The Determinants of IPO Decisions from Companies in Europe, Africa, Central Asia, and Russia

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Abstract

Initial public offering (IPO) can be viewed as a decision with trade-offs. While progressing through the life cycle, a firm always has the choice to stay private or go public. In this paper, I focus on identifying the determinants of the ownership status (publicly traded or not) for a company. To investigate the key characteristics behind decisions of IPOs, a Probit model with cross-sectional analysis is applied with anonymous survey data BEEPS. In this paper, explanatory variables with economic intuition and theoretical foundation are selected to estimate the model. Also, comprehensive specifications of models are presented to analyze the determinants of the IPO decision. For the estimation results, potential determinants that can be associated with a higher probability of IPO decision include the presence of environmental regulation, larger firm size, and board independence.

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Contents

1 Introduction

Initial public offering (IPO) is one of the most important decisions in the life cycle of a company (Latham and Braun, 2010; Nelson, 2013; Pagano et al, 1998). In this paper, I study the IPO as a decision rather than a normal consequence when companies progress through the life cycle.

IPO may be treated as a decision for the following reasons. Pagano et al. (1998) pointed out the fact that some large companies were not publicly traded even in the developed capital markets like the United States. They further suggested that relatively few large companies from European countries like Germany or Italian were publicly traded in the stock exchange. Drawing on their insights, this paper analyzes the IPO decisions from cross-sectional Europe, Africa, Russia, and central Asia countries.

To illustrate the tradeoff in the IPO decision, the benefits and costs from the IPO are considered as follows. First, firms can have greater access to the capital market and raise capital for company operation. Kim and Weisbach (2005) provided an empirical analysis to demonstrate that in their sample, most of the capital raised through IPOs was correlated with investment, debt repayment, and other operating-related needs. Second, as companies become bigger and more transparent (required by law to disclose financial information), listed firms are able to receive better borrowing rates and reduce credit costs.

However, the mandatory disclosure regulation can also be the cost that some firms want to avoid. Other than making the decision of going public, companies can also choose to halt the planned IPO, which further strengthens the argument that the status of the public company is a decision by the firm. Helbing et al. (2020) analyzed the determinants of IPO withdrawal from Europe. In the paper, Helbing et al. (2020) summarized the benefits and costs of going public. Since their study emphasized the IPO withdrawal, they illustrated more on the potential costs of becoming a public company.

The costs from IPO can be classified into financial and non-financial costs (Bessler et al., 2017; Helbing et al., 2020). In particular, non-financial costs such as increased oversight or scrutiny might be the reason that deterred companies from going public (Bessler et al., 2017). In this paper, I include the regulation-related variables to account for the potential scrutiny effect in certain sectors or countries.

After illustrating the tradeoff of the IPO decision, I apply the discrete choice model in the context of IPO. In this set up, the binary dependent variable accounts for the two status of the ownership structure, which is publicly traded company or not publicly traded, respectively. Using the Probit model, I find variables with different economic intuitions and try to analyze the determinants that are associated with the ownership structure of the company (publicly traded or not).

The paper is organized as follows. Section 2 is the literature review, while section 3 is the data description. Section 4 describes the model and specifications, and section 5 interprets the model results. Section 6 concludes.

2   Related Literature

2.1   IPO as a Decision

To explain the discrete choice variable (whether the company is publicly traded or not), this paper falls in the category of the IPO literature. Using the survey data BEEPS[1] from the European Bank for Reconstruction and Development, my paper differs from the existing literature in the following aspects.

Most literature studying the IPO decision included the data from financial statements, but I do not include many accounting variables in this paper. First, the extensive accounting data set is not easily accessible. Pagano et al. (1998) studied the IPO decision by analyzing the dataset of about 30,000 Italian non-financial firms. By obtaining the rich data from private firms in Italy, they were able to compare the ex-ante and ex-post characteristics by tracking the company before and after the IPO (Pagano, 1998). Second, the discrete choice model in this paper is built around survey data BEEPS which does not disclose the company identity. Because the company ID is anonymous, some standard accounting variables are omitted in the paper.

