(-9.24)	(4.11)	(5.49)
Country dummies	No	No	Yes	Yes	Yes	Yes
Industry dummies	No	No	Yes	Yes	Yes	Yes
Year dummies	No	No	Yes	Yes	Yes	Yes
Test for endogeneity, chi2(2) statistics	-	-	-	-	1.29	-
R^2/pseudo R^2	0.01	0.13	0.26	0.28	0.27	0.27
N	13813	16652	16652	16652	13718	16548

Note: robust t-statistics in parentheses,* p<0.10, ** p<0.05, *** p<0.01

While the regression in the third column contains a set of control variables, there is still a possibility that there are some omitted factors which can also affect the financial conditions of SMEs and therefore the estimation results can be biased. There also exists empirical evidence that actually not financial circumstances in firms affect their exports but instead export status of firms affect their financial health (Greenaway et al, 2007). To deal with this challenges, I

instrument the financial constrain variable with the industry-region average firm perception about the obstacles created by the access to finance. Furthermore, it is well known that non-instrumenting the labor productivity can also result in the biased results as it is a complex indicator affected by numerous factors. As an instrument for labor productivity, I use the labor productivity of a three year lag. The 2SLS estimates are reported in the fifth column. The coefficient of the financial constraint variable increased but remained statistically insignificant and the coefficient of the labor productivity remained significant and increased in magnitude. For all other control variables, the 2SLS estimator produced the results identical to those of the OLS estimator. Furthermore, the conducted endogeneity test fails to reject the null hypothesis that the variables of interest are exogenous. Therefore, one can conclude the third column result does not suffer significantly from the endogeneity problem.

Finally, it is known that the regression results can be sensitive to the choice and number of control variables. To examine such a possibility, I add three more variables – the availability of website, the fact of receiving any subsidy, and the legal status - to the specification of the third column. The results of the augmented regression are reported in the sixth column. Despite small differences in magnitudes of some control variables, the coefficient of financial constrain variable remained insignificant and close to zero. The coefficients of the website and subsidy variables are significant and positive, while the coefficient of the legal status variable is insignificant. This shows that SMEs which use IT tools and receive subsidies are more likely to internalize.

The regression analysis conducted to examine the impact of financial constraints on the likelihood of exporting is replicated to study the effect of the availability of overdraft facilities on the probability of exporting. Table 5 reports the estimation results. From the first column, one can see that without controlling any other factors, the availability of the overdraft facility variable has a significantly positive coefficient. Numerically, the availability of overdraft facilities is supposed to increase the probability of exporting by 15%. However, as control variables are added into the regression, the magnitude of the coefficient and its significance level fall. The third column shows that when one controls for firm-specific factors and includes country, industry, and period dummies, the availability of overdraft facilities appears to raise the likelihood of exporting only by 2%. The magnitudes of the control variables are close to those obtained from the probability of exporting - financial constraint analysis. The robustness check exercises show that the results are robust to the choice of the model, endogeneity, and inclusion of additional control variables (Table 5, Columns 4-6).

Table 5. Estimation results

(Dependent variable: Pr(exp=1))

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	**OLS**	**OLS**	**Probit**	**GMM**	**OLS**
Availability of overdraft facilities	0.15***	0.08***	0.02***	0.13***	0.15*	0.02**
	(19.42)	(10.12)	(3.24)	(3.96)	(1.96)	(2.44)
Log(productivity)		0.03***	0.01***	0.06***	0.01**	0.01***
		(12.34)	(5.29)	(5.16)	(2.22)	(4.5)
Log(employment)		0.05***	0.05***	0.27***	0.04***	0.05***
		(13.19)	(14.49)	(14.54)	(5.71)	(12.04)
Quality certificate		0.18***	0.13***	0.41***	0.12***	0.12***
		-17.54	-12.79	-11.69	-9.08	-11.78
Log(age)		0.02***	0.00	0.01	0.00	0.00
		(6.03)	(-0.07)	(0.33)	(-0.60)	(-0.19)
Human capital		-0.00***	0.00***	0.00***	0.00***	0.00***
		(-8.10)	(6.27)	(6.90)	(5.13)	(5.13)
Innovation		0.06***	0.05***	0.24***	0.05***	0.04***
		(8.61)	(7.03)	(7.45)	(5.17)	(5.78)
Foreign ownership		0.00***	0.00***	0.01***	0.00***	0.00***
		(9.72)	(7.82)	(7.26)	(7.15)	(7.81)
Websites						0.05***
						(7.26)
Subsidy						0.09***
						(6.71)
Legal status						-0.01
						(-1.43)
Constant	0.14***	0.03**	0.12***	-1.49***	0.09***	0.13***
	(38.95)	(2.21)	(3.74)	(-9.61)	(9.01)	(3.84)
Country dummies	No	No	Yes	Yes	Yes	Yes
Industry dummies	No	No	Yes	Yes	Yes	Yes
Year dummies	No	No	Yes	Yes	Yes	Yes
Test for endogeneity, chi2(2) statistics					2.16	
R^2/pseudo R^2	0.03	0.14	0.28	0.3	0.03	0.28
N	13715	13715	13715	13715	10674	13613

