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Do Malaysian Initial Public Offerings (IPOs) Survive in The After-Market?

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Abstract

In recent years, the survival of public companies after their initial public offering (IPO) has gained attention among academic researchers. Existing empirical studies, however, show a substantial variation in the survival rate across countries and periods. This study inspects the survival of Malaysian IPOs from 2002 to 2013 (385 IPOs). Surviving firms are the IPO firms that have continued their trading until 31st December 2020. The Kaplan Meier analysis reveals that these IPOs have a noticeably lower failure rate than those in the US and UK. Investigation into the factors of IPO survival using the accelerated failure time (AFT) model shows firm size, percentage of insider ownership, and dummy variable of ACE market significantly influence post-IPO survival in the Malaysian market. Findings of this study help investors to better understand the life of public firms and predict the survivability of those firms.

Keywords: IPO, survival, delisting, going public, Malaysia

1. Introduction

An initial public offering (IPO) involves selling a firm's shares to the public for the first time by a private company. The sale of the firm's shares to the public brings financial and non-financial advantages to the firm. From the financial perspective, an IPO enables firms to raise capital that is essential for financing future projects and investment opportunities as well as for paying their debt obligations. Brau and Fawcett (2006) have identified the non-financial reasons for going public, such as to extend the ownership foundation, to permit one or more principals to spread their private assets, and to enhance the firm's reputation. The decision on whether to go public or remain private is crucial because going public is a complex progression and can be costly and time-consuming. Some companies begin the IPO application process but later withdraw mid-way before making the offer, often confused and frustrated by the experience (Brau & Fawcett, 2006). Additionally, some companies that have gone public are subsequently delisted from the market due to their failure of raising equity capital to fulfil financial needs or through the failure of achieving satisfactory progress on its rehabilitation during its time in public (Duangthong, 2014; Pour & Lasfer, 2013).

Numerous empirical researches on IPOs' performance specify that companies which issue public equity are underpriced at the preliminary offering and underperform in the long run. These scenarios consequently cause the firms to suffer failure or being delisted from the public market. For instance, Gregory, Guermat, and Al-Shawawreh (2010) reported that weak long-term performances of Alternative Investment Market (AIM) IPOs caused higher failure rates. Fama and French (2004) recorded an abrupt drop in the survival rates of US IPO companies listed between 1973 and 1991. They also emphasised that changes in a firm's characteristics are among the factors that contribute to equity's cost reduction, which enables underperforming companies to issue public equity.

Therefore, the purpose of this study is to identify determinants that affect the survival of Malaysian firms after IPO and the overall survival rates of these firms. Although many researchers have examined the variables that play important roles in determining the survival of IPO companies (Ahmad & Jelic, 2014; Audretsch & Lehmann, 2005; Carpentier & Suret, 2011; Chancharat, Krishnamurti, & Tian, 2012; Espenlaub, Goyal, & Mohamed, 2016; Hensler, Rutherford, & Springer, 1997; Jain & Kini, 2008; Khurshed, 2000; Kooli & Meknassi, 2007; van der Goot, van Giersbergen, & Botman, 2009), following a comprehensive literature search, none of the studies focus entirely on analysing the determinants of the IPO firms' survival in the Malaysian market.

Examining the post-IPO survival determinants in Malaysia is relevant because this issue has received considerable attention among Malaysian regulatory bodies. For instance, public companies that show unsatisfactory financial performance will be classified under the Practice Note 17 (PN17) categories if listed on the Main Market or the Guidance Note 4 (GN4) category should they be listed on the ACE Market. This framework has been developed to certify that such firms engage in efficient stages of restructuring their financial conditions to continue being listed in the public market.

This study investigates the post-IPO survival of Malaysian companies. Previous studies on post-IPO survival largely focused on developed markets such as those of the US and the UK. This study investigates the ability of the Malaysian public companies to survive after the IPO issue. The findings of this study will help investors to understand more about the life of public companies and give an idea of how to predict the survivability of the companies.

The rest of the article is arranged as follows: Section 2 delivers a concise summary of the prevailing literature; Section 3 shows the hypotheses' development, whereas data collection and methodology are described in Sections 4 and 5, respectively. Findings are discussed in Section 6, while Section 7 summarises the article.

2. Literature Review

Schultz (1993) was one of the earliest scholars who observed the survival of 797 units (bundles of common stock and warrants) and share IPOs allotted in the US within the timeframe of 1986 to 1988. It was found that only 59% of firms' units survived compared to the 89% of share IPO firms after three years from the IPO date. Likewise, Hensler et al. (1997) discovered that the survival duration for 741 US IPOs grows according to company size, company age, preliminary returns, insider ownership percentage, and the level of the IPO's market activities. Seguin and Smoller (1997) used a large sample (5896) of the new US listed stocks to compare the attrition rate of penny stocks (initial share price below $3) and non-penny stocks (initial share price above $3). Within a five-year period, about 47% of penny stocks were delisted due to negative reasons compared to only 17% of non-penny stocks. The result has been corroborated by Bradley, Cooney, Dolvin, and Jordan (2006), documenting that the penny stocks IPOs show a substantially greater percentage (51.4 %) of delisting compared to common IPOs (14.3%) throughout the five years subsequent to the IPO.

Fama and French (2004) supplemented the preceding work done in the US market by providing a comprehensive view of how firms' survival is affected by the varying features of NASDAQ new listed stocks. The study recorded that the prospect of firms' survival in the first decade had decreased from 61% in 1973 to a mere 37% in 1991. It was proposed that that a greater delisting rate in the later period results from the profile variations of the firms registered in the market. A majority of the firms that release equity in the later period were categorised by lower profits and higher expansion. Specifically, variations in the profile of new lists were resultant of a regression in the equity issuance cost, enabling smaller and vulnerable companies to go public.

