MARKET TIMING & FINANCING DECISIONS
OF REAL ESTATE INVESTMENT TRUSTS

By Joseph T.L. Ooi# and Li-Lin
Department of Real Estate
School of Design and Environment
National University of Singapore
4 Architecture Drive, Singapore 117 566.
E-mail: rstooi1@nus.edu.sg

Preliminary Draft Dated: March 31, 2005

# corresponding author – can be contacted via e-mail at rstooi1@nus.edu.sg
MARKET TIMING & FINANCING DECISIONS: 
OF REAL ESTATE INVESTMENT TRUSTS

Abstract

This paper examines the financing decisions of U.S. REITs from a capital market perspective, with an emphasis on their market-timing behavior. The role of market-timing has been the focus of a few recent studies on the capital structure of corporations. Tracking the financing activities of the REIT sector between 1986 and 2003, this paper shows that the market-timing hypothesis describes REITs financing activities much better than either the capital structure trade-off or the pecking-order hypotheses. The evidence shows that REITs exhibit strong market-timing behavior, in terms of when and what type of capital to issue, to take advantage of variations in their relative costs in the capital market. Specifically, REITs time their equity offerings to coincide with periods of high stock valuation and when the hot stock market is hot. Debt securities, on the other hand, are preferred when the long-term rate is low and the credit spread is narrow. REITs appear to issue both debt and equity securities when investors are more risk-averse. The market-timing hypothesis suggests that firms choose the time and form of external financing.
MARKET TIMING & FINANCING DECISIONS OF REAL ESTATE INVESTMENT TRUSTS

1. Introduction

This paper examines the financing decisions of U.S. REITs from a capital market perspective, with an emphasis on their market-timing behavior. The common understanding views capital structure decisions either as a trade-off between the costs and benefits of using debt, or as a pecking-order where firm prefers internal source of funding, and debt capital over equity capital if external funds are required. Empirical evidences supporting both theories are abundant, while at the same time, each of the two theories meets difficulties in explaining certain aspects of firm financing activities. Recently, a new stream of research has examined the implications of market-timing behavior on corporate financing. Departing from existing capital structure theories by focusing on the “supply-side determinants” (i.e. conditions in the capital market), the proponents of the market-timing theories suggest that firms decide and time their debt-equity issues to take advantage of any perceived misvaluation in their securities in an attempt to minimize their cost of capital. In other words, firms can create value not only by undertaking positive NPV projects, but also by timing external financing decisions to take advantage of time-varying relative costs of debt and equity caused by market inefficiencies (Ritter, 2002a).

The Real Estate Investment Trust (REIT) sector provides a good ground to study the market-timing hypothesis. As a capital-intensive and external financing-dependent sector, REIT managers have strong incentives to closely monitor the capital market and exploit any pricing inefficiencies in the market to boost their bottom-line performance. Financing cost constitutes the single largest expense for REITs with interest charges alone accounting for 30% to 70% of their total expense. Furthermore, the driving forces behind the traditional pecking order and trade-off theories of capital structure are less relevant in the case of REITs. Firstly, the tax advantage of debt financing, which is central to the trade-off models, is not applicable to REITs, which enjoy tax-transparency status. Secondly, the requirement for REITs to pay out most of their taxable income to
qualify as a tax-transparent vehicle leaves them with little financial slack, thus minimizing the potential agency costs due to over-investment or managerial opportunism. Thirdly, a major proportion of the assets of equity REITs are made up of tangible real estate assets, which limits potential agency costs linked to asset substitution. The lower emphasis on growth opportunities in REITs also implies that the likelihood of mispricing due to asymmetric information on the firm’s intangible assets, which is a key assumption driving the pecking order hypothesis. The adverse signaling associated with stock issues is also less significant for REITs since they have little financial slacks and even a successful REIT would have to raise capital externally (Ghosh, Nag and Sirmans, 1997b).

Tracking the financing activities of equity-REITs in US between 1986 and 2003, we first investigate the sector’s reliance on various forms of debt and equity capital. We then examine to what extent conditions in the capital market dictate the financing activities of REITs. More specifically, the empirical study seeks to determine whether REITs exhibit market-timing behavior when making their financing decisions and if they do, how such market-timing behavior dictates the timing and the choice of financing sources. The analysis reveals that, REITs choices of the form of capital and the time to issue appear to be closely linked to the conditions in both equity and debt capital market.

