



## Market Signals Associated with REIT IPOs

AIGBE AKHIGBE

*Moyer Chair in Finance, The University of Akron, Akron, OH 44325, USA*

*E-mail: aigbe@uakron.edu*

JARROD JOHNSTON

*Assistant Professor of Finance, Appalachian State University, Boone, NC 28608, USA*

JEFF MADURA

*SunTrust Bank Professor of Finance, Department of Finance, Florida Atlantic University, Fort Lauderdale,*

*FL 33301, USA*

THOMAS M. SPRINGER

*Professor of Real Estate, Florida Atlantic University, 5353 Parkside Drive, Jupiter, FL 33458, USA*

### **Abstract**

Previous studies have found significant but time-varying valuation effects associated with real estate investment trusts initial public offerings (REIT IPOs). Because REIT IPOs may disclose relevant information about real estate market conditions, they may serve to revalue existing real estate securities. To determine whether REIT IPOs signal information that is impounded into the share prices of other real estate securities, we assess the returns on “rival” portfolios of existing real estate securities upon the issuance of the IPO. On average, the “rival” portfolios experience insignificant effects on the REIT IPO filing date, but negative and significant abnormal returns around the issue date. A cross-sectional analysis of combined effects at the time of the filing date and issue date shows that the negative effects on the “rival” portfolios are more pronounced when (1) the size of the REIT IPO is larger, (2) market conditions are relatively weak, (3) more REIT IPOs come to market, and (4) the IPO is not associated with an umbrella partnership REIT.

**Key Words:** REIT IPOs, REIT pricing and performance

### **1. Introduction**

Initial public offerings (IPOs) have been widely studied in the academic literature. In general, research has shown that IPOs are underpriced and lead to excess short-run returns. Specifically, for real estate investment trusts (REITs), IPOs are shown to be overpriced in the 1980s (Wang et al., 1992), but underpriced in the 1990s (Ling and Ryngaert, 1997).

The observed variability of returns to IPOs has led to further research seeking an understanding as to whether or not IPOs send signals to investors regarding the quality of the firm involved in the IPO. In this paper, we consider that the short-term performance of a REIT IPO can signal investors as to the performance of other real estate securities. That is, the decision to take a REIT public may emit signals about performance of the real estate

sector and the future price behavior of existing real estate securities. To do this, we consider two scenarios. First, we assume that REITs by definition represent a single economic sector, real estate securities; that is, a REIT competes with and may provide information relevant to other REITs. Next, we recognize that the REIT universe represents a diversity of industrial sectors. Using Standard Industry Classification (SIC)-codes, we tie individual REITs to their specific SIC-matched market niche. For example, we recognize home-builder REITs to be in the home-building industry (SIC 1521) not the REIT “industry” (SIC 6798).

Previous research on IPO signaling effects has focused primarily on the signal an IPO sends with regard to the issuing company. We assess the signal that a REIT IPO sends about other real estate securities that are trading at the time of the IPO issuance. Using an event study methodology, we examine the price effects of a rival portfolio of existing real estate securities around the time of the issue of a REIT IPO. In the aggregate, the results show that REIT IPOs do not signal information on the IPO filing date about the values of existing REITs in aggregate or for REITs trading in specific SIC-identified sectors. However, on the IPO issue date, there is evidence that REIT IPOs signal negative information about the values of other REITs and other real estate securities.

To explain the distribution of IPO effects on rival real estate portfolios, a cross-sectional analysis of the observed rival portfolio returns identifies factors that seemingly influence the returns of the rival real estate portfolio around the time of the IPO. Specifically, the SIC-matched rival portfolios experience a more pronounced negative effect in response to a REIT IPO when the IPO is relatively large, when market conditions prior to the IPO are relatively weak, when a relatively large number of other REITs recently have gone public, and when the REIT involved in the IPO is not structured as an umbrella partnership REIT (UPREIT).

The results imply that REIT IPOs convey information to the market about existing publicly-traded real estate securities, not necessarily REITs. Specifically, the results show that information is conveyed about various real estate sectors, such as homebuilding, commercial developers and hotels, and not REITs in general. This outcome suggests that investors do not assume that all REITs are similar, but consider the specific activity in which the REIT is involved. This result also supports the contention that some REIT indices may not be overly insightful, except in the case of sector investors, because they do not convey information about specific real estate activities. Finally, the results illustrate the usefulness of REIT information in valuing other non-REIT, but related, securities.

