# A DURATION ANALYSIS OF THE TIME FROM PROSPECTUS TO LISTING FOR A-REIT IPOs

## WILLIAM DIMOVSKI and CHRIS RATCLIFFE
### Deakin University

## ABSTRACT

*Dimovski (2010) finds that the time from prospectus registration to listing is significantly positively related to the amount of underpricing amongst 45 Australian Real Estate Investment Trust (A-REIT) initial public offerings (IPOs) from 2002 to 2008. This makes the understanding of the time from prospectus registration to listing for A-REITs an important matter. This study analyses 82 A-REIT IPOs from 1994 to 2008 using a Cox proportional hazard model to analyse the duration from prospectus date to listing date. The study finds that A-REIT IPOs issued after 2000 listed more quickly, as did those A-REITs that were underwritten and also those that sought to raise larger amounts of equity capital. Those that proposed higher debt to assets ratios in their prospectuses listed more slowly. When the data is partitioned into 1994 to 1999 and 2002 to 2008 groupings, earlier A-REIT IPOs listed more quickly if they were larger while in the more recent group, those that had higher debt to asset ratios took longer to fill their subscriptions.*

**Keywords**: IPOs, underpricing, duration analysis

## INTRODUCTION

The literature on initial public offerings (IPOs) has often concentrated on the anomaly of "underpricing". Underpricing refers to IPO issuers offering securities to subscribing investors at an issue price, on average, that is below the closing price of the securities on the first day of listing on a stock exchange. Ritter (2003) reports industrial company underpricing studies from 38 countries and updates these at http://bear.cba.ufl.edu/ritter. There is also a growing body of Real Estate Investment Trust (REIT) IPO underpricing literature with Wang et al. (1992), Ling and Ryngaert (1997), Chen and Lu (2006) and Joel-Carbonell and Rottke (2009) with US data, Dimovski and Brooks (2006) and Dimovski (2010) with Australian data, and Kutsuna et al. (2008) with Japanese data.

Broad themes for future IPO research were introduced through an important paper by Rock (1986). He argued the existence of two general classes of subscribing investor – the informed and uninformed. Informed subscribers (and likely more influential) are likely to subscribe to more securities and more quickly to more highly underpriced

new securities (allowing the subscribing investor to make higher underpricing returns) that will crowd out the uninformed (and likely less influential) subscribing investors. This hypothesis became known as the "winner's curse", since the more informed/influential investors would buy a larger proportion of the more underpriced IPOs, while the less well informed/influential investors bought a smaller proportion of the more underpriced issues and a larger proportion of the poorer issues.

Two Australian studies, How et al. (1995) and Lee et al. (1996) followed, to examine whether industrial companies that listed more quickly were more highly underpriced. Both studies argued this was a direct test level of the informed demand and both studies reported that industrial companies that listed more quickly were more highly underpriced.

It was not until Brooks et al. (2009) that the importance of understanding the time from prospectus registration to listing for Australian industrial and resource company IPOs was discussed. A-REITs were excluded from that study. Brooks et al. (2009) explain the time to list involves using duration data that is not generally appropriately handled using standard regression models, so they use Cox proportional hazard models that have been specifically developed for duration modeling.

Recently, Dimovski (2010) in studying the underpricing of Australian REIT (A-REIT) IPOs from 2002 to 2008 also found that the time from prospectus registration to listing is significantly positively related to underpricing. This makes understanding the time to list for A-REIT IPOs an important matter and hence the purpose of this paper. This paper does not retest underpricing and the time to list, but rather examines factors that might influence the time from prospectus registration to listing for A-REITs. The implications of the time to list are important to IPO issuers, their underwriters and their investors. IPO issuers often highlight in the prospectus the properties to be acquired conditional on the successful capital raising. The options to purchase these properties have limited time horizons and hence issuers will not want long drawn out capital raisings in case the options to acquire these properties expires. Underwriters have reputational capital at stake and will want speedy and successful capital raisings. Investors will also not want long drawn out raisings, because their money is tied up with no yield being earned.