The rest of this paper is organized as follows: Section II reviews recent literature on the market-timing hypothesis as well as past studies on the financial structure of REITs. Section III presents the research methodology, the data collection process and basic descriptive statistics on the sampled REITs. Section IV presents the financial patterns of REITs over the study period. Section V discusses the estimation results, whilst Section VI concludes with a summary of the major findings and their implications.

---

1 The Internal Revenue Code requires that REIT pays dividend of at least 90 per cent of their taxable income, the distribution requirement before 2000 was 95 per cent. Calculation of REITs taxable income involves some non-cash items such as depreciation. However, even from cash flow perspective, this high dividend payout requirement means that REITs distribute around half of their cash flow.
2. Literature Review

In an efficient capital market, there is no gain from switching between equity and debt and neither is there any benefit in timing securities issues (Modigliani and Miller, 1958). The efficiency of the capital market, however, has been questioned and more researchers are nowadays willing to explore the implication of market inefficiencies on corporate financial policy (Fama and French, 1993; Loughran and Ritter, 1995; Stein, 1996; Ritter, 2003). In particular, the presence of inefficiencies in the market, the debt-equity choice and security issues may have important implications on shareholders wealth. Accordingly, proponents of the market-timing theory contend that firms time and choose the type of securities to issue according to their relative costs. For example, Stein's (1996) proposes that a rational manager should take advantage of investor exuberance by issuing more shares when the firm's stock price is too high. Conversely, when the price is too low, the manager should repurchase shares. Ritter's (2002a) windows of opportunity theory of capital structure, similarly, proposes that equity can move temporarily to the top of the pecking-order if the market overprice the issuing firms' shares to the extent that equity capital becomes truly cheap. Alternatively, if debt is really cheap in certain period, debt issues can also move temporarily to the top of the pecking-order. Thus, firm follows different pecking-orders in different windows-of-opportunities in the capital market.

Empirical support of the windows of opportunity theory of capital structure is provided by Huang and Ritter (2004). Arguing that neither the static trade-off theory nor the pecking-order theory provide an adequate explanation for the observed variations in the financing patterns of U.S. firms, the authors demonstrate that market-timing behavior based on variations in the relative cost of equity provided a more satisfactory results. In their examination of corporate financing activities between 1928 and 1997, Baker and Wurgler (2000) observe that the proportion of new equity issues is higher when the overall stock market is more highly valued. They also present evidence that issuing firms display market timing ability in that managers time the equity issues successfully to coincide with “hot” phases of the market before the stock valuation returns to a more realistic level. In a follow-up study, Baker and Wurgler (2002) find that market timing has a persistent effect on firm's capital structure and more strikingly, capital structure is the cumulative outcome of past attempts to time the equity market.
The market-timing hypothesis is also consistent with the findings of a survey conducted by Graham and Harvey (2001). The extensive survey, which involved 392 CFOs, confirms that many of the CFOs practice market-timing their financing decisions to take advantage of temporary misvaluations. For example, more than two thirds of the managers said that they would issue equity when it is overvalued, especially when their share price has risen in the recent period. Similarly, they would time their debt issuance to coincide with periods when the interest rates are low. In addition, the managers would decide on the debt market timing depending on their expectation of future interest rate movements. The survey also revealed that large firms are more likely to engage in market timing activities.

In this study, we seek to examine the practice of market timing of financing decisions amongst REITs. As highlighted in the introductory section, the REIT sector offers a fertile ground to cross examine the market-timing theory of capital structure. So, far what we know about the financing decisions of REITs can be summarized in Table 1, which presents a summary of previous works on the financing and debt policy of REITs. Despite the lack of tax incentives, many equity REITs are traditionally highly geared. Although the debt level of the REIT sector have fallen since the recession of the early 1990s, the trend has reversed significantly in 1998 when the industry experienced sharp increases in debt and reductions in interest coverage ratios (Oppenheimer, 2000). Studies involving cross-sectional data provide some light on the determinants of financial structure of the tax-exempt REITs. Maris and Elayan (1990), for example, study the financial structure of 61 REITs between 1981 and 1987 and find that asset structure has a significant impact on the capital structure of REITs. They observe that large REITs with higher uncertain future cash flows tend to use more debt, whilst those with high growth rate employ less debt in their capital structure.

