The consequence of societal secrecy for financial constraints

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Abstract

Does the level of societal secrecy aggravate or alleviate access to finance? We explore this question for over 50,000 firms in around 40, predominantly developing, countries, from 2006 to 2015. We find a strong positive relationship between cultural orientation towards secrecy in a country and financial constraints faced by its firms. Our results are robust to several considerations and emphasise the adverse consequence of societal secrecy for perpetuating financing obstacles for firms.

JEL codes: G20; G30; O16; Z1

Keywords: financial constraints; access to credit; societal secrecy; national culture; firm-level data

1. Introduction

The extant literature has identified several determinants of firms' financial constraints, including the size of firms (with small and medium scale enterprises (SMEs) having lesser access to funds), their performance, financial deepening, socio-economic environment, and political institutions (see, e.g., Cull & Xu, 2005; Claessens et al., 2008; Kuntchev et al., 2012; Bose et al., 2020; Erel & Liebersohn, 2022). More recently, attention has shifted to show that high power distance, individualism, societal trust, and other cultural factors affect trade credits, and, by extension, financial constraints (Moro et al., 2021; Knetch & Salzman, 2022). In this paper, we examine the consequence of a cultural trait, namely societal secrecy, for financial constraints.

Societal secrecy has been found to affect IPO under-pricing through asymmetric information (Chen et al., 2022), negatively related to central bank transparency (Makrychoriti & Pasiouras, 2021) and to be a haven for corruption and tax evasion, as well as tax avoidance (Stiglitz & Pieth, 2016). However, no study, to our best knowledge, has investigated the effects of societal secrecy on access to finance. To shed light on this issue, we combine firm-level data from 39 countries, over the period of 2006-2015, within a probit/ordered probit econometric framework and find a positive and statistically significant relationship between measures of societal secrecy and financial constraints. This finding survives many robustness tests, including alternative specifications, measurement of key variables, estimation methods and expanding the vector of controls.

This paper contributes to two strands of literature. One is the stream of literature that measures the relevance of cultures/societal norms to economic outcomes (Kostis, 2021; Chu et al., 2022). In this regard, we show that societal secrecy hinders economic progress through constrained access to finance to the sampled firms. Two is the vast pool of literature on causes of, and solutions to, credit constraints (Manova, 2012; Coeurdacier et al., 2015; Leon, 2015).

The rest of the paper is organised into three sections. Section 2 details the data and econometric method for investigating the relationship between societal secrecy and financial constraints. Section 3 lays out the results of the regressions, and section 4 concludes.

2. Econometric specification and data

To examine the effects that societal secrecy has on financial constraints of firms, we run several variants of the following regression specification:

$$\textit{Financial constraints}_{ij} = \alpha + \beta \textit{Societal secrecy}_j + \gamma' \boldsymbol{F}_{ij} + \delta' \boldsymbol{C}_j + \boldsymbol{I} + \boldsymbol{Y} + \varepsilon_i \qquad (1)$$

where subscript i stands for firm, subscript j stands for country, and ε is the unobserved error term. We estimate the model with industry, $\boldsymbol{I}$, and year, $\boldsymbol{Y}$, fixed effects to help account for the roles of unobserved heterogeneities at the industry level and transitory changes in time-varying country-level controls. The outcome variable of interest, *Financial constraints*, is the credit constraints faced by firms, and is computed after Kuntchev et al. (2012), using a global firm-level data from the World Bank's Enterprise Surveys (WBES) database.[1] Using this approach, we obtain an ordinal measure of financial constraints, classifying firms into four categories, viz.: (i) Fully credit constrained (FCC) = 4; (ii) Partially credit constrained (PCC) = 3; (iii) Maybe credit constrained (MCC) = 2; and (iv) Not credit constrained (NCC) = 1.[2] The left panel of fig. 1 charts the distribution of this variable for our sample. For robustness, we also create a dummy variable analogue, *Financial constraints dummy*, which is equal to 1 if *Financial constraints* is equal to 3 (PCC) or 4 (FCC), and 0 otherwise (the cases when *Financial constraints* is equal to 1 (NCC) or 2 (MCC). This is graphed in the right panel of fig. 1. A third dependent variable we considered is *Credit constraints dummy*, which is equal to 1 if a firm does not have a bank line of credit or overdraft and 0 otherwise.

