"Early-stage financing diversity and firms' export intensity: a cross-country analysis"

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ABSTRACT

Drawing on data from the Global Entrepreneurship Monitor and a sample of more than 13,000 firms from 46 countries, we investigate the relationship between early-stage financing diversity and export intensity of both startups and established firms. We define early-stage financing diversity as the number of types of formal and informal external sources that provided the firm's seed capital. Based on the hypothesis that exporting is a risky and knowledge-based activity, we discover a positive relationship between early-stage financing diversity and export intensity. Notably, the study demonstrates that a country's financial development and degree of investor protection negatively moderate the baseline relationship.

1. Introduction

An enterprise's capacity to obtain external funds is negatively related to the degree of asymmetric information on its assets' value, strategies and managerial skills (e.g., Cosh et al., 2009; Andrieu et al., 2018). In this regard, during the initial years of development, firms can face greater constraints in the access to formal external financing because of the lack of a long-standing operating and credit history, limiting their capacity to invest and grow (e.g., Berger and Udell, 1998; Cole and Sokolyk, 2018; Bongini et al., 2019). As a consequence, informal investors, who usually suffer less from asymmetric information problems than formal investors do, can have a major role in the financing of new firms. Moreover, new firms may have less diversified formal funding sources, and rely mainly on bank credit (Petersen and Rajan, 1994; Hamilton and Fox, 1998, Cassar, 2004; Robb and Robinson, 2014; Deloof and Vanacker, 2018).

Emerging empirical research investigates the determinants of a firm's financing diversity and its relationship with the firm's outcome (e.g., Nofsinger and Wang, 2011; Lawless et al., 2015; Moritz et al., 2016). Nofsinger and Wang (2011) use GEM data and find that entrepreneurial characteristics are relevant in explaining a start-up's financing diversity. Lawless et al. (2015) use survey data on European firms and find that smaller and younger firms rely on fewer types of financing sources than older and larger firms. Moritz et al. (2016), also using survey data find that a relevant share of firms with a greater mix of funding sources, show a higher level of innovation and growth.

Based on these premises, our study contributes to the existing empirical literature by investigating if the diversity of financing sources that provided a firm's seed capital, that we define as early-stage financing diversity, is associated with its export intensity. Several studies (e.g., Oviatt and McDougall. 1994; McDougall et al., 1994) point out that engaging in export activities is relevant for business growth but requires substantial financial resources. Our study contributes to this strand of research by exploring if the combination of several types of financing sources in the initial stages of development, when high-growth can be a key determinant of success, support the export intensity of firms in both the short term, i.e., startups, and medium to long term, i.e., established firms.

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More broadly, credit constraints may hinder or even prevent the exporting business, given the potential greater risk and uncertainty as compared to the domestic business. Feenstra et al. (2014), discussing the differences in terms of credit constraints between exporting and non-exporting firms, show theoretically that the greater risk faced by exporters affects the extent of bank credit. Extant empirical research indicates that firms with greater credit constraints are less likely to export (e.g., Minetti and Zhu, 2011; Riding et al., 2012; Jinjarak and Wignaraja, 2016). However, these studies focus mostly on the dichotomy about bank and equity financing and do not consider the whole range of formal and informal financial sources. Based on these arguments, we expect a positive relationship between firms' early-stage financing diversity and their export intensity.

A second relevant question deals with how the baseline relationship between financing diversity and export intensity is moderated by the institutional context. A firm's performance depends on a favorable economic, social and financial environment. The financial environment, in particular, can be especially valuable for firms (e.g., Demirgüç-Kunt and Maksimovic, 1998; La Rocca et al., 2019). Existent cross-country studies on firm financing mainly looked at how institutional characteristics affect financial sophistication (e.g., Lawless et al., 2015; Deloof et al., 2019). In this study, we investigate how a country's financial development and the degree of investor protection influence the relationship between financing diversity and export intensity. The findings of the empirical literature suggest that there is a positive association between the quality of institutional context and business growth (e.g., Demirgüç-Kunt et al., 2006; Klapper et al., 2006); and that good institutional conditions may disproportionately support the growth of exporting firms. In this respect, greater financial development and better investor protection can reduce the benefits of financing diversity. So, we expect that the quality of institutional context negatively moderates our baseline relationship.