Demers and Joos (2007) explored the role of accounting information, e.g., leverage, R&D expenses, gross margin, sales, retained earnings, and

general expenses, on the failure rates of high-tech and non-tech IPOs listed in the US market from 1980 to 2000. The study showed that high-tech IPOs experience a reduced rate of failure (9.6%) compared to non-tech IPOs (16.7 %). Bhattacharya et al. (2009), however, argue that Demers and Joos (2007) excluded the internet stocks from their main samples. Using a similar definition of internet stocks used in Demers and Joos (2007), they found that within five years after the IPO dates, about 24% of the internet IPO were delisted from the market. Applying 6,235 U.S IPO samples listed from 1985 to 2005, Kooli and Meknassi (2007) observed whether company-specific and issuance-specific features affect the probability of the firm's survival in the long run. It was discovered that within the subsequent five years of the IPO, 55.18% of IPO companies had managed to survive, 24.59% had been acquired, and 20.23% of IPO companies were delisted because of multiple undesirable excuses.

Carpentier and Suret (2011) studied the survival of Canadian penny stock IPOs within the 1986 to 2003 timeframe. Findings showed that a substantially lower percentage of penny stocks (11.60 %) were delisted in the five years subsequent to the IPO compared to the US market (Bradley, Cooney, Dolvin, & Jordan, 2006; Seguin & Smoller, 1997). The projected Cox Proportional Hazard model exhibits that issuance features, e.g., size, age, and sector, at the time of IPO and the level of preliminary listing conditions serve a noteworthy function in elucidating IPOs' survival rate.

Espenlaub, Khurshed, and Mohamed (2012) examined the influence of the nominated advisor (Nomad) on the survival rate of IPO firms listed in the Alternative Investment Market (AIM). It was argued that a highly reputable Nomad has control and certification power to signal the firm quality. They discovered that IPOs supported by dependable Nomads would survive approximately two years more compared to those assisted by other Nomads. In comparison, Ahmad and Jelic (2014) found that the five year collective survival rate for Main Market IPOs listed from 1990 to 2006 on the London

Stock Exchange (LSE) was 69%, being greater than the AIM market's survival rate (59%) (Espenlaub et al. 2012). Higher survival rates of Main Market IPOs compared to the AIM IPOs, reported by Ahmad and Jelic (2014) and Espenlaub et al. (2012), are confirmed by Vismara, Paleari, and Ritter (2012) who documented that within five years after the IPO, 20-28% of the Main Market IPOs were delisted compared to the 42% for second-tier market in four European stock exchanges (London Stock Exchange, Euronext, Deutsche Borse, and Borsa Italiana).

In a more recent study, Shari (2019) examines the survival rate of IPOs that are listed in the Malaysia market between 2002 and 2010. The result showed that 2% of Malaysian IPOs had been delisted from the market after three years, whereas 7.7% had been delisted after five years.

3. Development of Hypotheses

3.1 Firm Age

The age of the IPO firms is a negative function of the ex-ante uncertainty. In particular, the longevity of the issuing firm prior to IPO is likely due to more information history being available in the market, allowing investors to evaluate the risks and prospects of the firms (Hensler et al., 1997). Moreover, older firms that have stable sources of business are less speculative (Chancharat et al., 2012) and more established in terms of their customers, suppliers, and labour market (Bhattacharya, Demers, & Joos, 2009). Consequently, older firms have less probability to fail compared to newer firms. This is consistent with the arguments made by most empirical studies that found a positive relationship between a firm's age and its post-IPO survival rate. For instance, Carpentier and Suret (2011) reported that an older issuer has a significantly lower failure risk than the younger issuer. Similar evidence was found in Demers and Joos (2007). Focusing on the survival rate of IPO firms listed in the AIM Market, Espenlaub et al. (2012)

posited that one standard deviation increase in a firm's age would increase its survival time by about 27 months.

$H1_1$: There is a significant positive correlation between firm age and Post-IPO survival.

3.2 Firm Size

Previous studies have claimed that a large-size organization has better access to critical resources, such as people, money, and knowledge, which are important for their survival. According to Goergen, Khurshed, and Mudambi (2006), large firms are more visible and have a higher degree of recognition among the public investors. Therefore, they have less asymmetric information that is relative to the small firms. Jain and Kini (1999) showed that the size of the company at the time of the IPO increased the probability of post-IPO survival. Demers and Joos (2007), Hensler et al. (1997), and Schultz (1993) provided evidence to support the positive correlation between the company's size and its survival rate. A similar finding was also reported in AIM by Espenlaub et al. (2012). Carpentier and Suret (2011), measuring the firm's size as the natural log of the post-IPO net asset, found that larger issuers possess a greater rate of success compared to small issuers.

$H2_1$: There is a significant positive correlation between firm size and Post-IPO survival.

3.3 Profitability

The profitability of the IPO firms before going public is used to predict the prospect of the companies (Su, 2004). Pour and Lasfer (2013) examined the factors that influenced a company's verdict to voluntarily delist from the London Stock Exchange. They found that companies had voluntarily decided to delist from the market when profitability, progress opportunity, and trading volume substantially dropped after the IPO. It was further found that the AIM Market had a higher tendency to be transferred to the Main Market.

A similar finding had been reported by Arcot, Black, and Owen (2007). All of the above findings have shown an affirmative effect of profitability level on the company's performance. Therefore, this study postulates that high profitability companies have a higher likelihood of extended survival than lower profitability companies.

