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IPO underpricing from the institutional investor perspective: evidence from emerging markets

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ABSTRACT

This paper examines IPO underpricing from the institutional investor perspective in emerging markets. Observing market adjusted returns for several countries, industries, and years, results show evidence that the underpricing phenomenon is present across all emerging markets, averaging at 30.29% on the first trading day, and 27.98% for the first trading month. Underpricing particularly stands out in China, for the Basic Materials industry, during the 2007/2008 financial crisis period, increases with higher levels of property rights protection and decreases in countries with relatively more freedom from corruption. Underpricing is positively related to a country's legal framework and negatively related to the number of IPOs.

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1. Introduction

When private companies want to expand their business or raise capital one option they have is to go public. When companies decide to go public, the phenomenon of underpricing initial public offering (IPO) appears. The underpricing emerges when, on average, company shares are offered at a price lower than the market price. Over the past few years, a couple of IPOs caught a lot of media attention. Dropbox raised about $750 million with around 35% jump in the share price, from $21 to $28.35 on its listing day (Farrell & Hufford, 2018). Another famous IPO is Alibaba, which considered raising capital of over $25 billion (with 38% surge in the share price on the first trading day), becoming the largest IPO in history. In China alone, IPOs have been undervalued by about $200 billion in the past few years (Lockett & Hale, 2021).

Following on from the existing research that mainly focusses on single-country studies or on the developed stock markets only (e.g., Engelen & Van Essen, 2010; Zou et al., 2020), this study's main goal is to examine whether the underpricing phenomenon is recently present in the emerging markets and to what degree it exists in terms of financial inference.[1] It addresses the IPO procedure and the potential

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underpricing from the perspective of an institutional index-investor standpoint (for instance an endowment fund). The main research questions investigated in this study primarily aim to answer whether: i) the IPOs in emerging markets are underpriced; ii) the underpricing is present and it differs at the individual country level in all emerging markets; iii) the underpricing is present and differs among specific industries; iv) the underpricing is present and differs across years, and whether the underpricing differs across legal frameworks and is observable through various economic indicators.

Observing 3645 IPOs from 18 different countries during the period from 2003 to 2019, the findings show abnormally high first day returns and monthly returns existing in the emerging markets, hence pointing to the presence of underpricing. Additional findings suggest that underpricing is evident in all individual industries and years observed. Furthermore, results indicate that underpricing increases with higher levels of property rights protection and decreases in countries with relatively more freedom from corruption. Underpricing is also found to be positively related to a country's legal framework and inversely related to the number of IPOs.

This paper makes the following contributions. With the exception of Ramana (2019) and Hu et al. (2021), this study is amongst the few that examines IPO underpricing in emerging countries from the institutional index-investor perspective. Second, as it appears, the immediate relation between the underpricing and modeling company-specific, country-specific, and issue-specific variables in a large firm-level dataset focusing on different emerging market countries is found rather scarce in the literature. Another contribution goes towards the relatively scant literature on evaluating IPO underpricing for individual industries and defining years of *hot* and *cold markets*. Finally yet importantly, through quantifying the level of underpricing, this study also contributes to both the investor sentiment, and signaling literature (see e.g., Baker & Wurgler, 2007).

The remainder of the paper is structured as follows. Section 2 provides a theoretical background. Section 3 describes the data and the methods used. Section 4 presents the results, and Section 5 concludes.

2. Literature review

Research on share underpricing is abundant, nonetheless academics have no clear consensus on the precise explanation of the underpricing process. The existing theories can be divided into four theoretical frameworks, namely theories based on asymmetric information, institutional explanations, ownership and control theories, and behavioral finance (Ljungqvist, 2005).

The research on asymmetric information theories postulates around the famous Rock's (1986) winner's curse. Rock (1986) argues that information anomaly exists amongst investors of two types, informed and uninformed. The informed investor recognizes which firms are offered at IPOs below their true value and those that are overvalued, while the uninformed investor remains in information darkness. As a result, the informed investor will only subscribe (invest) to undervalued IPOs and the uninformed will subscribe to undervalued as well as to the overvalued IPOs. De Ridder (1986) finds evidence of the winner's curse for Sweden and England; Koh and Walter (1989) for Singapore; Levis (1990) for England; Keloharju (1993) for Finland;

Yu and Tse (2006) for China. This paper contributes to the findings in the existing literature by expanding the analyses to the vast area of emerging markets, finding statistically significant evidence of underpricing as well.

From the perspective of the institutions, the justification is that underpricing is deliberately exploited due to inefficient tax laws. Rydqvist (1997) reports that underpricing may be advantageous due to specific differences amongst income tax and capital gains tax. Rydqvist (1997) studies the case of Swedish IPOs where before a new tax law was imposed, the income tax was higher than the capital gains tax, and underpricing is taxed at the capital gains rate. As a result, many employees were paid indirectly with shares and consequently ducking the higher income tax. In addition, the underpricing declined from 41% to 8% once a new tax law was enforced. Taranto (2003) finds comparable evidence for the US markets. In his case, stock options exercised before the listing date get taxed at the offering price. This creates an incentive to intentionally set the offer price low, to reduce the amount of taxes paid, thus automatically encouraging underpricing.

Engelen and Van Essen (2010) investigate whether underpricing is country specific. They find that 10% of the variation in underpricing is explained by country specific characteristics. In addition, they argue that a country's legal framework is one of the explanations of the differences in underpricing amongst the countries, and that by improving the legal framework underpricing can be reduced. The results in this study add up to those of Engelen and Van Essen (2010), showing a negative relationship between the quality of law enforcement and underpricing, which indicates that better law enforcement reduces the amount of underpricing.