[Please insert figure 1 around here]

Our main explanatory variable is *Societal secrecy*, which, in the benchmark regressions, is defined after Chen et al. (2022) by deducting a measure of individualism from the sum of uncertainty avoidance and power distance. The three cultural dimensions are taken from Hofstede (2001)[3] and the conceptual arguments for using them to derive *Societal secrecy* is provided in Gray (1988); see also Chen et al. (2022). Dividing by 100, our constructed *Societal secrecy* has values that range from −0.11

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[1] See https://www.enterprisesurveys.org/ for more information.
[2] Kuntchev et al. (2012, pp. 9-12) provide a full description of the methodology for constructing this variable.
[3] See https://geerthofstede.com for more information.

to 1.87, with a mean (std. dev.) of 1.08 (0.36). To check the robustness of our measure of societal secrecy, we use two additional definitions, viz.: (i) *Societal secrecy_UI* taken to be uncertainty avoidance minus individualism, still based on Hofstede (2001); and (ii) *Societal secrecy_EE* calculated as embeddedness minus egalitarianism, based on Schwartz's (2004) cultural dimensions.

The vector F comprises of firm-level control variables, viz.: firm size, firm age, being part of a larger establishment, has account externally audited, has internationally recognised quality certificate, foreign ownership, state ownership, indicators of firms' legal status (e.g., publicly listed, privately held, and sole proprietorships), female involvement in top management, and asset share of largest owner, all from WBES. We augment our model with country-level control variables housed in vector C: domestic credit to GDP ratio, GDP per capita, GDP growth rate, inflation, and institutional development. As additional country-level controls, we also use population density and the share of urban population. We extract all time-varying country-level control variables from the Quality of Government (QoG) dataset,[4] measuring them with a one-year lag to avoid contemporaneous bias. Besides, all control variables in F and C have been preferred based on existing literature (see, for example, Leon, 2015).

β is the parameter of most interest to us and our hypothesis is that it is positive. Given the ordinal nature of the benchmark dependent variable, equation (1) is estimated by performing an ordered probit analysis (Greene, 2012), with standard errors robust to heteroskedasticity clustered at the firm-year level (Cameron and Miller, 2015). Once we have matched the WBES firm-level data with Hofstede (2001)-based index of *Societal secrecy* and the country-level control variables from QoG, the sample used for empirical analysis in the complete benchmark specification contains 51,249 firms from 39 countries over the period 2006-2015. Summary statistics for variables used in this study are in table 1.

[Please insert table 1 around here]

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[4] See https://www.gu.se/en/quality-government/qog-data for more information.

3. Results

Table 2 presents the ordered probit coefficients from estimating equation (1), with all four regression specifications augmented with industry and year fixed effects. In column (1), we report the effect of *Societal secrecy* on *Financial constraints*, which is positive and statistically significant at the 1% level. In column (2), we control for only firm-level characteristics, while we insert only country-level controls in column (3). As in column (1), *Societal secrecy* continues to exert positive and significant effects (at the 1% level) on *Financial constraints* in both columns (2) and (3). We simultaneously account for firm- and country-level controls in column (4), with the finding confirming that the coefficient on *Societal secrecy* is positive and significant, again at the 1% level. This corroborates our hypothesis of a positive influence of *Societal secrecy* on *Financial constraints*. Next, we demonstrate that the effect of *Societal secrecy* on *Financial constraints* is not only statistically significant, but also economically significant. To judge the magnitude of this impact, we use the coefficient from the benchmark model in column (4) of table 2. Specifically, the coefficient on *Societal secrecy* (0.1543) implies that a rise of one standard deviation (0.3573) in this variable would lead to a rise in *Financial constraints* faced by firms of 0.0555 (= 0.36 × 0.1543), which amounts to a rise of 2.80% in obstacles before firms in accessing needed finance, when compared to the mean. Based on columns (1)-(4) of table 2, the lower and upper bands of the magnitude of effects that societal secrecy has on access to finance are 2.3% and 3.6%, respectively. The consequence of *Societal secrecy* for *Financial constraints* is thus noticeably large. Looking at the control variables in table 2, their coefficients are largely consistent with results obtained in related literature (Kuntchev et al., 2012, Leon, 2015).