Dimovski (2010) suggests that A-REITs are an important IPO industry sector, reporting that from 1994 to 2008, 82 A-REITs raised slightly over $14.0 billion of public equity capital through IPOs. They are also an important industry sector more generally. Newell (2007) identifies the importance of REITs to superannuation fund investors, while Newell and Peng (2008) identify the importance of REITs to institutional investors. Given the superannuation guarantee levy making it mandatory on employers to contribute 9% of an employees wage (with the government seeking to increase this in 2012) into a superannuation fund who in turn looks for suitable

investments, the importance of REITs to superannuation funds is not likely to diminish.

The remainder of this paper is as follows. In section 2, we briefly summarise related literature. Section 3 presents the model. Section 4 reports our results. Section 5 makes some concluding comments.

## RELATED LITERATURE

Since Beatty and Ritter's (1986) argument that underpricing is related to the uncertainty of the valuation of the IPO, researchers have sought to identify financial and non-financial characteristics (variables) about IPOs that may proxy for uncertainty and hence partially explain the level of underpricing. Some characteristics identified in previous studies include the size of the capital raising (Beatty and Ritter, 1986), the issue price (Chalk and Peavy, 1987), the quality of the underwriter (Carter and Manaster, 1990), the quality of the auditor/accountant (Beatty, 1989) and the existence of borrowing relationships (James and Weir, 1990).

Brooks et al. (2009) argue that given that the time to list is related to underpricing, it would be of interest to explore if the characteristics (or variables) that proxy for uncertainty might partially explain the time it takes for industrial company IPOs to list. Using Cox proportional hazard models, they confirm that the use of underwriters shows a strong certification effect and reduces the time to list.

In looking at REIT IPO research specifically, we begin with the earliest published study by Wang et al. (1992) who investigated 87 US REIT IPOs during the period 1971 to 1988. They find a surprising and difficult to explain statistically significant 2.82% overpricing. This means that on average, initial subscribers to these IPOs paid more than they could have bought the securities for on the first day of listing. Wang et al. (1992) conclude that subscribers to these issues may well have been uninformed investors.

Ling and Ryngaert (1997) investigated 85 US REIT IPOs during 1991 to 1994. They report a statistically significant 3.60% underpricing return to subscribers and suggest that Rock's (1986) "winner's curse" may have operated in the US REIT IPO market during the period of their study. Unlike the study period used in Wang et al. (1992) where few institutions subscribed to these IPOs, Ling and Ryngaert (1997) report significantly more institutional involvement. They suggest the institutions are more informed investors who are able to determine the more highly underpriced issues. Chen and Lu (2006) concur and suggest that information asymmetry was the cause of the difference in the level of underpricing returns.

In Australia, Dimovski and Brooks (2006) examined 37 Australian LPT IPOs during 1994 to 1999 and reported a median underpricing return of zero and a mean underpricing return that was not statistically significantly different to zero. However, Dimovski (2010) in examining underpricing returns of Australian REIT IPOs from 2002 to 2008, found that underpricing returns over this period were a statistically significant 3.37% and that these post-2000 REIT IPOs were subscribed to and listed much more quickly than those REIT IPOs of 1994 to 1999.

## DATA AND METHODS

A total of 82 A-REIT IPOs listed on the Australian Stock Exchange from January 1994 to June 2008 raising over A$14 billion of public equity capital. The mean underpricing return for these IPOs was 2.4%. The median return was 2.0%. The primary source of much of the data for this study, which was hand collected, was the *Connect 4 Company Prospectuses* database. The descriptive statistics for the variables of interest are reported in Table 1.

**Table 1: Descriptive statistics for time to list and the related variables**

|  | Mean | SD | Min. | Max. |
|---|---|---|---|---|
| Time to list (days) | 57.5 | 25.8 | 22 | 175 |
| Pre 2000 (Yes/No) | 0.45 | 0.50 | 0 | 1 |
| Stapled securities (Yes/No) | 0.17 | 0.37 | 0 | 1 |
| Underwritten (Yes/No) | 0.829 | 0.379 | 0 | 1 |
| Institution involvement (Yes/No) | 0.281 | 0.452 | 0 | 1 |
| Market sentiment | 0.012 | 0.040 | -0.048 | 0.067 |
| Forecast dividend yield | 0.087 | .023 | 0 | 0.120 |
| Proceeds ($millions) | 170918 | 173493 | 800 | 789883 |
| Debt to assets | 0.476 | .102 | 0 | 1.24 |