$H3_1$: There is a significant positive correlation between profitability and Post-IPO survival.

3.4 Leverage

The leverage ratio is one of the signals to the public regarding a firm's risk exposure. The level of leverage offers an indicator for investors to evaluate the eligibility of a firm to fulfil their debt obligations. A high level of debt is risky for companies as it may lead to credit problems and increase the probability of bankruptcy (Chancharat et al., 2012; Espenlaub et al., 2012). Espenlaub et al. (2016) argued that greater cash assets and lower leverage might sustain a company's long-term financial constancy. Most of the previous empirical studies documented a positive link between the leverage and the failure of a firm. For instance, Bhattacharya et al. (2009), Chancharat et al. (2012), and Demers and Joos (2007) discovered that leverage has a positively significant association with the prospect of failure. Focusing on the IPO listed in AIM LSE, Pour and Lasfer (2013) provided evidence that IPO companies delisted themselves from the market on a voluntary basis when failing to rebalance their leverage during their public life.

$H4_1$: There is a significant negative correlation between leverage and Post-IPO survival.

3.5 Issue Size

Ritter (1991) pointed out that a smaller issue tended to exhibit the lowest long-term performance. Consistent with Ritter (1991), Keloharju (1993), Belghitar and Dixon (2012), and Minardi, Ferrari, and AraújoTavares

(2013) discovered a positive correlation between the issue size and the IPOs' performance in the long run, suggesting that IPOs with a higher issue size demonstrate an improved long-term performance in comparison to IPOs with a smaller issue size. Hensler et al. (1997) found that the survival time of 741 NASDAQ IPOs had increased in tandem with the issue size that was offered by the firms. Bradley et al. (2006) observed that penny stock IPOs offered considerably smaller issue size than non-penny stock IPOs. Their analysis on the survival rate of the IPOs indicated that within five years subsequent to the IPO, 51.4% of penny stocks IPOs were delisted compared to only 14.3% of the non-penny stock IPOs. Indirectly, this evidence showed a negative link between the issue size and the survivability of the IPOs after issuance. Comparable findings were recorded by Chou, Cheng, and Chien (2013) for the U.S IPOs.

$H5_1$: There is a significant positive correlation between the issue size and Post-IPO survival.

3.6 Insider ownership

Separation ownership between the shareholder (principal) and manager (agent) can create an agency problem due to the different benefits between the principal and the agent (Jensen & Meckling, 1976). In particular, managers who act as an agent of the principal tend to deviate from the goals that are set by the shareholders to capitalise on the shareholders' profit. Jensen and Meckling (1976), however, argued that significant ownership resulted from the manager's help to align the managerial interests with the shareholders' interest which often resulted in an improved company performance. Leland and Pyle (1977) have also posited that a higher percentage of ownership retention could act as an indicator for the company's quality since insiders are presumed to possess additional information on the company's value. In line with the above argument, Jain and Kini (1994) found a positive impact of managerial ownership on the post-IPO operational performance. Correspondingly, Álvarez and González

(2005) and Thomadakis, Nounis, and Gounopoulos (2012) reported a positive correlation between insider ownership and long-term performance. Hensler et al. (1997) concluded that a higher insider ownership improves the survival time of the issuing firm after the IPO. Ahmad and Jelic (2014) found that the percentage of insider ownership that was retained after the IPO was positively associated with the firm's survival. In contrast, Yang and Sheu (2006) found that the link between the insider's ownership and IPO survival was non-linear (U-shape). The survival time of IPOs undergoes reduction and a subsequent extension with insider ownership. In a related study, Chancharat et al. (2012) indicated that the board ought to comprise several knowledgeable insiders as they helped to supply firm-specific information to the mainly independent board. Bhattacharya et al. (2009) reported that a higher percentage of insider ownership reduced the probability of failure in the internet IPO.

$H6_1$: There is a significant correlation between insider ownership and Post-IPO survival.

3.7 Underpricing

Underpricing is commonly quantified as the variance in percentage between the first-day trading's closing price and the final price offer. The consequence of underpricing on a company's survival is founded on two main hypotheses, namely, signalling hypothesis and uncertainty hypothesis. Under the signalling hypothesis, the IPO firm underpriced their IPO at the initial day of trading to show their high quality to the external investors. In particular, the issuing firm intentionally sells the discounted shares for the purpose of distinguishing the high quality from the low-quality firm and later recovers their under-priced costs and gains more money in the subsequent equity offerings (SEO) (Grinblatt & Hwang, 1989; Welch, 1989). Thus, a positive correlation is anticipated between underpricing and a company's survival. On the other hand, the uncertainty hypothesis argues that a firm with higher uncertainty needs to underprice their share to compensate investors

for participating in an offer that is significantly uncertain (risks) (Beatty & Ritter, 1986). Therefore, a negative link is expected between underpricing and survival rate.

$H7_1$: There is a significant correlation between underpricing and Post-IPO survival.