Facing the shortage of firm-level accounting data, I focus on exploiting the extensive corporate governance variables in the BEEPS data set. For example, corporate governance variables like family ownership percentage may explain the variation between IPO decisions

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[1]https://www.beeps-ebrd.com/data/

from different firms. Pagano and Roell (1998) mentioned that in European countries, share ownership tended to be more concentrated for both private and public companies. In other words, even after the company went public, the company might still maintain the ownership structure. In this paper, other than EU countries, the sample includes companies from central Europe, East Europe, Africa, and Russia. Since most observations in the BEEPS data are not from well-developed capital markets, the family ownership variable shows a certain variation (Figure 1) between companies that my model can potentially exploit.
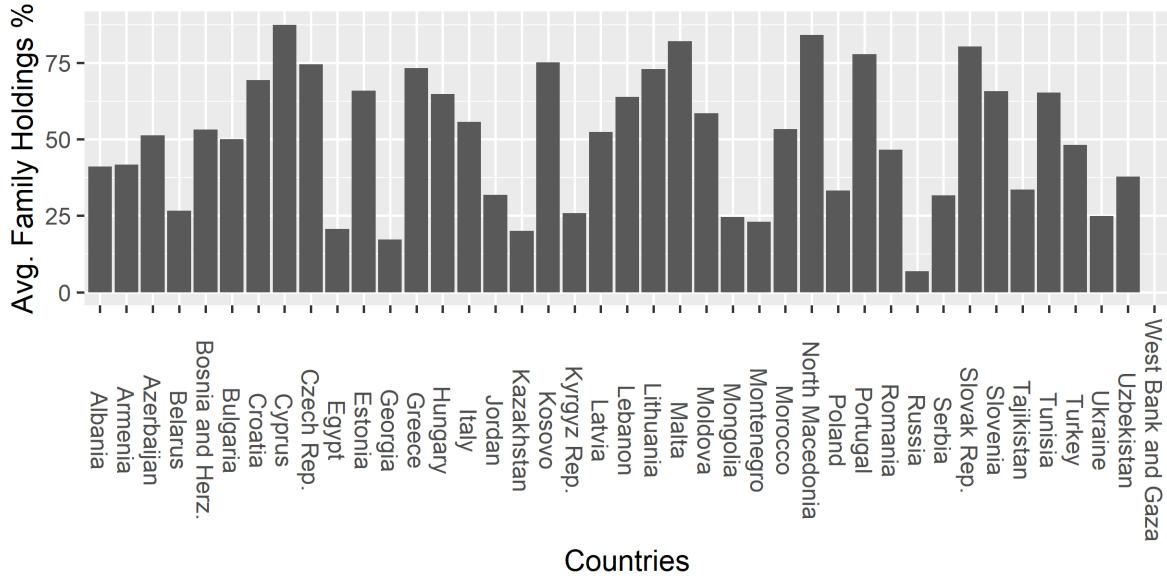
Figure 1 Avg. Family Holdings Percentage (2018-2020)

Using survey data, an important part of this paper is to address the company-level "unobserved" ability. In this context, "unobserved" refers to the anonymity of survey data, because the "unobserved" variables may be easily controlled by using the accounting variables. Facing the data constraints, this paper tries to estimate the Probit model by overcoming the lack of accounting variables. Moreover, the number of cross-section observations (company level) in the BEEPS data set is too large to estimate by individual fixed effect (totaling approximately 20,000 observations). Hence, this paper finds some individual company variables in the anonymous survey data to serve as the proxy for individual fixed effects. For example, the firm's sizes, year of establishment, are used in the model to account for this problem.

2.2 Explanatory Variables in the IPO Literature

2.2.1 Corporate Governance Variables

To investigate what associates with the probability of filing for IPOs, I first consider the incentives of top managers. In an ideal setting, top managers make decisions for their shareholders. For example, top managers are assumed to follow certain guidelines such as achieving an optimal ownership structure to match investors' expectations and always consider their shareholders as the top priority.