The time to list is the number of calendar days from the date of the prospectus registration to the date of listing. The average number of days these A-REITs took to list was 57.5 days, ranging from 22 days to 175 days. Tishman Speyer Office in 2004

was the A-REIT that took only 22 days to raise $560 million of equity capital and then list. The offer was fully underwritten by Deutsche Bank. The capital was to be used to acquire US real estate assets, some of which were owned by the Singaporean Government. The Singaporean Government was to continue to hold 49% of those assets. The property trust that took 175 days to raise $10 million in 1994 was Australian Healthcare, while Oakford Property Trust took 154 days to raise $25 million. Both were specialized property investments that may have caused investors to be somewhat cautious. These two entites could well be regarded as outliers. This study then uses variables consistent with the REIT IPO underpricing literature to analyse the level of uncertainty. A Pre2000 dummy variable is examined to investigate those IPOs that listed from 1994 to 1999 (about 45% of the sample or 37 in number) compared to those that listed from 2002 to June 2008 (about 55% of the sample or 45 in number). No REIT IPOs listed in 2000 or 2001. Ling and Ryngaert (1997) argue that as the REIT industry matures, investors become more familiar with REITs and their proper valuation. As such, we expect the A-REITs in this latter period to be subscribed to more quickly. While book-building has become common amongst international IPOs in more recent times, the Australian IPO market continues predominantly to nominate an issue price for IPOs at the prospectus registration and IPOs do not often get involved in an open book-building marketing campaign.

Some A-REITs offered stapled securities (17% of the sample, or 14 in number) consisting of a unit in the trust (generally earning rental income) and a share in a company (generally involved in property development and management). The property development activities add another risk feature to these entities, so these riskier stapled entities may well take longer to list. Many A-REITs used underwriters (83% of the sample, or 68 in number). There is no prestige ranking yet of underwriters in Australia, nor do IPOs need to be underwritten to list, but Brooks et al. (2009) examine a certification effect if IPO firms are underwritten. They argue that underwriters have a reputation capital to protect and would also have an established client base that should allow for the issue to be filled more quickly. Some A-REITs also invited institutions to declare the takeup of securities in the prospectus. About 28% of our dataset, or 23 in number, recorded institutional involvement at the outset of the IPO. A similar reputational argument might suggest these IPOs will be subscribed to more quickly. Dummy variables are utilized to reflect the use (1) or non use (0) of underwriters (Carter and Manaster, 1990) and institutions (Dimovski and Brooks, 2006).

A market sentiment variable reflecting the change in the All Ordinaries Index from the date of the prospectus to the All Ordinaries Index on the day of the listing is also used, as in Dimovski and Brooks (2004). It is expected that the more positive the mood of the stock market from the date of the prospectus to the date of listing, the quicker the issue is filled and the IPO is listed. The market return averages a positive 1.2% for our dataset, but has ranged from a negative 4.8% return to a positive 6.7% during this

prospectus to listing period. There does not appear to be a significant difference in market sentiment between the pre 2000 and post 2000 A-REIT IPOs.

The size of the capital raising has also been used to proxy for risk (Beatty and Ritter, 1986). Those IPOs seeking to raise more have been regarded as being less risky; hence it would be expected they would take less time to list. Higher dividend yield forecasting IPOs would be expected to be attractive and would provide some bargaining power of the issuer with the underwriter and with the subscribers, and hence the issue is expected to be filled more quickly. The debt to total assets ratio anticipated by the trust upon listing is discussed in Ling and Ryngaert (1997). They suggest that the more debt the trust has utilized, the more the restrictive growth opportunities might be in the future. To avoid any endogeneity problems, we do not include any under or over pricing in the model, but rather rely on the explanatory variables identified.

This study initially employs a Cox proportional hazard model (Cox, 1972) that is the most widely used regression model for censored duration data (Cox and Oates, 2001) to estimate the time to list being a function of all the characteristics identified above and is consistent with Brooks et al (2009). Given that the two time periods 1994 to 1999 and then 2002 to 2008 have been identified in Dimovski (2010) as two different time periods for A-REIT IPOs raising capital, likely due to the earlier period employing both a trustee (to safeguard the interests of unitholders) and a manager, while the latter period simply engaged a single responsible entity, we then employ Cox proportional hazard models separately in these two period groupings to estimate the time to list for A-REIT IPOs. It is possible also as Ling and Ryngaert (1997) point out that as the industry matures, investors and analysts become more familiar with REITs and their proper valuation. The models investigate the probability of staying unlisted in the first time period (1994 to 1999) and then the second time period (2002 to 2008), being a function of some of the characteristics identified above.

