Are Real Estate IPOs a Different Species? Evidence from Hong Kong IPOs

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Abstract

It is well documented that in the United States, real estate investment trust (REIT) initial public offerings (IPOs) have an abnormally low initial-day return when compared to that of industrial firm IPOs. Researchers suspect that the abnormal return pattern of REIT IPOs is caused by their unique real estate holdings. Examination of 399 IPOs issued in Hong Kong during the 1986–1997 period reveals strong evidence that suggests that underlying real estate holdings cannot be the sole reason for the observed low initial-day return of REIT IPOs. This investigation indicates that there is a need to re-think the current explanations for the abnormal performance of REIT IPOs.

Introduction

One of the most puzzling phenomena in the finance literature is the pricing behavior of initial public offerings (IPOs) of equity securities. In the United States, investors who participate in the IPOs of industrial firms earn about a 16% gain during the first trading day, on average. This first trading day return is even higher in some other countries. Just as puzzling is the fact that the IPO firms tend to underperform the market for a period of up to three years. These empirical regularities lead to two important questions. First, why do the original (non-public) equityholders offer new shares that are consistently underpriced? If the shares had been priced ''rationally,'' the original equityholders would have had 16% more capital after the first trading day. Second, why do IPO firms underperform the market over the longer-run, given that the initial prospects seem so positive?

While various answers to these questions have been suggested, they can be grouped into two types of explanations. The first group of explanations are variants of the ''winner's curse'' theory, according to which underwriters rationally price IPOs below their market value in order to achieve an economic equilibrium. The second group includes the ''fad'' or ''hot market'' theories, which simply state that those who purchase shares on the first day of trading of the IPO stocks pay too much for the shares. From this perspective, the price run-up during the first trading day is not rational, while the longer-run price decline restores rationality.[1]

Although empirical evidence exists to support both types of explanations, it is quite clear that the underlying theories are not comprehensive. For example, in

spite of the spectacular initial-day return for industrial firm IPOs, there is also anomalous evidence from the IPOs for real estate investment trusts (REITs), master limited partnerships (MLPs) and closed-end mutual funds. The IPOs of those units tend either to be overpriced or at least significantly less underpriced than the typical industrial firm IPOs.

Wang, Chan and Gau (1992) report that REIT IPOs from 1971 to 1988 were overpriced, while Weiss (1989) and Peavy (1990) show that IPOs of closed-end funds are not significantly different from zero. Ling and Ryngaert (1997) extend Wang, Chan and Gau's study to a more recent period, finding that REIT IPOs issued in the 1990s have a positive and significant average initial-day return. However, this return is extremely small when compared to industrial firm IPOs. In addition, Muscarella (1988) and Michaely and Shaw (1994) also find that MLP IPOs (including real estate related IPOs) are not as significantly underpriced as industrial firm IPOs. The evidence derived from IPOs of mutual funds, REITs and MLPs casts some doubt on the completeness of the existing theories of IPO underpricing as an equilibrium phenomenon.

To address this puzzle, Wang, Chan and Gau (1992) suggest that REIT IPOs may behave differently from industrial firm IPOs for three reasons. First, REITs, at least in the pre-1990s, have more uninformed investors subscribing to the IPOs when compared to industrial firms; a characteristic also true for mutual fund and MLP IPOs. Second, REITs during the pre-1990s were not operating companies. Given this, REIT IPOs should behave similarly to mutual fund IPOs. Third, REITs hold special assets (real properties and mortgages). In other words, since there is evidence that the return-risk relationship of real estate investments is different from stocks in general, real estate holdings may produce the difference in IPO performance. To summarize, the lack of information about the firm (due to the low participation from institutional investors), the non-operating characteristics of the trust and the underlying real estate asset may make REITs, real estate MLPs and mutual funds behave differently from other industrial firms.

While the proportion of uniformed investors in the REIT IPO market appears to be a factor prior to 1990, REIT IPOs in the 1990s were still significantly less underpriced than industrial firm IPOs (see Wang, Chan, Gau, 1992; and Ling and Ryngaert, 1997). Since Chan, Leung and Wang (1998) report that the institutional involvement in REIT IPOs after 1990 is as high as that for other stocks in the market (and is much higher than the institutional holding level of REIT IPOs before 1990), it appears that the institutional-investor (and information-related) explanation does not fully explain the initial price performance of REIT IPOs.

Given the observation that mutual fund IPOs are not underpriced, it is reasonable for us to suspect that REIT IPOs may also be affected by their fund-like structure (as non-operating firms). However, REITs and mutual funds are distinct in at least one crucial respect. Since a mutual fund holds stocks that are traded on stock exchanges, there is no uncertainty about the value of those funds. In contrast,

there is uncertainty about the value of REITs, because the values of the underlying assets are in general unknown. Given this important difference, it is not apparent that REIT IPOs should behave the same as mutual fund IPOs.

REITs behaved more like operating companies after 1990. Yet even after the change, the pricing behavior of their IPOs is still significantly different from that of industrial firms. Apparently, the change in the fund-like structure alone cannot explain why REIT IPOs are not as underpriced as industrial firm IPOs. Furthermore, empirical evidence indicates that MLP IPOs are also not significantly underpriced. Given the fact that MLPs are operating companies, the fund-like structure should not be the only factor that affects REIT IPO behavior. In other words, while the fund-like structure is a possible cause, the available evidence to support or to dispute this assertion is weak.