In sum, this study contributes to the existing literature in many ways. First, we add to the growing literature on financing diversity (e.g., Nofsinger and Wang, 2011; Lawless et al., 2015; Moritz et al., 2016) considering as the whole range of formal and informal seed-capital sources impact on the export intensity of firms. Second, we conduct a comparative analysis between the impact on the export expectations of startups (SUs) and the impact on the effective export activities of established firms (EFs). This separate analysis allows to investigate if the relationship between early-stage financing diversity and export intensity is relevant for firms in both the initial stages of development as well as when they are established. Third, by using data from the 2015 GEM survey we can investigate the relevance of our results in different institutional contexts (e.g., Demirgüç-Kunt et al., 2006; Klapper et al., 2006; Bongini et al., 2019) with regards to the degree of financial development and investor protection.

We find a positive impact of early-stage financing diversity on the export intensity of both SUs and EFs. Moreover, we find that the quality of the institutional context, in terms of both financial development and degree of investor protection, moderates our baseline relationship.

The rest of the paper is organized as follows: Section 2 introduces the dataset and empirical model, Section 3 presents and discusses the empirical results, and Section 4 concludes the paper.

2. Data and model specification

Measuring financial diversity is challenging because of the limited information about informal sources of finance. However, informal sources can play a pivotal role, along with more formal sources such as banks and venture capital, in supporting the development of entrepreneurial ventures. Data on informal and formal sources of finance is further limited when combined with data on the export activities of firms. We address these challenges by using data from the expanded 2015 GEM survey, which includes a special section on the financing step of the start-up phase. First, we exclude more than 140,000 observations for non-entrepreneurs. Excluding incomplete or missing data leads to a final sample of 13,131 firms from 46 countries: 8,888 observations for SUs and 4,243 observations for EFs. Appendix A reports the distribution of sample firms among countries.

GEM data provide information about seven external financial sources that the sampled firms are using or will use (if they are SUs) or have used (if they are EFs) in the start-up phase: close family members, friends or neighbors, employers or work colleagues, banks or other financial institutions, private investors or venture capitalists, government programs or donations or grants, and online crowdfunding.

As reported in Fig. 1, family members, friends or neighbors, and banks or other financial institutions are the most important sources of early-stage financing for exporting firms compared to non-exporting firms.

Following Nofsinger and Wang (2011), we build a financing diversity index (*FDI*) that is equal to the total number of types of external sources of the start-up capital. We also use two alternative measures: two dummy variables for the 75th and 95th percentiles of *FDI* (*FDI75* and *FDI95*, respectively), respectively. *FDI* is zero for 27% of SUs and 44% of EFs—i.e., the seed capital is/was fully self-financed—and 7 for less than 1% of firms— i.e., all seven types of external sources are/were used. On average, one-third of the sample firms received financing from more than one type of external source. Moreover, the average *FDI* for exporting firms is slightly greater than the average *FDI* for non-exporting firms. A test on the difference in means suggests that *FDI* is positively and statistically associated with export activity.
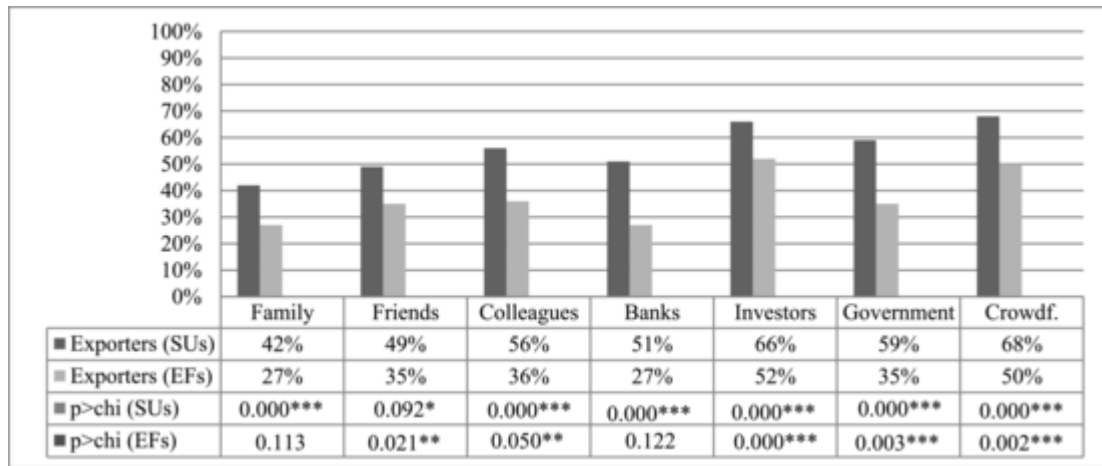
Fig. 1. Financing sources of survey respondent.Notes: *** *p*-value < 0.01, ** *p*-value < 0.05 and * *p*-value < 0.1. The statistical test Pearson's chi2, confirms the existence of a significant difference for each source of funds considered between exporting and non-exporting firms.

