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The level of representative underwriting and the underwriting costs of REIT SEOs

Ranajit Kumar Bairagi and William Dimovski
School of Accounting, Economics and Finance, Deakin University, Burwood, Australia

Abstract

Purpose – The purpose of this paper is to investigate factors influencing the underwriting discount for US Real Estate Investment Trust (REIT) Seasoned Equity Offerings (SEOs).

Design/methodology/approach – The study provides new evidence on determinants of underwriting discounts with a comprehensive dataset of 783 US REIT SEOs from 1996 until June 2010. Ordinary least squares regressions are performed to estimate the effect of the level of representative underwriting along with other potential factors on underwriting discounts.

Findings – The study complements the well-documented notion of the economies of scale in SEO underwriting discounts. The equally (value) weighted underwriting discounts averaged 4.21 per cent (4.10 per cent) with a declining trend over time. The findings of this study show the statistically and economically significant negative effect of the level of representative underwriting on the underwriting discounts, as well as the significance of the structure of underwriting syndicate in determining the underwriting discounts. The findings suggest that issuers can minimize the costs of raising secondary equity capital by optimally allocating the underwriting business among the underwriters.

Originality/value – This paper adds to the international REIT SEO literature by exploring new evidence behind underwriting discounts. The study includes data before and after the REIT Modernization Act 1999 and during the recent global financial crisis period.

Keywords United States of America, Equity capital, Underwriting, Costs, Real estate, Investments, Seasoned equity offerings, Underwriting syndicate, Level of underwriting, Underwriting discount

Paper type Research paper

1. Introduction

The direct costs of issuing seasoned equity offerings (SEOs) reduce the net proceeds to the issuing firm. A major portion of the SEO direct costs is the underwriting discount, 76 per cent of total direct costs (Lee *et al.*, 1996), which is the remuneration directly paid to the investment banks involved in floating the offerings from valuation to hiring dealers. This underwriting discount is also often refereed to as the "gross spread". This underwriting cost broadly ranges from 3 to 8 per cent of SEO gross proceeds (Lee and Masulis, 2009) but Butler *et al.* (2005) report a range from 1 to 10 per cent. Unlike initial public offerings (IPOs), which experience clustering at certain percentages, SEOs experience modest clustering of underwriting costs with substantial cross-sectional variation but very little was known about the determinants of these costs for SEOs until Butler *et al.* (2005). Lee and Masulis (2009) suggest asymmetric information between managers and outside investors to have a positive effect on these costs. The literature on underwriting costs is, however, mainly centered on IPOs (Chen and Ritter, 2000; Torstila, 2001; Hansen, 2001; Butler and Huang, 2003; Kaserer and Kraft, 2003) and SEOs (Smith, 1977; Eckbo and Masulis, 1992; Lee *et al.*, 1996; Corwin, 2003;

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Mola and Loughran, 2004; Butler *et al.*, 2005; Lee and Masulis, 2009) of industrial companies.

Real estate investment trusts (REITs) which are entirely engaged in real estate properties with relatively certain income from rent and mortgage payments have proved a very active sector in the capital market during last two decades (Ghosh *et al.*, 2000; Laopodis, 2009). Over the last five years their daily trading volume has increased by 163 per cent and during first six months of 2010 their dividend yield has more than doubled the dividend yield of S&P500 (REITWATCH, July 2010). It is worth mentioning that during this same six-month period the REIT index experienced a 5.56 per cent gain against a 6.65 per cent loss for the S&P500. The significance of REIT SEOs in the capital market is also worth noting because during this six-month period, the industry raised $22 billion in total, $9.8 billion of which was raised by secondary equity and preferred offerings against $1.3 billion by IPOs. Additionally, because of hardly any tax-based incentives, REITs need to issue frequent SEOs in comparison to industrial companies to fund their growth opportunities. Hence, costs of raising secondary equity capital by REITs are significant factor to their capital budgeting decision but there is a paucity of study on the determinants of REIT SEO underwriting costs. The purpose of this study is to investigate the determinants of underwriting costs of REIT SEOs and more specifically the effect of the level of representative underwriting on underwriting costs.

The rationale behind this lies in the idea that offers size and underwriter reputation, among others, are significant determinants of SEO underwriting costs but the empirical evidence of the effect of lead underwriter's reputation on the underwriting costs is somewhat mixed[1]. Mola and Loughran (2004) report the prior market share, reputation and quality of analyst group of an investment bank to influence most of its subsequent underwriting business in seasoned offerings. Butler *et al.* (2005) assume investment banks with better reputations have a larger market share. Despite the mixed effect on underwriting costs, the empirical evidence shows that the underwriter reputation affects the underwriting business of an underwriter. This led us to hypothesize that the representative underwriting banks (including the lead underwriter) may well influence the size of their remuneration. This paper addresses this issue by relating the level of the active participation of the representative underwriters in an offer, to their compensation. We test the significance of the level of active participation by the representative underwriters with a sample of 783 US REIT SEOs from a period of January 1996 until June 2010 and find a statistically significant and robust negative effect on underwriting costs.

We hypothesize that the underwriters emphasize on both their reputation and the level of their volume of shares in an offer in determining their compensation. We also hypothesize that the underwriters with higher reputation but lower proportion of shares in an offer demand higher compensation. The rationale behind this lies in the fact that an offer is usually underwritten either by a single underwriter or a syndicate of underwriters, with a few of them acting as lead managers and or representatives. The offer prospectus states the underwriting structure with the name and the respective volume of each underwriter along with the name of the underwriter who will lead and represent the underwriting syndicate. We have used the percentage of underwriting by the representative underwriters because they underwrite a relatively large portion (81 per cent in our case) of the offer and sometimes both lead and representative underwriters equally underwrite the offer. Lead underwriters are always included in the list of representative underwriters and they may need to incur some sunk costs

in seeking out investors and processing transactions. As their costs are similar to other market makers, they enjoy some economies of scale with volume. Hence, they may take into account both the uncertainty of the pricing of the offer and the level of underwriting in the offer to reap the benefit of economies of scale. As such, they tend to underwrite a larger portion of the more certain offers and vice versa. Thus, if the underwriters with higher reputations are offered a relatively small proportion in the offer, they may not be able to make a competitive remuneration from such offer and hence they need a higher underwriting compensation. Alternatively, if the representative underwriters consider the offer to have less uncertainty in its pricing, they compete to raise their underwriting proportion/level and demand lower compensation.

This study is significant because it sheds light on the determinants of REIT SEO underwriting discount and more specifically on the level of active underwriting by the representative underwriters. Interestingly, Chen and Lu (2006) report equally (value) weighted underwriting gross spreads of 6.78 per cent (6.56 per cent) for 197 US REIT IPOs over 1980-1999 and this study with 783 REIT SEOs over 1996-2010 reports equally (value) weighted underwriting costs of 4.21 per cent (4.10 per cent). The SEOs are likely to offer lower uncertainty about their future cash flows and with the established secondary market record are likely to need a lower marketing effort. As such, underwriting costs for REIT SEOs would be expected to be lower than for REIT IPOs. The study incorporates the effects of REIT Modernization Act 1999 and the post-global financial crisis (GFC) period. The study reports the significant negative effect of the level of representative underwriting on underwriting discount of REIT SEOs. It also reports that the effect of the level of representative underwriting is well pronounced for offers with lower relative offer sizes, larger offer size, higher offer prices and top-ranked underwriters. The study further investigates the factors influencing the level of representative underwriting.

The study contributes to the REIT literature in four ways. First, this paper is the first to our knowledge, to provide the direct underwriting costs of raising equity by US REIT SEOs. Second, it investigates the effect of the level of representative underwriting on underwriting costs. Third, it investigates some of the other determinants of SEO underwriting costs. Fourth, it identifies the factors significantly influencing the level of representative underwriting. The study will benefit both the issuers and the underwriters in determining underwriting discount.

The remainder of the paper is structured as follows. Section 2 contains a review of relevant literature, while Section 3 outlines the data and methodological design of the study. Section 4 deals with some summary statistics, the main empirical results along with some robustness tests. Finally, Section 5 summarizes the findings and concludes with some implications.

2. Literature

While IPOs are often used to fund the initial public growth of firms, SEOs are used to raise secondary external equity capital to fund subsequent growth for these publicly traded firms. Additionally, in contrast to industrial companies, which can fund their growth through retained earnings and debt financing, REIT firms have hardly any retained earnings and also get hardly any tax-based incentives to raise debt capital (Ghosh *et al.*, 2000). Owing to this limitation, REIT firms find the equity capital market as

a useful means to raise much needed capital by issuing comparatively frequent SEOs compared to their industrial entity counterparts.

To issue an SEO however, the issuing firm hires investment banks to facilitate the entire issuing process from valuation to hiring dealers to collecting subscriber applications. The investment banks or underwriters bear the inventory risk of having to take shares not sold and the litigation risk of defending against possible lawsuits from disgruntled investors or even issuers. The investment banks or banking group may incur some sunk costs in seeking out the investors and processing the whole transaction. They also need to pay for dealers or brokers who ultimately sell the shares to the investors.