## 2. Related research

There is substantial research on IPOs. Generally, research has shown IPOs to be significantly underpriced with the underpricing attributable to uncertainty surrounding the valuation of the IPO (see Beatty and Ritter, 1986; Ibbotson et al., 1988). The price effects of REIT IPOs have also been studied. Wang et al. (1992) establish that initial returns for REIT IPOs are negative, implying that REITs were overpriced at the time of the IPO. Subsequent research (Below et al., 1995) contends that the overpricing may be a result of

measurement error, and that REIT IPOs, on average, between 1972 and 1988 were correctly priced. Finally, Ling and Ryngaert (1997) finds REIT IPOs to be underpriced in the 1990s. This result is in accord with those in the general finance literature on IPOs. The difference in the results between the 1980s and the 1990s suggests a possible shift in REIT pricing between these two time periods.

Other studies have investigated the signaling effects of IPOs. Previous research (Michaely and Shaw, 1994; Benveniste et al., 2002; Lowry and Schwert, 2002, and others) document that IPO activity provides signals for other issuers and the overall industry. Recent research documents that the IPO behavior is closely tied to market preferences. Benveniste et al. (2002) suggest that firms going public are sensitive to feedback from the market before finalizing their decision to go public and the specific provisions of their IPO. Furthermore, privately-held rivals can monitor IPO efforts to determine whether they are properly positioned to go public. According to Benveniste et al. (2002), underwriters may attempt to bundle IPOs to allow more transparent comparisons to investors who consider IPOs. That is, if underwriters signal the market's prevailing valuation of private firms in the same industry, there is less uncertainty about the valuation of these firms. While these studies acknowledge a link between a firm that goes public and its corresponding rivals, they do not measure how an IPO by one firm affects its corresponding rivals.

In the real estate literature, Ghosh et al. (2000) consider the signal that an issuing REIT IPO sends to investors with regard to the issuing REIT. In contrast to these efforts, we focus on whether a REIT IPO and its pricing sends the market signals about other real estate securities.

Akhigbe et al. (2001) show that corporate IPOs elicit an initial favorable share price response of other corresponding rivals in the same industry. They attribute this initial response as a signal of favorable prospects for the industry. However, they suggest that the effects could change following the IPO. Applying a theory by Kim and Ritter (1999) that IPO valuations are partially driven by market multiples of firms in the same industry, they argue that when a private firm recognizes publicly-held comparables to be overvalued, they attempt to time their IPO when market multiples (such as market price per share per level of earnings) are high. In this way, they can extract more IPO proceeds because the prevailing price of equity is high. Such timing may signal adverse valuation effects over time, as market multiples could decline after the IPO. Ritter (1991) finds that firms experience declining share prices following an IPO. In addition, Jain and Kini (1994) compare accounting performance before and after an IPO. They find evidence of weak accounting performance of a firm following its IPO and conclude that the IPO is timed when the firm expects that its performance has peaked. To the extent that the decline in the post-IPO performance detected by Ritter and by Jain and Kini is due to a decline in the industry, an IPO may signal that the market multiples in the corresponding industry are near their peak. This signal has negative ramifications for the stock prices of corresponding rivals of a firm that goes public.

Akhigbe et al. (2001) find that over a longer time period following the IPO, the rivals experience negative valuation effects, a result which supports the argument that the IPOs are timed when industry prices (and therefore the multiples applied to the IPO offer price) are near their peak. However, their focus is not on REITs. The unique characteristics of

REITs that cause separate assessments of the effects on the firms that go public also justify separate assessments of how the REIT IPOs influence their corresponding rivals.

Szewczyk (1992) suggests that the secondary offering of a firm may not only signal that the firm is overvalued, but also that the entire industry is overvalued. To the extent that the firm's market value is linked to industry multiples, its actions may signal its expectation that the industry multiple and therefore its own value will decline. He finds negative intra-industry effects, which support his theory.