The last possible explanation to be explored is whether a REIT's underlying real estate assets produce the anomalous behavior of REIT IPOs. This article examines this important issue. This is accomplished by analyzing 56 real estate related IPOs in comparison to 343 non-real estate IPOs in Hong Kong during the 1986–1997 period. Hong Kong property firms (real estate related) have a considerable presence in the Hong Kong financial market. As operating companies, they manage significant property holdings. With the Hong Kong sample, the fund-like structure explanation of IPO pricing is not an issue, because all firms are operating companies. In addition, the informational problem faced by uninformed REIT investors in the U.S. is not relevant in the current context, because most Hong Kong property companies are heavily traded. As a result, the use of the Hong Kong IPO sample allows us to focus the analysis on whether real estate holdings explain the observed REIT IPO price behavior.

Results indicate that Hong Kong IPOs, both real estate related and non-real estate, are significantly underpriced at roughly the same degree as U.S. industrial firm IPOs. Furthermore, given this evidence, we conclude that the underlying assets of firms do not directly cause a difference in the IPO valuation. The puzzle concerning the difference in behavior between REIT and typical industrial firm IPOs therefore remains unsolved. Since the current analysis excludes the possibility that real estate holdings can explain REIT IPO price behavior, this evidence suggests that the impact of the fund-like structure on REIT IPOs should be re-examined. This seems to be the only explanation that has not been eliminated.

This article is organized as follows. Next, the institutional features of the IPO market in Hong Kong are examined and an explanation is given of why the Hong Kong IPO market is suitable for analyzing real estate IPO pricing behavior. Next, the methodology and univariate results are presented, followed by an explanation of the multivariate (regression) results for the initial-day returns. The long-run performance of the Hong Kong IPOs is then considered. Finally, the concluding comments are presented.

Hong Kong IPO Market as a Laboratory

Hong Kong provides an ideal environment for examining the price behavior of real estate IPOs for two reasons. First, real estate companies comprise a significant portion of the total market capitalization in the Hong Kong stock market. Exhibit 1 reports the market capitalization of Hong Kong firms by industry classification during the 1995–1999 period. Panel A indicates that the market capitalization of property and hotel stocks is HK $813,478 million (US $104.6 billion) in 1999. This market capitalization is not much below the total market value of REITs traded in U.S. stock exchanges. Panel B indicates that, during the 1995–1999 period, property and hotel stocks on average account for 24.79% of the total market capitalization of the Hong Kong stock market.

Exhibit 2 reports the turnover of equity securities in Hong Kong, classified by industry during 1999. The exhibit shows that around 42.64% of property stocks exchanged hands in 1999. As a comparison, only 37.51% of stocks traded on the Hong Kong stock exchange changed hands during the same year. This indicates that investors pay at least as much attention to property stocks as they do to other equity securities. Further, the 1999 *Hong Kong Stock Exchange Fact Book* reports that five out of the top twelve most active stocks (in terms of turnover trading value) on the exchange are property stocks.

In contrast to the attention that property stocks receive in Hong Kong, REITs in the U.S. receive much less attention from investors (especially institutional investors), at least prior to 1995. Consequently, by using Hong Kong data to study real estate IPOs, there is no concern about the uninformed investor explanation that must be addressed by REIT IPOs studies.

Second, all real estate companies in Hong Kong are operating companies. Some of them are in the development business. However, even for the development companies, Lai and Wang (1999) report that such firms have significant property holdings as investment vehicles. In this regard, the price behavior of those stocks should also reflect their underlying real assets. Consequently, the use of Hong Kong IPOs allows us to examine the price behavior of real estate IPO without the influence of the fund-like structure (as in REIT IPOs).

Sample Design and Univariate Results

The initial sample consists of all IPOs listed on the Stock Exchange of Hong Kong (SEHK) from 1986 to 1997.[2] The sample period, 1986–1997, is important for Hong Kong because it follows the consolidation of the four previous equity markets in Hong Kong into the SEHK on April 2, 1986. This consolidation plus a vibrant economy contributed to a dramatic increase in the number of IPOs in Hong Kong, from only 4 IPOs during 1975–1979, to 35 IPOs during 1980–1985 (see McGuiness, 1992), increasing to an average of almost 50 per year during the 1991–1997 period.[3]

Exhibit 1 | Equity Market Capitalization Trends in Hong Kong by Industry Classification—1995–1999

Industry Classification	1995	1996	1997	1998	1999	Average
Panel A: Year-end figures (in HK $million)						
Properties	621,079	1,079,347	679,295	562,577	773,490	743,157
Hotels	52,074	68,829	48,226	31,576	39,987	48,138
Subtotal	673,154	1,148,177	727,521	594,153	813,478	791,296
Finance	569,955	805,527	864,008	787,358	1,224,168	850,203
Utilities	327,986	357,489	598,860	527,727	1,132,493	588,911
Consolidated enterprises	634,905	903,181	674,781	527,961	1,170,675	782,301
Industrials	137,316	252,041	320,038	216,974	377,542	260,782
Miscellaneous	4,993	9,551	17,422	7,539	9,171	9,735
Subtotal	1,675,156	2,327,789	2,475,109	2,067,559	3,914,049	2,491,933
Equity total	2,348,310	3,475,965	3,202,630	2,661,713	4,727,527	3,283,229
Panel B: Percentage of market total						
Properties	26.45	31.05	21.21	21.14	16.36	23.24
Hotels	2.22	1.98	1.51	1.19	0.85	1.55
Subtotal	28.67	33.03	22.72	22.33	17.21	24.79
Finance	24.27	23.17	26.98	29.58	25.89	25.98
Utilities	13.97	10.28	18.70	19.83	23.96	17.35
Consolidated enterprises	27.04	25.98	21.07	19.84	24.76	23.74
Industrials	5.85	7.25	9.99	8.15	7.99	7.85
Miscellaneous	0.21	0.27	0.54	0.28	0.19	0.30
Subtotal	71.34	66.95	77.28	77.68	82.79	75.21
Equity total	100.00	100.00	100.00	100.00	100.00	100.00