3.8 ACE Market

Past research has contended that firms listed in the Main Market comprise high-quality firms since the listing requirements for the Main Market IPOs are more inflexible than the listing requirements of another market (Thomadakis et al., 2012). Empirically, Thomadakis et al. (2012) found a positive correlation between the Greek Main Market IPOs and post-IPOs' performance. A similar finding was recorded by Ljungqvist, Jenkinson, and Wilhelm (2003) in the US Market. Vismara et al. (2012) compared the empirical pattern in the delisting rates of IPOs that were listed on the Main Market and the second of four European stock markets, i.e., Euronext, Deutsche Borse, Borsa Italiana, and the London Stock Exchange. Results showed that the IPOs listed in the Main Market IPO had less probability of being delisted and being targeted by merger and acquisition deals. Notably, Ahmad and Jelic (2014) found a comparable result in their samples based on the UK Main Market IPOs and AIM Market IPOs, which was conveyed by Espenlaub et al. (2012) in terms of the five year delisting rate. It was reported that 31% of the Main Market IPO had been delisted from the market subsequent to five years of having been listed, being smaller than 41% of the delisting rates of the AIM Market (Espenlaub et al. 2012). In Malaysia, the ACE Market was first established for small- and high-growth firms wishing to go public but were incapable of fulfilling the listing requirement of the Main Market.

$H8_1$: There is a significant negative correlation between the ACE Market and Post-IPO survival.

3.9 Private placement

The private placement is one of the listing methods used by the issuing firm in the IPO process. Private placement denotes selling the shares to several designated investors, which commonly entail large banks, mutual funds, and pension funds. Yong (2011) used private placement as a proxy for institutional investors' participation in IPOs where she hypothesised that if IPOs did not have the participation from institutional investors they would experience higher initial underpricing. Using Malaysian IPOs listed from 2001 to 2009, she found that the evidence supported the hypothesis. IPO firms which take private placement have lower initial underpricing than IPO firms without private placement. Following Yong (2011), this study has also hypothesised that firms without institutional investors tend to failure and survive shorter after the IPOs.

$H9_1$: There is a negative correlation between the private placement and post-IPO survival.

3.10 Offer for Sale

Offer for sale refers to selling shares done by the existing shareholder pursuant to the offer for sale. Previous studies have argued that underpricing is a way of offering compensation to investors for undertaking the risk of IPO (Booth & Chua, 1996; Brau & Fawcett, 2006; Busaba & Chang, 2010). Brau and Fawcett (2006a) surveyed the perceptions of the chief financial officer (CFO) on nine possible signals that had been used by the firm to show their quality. Based on the survey, they found that stronger historical earning and top investment bank (top underwriter) were perceived as positive signals to reflect the firm's quality. In contrast, 80% of the CFOs agreed that insider selling is associated with negative signals that are associated to the investors; 44.4% of the CFOs agreed that trading a great segment of the company in the IPO also showed a negative signal to the investors. Therefore, IPO firms that take an offer for sale (insider selling) have a higher possibility to survive shorter after the IPO.

$H10_1$: There is a negative correlation between the insider selling pursuant to offer for sale and post-IPO survival.

4. Data Collection

This study's dataset encompasses IPO firms listed on the Malaysian stock exchange (Bursa Malaysia) from 2002 to 2013. The survival duration of each IPO firm is monitored over seven years beginning with the conclusion of the opening trading day. The data of the IPO firms are traced up to 31st December 2020. Consequently, survival entails that a firm is still being traded on the market or is relocated to a different market at the conclusion of the study's duration. Data on IPO firms have been downloaded from Bursa Malaysia's website. Subsequent to categorising and discarding values which are imprecise, inadequate, and misplaced, 385 IPOs were chosen as the final sample.

5. Methodology

This study used a Kaplan-Meier method in measuring survival rates of Malaysian IPOs. The Kaplan Meier estimator is a non-parametric statistic, typically applied in the approximation of the survival function from lifetime data. In particular, the time for the firm to failure is always positive (right censored). This technique considers censoring the survival data and other attributes (Cleves, Gould, & Gutierrez, 2004). The log-rank test is performed to gauge the statistical variances in the survival rate among the different categories, such as listing years and sectors. The Kaplan-Meier method is described as follows:

$$S(t_j) = S(t_{j-1})\left(\frac{n_j - d_j}{n_j}\right) \quad (1)$$

Where $S(t_j)$ is the probability of surviving in month t_j, $S(t_{j-1})$ is the possibility of survival in month t_{j-1}. n_j is the number of IPOs at risk or included in the study at the start of month t_j, and d_j is the number of IPO firms delisted during month t_j.

To detect the determinants that impact the survival time of the IPO companies, this study employed the parametric model of Accelerated Failure Time (AFT). Since the AFT model is a parametric model, it needs specific underlying distribution, e.g., weibull, exponential, log-logistic, log-normal, gompertz, or generalised gamma. To select the best-fit parametric model, this study performs the Akaike Information Criterion (AIC) test for each parametric distribution mentioned above. The model that produces a lowest AIC value is selected. The AIC test is defined as follows:

$$AIC = -2LnL + 2(k + c)(5) \quad (2)$$

Where L represents the maximised value of the likelihood function, k represents the number of model covariates, while c represents the number of distribution parameters that are specific to the model. The log-logistic AFT model is expressed as follows:

$$Ln(T_j) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots \beta_p X_p + \varepsilon_j \quad (3)$$

Where $Ln(T_j)$ represents the natural logarithm of the time to failure or survival duration, while the explanatory variables are reported in Table 1 below.

Table 1: Definitions of the variable used and its expected sign.