To further investigate the relationship between early-stage financing diversity and export intensity, we run a battery of ordered logit models, where the dependent variable (*Export*) is ordinal and measures the share of foreign customers over the total number of customers[1]. For SUs, *Export* proxies expected export intensity, while for EFs, it measures actual export intensity.

In ordered logit, an underlying score is estimated as a linear function of the independent variables and a set of cut points. The probability of observing outcome *i* corresponds to the probability that the estimated linear function, plus random error, is within the range of the cut points estimated for the outcome.

We include a set of categorical control variables: managerial education (*Educ*), managerial experience (*Skills*), number of firm owners (*Owners*), technological level (*High-tech*), reasons for starting a business activity (*Reason*) and competition (*Competit*). We also include country dummy variables to account for country-specific characteristics. The detailed description of all variables is summarized in Appendix B.

Notably, we conduct further analyses investigating the moderating effect of the quality of the institutional context in terms of financial development and investor protection on the sample of SUs[2] (e.g., Beck et al., 2006; Demirgüç-Kunt et al., 2006; Klapper et al., 2006). We alternately use two measures of financial development: domestic credit to the private sector to GDP (*Domestic credit to private sector*) and stock market capitalization to GDP (*Market cap*). Investor protection is instead measured by the "strengths of legal rights index" (*Legal rights*) and the "enforcing contracts score" (*Enforcing*). Data are retrieved from the World Bank Global Financial Development database and Doing Business database, respectively.

3. Results

Table 1 reports the main results. Columns 1-3, report the impact of all early-stage financing diversity proxies on export intensity for the sample of SUs. Similarly, columns 4-6, report this relationship for the sample of EFs.

We find a positive and highly statistically significant coefficient for all proxies of financial diversity, consistent with the hypothesis that financing diversity is positively associated with export intensity. These results suggest that the use of multiple financing sources in the early-stage of development supports the export activity of enterprises. The risk-sharing benefits and diversity of knowledge and skills that come from multiple investors can help these firms overcome the many challenges and risks involved in the exporting business.

Moreover, we find that managerial education, number of firm owners, competition and technology level are statistically associated with export intensity. In particular, education and number of firm owners are positively associated with export intensity for both the SUs and EFs samples. This suggests that exporting is a knowledge-intense activity and requires the effort and commitment to risk-sharing of multiple owners in all phases of development of the enterprise. In contrast, competition, negatively, and technology, positively, are associated with export intensity only for the EFs sample. This may indicate that they are important drivers of the exporting business only in a later stage of development of the enterprise.

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[1] The variable can take seven different values: 0 if the share of foreign customers is zero; 1 if the share is between 1% and 10%; 2 if the share between 11% and 25%; 3 if the share is between 26% and 50%; 4 if the share is between 51% and 75%; 5 if the share is between 76% and 90%; and 6 if share is more than 90%.

[2] We cannot conduct similar analyses for the sample of EFs because data on the firm's age is not available. Therefore, we are not able to match the indicators of financial development and investment protection with the year of establishment of these firms.

Table 1

Results of the relationship between early-stage financing diversity and export intensity.