Issuing firms need to compensate the investment banks for assuming inventory risk, valuing shares, litigation risk, incurring sunk costs, paying for dealer-brokers and also for their reputation and expertise. This compensation varies across industries and even countries. For industrial company IPOs, it is well documented to cluster at round percentages across firm size (Chen and Ritter, 2000; Hansen, 2001) and even across countries (Torstila, 2003). Butler *et al.* (2005) report a modest clustering of SEO gross fees on round percentages. These gross fees mainly depend on the underwriting syndicate structure and the bargaining capacity of both the underwriter(s) representing the syndicate and the managers of the issuing firm. The underwriting syndicate originates with the appointment of a bookrunning manager or lead underwriter by the issuers who usually emphasize on the general reputation, prior market share, research support/analyst quality, industry knowledge of the underwriter and the prior relationships with the issuer in appointing an underwriter as the bookrunning manager.

Subsequent to the appointment of the bookrunning manager, issuers appoint co-managers from those competing for the position of bookrunning manager and even they sometimes consider the advice of bookrunning manager in selecting the co-manager. Bookrunning managers typically underwrite a substantially large portion of the offer. The allocations for co-managing syndicate members are usually decided upfront and for other non-managing members the distributions are solely dependent on the discretion of the bookrunning manager who usually finalize the allocations at the due diligence meeting a few days prior to the offer becoming effective (Corwin and Schultz, 2005). The other non-managing underwriters are selected by both the issuer and the bookrunning manager. Corwin and Schultz (2005) report IPO share allocations roughly 40, 40 and 20 per cent among book managers, co-managers and other non-managing underwriters, respectively. Mola and Loughran (2004) report nearly 72 per cent of SEO proceeds were underwritten with top-tier bankers. Ljungqvist *et al.* (2006) and Ljungqvist *et al.* (2009) suggest that issuers consider the prior market share of the underwriters in appointing the bookrunning manager and underwriters tend to provide aggressive analysts coverage to win co-manager designation.

Underwriters in the syndicate play different roles including information production, certification and underwriter reputation, analyst coverage and market making (Corwin and Schultz, 2005). These roles in the syndicate are competitive and may become fierce for large offers because being a co-manager in an offer raises their chance of becoming a book manager in follow-on offerings. To reduce future underwriting competition and potential conflicts among themselves, the bookrunning manager tends to confine the syndicate size. Bookrunning managers can do this because managers of issuing firms emphasize on the strength of the underwriters who can aggressively talk up their stock (Mola and Loughran, 2004). After getting appointed, the bookrunning manager can

conduct the road shows under bookbuilding process to spread the opinion of the potential investors (Huang and Zhang, 2011).

After completion of the road show, along with setting the final offer price, the bookrunning manager negotiates for underwriting fees that are apportioned among bookrunning managers, co-managers and non-managing members according to the role of each group in the syndicate. Specifically, these fees consist of management fees, underwriting fees and selling concessions. Management fees are apportioned among bookrunning managers and co-managers, with the bookrunning manager retaining the larger portion due to their due diligence services. Underwriting fees are shared among syndicate members proportionately to the shares underwritten and finally the selling concessions are distributed according to the selling loads[2]. In each segment of the fees, bookrunning managers get a lion's portion of the spread and particularly the lead bookrunning manager. As the proportion of shares underwritten is a key determinant in allocations of all segments of spreads, the proportion of shares underwritten by the key underwriters becomes an instrument of bargaining. Even though the underwriting competition may have been strongly competitive, the lead bookrunning manager with aggressive analyst bankers enjoys the major bargaining power. However, the bargaining strength regarding fees depends on the strength of both the concerned bookrunning manager and the characteristics of the issue.

The previous literature on industrial SEOs shows a downward trend of underwriting discount. For example, Smith (1977) reports 6.17 per cent, Eckbo and Masulis (1992) 6.09 per cent, Lee *et al.* (1996) 5.44 per cent, Corwin (2003) 5.40 per cent, Mola and Loughran (2004) 5.10 per cent, Butler *et al.* (2005) 4.80 per cent and Lee and Masulis (2009) 5.09 per cent. Lee *et al.* (1996) and Butler *et al.* (2005) report some economies of scale in SEO underwriting discounts are noticeable.

As institutional investors tend to shun low-priced stocks (Butler *et al.*, 2005), representative underwriters may tend to underwrite higher stock price issues. Underwriters also consider relative offer size which is the ratio of the offer size and firm size the day before the offer and measures both the uncertainty (Mola and Loughran, 2004) and the relative capacity of the market to absorb the firm's offer (Butler *et al.*, 2005). Underwriters might face difficulty in placing offers with higher relative offer sizes and demand higher compensation for such offers. Owing to the lower uncertainty (Kutsuna *et al.*, 2008) and higher demand by institutional investors (Butler *et al.*, 2005) for issues with higher offer price, we expect offer price to negatively affect underwriting discount. The higher ranked underwriters are associated with larger and more certain offers and may work harder to make the offer successful. The effect of underwriter reputation on underwriting discount is mixed in the literature. For example, Carter and Dark (1990) report a negative relationship whereas Butler *et al.* (2005) find a positive effect on underwriting discount. The number of total underwriters in the syndicate is reported to have negative effect on underwriting compensation due to its successful distributional effect (Carter and Dark, 1990) and better coordination (Butler *et al.*, 2005). In contrast to Carter and Dark (1990), we argue for a positive effect of the number of both representative and total underwriters on the underwriting discount because a higher number of underwriters reduces the underwriting business for each underwriter and simultaneously positively affects coordination complexities.

The SEOs of entities listed in the New York Stock Exchange (NYSE) are associated with the lower level of uncertainty (Mola and Loughran, 2004; Butler *et al.*, 2005)

due to its broader shareholder base. Firms with recent prior SEOs can reduce the problem of asymmetric information by disseminating information during that issue. This complements the leaving a good taste hypothesis (Mola and Loughran, 2004) that investors can remember about the performance of the recent past issue. Hence, underwriters might demand a lower discount to place the offer for the firm with the recent past SEO because they might need less effort to place such offers. As the hiring of quality auditors reduces the uncertainty (Beatty, 1989), we expect a lower underwriting discount for offers audited by an industry-differentiated auditor (Wang and Wilkins, 2007).

The interest rate on fixed income securities is closely related with the dividend yield of REIT securities. During a higher level of interest rates, underwriters might face difficulty in attracting investors. Hence, due to the "yield effect" (Ling and Ryngaert, 1997) we can expect a positive relationship between the treasury interest rate and underwriting discount. Howe and Jain (2004) report reduced systematic risk and lower dividend payout requirements after implementation of REIT Modernization Act 1999 in 2001. The reduced payout requirement of the Act is expected to raise the bargaining strength of the issuer. Owing to the higher bargaining strength of the issuer and the reduced systematic risk of the issue, we expect underwriters to demand a lower discount for post-2000 SEOs. Underwriters might, however, face difficulty in placing the offer after the recent GFC which burst in late 2007 (Valentine and Gordon, 2009) and is attributed to the sharp downturn of housing prices (Laopodis, 2009). As such, we expect the post-GFC SEO issuers to pay different underwriting discounts to the underwriters.

3. Data and method

This study is primarily based on data stated in the prospectuses of all REIT SEOs issued and listed on the NYSE, AMEX and NASDAQ as reported in the National Association of Real Estate Investment Trusts (NAREIT) historical offering records and in the Securities Exchange Commission's Electronic Data Gathering, Analysis and Retrieval (EDGAR) archives over the period January 1996 until June 2010. The sampling period is from January 1996 to capture the effect of widespread subprime real estate mortgage lending that started in the mid-1990s (Sanders, 2008). The year-wise offerings of REIT SEOs have been tabulated from the historical SEOs of securities of NAREITs as reported in the NAREIT historical offerings archives till July 2010. Our final sample includes 783 out of 1,295 total SEOs issued by 197 different REITs after excluding offers that are issued by parties other than the REIT itself, like the issues underwritten by placement agents and issued by selling shareholders. A total of 51 REITs issued an SEO once, 30 REITs – three times, 29 – two times, 25 – four times, 21 – five times, eight – six and seven times, six – nine times, five – 12 and 13 times, four – eight times, two – 11 times and one – ten, 15 and 17 times.

All REIT SEO prospectuses have been sourced from EDGAR. This source has been keeping the SEC filings of all US-based publicly listed and traded companies since 1996 and used as a source in a number of studies[3].

Underwriting discount, lead and representative underwriters, level of representative underwriting, number of representative underwriters, the name of the listing exchange and the name of the auditors who audited the financial statements in the prospectuses have been hand collected and compiled from respective SEO prospectuses. The direct underwriting discount has been scaled by the total proceeds raised to derive a percentage of gross proceeds.