[Please insert tables 2-3 around here]

Table 3 presents estimates from our various robustness exercises.[5] In columns (1)-(4), we focus on whether our results are robust to alternative measures of key variables. As dependent variables, we use *Financial constraints dummy* in column (1) and *Credit constraints dummy* in column (2), and report results from probit estimates. Alternative definitions of secrecy, *Societal secrecy_UI* and *Societal*

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[5] For brevity, we only document the estimated coefficient on *Societal secrecy* in table 3.

secrecy_EE are employed in columns (3) and (4), respectively. Besides, our benchmark model clusters standard errors by firm-year level. To check whether this affects our results, we alternatively cluster standard errors by industry-year (column (5)) and country-year (column (6)).[6] Further, we utilise two alternative estimation methods in column (7), ordered logit, and column (8), logit. We then contemplate alternative sample compositions in columns (9) and (10), where we respectively estimate equation (1) on the sample judged to be strictly "*Truthful*" by the World Bank's survey supervisors/contractors and the latest available survey for countries in our sample. The final two columns add two firm-level controls in column (11) (female involvement in top management and asset share of largest owner) and country-level controls in column (12) (population density and urban population share).[7] As shown, societal secrecy, whether measured using the benchmark approach or the alternatives, remains highly statistically significant at the 1% level in all specifications, except in column (6) where it achieved significance at the 10% level.

4. Conclusion and policy implications

In this paper, we have examined the effect of societal secrecy on financial constraints in the context of firms in 39 countries. Our main finding is that societal secrecy is positively related to financial constraints, and the results are robust to various specifications. Specifically, we find that societal secrecy constrains access to finance by 2.3-3.6 percent, using the main and alternative specifications reported in table 2.

The implication of this discrete study is that information asymmetry or withholding information from those not closely related to those financing and managing the firm, could hinder the flow of credit to firms in need of financing. Further, this finding illuminates the important role of egalitarianism, trust,

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[6] Additional clustering levels/types have been experimented with, obtaining essentially the same findings as reported.

[7] In unreported additional robustness tests, we have checked for the impacts of other banking and institutional environment in confounding our benchmark results, including measures of bank competition (e.g., three-bank concentration ratio, Lerner index, H-statistics, and Boone indicator), information sharing (e.g., depth of credit information, public registry coverage, and private bureau coverage), costs of intermediation (e.g., bank net interest margin, bank lending-deposit spread, and bank overhead costs to total assets), and foreign bank assets as a share of total bank assets (to capture the extent of financial liberalisation in a country). In all cases, our results remain effectively unchanged; these results are available upon request.

and transparency in enhancing access to credit, and, by extension, scope to improve economic outcomes for the wider community. Policy makers in the sampled countries could formulate policies that promote a more equal access to finance by eligible firms and/or set up a financing organisation with the sole aim of entrepreneurial and business financing. Future research could consider the impact of societal secrecy on trade flows and entrepreneurship.

References

Bose, U., Mallick, S., & Tsoukas, S. (2020). Does easing access to foreign financing matter for firm performance? *Journal of Corporate Finance*, *64*, 101639.

Cameron, A. C., & Miller, D. L. (2015). A practitioner's guide to cluster-robust inference. *Journal of human resources*, *50*(2), 317-372.

Chen, Y., Chui, A. C., Goyal, A., & Veeraraghavan, M. (2022). Societal secrecy and IPO underpricing. *Journal of Corporate Finance*, *76*, 102257.

Chu, A.C., Kou, Z., & Wang, X. (2022) Culture and stages of economic development. *Economic Letters* 210:110213

Coeurdacier, N., Guibaud, S., and Keyu, J. (2015). Credit Constraints and Growth in a Global Economy. *American Economic Review*, 105 (9): 2838-81.

Claessens, S., Feijen, E., & Laeven, L. (2008). Political connections and preferential access to finance: The role of campaign contributions. *Journal of financial economics, 88*(3), 554-580.

Cull, R., & Xu, L. C. (2005). Institutions, ownership, and finance: the determinants of profit reinvestment among Chinese firms. *Journal of Financial Economics*, *77*(1), 117-146.

Erel, I., & Liebersohn, J. (2022). Can FinTech reduce disparities in access to finance? Evidence from the Paycheck Protection Program. *Journal of Financial Economics*, *146*(1), 90-118.

Gray, S. J. (1988). Towards a theory of cultural influence on the development of accounting systems internationally. *Abacus*, *24*(1), 1-15.