	SUs			EFs		
	(1)	(2)	(3)	(4)	(5)	(6)
FDI	0.0556 ***			0.115 ***		
	(3.39)			(2.86)		
FDI75		0.224 ***			0.0508	
		(4.78)			(0.66)	
FDI95			0.151*			0.326 ***
			(1.90)			(3.30)
Educ: Secondary	0.372 ***	0.364 ***	0.374 ***	0.143	0.143	0.136
	(4.31)	(4.22)	(4.35)	(1.00)	(1.00)	(0.95)
Educ: Post-sec./Grad. Exp.	0.598 ***	0.590 ***	0.597 ***	0.416 ***	0.420 ***	0.409 ***
	(6.70)	(6.62)	(6.69)	(2.83)	(2.85)	(2.78)
Skills: Don't Know	0.260	0.268	0.245	-0.189	-0.176	-0.182
	(1.08)	(1.12)	(1.02)	(-0.62)	(-0.57)	(-0.60)
Skills: Yes	0.0569	0.0545	0.0568	0.106	0.112	0.110
	(0.86)	(0.83)	(0.86)	(0.97)	(1.02)	(1.00)
Owners: 2-5	0.0966 **	0.0902*	0.109 **	0.317 ***	0.330 ***	0.321 ***
	(2.05)	(1.91)	(2.33)	(3.90)	(4.06)	(3.95)
Owners: 6-10	0.109	0.101	0.132	0.548	0.570	0.555
	(0.78)	(0.72)	(0.94)	(1.44)	(1.51)	(1.47)
Owners: >10	0.536 ***	0.527 **	0.551 ***	0.504	0.652	0.499
	(2.61)	(2.55)	(2.69)	(0.92)	(1.30)	(0.95)
High-tech: Medium	0.00838	0.00500	0.0135	0.291 **	0.305 **	0.287 **
	(0.12)	(0.07)	(0.19)	(2.08)	(2.18)	(2.05)
High-tech: High	-0.0976	-0.0995	-0.0981	-0.194	-0.192	-0.202
	(-1.50)	(-1.52)	(-1.51)	(-1.48)	(-1.46)	(-1.54)
Reason: Necessity	-0.0773	-0.0749	-0.0784	-0.0469	-0.0480	-0.0443
	(-1.44)	(-1.40)	(-1.46)	(-0.55)	(-0.57)	(-0.52)
Reason: Mixed	-0.0381	-0.0381	-0.0399	-0.00875	-0.00250	-0.00101
	(-0.50)	(-0.50)	(-0.52)	(-0.07)	(-0.02)	(-0.01)
Reason: Other	-0.0592	-0.0552	-0.0664	0.103	0.0923	0.106
	(-0.52)	(-0.48)	(-0.58)	(0.71)	(0.64)	(0.74)
Competit: Few	0.125	0.126	0.130*	-0.0118	-0.0119	-0.0210
	(1.62)	(1.63)	(1.68)	(-0.07)	(-0.07)	(-0.12)
Competit: Many	0.0180	0.0191	0.0217	-0.335 **	-0.340 **	-0.345 **
	(0.23)	(0.25)	(0.28)	(-2.07)	(-2.12)	(-2.12)
Country dummies	YES	YES	YES	YES	YES	YES
N	8888	8888	8888	4243	4243	4243
pseudo R^2	0.126	0.127	0.126	0.116	0.115	0.117

Notes: *** p-value < 0.01

** p-value < 0.05 and * p-value < 0.1.

To analyze the moderating effect of financial development on the export decision of SUs, we add interaction terms between our proxies for early-stage financing diversity and two proxies of financial development. In Table 2, columns 1-3 present the results considering the variable *Domestic credit to private sector* as the moderator variable. Columns 4-6 report the results considering the variable *Market cap*.

Table 2 shows that both financing diversity and financial development are positively associated with export intensity. However, we find that the greater a country's financial development is, the lower the impact of financing diversity on export intensity. Moreover, it is important to notice that the size of the coefficient of the interaction term increases from using FDI75 to using FDI95. This further supports the main result, that is, the greater a country's financial development the lower the importance of financing diversity in supporting the export activity of SUs.

Table 3 reports the results of the analyses of the moderating effect of investor protection on the financing diversity-export intensity relationship. Specifically, columns 1-3 report the results considering the variable *Legal rights* as the moderator variable, while columns 4-6 replace the variable *Legal rights* with the variable *Enforcing*.

Similar to the results for the financial development measures, we find that the degree of a country's investor protection negatively moderates our baseline relationship.

Table 2
The moderating role of country-financial development on the relationship between early-stage financing diversity and export intensity.

	SUs					
	(1)	(2)	(3)	(4)	(5)	(6)
FDI	0.277 [***]			0.181 [***]		
	(8.61)			(5.99)		
FDI75		0.720 [***]			0.541 [***]	
		(8.35)			(5.86)	
FDI95			1.105 [***]			0.724 [***]
			(7.17)			(5.07)
FDI x *Domestic credit to private sector*	-0.00196 [***]					
	(-5.74)					
FDI75 x *Domestic credit to private sector*		-0.00465 [***]				
		(-4.73)				
FDI95 x *Domestic credit to private sector*			-0.00732 [***]			
			(-4.38)			
Domestic credit to private sector	0.00666 [***]	0.00560 [***]	0.00438 [***]			
	(9.27)	(8.90)	(8.45)			
FDI x *Market cap*				-0.000892 [***]		
				(-2.80)		
FDI75 x *Market cap*					-0.00237 [**]	
					(-2.19)	
FDI95 x *Market cap*						-0.00349 [**]
						(-2.23)
Market cap				0.00193 [***]	0.00149 [**]	0.000919*
				(2.63)	(2.26)	(1.65)
Control variables	YES	YES	YES	YES	YES	YES
N	8288	8288	8288	5773	5773	5773
pseudo R^2	0.021	0.022	0.020	0.018	0.019	0.018