Note: robust t-statistics in parentheses,* p<0.10, ** p<0.05, *** p<0.01.

The above analysis assumes that the financial constraint and control variables have the same effect on the probability of exporting for all post-transition countries and in all years although it is

not necessary to be so. Therefore, as a next step, I separate sample into sub-samples based on the regional origin which can influence development prospects of countries and conduct regression analysis for each region. Table 6 reports the separate estimation results for Balkans, Caucasus, Central Asia, the European part of CIS, and post-transition countries which are currently EU members and Turkey. The results show that the financial constraints produce no significant effect on the likelihood of exporting in all regions, so the results of the disaggregated regression analysis are in accordance with the results obtained for the whole sample. For control variables, the estimation output shows that there is a certain degree of heterogeneity in response of the export likelihood to variations in labor productivity, firm size, availability of quality certificates, and innovation. In particular, one can see that the likelihood of exporting by SMEs in Balkan countries is more sensitive to changes in control variables. On the contrary, the likelihood of exporting by the Caucasian SMEs is less responsive to shifts in control variables.

Table 6. Region heterogeneity

(Dependent variable: Pr(exp=1))

	Balkans	**CIS-Caucasus**	**CIS-Central Asia**	**CIS-Europe**	**European Union**
	OLS	**OLS**	**OLS**	**OLS**	**OLS**
Financial constraints	0.00	-0.01	0.01	0.00	-0.02
	(0.21)	(-1.03)	(1.39)	(0.25)	(-1.23)
Log(productivity)	0.02**	0.01**	0.01**	0.02***	0.02***
	(2.49)	(1.96)	(2.49)	(4.06)	(3.44)
Log(employment)	0.09***	0.06***	0.03***	0.05***	0.07***
	(10.38)	(5.85)	(5.32)	(8.71)	(10.93)
Quality certificate	0.14***	0.02	0.08***	0.12***	0.09***
	(7.15)	(0.68)	(3.51)	(5.93)	(5.96)
Log(age)	0.00	0.00	-0.01	0.01**	0.00
	(-0.41)	(-0.31)	(-0.94)	-2.23	-0.16
Human capital	0.00***	0.00*	0.00***	0.00***	0.00***
	(3.03)	(1.69)	(3.68)	(4.51)	(4.52)
Innovation	0.09***	0.03	0.01	0.06***	0.07***
	(5.15)	(1.34)	(0.65)	(5.46)	(5.77)
Foreign ownership	0.00***	0.00	0.00***	0.00***	0.00***
	(4.32)	(1.63)	(3.27)	(4.52)	(7.73)
Constant	0.20***	0.08	0.11**	0.18***	0.12***
	(3.28)	(1.29)	(2.16)	(3.94)	(2.82)
Country dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes

Year dummies	Yes	Yes	Yes	Yes	Yes
R^2	0.28	0.17	0.15	0.15	0.29
N	3154	1298	2418	4883	4899

Note: robust t-statistics in parentheses,* p<0.10, ** p<0.05, *** p<0.01

The check for heterogeneity in responses among regions is also run for the overdraft facility specification. The results of the check are reported in Table 7. One can see that in fact, the availability of overdraft facilities is of importance only to SMEs in the European part of CIS and EU countries. There is also a difference in the magnitudes of the coefficients between European part of CIS and EU countries. For example, for SMEs from EU, the availability of overdraft facilities increases the probability of exporting by 6%, while for SMEs from the European part of CIS countries, it raises the probability only by 3%. The magnitudes of the coefficients of the controls and their significance level across regions are close to those obtained for the financial constraint case.