Reputation rank for lead underwriters has been compiled as per Carter and Manaster (1990) as updated in Ritter's homepage (http//bear.cba.ufl.edu/ritter/Rank.xcl). Following Carter and Dark (1990) lead underwriters' rank has been averaged where there are multiple lead underwriters. The ten-year treasury interest rate is sourced from Bloomberg. In calculating the value-weighted amount, the amount of offer proceeds is expressed with 2009 purchasing power using the US GDP price deflator.

Methodology

We use the ordinary least squares (OLS) regression specifications with percentage of underwriting discount as dependent variable in the first equation to investigate its significant determinants. The second dependent variable investigated is the percentage of the SEO's shares underwritten by the representative underwriters. The OLS specifications used are as follows:

$$\begin{aligned} \text{UNDDISC} = {} & \beta_0 + \beta_1 \text{REPUNDWRITING} + \beta_2 \text{LNSEOAMOUNT} \\ & + \beta_3 \text{LNOFFPRICE} + \beta_4 \text{RELOFF} + \beta_5 \text{UNDRANK} \\ & + \beta_{12} \text{NUMREPUND} + \beta_9 \text{TENYRTRSINT} + \beta_6 \text{NYSE} \\ & + \beta_{11} \text{POSTGFC} + \beta_{10} \text{POSTRMA} + \beta_7 \text{PRESEO} \\ & + \beta_8 \text{TOPAUDITOR} + \varepsilon \end{aligned} \tag{1}$$

$$\begin{aligned} \text{REPUNDWRITING} = {} & \beta_0 + \beta_1 \text{LNSEOAMOUNT} + \beta_2 \text{LNOFFPRICE} \\ & + \beta_3 \text{RELOFF} + \beta_4 \text{UNDRANK} + \beta_5 \text{NUMREPUND} \\ & + \beta_6 \text{NUMTOTUND} + \beta_7 \text{NYSE} + \beta_8 \text{POSTGFC} + \varepsilon \end{aligned} \tag{2}$$

where UNDDISC is the underwriting discount directly paid to the underwriters as a percentage of proceeds raised and REPUNDWRITING is the percentage of SEO offer underwritten by lead and or representative underwriters. Other variables are as defined in Table I.

To test the robustness of factors influencing underwriting discount, we divide the sample into a subsample from 2001 to 2010. The sample period 2001-2010 is utilized because the REIT Modernization Act 1999 became effective from January 1, 2001 (Howe and Jain, 2004), the S&P500 stock index incorporated some REITs in its index in 2001 (Laopodis, 2009) and the GFC occurred during this period (Valentine and Gordon, 2009). We have also tested the robustness by dividing the sample into a further two subsamples based on the level of representative underwriting of less than 1 and equal to 1.

4. Summary statistics

In Table II, we present the summary statistics of variables (defined in Table I) used in our regression specifications. The table shows the left-skewed underwriting discount which averaged 4.21 per cent. The underwriter rank and the level of representative underwriting are also left-skewed and averaged 7.86 and 81.36 per cent, respectively. Among other variables, SEO offer size (SEOAMOUNT ml $), offer price per share (OFFPRICE), relative offer size (RELOFF), ten-year treasury interest rate (TENYRTRSINT), number of representative underwriters (NUMREPUND) and number of total underwriters (NUMTOTUND) are all right-skewed and averaged $131.15 million, $24.44, 20.76 per cent, 4.79 per cent, 2.12 and 5.92, respectively. The representative underwriters averaged nearly 36 per cent of total underwriters in the syndicate.

REPUNDWRITING	−	Percentage of SEO shares underwritten by underwriters including lead underwriter(s) who represent the underwriting syndicate
LNSEOAMUNT	−	Natural logarithm of gross proceeds (Ibbotson *et al.*, 1994; Ling and Ryngaert, 1997; Butler *et al.*, 2005; Chen and Lu, 2006)
LNOFFPRICE	−	Natural logarithm of dollar offer price per share (Mola and Loughran, 2004; Bradley *et al.*, 2006; Kaserer and Kraft, 20032)
RELOFF	+	Relative offer with respective to firm size and defined as total amount of dollar offer size scaled by market capitalization of the firm or volume of shares offered divided by volume of outstanding shares the day before the offer (Corwin, 2003; Mola and Loughran, 2004)
UNDRANK	±	Reputation rank of lead underwriters as per Carter and Manaster (1990), Carter and Dark (1990), Dunbar (1995) and Butler *et al.* (2005) which is sourced from Ritter's homepage
NUMREPUND	+	Number of representative underwriters in the underwriting syndicate
NUMTOTUND	+	Number of total underwriters in the underwriting syndicate (Carter and Dark, 1990)
TENYRTRSINT	+	Interest rate on the ten-year US treasury bond (Ling and Ryngaert, 1997)
TOPAUDITOR	−	Dummy variable with 1 for auditor differentiated with the highest market share in the REIT SEOs during the sample period and 0 otherwise scaled in dollar of 2009 (Wang and Wilkins, 2007)
PRESEO	−	Dummy variable representing 1 for the firm having at least one SEO during either current or prior year (Mola and Loughran, 2004)
POSTRMA	−	Dummy variable representing 1 for offers issued after 2000 and 0 otherwise to control any effect of RMA1999 (Howe and Jain, 2004)
POSTGFC	±	Dummy variable representing 1 for offers issued after August 2007 and 0 otherwise (Valentine and Gordon, 2009)
NYSE	−	Dummy variable representing 1 if the firm is listed on the NYSE at the time of the offer and 0 if it is listed on either NASDAQ or AMEX (Butler *et al.*, 2005; Corwin, 2003)
DHIGHREPUND		Dummy variable representing 1 for the level of representative underwriting equal to 1 or in highest quartile and 0 otherwise
DLOWREPUND		Dummy variable representing 1 if the level of representative underwriting falls in lower quartile and 0 otherwise
DHIGHOFFPRICE		Dummy variable representing 1 if the offer price falls in higher quartile and 0 otherwise
DHIGHSEOAMOUNT		Dummy variable representing 1 if the SEO amount falls in higher quartile and 0 otherwise
DLOWSEOAMOUNT		Dummy variable representing 1 if the SEO amount falls in lower quartile and 0 otherwise
DHIGHRELOFF		Dummy variable representing 1 if the relative offer size falls in higher quartile and 0 otherwise
DLOWRELOFF		Dummy variable representing 1 if the relative offer size falls in lower quartile and 0 otherwise
DTOPRANKUND		Dummy variable representing 1 if the underwriting rank of lead underwriters is greater than median rank of 8 and 0 otherwise
*		Denotes multiplication and used in identifying the multiplicative dummy

Table I.
Definition of variables used in the above specifications and predicted sign

The sample consists of 783 SEOs over January 1996 until June 2010 issued by 197 different REITs during this sample period.

Table III reports the yearly and subperiod distribution of the sample, offer size, level of representative underwriting, relative offer, offer price per share and underwriting discounts of SEOs over the period from 1996 to 2010. Tables I and II delineate that the average (median) underwriting discount is 4.21 per cent (4.85 per cent). We have

divided the sample period into three subperiods to identify any periodical trend in underwriting discount and it shows 4.78 per cent for the period of 1996-2000 which is consistent with 4.80 per cent of Butler *et al.* (2005) and 5 per cent of Mola and Loughran (2004). The middle subperiod of our sample experienced the lowest underwriting discount. The level of representative underwriting experienced a constant downward trend from 90 to 70 per cent. The relative offer size is the lowest in the second subperiod and offer price higher in the third subperiod compared to that of first subperiod. The trend of underwriting discount is consistent with the trend of relative offer size.

The sample consists of 783 SEOs over January 1996 until June 2010 out of 1,295 total SEOs issued by 197 different REITs during this sample period. The table consists of nine columns. The left most column is the year and three subperiods. The column total SEOs is the number of SEOs, the column sample SEOs is the number of SEOs in our sample, fourth column is the amount in million dollars at constant dollars in 2009 using US GDP growth rate, fifth column shows the amount raised in million dollars, sixth column

Table II.
Summary statistics of the variables used in the statistical analysis

	Mean	Median	Maximum	Minimum	SD	*n*
UNDDISC %	4.21	4.85	8.00	0.04	1.53	783
REPUNDWRITING %	81.36	90.00	100.00	18.88	21.31	783
SEOAMOUNT ml $	131.15	80.61	1,230.00	1.78	153.13	783
OFFPRICE $	24.44	22.38	134.50	2.25	14.96	783
UNDRANK	7.86	8.00	9.00	0.00	1.52	783
RELOFF %	20.76	12.81	330.24	0.17	27.49	782
TENYRTRSINT %	4.79	4.65	7.01	2.44	1.04	783
NUMREPUND	2.12	2.00	9.00	1.00	1.51	783
NUMTOTUND	5.92	4.00	50.00	1.00	6.93	783

Table III.
Yearly distribution of SEOs, offer size and underwriting costs for 1996-2010