Note: The data on market capitalization trends are obtained from the *Stock Exchange Fact Book*, 1999, published by the Stock Exchange of Hong Kong.

Exhibit 2 | Turnover of Equity Securities in Hong Kong by Industry Classification—1999

Industry Classification	Number (Year-end Figures)	Turnover[a]		
		Trading Value ($HKM)[b]	% of Total Trading Value	Annual Turnover Velocity (%)[c]
Properties	112	329,809	18.60	42.64
Hotels	14	6,541	0.37	16.36
Finance	52	297,376	16.77	24.29
Utilities	14	228,774	12.90	20.20
Consolidated enterprises	220	545,176	30.75	46.57
Industrials	289	344,958	19.45	91.37
Miscellaneous	9	20,542	1.16	223.98
Total	710	1,773,176	100.00	37.51

Notes: The data is obtained from the *Stock Exchange Fact Book*, 1999, published by the Stock Exchange of Hong Kong.
[a]Turnover in warrants, and unit trusts are not included.
[b]Turnover values have been adjusted for late reported and rejected sales.
[c]Annual turnover velocity is computed using the trading value (in column 3) divided by the corresponding year-end equity market capitalization for 1999 (given in Exhibit 1).

Data from the annual editions of the *Hong Kong Stock Exchange Fact Books* and the Securities Database Corporation (SDC) Platinum New Issues database is used to identify the sample of Hong Kong IPOs for the 1986–1997 period. The information from these two sources includes the name of the offering firm, the date of the offer, the lead manager, the number of shares offered and the offer price.[4] The SDC New Issues database also provides the industry classification of the offering firms. The PACAP Database (from the Pacific-Basic Capital Markets Research Center) is used to determine the after-market closing price and the long-run returns of these IPOs as well as the returns on the market (Hang Seng) index. These data requirements restrict the sample size, such that the final sample consists of a total of 399 IPOs, with 56 real estate related and 343 non-real estate related IPOs during the 1986–1997 period. The effect of the data restrictions is minimal however. For example, the *Stock Exchange Fact Book* lists 24, 44 and 79 IPOs that are offered for public subscriptions during the 1995–1997 period, while the sample includes 23, 44 and 74 IPOs, over 95% of the total IPOs during these years.

Exhibit 3 reports the annual number of all Hong Kong IPOs in the sample (both real estate related and non-real estate). Interestingly, the number of offerings moves quite closely with the Hang Seng Index during the 1986–1997 period.

Exhibit 3 | Annual Distribution of the Number of Offerings, Average Initial-day Raw Returns and Gross Funds Raised for the Hong Kong Real Estate Related and Non-real Estate Industries—1986–1997

Year	Number of Offerings	Average Initial-Day Return (%)	*t*-Statistic	Funds Raised ($HKM)
Panel A: Real estate related				
1986	1	14.41		118
1987	1	0.78		273
1988	0	na	na	0
1989	1	−2.00		1,219
1990	2	34.37	0.71	127
1991	6	12.08	1.95	647
1992	7	15.35*	2.57	2,008
1993	7	12.55*	3.07	3,004
1994	2	3.00	3.00	405
1995	3	6.90	1.34	2,226
1996	8	10.56	1.10	12,898
1997	18	24.81	1.27	16,159
Total	56	16.21*	2.47	39,084
1986–89	3	4.40	0.87	1,610
1990–93	22	15.30*	3.50	5,786
1994–97	31	18.00	1.56	31,688
Panel B: Non-real estate				
1986	5	1.36	0.13	2,953
1987	17	29.68*	3.14	2,546
1988	18	18.31*	4.81	1,220
1989	7	6.34	1.07	1,723
1990	9	9.43**	1.85	1,854
1991	42	14.08**	1.93	4,979
1992	47	18.06	3.02	7,324
1993	49	36.63*	7.03	15,317
1994	37	7.35	1.41	6,112
1995	20	−3.14	−0.45	4,970
1996	36	14.65*	2.43	18,225
1997	56	27.89*	3.71	24,270
Total	343	18.96*	8.50	91,493
1986–89	47	18.84*	4.54	8,442
1990–93	147	22.58*	6.62	29,474
1994–97	149	15.43*	4.23	53,576

*Significant at the 5% level for a two-tailed test.
**Significant at the 10% level for a two-tailed test.

Although the observation period is only twelve years, the correlation between the total number of IPOs in a year and the Hang Seng Index (at the mid-point of the year) is 0.75; while the correlation between the number of real estate IPOs and the number of non-real estate IPOs per year during this same period is 0.79. Clearly, market sentiment is important to IPO issuance in Hong Kong and there is preliminary evidence that a ''hot market'' might affect the price behavior of real estate and non-real estate IPOs.