In aggregate, the body of related research implies that offerings may be timed when the respective sector's prices are overvalued, which may signal that sector valuations will decline in the near future. The timing of secondary offerings is relevant to the firm that wants to maximize the price received for its shares so that it can reduce its cost of capital. Ghosh et al. (2000) find that REITs that underprice their IPOs are likely to sell seasoned equity sooner and that REITs that underprice the IPO also underprice secondary equity offerings. The timing of IPOs is relevant for the same reason, and is also relevant to the original owners who want to cash out. Regardless of the motivation, if issuers expect pricing to be more favorable in the near future, they may choose to defer the offering.

To the extent that market multiples are applicable in pricing an IPO, the decision to issue shares signals that market multiples and therefore share prices may be peaking. The research by Ritter (1991) and by Jain and Kini (1994) could apply to REIT IPOs that are motivated by existing owners who want to sell out. That is, to the extent that a REIT is timed when valuations are expected to be near their peak, there could be a negative signal about the future valuations of other real estate securities. The negative signal is more likely when REITs engage in an IPO to restructure ownership, allowing some owners to cash out. However, if the issuers are simply trying to raise cash because they anticipate opportunities and need to raise cash, the signal may be more favorable.

### 3. Signals due to REIT IPOs

A REIT IPO may signal favorable prospects for the overall real estate market and the availability of additional real estate investment opportunities that require funding. Investors may view the IPO issuer as a REIT sector insider having insight to opportunities in the real estate market. Thus, if a REIT is raising capital through an IPO, then one can conclude that investment opportunities must exist elsewhere in the real estate market.

Alternatively, the REIT IPO may result in an abrupt increase in the supply of shares available for sale and possibly trigger a substitution effect within the real estate securities market. That is, for a given level of aggregate funding allocated to real estate securities, an increase in the shares available in the market could result in negative price pressures on the shares of existing real estate securities. More REITs may be fighting for the same pool of funds.

Also, the decision of a REIT to go public may signal the view that real estate security prices are at their peak. An IPO is a means by which the existing owners can cash out of the REIT. Under these circumstances, the REIT may time the conversion to public ownership to coincide with the time at which the existing owners believe that REIT prices are at or

near their peak. Thus, the market multiples applied to real estate allow the shares to be priced relatively high, and existing owners can sell off their shares at the high valuations.

#### 4. Research design

The sources of the data were the SNL REIT Datasource and the Thomson Financial Securities database of corporate new issues. To qualify for the sample of REIT IPOs, the following conditions had to be satisfied: (1) the REIT has one or more industry rivals that are assigned the same four-digit SIC code;<sup>1</sup> (2) the REIT and industry rivals have common stock outstanding that was traded on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) or Nasdaq and daily return data are available from the Center for Research in Security Prices (CRSP) tapes.

A total of 123 REITs qualified for this sample. Table 1 summarizes the distribution of REIT IPOs by year, while Table 2 provides descriptive statistics of the REIT IPOs and their corresponding rivals. The mean market value of the REITs engaging in IPOs is \$305.02 million, which is somewhat smaller than the \$345.97 million mean market value associated with the rivals. The mean and median numbers of rivals per REIT IPO are 99.64 and 95, respectively.

The share price response of existing real estate securities to the REIT IPO announcement is estimated by measuring abnormal returns for each individual real estate security from the SIC sector, and deriving the average abnormal return for all rivals (either existing REITs or SIC-matched existing real estate securities). The event study

Table 1. Distribution of REIT IPOs (1982–2000).

Year	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1982	1	0.81	1	0.81
1984	2	1.63	3	2.44
1985	1	0.81	4	3.25
1986	4	3.25	8	6.50
1987	1	0.81	9	7.32
1988	5	4.07	14	11.38
1989	1	0.81	15	12.20
1991	2	1.63	17	13.82
1992	7	5.69	24	19.51
1993	42	34.15	66	53.66
1994	19	15.45	85	69.11
1995	4	3.25	89	72.36
1996	9	7.32	98	79.67
1997	20	16.26	118	95.93
1998	4	3.25	122	99.19
2000	1	0.81	123	100.00

Notes. This table shows the number of REIT IPOs filed with the SEC per year and the percent of the total number of IPOs occurring each year. The list of IPOs is obtained from the Thomson Financial Securities database of corporate new issues. Firms that did not have daily prices available on CRSP were excluded.