Several researchers have also examined the financing choices of REITs. Tracking the financial activities of equity REITs between 1991 and 1996, Ghosh, Nag and Sirman (1997b) observe that REITs generally prefer equity offering to debt issues. REITs issued equity three times more frequently than debt, and raised almost twice as much through equity than debt during the sample period. REIT’s preference for equity capital may be attributed to the fact that REITs have no tax incentive to use debt and the usual problem of adverse information associated with equity offering is mitigated since REITs have
little retained earnings. The authors also observe a positive relationship between stock price performance and capital raising activity of the individual REITs. In particular, REITs that actively raised capital registered significantly higher returns (measured by their share price performance since IPO) as compared to those which are less active in the capital markets.

Table 1. Literature on Financing Decisions of REITs

<table>
<thead>
<tr>
<th>Authors</th>
<th>Sampling</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maris and Elayan (1990)</td>
<td>61 REITs during period of 1981-1987</td>
<td>Examine REITs financial structure to determine the factors influencing their debt-equity choice</td>
</tr>
<tr>
<td>Ghosh, Nag and Sirmans (1997b)</td>
<td>92 IPOs, 173 common stock, 109 debt and 40 preferred stock issues as well as 43 private placements during 1991 to 1996</td>
<td>Examine the financing choices of equity-REITs</td>
</tr>
<tr>
<td>Ghosh, Nag and Sirmans (1999)</td>
<td>100 REITs during 1991 to 1995 period</td>
<td>Investigate the filing announcement of REITs SEOs (seasoned equity offerings)</td>
</tr>
<tr>
<td>Oppenheimer (2000)</td>
<td>Equity REITs trading on NYSE for the period 1994 through 1998.</td>
<td>Investigate the debt levels of equity REITs, as well as their ability to meet interest and dividend payments</td>
</tr>
<tr>
<td>Brown and Riddiough (2003)</td>
<td>174 fixed-rate public debt offerings and 140 equity offerings by equity-REITs from late 1993 to early 1998</td>
<td>Analyze of public security offerings by equity-REITs, focusing on liability-structure effects and whether or not REITs target long-run debt ratios</td>
</tr>
</tbody>
</table>

Analyzing public security offerings of equity-REITs from late 1993 to early 1998, Brown and Riddiough (2003) observe that proceeds from REITs equity offerings are more likely to fund investment, whereas public debts are typically used to reconfigure the liability structure of the REITs. Their results reveal that pre-offer liability structure affects the debt-equity choice decision, in that REITs with higher pre-offer levels of secured debt tend to issue equity, while those with higher pre-offer levels of unsecured debt tend to issue public debt. The authors further observe showed that public debt issuers are often capital constrained and target total leverage ratios to retain an investment grade credit rating. In another study, Gentry and Mayer (2002) seek to examine the relationship between stock prices, investment, and capital structure decisions of REITs. They found that the debt ratios of REITs move in opposite direction from the stock price-to-NAV ratio. Their study indicates that REIT managers do market time their financing activities based on quasi-public information on NAV.
Event studies by Howe and Shilling (1988), Allen and Rutherford (1992) and Ghosh, Nag and Sirmans (1999) have evaluated REIT stock price reactions to announcements of new debt and secondary equity issues. Using the event study methodology, these studies focused on identifying abnormal returns associated with the event announcement. Essentially, they measure the effects of certain financing decisions on the capital market, as reflected in movements in the stock prices. This paper, however, examines the reverse process, namely how conditions in the capital market, such as equity market valuations and returns or debt market yields and spreads, influence the financing decisions of REITs, in particular, the timing of their issues as well as what type of instruments to issue. Moreover, the majority of them only cover a study period before 1998, while REITs financing activities occurred during 1999-2003 account for 36% of the total amount of capital raised of the whole study period (1988–2003).