Initial-Day Return

Exhibit 3 also reports the average initial-day return of real estate IPOs (Panel A) and non-real estate IPOs (Panel B) for each year during the 1986–1997 period. The returns of those IPOs are also partitioned into three four-year subperiods: 1986–1989, 1990–1993 and 1994–1997. Given the relatively small number of real estate related IPOs in each year, it is perhaps surprising that two (1992–1993) of the eight years (1990–1997) with multiple IPOs show a positive and statistically significant initial-day return. The initial-day returns, while positive, are not statistically different from zero during the last four sample years of 1994 to 1997.

The partitioning of the real estate sample into four-year periods highlights the pattern of initial-day returns from the year-by-year analysis. For the 1990–1993 period, real estate IPOs are underpriced by a statistically significant 15.3%. During the most recent period of 1994–1997, the mean underpricing of 18% is not statistically different from zero. Nonetheless, the average initial-day return for all 56 real estate related IPOs is a statistically significant 16.21%. This underpricing is equivalent to the average underpricing of 16% for industrial firms in the U.S.

The pattern of underpricing across years for non-real estate IPOs is similar to that for the real estate IPOs, in that both the real estate and the non-real estate samples have returns for 1994 and 1995 that are not statistically different from zero. The year 1995 marked the bottom of a bear market for the Hang Seng Index, which fell from a high of 12,158 in early 1994 to a low of 7,297 in mid 1995, a drop of 40%. The average underpricing during the whole sample period for the non-real estate sample is a statistically significant 18.96%, a level of underpricing roughly equal to that in the U.S. for the typical industrial firm. The comparison indicates that real estate related IPOs perform about the same as non-real estate IPOs on the initial trading day.

The Impact of Business Concentration

Based on the business description of the offering firms provided in the SDC Platinum New Issues database, the real estate related IPOs are further classified into: (1) 26 real estate (or property) IPOs; (2) 23 construction IPOs; and (3) 7 hotel IPOs. Exhibit 4 provides descriptive statistics about the average funds raised by the real estate related and non-real estate IPOs.

Exhibit 4 | Summary Statistics for Hong Kong IPO Funds Raised (in HK $000s) Classified by Industry during 1986–1997

Sample	Average Funds Raised ($)	Std. Dev. ($)	Min. ($)	Max. ($)	Sample Size
Real estate related	697,920	954,580	25,000	4,326,300	56
Real estate	544,411	599,333	37,741	2,794,340	26
Construction	955,442	1,300,631	25,000	4,326,300	23
Hotels	421,950	456,817	48,640	1,219,270	7
Non-real estate	266,745	549,608	10,500	5,937,500	343

An examination of Exhibit 4 reveals two interesting observations. First, the average funds raised of $698M by the 56 real estate related IPOs is more than double that of the $267M average for 343 non-real estate IPOs. This pattern is very similar to the U.S., where the average IPO size is much larger for REIT IPOs than for industrial firm IPOs. Second, the average funds raised within the real estate related IPOs differs dramatically. The 23 construction IPOs raised an average $955M, which is much larger than the funds raised by the 26 real estate IPOs (at $544M raised on average) and the seven hotel IPOs (at $422M raised).

Exhibit 5 displays the initial-day returns along with the number of IPOs with returns less than, equal to and greater than zero for all real estate related IPOs

Exhibit 5 | Summary Statistics for the Initial-day Raw Returns for Hong Kong Real Estate Related and Non-real Estate Industries during 1986–1997

Sample	Mean Initial-day Return (%)	*t*-Statistic	Sample Size	# < 0	# = 0	# > 0	Median	Min.	Max.
Real estate related	16.21*	2.47	56	14	0	42	4.60	−39.50	317.14
Subcategorized by:									
Real Estate	27.81**	2.04	26	7	0	19	4.33	−39.50	317.14
Construction	3.01	1.15	23	6	0	17	2.00	−19.39	29.55
Hotels	16.46*	2.84	7	1	0	6	14.41	−2.00	42.50
Non-real estate	18.96*	8.50	343	87	5	251	9.00	−77.39	293.33

*Significant at the 5% level for a two-tailed test.
**Significant at the 10% level for a two-tailed test.

and the three sub-groups of real estate as well as for non-real estate IPOs. This exhibit highlights the differences in the mean initial-day returns among the three types of real estate IPOs. Real estate IPOs and hotel IPOs both have positive and significant mean initial-day returns. The mean initial-day return (27.81%) of real estate IPOs is affected by one outlier (an initial-day return of 317.14%). After the removal of this outlier, the mean initial-day return of real estate IPOs is consistent with the IPOs in the general stock market.

The 23 construction IPOs experience only an insignificant 3.01% initial-day return and this gain is not statistically different from zero. Since construction (real estate) firms should exhibit more operating characteristics than other real estate firms, the initial-day return of construction (real estate) IPOs should be greater if the fund-like structure of REITs caused the REIT IPOs to behave differently from the industrial firm IPOs. Given the evidence that the average initial-day return of construction real estate IPOs (with more operating characteristics) is lower than that of real estate IPOs (with more real estate holdings), we suspect that the fund-like structure explanation alone might not be able to explain the observed low REIT IPO initial-day returns.