Table 2. Summary statistics of REIT IPOs and their industry rivals (1982–2000).

Mean market value of IPO firms	\$305.02*
Mean market value of rivals	\$345.97*
Mean number of rivals per event	99.64
Median number of rivals per event	95
Minimum number of rivals per event	2
Maximum number of rivals per event	205
Number of different 4-digit SIC	8

*Notes.* This table presents summary statistics for REIT IPOs and their industry rivals. The full sample consists of 123 IPOs occurring on the NYSE, AMEX, and Nasdaq between 1982 and 2000. REIT rivals are identified using the four-digit SIC code. Market value data for rivals are obtained from the CRSP and are calculated as the number of shares times the price per share on the IPO issue date.

\*In millions of dollars.

methodology is used to measure the average share price response of the existing real estate securities to the REIT IPOs.

For the REIT IPOs, abnormal returns for REIT  $i$  and for each day  $t$  in the event period  $t_0$  to  $t_{+11}$  are calculated as:

$$AR_{it} = R_{it} - (\alpha + \beta R_{mt}), \quad (1)$$

where  $AR_{it}$  is the abnormal return,  $R_{it}$  is the daily return,  $R_{mt}$  is the daily return on the CRSP equally-weighted index, and the parameters  $\alpha$  and  $\beta$  are obtained from the market model, estimated with daily returns from the period  $t_{+20}$  to  $t_{+120}$  relative to the issue date.

The share price response of real estate rivals of the IPO REIT is measured using the procedure of Lang et al. (1991). For each IPO by a REIT, we create an equally-weighted portfolio of all rivals that were publicly-traded at the time of the issuance. Two alternative specifications of “rival” portfolios are used: (1) all existing REITs (SIC 6798) and (2) existing companies with a matching SIC to the IPO REIT. This equal-weighted portfolio accounts for potential cross-sectional correlation of returns in the real estate sector. Based on the approach of Mikkelsen and Partch (1988), the  $z$ -statistics are computed and used to test for statistical significance of standardized daily average ARs of REIT IPO firms and portfolios of the REIT rivals.

## 5. Impact of REIT IPOs on the REIT market

The share price response of REIT IPOs, and their associated  $z$ -statistics on the IPO filing date are disclosed in Table 3. The initial returns of REIT IPOs (day 0 and days 0, 1) are positive and significant. The immediate post-event Cumulative abnormal return (CAR) (days 2–10) is insignificant. The results for the issuing REITs are consistent with the findings of Ling and Ryngaert (1997) in that the average REIT IPO was underpriced over

Table 3. Cumulative abnormal returns for REIT IPOs.

Event Period	Number of Events	CAR (%)	z-statistic	% Positive
<i>Initial returns of REIT IPOs</i>				
[0]	123	4.38	26.05***	73
[0, + 1]	123	4.08	17.26***	70
[+ 2, + 10]	123	-0.31	-0.95	46

*Notes.* This table presents the CARs of the sample REITs on the issue date. The sample period is from 1982 to 2000. Abnormal returns are calculated as the differences between the actual and expected returns. Expected returns are generated from the market model parameters, estimated with daily returns from the period  $t_{+20}$  to  $t_{+120}$  where  $t_0$  is date of the IPO. The z-statistic tests the null hypothesis that the CARs equal zero.

the study period. The underpricing shows initial excess returns of slightly more than 4 percent across the 1982–2000 period, quite similar to the initial excess returns observed by Ling and Ryngaert over the 1991–1994 period.

Table 4 shows the CARs of two different types of rival portfolios on the IPO filing date. One portfolio is composed entirely of REITs (SIC = 6798), while the other portfolio is comprised of SIC-matched rivals, according to the SIC assigned to the REIT IPO by the CRSP. For both cases, rival portfolios do not experience significant valuation effects on average at the time of the filing of REIT IPOs. This suggests that, on average, the sample of existing real estate securities are unaffected by the filing of REIT IPOs. For both cases, approximately half of the events exhibited positive returns. Thus, any generalization about the rivals is limited, since the share prices of some rival portfolios increased while other decreased.

The CARs are also generated for the REIT rival portfolios on the issue date, and are disclosed in Table 5. For both types of portfolios, there are negative and significant CARs at the IPO issue date. These findings support the hypothesis of adverse effects of a REIT

Table 4. Cumulative abnormal returns for REIT industry rivals on the IPO filing date.