However, because of the principal agent's conflict of interest, existing literature showed that managers may not always make decisions that prioritize the shareholder (Hart, 1995). Since top managers in different companies may not treat their shareholders in the same way because of different degrees of conflicting interests, this paper provides an empirical analysis of the potential effect of the top management's 'loyalty' (the degrees that top management cares about shareholders) on IPO decisions.

The degrees of conflicts of interest are correlated with the IPO status. Latham and Braun (2010) concluded that stakeholders were better served while balancing principals' and agents' interests. In classical principal-agent analysis, Hart (1995) showed that governance did matter when there existed agency problems and writing contracts between the principal and agent was too costly. Therefore, the highly aligned interests between principals and agents are expected to create more company value, attract more investors, and might be associated with the IPOs, since more investors are more willing to pay for the stocks. For example, companies with better board independence are expected to have a higher IPO probability.

Hence, corporate governance variables are essential to explain the IPO decision. Helbing et al. (2019) noted that more intrinsic values were created through corporate governance mechanisms with a resource-dependent and younger company, while the agency conflicts were more prominent in an older company, but good corporate governance might preserve the existing greater intrinsic value. When the intrinsic value was higher, companies may have a higher probability to file for the IPO. Helbing et al. (2019) found that for both young and old companies, good corporate governance reduced the probability of IPO withdrawal. Hence, a set of explanatory variables considered in this paper are related to corporate

governance. For example, the age of the company, board independence, and the ownership structure are included to examine the theory empirically.

2.2.2 Regulatory Variables

After stating the potential effect of corporate governance on IPO decisions, I also consider those variables that may affect different corporate governance structures. Corporate governance mechanisms such as economic and legal institutions could be altered through the political process (Shleifer and Vishny, 1997). The evidence from Bancel and Mittoo (2009) suggested that the IPO decisions made by firms were influenced not only by the firm's ownership structure, size, and age but also by the home country's regulatory environment.

In particular, the latter one (home country's regulatory environment) influenced the uncertainty prior to an IPO (Engelen and van Essen, 2010) and thus might affect the final IPO finalization. From the individual investors' point of view, when the political and legal frameworks were more stable, the environment was considered to be friendlier so the investors might be more willing to accept the IPO (La Porta et al., 1997), then increasing the probability of the company's IPO decision. Bancel and Mittoo (2009) showed that European firms regarded outside monitoring as a major benefit to enhance stability. However, more regulations may also deter companies from going public (Bessler et al., 2017). Therefore, regulatory and economic environment variables are another set of variables worth exploring.

In the BEEPS data set, there are plenty of variables about regulatory dummies, such as environmental obstacles and trade regulations. I consider these variables in the model specification to evaluate IPO decisions.

2.2.3 Country and Time Dummy Variables

Due to the limitation of survey data, some country-specific factors might not be fully captured in my models because I have controlled only regulatory and corporate governance variables so far. Other than regulatory and economic variables, unobserved country-specific factors and risks may need to be controlled in the model because the optimal ownership structure of a company might be country-specific.