Year	Total SEOs	Sample SEOs	Amount in million $ at 2009	Amount in million $	Underwriting discount in per cent	Representative underwriting	Relative offer	Offer price
1996	113	48	121.35	86.68	4.87	86.25	32.48	22.04
1997	227	119	150.38	108.18	4.84	89.51	21.81	25.98
1998	216	64	103.78	75.21	4.63	95.58	15.81	26.97
1999	29	10	132.47	98.13	4.79	88.60	22.34	22.13
2000	11	4	361.78	274.08	4.14	64.33	13.69	41.45
2001	58	52	87.95	68.18	5.15	82.07	32.59	19.97
2002	85	54	109.77	86.43	4.54	90.02	21.53	19.74
2003	82	67	100.69	80.55	3.59	84.69	18.25	24.40
2004	79	66	116.70	96.45	3.04	81.67	11.12	26.03
2005	71	50	141.65	121.07	3.65	72.17	18.44	25.00
2006	75	62	213.57	189.27	3.68	74.37	17.70	32.44
2007	56	38	238.59	217.20	3.97	71.98	15.69	27.58
2008	60	46	225.86	209.13	3.81	68.85	15.90	25.56
2009	87	71	235.65	235.65	4.15	71.22	26.46	18.52
2010	46	32	200.02	200.02	4.33	71.26	23.89	19.28
1996-2000	596	245	135.24	97.65	4.78	90.01	22.22	25.26
2001-2006	450	351	139.69	118.30	3.90	80.95	19.47	24.84
2007-2010	249	187	227.74	219.28	4.06	70.80	21.23	22.22
All	1,295	783	154.53	131.15	4.21	81.36	20.76	24.44

underwriting discount is the discount or fees paid to the underwriters as percentage of amount raised, seventh column representative underwriting is the percentage of shares in the offer underwritten by the representative underwriters including lead underwriters, eighth column is the relative offer which is the offer volume with respect to firm size in terms of market capitalization or outstanding shares on the day before the offer and the last column is the offer price per share. The last row totals the second and third columns and then reports mean averages for the following six columns.

Univariate results

In Table IV, we present the univariate relationship of the level of representative underwriting with offer size (volume), underwriter rank, relative offer and offer price per share. Panel A presents the relationship with the full sample of 783 SEOs, Panel B with 359 SEOs and Panel C with 424 SEOs. The level of underwriting by the representative underwriters is 100 per cent in Panel B whereas it is less than 100 per cent in Panel C. In each panel each variable is divided into four quartiles from lowest to highest and the average underwriting discount is reported along with the difference and the level of statistical significance between the lowest and highest quartile. Panel A shows that the underwriting discount significantly declines in higher quartiles for offer size, underwriter rank, offer price and REPUNDWRITING but increases with the relative offer size. In sorting the quartile for the level of representative underwriting, we have used underwriter rank as the second-level condition because the REPUNDWRITING is 100 per cent for nearly 46 per cent of the sample. It shows that the difference in underwriting discount is zero for first two quartiles and it is apparently significant in the last two quartiles of REPUNDWRITING. In Panel B, the variable REPUNDWRITING is immaterial because its value is 100 per cent for all observations. In Panel C, the significance of the difference of underwriter rank is considered between first and third quartile because almost all observation in last two quartiles have the highest rank of 9. The significance of the underwriting discount in terms of the difference

	Underwriting discount				
	Quartile lowest	2	3	Quartile highest	%Δ (Q1-Q4)
Panel (n: 783): A					
SEO size	4.54	4.15	4.16	3.97	14.74***
Under rank	4.59	4.33	4.31	3.51	21.80***
Offer price	4.82	4.53	4.09	3.37	30.00***
Relative offer	3.42	3.87	4.45	5.09	49.10***
REPUNDWRITING	4.73	4.73	4.28	4.08	34.74***
Panel (n: 359): B					
SEO size	4.38	3.85	3.36	3.04	11.65***
Under rank	4.66	3.20	3.36	3.41	21.34***
Offer price	4.50	4.18	3.26	2.68	40.31***
Relative offer	3.48	2.80	3.63	4.74	43.36***
Panel (n: 424): C					
SEO size	4.96	4.73	4.64	4.34	12.50***
Under rank	4.79	4.71	4.45	4.74*	7.20**
Offer price	4.87	4.87	4.67	4.27	12.28***
Relative offer	4.12	4.56	4.85	5.15	24.99***
REPUNDWRITING	4.77	4.68	4.72	4.50	5.62*

Table IV. Univariate relationship of the level of representative underwriting with offer size, underwriter rank, relative offer and offer price per share

between the lowest and the highest quartile of REPUNDWRITING is marginal but consistent with our argument.

Table IV presents the univariate relationship between some key explanatory variables and underwriting discount in Panel A with the full sample of 783 SEOs, in Panel B with 359 SEOs having 100 per cent level of underwriting by representative underwriters, and in Panel C with 424 SEOs that have a level of underwriting less than 100 per cent. Each variable in the table is divided into four quartiles from lowest to highest and the average underwriting discount is reported along with the difference and the level of statistical significance between the lowest and highest quartile.

Figure 1 shows the scatter plot of underwriting discount against the level of representative underwriting. While the figure depicts apparent clustering of the level of representative underwriting at 100 per cent, there exists substantial variation in underwriting discount for both less than 100 per cent and at 100 per cent level of their underwriting. It clearly depicts that other variables have influences on underwriting discount. To control the confounding effects of other variables, we run the OLS multivariate regressions in the next section.

Figure 1 shows the scatter plot of underwriting discount for REIT SEOs against the level of representative underwriting with a full sample of 783 out of 1,295 SEOs issued by 197 different REITs during the period of January 1996 to June 2010. Our sample discards SEOs underwritten by placement agents and issued by selling shareholders. Underwriting discount is the underwriting discount directly paid to the underwriters as a percentage of SEO proceeds and the representative underwriting is the percentage of offer underwritten by the representative underwriters.

Empirical results

Table V presents the OLS regression results of factors influencing underwriting discount of raising secondary equity capital by issuing REITs from January 1996 until

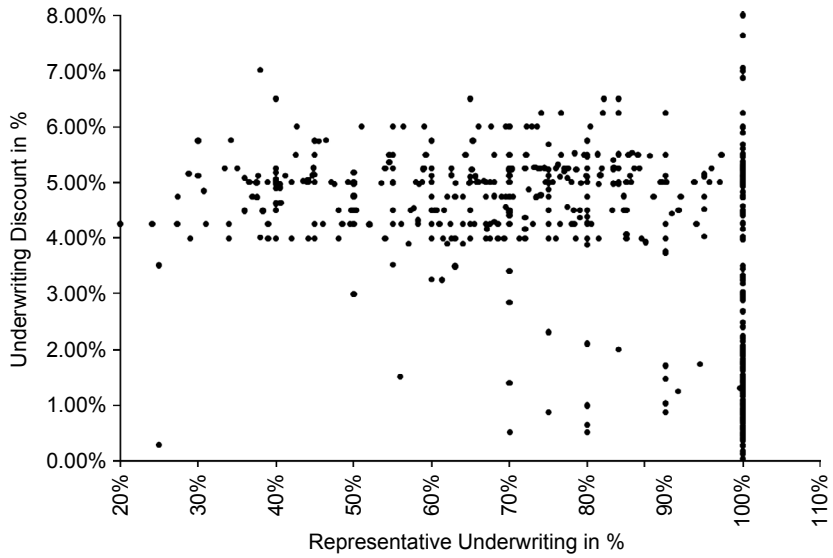

Figure 1.
Underwriting discount vs level of representative underwriting

	1		2		3		4		5	
C	0.131	0.000***	0.135	0.000***	0.141	0.000***	0.088	0.000***	0.143	0.000***
REPUNDWRITING	−0.032	0.000***	−0.032	0.000***	−0.032	0.000***	−0.032	0.000***	−0.032	0.000***
LNSEOAMOUNT	−0.002	0.000***	−0.003	0.000***	−0.002	0.000***			−0.003	0.000***
LNOFFPRICE	−0.006	0.000***	−0.006	0.000***	−0.006	0.000***			−0.005	0.000***
RELOFF							0.006	0.001***	0.004	0.064*
UNDRANK	−0.002	0.000***	−0.002	0.000***	−0.002	0.000***	−0.002	0.000***	−0.002	0.000***
NUMREPUND	0.004	0.000***	0.004	0.000***	0.004	0.000***	0.003	0.000***	0.003	0.000***
TENYRTRSINT	0.154	0.018**	0.120	0.069*						
NYSE	−0.003	0.018**	−0.003	0.015**	−0.003	0.019**	−0.004	0.011**	−0.002	0.082*
POSTGFC					0.002	0.449	0.006	0.038**	0.002	0.390
POSTRMA					−0.008	0.016**	−0.012	0.001***	−0.008	0.021**
PRESEO			−0.002	0.014**	−0.002	0.011**	−0.002	0.049**	−0.002	0.043**
TOPAUDITOR			−0.002	0.033**	−0.002	0.035**	−0.003	0.003***	−0.002	0.029**
Adj. R^2	0.51		0.52		0.52		0.47		0.52	
Sample size (n)	783		746		746		745		745	

Table V.
Regression results of factors influencing underwriting discount of raising secondary equity capital for US REIT SEOs from January 1996 until June 2010

June 2010 with total included being 783 SEOs. The table shows that all the variables except POSTGFC in all specifications are statistically significant and consistent with the predicted sign. The negative coefficient of REPUNDWRITING strongly supports that underwriters demand a lower discount when they get the higher level of underwriting business in the offer. To investigate whether underwriting fee and the level of underwriting might be determined simultaneously, we utilize a Hausman test to test whether the differences between two-stage least squares and OLS estimates are so large that the OLS estimates may not be consistent. The results of the test suggest that allowing the level of underwriting to be affected by the underwriting fee does not significantly alter the OLS coefficients reported in Table V. Consistent with Lee *et al.* (1996), the negative coefficient of LNSEOAMOUNT supports the economies of scale in REIT SEOs and is also consistent with Butler *et al.* (2005) and Bradley *et al.* (2006). The negative coefficient of LNOFFPRICE supports the intuition that the higher priced SEO stocks are easier to place in the market because the institutional investors who may be the major participant in the SEOs shun the low-priced stocks. This is also consistent with the greater certainty of the pricing of the offer (Kutsuna *et al.*, 2008, p. 228).