Variables	Descriptions	Data type	Post-IPO survival
Dependent variables			
Ln(T_j)	Natural log of survival time or time to delist	Log (survival time)	Expected Sign
Independent variables			
Ln (FIRMAGE)	Firm age (year) measured by the natural log of 1 plus the difference between the incorporation date of the firm and IPO listing date	Log(1+age)	+
Ln (FIRMSIZE)	Natural log of total asset 1 year prior to going public	Log (RM)	+
PROFIT	Profitability is proxies by ROA one year before firm goes public	Percentage	+
LEV	Leverage ratio of the firm one year before the IPO.	Percentage	+/-
D_ACE	Board of listing is created as a dummy variable; 1=ACE market, 0=otherwise	Binary	-
RETAIN_OWN	Percentage of shareholding reserved by the original owner	Percentage	+/-
Ln (ISSUESIZE)	Natural log of the number of shares offered multiplied by offer price	Log (RM)	+
UNDERPRICE	Closing price less issue price on the first-day trading	Percentage	-
D_PRIVATEPLACE	Dummy variable; 1=firm offers private placement, 0= otherwise	Binary	-
D_OFFERSALE	Dummy variable; 1=firm sell their shares pursuant to offer for sale, 0=otherwise	Binary	+

6. Data Analysis and Discussion

6.1 Kaplan-Meier Survival Rates

Table 2 shows the collective survival rates throughout seven years subsequent to the closing date of the trading day opening. The full samples' survival rate (PANEL A) confirms that approximately 99.2% of the IPOs out of the 385 listed firms from 2002 to 2013 persist in survival for one year subsequent to the IPO. It can be inferred that approximately 0.8% (100-99.2) of the IPO were delisted from the Bursa Malaysia. This value is less than the delisting rate stated in the US Market (Kooli & Meknassi, 2007; Schultz, 1993). It was found that 2%–7% of the US IPOs had been delisted from the Market after having been listed for one year. Table 2 indicates that the Malaysian IPOs' survival rate falls to 96.6% after three years and 92.2% after five years from the initial day of trading. The results are consistent with Espenlaub et al. (2016), who observed the survival rate of the IPOs listed in four distinct areas, e.g., North America, Europe, BRICS, and Asia-Pacific. To compare, the five-year post-IPO survival rates (92.2%) discovered in this study are prominently greater than those in North America (73.11%), Europe (61.03%), and BRICS (81.61%) but somewhat lower than Asia-Pacific (93.17%).

From PANEL A, an additional 5.5% (92.2%–85.7%) of IPOs were removed from the market, resulting in a collective survival rate of 85.7% IPOs that managed to survive post seven years. The lower failure rates reported in the Malaysian market are possibly the result of implementing listing prerequisite framework under PN17. The PN17 category is for firms with financial difficulties should they be listed in the Main Market, while the GN4 category is for firms listed in the ACE Market. Firms under these categories would be under the appropriate observation of Bursa Malaysia for the purpose of maintaining their listing position. In addition to the introduction of PN17 and GN4, the 30% requirement of the firm shares that has been allocated to Bumiputera may potentially affect the longevity of the Malaysian IPO firms.

To some extent, this result provisions the findings by How, Jelic, Saadouni, and Verhoeven (2007), who proposed that the higher share apportionment to retail Bumiputera investors assists in the improvement of firms' performance by reason of backing obtained from the Malaysian government. This indication suggests an optimistic impact of the Bumiputera control structure on IPOs' survival.

As shown in PANEL B, the survival rate of the IPO differs to some extent across the listing year. The log-rank test rejects the null hypothesis of the survival rates' equality across the listing years with a chi-squared value of 26.04 (p-value=0.0020). This study discovers that low-risk firms include those that have gone public throughout the worldwide financial crisis. Firms listed in 2003 report the lowest survival rates. The collective survival rates fall from 96.3% after three years to 79.6% subsequent to having been listed in the market for seven years. It can be noted that IPO companies listed in 2004 undergo the initial delisting record, especially if the IPO has been listed in the market under a year.

As shown in PANEL C, dividing the sample based on sectors shows how the survival rate differs among them. Nevertheless, the equality test shows that the difference is statistically insignificant (Chi-square=12.48, p-value=0.1311). Comparable results were recorded by Espenlaub et al. (2012) in the UK's AIM. Results also indicate that infrastructure projects and the plantation sector had not been delisted throughout the seven years of monitoring, owing to the fervent support by the Malaysian government. Based on the Eighth Malaysia Plan, the government has expended approximately RM64.13 billion for the nation's infrastructural growth (Naidu, 2008) with RM11.4 billion apportioned for the plantation sector to enhance productivity, research and development, land consolidation, and new land development (Economic Planning Unit, 2006). The continuous assistance by the Malaysian government enables a prolonged survival for the infrastructure and the plantation sector after the IPOs.

Construction, REITs, and the technology sector register the lowest survival rate (85.7%) after seven years, considerably lower than the full sample's failure rate. The seven-year survival rates for construction, REITs, and technology IPOs are 66.7%, 71.4%, and 79.6%, respectively. Findings of technology-related IPOs are in line with results by Bhattacharya et al. (2009) and Demers and Joos (2007), who emphasised that technology-related IPOs tend to show deficits and accrued arrears in the year before IPO. Technology firms show a higher likelihood of experiencing financial difficulty before listing because of low financial accomplishment; as a result, they fail to be publicly listed.

Additional research on the construction sector indicates that substandard financial status, mergers, and acquisitions become the major causes for the sector's failure. Tserng, Liao, Jaselskis, Tsai, and Chen (2012) argued that in comparison with other sectors, the exclusive attributes of construction firms may raise the likelihood of insolvency. Construction firms are highlighted as undertaking risky endeavours, taking a longer duration in the completion of such endeavours or projects, experiencing higher uncertainties or construction-related risks, and combining various types of firms commonly with the involvement of numerous specific teams. Variation in the survival rate across the sectors suggests that the nature of the business may influence the survivability of the firm.