Event Period	Number of Events	CAR (%)	z-statistic	% Positive
<i>Panel A: CARs for rival REIT (SIC 6798) portfolios on filing date</i>				
[0]	123	-0.01	-0.15	48
[0, + 1]	123	0.01	0.31	47
[+ 2, + 10]	123	0.10	0.50	51
<i>Panel B: CARs for rival SIC-matched portfolios on filing date</i>				
[0]	123	-0.08	-0.06	48
[0, + 1]	123	-0.07	0.20	48
[+ 2, + 10]	123	0.42	0.98	53

*Notes.* Rival portfolios contain all identified rival firms that are publicly-traded at the time of the IPO. The sample period is from 1982 to 2000. Abnormal returns are calculated as the differences between the actual and expected returns. Expected returns are generated from the market model parameters, estimated with daily returns from the period  $t_{+20}$  to  $t_{+120}$  where  $t_0$  is date of the IPO. The z-statistic tests the null hypothesis that the CARs equal zero.



Table 5. Cumulative abnormal returns for REIT industry rivals on the IPO issue date.

Event Period	Number of Events	CAR (%)	z - statistic	% Positive
<i>Panel A: CARs for rival REIT (SIC6798) Portfolios on issue date</i>				
[0]	123	-0.06	-2.04**	47
[0, +1]	123	-0.17	-3.93***	32
[+2, +10]	123	-0.03	-0.67	43
<i>Panel B: CARs for rival SIC-matched portfolios on issue date</i>				
[0]	123	-0.11	-1.97**	48
[0, +1]	123	-0.13	-3.93***	34
[+2, +10]	123	-0.06	-0.79	43

Notes. Rival portfolios contain all identified rival firms that are publicly traded at the time of the IPO. The sample period is from 1982 to 2000. Abnormal returns are calculated as the differences between the actual and expected returns. Expected returns are generated from the market model parameters, estimated with daily returns from the period  $t_{+20}$  to  $t_{+120}$  where  $t_0$  is date of the IPO. The z-statistic tests the null hypothesis that the CARs equal zero.

\*Significant at the 10 percent level.

\*\*Significant at the 5 percent level.

\*\*\*Significant at the 1 percent level.

IPO on rivals, and may be attributed to either a dilution effect or a negative signal (that the IPOs were timed when real estate prices were believed to be near their peak).

### 5.1. Cross-sectional variation in REIT sector signals

Since the rival portfolio effects could occur at the time of the IPO filing or the time of the IPO issue, we consider the combined CAR. The combined CAR is the sum of the matched rival portfolio two-day (0, 1) CARs over the filing date and issue date. The distribution of the combined effects of IPOs on SIC-matched rival portfolios in Table 6 reveals substantial dispersion. To explain the variation in the CARs among matched rival portfolios, a cross-sectional analysis is conducted. The combined CAR of the SIC-matched rival portfolio (RivalAR) in response to each IPO serves as the dependent variable. We hypothesize that the signal emitted by a REIT IPO about the real estate sector in aggregate may be related to the following characteristics peculiar to the IPO announcement or to prevailing real estate market conditions.

If the intention of a REIT IPO is to raise funds for expansion purposes, the IPO is more likely to signal favorable prospects for real estate markets and investments, and thus for other related real estate securities. Conversely, if the intent of the REIT IPO is purely a revision of the REITs ownership structure, then the IPO is less likely to signal favorable prospects about the industry. To account for the intended purpose of the REIT IPO, we include a variable, UseIPO, which is assigned a value of one when the intent of the offering is to support expansion, and zero otherwise.<sup>2</sup>

The size of the IPO may create or affect any signal emitted by the offering. A larger offering is more likely to create a dilution effect, placing downward pressure on real estate



Table 6. Distribution of rival portfolio abnormal returns (CARs) on combined filing and issue dates.