## RESULTS

Figure 1 illustrates the time to list model. The probability of listing in the first 30 or so days is very low, while the probability of not being listed after about 120 days is also very low. Most of the A-REITs took around 40 to 80 days to list. The smoothness of the survival function indicates a well-defined relationship between time and the rate of listing.

**Figure 1: The survival function for the time to list for A-REIT IPOs 1994 to 2008**
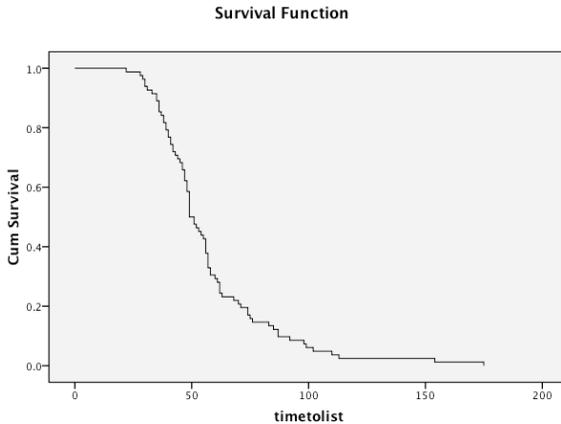


Table 2 reports the results for how certain characteristics (variables) play a role on how quickly the A-REITs listed. The positive coefficients accompanied with hazard (time to list) ratios of greater than one which are significant at the 5% level suggest that that variable increases the probability of listing (that is, the IPO fills their subscriptions and lists more quickly). There are two characteristics that demonstrate positive coefficients and hazard ratios of greater than one - those IPOs that are underwritten; and those which seek to raise more equity capital (proceeds). This means that underwritten A-REIT IPOs and those that are larger, listed more quickly than those that were not underwritten and smaller. Rather than omit the data for the two outlier entities entirely, we alter only their time to list values to three standard deviations away from the mean number of days. The results remain robust.

On the other hand, the Pre2000 variable (a dummy of 1 if the IPO listed before 2000, or 0 if it listed after 2000) has a negative coefficient and a hazard ratio of less than one. This suggests that the A-REIT IPOs of 1990 to 1999 listed more slowly than the A-REIT IPOs of 2002 to 2008. Yearly dummies are possible, but given the small sample sizes considering the many years in the sample, statistically useful results were not apparent.

Given that these may well be structurally different periods or "stratas" considering the very high significance level, we "de-group" the data into two distinct periods and analyse the impact of the remaining variables on the time to list. Table 3 reports the results of the 1994 to 1999 IPOs. It appears that the earlier group of A-REIT IPOs

listed more quickly if they were larger, given the positive coefficient and significant hazard ratios of greater than one. Table 4 reports the results for the A-REIT IPOs of 2002 to 2008. The negative coefficient and significant hazard ratio of less than one on the debt to assets ratio variable suggest those A-REIT IPOs that sought higher leverage were subscribed to more slowly. The positive coefficients and slightly significant (at the 10% level) on the underwritten and stapled variables suggests these underwritten and stapled IPOs were subscribed to slightly more quickly than if they were not underwritten or stapled. Figure 2 also illustrates the data graphically with Pre2000 IPOs using a dummy variable 1 being those 1994 to 1999 IPOs, while the Pre2000 and dummy variable 0 identifies those A-REIT IPOs during 2002 to 2008.