The Impact of the Underwriter

Prior evidence suggests that IPOs are more underpriced when they are underwritten by investment banks with lower prestige. Beatty and Ritter (1986) offer the standard explanation for this behavior, which is that prestigious underwriters maintain their reputation by ''producing'' for the firms they underwrite. Prestigious underwriters obtain a higher offering price for the IPO, in part by managing IPOs with a low variance of possible firm values. Stoughton and Zechner (1998) add that having a reputation at stake also embodies a longer-term relationship between the underwriter firm and the corporation floating the IPO. The longer-term relationship serves to minimize agency costs of monitoring the corporation.

There is not a standard ranking of investment banks that underwrite IPOs in Hong Kong or Asia for the 1986–1997 period. As a result, this study follows the general procedure of Carter and Manaster (1990) and ranks the underwriters in Hong Kong according to the number of IPOs they undertake. The 60 lead underwriters that underwrite IPOs in the sample are ranked according to the total number of offerings they manage over the twelve years in the sample time period. The ranking criteria for the Hong Kong underwriters appear in Exhibit 6, along with the number of underwriters within a group and the total number of IPOs undertaken by the firms within the group. Underwriters are assigned to IPOs according to the lead underwriter. A ranking of 1 designates the highest prestige, down to a ranking of 5, indicating the lowest prestige of the underwriters for which there is data. Data about the underwriters for 17 IPOs was not specified in our data source. The unknown underwriters for this group receive a ranking of 6, indicating the lowest overall prestige.

Exhibit 6 | Ranking of Underwriters in Hong Kong—1986–1997

Ranking	# of IPOs Underwritten by Underwriter	# of Underwriters within Group	# of IPOs Underwritten within Group
1	# ≥ 70	1	74
2	40 ≤ # < 70	2	87
3	10 ≤ # < 40	5	69
4	5 ≤ # < 10	11	72
5	# < 5	41	80
6	–	–	17
Total		60	399

Note: The 60 investment banking firms that underwrite IPOs in Hong Kong are ranked according to the total number of offerings they manage over the twelve years in the sample period. A ranking of 1 indicates the highest prestige / reputation. Data about the underwriters for 17 IPOs was not specified in the IPO documents. The unknown underwriters for this group receive a ranking of 6.

Exhibit 7 explores the relationship between the underwriter's reputation and the mean initial-day return, by ranking the underwriters' reputation on a scale of 1 to 6 (as specified in Exhibit 6). The exhibit decomposes each sub-category of IPO into the five ranks of the underwriter's reputation. (The information on Rank 6 is reported only when the sample size is meaningful.) Wang, Chan and Gau (1992) report that underwriters with the highest reputations generate the least amount of underpricing (i.e., the lowest initial-day returns) for REIT IPOs issued in the U.S. stock market.

Exhibit 7 reports the information on the influence of the underwriter's reputation on initial-day returns. It is interesting to note that Rank 2 (for both real estate related and non-real estate) and Rank 5 (for real estate related) tend to exhibit higher mean initial-day returns than other ranks. The two investment banks in Rank 2 underwrite a total of 87 IPOs during the sample period, while the 37 underwriters in Rank 5 underwrite a total of 65 IPOs.

While Exhibit 7 indicates that underwriter's reputation affects the initial-day return of an IPO, a detailed examination of the data reveals that outliers might be the cause of this discrepancy. The maximum return of IPO in the Rank 2 of real estate related category is 144.32%, while the maximum return of the Rank 5 in the real estate related category is 317.14%. If two observations are deleted, the average initial-day returns of IPOs among the 5 ranks do not differ much. Given this evidence, and since there is no reason to believe that the relationship between initial-day return and underwriter's reputation should not be monotonic, it is safe to conclude that underwriter's reputation does not affect the initial-day return of

Exhibit 7 | Summary Statistics of Initial-day Raw Returns by Underwriter (UW) Reputation for the Hong Kong Real Estate Related and Non-real Estate Industries during 1986–1997

Sample	Mean Return (%)	*t*-Statistic	Sample Size	# < 0	# = 0	# > 0	Median	Min.	Max.	# of UW
Panel A: All real estate related										
Rank 1	11.04	1.69	8	2	0	6	5.00	−13.82	42.50	1
Rank 2	27.05**	2.16	12	0	0	12	8.21	1.56	144.32	2
Rank 3	−0.44	−0.22	7	2	0	5	1.79	−11.58	4.65	3
Rank 4	13.82**	1.82	11	3	0	8	7.41	−16.00	71.61	8
Rank 5	24.68	1.16	15	5	0	10	1.56	−19.39	317.14	14
Rank 6	−8.10	−0.49	3	2	0	1	−2.00	−39.50	17.19	na
Sub-categorized by:										
Real Estate										
Rank 1	9.03	0.75	2	1	0	1	9.03	−2.94	21.00	1
Rank 2	65.50	2.13	4	0	0	4	55.85	6.00	144.32	2
Rank 3	2.81**	3.06	3	0	0	3	2.00	1.79	4.65	2
Rank 4	13.61	1.29	8	3	0	5	2.92	−16.00	71.61	7
Rank 5	49.72	1.11	7	2	0	5	1.56	−8.51	317.14	7
Construction										
Rank 1	5.54	0.80	5	1	0	4	5.00	−13.82	29.55	1
Rank 2	5.34*	2.79	5	0	0	5	4.55	1.85	12.22	2
Rank 3	−2.88	−0.94	4	2	0	2	−0.95	−11.58	1.96	2
Rank 4	9.33	4.86	2	0	0	2	9.33	7.41	11.25	2
Rank 5	1.10	0.16	7	3	0	4	0.16	−19.39	25.91	7
Hotels										
Rank 1	42.50		1	0	0	1	42.50	42.50	42.50	1
Rank 2	11.93	1.82	3	0	0	3	10.17	1.56	24.07	2
Rank 3	0.00	0.00	0	0	0	0	0.00	0.00	0.00	0
Rank 4	24.49		1	0	0	1	24.49	24.49	24.49	1
Rank 5	14.41		1	0	0	1	14.41	14.41	14.41	1