Hence, this paper believes that country dummies are necessary to be introduced in the model specifications. Figure 2 shows the number of observations for each country. In the BEEPS sample, the total number of countries is below 50, so the approach of estimating country dummies to address the potential country fixed effects is implementable.
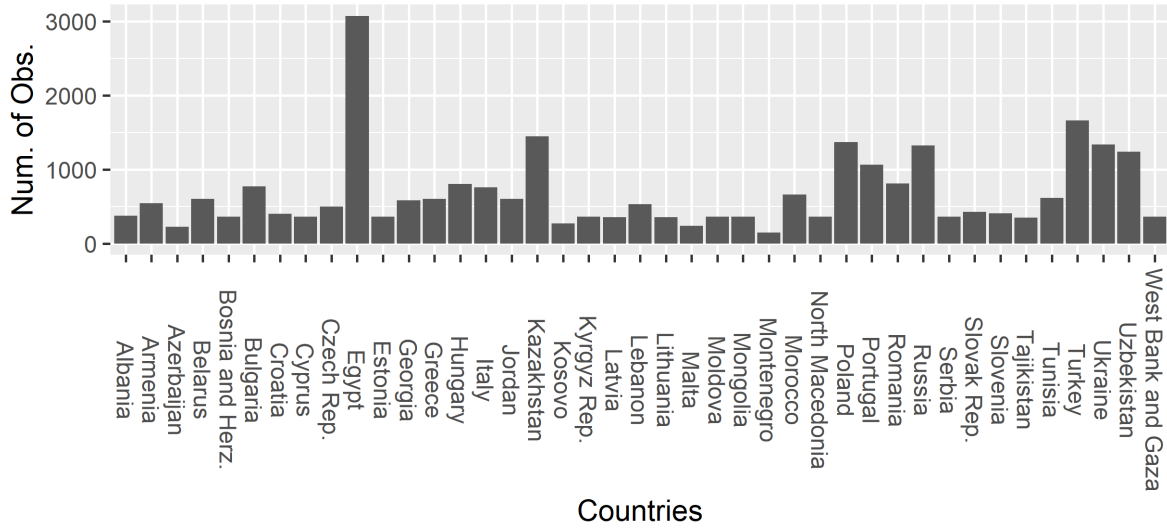
Figure 2 Observations in BEEPS (2018-2020)

I also attempt to understand whether IPO underpricing occurs in Eastern Europe because many of the companies in the sample come from those regions. If so, then the fact may partially explain why firms choose not to go public. Peterle and Berk (2016) found that IPO cycles in Central and Eastern Europe (CEE) (the main region of my data) were similar to developed economies like the US in the 2000s. Since similar patterns were detected in both developed and less-developed economies, using country dummies might be helpful to eliminate the unobserved country-specific factors in different countries and markets. Also, Peterle and Berk (2016) noted that a higher proportion of uninformed investors participated in the IPO market during economic booms, and thus indirectly contributing to the underpricing phenomenon. In other words, uninformed investors may also be an indirect determinant that may affect the firm's IPO decision. This paper recognizes the IPO as a complicated decision as suggested by Bancel and Mittoo (2009). Thus, the analysis of the effect caused by uninformed investors is not included in this paper but can be the future extension.

2.2.4 Firm-specific Variables

Good firm-specific characteristics such as a high ROE might be appealing to outside investors. When the ROE is high, it usually reflects on the stock valuations and therefore may encourage top managers to file for IPOs.

Bancel and Mittoo (2009) found the motivations for an IPO differ significantly across countries, legal systems, and firms. They suggested that large firms in Europe regarded enhanced outside monitoring as the most important benefit; small firms raised capital for larger growth potentials, and family-controlled firms thought of IPO as a vehicle to bargain against creditors without relinquishing control. This result was consistent with Helbing et al.(2019) since firms with larger sizes tended not to withdraw IPOs. In addition, companies employed private financings when equity valuation was lower (Lerner, 1994). Thus, Firm sizes and proportion of internal financing are selected as a firm-specific set of explanatory variables in this paper. In summary, the potential determinants of the IPO decision is organized in Table 1.

Table 1 Variable References for Model Specification

Variable Classification	Variable Code	Description
(a)Corporate Governance Variable		
	b4	Amongst The Owners of The Firm, Are There Any Females? (1Yes, 2NO)
	bmb1	% of the Firm Owned By The Same Family (%)
	bmb2	% of Family Members in Key Management Positions
	bmb3	Does Firm have Formalized Written Business Strategy?
	bmb4	Does Firm have Board of Directors or Supervisory Board?
	bmb5	Owner/CEO/Top Manager/Board Member Ever Elected/Appointed to Political Position?
(b)Regulatory Variable		
	bmj4a	How Much of An Obstacle? Environmental Regulations (transformed dummy)
	bmj4b	How Much of An Obstacle: Health and hygiene regulations (transformed dummy)
	bmj4c	How Much of An Obstacle: Environmental regulations (transformed dummy)
(c)Firm-Specific Variable		
	strata	Firm sizes (number of employees) [2]
	b5	Year Establishment Began Operations
	b7	How Many Years of Experience Does The Top Managers Working in this Sector Have?
	d2	In Last Fiscal Year, What Were This Establishment's Total Annual Sales?
	d2_sq	Squared of the d2 Variable
	d30b	How Much of An Obstacle: Customs And Trade Regulations?
	k3a	% of Working Capital Financed from Internal Funds
	h5	Does the Company Have New or Improved Products or Services in 3 Years?

