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Why Do Companies Choose to Go IPOs?

New Results Using Data from Taiwan

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Abstract

In this study, we examine the determinants of firms' IPO decisions in Taiwan, for the sample period of 1989 to 2000. The regulations in Taiwan permit us to identify firms that met IPO requirements but chose not to go public. The unique regulatory environment allows a clear comparison of firms that choose IPOs and those that do not. With the exception of Pagano, Panetta and Zingales (1998), we are not aware of any similar study. Their paper examines the IPO market in Italy, and there seem to be considerable differences between that market and Taiwan market. Indeed, we find strong evidence that IPOs are not motivated by financing needs or constraints while they do. Some of our results are nevertheless consistent with theirs -- in particular, we find that larger and profitable firms are more likely to list equity. Our other findings also provide support for, though not overwhelmingly, information asymmetry, listing costs, liquidity, owners' diversification desire, and market timing as factors influencing IPO decisions. Finally, we present evidence strongly consistent with venture capital providing certification to firm credibility.

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Introduction

Research in initial public offerings (IPOs) is vast and has been growing at a faster pace in recent years (Varshney and Robinson (2004)). However, the research has been mostly concentrated on post-IPO performances and markets. Moreover, as Ritter and Welch (2002) state “For the most part, formal theories of IPO issuing activity are difficult to test. This is because researchers usually only observe the set of firms actually going public. They do not observe how many private firms could have gone public.” One notable exception is Pagano, Panetta and Zingales (1998, hereinafter PPZ) that studies IPOs in Italy.¹ Their study indicates that IPOs are relatively infrequent events in Italy—only 69 firms conducted IPOs in their sample period of 1982 to 1992, which is just a fraction of over 10,000 public companies in that country. Moreover, the breath of the IPO market is fairly low; firms that undertook IPOs typically are well-established, large firms; and venture capital is inactive in the Italian market. In contrast, the IPO market in the US is characterized by high liquidity, abundance of small firms and growth-oriented firms, and active participation by venture capitalists. The IPO markets in some Asian countries exhibit characteristics that are more similar to the US market than to the Italian market. For instance, the venture capital market is fairly active in Taiwan, which is not surprising in that many executives, scientists, and entrepreneurs are familiar with the US market and, in many cases, trained in the US.² More important to our study, pre-issue data is

¹ Another is Lerner (1994) that finds market-to-book ratio is an important determinant of going public. However, he examines only one industry: Biotech.

² The number of venture capital firms in Taiwan is 48 in 1996 and 199 in 2001.

available for most firms in Taiwan owing to regulations. Specifically, the government requires all firms that exceed a minimum asset size to file financial statements with the SEC there, even if their shares are not publicly traded.

In order to make our results comparable to those in PPZ (1998), we use a methodology that closely follows theirs. Moreover, we have additional data unavailable in their study. Consequently, we extend their study by including venture capital involvement, free cash flows, and R&D expenditures in the analysis.

We find some differences between results of PPZ (1998) and ours. Consistent with their evidence, we show that the probability of going public is greater for larger and profitable firms. Unlike theirs, we do not find strong evidence that firms in industries with higher industry market-to-book ratios are prone to issue new shares. In fact, for firms that are not in the electronics industry, the tendency is the opposite. PPZ (1998) also conclude that the primary motive for firms to raise fund through public offering is restructure of financing or a reduction of the outstanding debt. Our results, on the other hand, imply that financing need is not a strong motive for IPO. We also find evidence that the involvement of venture capital raises the likelihood of going IPO.

Sample, Methodology and Hypotheses

Our sample covers the period of 1989 to 2000 and consists of 383 firms that went IPOs and 522 firms that met listing requirements but chose not to go for IPOs in the period. The data source is Taiwan Economic Journal, which contains financial statements of all firms, publicly traded or not. The information on venture capital involvement comes from the venture capital association in Taiwan. In Taiwan, listing requirements

are well defined though vary across time.³ Also, the listing requirements of the over-the-counter (OTC) market generally are less stringer than those used in Taiwan Stock Exchange (TSE). As a result, we need to carefully examine all financial statements to screen out those that satisfy the requirements but elect not to undertake IPOs. The following Probit regression is then employed to estimate the probability of IPO. Note that the regression makes use of both cross-sectional and time-series data. After a firm undertakes IPO, the firm's data on subsequent years is not used in the regression analysis. The sampling procedure and regression closely follows those of PPZ (1998), so differences in the results cannot be attributable to variations in methodologies. Nevertheless, we do extend their analysis by including variables that reflect venture capital participation, free cash flows, and R&D expenses. Additionally, the OTC market was not established until 1995, thus we repeat the analysis for the sub-period 1995-2000. This can also serve as a robustness check.⁴ The Probit regression is stated as follows.