Our significant positive coefficient of RELOFF is consistent with the idea of higher uncertainty for SEOs with higher relative offer sizes. The intuition behind this is the higher proportion of shares offered relative to the shares outstanding creates more pressure in the market to absorb the offer (Corwin, 2003, p. 2254) and also uncertainty (Mola and Loughran, 2004, p. 7). Investment banks either need more effort in marketing or suspect more inventory risk for such offers. As such, they might charge a higher underwriting discount for such offers and vice versa. This also complements Corwin (2003) that higher relative offer has a significantly positive influence on SEO underpricing. The negative coefficient of underwriter rank, UNDRANK, is consistent with the hypothesis that the higher ranked underwriters underwrite the larger and more certain offers and due to the economies of scale, they can charge lower underwriting fees (Carter and Dark, 1990). The number of representative underwriters is used to control for the level of required coordination in the syndicate. In contrast to the argument of reduced risk of successful distribution with the larger syndicate of Carter and Dark (1990), we argue that the larger and more uncertain offer hires a larger syndicate. The larger syndicate needs more representative underwriters to efficiently deal with the parties involved in the offer. As the representative underwriters assume more responsibility, the size of both the representative underwriters and the syndicate may have a positive effect on underwriting discount. In contrast to Carter and Dark (1990), the significant positive coefficient of the size of representative underwriters and also the total syndicate size, supports our argument (although not specifically reported here). The significant positive coefficient of the ten-year treasury interest rate (TENYRTRSINT) supports the notion that during a period of higher interest rates in fixed income securities, underwriters might face difficulty in attracting investors to SEO shares due to the "yield effect" (Ling and Ryngaert, 1997). The negative coefficient of listing exchange (NYSE) justifies the broader investor base and confidence arguments. It also complements the lower underpricing of Corwin (2003) for SEOs listed in NYSE. The significant negative sign of POSTRMA is consistent with the higher bargaining strength of issuer after 2000. Consistent with our argument, the positive coefficient of POSTGFC, significant in one specification, might be attributed to the higher marketing uncertainty and required efforts of the underwriters during

the post GFC period. The negative effect of both PRESEO and TOPAUDITOR might be attributed to the more available information and greater certainty, respectively, for offers which have recent past SEOs and which are audited by the auditor who has audited the largest volume of REIT SEOs during our sample period, respectively. The firms with the prior SEO should have less asymmetric information (Ghosh *et al.*, 2000, p. 364) because the market is well familiar and can recall past information (Mola and Loughran, 2004). The firms audited by the top auditor reflect the greater reliability of their financial information. After controlling for these confounding effects on SEO underwriting discount, the negative significant coefficient of the level of representative underwriting strongly supports our conjecture that representative underwriters with the higher percentage of underwriting in the offer charge a lower underwriting discount to market the issue. As the underwriting process becomes more refined over time, the process may become cheaper and it is possible that SEO capital raising costs may be time dependent. Yearly dummies were tested but the key results remain consistent with only the POSTRMA variable remaining statistically significant.

This table reports the OLS results of factors influencing the underwriting discounts paid by the issuers of 783 US REIT SEOs over the period from January 1996 until June 2010. The number of complete observations (n) is presented at the last row. The dependent variable is the underwriting discount, UNDDISC, as a percentage of total proceeds raised which averaged 4.21 per cent. Sample size declines in subsequent specifications after adjusting for missing data of variables used in the regressions. The results in the table are based on the following estimation. The other variables are as defined in Table I:

$$\begin{aligned} \text{UNDDISC} = {} & \beta_0 + \beta_1 \text{REPUNDWRITING} + \beta_2 \text{LNSEOAMOUNT} \\ & + \beta_3 \text{LNOFFPRICE} + \beta_4 \text{RELOFF} + \beta_5 \text{UNDRANK} \\ & + \beta_{12} \text{NUMREPUND} + \beta_9 \text{TENYRTRSINT} + \beta_6 \text{NYSE} \\ & + \beta_{11} \text{POSTGFC} + \beta_{10} \text{POSTRMA} + \beta_7 \text{PRESEO} \\ & + \beta_8 \text{TOPAUDITOR} + \varepsilon \end{aligned} \tag{1}$$

***, ** and * indicate the levels of significance at 1, 5 and 10 per cent, respectively. White (1980) heteroskedasticity consistent coefficients and p-values are reported.

Table VI depicts the sensitivity of REPUNDWRITING on underwriting discount. The table consists of four specifications. The average level of underwriting by representative underwriters including lead underwriters is 81 per cent and this level is 100 per cent for 46 per cent of sample SEOs (359 of 783 SEOs). For rest of the 54 per cent sample SEOs (424 of 783), the average level of representative underwriting is 66 per cent. To detect the sensitivity of this level of underwriting on underwriting discount, we have used a number of multiplicative dummy variables in all the specifications along with some control variables not highly correlated themselves. In specifications 1 and 2, the higher level of representative underwriting (DHIGHREPUND) is 100 per cent or 1 and for the next two specifications it is greater than or equal to 75 per cent or 0.75. In terms of sign, magnitude and statistical significance of the coefficients of variables used in Table VI, they are consistent in all the specifications. The results show that the coefficients of the multiplicative dummy of higher and lower representative underwriting with the dummy of offer price in the highest quartile, DHIGHREPUND*DHIGHOFFPRICE and DLOWREPUND*DHIGHOFFPRICE are both negative but significant in DHIGHREPUND*DHIGHOFFPRICE as predicted. It indicates that underwriters

Table VI.
Regression results of factors influencing underwriting discount of raising secondary equity capital for US REIT SEOs from January 1996 until June 2010

	DHIGHREPUND = 1.0				DHIGHREPUND ≥ 0.75			
	1		2		3		4	
C	0.055	0.000***	0.061	0.000***	0.061	0.000***	0.059	0.000***
UNDRANK	−0.001	0.034**	−0.001	0.032**	−0.001	0.020**	−0.001	0.021**
TENYRTRSINT	0.066	0.299					0.006	0.935
NYSE	−0.004	0.003***	−0.004	0.004***	−0.003	0.027**	−0.003	0.024**
POSTGFC			0.006	0.039**	0.005	0.182		
POSTRMA			−0.012	0.001***	−0.007	0.073*		
PRESEO	−0.002	0.013**	−0.002	0.011**	−0.002	0.040**	−0.002	0.042**
TOPAUDITOR	−0.002	0.039**	−0.002	0.034**	−0.002	0.025**	−0.002	0.028**
DHIGHREPUND*DHIGHOFFPRICE	−0.010	0.000***	−0.010	0.000***	−0.008	−0.000***	−0.008	0.000***
DLOWREPUND*DHIGHOFFPRICE	−0.001	0.403	−0.001	0.461	−0.002	0.351	−0.002	0.304
DHIGHREPUND*DHIGHSEOAMOUNT	−0.008	0.001***	−0.008	0.001***	−0.004	0.036**	−0.004	0.028**
DLOWREPUND*DHIGHSEAMOUNT	0.001	0.651	0.001	0.375	0.001	0.720	0.001	0.974
DHIGHRELOFF*DHIGHREPUND	0.005	0.006***	0.005	0.009***	0.006	0.000***	0.006	0.000***
DLOWRELOFF*DHIGHREPUND	−0.007	0.000***	−0.007	0.000***	−0.008	0.000***	−0.008	0.000***
DHIGHREPUND*DTOPRANKUND	−0.007	0.000***	−0.007	0.000***	−0.004	0.008***	−0.004	0.008***
DLOWREPUND*DTOPRANKUND	0.004	0.000***	0.004	0.000***	0.004	0.001***	0.004	0.001***
Adj. R^2	0.42		0.43		0.40		0.40	
Sample size (n)	745		745		745		745	