Quantile (%)	CAR (%)	
	(Using SIC 6798 Only)	(Using All Matched SICs)
100 max.	1.89	5.90
99	0.67	4.83
95	0.92	1.33
90	0.79	0.89
75 Q3	0.32	0.34
50 median	-0.19	-0.18
25 Q1	-0.67	-0.68
10	-1.01	-1.18
5	-1.22	-1.67
1	-1.67	-4.12
0 min.	-1.76	-6.15

security prices by increasing the supply of real estate securities relative to demand. In addition, the signal emitted by a larger IPO may carry more weight than one emitted by a relatively small IPO. The variable, RelSize, is defined as the ratio of the size of the offering relative to the median market value of the SIC-matched rival portfolio corresponding to the specific REIT IPO.

The recent trend in market prices serves as an indicator of the recent market sentiment. A variable accounting for recent stock market performance (MarketRunup) is measured as the cumulative return in the CRSP equally-weighted stock market index portfolio for 100 days ending 20 days prior to the IPO. The signal should be more favorable when market sentiment is more favorable, showing a higher return over the measured period. The recent REIT portfolio runup just before the IPO announcement (ReitRunup) is measured as cumulative return in the SIC-matched rival portfolio for 100 days ending 20 days prior to the IPO. Akhigbe et al. (2001) use a similar proxy for the market runup variable.

If a series of events emits a stronger signal to the market in comparison to an isolated event, there may be a more pronounced signal conveyed by a REIT IPO announcement that follows a string of other REIT IPO announcements. Therefore, the SIC-matched rival portfolio share price response to REIT IPO announcements may be more adversely affected when there is a large number of recent REIT IPO announcements. Furthermore, the number of IPOs may create a dilution problem in the REIT market. If the market can not absorb all the REITs coming to market, there may be adverse consequences for all REITs. The stream of recently related IPOs (NumIPO) is measured as the number of other IPOs in the same SIC-matched sector in the last 30 days prior to the REIT IPO.

The UPREIT is a form of REIT that holds partnerships as assets. The UPREIT form was developed in 1992 and enables property owners to defer recognition of capital gains on properties contributed to the REIT in exchange for partnership units. Thus, compared to traditional REITs, UPREITs held an additional tax advantage. The Taxpayer Relief Act of 1997 was detrimental to this tax advantage (see Sinai and Gyourko, 2000), but between 1992 and 1997 many REITs converted to UPREIT status and many REIT IPOs were

Table 7. Correlation matrix of cross-sectional variables.

UseIPO	1.0000							
RelSize	0.0467	1.0000						
MarketRunup	-0.0312	0.1772	1.0000					
ReitRunup	-0.0035	-0.0362	0.3142	1.0000				
NumIPO	-0.1061	0.0607	0.0411	-0.1541	1.0000			
UPREIT	0.0138	0.2173	-0.0794	-0.0528	0.3489	1.0000		
IPOReturn	-0.0669	-0.0817	-0.0645	-0.0872	-0.1272	-0.0555	1.0000	
	UseIPO	RelSize	MarketRunup	ReitRunup	NumIPO	UPREIT	IPOReturn	

UPREITs. A dummy variable, UPREIT, designated as 1.0 if IPO is associated with UPREIT, and zero otherwise, accounts for differences between UPREIT and non-UPREIT IPOs.

The initial return of the REIT IPO is also included as a control variable, since the share price response of REITs in general may be positively associated with the IPO itself. That is, favorable sentiment about the IPO may transfer throughout the industry. The initial return of the IPO (IPOReturn) is measured as the percentage change from the offer price to the closing price at the end of the first day of trading.

The variation in share price response of the SIC-matched rival portfolios to the announced REIT IPOs is assessed with the following cross-sectional model:

$$\text{RivalAR}_j = \lambda_0 + \lambda_1 \text{UseIPO}_j + \lambda_2 \text{RelSize} + \lambda_3 \text{MarketRunup}_j + \lambda_4 \text{NumIPO}_j + \lambda_5 \text{UPREIT}_j + \lambda_6 \text{IPOReturn}_j + \mu_j, \quad (2)$$

where RivalAR is the SIC-matched rival portfolio combined CAR over the filing date and the issue date. Since MarketRunup and ReitRunup are correlated, separate models were run to preclude them from being in the same model. Correlations among the cross-sectional variables are provided in Table 7. The correlation matrix verifies the collinearity between MarketRunup and ReitRunup.