Within the investor sentiment research strain, Baker and Wurgler (2000) and Ljungqvist et al. (2006) argue that sometimes there are irrational investors who are 'over optimistic' about a firm's future cash flows. The issuing firm wants to attract as many investors as possible, because the stock's value is now higher than its real value. In this scenario the underwriter allocates big blocks of shares to the regular investors (institutional investors), who will gradually sell these shares, because a large flooding of shares at the same time will tremendously depress the share price. In addition, Baker and Wurgler (2000) even argue that firms are waiting for 'hot issue markets' (market full of sentimental investors and high underpricing) to go public.

In a more recent study, Fullbrunn et al. (2020) study the underpricing of IPOs in experimental asset markets. In a laboratory setting, assuming almost perfect market conditions, they study three IPO mechanisms (a stylized book building approach, a closed book auction, and an open book auction) and they report underpricing in each of the mechanisms. They find that uncertainty about the aftermarket behavior may explain IPO excess returns but the IPO underpricing remains significant even in the tests when uncertainty is negligible and despite equilibrium adjustment dynamics.

3. Data and methodology

3.1. Data

The comprehensive sample of IPOs during the period from January 2003 until December 2019 is retrieved from the Bloomberg database. The sample follows a five-

step construction procedure: i) firms undergoing an IPO must be incorporated in an emerging market FTSE index; ii) the value of the IPO should be at least 100 million in US dollar denomination; iii) the IPO must be a common stock offering;[2] iv) IPOs listed in Hong Kong must have a Chinese ownership background[3], and v) firms must have a record of at least 15 trading days out of 30 calendar days after the initial public offering. Out of the total number of 3861 IPOs 216 did not meet the sample construction criteria (either because of no full data or not enough trading days available), which leads to 3645 IPOs from 18 different countries left in the final sample.[4] Lastly, financial markets data, country-and industry- specific data is also collected from the Bloomberg database.

3.2. Methodology

Following Ritter (1991), Kiymaz (2000), Amihud et al. (2003), and Rathnayake et al. (2019) market adjusted returns are calculated in order to observe the level of IPO underpricing for two time intervals. The first interval, labeled as 'first day return', is defined as the difference between the offering price and the closing price on the day of listing (L). The second interval, labeled as 'first month return', is defined as the cumulative average adjusted return from the first 30 calendar days.[5] The cumulative average adjusted return for the first 30 days is used to observe a potential yield in the days after the initial listing, which in the remainder of the paper is specified as the 'after effect'. In addition, returns are adjusted to after-trading hours, holidays, as well as to the corresponding country benchmark according to the FTSE emerging market index.

To observe whether the presence of underpricing in the emerging markets is statistically significant upon various firm-, industry-, and country- specific covariates, the following model is used (see, e.g., Djankov et al., 2008; Engelen & Van Essen, 2010; Boulton et al., 2011; Chang & Kwon, 2020):

$$AR_{i,t} = \gamma_0 + \gamma_1' X_{i,t} + \gamma_2' Z_{i,t} + \sum_i \beta_3 Country_i + \sum_j \beta_4 Industry_j \sum_k \beta_5 Year_k + \epsilon_t, \tag{1}$$

where $AR_{i,t}$ is either the market adjusted 'first day return' or the market adjusted *after effect* return, and γ_0 is the regression intercept. $X_{i,t}$ is a set of country specific variables that control for: i) property rights protection (an index from 0 to 10 that measures the degree of investor protection per country and year - it is used to investigate whether there is a risk of expropriation of invested capital by governments); ii) freedom of corruption (an index that measures the freedom of corruption per country and year - it controls the chances of corruption in a firm, and thus the suboptimal behavior of managers and owners); iii) minority investor protection (an anti-self-dealing index ranging from 0 to 1 measuring the average amount of ex-ante and ex-post private control of self-dealing - it is used to capture the effect of expropriation by insiders); iv) public enforcement (an index ranging from 0 to 1 that controls quality of legal sanctions available); and v) the legal origin of the country (an indicator variable that can either be Common, French, Civil or German Civil law). A Country's legal origin is

utilized because legal systems differ in investor protection and thus influence the level of underpricing, see e.g., Gugler et al. (2004) & Engelen and Van Essen (2010)). $Z_{i,t}$ is a set of company specific control variables (the free float ratio – the amount of shares that are freely available for investors divided by the total amount of shares; and the number of IPOs)[6,7], and $Country_i$, $Industry_j$, and $Year_k$ are dummy variables for each country, industry[8], and year, respectively.

4. Results

4.1. IPO underpricing – market adjusted returns

Table 1 accompanied by Figure A1 in the Appendix summarize the results of the market adjusted underpricing model for all emerging markets as a whole, per individual country, industry, and per year. Panel A shows that for all emerging markets as a whole, the observed difference between the offering price and the closing price on the first day (L) is 30.29%, statistically significant at 1% level. When observing for *after effects*, namely L1-L10; L11-L20; L21-L30, the market adjusted return for the firms conducting an IPO is negative and statistically significant at 1%, whereas when examining the first month return, L-L30, the returns are positive and also significantly different from the benchmark. When looking at each individual country, the highest underpricing level is observed in China with an average market adjusted first day return of 40.70%. The Chinese first month return is valued at 36.90%, with statistically significant but negative returns in the between periods referring to the observed after IPO effects. The second country with highest level of underpricing (looking at the first day return) is Taiwan valuing at 27.41%, and then comes India, Indonesia, Poland, Malaysia, Thailand, etc. Brazil and the group of Other emerging markets[9] show only mild levels of underpricing, precisely 4.25% and 4.66%, respectively.

To summarize, Panel A shows that underpricing is present in all emerging countries since all of them show statistically different from the benchmark market adjusted returns on the first day of the IPO. While in the days after the listing the market adjusted returns are either with opposite sign or insignificant, one can argue that this is potentially a market correction for the first day return. The *after effect* periods can only be statistically observed for China, which by the fact is the largest contributor to the sample size with 1712 IPOs (see similar results in Wang et al., 2023).