Table 7. Country heterogeneity

(Dependent variable: Pr(exp=1))

	Balkans	**CIS-Caucasus**	**CIS-Central Asia**	**CIS-Europe**	**European Union**
	OLS	**OLS**	**OLS**	**OLS**	**OLS**
Availability of overdraft facilities	0.00	0.02	-0.01	0.03***	0.06***
	(0.20)	(0.87)	(-0.93)	(2.65)	(3.94)
Log(productivity)	0.01*	0.02**	0.01**	0.02***	0.01**
	(1.81)	(2.44)	(2.07)	(4.27)	(2.51)
Log(employment)	0.09***	0.03***	0.03***	0.04***	0.05***
	(9.99)	(3.43)	(4.35)	(7.15)	(6.68)
Quality certificate	0.14***	0.01	0.10***	0.12***	0.10***
	(7.41)	(0.49)	(4.18)	(5.56)	(5.47)
Log(age)	-0.01	-0.01	0	0.01**	-0.01
	(-0.63)	(-0.79)	(-0.71)	-2.5	(-0.98)
Human capital	0.00***	0.00	0.00***	0.00**	0.00***
	(2.74)	(0.26)	(4.06)	(2.50)	(3.22)

Innovation	0.10***	0.04*	0.00	0.05***	0.06***
	(5.01)	(1.88)	(0.01)	(4.57)	(3.88)
Foreign ownership	0.00***	0.00	0.00***	0.00***	0.00***
	(3.76)	(1.54)	(3.31)	(2.98)	(5.07)
Constant	0.14**	0.14**	0.04	0.15***	0.16***
	(2.05)	(2.09)	(0.91)	(2.65)	(2.97)
Country dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
R^2	0.30	0.15	0.17	0.14	0.31
N	2866	1014	2085	4343	3407

The effect of financial constraints on the likelihood of exporting can vary across the sectors. Table 8 reports the regression results obtained for manufacturing and non-manufacturing sectors. It is found that the financial constraints have no significant effect on the probability of exporting regardless of the sector of SME operation. For control variables, there is much heterogeneity in the sizes of the coefficients. For example, it is found that an increase in labor productivity and firm size, availability of quality certificates, introduction of new products and services have a larger impact on the likelihood of exporting in the manufacturing sector than in the non-manufacturing sector.

Table 8. Industry heterogeneity

(Dependent variable: Pr(exp=1))

	Manufacturing	**Non-manufacturing**
	OLS	**OLS**
Financial constraints	0.00	0.00
	(0.01)	(-0.36)
Log(productivity)	0.02***	0.01***
	(5.06)	(4.23)
Log(employment)	0.11***	0.03***
	(19.14)	(7.79)
Quality certificate	0.14***	0.07***
	(10.32)	(6.00)
Log(age)	0.00	0.00
	(0.51)	(1.26)

Human capital	0.00***	0.00***
	(3.61)	(7.73)
Innovation	0.07***	0.05***
	(6.81)	(6.23)
Foreign ownership	0.00***	0.00***
	(8.39)	(7.14)
Constant	0.05	0.00
	(0.99)	(-0.09)
Country dummies	Yes	Yes
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
R^2	0.29	0.19
N	6624	10028

Table 9 displays the results of the industry heterogeneity check for the overdraft specification. The significance of the coefficients shows that the availability of overdraft facility is of significance to both manufacturing and non-manufacturing sectors; however, the importance of the availability of overdraft facilities is greater for manufacturing SMEs. The magnitudes and significance levels of the control variables are similar to those of the financial constraint specification.

Table 9. Industry heterogeneity

(Dependent variable: Pr(exp=1))

	Manufacturing	**Non-manufacturing**
	OLS	**OLS**
Availability of overdraft facilities	0.03**	0.02***
	(2.15)	(2.82)
Log(productivity)	0.02***	0.01***
	(4.82)	(3.24)
Log(employment)	0.10***	0.02***
	(15.29)	(5.39)
Quality certificate	0.16***	0.07***

	(10.35)	(5.72)
Log(age)	0.00	0.00
	(0.13)	(0.57)
Human capital	0.00***	0.00***
	-3.17	-5.19
Innovation	0.07***	0.04***
	-5.43	-5.15
Foreign ownership	0.00***	0.00***
	(6.05)	(5.70)
Constant	0.00	-0.06*
	(-0.02)	(-1.90)
Country dummies	Yes	Yes
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
R^2	0.31	0.19
N	5413	8302

The coefficient estimates can vary over time due to period-specific circumstances, for example, financial crisis; therefore, as a next step, I run separate regression for each round of the BEEPS. Table 10 reports the corresponding estimation results which show that the financial constraints have no significant effect on the probability of exporting in all rounds. The coefficients of the most control variables vary across rounds and most of them have the tendency to decline over years. The only variable whose coefficient increased over rounds is the availability of internationally recognized quality certificates. In the fifth round relative to the third round, the magnitude of this coefficient increased 0.05 points.