## 5.2. Cross-sectional results

The cross-sectional model for SIC-matched rival portfolios was estimated and is presented in Table 8. The results are segmented into two models: the first includes MarketRunup (adjusted- $R^2$  of 0.277) and the second includes ReitRunup (adjusted- $R^2$  of 0.260). Both models has significant  $F$ -statistics with a majority of the independent variables being statistically significant. The variable RelSize is negative and significant, implying an inverse relationship between the size of the IPO and the signal about the SIC-matched rival portfolio. This result supports the hypothesis of a more pronounced dilution effect

Table 8. Cross-sectional analysis of REIT rival portfolio effects.

Variable	Coefficient			
	Model 1		Model 2	
	( <i>t</i> -statistics)	VIF	( <i>t</i> -statistics)	VIF
Intercept	0.0182 (1.40)	0.00	0.0418 (4.33)***	0.00
UseIPO	-0.0132 (-0.46)	1.02	-0.0141 (-0.48)	1.02
RelSize	-0.0062 (-5.15)***	1.20	-0.0062 (-5.16)***	1.19
MarketRunup	0.1257 (1.77)*	1.09	—	—
ReitRunup	—	—	-0.0245 (-0.65)	1.20
NumIPO	-0.0525 (-3.79)***	1.08	-0.0555 (-3.99)***	1.07
UPREIT	0.0460 (4.36)***	1.36	0.0486 (4.43)***	1.43
IPOReturn	0.0392 (1.15)	1.04	0.0377 (1.07)	1.09
Sample size	123		123	
<i>F</i> -value	8.73***		8.09***	
<i>R</i> <sup>2</sup>	0.3130		0.2969	
Adjusted- <i>R</i> <sup>2</sup>	0.2772		0.2602	

*Notes.* Cross-sectional regression effects among combined CARs of matched rival portfolios on the filing and the issue date of REIT IPOs. The dependent variable is the combined CAR for the rival portfolio on the filing and the issue date. UseIPO is an indicator variable equal to one when the intent of the offering is to support expansion, zero otherwise. RelSize is the ratio of the size of the offering relative to the median market value of the rival portfolio. MarketRunup is the cumulative return of the CRSP equally-weighted stock market index portfolio for 100 days ending 20 days prior to the IPO. ReitRunup is the cumulative return of the rival portfolio for 100 days ending 20 days prior to the IPO. NumIPO is the number of other IPOs in the same SIC-matched sector in 30 days prior to the REIT IPO. UPREIT is an indicator variable equal to 1 if the IPO is associated with an UPREIT, zero otherwise. IPOReturn is the percentage change from the offer price to the closing price at the end of the first day of trading.

\*Significant at the 10 percent level.

\*\*Significant at the 5 percent level.

\*\*\*Significant at the 1 percent level.

resulting from larger REIT offerings. The coefficient on MarketRunup is positive and significant. However, the ReitRunup variable is insignificant. The volume of IPOs at issuance (NumIPO) also has a negative and significant coefficient. The implication is that more IPO activity results in a negative signal to the SIC-matched rival portfolio. The UPREIT variable is positive and significant, suggesting that going public as an UPREIT sends favorable signals to the industry. The UseIPO and IPOReturn variables are insignificant.

## 6. Conclusion

Due to asymmetric information, investors may interpret an IPO of an individual REIT to serve as a signal about real estate market conditions. To the extent there is a material signal, the existing publicly-traded real estate securities should be revalued. We test whether REIT IPOs signal information that affects the values of other existing publicly-traded real estate securities. The effect of a REIT IPO on the rival portfolio is not significant on average at the time the IPO is filed. However, it appears individual portfolios were affected, but the overall effect was not significant due to offsetting effects. The REIT IPO had a significant and negative effect on existing rivals on the issue date. This effect may be attributed to the dilution resulting from an IPO in the REIT market, or to a negative signal that a REIT IPO is timed when the market prices are near their peak.

The combined CARs of SIC-matched rival portfolios on the REIT IPO filing and issue date shows that the effects are widely disbursed among portfolios. A cross-sectional analysis is conducted to explain why the IPO effects on the portfolio of existing publicly-traded real estate securities vary among IPOs. The cross-sectional results suggest that the REIT IPO has more negative effects on existing publicly-traded rivals when the IPO size is relatively large, when market conditions are weak, when the number of REIT IPOs coming to market is relatively high, and when the REIT IPO is not an UPREIT. Overall, the implications are that REIT IPOs transmit a signal that alters the valuations of existing publicly-traded real estate securities, but the signal varies with the characteristics of the IPO.