**Table 2: Estimation of time to listing model for A-REIT IPOs 1994 to 2008**

|  | Coef. | SE | Sig. | Hazard ratio |
|---|---|---|---|---|
| Pre2000 (Y/N) | -1.371 | .284 | .000*** | .254 |
| Stapled (Y/N) | .271 | .321 | .399 | 1.312 |
| Underwritten (Y/N) | .905 | .378 | .017** | 2.472 |
| Institution Involvement (Y/N) | -.098 | .286 | .731 | .906 |
| Market Sentiment | .687 | 3.041 | .821 | 1.988 |
| Dividend Yield | -.282 | 1.474 | .848 | .754 |
| Gross Proceeds | .002 | .001 | .018** | 1.002 |
| Debt to Assets | -1.924 | .947 | .042** | .146 |

*** statistically significant at the 1% level, ** statistically significant at the 5% level

**Table 3: Estimation of time to listing model for A-REIT IPOs 1994 to 1999**

|  | Coef. | SE | Sig. | Hazard ratio |
|---|---|---|---|---|
| Stapled (Y/N) | -.544 | .636 | .393 | .581 |
| Underwritten (Y/N) | 1.164 | .727 | .109 | 3.203 |
| Institution Involvement (Y/N) | -.085 | .381 | .823 | .918 |
| Market Sentiment | 3.102 | 4.251 | .466 | 22.245 |
| Dividend Yield | 6.032 | 13.252 | .649 | 416.361 |
| Gross Proceeds | .002 | .001 | .020** | 1.002 |
| Debt to Assets | .671 | 4.867 | .890 | 1.955 |

** statistically significant at the 5% level

**Table 4: Estimation of time to listing model for A-REIT IPOs 2002 to 2008**

|  | Coef. | SE | Sig. | Hazard ratio |
|---|---|---|---|---|
| Stapled (Y/N) | .723 | .419 | .084* | 2.061 |
| Underwritten (Y/N) | 1.018 | .535 | .057* | 2.767 |
| Institution Involvement (Y/N) | .015 | .519 | .977 | 1.015 |
| Market Sentiment | -5.616 | 5.681 | .323 | .004 |
| Dividend Yield | -.278 | 1.732 | .872 | .757 |
| Gross Proceeds | .002 | .001 | .232 | 1.002 |
| Debt to Assets | -2.833 | 1.274 | .026** | .059 |

** statistically significant at the 5% level, * statistically significant at the 10% level

**Figure 2: Cox proportional baseline survival function for time to list**
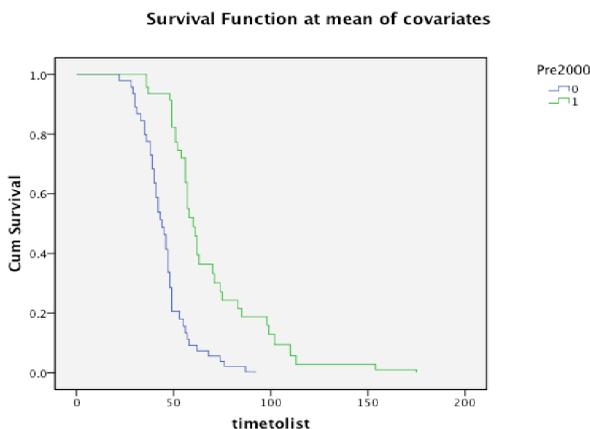


## CONCLUSION

While the time to listing of A-REIT IPOs has been identified as an important variable in A-REIT IPO literature, it has not been formally analysed so as to understand factors that might influence how long A-REIT IPOs take to list. This study investigates some financial and non-financial characteristics about A-REIT IPOs, so that the time to listing might be better understood. While we still cannot confirm who is an informed investor and who is uninformed (as Gordon and Jin (2003) suggest would be difficult), we do find that the use of underwriters is significant to reducing the time to listing. The study also finds that larger A-REIT IPOs in the 1994 to 1999 period were

subscribed to and listed more quickly than smaller ones. The IPOs of 2002 to 2008 however that sought a higher debt to assets ratio took longer to list.

Importantly, the findings also suggest support for Ling and Ryngaert (1997), who argue that as the industry matures, and investors and analysts become more familiar with REITs, that an informed demand develops. As such, REIT IPOs appear to be subscribed to more quickly in these more recent times. These findings provide implications for the issuer who wants to manage the delay in taking the firm public, so that options to acquire specific properties do not expire; for the underwriter who wants to maintain their reputational capital and earn their fees in a timely manner; and for the investors who do not want to miss out on an issue by waiting too long before subscribing or by investing too early without earning any yield.

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**Email contact: wd@deakin.edu.au**