$$\begin{aligned} \text{Prob (IPO}_{i,t}\text{)} = & F(\alpha_1 * \text{SALES}_{i,t-1} + \alpha_2 * \text{CAPEX}_{i,t-1} + \alpha_3 * \text{R\&D}_{i,t-1} + \alpha_4 * \text{ROA}_{i,t-1} \\ & + \alpha_5 * \text{D/A}_{i,t-1} + \alpha_6 * \text{INT}_{i,t-1} + \alpha_7 * \text{M/B}_{i,t-1} + \alpha_8 * \text{GROWTH}_{i,t-1} + \alpha_9 * \text{FCF}_{i,t-1} \\ & + \alpha_{10} * \text{VC}_{i,t-1}) \end{aligned}$$

where $\text{IPO}_{i,t}$ is a dummy variable that takes on the value of one for i 'th firm that goes IPO in year t ; SALES is the log of sales a year before; CAPEX represents the rate of increase in fixed assets; R&D is computed as R&D expense over total assets; ROA is EBIT

³ For Example in 1995, the primary listing standards for Taiwan Stock Exchange are: capital is in excess of NT\$0.2 billion (roughly \$6 million using current exchange rate), pre-tax return on capital has been at least 5% for two consecutive years, number of shareholders is at least 2,000, and that equity ratio is over 1/3. The OTC requirements are less demanding and have no restrictions on equity ratios.

⁴ PPZ (1998) perform separate analyses of carve-outs and independent companies. We do not do that here, since carve-outs are very few in Taiwan.

divided by total assets; ; D/A represents the debt-to-asset ratio; INT measures effective interest rate, estimated by interest plus amortization expenses divided by the outstanding debt amount; M/B is the industry median market-to-book ratio; GROWTH is sales growth rate; FCF is free cash flow, calculated as income before interest, tax, and depreciation minus interest and dividends, normalized by total assets; and VC is a dummy variable that equals one if venture capital is involved and zero otherwise. As in PPZ (1998), a variable that represents the year when IPO is conducted is added to the regression but not reported.

The hypothesized signs of these variables are discussed by PPZ (1998) and summarized in Table II of that paper. Consequently, we will just outline their conclusions, as stated below. The presence of information asymmetry or substantial issuance costs or desire for liquidity (so that initial owners can achieve diversification) would give large firms comparative advantages in IPOs, thus the hypothesized sign of SALES is positive. Firms with higher R&D activities and those in the high-tech industries are likely more sensitive to confidentiality, suggesting a negative coefficient for R&D. (Due to the lack of data, this hypothesis is not tested in PPZ (1998).) If firms go IPOs to gain access to equity markets, then firms with high CAPEX, high D/A, and high GROWTH or M/B would more likely go for IPOs, assuming that growth potential is appropriately measured by M/B. Using a similar logic, firms facing high INT tend to issue new equity. Nevertheless, it should be pointed out that a positive coefficient on M/B could also suggest some market-timing ability. With regard to ROA, the expected sign is undetermined. More profitable firms are more likely to satisfy listing criterion and

more likely to be embraced by investors. On the other hand, profitable firms would lack incentives to seek external financing.

PPZ (1998) also mention another possible motive for IPO but do not offer a way to test it: the desire for original owners to diversify. Based on the argument of Pagano (1993) that riskier firms would be more inclined to seek public listing due to diversification desire, we develop the following hypotheses. Arguably, riskier firms are characterized by high interest rate (since interest risk should incorporate a risk premium) and less free cash flow. To the extent that these two variables are good proxies for riskiness, the expected signs for coefficients of INT and FCF are positive and negative, respectively. The coefficient of free cash flow, FCF, also is predicted to be negative if firms prefer to use internally generated capital and would use external funds only if they cannot produce sufficient cash flows. In addition, high cash flows might be a symptom of agency problems thus a lower propensity for IPO. Megginson and Weiss (1991), Gompers (1995) and Lerner (1995) suggest that venture capitalists provide a certification function; if so, the engagement of venture capital likely raises the probability of listing. Therefore, we hypothesize that the coefficient of VC is positive.