Panel B presents an evidence of IPO underpricing for individual industries. The results indicate that all industries experience positive and significant market adjusted returns on the IPO day (L). Returns vary between 38.51% for the Basic Materials industry to 13.05% for the Financials. Differently than Panel A, statistically significant market adjusted returns for the sub-periods indicating *after effects* are present in most of the industries, which reason in part lies in the more balanced industry subsample.

Panel C presents underpricing levels in the emerging markets per year. Observing the market adjusted returns, one can see that there are periods of so-called *hot markets* (periods with high levels of underpricing)[10]. For us, these periods are the year 2003 and from the year 2007 to 2009, where the market adjusted first day return is on average just above 45%. On the other hand, years of *cold markets* (periods with

Table 1. IPO underpricing – market adjusted returns.

Country	(1) L	(2) L1-L10	(3) L11-L20	(4) L21-L30	(5) L-L30	No. of Obs.
Panel A. Underpricing per country						
All emerging markets	**30.29**%***	**−1.48**%***	**−0.49**%***	**−0.45**%***	**27.98**%***	3645
	(30.48)	**(−6.08)**	**(−2.70)**	**(−2.72)**	**(27.66)**	
Brazil	**4.25**%***	0.34%	−0.08%	0.58%	**5.09**%***	269
	(5.38)	(0.67)	(−0.22)	(1.04)	**(4.56)**	
China	**40.70**%***	**−2.49**%***	**−0.66**%***	**−0.65**%***	**36.90**%***	1712
	(28.90)	**(−8.20)**	**(−2.77)**	**(−3.00)**	**(26.12)**	
India	**17.76**%***	−0.11%	−0.80%	−0.95%	**15.89**%***	299
	(6.89)	(0.07)	(−1.14)	(−1.44)	**(5.17)**	
Indonesia	**15.68**%***	1.94%	0.11%	0.00%	**17.73**%***	227
	(6.92)	(1.15)	(0.13)	(−0.12)	**(4.70)**	
Malaysia	**11.76**%***	−0.90%	−0.91%	−0.33%	**9.61**%***	198
	(4.62)	(−0.99)	(−1.56)	(−0.50)	**(3.05)**	
Poland	**12.61**%***	0.11%	−0.73%	**−1.51**%**	**10.48**%***	200
	(3.78)	(0.09)	(−1.27)	**(−2.08)**	**(2.94)**	
Taiwan	**27.41**%***	0.02%	1.31%	−0.27%	**28.47**%***	192
	(5.87)	(0.09)	(1.12)	(−0.23)	**(5.29)**	
Thailand	**10.04**%***	−0.13%	−0.55%	**2.00**%***	**11.36**%***	214
	(3.55)	(0.02)	(−0.63)	**(2.78)**	**(3.47)**	
Other emerging markets	**4.66**%***	0.83%	0.27%	−0.08%	**5.69**%***	334
	(6.18)	(1.15)	(0.49)	(−0.05)	**(4.62)**	
Industry	L	L1-L10	L11-L20	L21-L30	L-L30	No. of Obs.
Panel B. Underpricing per industry						
Basic Materials	**38.51**%***	**−2.17**%***	**−1.04**%**	0.30%	**35.61**%***	432
	(10.62)	**(−3.33)**	**(−2.10)**	(0.54)	**(9.75)**	
Consumer Goods	**28.91**%***	**−2.08**%***	**−1.07**%**	−0.24%	**25.52**%***	521
	(12.93)	**(−3.51)**	**(−2.35)**	(−0.55)	**(11.34)**	
Consumer Services	**23.87**%***	−0.44%	0.31%	**−0.98**%*	**22.76**%***	339
	(7.55)	(−0.53)	(0.58)	**(−1.94)**	**(6.68)**	
Financials	**13.05**%***	−0.29%	0.10%	−0.27%	**12.59**%***	462
	(8.17)	(−0.43)	(0.32)	(−0.83)	**(6.89)**	
Health Care	**37.52**%***	−1.37%	1.20%	**−1.60**%*	**35.74**%***	245
	(10.72)	(−1.09)	(1.09)	**(−1.85)**	**(9.07)**	
Industrials	**38.17**%***	**−2.41**%***	−0.54%	−0.38%	**34.84**%***	789
	(17.98)	**(−5.20)**	(−1.54)	(−1.18)	**(16.76)**	
Oil & Gas	**25.18**%***	0.93%	0.22%	−1.25%	**25.08**%***	208
	(5.15)	(0.79)	(0.23)	(−1.19)	**(5.18)**	
Technology	**34.31**%***	−0.91%	**−1.35**%**	−0.62%	**31.43**%***	313
	(10.75)	(−0.88)	**(−2.02)**	(−0.92)	**(9.50)**	
Telecommunications	**21.90**%***	1.61%	−0.24%	0.03%	**23.29**%***	143
	(3.77)	(0.65)	(−0.18)	(0.01)	**(4.30)**	
Utilities	**19.80**%***	−1.00%	−1.25%	**−1.53**%*	**16.02**%***	193
	(4.38)	(−1.08)	(−1.49)	**(−1.90)**	**(3.25)**	
Year	L	L1-L10	L11-L20	L21-L30	L-L30	No. of Obs.
Panel C. Underpricing per year						
2003	**52.49**%***	−1.40%	**−2.71**%***	**−1.49**%**	**46.90**%***	90
	(10.55)	(−1.40)	**(−4.32)**	**(−2.26)**	**(9.43)**	
2004	**37.83**%***	**−2.06**%**	**−1.11**%*	**−1.99**%***	**32.68**%***	142
	(9.50)	**(−2.11)**	**(−1.81)**	**(−3.24)**	**(8.28)**	
2005	**14.03**%***	−0.34%	−0.25%	−0.06%	**13.38**%***	102
	(5.56)	(−0.42)	(−0.51)	(−0.09)	**(5.07)**	
2006	**31.63**%***	0.33%	0.46%	−1.00%	**31.41**%***	188
	(10.61)	(0.35)	(0.55)	(−1.51)	**(10.18)**	
2007	**49.66**%***	0.17%	−0.19%	**−0.87**%*	**48.77**%***	328
	(10.98)	(0.33)	(−0.33)	**(−1.68)**	**(10.81)**	
2008	**52.12**%***	**−3.63**%***	**−2.76**%***	**−2.57**%***	**43.15**%***	124
	(7.94)	**(−2.62)**	**(−2.89)**	**(−2.97)**	**(6.97)**	

(*continued*)

Table 1. Continued.