Table 2: Survival rate of Malaysian IPOs

Category	Obs.	Cumulative Survival Rates (%)							Log Rank
		1-Yr	2-Yrs	3-Yrs	4-Yrs	5-Yrs	6-Yrs	7-Yrs	
PANEL A: Full Sample									
Full Sample	385	99.2	98.9	96.6	94.0	92.2	88.6	85.7	
PANEL B: Listing Year									
2002	50	100.0	100.0	98.0	96.0	96.0	96.0	82.0	
2003	54	100.0	100.0	96.3	90.7	87.0	83.3	79.6	
2004	68	98.5	98.5	97.0	92.5	91.0	86.6	82.0	
2005	73	100.0	98.6	94.5	93.1	91.8	91.8	89.0	
2006	37	100.0	100.0	95.6	89.2	86.5	81.0	81.0	Chi-Square= 26.04
2007	14	100.0	100.0	100.0	100.0	100.0	92.8	85.7	P-value= 0.0020
2008	19	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
2009	13	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
2010	24	100.0	100.0	100.0	100.0	100.0	95.6	95.6	
2011	8	100.0	100.0	100.0	100.0	87.5	87.5	87.5	
2012	13	100.0	100.0	100.0	100.0	92.3	92.3	84.6	
2013	12	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

PANEL C: Sector									
Construction	9	100.0	100.0	100.0	77.8	77.8	66.7	66.7	
Consumer Products	55	100.0	100.0	100.0	100.0	100.0	98.1	96.3	
Finance	9	100.0	88.9	88.9	88.9	88.9	88.9	88.9	
Industrial Products	108	99.0	99.0	97.2	95.4	94.4	90.7	88.8	
Infrastructure Project	2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	Chi-Square= 12.48
Plantation	7	100.0	100.0	85.7	85.7	85.7	85.7	85.7	P-value= 0.1311
Property	14	100.0	100.0	100.0	100.0	100.0	100.0	92.8	
REITs	7	100.0	100.0	100.0	100.0	85.7	85.7	71.4	
Technology	89	100.0	100.0	97.7	94.3	90.9	86.3	79.6	
Trading/Services	85	100.0	100.0	95.2	91.7	89.3	84.5	84.5	

This table shows the cumulative survival rates using the Kaplan-Meier method for one year to seven years after the IPO. The survival rates for the full samples are reported in PANEL A. The table also reports the survival rates based on the listing year and sector as presented in PANEL B and PANEL C, respectively. This study conducts log-rank test to evaluate the statistical significance of any difference between the survival rates across years and sectors.

6.2 Delisting Reasons and Failure Rate

Table 3 shows the failure rate across delisting reasons and sectors after seven years of listing. Survivors are the firms that continue to be listed as of December 31, 2020. Based on the samples, this study has identified five causes for the delisting of the IPO companies from the market, including the transfer to the other market, failure to continue listing requirements, unsatisfactory financial condition, merger and acquisition, and other delisting reasons, e.g., selective capital repayment or cancelation of trading. However, IPOs delisted due to transfer to other market are excluded from the definition of failure which is consistent with Espenlaub et al. (2016) who defined the survival as companies that continue to trade on the stock market or transfer to another stock market. Thus, only four reasons are considered in this analysis. From the inspection of the data, this study finds that of the total samples of 385 IPOs, 21 (5%) companies delisted from the market due to unsatisfactory financial condition,16 (4%) companies were involved in merger and acquisition, 8 (2%) companies failed to continue listing requirements, and 10 (3%) companies delisted due to other reasons.

The findings suggest that the main reason for the failure of the Malaysian IPO companies listed between 2002 and 2013 was financial distress. Further investigations revealed that the construction sector accounted for 33% of the failure rate. The main reasons for failure of this sector were merger and acquisition (22%) and unsatisfactory financial conditions (11%). As argued by Tserng et al. (2012), the unique characteristics of the construction companies may increase the probability of bankruptcy compared to other sectors. The technology and trading and services sector are among the highest failure rates. After 7 years of listing, 11% of technology sector and 6% of trading and services sector IPOs were delisted from the market due to unsatisfactory financial conditions.

Table 3: Delisting Reason by Sector

Sector	N	Survive	Unsatisfactory financial condition	Merger & acquisition	Fail to continue listing requirement	Other reason
Construction	9	6	1	2	0	0
	2%	67%	11%	22%	0%	0%
Consumer Products	55	53	0	0	2	0
	14%	96%	0%	0%	4%	0%
Finance	9	8	0	1	0	0
	2%	89%	0%	11%	0%	0%
Industrial Products	108	96	6	4	1	1
	28%	89%	5%	4%	1%	1%
Infrastructure Project	2	2	0	0	0	0
	1%	100%	0%	0%	0%	0%
Plantation	7	6	0	1	0	0
	2%	86%	0%	14%	0%	0%
Property	14	13	0	0	0	1
	4%	93%	0%	0%	0%	7%
REITs	7	5	0	0	0	2
	2%	71%	0%	0%	0%	29%
Technology	89	70	9	4	4	2
	23%	79%	11%	4%	4%	2%
Trading/Services	85	71	5	4	1	4
	22%	83%	6%	5%	1%	5%
TOTAL	**385**	**330**	**21**	**16**	**8**	**10**
	100%	**86%**	**5%**	**4%**	**2%**	**3%**

This table provides the failure rates for 385 IPOs listed in the Bursa Malaysia between 2002 and 2013 for different delisting reasons. The sample is broken down according to sector. The delisting reasons include failing to fulfil the listing requirements, unsatisfactory financial condition, merger and acquisition, and other reasons. The failure is measured as 100% minus the survival rates.