Table 10. Period heterogeneity

(Dependent variable: Pr(exp=1))

	BEEPS III	**BEEPS IV**	**BEEPS V**
	OLS	**OLS**	**OLS**
Financial constraints	-0.01	0.01	0.00
	(-0.87)	(0.83)	(-0.29)
Log(productivity)	0.04***	0.02***	0.01***
	(3.88)	(6.56)	(2.87)
Log(employment)	0.07***	0.06***	0.05***

	(10.26)	(11.79)	(9.53)
Quality certificate	0.09***	0.11***	0.14***
	(3.36)	(7.58)	(10.76)
Log(age)	0.01	0.00	0.00
	(0.49)	(0.45)	(0.35)
Human capital	0.00***	0.00***	0.00***
	(5.08)	(5.33)	(3.82)
Innovation	0.09***	0.06***	0.04***
	(5.55)	(5.90)	(3.38)
Foreign ownership	0.00***	0.00***	0.00***
	(6.38)	(4.68)	(6.69)
Constant	0.26***	0.16***	0.01
	(3.46)	(3.28)	(0.16)
Country dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
R^2	0.24	0.30	0.27
N	2839	6295	7518

Note: robust t-statistics in parentheses,* p<0.10, ** p<0.05, *** p<0.01

Table 11 reports the results of period heterogeneity check for the overdraft facility specification. The estimated coefficients of the overdraft facility variable show that in fact, the availability of overdraft facility was important for SME exporting only in the fourth round of BEEPs. This result is not surprising as the fourth round of BEEPs falls into the 2008-2009 crisis and can indicate that for SMEs, the availability of overdraft facilities is important during crisis periods when there are longer delays in payments. The sizes of the coefficients of the control variables are pretty close to those estimated for the financial constraint specification.

Table 11. Period heterogeneity

	BEEPS IV	**BEEPS V**
	OLS	**OLS**
Availability of overdraft facilities	0.05***	0.00
	(4.79)	(0.09)
Log(productivity)	0.02***	0.01**
	(6.18)	(2.53)
Log(employment)	0.06***	0.05***
	(10.77)	(9.62)

Quality certificate	0.11***	0.14***
	(7.55)	(10.91)
Log(age)	0.00	0.00
	-0.33	-0.13
Human capital	0.00***	0.00***
	(4.70)	(4.02)
Innovation	0.06***	0.04***
	(5.71)	(3.94)
Foreign ownership	0.00***	0.00***
	(4.76)	(6.30)
Constant	0.14***	0.01
	(2.83)	(0.10)
Country dummies	Yes	Yes
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
R^2	0.30	0.27
N	6047	7668

Conclusions

This paper analyzes the impact of financial constraints and flexibility of finance on SME internalization in 28 post-transition countries and Turkey. The cross-sectional analysis conducted over the sample which combines data of the last three rounds of the BEEPS shows that the financial constrains produce no significant effect on the probability of exporting, whereas the availability of overdraft facilities has a significantly positive effect on the likelihood of exporting. These results are robust to the functional form, endogeneity, reverse causality, and inclusion of additional control variables. The insignificance of the financial constraint variable implies that internalization costs for SMEs in the post-transition countries are not a serious obstacle to start exporting even for financially constrained entities. The significance of the overdraft facility variable, in turn, implies the risks of delays in payments for goods shipped abroad can be a serious obstacle for SMEs to begin exporting.

The heterogeneity analysis conducted to examine whether the results differ across country groups, industries, and periods shows that financial constraints have no significant effect on the likelihood of exporting of SMEs regardless of the country group of registry, industry of operation, and survey period. However, for the availability of overdraft facilities, the results show that there is heterogeneity in responses. In particular, it is found that the exporting probability of SMEs located only in the European part of CIS and EU is significantly sensitive to the availability of overdraft facility. The heterogeneity analysis also reveals that the availability of overdraft facilities has a marginally larger effect on the probability of exporting of SMEs in the manufacturing sector than on the probability of exporting of SMEs in the non-manufacturing sector. Further, the analysis shows that the availability of overdraft facilities has a significant effect on the likelihood of exporting only in the third round of the BEEPS conducted in the years 2008 to 2009 during the financial distress. This is not surprising because in financial crisis, firms can have temporary financial difficulties due to delays in payments for marketed goods and therefore to be able serve foreign markets, they need to have flexible sources of finance.

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