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[2]5-19 small, 20-99 medium, 100+ large.

3 Data

3.1 Cross Sectional Company-level Survey Data (BEEPS)

BEEPS[3] is a joint initiative of the European Bank for Reconstruction and Development (EBRD) and the World Bank Group (the World Bank). The most recent round of Enterprise Surveys conducted in 2018-2020 covered 27,727 enterprises as a representative and firm-level sample respectively in 41 economies of EU, Eastern Europe, Central Asia, the Middle East, and North Africa. Business owners and top managers are interviewed in person with a broad range of business environment topics including access to finance, corruption, infrastructure, crime, competition, and performance measures in this survey. Several rounds (Table 2 illustrates how many cross-sectional surveys were conducted in the recent years) of the survey are conducted and the rounds of survey used are following the Enterprise Survey Global Methodology and stratified random sampling. The strata for BEEPS are firm size, sector, and geographic region within a country. Firm size levels are categorized by the number of employees, for example, 5-19 (small), 20-99 (medium), and 100+(large-sized firms).

Table 2 Actual Surveyed Year in BEEPS (2018-2020)

Surveyed Year	2018	2019	2020
Num. of Observations	1258	22352	4098

Despite the fact that this survey contains comprehensive questions, one of the limitations in this paper is that all variables are in Local Currency Units (LCU), and it causes difficulty in transforming nominal-term variables into real-term ones. Also, some survey questions may contain only subjective responses without precision (eg, never, minor, moderate). In this paper, I denote two of the most recent rounds (conducted in 2018-2020) of surveys by the 'Second' and the second-newest one as the 'First" survey (conducted in 2014-2020).

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[3]https://www.beeps-ebrd.com/data/

3.2 Unavailable Time Panel Structure

As mentioned earlier, BEEPS provides several rounds of company-level cross section survey data. Hence, I intended to merge different data by company data into one and manually construct a time panel structure. However, it is not suitable to merge the data set for the following reasons.

First, as Table 3 shows, the surveyed targets (different companies in different countries) are not the same in both of these data sets, so the company-level panel structure is not comprehensively preserved. Furthermore, the surveyed questions are not the same between the first-round survey (2012-2018) and the second round survey (2018-2020). With the data limitations, it is difficult to create a time panel dimension manually.

Table 3 Countries Proportion in the Sample

(First and Second Survey in BEEPS)

Country (2014-2018)	Obs.	Country (2018-2020)	Obs.
Egypt	3075	Russia	4220
Turkey	1663	Turkey	1344
Kazakhstan	1446	Ukraine	1002
Poland	1369	Kazakhstan	600
Ukraine	1337	Poland	542
Russia	1323	Romania	540
Uzbekistan	1239	Azerbaijan	390
Portugal	1062	Uzbekistan	390
Romania	814	Albania	360
Hungary	805	Armenia	360

Second, using the first round of survey data (collected from 2014 to 2018) as a basis, I merged the first round (collected from 2014-2018) of survey data with the second round of survey data (collected from 2018 to 2020) by company individual ID. By maintaining important variables such as sales or % of family members in key management positions, I lost many observations when dropping the rows with all null values. To preserve the panel structure, the observation in the data will drop to only approximately 700 individual

company observations with a concentration in countries like Russia and Greece. In other words, by manually constructing a time panel structure, I may incur another selection problem, since most companies (observations) outside Russia and Greece do not appear in both first-round survey data and second-round survey data.