Greene, W. H. (2012). *Econometric analysis*. 7th ed. Pearson, Boston.

Hofstede, G. H., & Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviours, institutions, and organizations across nations*. Sage, Thousand Oaks, CA.

Knetsch, A. & Salzman, A. (2022). Societal trust and corporate underinvestment. *Global Finance Journal,* 54(100755).

Kostis, C.P. (2021). Culture, innovation, and economic development. *Journal of Innovation and Entrepreneurship*. 10(22).

Kuntchev, V., Ramalho, R., Rodríguez-Meza, R., & Yang, J. S. (2012). World Bank, Washington DC, USA. *What Have We Learned from the Enterprise Surveys Regarding Access to Finance by SMEs*.

Leon, F. (2015). Does bank competition alleviate credit constraints in developing countries? *Journal of Banking & Finance*, *57*, 130-142.

Makrychoriti, P. & Pasiouras, F. (2021). National culture and central bank transparency: cross-country evidence. *Journal of International Financial Markets, Institutions and Money*, 72(101318)

Manova, K. (2012). Credit constraints, heterogeneous firms, and international trade. *The Review of Economic Studies*, 80(2):711-744

Moro, A., Belghitar, Y., & Mateus, C. (2021). National culture and small firms' use of trade credit: Evidence from Europe. *Global Finance Journal,* 49(100655).

Schwartz, S. H. (2004). Mapping and interpreting cultural differences around the world. In: Vinken, H., Soeters, J., Esters, P. (Eds.), *Comparing cultures, dimensions of culture in a comparative perspective.* The Netherlands, Brill Leiden, pp. 43-73.

Stiglitz, J.E. & Pieth, M. (2016). Overcoming the Shadow Economy. *International Policy Analysis,* pp. 1-25.

Table 1. Summary statistics.

	N	mean	sd	min	p25	p50	p75	max
Panel A. Dependent variables								
Financial constraints (ordinal measure)	51,249	1.98	1.04	1	1	1	1	4
Financial constraints dummy	51,249	0.29	0.45	0	0	0	0	1
Credit constraints dummy	50,230	0.61	0.49	0	0	0	0	1
Panel B. Independent variables								
Main explanatory variables								
Societal secrecy	51,249	1.08	0.36	-0.11	-0.11	-0.11	-0.11	1.87
Societal secrecy_UI	51,249	0.34	0.30	-0.42	-0.42	-0.42	-0.42	0.92
Societal secrecy_EE	32,719	-0.63	0.37	-1.73	-1.73	-1.73	-1.73	0.18
Firm-level control variables								
Small firm = 1	51,249	0.39	0.49	0	0	0	0	1
Medium firm = 1	51,249	0.37	0.48	0	0	0	0	1
Large firm = 1	51,249	0.24	0.43	0	0	0	0	1
Log of firm age	51,249	2.74	0.89	0	0	0	0	7.61
Subsidiary = 1	51,249	0.15	0.36	0	0	0	0	1
Direct exports (% of sales)	51,249	8.32	23.1	0	0	0	0	100
Audited = 1	51,249	0.54	0.50	0	0	0	0	1
Quality certificate = 1	51,249	0.29	0.45	0	0	0	0	1
Foreign owned (%)	51,249	0.065	0.23	0	0	0	0	1
State owned (%)	51,249	0.0055	0.060	0	0	0	0	1
Publicly listed = 1	51,249	0.051	0.22	0	0	0	0	1
Privately held = 1	51,249	0.48	0.50	0	0	0	0	1
Sole proprietorship = 1	51,249	0.27	0.44	0	0	0	0	1
Partnership = 1	51,249	0.17	0.38	0	0	0	0	1
Female in leadership = 1	51,157	0.13	0.33	0	0	0	0	1
Largest owner asset share (%)	49,290	77.2	26.8	0	0	0	0	100
Country-level control variables								
Domestic credit (% of GDP)	51,249	51.8	28.4	16.2	16.2	16.2	16.2	132
Log of GDP per capita	51,249	8.47	0.95	6.76	6.76	6.76	6.76	10.9
GDP growth rate (annual %)	51,249	4.14	3.32	-5.29	-5.29	-5.29	-5.29	9.55
Inflation (annual %)	51,249	7.04	4.32	-0.13	-0.13	-0.13	-0.13	27.1
Institutional development	51,249	-0.15	0.60	-1.25	-1.25	-1.25	-1.25	1.78
Population density (people per sq. km of land area)	51,249	4.55	1.28	1.21	1.21	1.21	1.21	7.06
Urban population (% of total population)	51,249	57.9	19.3	29.1	29.1	29.1	29.1	94.2

Table 2. Societal secrecy and financial constraints: main results.