3. Data & Sample Description

Data is obtained from various sources. The equity market price information is extracted from the Center for Research in Security Prices of University of Chicago (CRSP) database, whilst information on the debt capital market is obtained from the Federal Reserve database. The fundamental data for individual REITs is obtained from Standard & Poor’s COMPUSTAT database, which provides the balance-sheet, income statement and cash flow statement on an annual and quarterly basis. Identification of the individual REITs are further verified with the National Association of Real Estate Investment Trusts (NAREIT) database. The study period covers 17 years from 1986 to 2003. The year of commencement, 1986, coincides with the introduction of the Tax Reform Act which fundamentally changed the REIT landscape.2

The study sample covers 144 equity REITs with a total market capitalization of $205 billion.3 It accounts for nearly 94% of the total capitalization of the REIT sector. Figure

---

2 Prior to the legislation, REITs functioned primarily as passive income-producing asset owner and operator under a third-party management structure. However, after 1986, REITs were allowed to self-manage. Since then, equity REITs have increasingly become like real estate operating corporations that engage in a wide range of real estate activities, including leasing, development of real property and tenant services.

3 REITs bankruptcies and consolidations during the 1990s resulted in the reduction of the number of REITs from its peak of 178 in 1995 to 144 at the end of 2003. Although the study sample only
1 shows that external fund raising activities of the REIT sector over the study period. Between 1988 and 1991, the aggregate amount of capital issued by REITs was less than US$ 5 billion per year. The number of issues started to climb progressively from 1992, moving in tandem with the sector’s demand for public fund to replace the private capital which left the industry after the real estate crisis. The capital raising activities reached at peak in 1997 with 463 issuances totaling US$ 45.4 billion. Over the next few years, both the number of offerings and the amount of capital raised declined. The capital raising activity of the sector started to rise again from 2001. Between 1992 and 1998, equity capital constituted nearly 70% of the external fund raised by REITs. The sector’s debt offering also increased in tandem with equity issues during 1992 to 1998, though it played a secondary role compared to equity issues. However, since 1999, REITs have turned increasingly to the debt capital market to meet their capital requirements. As a result, debt financing outpaced equity as the major form of external finance for the period of 1999-2002.

Figure 1: Fund Raising Activities by REITs

The activities include initial public offerings, secondary equity offerings and public debt issues. Debt securities include both secured and unsecured debt offerings but not private sources of debt and bank loans. Figures for 2004 only reflected issued completed before Feb 27, 2004.

included surviving REITs, it is reasonable to assume that their financing activities are more likely to be driven by survival rather than market timing considerations.
The quarterly cash flow statements of the individual REITs are examined to isolate equity issuance, equity repurchase, net debt increase and net debt reduction activities. The basis of classification follows previous methodology adopted by Hovakimian, Opler and Titman (2001), Leary and Roberts (2003) and Frank and Goyal (2003). Unlike previous studies which had to employ annual data due to unavailability of lower frequency data, the quarterly data employed in our present study will better capture the dynamics of the capital market and the firms financing activities. This is important considering that pace of changes in the capital market and that firms often make issuance decisions more than once in a particular year. The availability of cash flow statements for REITs facilitates a more accurate compilation of the net issuance activities since both the issuing and retiring amounts are known. Next, we apply a filtering process to include only material financing activities identified from the cash flow statement. In all the financial activities identified, the sum involved must be larger than US$ 1 million. In addition, the amount involved for equity issue or repurchases must constitute more than 1% and 5% of the REIT’s total asset and equity capitalization, respectively. For net debt activities, the amount must constitute at least 2% of the REIT’s total assets. The filtering criteria considers consistency with that adopted in prior studies by Hovakimian, Opler and Titman (2001), Baker and Wurgler (2002) and Huang and Ritter (2004) as well as the percentile distribution of the actual financing amount by REITs. After going through the filtering process, the final sample comprises 767 events involving equity issuances, 101 events involving equity repurchases, 1,570 events involving net debt issuance and 622 events involving net debt reduction. In addition, there were 170 incidents which involved dual offerings where the REIT issued both debt and equity securities in the same quarter.