Country	(1) L	(2) L1-L10	(3) L11-L20	(4) L21-L30	(5) L-L30	No. of Obs.
2009	**45.38%*****	**−3.92%*****	**3.49%*****	**1.93%*****	**46.87%*****	168
	(12.59)	**(−4.44)**	**(3.92)**	**(2.86)**	**(12.14)**	
2010	**30.02%*****	**−2.49%*****	**−1.66%*****	−0.36%	**25.51%*****	527
	(17.57)	**(−4.64)**	**(−4.66)**	**(−0.98)**	**(14.83)**	
2011	**14.05%*****	**−1.66%*****	−0.34%	−0.23%	**11.82%*****	395
	(10.58)	**(−3.38)**	(−0.81)	(−0.58)	**(7.62)**	
2012	**16.90%*****	**−1.47%***	−0.18%	−0.20%	**15.05%*****	263
	(9.78)	**(−1.86)**	(−0.31)	(−0.48)	**(7.41)**	
2013/2019	**7.89%*****	0.88%	0.28%	0.88%	**9.93%*****	1318
	(5.11)	(0.96)	(0.43)	(1.46)	**(4.68)**	

Note: Average market adjusted returns are presented in Panel A, Panel B, and Panel C on country-, industry-, and year basis, respectively. Column (1) presents the estimates of the 'first day return' which is defined as the difference between the offering price and the closing price on the day of listing (L). Column (2) – Column (5) present the 'after effect' intervals. Asterisks *, **, and *** denote significance of the standard t-tests (presented in brackets) at 10%, 5%, and 1% levels, respectively. Although not reported, difference-in-means tests for each group support the statistical significance of the results.
Source: author's calculations using data from the Bloomberg database.

low levels of underpricing) are the year 2005, and from the year 2011 to 2019, with returns not exceeding 20%. All first day returns are statistically significant at 1% level, and first month results reveal similar characteristics as when observing underpricing levels for individual countries and industries.

The highest levels of underpricing are observed during the 2007/2008 financial crisis, where one could speculate that investors due to the increased uncertainty of firms' aftermarket performance demand higher levels of underpricing. Comparing this result to the results of Ritter (2020) from the US market, other potential reason for the abrupt underpricing surge during the 2007/2008 financial crisis period could be that emerging market firms are relatively harder to value, due to the absence of traditional firm-quality indicators (Sanders & Boivie, 2004). Yet another reason may be due to the preluding sentiment of the investors whose expectations of future firm performance are too high (Ljungqvist et al., 2006; Gupta et al., 2022). Last but not least, the statistically insignificant results in some of the *after effect* periods do not mean that there is no underpricing effect present, but that it cannot simply be observed.

4.2. Multivariate regression

The results from examining the effect of country-, firm-, industry-, and year-specific controls on the IPO underpricing are presented in Table 2. Malaysia, Utilities, Common Law, and period 2013/2019 are used as a baseline for the dummy variables to resolve the potential collinearity. All analyses are performed with the robust standard errors option and errors are presented in brackets.

In general, all country-specific variables are statistically significant on at least 10% level in periods L and L-L30. The property rights protection coefficient for the listing day (L) is positive, 1.242, and statistically significant at 1% level. This result indicates that when there is a higher level of property rights protection, underpricing increases. On the other hand, the coefficient on the control for freedom from corruption is negative and yet again significant at 1% level. This coefficient rather suggests that when a firm is listing in a country with relatively more freedom from corruption,

Table 2. Multivariate regression.