6.3 Descriptive Statistics Across IPO Survivors and Non-Survivors

Table 4 compares the descriptive statistics for the subsamples of IPO survivors and non-survivors. The average size of the IPO survivors is lower than that of the IPO non-survivors to some extent, exhibiting the undesirable effect of firm size on post-IPO survival. This study shows that IPO firms with lower leverage and higher profits demonstrated an extended survival period compared to IPO firms with higher leverage and lower profits.

The average issue size for the survivors is slightly lower compared to non-survivors, though statistically insignificant. As for insider ownership, the results show that the IPO survivors have a lower mean compared to the IPO non-survivors. This indicates that companies with a higher percentage of insider retention after the IPO have a lower survival rate compared to companies with a lower percentage of insider retention. However, the variable is not significant at any level. Besides, this study finds a significant positive impact of the dummy variable offer for sale on the firms' post-IPO survival.

The analysis of IPO survivors and non-survivors based on the listing year and sector showed that none of the IPO firms that listed in 2008, 2009, and 2013 were delisted from the market. Also, some sectors showed better survival rates post-IPO than other sectors. For example, the consumer product sector and industrial products sector have higher percentages of IPO survivors compared to other sectors. In contrast, the technology sector and the trading or services sector experienced a lower survival rate after the public issues. The equivalence of the mean test indicates that only the sectors of consumer products and technology show a statistical significance level of at least 10%.

Table 4: Descriptive statistics between IPO survivors and non-survivors

Variables	Survivor IPOs 330			Non-Survivor IPOs 55			Equality of Means Test
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	
Ln(FIRMAGE)	1.01	0.69	1.03	1.16	1.10	0.99	-1.20
Ln(FIRMSIZE)	18.12	18.10	1.49	18.45	18.38	1.80	-1.54
PROFIT	27.04	21.38	25.95	25.41	20.61	19.80	0.63
LEVERAGE	50.94	42.37	73.61	77.21	48.67	251.10	-0.95
Ln(ISSUESIZE)	18.52	18.18	1.23	18.72	18.42	1.38	-1.16
RETAIN_OWN	73.61	74.89	11.08	75.78	75.00	13.26	-1.38
UNDERPRICE	25.13	13.97	49.53	26.38	13.33	47.61	-0.21
D_ACE	0.37	0.00	0.48	0.38	0.00	0.49	-0.11
D_PRIVATEPLACE	0.10	0.00	0.30	0.07	0.00	0.26	0.62
D_OFFERSALE	0.51	0.00	0.50	0.31	0.00	0.47	2.91***
Year dummies:							
2002	0.12	0.00	0.33	0.16	0.00	0.37	-0.74
2003	0.13	0.00	0.34	0.20	0.00	0.40	-1.21
2004	0.17	0.00	0.37	0.24	0.00	0.43	-1.14
2005	0.20	0.00	0.40	0.15	0.00	0.36	0.98
2006	0.09	0.00	0.29	0.11	0.00	0.31	-0.33
2007	0.04	0.00	0.19	0.04	0.00	0.19	0.00
2008	0.06	0.00	0.23	0.00	0.00	0.00	4.48***
2009	0.04	0.00	0.20	0.00	0.00	0.00	3.67***
2010	0.07	0.00	0.25	0.04	0.00	0.19	1.05
2011	0.02	0.00	0.14	0.02	0.00	0.14	0.15
2012	0.03	0.00	0.18	0.04	0.00	0.19	-0.11
2013	0.04	0.00	0.19	0.00	0.00	0.00	3.52***
Sector dummies:							
Construction	0.02	0.00	0.13	0.06	0.00	0.30	-1.15
Consumer products	0.16	0.00	0.37	0.04	0.00	0.19	3.82***
Finance	0.02	0.00	0.15	0.02	0.00	0.13	0.30
Industrial products	0.29	0.00	0.45	0.22	0.00	0.42	1.18
Infrastructure project	0.01	0.00	0.08	0.00	0.00	0.00	1.42
Plantation	0.02	0.00	0.13	0.02	0.00	0.14	1.00
Property	0.04	0.00	0.19	0.02	0.00	0.13	1.01

REITs	0.02	0.00	0.12	0.04	0.00	0.19	-0.81
Technology	0.21	0.00	0.41	0.35	0.00	0.48	-1.95*
Trading/Services	0.22	0.00	0.41	0.26	0.00	0.44	-0.62

This table presents the mean, median, and standard deviations of variables defined in Table 1 for the subsamples of IPO survivors that successfully survived until 31 December 2013 and IPO non-survivors that were delisted from the market by 31 December 2013. The statistical significance of differences in the means of the variables is evaluated using a t-test with the assumption of unequal variances.

***, **, * Statistically significant at 1%, 5%, and 10%, respectively.

6.4 Determinant of IPO Survival Using AFT Model

The estimated AFT model (Table 5) indicates four variables with a statistical significance that influence the survival time of the IPO firms, namely firm size (Ln(FIRMSIZE)), percentage of insider-retained ownership after the IPO (RETAIN_OWN), squared percentage of insider ownership (RETAIN_OWN^2), and the dummy variable of ACE market (D_ACE). The table shows that company size is negatively linked to the survival time of the IPOs. A 1% increase in a firm size would decrease its post-IPO survival time by about 0.0028. This result is in contradict to Goergen et al. (2006), who claimed that large companies are more visible and have a higher degree of recognition among the public investors who are important for their survival.