Empirical Results

Table 1 compares the IPO firms and firms that satisfied listing criteria but have not elected to do so. Because the following regression analysis will pool the cross-sectional and time-series data, we choose to present strictly cross-sectional data here, based on the financial data in the year of 2000. We expect to see fewer differences between IPO and non-IPO firms over a long period of time, but the patterns here are

remarkably similar to those in the following regression analysis, implying the results here are fairly robust across time. The table indicates that IPO firms have significantly greater size (in terms of sales), R&D, and profitability (measured by return on assets) but their debt ratios are on average lower. The initial evidence implies that IPOs are not strongly motivated by financing needs: if financing need or constraint is the predominant consideration, we would expect smaller, less profitable and high debt firms to seek listing, but the results point to the opposite. The result on R&D is somewhat surprising and is inconsistent with confidentiality being a major concern. This may to some extent reflect the fact that a considerable proportion of IPOs in Taiwan is in the electronic industry, which tends to have high R&D costs. Therefore, in the following Probit regression, we present separate analyses on the sub-samples of the electronic industry and of all other industries. The results are displayed in Table 2. Note that the majority of observations occur after 1995, reflecting the facts that the Taiwan market is largely illiquid and that venture capital is virtually non-existing before 1995. Furthermore, the OTC market was not established until 1995.

Consistent with the results in PPZ (1998), the correlation with IPO of either SIZE or ROA is positive. The positive sign of SIZE coefficient is in agreement with information asymmetry, listing costs, and liquidity being relevant factors for initial owners. In contrast to their study where M/B was found to be a major determinant, we find M/B is significantly positively related to IPO only for the entire sample but not for industries outside electronics. In fact, in the regression that excludes the industry of electronics, the coefficient of M/B is negative though statistically insignificant. Thus the evidence in favor of market-timing ability is rather weak.

Perhaps our most striking result is that many coefficients are contrary to the notion that IPO arises from the need for financing or as an attempt to seek alternative financing sources. We reach this conclusion by the observations described below. (a) The coefficient of CAPEX is negative though significant only for electronics. (b) The coefficient of INT is negative if we use the OTC listing standards. (c) The coefficient of GROWTH is negative though insignificant. (d) The coefficient of debt (D/A) is significantly negative. (e) Profitability as measured by ROA increases the probability of listing. Taken together, they imply that the greater the expenditure, the lower the probability of IPO. Therefore, we interpret that the overall evidence against IPO being motivated by financing need and/or constraint is fairly strong.

The table also shows that the probability of IPO is positively related to R&D expenditure. As stated earlier, this is inconsistent with confidentiality being a major factor. We feel that to a large extent that this result can be explained by the fact that electronic industry, as a whole, tends to have greater R&D and tend to favor IPOs. Stated differently, the result here may be a reflection of higher probability for an electronic firm to seek listing. When we examine only the electronic industry, this coefficient becomes insignificant, which might be due to the lack of variations in R&D expenditures in this industry – it is plausible that competition among electronic firms is so intense that most firms consider R&D necessary and unavoidable activities.

The negative sign of D/A is clearly a piece of evidence against IPO as a solution for financial restructure. The trouble with this result is that no existing theory seems to be capable of explaining the negative sign. A possible explanation is that firms with high debt may be firms with financial difficulties and/or considerable information asymmetry,

thus they are unlikely to meet the listing requirements. Another reason for this result is TSE's requirement that equity must be at least 1/3 of assets, which would deny firms with high debt ratios. However, the OTC market imposes no such requirement and yet the result is qualitatively the same.

There is some evidence supporting IPO as a means for initial owners to diversify. Specifically, lower amount of cash flow implies a riskier firm thus greater probability of IPO, which is confirmed by the negative coefficient on FCF. On the other hand, the coefficient of INT is not unambiguously positive, as would be expected if diversification is an important driving force.

The result on venture capital is uniformly positive using any sample. This is consistent with venture capital serving as a certification agent. The participation by venture capital likely enhances managerial efficiency and transparency thus promoting investor confidence and the likelihood of going public.⁵

Conclusions

In this study, we examine the determinants of firms' IPO decisions in Taiwan, for the sample period of 1989 to 2000. The regulations in Taiwan permit us to identify firms that met IPO requirements but chose not to go public. The unique regulatory environment allows a clear comparison of firms that choose IPOs and those that do not. With the exception of Pagano, Panetta and Zingales (1998), we are not aware of any similar study. Their paper examines the IPO market in Italy, and there seem to be considerable differences between that market and Taiwan market. Indeed, we find strong evidence that

⁵ Venture capital is relatively inactive before 1995, thus we do not include this variable for the entire period.