Variable	(1) L	(2) L1–L10	(3) L11–L20	(4) L21–L30	(5) L–L30
Property rights protection	**1.242*****	−0.008	−0.003	−0.006	**1.227*****
	(0.237)	(0.008)	(0.050)	(0.054)	**(0.260)**
Freedom of corruption	**−2.034*****	−0.048	0.017	−0.105	**−2.157*****
	(0.317)	(0.104)	(0.067)	(0.072)	**(0.351)**
Minority investor protection	**72.968*****	7.098	0.070	4.426	**83.730*****
	(13.255)	(5.075)	(3.670)	(3.800)	**(15.088)**
Public enforcement	**−8.573***	0.82	0.731	−1.006	−8.437
	(5.062)	(2.027)	(1.313)	(1.223)	(5.682)
French civil law	**23.511*****	2.371	−0.065	1.158	**27.270*****
	(6.934)	(3.944)	(1.943)	(2.064)	**(8.724)**
German civil law	**45.303*****	**−4.261***	−1.026	**−5.039*****	**35.554*****
	(6.944)	**(2.230)**	(1.736)	**(1.879)**	**(7.609)**
Free float ratio	**−8.573****	**2.254***	0.158	−0.286	−6.296
	(4.296)	**(1.366)**	(0.986)	(0.908)	(4.682)
Number of IPOs	**−0.026*****	**0.006****	**−0.008*****	**−0.004****	**−0.032*****
	(0.008)	**(0.002)**	**(0.002)**	**(0.002)**	**(0.009)**
Brazil	**−28.195****	3.612	1.940	1.600	**−10.443***
	(7.933)	(3.794)	(2.049)	(1.945)	**(10.225)**
China	**19.011****	3.781	1.976	2.321	**16.370***
	(6.374)	(2.861)	(2.184)	(2.006)	**(9.538)**
India	−10.803	3.254	0.936	−0.918	−7.714
	(6.819)	(2.745)	(1.703)	(1.752)	(7.868)
Indonesia	**−16.621*****	2.374	1.820	−3.435	**−27.704****
	(9.689)	(4.839)	(2.530)	(2.595)	**(11.950)**
Poland	**14.812****	3.179	1.991	0.474	−9.638
	(7.316)	(3.690)	(1.900)	(1.799)	(9.663)
Taiwan	**−18.959***	**9.915****	1.084	**6.551***	−2.601
	(10.183)	**(3.891)**	(3.092)	**(3.401)**	(11.450)
Thailand	−14.991	**9.317****	4.377	**7.119***	4.756
	(12.971)	**(4.511)**	(3.623)	**(3.668)**	(14.708)
Other emerging markets	**−23.288*****	1.394	1.385	0.946	**−19.774****
	(7.316)	(2.658)	(1.754)	(1.748)	**(8.405)**
Basic Materials	3.217	−0.411	0.380	**2.202****	5.307
	(5.022)	(1.127)	(1.049)	**(0.896)**	(5.514)
Consumer Goods	−3.551	0.054	0.173	**1.691****	−1.632
	(4.492)	(1.101)	(1.024)	**(0.835)**	(5.022)
Consumer Services	**8.017***	0.110	1.040	0.437	**9.808***
	(4.733)	(1.150)	(1.038)	(0.878)	**(5.324)**
Financials	−3.219	−0.350	1.199	1.255	−1.182
	(44.036)	(1.111)	(0.976)	(0.795)	(4.975)
Health Care	4.412	0.915	1.462	0.977	7.802
	(5.195)	(1.521)	(1.182)	(1.008)	(5.947)
Industrials	2.314	−0.123	0.770	**1.469***	4.353
	(4.427)	(1.054)	(0.977)	**(0.802)**	(4.940)
Oil & Gas	−4.325	2.788	1.183	0.271	0.008
	(5.771)	(1.676)	(1.571)	(1.263)	(6.270)
Technology	−3.450	1.615	−0.290	1.123	−0.869
	(4.887)	(1.361)	(1.150)	(1.016)	(5.396)
Telecommunications	−2.495	1.981	0.303	1.696	1.164
	(7.325)	(2.940)	(1.815)	(1.315)	(6.909)
2003/2004	0.358	−1.091	−1.074	**−2.517*****	−5.071
	(3.588)	(1.372)	(0.877)	**(0.888)**	(4.068)
2005/2006	3.712	−1.038	0.466	**−1.497***	1.656
	(2.928)	(1.248)	(0.867)	**(0.859)**	(3.507)
2007/2008	**31.845*****	−1.556	0.407	**−1.971****	**28.793*****
	(3.767)	(1.330)	(0.939)	**(0.891)**	**(4.212)**
2009/2010	4.535	**−3.490*****	**2.580****	0.876	4.360
	(3.679)	**(1.361)**	**(1.060)**	(0.955)	(4.310)
2011/2012	**−18.252*****	−1.793	**1.886****	0.050	**−18.060*****
	(3.123)	(1.255)	**(0.897)**	(0.842)	**(3.721)**

(*continued*)

Table 2. Continued.

Variable	(1) L	(2) L1–L10	(3) L11–L20	(4) L21–L30	(5) L–L30
# of Observations	3426	3426	3426	3426	3426
R-squared	0.293	0.035	0.021	0.0296	0.239

Note: Table 2 summarizes the results of the regression analyses excelled in model (1) where Malaysia, Utilities, Common Law, and period 2013/2019 are used as a baseline for the dummy variables to resolve the potential collinearity. Column (1) presents the estimates of the 'first day return' which is defined as the difference between the offering price and the closing price on the day of listing (L). Column (2) – Column (5) present the 'after effect' intervals. Between brackets are robust standard errors, and *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.
Source: author's calculations using data from the Bloomberg database.

underpricing is lower (see also, Wang & Song, 2021). The coefficients for the minority investor protection and public enforcement are positive 72.968 and negative 8.573, respectively. The finding regarding the minority investor protection is contradicting the evidence found by Engelen and Van Essen's (2010) when examining underpricing among the developed countries. They find that developed countries with higher levels of minority protection have lower levels of underpricing since better protection decreases the level of ex-ante uncertainty for the investors (see also, Liu et al, 2014a, 2014b). The coefficients regarding the *reversal effects* are mildly significant with the exception to the L-L30 period, which follows similar sign pattern as the coefficients in column (1). Finally, the coefficients regarding countries' legal origin demonstrate positive coefficients on the first day of 23.511 and 45.303 for the French civil law countries and for the German civil law countries compared to Common law countries, respectively. This finding relates to La Porta et al. (2002), Cheung et al. (2009), and Engelen and Van Essen's (2010) expectations that due to a better legal framework in Common law countries, ex-ante uncertainty should be less and therefore lower levels of underpricing should be observed.

From the firm specific variables, the free float ratio coefficient is negative and statistically significant at 5% level indicating that a percentage point increase in the free float ratio would lower the level of underpricing. The negative sign of the coefficient could be argued to be an evidence of the signaling theory (see e.g., Grinblatt & Hwang, 1989; Yatim, 2011). Firms which bring only a small percentage of the shares to the financial market, could deliberately underprice the shares in order to give investors 'a good taste in their mouth' for future offerings. On the other side, low quality firms would bring all their shares to the exchange at once, consequently trying to set the offering price as close as possible to the real value, so that they do not leave large amounts of money on the table (see e.g., Allen & Fulhaber 1989; Ramana, 2019; Wu & Reuer, 2021). The negative coefficient of the number of IPOs indicates that with each additional IPO in a given year, the level of underpricing decreases. This means that if there were already 100 IPOs conducted in the same year the underpricing should be 2.60% lower on average. Examining the first month return displays similar results as the first day return, let alone the public enforcement and the free float ratio coefficients that are insignificant.