Notes: [***] *p*-value < 0.01

[**] *p*-value < 0.05 and * *p*-value < 0.1. For the sake of simplicity, the estimates for the control variables are not included in the table. We exclude country fixed-effects because of collinearity problems with the financial development indicators.

All results suggest that the advantages of an efficient institutional context, in terms of more developed financial systems and better investor protection, characterized by less asymmetric information problems, greater access to better financing and risk-sharing mechanisms, and better quality of the legal environment, can substitute for some of the benefits of greater financing diversity. These results further support the established view that firms are more likely to enter and face lower obstacles to their growth in countries with better access to external finance and better investor protection (e.g., Beck et al., 2006; Demirgüç-Kunt et al., 2006; Klapper et al., 2006).

4. Conclusions

We conduct an analysis of a global sample of enterprises from the GEM survey. In particular, we use data on the sources of start-up capital, the export intensity and the entrepreneurial characteristics. Firms, during the initial years of development, may depend on a limited number of formal and informal external financial sources - given their short track record and lack of reputation (e.g., Cole and Sokolyk, 2018; Bongini et al., 2019). For these firms, while exporting business may promote growth, it requires extensive financial resources (e.g., Nofsinger and Wang, 2011; Lawless et al., 2015). This paper contributes to the literature on the financing of firms by empirically examining the relationship between early-stage financing diversity and export intensity. We find that early-stage financing diversity is positively associated with the export intensity of both SUs and EFs. In terms of policy implications, promoting the access of new firms to a diversified pool of investors can support their internationalization process from the initial stages of development. Greater exports can ultimately lead to higher growth and odds of success.

This study also focuses on the moderating role of institutional context. Previous studies suggest that new firms, facing greater financial constraints, are more sensitive to country-specific conditions (e.g., Demirgüç-Kunt et al., 2006; Klapper et al., 2006). A country's financial development and the degree of investor protection may then moderate the relationship between financing diversity and export intensity. We find that the benefits of early-stage financing diversity are indeed lower in countries with greater financial development and better investor protection. It follows that, a greater financial development and a more supportive institutional context can substitute for some of the benefits of a diversified pool of early-stage investors in supporting the export activities of new firms.

The results of this study may be of interest to policymakers, researchers and entrepreneurs involved in the promotion of an inclusive financial system for firms, especially in their early stages of development.

Table 3

The moderating role of investor protection on the relationship between early-stage financing diversity and export intensity.

	SUs					
	(1)	(2)	(3)	(4)	(5)	(6)
FDI	0.310 ***			0.622 ***		
	(6.73)			(8.02)		
FDI75		0.915 ***			1.808 ***	
		(7.19)			(7.74)	
FDI95			0.967 ***			2.022 ***
			(4.45)			(6.25)
FDI x Legal rights	-0.0307 ***					
	(-4.51)					
FDI75 x Legal rights		-0.0891 ***				
		(-4.56)				
FDI95 x Legal rights			-0.0716 **			
			(-2.19)			
Legal rights	0.174 ***	0.162 ***	0.136 ***			
	(12.26)	(13.13)	(13.39)			
FDI2 x Enforcing				-0.00847 ***		
				(-6.70)		
FDI75 x Enforcing					-0.0241 ***	
					(-6.28)	
FDI95 x Enforcing						-0.0251 ***
						(-4.70)
Enforcing				0.0208 ***	0.0177 ***	0.0100 ***
				(6.76)	(6.32)	(4.58)
Control variables	YES	YES	YES	YES	YES	YES
N	8839	8839	8839	8839	8839	8839
pseudo R^2	0.028	0.029	0.027	0.022	0.023	0.021

Notes: *** p-value < 0.01

** p-value<0.05 and * p-value<0.1. For the sake of simplicity, the estimates for the control variables are not included in the table. We exclude country fixed-effects because of collinearity problems with the investor protection indicators.