Third, if I ignore the potential selection problem and continue by analyzing the manually merged data, the dependent choice variable (IPO decision) will not be binary with the first difference estimator. Since IPO status is encoded as 1 and private company status as 0 in this paper, the first difference estimator can yield the results of 1, 0, or -1. Not surprisingly, I observed this multi-choice variable in the BEEPS data. In other words, not only can the companies go public, but public companies can also choose to be delisted and switch back to private status. To address this problem, papers in the literature tend to focus on IPO company or IPO withdrawal, but not both in a cross-sectional setting (Helbing et al., 2019; Lerner, 1993; Pagano, 1998).

In this paper, I apply the binary discrete choice model on cross-sectional data because of the limitations of data and the potential problem when using the first difference estimator. Multi-choice models including the delisting decision can be a future extension of this work.

4   Model

In this paper, my model specifications are based on the binary discrete choice model considering the y^* latent variable[4] (Probit).

$$y^* = X\beta + \epsilon \tag{1}$$

where, $\epsilon \sim N(0, 1)$.

$$y^* = \begin{cases} > 0, & \text{with prob. } p \\ < 0, & \text{with prob. } 1 - p \end{cases} \tag{2}$$

Equivalently,

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[4]Lecture slides p.6-p.8 *DiscreteChoice.pdf* on Github provided by Prof. Modibo Sidibe.

$$y = \begin{cases} 1, & \text{with prob. } p \\ 0, & \text{with prob. } 1 - p \end{cases} \tag{3}$$

Hence, the probabilities of the binary dependent variable can be written as follow.[5]

$$Pr(y = 1) = \phi(X\beta) \tag{4}$$

$$L(\beta) = \prod_{i=1}^{n} F(x_i\beta)^{y_i}(1 - F(x_i\beta))^{1-y_i} \tag{5}$$

With the likelihood specified, the parameters β are estimated using numerical MLE methods.[6]

As summarized in Table 1, I consider variables from the corporate governance, regulatory, and firm-specific perspective with different specifications and try to find the determinants of the IPO decision. As Table 4 and 5 shows, I consider 10 specifications of the IPO Probit model. The interpretation of the models will be explained in Section 5.

Table 4 Model Specifications I

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	30.9493504***	30.3448567***	9.45	3.09***	30.22***
	(1.38)	(1.51)	(599.9)	(1.39)	(1.5)
b42	-0.2148032***	-0.1553891***	0.09717***	-0.21***	-0.16***
	(0.026)	(0.03)	(0.02)	(0.03)	(0.03)
b5	-0.0161688***	-0.016240***	3.965e-04***	-0.02***	-1.620e-02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
b7	-0.0027760*	-0.0004258	1.673e-04	-2.803e-03*	-7.898e-05
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
strata				-6.473e-05	1.328e-03***
				(0.00)	(0.00)
Country FE		✓	✓		✓
Surveyed Time Dummy			✓		

[5]Lecture slides p.8 *DiscreteChoice.pdf* on Github provided by Prof. Modibo Sidibe.

[6]Lecture slides p.10-p.11 *DiscreteChoice.pdf* on Github provided by Prof. Modibo Sidibe.

Table 5 Model Specifications II

	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept	-2.15***	29.2***	29.64 ***	29.6***	26.8***
	(0.02)	(1.56)	(1.5)	(1.5)	(1.5)
b42	-1.963e-01***	-1.580e-01***	-1.627e-01***	-1.641e-01***	-2.140e-01***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
b5		-1.577e-02***	-1.587e-02***	-1.581e-02***	-1.425e-02***
		(0.00)	(0.00)	(0.00)	(0.00)
b7		-3.294e-04	-2.486e-04	-3.092e-04	9.485e-04
		(0.01)	(0.01)	(0.01)	(0.00)
bmj4c	1.702e-01***	2.699e-02***	1.464e-01***	1.490e-01***	1.672e-01***
	(0.03)	(0.00)	(0.00)	(0.03)	(0.04)
d2	7.540e-12***	6.279e-12***	6.166e-12***	6.264e-12***	5.382e-12***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d2_sq	-7.489e-24***	-6.032e-24**	-5.836e-24*	-5.967e-24**	-4.975e-24*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
k3a			-1.496e-01***	-1.432e-01***	-1.037e-03*
			(0.04)	(0.04)	(0.00)
h52				-3.422e-02	
				(0.04)	
strata					1.308e-03***
					(0.00)
bmb1					-5.465e-03***
					(0.00)
bmb4					-2.128e-01***
					(0.02)
bmb5					-2.537e-02
					(0.01)
bmj4b					-6.735e-02
					(0.04)
d30b					-8.180e-03
					(0.03)
Country Fixed Effect	✓	✓	✓	✓	✓
Surveyed Time Dummy	✓	✓	✓	✓	✓