Observing the country dummies, the outcomes indicate that highest level of underpricing is recorded in China. This result corresponds to the previous findings in Table 2.

When controlling for individual industries, the *Technology* industry has the highest level of underpricing on the first day. This corresponds to Ritter (1984), Karlis

(2000), Beard et al. (2002), and Chang and Kwon (2020) who argued that technology sector should experience higher levels of underpricing due to more valuation uncertainty. Oil and Gas firms on the other hand show the lowest levels of underpricing.

Next, observing the year dummies show that, on the first day, the highest underpricing is seen in 2007/2008 where the coefficient is positive 31.845 and statistically significant at 1% level. This result suggests that during the 2007/2008 financial crisis investors demanded relatively high levels of underpricing. One reason could be due to the increased ex-ante uncertainty. Another potential reason could be the investor sentiment that drove up the firm value beyond its real value.

Last but not least, Table A2 in the Appendix presents robustness check results where the focus of the analysis is on the period after the 2007/2008 financial crisis. The robustness check estimations of individual control variables correspond to the main results, however the level of underpricing for this period is of somewhat lower magnitude. This finding indicates that underpricing fluctuates over time (e.g., Ibbotson et al. 2001).

5. Concluding remarks

This study documents the presence of the IPO underpricing phenomenon and its magnitude in the emerging markets from January 2003 until December 2019. Tests reveal that underpricing is present among all emerging countries, it differs between individual industries, and has its peak in specific years.

Namely, among the emerging markets, the highest level of underpricing is recorded in China. When controlling for individual industries, the technology industry has the highest level of underpricing on the first trading day, which according to Chang and Kwon (2020) comes as a result of more valuation uncertainty. On the other hand, oil and gas firms show the lowest levels of underpricing. Next, observing year effects shows that highest underpricing is in the period 2007/2008, which indicate that during financial crisis investors demanded more underpricing. When observing protection rights and corruption, results indicate that when there is higher level of property rights protection, underpricing increases. On the other hand, the findings on the control for freedom from corruption rather suggest that when a firm is listing in a country with relatively more freedom from corruption, underpricing is lower. Further estimations on the role of legal frameworks conclude that in common law countries ex-ante uncertainty is less and therefore lower levels of underpricing are observed.

Last but not least, robustness tests focus the analyses on the period after the 2007/2008 financial crisis. The estimations of individual control variables correspond to the main results, however the level of underpricing for this period is of somewhat lower magnitude.

This study is limited in few ways. One limitation is that there is no differentiation made among various types of investors. Another limitation would be resolved if one includes several additional control variables, and thus try to clarify what causes the underpricing phenomenon and what explains the variation in the underpricing. In addition, these controls would also report on the potential sentiment return reversal effect in the post-issuance hype of the stock. Another limitation is that the study focuses inside the range of emerging markets without cross-market benchmarking

with the developed markets. Yet another limitation is that the study does not incorporate the COVID-19 period. However, it is important and worth documenting the underpricing effect in the emerging countries as the existing research is surprisingly limited to single country studies; and investors may find the bottom-line results of this study as an incentive to reconsider their strategies.

Disclosure statement

No potential conflict of interest was reported by the author.

Notes

1. The term emerging market describes nation's socio-economic activity in the process of prompt industrialization (FTSE Classification of Equity Markets, 2019).
2. This means Unit-, ADR-, MLP-, Receipt- and royalty trust IPOs have been excluded. Common stock offerings are perceived to be "pure" investments (no external factors) whereas other types of offerings could be influenced by additional factors (Tiniç, 1988).
3. China is considered to be an emerging market whereas Hong Kong is classified as a developed market (FTSE Classification of Equity Markets, 2019).
4. Table A.1 in the appendix presents the number of IPOs per country.
5. Cumulative average adjusted returns are calculated using the sum of all returns from that period (arithmetic). The effect of using arithmetic returns is that this leads to underestimation bias. However, one could argue that differences between arithmetic and geometric returns would be small in the case of first month returns, since most of the first month's return is made on the first day (e.g. Ritter, 1991; Rock, 1986).
6. The free float ratio is measured on the listing day. Welch (1989) argues that firms underprice in order to signal high quality and are rewarded for this underpricing during secondary offerings by investors. Firms that apply this signaling method will only bring a small fraction of the firm to the market (free-floating shares), to make underpricing losses as small as possible, and the secondary offering as rewarding as feasible.
7. Institutional investors only have limited funds available for investing in IPOs, thus when there are relatively many IPOs in a year, investors demand higher underpricing because there is an oversupply of IPOs and scarcity of money (see also, Allen et al., 1999; Chorruk & Worthington 2010).
8. Firms are classified in 10 industry groups according to the FTSE industry classification benchmark (ICB).
9. For a consistent statistical inference, if a country has less than 50 observed IPOs it is placed in the trench "Other emerging markets". Table A1 and graph A1 present the countries distribution of the sample.
10. Helwege and Liang (2004) note that hot IPO markets are characterized by high volume of offerings, high levels of underpricing and oversubscription of offerings. Cold markets on the other hand, are associated with low IPO volume, reduced underpricing and reduced oversubscription of offerings.