## Notes

1. The CRSP database was used to generate a list of firms that had the same four-digit SIC code as the REIT. Officially, SIC code 6798 denotes REITs. However, many REIT qualified firms (IPOs) generated different SIC codes. Thus, we recognize that the REIT IPO may signal information, not just to other REITs, but also to real estate securities operating in the same sector. To qualify for the sample, the REIT SIC code had to be associated directly with a real estate activity. Some SIC codes were eliminated because they were overly broad in their focus and included many non-real estate functions. The other SIC codes identified include: 1521 (General Contractors—single-family houses), 1522 (general contractors—other residential), 6510, 6512 (operators of non-residential buildings), 6552 (land subdividers and developers), and 7010, 7011 (hotels and motels). Source: [www.naics.com](http://www.naics.com).
2. This information was gleaned from the IPO announcement information.

## References

- Akhigbe, A., J. Johnston, and J. Madura. (2001). "IPOs Across and Within Industries," Working Paper, Florida Atlantic University.
- Beatty, R. P., and J. R. Ritter. (1986). "Banking, Reputation, and the Underpricing of Initial Public Offerings," *Journal of Financial Economics* 15, 187–232.
- Below, S., M. A. Zaman, and W. McIntosh. (1995). "Pricing of Real Estate Investment Trust Initial Public Offerings," *Journal of Real Estate Finance and Economics* 11, 55–64.

- Benveniste, L. M., W. Y. Busaba, and W. Wilhelm. (2002). "Information Externalities in Primary Equity Markets," *Journal of Financial Intermediation* 11, 61–86.
- Ghosh, C., R. Nag, and C. F. Sirmans. (2000). "The Pricing of Seasoned Equity Offerings: Evidence from REITs," *Real Estate Economics* 28, 363–384.
- Ibbotson, R. G., J. L. Sindelar, and J. R. Ritter. (1988). "The Market's Problems with the Pricing of Initial Public Offerings," *Journal of Applied Corporate Finance* 66–74.
- Jain, B. A., and O. Kini. (1994). "The Post-Issue Operating Performance of IPO Firms," *Journal of Finance* 49, 1699–1726.
- Kim, M., and J. Ritter. (1999). "Valuing IPOs," *Journal of Financial Economics* 53, 409–437.
- Lang, L. H. P., R. Stulz, and R. A. Walkling. (1991). "A Test of the Free Cash Flow Hypothesis: The Case of Bidder Returns," *Journal of Financial Economics* 29, 315–335.
- Ling, D. C., and M. Ryngaert. (1997). "Valuation Uncertainty, Institutional Involvement, and the Underpricing of IPOs: The Case of REITs," *Journal of Financial Economics* 43, 433–456.
- Lowry, M., and G. W. Schwert. (2002). "IPO Market Cycles: Bubbles or Sequential Learning?" *Journal of Finance* 57, 1171–1200.
- Michaely, R., and W. Shaw. (1994). "The Pricing of Initial Public Offerings: Tests of Adverse-Selection and Signaling Theories," *Review of Financial Studies* 7, 279–319.
- Mikkelson, W. H., and M. M. Partch. (1988). "Withdrawn Security Offerings," *Journal of Financial and Quantitative Analysis* 23, 119–133.
- Ritter, J. (1991). "The Long-Run Performance of Initial Public Offerings," *Journal of Finance* 46, 3–27.
- Sinai, T., and J. Gyourko. (2000). "The Asset Price Incidence of Capital Gains Taxes: Evidence from the Taxpayer Relief Act of 1997 and Publicly-Traded Real Estate Firms," Working Paper, University of Pennsylvania.
- Szewczyk, S. (1992). "The Intra-Industry Transfer of Information Inferred From Announcements of Corporate Security Offerings," *Journal of Finance* 47, 1935–1946.
- Wang, K., G. Gau, and S. H. Chan. (1992). "Initial Public Offerings of Equity Securities: Anomalous Evidence Using REITs," *Journal of Financial Economics* 31, 381–410.