Exhibit 7 | (continued)

Summary Statistics of Initial-day Raw Returns by Underwriter (UW) Reputation for the Hong Kong Real Estate Related and Non-real Estate Industries during 1986–1997

Sample	Mean Return (%)	*t*-Statistic	Sample Size	# < 0	# = 0	# > 0	Median	Min.	Max.	# of UW
Panel B: Non-real estate										
Rank 1	13.12*	4.38	66	16	2	48	6.84	−63.00	64.76	1
Rank 2	33.87*	5.20	75	14	1	60	12.50	−25.00	293.33	2
Rank 3	14.85*	3.28	62	18	1	43	8.82	−71.00	181.36	5
Rank 4	17.27*	3.76	61	17	1	43	10.95	−63.00	120.00	11
Rank 5	17.57*	3.19	65	16	0	49	7.77	−77.39	200.00	37
Rank 6	−1.26	−0.30	14	6	0	8	4.81	−33.18	20.95	na

*Significant at the 5% level for a two-tailed test.
**Significant at the 10% level for a two-tailed test.

Hong Kong IPOs in a systematic way. This evidence contrasts with what we have observed in the U.S. REIT stock market.

Regression Results for the Initial-day Return

This section examines whether a multivariate analysis preserves the results of the univariate analysis presented. Two regression models are considered. Model 1 is a regression analysis with 5 independent variables (offering size, underwriter's ranking, period, market condition and real estate related). The offering size variable is defined as the market value of the initial offering (the product of the offer price and the number of shares issued by the IPO). This variable is included as a control variable. The natural log of this value is calculated, yielding the regression variable, Ln(MV). A UW ranking is used to control for the influence of the underwriter, with a UW Rank of 1 indicating the highest prestige down to a UW rank of 6, indicating the lowest prestige (see Exhibit 6).

Loughran, Ritter and Rydqvist (1994) report that firms successfully time their IPOs by issuing them when valuations are high.[5] To control for this effect, the six-month return of the Hang Seng Index (HSI Return) for each IPO is calculated on the day of the IPO.[6] This variable is the HSI Return in the regressions. A positive relationship between the initial-day return and the HSI Return would support the market-timing hypothesis.

Finally, Loughran, Ritter and Rydqvist (1994) also suggest that the reduction in regulatory interference in East Asian countries should result in less short-run underpricing in the 1990s than in the 1980s. To control for this potential effect, two dummy variables are included. One dummy variable represents the subperiod 1990–1993, while the other represents subperiod 1994–1997. Negative coefficients for either of these two dummy variables would tend to support this hypothesis (*i.e.*, as the year progresses, markets become more competitive and there is less underpricing).[7]

Central to the current study is whether real estate related IPOs have significantly different initial returns from non-real estate IPOs. A dummy variable is constructed in order to test whether the pricing of real estate related IPOs in Hong Kong is the same as that for standard non-real estate IPOs. The dummy variable is labeled Real Estate Related, and is defined as 1, if the IPO is a real estate related IPO, and 0 otherwise. If the underlying real estate holding explains why real estate related IPOs behave differently from other industrial IPOs, the coefficient estimate for this variable should be significantly different from zero. Otherwise, this coefficient should not be statistically different from zero. In other words, the coefficient estimate for this variable provides critical evidence for addressing the central question posed by this article: Are real estate IPOs a different species? The second regression model (Model 2) estimates the same equation except omitting the real estate related dummy variable.

Exhibit 8 reports the regression results for Models 1 and 2. First and most importantly, the coefficient estimate (−2.11) for the Real Estate Related variable in Model 1 is statistically insignificant, which indicates that the initial-day returns for real estate related IPOs are not statistically different from the returns of non-real estate IPOs. This result is different from that reported for the IPOs of U.S. real estate MLPs and REITs. The result provides strong evidence that an IPO with real estate holdings should not behave differently from an IPO without real estate holdings. If this evidence is applied to the U.S. REIT market, then it is

Exhibit 8 | Regression Results from Regressing the Raw Initial-day Return on Independent Variables for the Hong Kong Real Estate Related and Non-real Estate Industries during 1987–1997

Variable[a]	Expected Sign	Model 1	Model 2
Intercept		18.35 (1.38)	19.26 (1.48)
Ln(MV)		0.48 (0.23)	0.30 (0.15)
UW Rank	+	−1.02 (−0.63)	−1.06 (−0.66)
HSI Return	+	0.46* (3.51)	0.46* (3.54)
1990–1993	−	−4.10 (−0.53)	−4.33 (−0.56)
1994–1997	−	−6.16 (−0.85)	−6.33 (−0.87)
Real estate related		−2.11 (−0.33)	
Number of observations		393	393
Adj. R^2		0.02	0.04
F-value		2.48*	2.96*