IPOs are not motivated by financing needs or constraints while they do. Some of our results are nevertheless consistent with theirs -- in particular, we find that larger and profitable firms are more likely to list equity. Our other findings also provide support for, though not overwhelmingly, information asymmetry, listing costs, liquidity, owners' diversification desire, and market timing as factors influencing IPO decisions. Finally, we present evidence strongly consistent with venture capital providing certification to firm credibility. The results using the Taiwan market may be more relevant to US investors, since in many aspects this market is more similar to the US than to the Italian market where IPOs are infrequent events and venture capital is inactive.

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Table 1
Summary Statistics

Panel A: IPO firms						
	mean	median	sd	min	max	n
SALES	14.05	13.97	1.09	0.00	19.05	383
R&D (%)	1.76	0.55	3.58	0.00	48.89	383
ROA (%)	13.72	12.19	9.02	-23.50	87.50	383
D/A (%)	47.50	47.41	17.21	1.89	107.28	383
INT (%)	9.27	7.84	29.32	0.00	1351.35	383
M/B	1.28	1.30	0.44	0.42	3.61	383
GROWTH (%)	41.92	17.77	450.94	-98.62	22645.38	383
FCF (in million of NT\$)	51.62	16.06	390.86	-81.04	10959.35	383
Panel B: non-IPO firms						
	mean	median	sd	min	max	n
SALES	14.24	14.22	1.39	0.00	19.98	522
R&D (%)	0.79	0.00	1.88	0.00	26.45	522
ROA (%)	8.59	8.27	8.34	-87.09	46.76	522
D/A (%)	50.45	51.29	21.17	0.17	195.18	522
INT (%)	8.13	7.57	15.36	0.00	442.43	522
M/B	1.25	1.27	0.44	0.42	3.61	522
GROWTH (%)	8.81	4.81	68.61	-127.78	2277.68	522
FCF (in million of NT\$)	47.88	19.59	230.42	-476.03	6254.57	522

Note: sales are shown as the log of amount in NT\$1,000

Note: The means of R&D and ROA are significantly different at 1% between IPO and non-IPO firms and the means of SALES and D/A are significantly different at 5%, according to the t test.

Table 2

Probit Analysis of the probability of going IPO

The numbers represent coefficients in the regression. Standard errors are in parentheses. The signs ***, **, and * indicate significant at 1%, 5%, and 10%, respectively.

period	1989-2000 (TSE standards)			1995-2000 (TSE standards)			1995-2000 (OTC standards)		
	All Firm-years	Electronics	others	All Firm-years	Electronics	others	All Firm-years	Electronics	others
SALES	0.177*** (0.029)	0.398*** (0.062)	0.110*** (0.036)	0.135*** (0.033)	0.405*** (0.068)	0.030 (0.042)	0.240*** (0.032)	0.528*** (0.061)	0.121*** (0.045)
CAPEX	-0.000 (0.001)	-0.001*** (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.001** (0.001)	-0.000 (0.001)	0.240 (0.032)	-0.001*** (0.001)	-0.000 (0.001)
R&D	0.029*** (0.008)	0.009 (0.012)	0.030* (0.018)	0.033*** (0.009)	0.013 (0.012)	0.038*** (0.019)	0.035*** (0.004)	0.014** (0.006)	0.039*** (0.006)
ROA	0.010*** (0.003)	0.002 (0.005)	0.012** (0.004)	0.009** (0.004)	-0.001 (0.006)	0.010 (0.007)	0.007*** (0.004)	0.001 (0.001)	0.008 (0.007)
D/A	-0.010*** (0.002)	-0.022*** (0.004)	-0.009*** (0.002)	-0.009*** (0.002)	-0.022*** (0.004)	-0.007*** (0.003)	-0.129*** (0.002)	-0.026*** (0.004)	-0.007*** (0.003)
INT	0.001 (0.003)	-0.001 (0.004)	0.002 (0.004)	0.004 (0.003)	0.000 (0.004)	0.006 (0.005)	-0.109 (0.008)	-0.057*** (0.012)	-0.174*** (0.001)
M/B	0.163*** (0.062)		-0.168 (0.112)	0.282*** (0.083)		-0.268 (0.170)	-0.001 (0.002)		-0.047 (0.182)
GROWTH	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
FCF	-0.000 (0.001)	-0.001* (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.001* (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.001** (0.001)	-0.000 (0.001)
VC				0.447*** (0.095)	0.374*** (0.130)	0.266* (0.157)	0.560*** (0.094)	0.419*** (0.125)	0.543*** (0.163)
n	2918	748	2170	2154	678	1476	3080	799	2281
Log Likelihood	-1378.267	-457.267	-870.714	-1025.393	-391.848	-592.070	-1035.417	-446.753	-520.401