Appendix A

Distribution of sample firms.

	Total sample		SUs		EFs	
	Observations	%Export	Observations	%Export	Observations	%Export
Spain	1,857	20%	483	22%	1,374	20%
Chile	854	43%	704	46%	150	31%
Colombia	831	80%	775	80%	56	79%
Indonesia	768	3%	477	4%	291	2%
Ecuador	648	19%	510	22%	138	10%
Botswana	622	34%	433	38%	189	26%
Cameroon	440	29%	296	32%	144	22%
Peru	411	19%	276	24%	135	10%
Philippines	386	20%	309	18%	77	29%
United Kingdom	379	71%	292	75%	87	57%
China	355	37%	296	36%	59	37%
Iran	340	23%	275	26%	65	11%
Thailand	330	12%	180	12%	150	13%
United States	295	87%	257	89%	38	71%
Canada	275	86%	225	86%	50	88%
Guatemala	272	4%	272	4%	0	0%
Uruguay	238	36%	209	36%	29	38%
Brazil	233	10%	109	15%	124	6%
Panama	219	58%	114	70%	105	46%
Latvia	205	62%	156	65%	49	51%
South Africa	202	48%	144	51%	58	40%

Slovakia	199	82%	114	90%	85	71
Australia	188	79%	146	84%	42	62
Estonia	188	63%	144	64%	44	59
South Korea	176	22%	84	32%	92	13
Romania	172	56%	137	56%	35	57
Egypt	157	47%	106	56%	51	29
Israel	148	57%	126	60%	22	41
Sweden	138	72%	87	79%	51	59
Portugal	135	82%	99	84%	36	78
Poland	121	38%	80	41%	41	32
Croatia	119	92%	106	95%	13	69
Kazakhstan	119	29%	115	29%	4	25
Netherlands	103	60%	71	63%	32	53
Hungary	99	65%	77	73%	22	36
Switzerland	99	78%	69	78%	30	77
Taiwan	99	45%	69	43%	30	50
Luxembourg	94	85%	83	88%	11	64
Belgium	90	80%	70	81%	20	75
Finland	87	66%	50	74%	37	54
Macedonia	80	40%	49	39%	31	42
Other	360	44%	214	48%	146	40
Total	13,131	40%	8,888	46%	4,243	28

Notes. The sample consists of 8,888 observations for SUs and 4,243 observations for EFs in 2015. %*Export* reports the percentage of exporting firms.

Appendix B

Variable sources and definitions.

Variable	Definition
Export	Categorical variable for export intensity as follows: None; Less than 10%; 11% to 25%; 26% to 50%; 51% to 75%; 75% to 90%; More than 90%. Source: GEM.
FDI	Number of types of external sources of the seed capital (received/expect to receive): Family members; Friends or neighbors; Employer or work colleagues; Banks or other financial institutions; Private investors or venture capital; Government programs; donations or grants and Online crowdfunding. Source: GEM.
FDI75	Dummy variable for the 75th percentiles of *FDI*. Source: GEM.
FDI95	Dummy variable for the 95th percentiles of *FDI*. Source: GEM.
Educ	Categorical variable for managerial education as follows: None; Some Secondary/Secondary Degree; Post-Secondary/Grad Exp. Reference category is None. Source: GEM.
Skills	Dummy variable for knowledge; skill and experience required to start a new business as follows: No; Don't know; Yes. Reference category is No. Source: GEM.
Owners	Categorical variable for number of owners; as follows: 1 owner; 2-5 owners; 6-10 owners; >10 owners. Reference category is 1 owner. Source: GEM.
High-tech	Categorical variable for technology level of the sector as follows: No/low technologies; Medium-tech; High-tech. Reference category is No/low technologies. Source: GEM.
Reason	Categorical variable for Reason for established business as follows: Opportunity; Necessity; Mixed; Other. Reference category is Opportunity. Source: GEM.
Competit	Categorical variable for competitors as follows: None; Few; Many. Reference category is None. Source: GEM.
Country	Categorical variable for country of respondent. Source: GEM.
Market cap	Stock market capitalization to GDP (%). Source: World Bank
Domestic credit to private sector	Domestic credit to private sector to GDP (%). Source: World Bank
Legal rights	Getting credit: Strength of legal rights index (DB05-14). Source: World Bank
Enforcing	Enforcing contracts score. Source: World Bank

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