Note: DHIGHREPUND = 1.0 or ≥0.75

charge a lower underwriting discount for offers with both the higher offer price and the higher level of representative underwriting in the syndicate. The level of underwriting by the representative underwriters matters as is evident from the reduced economic significance in the last two specifications where the level of underwriting reduces from 1 to 0.75. Similarly, the coefficient of the next pair of multiplicative dummies show that underwriting discount is significantly lower for offers with both the higher offer size and the higher level of representative underwriting. It also indicates that underwriters charge lower compensation when the offer size is larger and their level of underwriting becomes higher. This is attributed to the higher certainty and economies of scale enjoyed by the representative underwriters for the larger offer size. The reduced economic and the statistical significance in the next two specifications indicates the significance of the level of representative underwriting. To test the significance of the relative offer, we have used dummies for highest and lowest quartile of relative offer size and multiplied by the higher level of representative underwriting. The estimated coefficients show that the offers with the relative offer in the highest quartile in all specifications are positive and statistically significant at 1 per cent whereas the coefficients of those with the relative offer in the lowest quartile are all negative and significant at 1 per cent. The significantly lower underwriting discount of offers with lower relative offer indicates that underwriters charge lower underwriting discount for offers with lower relative offer sizes and they charge a higher discount for offers with higher relative offer sizes. It shows that underwriters consider the relative uncertainty of the offer along with their level of underwriting in demanding their compensation. In the last two rows of multiplicative dummies, we have tested the sensitivity effect of the level of representative underwriting by controlling the rank of top underwriters. We argue that the top-ranked underwriters, ranked above a median rank of 8 in our sample, tend to underwrite relatively larger amounts of the offer and demand lower compensation. The estimated coefficients in first two specifications strongly support our argument. When the level of higher representative underwriting reduces from 1 to 0.75 with the lead underwriting rank remaining the same, the economical significance slightly reduces but remains significant at 1 per cent. This also supports our argument.

Table VII presents the regression results of two subsamples of 424 and 359 SEOs with the level of representative underwriting less than 1 and equal to 1, respectively. The average underwriting discounts for these two subsamples are 4.67 and 3.66 per cent, respectively. The difference in average underwriting discount in these two subsamples apparently indicates that the SEOs with higher level of representative underwriting pay relatively lower compensation to the concerned underwriting syndicate. The table consists of six regression specifications. Specifications 1 to 3 are for the subsample with representative underwriting less than 1 and specifications 4 to 6 are for the subsample with representative underwriting equal to 1. The regression coefficient of REPUNDWRITING confirms that both the economic and statistical significance of the level of representative underwriting remain consistent after adjusting for other effects in the subsample of 424 SEOs with the level of REPUNDWRITING less than 1. To avoid the effect of multicollinearity problem of TENYRTRSINT with POSTGFC and POSTRMA, they are used interchangeably.

The significant positive coefficient of RELOFF in specifications 4 and 5 strongly confirms our argument that offers with higher relative offer size and higher representative underwriting (100 per cent) pay a higher underwriting discount to the underwriters.

Table VII. Regression results of factors influencing underwriting discount of raising external equity capital for US REIT SEOs from January 1996 until June 2010

	REPUNDWRITING < 1						REPUNDWRITING = 1					
	1		2		3		4		5		6	
C	0.097	0.000***	0.088	0.000***	0.057	0.000***	0.143	0.000***	0.134	0.000***	0.043	0.000***
LNSEOAMOUNT	−0.002	0.036**	−0.002	0.005***			−0.003	0.003***	−0.004	0.002***		
LNOFFPRICE	−0.003	0.001***	−0.003	0.000***			−0.006	0.001***	−0.006	0.001***		
REPUNDWRITING	−0.017	0.000***	−0.017	0.000***								
RELOFF	0.003	0.121	0.004	0.030**			0.008	0.000***	0.008	0.000***		
UNDRANK	−0.001	0.717	−0.001	0.794			−0.002	0.000***	−0.002	0.000***		
TENYRTRSINT		0.143	0.043**				−0.165	0.287				
NYSE	−0.004	0.001***	−0.004	0.005***	−0.004	0.005***	−0.001	0.603	−0.001	0.623	−0.003	0.336
POSTGFC	0.001	0.849			0.003	0.384			0.009	0.016**	0.005	0.364
POSTRMA	−0.006	0.046**			−0.011	0.004***			−0.009	0.177	−0.007	0.439
PRESEO	−0.001	0.124	−0.001	0.124	−0.001	0.915	−0.002	0.100	−0.002	0.117	−0.003	0.049**
TOPAUDITOR	−0.001	0.404	−0.001	0.404	0.001	0.888	−0.003	0.107	−0.002	0.121	−0.003	0.076*
NUMREPUND	0.002	0.000***	0.002	0.000***			0.004	0.000***	0.004	0.000***		
DHIGHSEOAMOUNT					−0.003	0.007***					−0.004	0.098*
DLOWSEOAMOUNT					−0.001	0.650					0.004	0.079*
DHIGHOFFPRICE					−0.002	0.088*					−0.004	0.098*
DLOWOFFPRICE					0.001	0.301					0.008	0.000***
DHIGHREPUND					−0.004	0.000***						
DLOWREPUND					0.002	0.115						
DHIGHRELOFF					0.002	0.029**					0.009	0.000***
DLOWRELOFF					−0.005	0.000***					0.001	0.846
Adj. R^2	0.37		0.37		0.37		0.59		0.59		0.49	
Sample size (n)	408		408		408		337		337		337	

Note: REPUNDWRITING < 1 and = 1

Similarly, the significant negative coefficient of UNDRANK in specifications 4 and 5 also strongly confirms that representative underwriters demand a significantly lower underwriting discount for offers where the level of both their representative underwriting and lead underwriters' rank are relatively higher. The insignificant coefficients of listing exchange, NYSE and POSTGFC indicate that these are not significant factors to underwriters in demanding their compensation when they have higher level of underwriting in the offer.

DHIGHSEAMOUNT is the dummy variable as defined and used here to control the effect of higher offer size. The result shows that its coefficients in both subsamples are significantly negative with higher significance in subsample with REPUNDWRITING < 1. This is attributed to the larger offer size in this subsample, ($166ml against $90ml) and is also consistent with the conjecture of Mikkelson and Partch (1985) that low-volume stocks are less demand elastic. Similarly, the dummy variable DLOWSEOAMOUNT is positive but significant only in specification 6 due to this elasticity effect. The coefficients of offer price in the highest quartile, DHIGHOFFPRICE, are significant at 10 per cent in both subsamples but the economic significance is higher in the subsample with the level of 100 per cent representative underwriting where the average offer price is 33 per cent higher than that of representative underwriting less than 100 per cent ($28 against $21). The average relative offer size, RELOFF, in the subsample with representative underwriting less than 100 per cent is 26 per cent against 14 per cent in that with representative underwriting of 100 per cent. The higher economic magnitude of DHIGHRELOFF in specification 6 indicates that the representative underwriters who underwrite 100 per cent of the offer penalize the offers with higher relative offer size by demanding a higher underwriting discount than those where their level of underwriting is less than 100 per cent. It also shows that the level of representative underwriting is an inverse function of the relative offer size. The significant negative coefficient of DLOWRELOFF justifies the significance of the relative offer size in demanding the underwriting discount. The significant negative coefficient of DHIGHREPUND shows further the significance of the level of representative underwriting to top-ranked underwriters even when we divide the sample as per the level of representative underwriting.

Table VIII presents the OLS regression results of a periodical subsample of 538 SEOs from January 2001 until June 2010. We have divided our sample into this period to test the consistency of the level of representative underwriting along with other control variables. The subsample is significant because the REIT Modernization Act 1999 became effective from 1 January 2001 (Howe and Jain, 2004) and some REITs were first included in the S&P500 index in 2001 (Laopodis, 2009, p. 563). These two are significant events for the REIT industry. However, the average underwriting discount for this subperiod is 3.95 per cent which is also relatively lower than that of our full sample (at 1 per cent significance). This relatively lower underwriting discount may well be attributed to the effects of these two events and it also justifies the dividing of the sample into this subperiod.