Interestingly, this study finds that the survival duration of the IPO companies after going public has a curvilinear relationship with the percentage of insider ownership. However, the results contradict the findings of Hensler et al. (1997) and Ahmad and Jelic (2014) who have documented a significant positive link between survival duration and insider-retained ownership. A company's age and profitability has a positive association with its survival time, though the variable is statistically insignificant at any level. As predicted, the leverage level is negatively associated with the survival time. The dummy variable ACE market has been discovered to show a negative effect on the survival time, signifying that ACE market IPO firms have a greater prospect

of being delisted or surviving shorter than the Main Market IPO firms. The variable is statistically significant at the 10% level. Underpricing and dummy private placement have no significant effect on survival time of IPOs.

The dummy offer for sale is positively correlated to survival time after the IPO issued. This indicates that firms which take the offer for sale are inclined to a longer survival after the IPO. The model specification test (link test) demonstrates that the model is fittingly quantified with the hatsq *p*-values of 0.460.

Table 5: Log-logistic Accelerate Failure Time Model (AFT)

Variables	Coeff.	z-test	Time Ratio
Ln(FIRMAGE)	0.032	0.24	1.032
Ln(FIRMSIZE)	-0.277**	-2.52	0.758
PROFIT	0.000	0.08	1.000
LEV	0.000	0.37	1.000
Ln(ISSUESIZE)	0.054	0.43	1.055
RETAIN_OWN	0.085*	1.78	1.089
RETAIN_OWN²	-0.001**	-2.06	0.999
UNDERPRICE	-0.001	-0.70	0.999
D_ACE	-0.516*	-1.68	0.597
D_PRIVATEPLACE	0.645	1.39	1.906
D_OFFERSALE	0.417	2.17	1.517
Observations	385		
Time at Risk	3599		
Log-likelihood	-187.81		
LR-Chi	25.23***		
Link test (hatsq p-value)	0.460		

This table presents the results of estimated Accelerate Failure Time (AFT) models for the full (385) sample IPO. The table reports the coefficient (coeff.), z-test, and time ratio. Time ratio examines the extent to which changes in the independent variables accelerate or delay the delisting of the IPO.

***, **, * Statistically significant at 1%, 5%, and 10%, respectively.

6.5 Robustness of the Determinant of IPO Survival Using Cox Proportional Hazard Model

To check the robustness of the result in the determinant of IPO survival, this study runs another regression test using a Cox Proportional Hazard (CPH) model. Unlike an Accelerated Failure Time (AFT) model, the dependent variables for Cox's model are the logarithm of the hazard rate. Thus, a positive coefficient indicates that an increase in the explanatory variable will increase the hazard rate, resulting in shorter survival duration. The estimated results from the Cox's model are presented in Table 6.

In general, the results are robust in terms of being statistically significant in terms of level and direction except for the company size. The significant level for Ln(FIRMSIZE) is increased from 5% to 1% level. There are also slight changes in the magnitude of the estimated coefficient reported in this model compared to the AFT model. For instance, the coefficient of the D_ACE slightly increases from 0.516 in the AFT model to 0.675 in the CPH model. However, the variable remains statistically significant at the 10% level.

Table 6: Cox Proportional Hazard Model (CPH)

Variables	Coeff.	z-test	Hazard Ratio
Ln(FIRMAGE)	-0.049	-0.29	0.953
Ln(FIRMSIZE)	0.383***	2.59	1.466
PROFIT	0.000	-0.07	1.000
LEV	-0.001	-0.42	0.999
Ln(ISSUESIZE)	-0.094	-0.56	0.910
RETAIN_OWN	-0.089*	-1.79	0.914
RETAIN_OWN^2	0.001**	2.1	1.001
UNDERPRICE	0.002	0.68	1.002
D_ACE	0.675*	1.71	1.964
D_PRIVATEPLACE	-0.792	-1.36	0.453
D_OFFERSALE	-0.557	-1.42	0.573

Observations	385
Time at Risk	3599
Log-likelihood	-312.06
LR-Chi	24.03**
Link test (hatsq p-value)	0.27

This table presents the results based on Cox Proportional Hazard models for the full (385) sample IPO. The table reports the coefficient (coeff.), z-test, and hazard ratio. Hazard ratio examines the extent to which changes in the independent variables accelerate or delay the delisting of the IPO.
***, **, * Statistically significant at 1%, 5%, and 10% respectively.

7. Conclusion

This study explores whether IPO firms survive in the after-market and what determines post-issue survivability of portfolio companies. The findings reveal that the five year failure rate of Malaysian IPOs (7.8%) is noticeably lower than those that reported in the US and UK, which are above 20% (Hensler et al., 1997; Jain & Kini, 2008; Kooli & Meknassi, 2007). Extending the observation for up to seven years results in 14.3% of IPO firms being delisted from the market.

The findings demonstrate that the AFT model characterises the changeability of the duration an IPO survives in the aftermarket before delisting. The result shows that firm size, percentage of insider ownership, square of percentage of insider ownership, and the dummy variable ACE market substantially affect the IPO's survival duration after public issuance. As predicted, large firms survived longer after the IPO than the small firms. The percentage of insider ownership is non-linear. The likelihood of an IPO to survive initially increases when the percentage of insider-retained ownership after the IPO is increased and then decreases when the percentage of insider-retained ownership is increased up to a certain percentage. Finally, this study finds support that the IPOs listed in the ACE Market had higher

probability of being delisted compared to the IPOs listed in the Main Market. The results are robust using the Cox Proportional Hazard Model (CPH).

This study has provided crucial insights to investors and additional stakeholders who have interests in IPO firms' survivability, specifically in Malaysia. The results propose that investors should pay attention to the firm size, insider ownership, and the offer for sale, as they have a substantial bearing on IPO firms' survivability in the Malaysian market.

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