Dependent variable:	Financial constraints			
Estimation method:	Ordered probit			
	(1)	(2)	(3)	(4)
Societal secrecy	**0.1962***	**0.1955***	**0.1283***	**0.1543***
	(14.602)	**(13.919)**	**(6.174)**	**(7.042)**
Medium size		0.0216**		-0.0265**
		(2.187)		(-2.161)
Large size		0.0433***		-0.0144
		(3.507)		(-0.946)
Log of firm age		-0.0260***		-0.0162***
		(-5.159)		(-2.618)
Subsidiary		-0.0437***		-0.0418***
		(-4.047)		(-3.027)
Direct exports		-0.0007***		-0.0010***
		(-4.183)		(-4.425)
Audited		-0.0589***		-0.0746***
		(-6.584)		(-6.746)
Quality certificate		0.0017		-0.0084
		(0.177)		(-0.681)
Foreign owned		-0.2755***		-0.2593***
		(-15.531)		(-11.412)
State owned		-0.1978**		-0.1816**
		(-2.279)		(-1.995)
Publicly listed		-0.0276		0.0316
		(-0.860)		(0.829)
Privately held		-0.0122		0.0645**
		(-0.443)		(1.991)
Sole proprietorship		0.1503***		0.2107***
		(5.211)		(6.319)
Partnership		0.1309***		0.1861***
		(4.532)		(5.475)
Domestic credit$_{t-1}$			-0.0007***	-0.0005**
			(-2.915)	(-2.059)
Log of GDP p.c.$_{t-1}$			-0.0388***	-0.0160
			(-3.839)	(-1.507)
GDP growth rate$_{t-1}$			0.0213***	0.0176***
			(8.648)	(6.890)
Inflation$_{t-1}$			0.0097***	0.0079***
			(6.759)	(5.298)
Institutional development$_{t-1}$			-0.0275*	-0.0267*
			(-1.768)	(-1.654)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Number of countries	55	55	39	39
Observations	83,593	79,602	54,010	51,249

t-statistics in parentheses are computed based on standard errors clustered at the firm-year level. ***: statistical significance at 1% level; **: statistical significance at 5% level; * statistical significance at 10% level.

**Table 3.** Societal secrecy and financial constraints: robustness checks.

Dependent variable:	Financial constraints dummy	Credit constraints	Financial constraints			
Estimation method:	Probit		Ordered probit			
Robustness test:	Alternative measures of financial constraints		Alternative measures of societal secrecy		Alternative clustering of standard errors	
	(1)	(2)	(3)	(4)	(5)	(6)
Societal secrecy	0.1348***	0.1755***	0.3637***	0.5064***	0.1543***	0.1543*
	(4.400)	(6.003)	(11.066)	(13.705)	(3.625)	(1.875)
Vector **F**	Yes	Yes	Yes	Yes	Yes	Yes
Vector **C**	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	39	39	39	25	39	39
Observations	51,236	50,194	51,249	32,719	51,249	51,249
Dependent variable:	Financial constraints	Financial constraints dummy	Financial constraints			
Estimation method:	Ordered logit	Logit	Ordered probit			
Robustness test:	Alternative estimation methods		Alternative sample compositions		Additional firm- and country-level controls	
	(7)	(8)	(9)	(10)	(11)	(12)
Societal secrecy	0.2553***	0.2225***	0.1795***	0.4210***	0.1597***	0.1572***
	(7.102)	(4.086)	(6.023)	(8.271)	(7.129)	(6.822)
Vector **F**	Yes	Yes	Yes	Yes	Yes	Yes
Vector **C**	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	39	39	34	16	39	39
Observations	51,249	51,236	29,428	21,981	49,218	51,249