In specification 3, the dummy variable DHIGHREPUND is 1 for REPUNDWRITING equal to 1 and 0 otherwise whereas in specification 4, it is 1 for REPUNDWRITING equal to or greater than 0.75 and 0 otherwise. The table shows that the offers with both the offer price in the highest quartile and the higher level of representative underwriting pay a significantly lower underwriting discount. Specifications 1 and 2 show that the level of representative underwriting and the number of representative underwriters

Table VIII. Regression results of factors influencing underwriting discount of raising secondary equity capital for US REIT SEOs from January 2001 until June 2010

	DHIGHREPUND 1.0				DHIGHREPUND ≥ 0.75			
	1		2		3		4	
C	0.103	0.000***	0.063	0.000***	0.062	0.000***	0.062	0.000***
LNSEOAMOUNT	−0.001	0.609						
LNOFFPRICE	−0.008	0.000***	−0.008	0.000***				
REPUNDWRITING	−0.030	0.000***						
NUMREPUND			0.005	0.000***				
UNDRANK	−0.002	0.000***	−0.002	0.000***	−0.001	0.012***	−0.001	0.003***
TENYRTRSINT	0.310	0.000***	0.316	0.000***				
NYSE	−0.006	0.000***	−0.008	0.000***	−0.008	0.000***	−0.007	0.000***
POSTGFC					−0.001	0.803	0.001	0.280
PRESEO	−0.003	0.004***	−0.003	0.012***	−0.003	0.012**	−0.003	0.021**
TOPAUDITOR	−0.001	0.276	−0.002	0.108	−0.002	0.042**	−0.003	0.040**
DHIGHREPUND*DHIGHOFFPRICE					−0.010	0.000***	−0.010	0.000***
DLOWREPUND*DHIGHOFFPRICE					−0.002	0.320	−0.002	0.312
DHIGHREPUND*DHIGHSEAMOUNT					−0.010	0.005***	−0.004	0.091*
DHIGHREPUND*DLOWSEOAMOUNT					−0.001	0.993	0.001	0.995
DHIGHRELOFF*DHIGHREPUND					0.007	0.082*	0.008	0.000***
DLOWRELOFF*DHIGHREPUND					−0.008	0.003***	−0.009	0.000***
DHIGHREPUND*DTOPRANKUND					−0.010	0.000***	−0.005	0.007***
DLOWREPUND*DTOPRANKUND					0.004	0.000***	0.004	0.000***
Adj. R^2					0.43	0.34	0.42	0.39
Sample size (n)	525		525		524		524	

Note: DHIGHREPUND = 1.0 and ≥0.75

are consistent with all previous sample results after adjusting for the effects of other variables. The effect of the offer size and the top auditor are not statistically significant. This implies that the offer size and the top auditor cannot completely explain the underwriting discount. Among variables, the effects of offer price per share, underwriter rank, ten-year treasury interest rate, listing exchange and prior recent SEOs are significant and robust. The significance of the level of representative underwriting is consistent with that of Table V with respect to higher offer price, relative offer size and top-ranked underwriter.

We have tested the significance of the level of representative underwriting in a couple of different ways with different subsamples and our results are both economically and statistically significant and consistent across subsamples. Additionally, our results of sensitivity analysis using multiplicative dummies show that the offers with the higher level of representative underwriting but the lower relative offer size pay lower underwriting discount to the underwriters. When we control the offer price per share and top-ranked underwriter, our results report the consistent significance over two sample periods. As such, based on our results, we suggest that the level of representative underwriting is a significant determinant to underwriters in demanding their compensation.

In Table IX, we present the OLS regression results of factors determining the level of representative underwriting with our full sample of 783 SEOs from January 1996 until June 2010. The significant negative coefficients of the offer size, LNSEOAMOUNT, denote that the level of representative underwriting is a negative function of the offer size whereas it is positively influenced by the offer price of the stock, LNOFFPRICE. The intuition behind the negative and positive influence of offer size and offer price, respectively, on the level of underwriting is that the larger offer positively affects the inventory risk whereas the higher offer price inversely affects uncertainty. This is also consistent with our findings that the average SEO amount is significantly lower for the level of representative underwriting equal to 1.

Thus, underwriters tend to underwrite less for those larger offers but tend to raise their underwriting share for higher priced offers. For the larger and more uncertain lower priced offers, the representative underwriters take more underwriters in the syndicate to reduce their inventory risk and promote the successful distribution. When there are larger syndicate sizes, the proportion of representative underwriting declines but the representative underwriters tend to raise their proportion in the offer when

	1		2		3		4	
C	1.267	0.000***	1.972	0.000***	2.041	0.000***	0.823	0.000***
LNSEOAMOUNT	−0.027	0.000***	−0.075	0.000***	−0.070	0.000***		
LNOFFPRICE	0.035	0.001***	0.065	0.000***				
RELOFF					−0.067	0.043**	−0.090	0.013**
UNDRANK	0.001	0.778	−0.007	0.172				
NUMREPUND			0.030	0.000***	0.029	0.000***	0.016	0.000***
NUMTOTUND	−0.013	0.000***						
NYSE	0.016	0.613	0.018	0.413	0.020	0.371		
POSTGFC	−0.073	0.000***	−0.058	0.001***	−0.085	0.000***	−0.133	0.000***
PRESEO					0.002	0.895	0.004	0.806
Adj. R^2					0.30	0.17	0.15	0.08
Sample size (n)	783		783		780		780	

Table IX.
OLS regression results of factors influencing level of representative underwriting (REPUNDWRITING) of raising secondary equity capital for US REIT SEOs from January 1996 until June 2010

their number increases in the syndicate. The significant negative coefficients of the number of total underwriters, NUMTOTUND, and significant positive coefficients of the number of representative underwriters, NUMREPUND, strongly support our argument. Owing to the higher uncertainty associated with the higher level of relative offer sizes, there appears an inverse effect which is demonstrated by the significant negative coefficient of RELOFF.

We include the underwriter rank, UNDRANK, in this specification because we expect that the certainty of the higher rank of the lead underwriters in the syndicate motivates the team of the representative underwriters to underwrite a larger portion in the offer. The significance of the coefficient of UNDRANK fails to support this argument. Because of the broader base and confidence of NYSE, and less asymmetric information of offers with a recent prior SEO, representative underwriters might get motivation to raise their level of underwriting in offers listed in the NYSE and that have a prior SEO. To control their influences, we include the dummy variable of NYSE and PRESEO in our specification. Our results show that the directions of both the coefficients are consistent with our expectation but their statistical significance fails to support it.

The table also shows that the level of representative underwriting is significantly lower for post GFC offers. This supports the intuition that underwriters might expect higher inventory risk for the post-GFC offers and might want to reduce that risk by underwriting less in the offer. This is in contrast to our findings of lower underwriting discount for post GFC SEOs. We may argue that underwriters might want to motivate the issuers by reducing their compensation and simultaneously reduce their inventory risk through lowering their level of underwriting in the offer.

This table reports the OLS results of factors influencing the level of representative underwriting of 783 US SEOs out of 1,295 SEOs issued by 197 different REITs over the period from January 1996 until June 2010. The average level of representative underwriting is 81 per cent. The number of complete observations (n) is presented at the last row. Sample size reduced to 780 in specification 3 after adjusting for missing variable data in three SEOs. The table presents the estimates based on the following regression specification:

$$\begin{aligned} \text{REPUNDWRITING} = {} & \beta_0 + \beta_1 \text{LNSEOAMOUNT} + \beta_2 \text{LNOFFPRICE} \\ & + \beta_3 \text{RELOFF} + \beta_4 \text{UNDRANK} + \beta_5 \text{NUMREPUND} \\ & + \beta_6 \text{NUMTOTUND} + \beta_7 \text{NYSE} + \beta_8 \text{POSTGFC} + \varepsilon \end{aligned} \tag{2}$$

The other variables are as defined in Table I. ***, ** and * indicate the level of significance at 1, 5 and 10 per cent, respectively. White (1980) heteroskedasticity consistent coefficients and p-values are reported.

5. Conclusion

This paper empirically depicts that the level of underwriting by the representative underwriters in the syndicate can be a significant determinant to them in demanding their compensation. Our results suggest that underwriters place emphasis on both the level of underwriting and the level of uncertainty in an offer in determining their compensation. Antecedent empirical evidence shows the mixed effect of the underwriter reputation on the underwriter remuneration. Our results provide evidence that underwriters may place emphasis on their both reputation and volume of underwriting in an offer in determining their compensation. The empirical evidence of this paper

reconciles the mixed effect of the underwriter's reputation on their remuneration by incorporating the uncertainty and the level of underwriting along with their reputation in fixing their remuneration. Our findings complement the well-documented notion of the economies of scale of the offer size on underwriting cost by reporting the statistically significant negative relationship between the offer size and the underwriting discount. Our results show that the structure of the underwriting syndicate such as the reputation of the lead underwriter, the number of underwriters and the level of underwriting in an offer are significant determinants of REIT SEO underwriting costs.

Consistent with the industrial SEOs, by investigating a large sample of REIT SEOs, our findings document the declining trend of SEO underwriting costs. It also documents the effect of both the post-REIT Modernization Act 1999 and the GFC on underwriting costs and confirms that the SEOs floated after 2000 and during post-GFC pay lower compensation to underwriters. Overall, the results suggest that issuers can minimize the direct costs of raising secondary equity capital by selecting the underwriting syndicate with a higher ranked lead underwriter and fewer representatives but who will underwrite the larger proportion of the offer in the syndicate.

The study contributes to the literature by providing the determinants of the direct costs of REIT SEOs and more specifically the effect of the level of representative underwriting. It also contributes to the literature by providing the determinants of the level of representative underwriting. The significance of the level of underwriting in the syndicate complements Mola and Loughran (2004) that managers of issuing firms emphasize on the underwriters who will aggressively talk up their stock because the aggressive underwriters refrain from talking up in favor of the offer unless they get their optimum level of underwriting in the offer. The study can directly help both the managers of the issuing firms and the underwriting syndicate in bargaining on the underwriting compensation.