Notes: t-Statistics are given in parentheses.
*Significant at the 5% level for a two-tailed test.
**Significant at the 10% level for a two-tailed test.
[a]The dependent variable in the regression is the Initial-day Return, defined as the raw percentage return for the firm's stock on the day of the IPO. The independent variables include: Ln(MV) is the natural log of the product of the offer price and the number of shares offered for the IPO; Real Estate Related is a dummy variable with a value of 1 for IPOs that are real estate related; UW Rank indicates the prestige of the lead underwriter of the IPO according to an index ranging from 1 (the highest prestige) to 6 (the lowest prestige) as displayed in Exhibit 6; HSI Return is the percentage return of the Hang Seng Index for the 6 months leading up to the IPO; the Periods 1990–1993 and 1994–1997 are dummy variables, with the 1986–1989 period omitted.

clear that the abnormally low initial-day return of REIT IPOs should not be caused by their underlying real estate holdings.

As a double check, in Model 2, a similar regression analysis is run except that the Real Estate Related variable is omitted. The result is also displayed in Exhibit 8. After omitting the Real Estate Related variable, the coefficients of all other variables are still quite stable. Furthermore, the adjusted R^2 of Model 2 (without the Real Estate Related variable) is higher than that of Model 1 (with the Real Estate Related variable), meaning that the inclusion of the Real Estate Related variable in the equation does not increase its explanatory power. This analysis provides more evidence to support the finding that real estate holdings alone do not provide explanatory power for the initial-day return of IPOs.

Exhibit 8 also indicates that four out of the five control variables are not significantly different from zero. However, both models indicate that market timing might be the most important factor determining the initial-day return. The coefficient estimates of 0.458 and 0.459 for HSI Return are statistically significant. This seems to indicate that market condition is the most important factor determining the initial-day return of an IPO. While this result seems quite interesting, there might be other (omitted) variables that drive the stock market return, which are not specified in the regressions. Institutional or contractual features, such as the subscription rate proposed by Chowdhry and Sherman (1996), may be driving the impact of the stock market (HSI Return) on the initial-day return.

The Long-term Performance of Real Estate IPOs in Hong Kong

In addition to the initial-day excess returns to investors, it is well known that U.S. IPOs underperform the market in the longer run, to the extent of losing all of their initial gains within the first year. Do real estate related or non-real estate related IPOs in Hong Kong also exhibit the similar characteristics as U.S. IPOs in the long run? REIT IPOs, although not underpriced in the initial-day, also perform poorly in the subsequent 200 trading days. Do Hong Kong real estate related IPOs (with a strong positive initial-day return) behave differently from U.S. REIT IPOs? This section examines these issues.

The methodology used by Wang, Chan and Gau (1992) is adopted to analyze the long-run performance of Hong Kong IPOs. Exhibit 9 presents the market-adjusted cumulative average daily returns (CARs) for selected intervals of up to 200 days after the initial offering. The market-adjusted return is defined as the difference between the raw return and the return of the Hang Seng Index (the market index of the Hong Kong stock market) of the same day. The exhibit also compares CARs for the sample of 343 non-real estate IPOs and the sample of 56 real estate related IPOs.

Exhibit 9 | Market-adjusted Cumulative Average Daily Returns (CARs) for Selected Intervals during the First 200 Trading Days after the IPOs of Hong Kong Real Estate Related and Non-real Estate Firms during 1986–1997

	Non-real Estate Firms		Real Estate Related Firms	
Days	Market-adjusted CAR[a] (%)	Sample Size[b]	Market-adjusted CAR[a] (%)	Sample Size[b]
1–10	17.28* (23.63)	337	13.67* (7.27)	54
1–20	16.87* (15.64)	327	11.53* (4.22)	54
1–30	16.90* (12.66)	326	11.05* (3.15)	50
1–60	17.09* (8.80)	313	6.64 (1.35)	52
1–90	17.31* (7.14)	303	7.76 (1.31)	51
1–120	16.82* (5.91)	294	8.18 (1.13)	48
1–150	16.76* (5.31)	299	6.79 (0.84)	48
1–200	17.52* (4.70)	287	7.34 (0.79)	49
2–20	−2.06* (−1.96)	327	−4.73** (−1.77)	54
2–60	−1.84 (−0.96)	313	−9.62* (−1.98)	52
2–200	−1.41 (−0.38)	287	−8.92 (−0.96)	49
21–200	0.64 (0.18)	287	−4.19 (−0.48)	49

Notes: *t*-Statistics are given in parentheses.

*Significant at the 5% level for a two-tailed test.

**Significant at the 10% level for a two-tailed test.

[a]The market-adjusted CAR from day t_1 to t_2 is computed as the sum of the cross-sectional average daily returns (A_t) from day t_1 through t_2. The *t*-Statistic for CAR in the interval (t_1, t_2) is computed as $CAR_{t_1,t_2} \cdot \sqrt{N_t}/CSD_t$, where N_t is the number of IPOs trading during each day, and CSD_t is computed as $CSD_t = \sqrt{(t_2 - t_1 + 1) \cdot \text{var} + 2(t_2 - t_1) \cdot \text{cov}}$. The variance (var) is the average cross-sectional variance (from day 2 to day 200) and the covariance (cov) is the first-order autocovariance of the AR_t series. The market adjusted return is defined as the difference between raw return and the HSI return (the market index of the Hong Kong stock market) during the same day. This methodology assumes that the measures of performance are independent and identically distributed in the cross section of securities.