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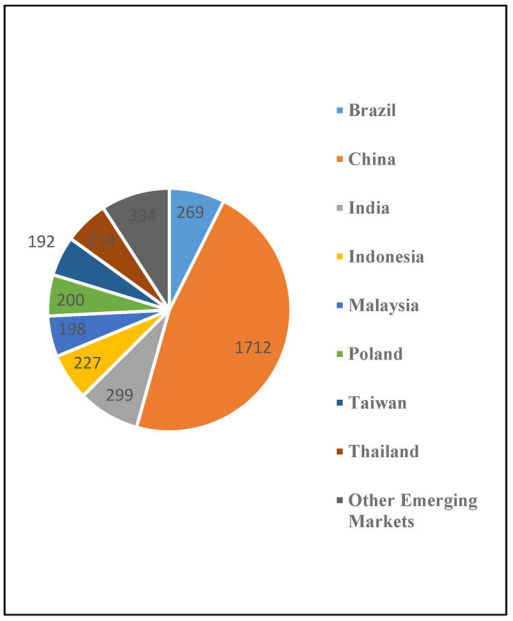
Appendix

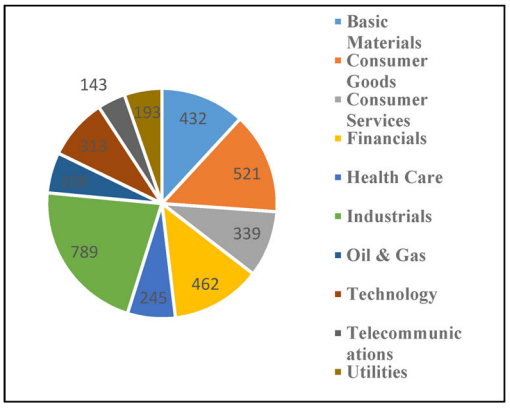
Table A1. Number of IPOs and related benchmarks per country.



Country	No. of IPOs	Benchmark
Brazil	269	FTL1BR Index
Chile	30	FTL1CL Index
China	1712	FTL1CH Index
Columbia	15	FTL1CO Index
Czech	23	FTL1CZ Index
Hungary	41	WIHUN Index
India	299	FTL1ID Index
Indonesia	227	FTL1IN Index
Malaysia	198	FTL2MA Index
Mexico	39	FTL2MX Index
Peru	13	FTL2PE Index
Philippines	22	FTL2PH Index
Poland	200	FTL2PD Index
Russia	53	FTL2RU Index
South Africa	40	FTL2SA Index
Taiwan	192	FTL2TA Index
Thailand	214	FTL2TH Index
Turkey	58	FTL2TU Index

Source: author's calculations using data from the Bloomberg database.

Table A2. Number of IPOs per industry.



Industry	No. of IPOs
Basic Materials	432
Consumer Goods	521
Consumer Services	339
Financials	462
Health Care	245
Industrials	789
Oil & Gas	208
Technology	313
Telecommunications	143
Utilities	193

Source: author's calculations using data from the Bloomberg database.