Notes

1. Pugel and White (1988) and Carter and Dark (1990) report a statistically significant negative impact of underwriter's reputation on underwriting spread but Chisty *et al.* (1996) find an insignificant negative effect. Dunbar (1995) also documents a significant negative impact on total cost spread, whereas How and Yeo (2000), Butler *et al.* (2005) find an insignificant positive effect on underwriting fees but Lee and Masulis (2009) report a significant negative effect on underwriting fees.
2. Corwin and Schultz (2005) report selling concessions nearly 60 percent, our sample shows it as 64 percent.
3. Horng and Wei (1999) who used EDGAR database for financial footnotes, Howe and Jain (2004) for annual reports, Loughran and Ritter (2004) for final IPO prospectuses (form 424B4) after 1996, Chung *et al.* (2005) for selecting their sample period from 1996 due to availability of some required data in EDGAR since 1996 and Brau *et al.* (2007) for number of primary and secondary shares.

References

Beatty, R.P. (1989), "Auditor reputation and the pricing of initial public offerings", *The Accounting Review*, Vol. 64, pp. 693-709.

Bradley, D.J., Cooney, J.W.J., Dolvin, S.D. and Jordan, B.D. (2006), "Penny stock IPOs", *Financial Management*, Spring, pp. 5-29.

Brau, J.C., Li, M. and Shi, J. (2007), "Do secondary IPO process have a negative effect on aftermarket performance?", *Journal of Banking & Finance*, Vol. 31, pp. 2612-31.

Butler, A.W. and Huang, P. (2003), "On the uniformity of investment banking spreads: the seven percent solution is not unique", *Journal of Multinational Financial Management*, Vol. 13, pp. 265-72.

Butler, A.W., Grullon, G. and Weston, J.P. (2005), "Stock market liquidity and the costs of issuing equity", *Journal of Financial and Quantitative Analysis*, Vol. 40 No. 2, pp. 331-47.

Carter, R.B. and Dark, F.H. (1990), "The use of over-allotment option in initial public offerings of equity: risk and underwriter prestige", *Financial Management*, Vol. 19 No. 3, pp. 55-64.

Carter, R.B. and Manaster, S. (1990), "Initial public offerings and underwriter reputation", *Journal of Finance*, Vol. 45, pp. 1045-67.

Chen, H.-C. and Lu, C. (2006), "How much do REITs pay for their IPOs", *Journal of Real Estate Finance & Economics*, Vol. 33 No. 2, pp. 105-25.

Chen, H.-C. and Ritter, J. (2000), "The seven percent solution", *Journal of Finance*, Vol. 55, pp. 1105-31.

Chisty, M.R.K., Hasan, I. and Smith, S.D. (1996), "A note on underwriter compensation and initial public offerings", *Journal of Business Finance & Accounting*, Vol. 23, pp. 905-14.

Chung, K.H., Li, M. and Yu, L. (2005), "Assets in place, growth opportunities, and IPO returns", *Financial Management*, Autumn, pp. 65-88.

Corwin, S.A. (2003), "The determinants of underpricing for seasoned equity offers", *Journal of Finance*, Vol. 58 No. 5, pp. 2249-79.

Corwin, S.A. and Schultz, P. (2005), "The role of IPO underwriting syndicates: pricing, information production, and underwriter competition", *The Journal of Finance*, Vol. 60 No. 1, pp. 443-86.

Dunbar, C.G. (1995), "The use of warrants as underwriter compensation in initial public offerings", *Journal of Financial Economics*, Vol. 38, pp. 59-78.

Eckbo, B.E. and Masulis, R.W. (1992), "Adverse selection and the rights offer paradox", *Journal of Financial Economics*, Vol. 32, pp. 293-332.

Ghosh, C., Nag, R. and Sirmans, C.F. (2000), "A test of the signaling value of IPO-underpricing with REIT IPO-SEO pairs", *Journal of Real Estate Finance & Economics*, Vol. 20 No. 2, pp. 137-54.

Hansen, R. (2001), "Do investment banks compete in IPOs? The advent of the 7 percent plus contract", *Journal of Financial Economics*, Vol. 59, pp. 313-86.

Horng, Y. and Wei, P. (1999), "An empirical study of derivatives use in the REIT industry", *Journal of Real Estate Economics*, Vol. 27, pp. 561-86.

How, J.C.Y. and Yeo, J.J.L. (2000), "The pricing of underwriting services in the Australian capital market", *Pacific-Basin Finance Journal*, Vol. 8, pp. 347-73.

Howe, J.S. and Jain, R. (2004), "The REIT modernization act of 1999", *Journal of Real Estate Finance & Economics*, Vol. 28 No. 4, pp. 369-88.

Huang, R. and Zhang, D. (2011), "Managing underwriters and the marketing of seasoned equity offerings", *Journal of Financial and Quantitative Analysis*, Vol. 46 No. 1, pp. 141-70.

Ibbotson, R.G., Sindelar, J.L. and Ritter, J.R. (1994), "The market's problems with the pricing of initial public offerings", *Journal of Applied Corporate Finance*, Vol. 7, pp. 66-74.

Kaserer, C. and Kraft, M. (2003), "How issue size, risk and complexity are influencing external financial costs: German IPOs analyzed from an economies of scale perspective", *Journal of Business Finance & Accounting*, Vol. 30, pp. 479-512.

Kutsuna, K., Dimovski, W. and Brooks, R. (2008), "The pricing and underwriting costs of Japanese REIT IPOs", *Journal of Property Research*, Vol. 25 No. 3, pp. 221-39.

Laopodis, N. (2009), "REITs, the stock market and economic activity", *Journal of Property, Investment & Finance*, Vol. 27 No. 6, pp. 563-78.

Lee, G. and Masulis, R.W. (2009), "Seasoned equity offerings: quality of accounting information and expected floatation costs", *Journal of Financial Economics*, Vol. 92, pp. 443-69.

Lee, I., Lochhead, S., Ritter, J.R. and Zhao, Q. (1996), "The costs of raising capital", *Journal of Financial Research*, Vol. 19, pp. 59-74.

Ling, D.C. and Ryngaert, M. (1997), "Valuation uncertainty, institutional involvement and the underpricing of IPOs: the case of REITs", *Journal of Financial Economics*, Vol. 43 No. 3, pp. 433-56.

Ljungqvist, A., Marston, F. and Wilhelm, W. Jr (2006), "Competing for securities underwriting mandates: banking relationships and analyst recommendations", *The Journal of Finance*, Vol. 61 No. 1, pp. 301-40.

Ljungqvist, A., Marston, F. and Wilhelm, W. Jr (2009), "Scaling the hierarchy: how and why investment banks compete for syndicate co-management appointments", *Review of Financial Studies*, Vol. 22 No. 10, pp. 3977-4007.

Loughran, T. and Ritter, J. (2004), "Why has IPO underpricing changed overtime?", *Financial Management*, Autumn, pp. 5-37.

Mola, S. and Loughran, T. (2004), "Discounting and clustering in seasoned equity offering prices", *Journal of Financial and Quantitative Analysis*, Vol. 39 No. 1, pp. 1-22.

Pugel, T.A. and White, L.J. (1988), "An empirical analysis of the underwriting spreads on initial public offerings", *Quarterly Review of Economics and Business*, Vol. 28 No. 4, pp. 6-20.

Sanders, A. (2008), "The subprime crisis and its role in the financial crisis", *Journal of Housing Economics*, Vol. 17, pp. 254-61.

Smith, C.W. (1977), "Alternative methods for raising capital: right vs underwritten offerings", *Journal of Financial Economics*, Vol. 5, pp. 273-307.

Torstila, S. (2001), "What determines IPO gross spreads in Europe?", *European Financial Management Journal*, Vol. 7, pp. 523-41.

Torstila, S. (2003), "The clustering of IPO gross spreads: international evidence", *Journal Financial and Quantitative Analysis*, Vol. 38, pp. 673-94.

Valentine, T. and Gordon, C. (2009), *Economics in Focus: The Global Financial Crisis*, Pearson Education Australia, Frenchs Forest.

Wang, K. and Wilkins, M.S. (2007), "The impact of audit firm industry differentiation on IPO underpricing", *Pacific Accounting Review*, Vol. 19 No. 2, pp. 153-63.

White, H. (1980), "A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity", *Econometrica*, Vol. 48, pp. 817-38.

Further reading

Altinkilic, A. and Hansen, R.S. (2003), "Discounting and underpricing in seasoned equity offers", *Journal of Financial Economics*, Vol. 69, pp. 285-323.

Safieddine, A. and Wilhelm, W.J. Jr (1996), "An empirical investigation of short-selling activity prior to seasoned equity offerings", *Journal of Finance*, Vol. 46, pp. 729-49.

Corresponding author

William Dimovski can be contacted at: wd@deakin.edu.au