t-statistics in parentheses are computed based on standard errors clustered at the firm-year level. ***: statistical significance at 1% level; **: statistical significance at 5% level; * statistical significance at 10% level.
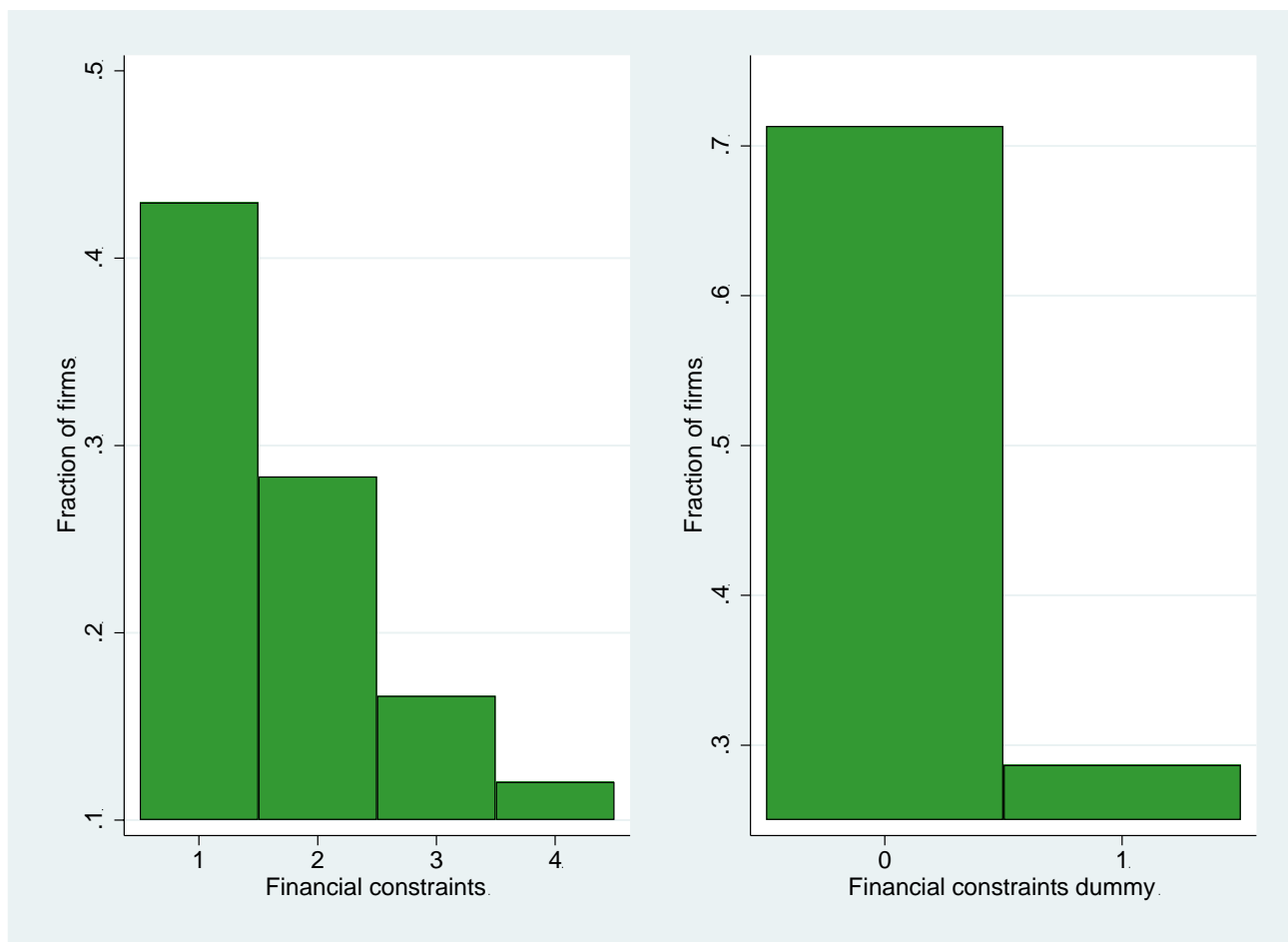
Fig. 1. Histograms of financial constraints.
Left panel: Histogram of financial constraints – 1 = Not credit constrained (NCC); 2 = Maybe credit constrained (MCC); 3 = Partially credit constrained (PCC); and 4 = Fully credit constrained (FCC). Right panel: Histogram of financial constraints dummy – 0 = Not credit constrained (NCC) | Maybe credit constrained (MCC); and 1 = Partially credit constrained (PCC) | Fully credit constrained (FCC).