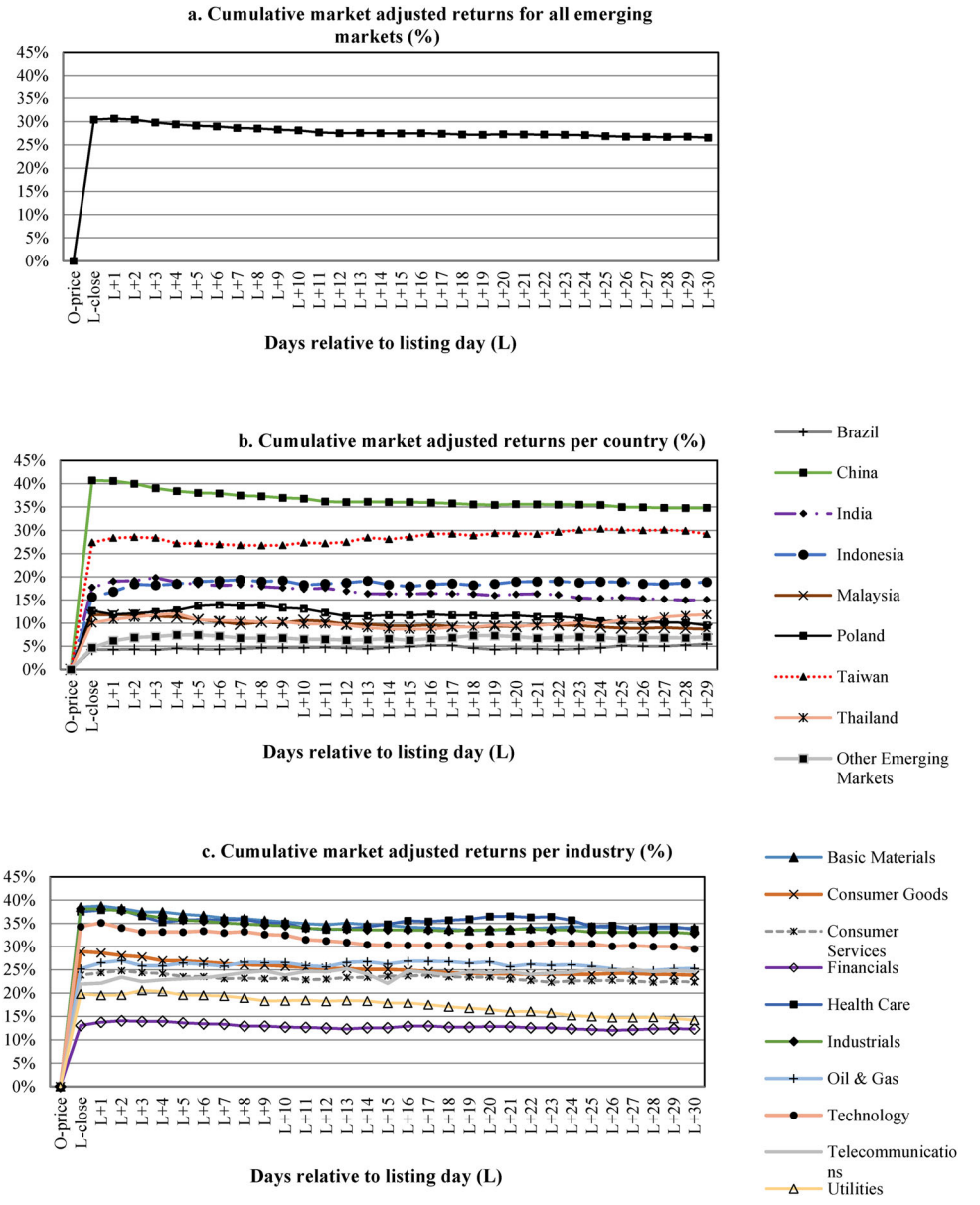


Figure A1. Cumulative market adjusted returns.
Source: author's calculations using data from the Bloomberg database.

Table A3. Multivariate regression.

Variable	(1) L	(2) L1–L10	(3) L11–L20	(4) L21–L30	(5) L–L30
Property Rights	0.368	−0.012	−0.030	−0.008	0.316
	(0.265)	(0.079)	(0.052)	(0.052)	(0.279)
Freedom from Corruption	**−1.063**	−0.038	0.033	**−0.107**	**−1.156**
	(0.313)***	(0.103)	(0.070)	**(0.071)****	**(0.342)*****
Minority investor protection	**47.742**	6.561	0.600	4.399	**58.468**
	(12.381)***	(5.139)	(3.744)	(3.791)	**(13.880)*****
Public Enforcement	−5.071	0.736	0.843	−1.049	−4.932
	(4.691)	(2.018)	(1.294)	(1.232)	(5.351)
French civil law	**17.180**	2.617	−0.166	1.004	**20.959**
	(6.459)***	(3.934)	(1.930)	(2.074)	**(8.158)*****
German civil law	**22.182**	**−4.193**	−1.944	**−5.372**	11.169
	(7.947)***	**(2.201)***	(1.745)	**(1.865)*****	(8.480)
Freefloat ratio	**−14.824**	**2.599**	0.037	−0.337	**−12.354**
	(4.251)**	**(1.369)***	(0.995)	(0.913)	**(4.684)*****
Number of IPOs	**−0.017***	0.002	**−0.005**	**−0.002**	0.001
	(0.006)	(0.002)	**(0.002)*****	**(0.001)***	(0.007)
Brazil	−12.569	3.040	2.752	1.776	−5.948
	(6.701)*	(3.754)	(2.0238)	(1.918)	(9.226)
China	**17.845**	3.346	2.707	2.523	**25.734**
	(8.035)**	(2.856)	(2.194)	(1.991)	**(9.226)*****
India	−10.629	2.961	1.743	−0.823	2.142
	(6.756)	(2.675)	(1.683)	(1.710)	(7.659)
Indonesia	**−18.855**	2.196	1.926	−3.443	**−18.436**
	(8.543)**	(4.796)	(2.498)	(2.615)	**(10.978)***
Poland	**11.327**	2.868	2.531	0.583	−5.786
	(6.371)*	(3.653)	(1.864)	(1.789)	(8.786)
Taiwan	−5.954	**9.444**	2.596	**6.933**	11.933
	(10.484)	**(3.804)****	(3.140)	**(3.325)****	(11.701)
Thailand	8.684	**9.081**	5.917	**7.420**	3.019
	(13.782)	**(4.414)****	(3.670)	**(3.601)****	(15.399)
Other Emerging markets	**−10.312**	1.626	1.483	0.846	−6.502
	(7.256)***	(2.637)	(1.777)	(1.758)	(8.228)
Basic Materials	4.556	−0.323	−0.489	**2.161**	6.835
	(5.179)	(1.105)	(1.027)	**(0.894)****	(5.620)
Consumer Goods	−2.710	0.175	0.239	**1.649**	−0.617
	(4.518)	(1.142)	(1.005)	**(0.832)****	(4.991)
Consumer Services	**8.412**	0.273	1.076	0.376	**10.377**
	(4.854)*	(1.142)	(1.021)	(0.876)	**(5.418)***
Financials	1.035	−0.201	0.127	1.204	3.280
	(4.341)	(1.083)	(0.946)	(0.784)	(4.840)
Health Care	5.261	1.000	1.494	0.910	8.726
	(5.331)	(1.535)	(1.165)	(1.008)	(6.030)
Industrials	4.143	−0.054	0.878	**1.440**	6.359
	(4.465)	(1.063)	(0.956)	**(0.799)***	(4.925)
Oil & Gas	−1.441	**2.862**	1.339	0.258	3.143
	(5.856)	**(1.665)***	(1.563)	(1.275)	(6.290)
Technology	**8.659****	2.641	−0.186	1.113	**6.060****
	(3.040)	(1.372)	(1.114)	(1.017)	**(2.523)**
Telecommunications	0.399	2.083	0.426	1.596	4.230
	(7.348)	(2.884)	(1.716)	(1.317)	(6.859)
2009/2019	**−30.518**	−0.496	**1.423**	**2.231**	**−27.421**
	(3.094)***	(0.742)	**(0.556)****	**(0.519)*****	**(3.226)*****
# of Observations	3426	3426	3426	3426	3426
R-squared	0.2437	0.0308	0.0169	0.0238	0.1914

Note: Table A3 summarizes the results of the regression analyses excelled in model (1) where Malaysia, Utilities, Common Law, and period 2003/2008 are used as a baseline for the dummy variables to resolve the potential collinearity. Column (1) presents the estimates of the 'first day return' which is defined as the difference between the offering price and the closing price on the day of listing (L). Column (2) – Column (5) present the 'after effect' intervals. Between brackets are robust standard errors, and *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.

Source: author's calculations using data from the Bloomberg database.