5   Result

Following the structure of Section 2, I have three categories of variables of interest (ie, firm-specific, corporate governance, and regulatory variables). Please refer to Table 1 for variable references.

The evidence shows some interesting features. First, outside monitoring may be considered as a benefit for IPO (Brau and Fawcett, 2006; Bancel and Mittoo, 2009) because regulation variables are positively associated with the probability of filing for IPO (Model 6 to Model 10). Second, firm size (strata) is positively associated with the dependent variable (IPO decision) when country dummies are controlled (Model 4 to Model 5), indicating that a firm with a larger size tends to file for IPO (Bancel and Mittoo, 2009; Helbing et al., 2019). Also, comparing Model 5 with Model 10, the coefficients show that the variable strata is somewhat consistent after controlling country fixed effects because the estimates are almost the same when adding more variables. Third, a firm with more internal financing (variable k3a in Model 8, Model 9, and Model 10) tends not to go public (Meluzín et al., 2018). Finally, top manager experience (b7) becomes insignificant in a more robust model (Model 1 compared to Model 2).

Among all regulatory variables in Model 10, the evidence indicates that there is a representative variable (bmj4c, the environmental regulation) with certain consistency. I estimate these three variables (d30b: trade regulations, bmj4b: health and hygiene, bmj4c: environmental regulations) and consider all combinations. The estimator bmj4c is always statistically significant, and the standard deviations of the estimator are small. However, the other two estimators are also significant when estimated alone, but they become insignificant when bmj4c is in presence. Hence, bmj4c may explain more than the others do, and I suggest it is because of the consistency of regulations among the countries in my sample, BEEPS. Perhaps this is because European countries tend to impose the strictest regulations on the environment.

Apart from regulatory coefficients, firm-specific coefficients report as expected (Model 8 to Model 10). For example, the more internal financing (k3a), the fewer IPO decisions would be made. This result has two implications. First, a firm with strong internal capital tends to stay private. Second, it may suggest the cost of IPO underpricing is greater than

staying private. Furthermore, I show that country-specific effects must be specified in this Probit model. Without country dummies, firm size (strata) is negative and insignificant, whereas it becomes positive controlling country-specific factors.

6   Conclusion

In summary, this paper studies the IPO decisions from companies surveyed in BEEPS. From the company's perspective, the tradeoff of the public versus private status is illustrated in this paper. Also, by reviewing the IPO game-theoretical and empirical literature, my model tries to include meaningful variables with economic insights.

In particular, this paper estimates the discrete choice Probit model with variables representing three different categories. Corporate governance, regulation, and firm-specific variables are considered in the empirical models with theoretical foundations from the existing IPO literature.

As for the interpretations of the estimation results, the effects of each possible determinant on the IPO decision are in line with the existing literature overall (both theoretically and empirically). For example, regulation and outside monitoring may be viewed as a benefit for IPO since regulation may provide stability. My estimation shows the positive association between the regulation and IPO probability. I also show the different explaining power of potential determinants by considering 10 different specifications of models in sequence.

For future work, this analysis can be extended to include more accounting variables. In this paper, the company ID is anonymous and not identifiable, so the data may lose certain objective information. Also, since many variables are categorical from the BEEPS survey, future literature can include more continuous variables. Lastly, the time panel structure is not complete in the BEEPS dataset. If data permits, future work can exploit the panel data by considering the explanatory variables and model specifications suggested in this paper.

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