[b]The sample size varies because some firms do not have price data for all 200 days after the initial offerings.

Both CARs (for the real estate related and non-real estate samples) exhibit a similar pattern that is quite like those for U.S. IPOs. That is, IPO stocks perform worse than the market index immediately after the first trading day. For the non-real estate IPOs, the only statistically significant loss of −2.06% occurs for the 2 − 20 day interval. This early loss, as for the REIT sample in Wang et al. (1992), does not support Peavy's (1990) underwriter's support hypothesis. After 20 trading days, the non-real estate IPOs seem to perform similarly to the market index. The CAR for the 21 − 200 day interval is not significantly different from zero, meaning that non-real estate IPO stocks and the stock index perform roughly the same. Indeed, the 1 − 200 day return of 17.52% as compared to the 1 − 10 day return of 17.28% (both statistically different from zero) clearly indicates that the average investor in a Hong Kong non-real estate IPO does not lose value. An investor who buys and holds maintains virtually all of the initial-day gain over the next 200 days. This result is different from that observed in the U.S. stock market.

Finally, consider the sample of 56 real estate related firms. While the general pattern of the CARs is similar to the non-real estate sample, one important difference emerges. The difference is that, while real estate IPOs do not significantly underperform the market for all of the longer-term intervals, they clearly do not outperform the market. The CARs for several of the intervals indicate this difference. While the 1 − 10, 1 − 20 and 1 − 30 day intervals for the real estate sample all have statistically significant positive gains (13.67%, 11.53% and 11.05%, respectively), there is a clear pattern that investors are losing the gains obtained during the initial trading day.

The most striking evidence is a statistically significant −9.62% CAR for the real estate 2 − 60 day interval. This drop corresponds to the 1 − 60 day gain of 6.64%, which is not statistically different from zero. That is, while the real estate IPOs experience an initial-day gain of 16.21%, that gain erodes to only 6.64% after 60 trading days following the IPO. This pattern is very similar to that of the long run performance of U.S. REIT IPOs. However, there is still a critical difference between U.S. REIT IPOs and Hong Kong real estate IPOs. Investors in U.S. REIT IPOs lost money in the long-run, while investors of Hong Kong real estate IPOs still earn a significant positive return, at least during the first 30-day interval following the IPO.

Conclusion

This article examines whether the underlying real estate holding is the main reason for the abnormal price performance of U.S. REIT IPOs. The literature indicates that there are three competing explanations for the abnormally low REIT initial-day return: (1) less attention from informed investors; (2) non-operating firm (or fund-like) structure; and (3) the underlying real estate holding. Because of the unique characteristics of Hong Kong IPOs, the first two competing explanations (informed investors and non-operating firm structure) can be ruled out and the

analysis can concentrate on the third explanation (real estate holding) when Hong Kong IPOs are used as the sample.

The results indicate that the mean initial-day return of the 56 real estate related IPOs is 16.21%, which is comparable to 18.96% for the 343 non-real estate IPOs in the sample. These returns are also consistent with the average 16% initial-day return for U.S. operating firm IPOs. The results provide strong evidence that suggests that the underlying real estate holding alone does not explain the observed low initial-day returns for U.S. REIT IPOs.

However, the puzzle remains. Why do REIT IPOs behave so differently from industrial firm IPOs? It is not due to real estate or to uninformed investors. Some ad hoc evidence indicates that the fund-like structure may not be the explanation either. Since none of the current three explanations are supported by empirical evidence, the article clearly indicates a need to rethink the explanations for the abnormally low initial-day returns of U.S. REIT IPOs.

Endnotes

[1] See Beatty and Ritter (1986), Rock (1986), Chowdhry and Sherman (1996), Brennan and Franks (1997) and Stoughton and Zechner (1998) for first group of explanations. See Ibbotson and Jaffe (1975), Ritter (1991), Loughran, Ritter and Rydqvist (1994) and Subrahmanyam and Titman (1999) for the second type of argument.

[2] The IPO sample is limited to 1997 and earlier because the return data from the PACAP database is available up to only 1998 and 200 trading days of after-market return data are required to study the long-run performance of the IPOs.

[3] These levels refer only to those IPOs actually included in the samples of either McGuiness (1992) or the current study.

[4] The SDC Platinum New Issues database does not provide IPO data for Hong Kong firms prior to 1991 while the *Stock Exchange Fact Books* do not report offer prices for the years 1991 through 1994. Therefore, all of the IPO data for the 1991 to 1994 period are collected from the SDC database.

[5] Note that Loughran et al (1994) gather evidence that indicates that IPO volume in fourteen countries is positively correlated with the stock market level. They then interpret this as evidence that private firms have some ability to time their offerings for periods when market multiples are high. The direct hypothesis tested herein is that underpricing is greater following a run-up in the market.

[6] HSI Return = [HS Index (t)/HS Index (t − 6 months)] − 1.

[7] Regressions using eleven individual year dummies to represent each year during the sample period are also run. The qualitative result is virtually the same. To simplify the presentation, the results are reported using the two period dummies.

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