4. Multinomial Logistic Models

To identify what factors influence the financing choices of REITs, discrete choice models can be employed. Previous studies, such as Hovakimian, Opler and Titman (2001) and Brown and Riddiough (2003), have employed probit models to examine the debt-equity choice of firms, whilst Guedes and Opler (1996) and Huang and Ritter

---

4 In the absence of cash flow statements, net issuance information could also be construed from the balance-sheet statement. Huang and Ritter (2004) suggest that the choice of balance-sheet data or cash flow statement in constructing firm financing activities will not materially affect the results.
(2004) used multinomial logistic models to examine corporate financing decisions. For our empirical investigation, a multinomial logistic model is used to simultaneously model the probability of the occurrence and the choices between different forms of financing activities. To estimate the multinomial logistic model, we first code each of the five mutually-exclusive financing activities, namely equity issuance/repurchase, net debt increase/reduction and dual offering with an integer ranging from 1 to 5. Firm-quarter observations during which no financing activities are observed are taken as baseline scenario. By pooling together the firm-period observations, the multinomial logistic model allows us to jointly examine how capital market dynamics influence the five mutually exclusive financing events made by REITs. In other words, the dependent variable in our logistic models is the five possible outcomes, whilst the independent variables in our model comprise factors reflecting the relative cost of equity or debt capitals for individual REITs as well as market-wide costs. A summary of the proxies used to represent each of the explanatory variables is presented in Table 2.

Table 2. Explanatory Variables in Market-Timing Test

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Proxy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1) Valuation of Individual REITs</strong></td>
<td></td>
</tr>
<tr>
<td>Market-to-Book Ratio (MB_R)</td>
<td>Closing price of a REIT’s share at the end of each quarter divided by book value per share</td>
</tr>
<tr>
<td>Dividend Yield (DY_FIRM)</td>
<td>Annualized dividend rate divided by a REIT’s quarter-end share price</td>
</tr>
<tr>
<td>Price-Earning Ratio (PE_R)</td>
<td>Closing price of a REIT’s share at the end of each quarter divided by the 12-month moving-average of annualized earning per share</td>
</tr>
<tr>
<td>Price Return (PR_4Q)</td>
<td>Price appreciation of a REIT’s share in the 4 quarters prior to the financing activity</td>
</tr>
<tr>
<td><strong>2) Costs of Equity Capital</strong></td>
<td></td>
</tr>
<tr>
<td>Price Return of S&amp;P 500 Index (SP_R4Q)</td>
<td>Price appreciation of the aggregate stock market in the 4 quarters prior to the financing activity</td>
</tr>
<tr>
<td>E-REITs Price Return (REIT_R4Q)</td>
<td>Price appreciation of the aggregate equity REITs sector in previous 4 quarters</td>
</tr>
<tr>
<td>Fama-French Size Factor Return (FF_SMB)</td>
<td>The difference between small and big size equity-portfolio return, defined as in Fama and French (1993)</td>
</tr>
<tr>
<td>Fama-French Growth Factor Return (FF_HML)</td>
<td>The difference between high and low book-to-market equity-portfolio return, defined as in Fama and French (1993)</td>
</tr>
<tr>
<td><strong>3) Costs of Debt Capital</strong></td>
<td></td>
</tr>
<tr>
<td>10-Year Gov Bond Yield (GB_10Y)</td>
<td>The constant maturity 10-Year Gov. bond from Federal Reserve Data Base</td>
</tr>
<tr>
<td>Real Short Term Interest Rate (REAL_GB_3M)</td>
<td>3-month Treasury bill rate minus corresponding quarter's inflation rate</td>
</tr>
<tr>
<td>Term Spread of Gov. Bond Yield (GB_TS)</td>
<td>The difference between the yields of 10-Year and 1-Year Gov. bond</td>
</tr>
</tbody>
</table>
Credit Spread of Bond Yield (CBS)  The difference between the yields of high-quality (Aaa rated) and high-yield (Baa rated) US corporate bond

Inflation Rate (INFLA)  The quarterly percentage change in the Consumer Price Index (CPI)

4) Firm-Specific Control Variables

S&P Long-Term Debt Rating (RATING)  Dummy variable for the long-term domestic issuer debt rating by S&P, 1 for investment grade, 0 for non-investment grade or non-rated

Firm Profitability (PROFIT)  Net-income scaled by total-asset of a REIT at the end of each quarter

Firm Size (SIZE)  The natural logarithm of a REIT's total-asset at the beginning of the quarter

Leverage Ratio (LEVERAGE)  The ratio of a REIT's total-debt over total-asset at the beginning of the quarter

*The filtering criteria for individual REIT firm-specific variables are applied to remove the outliers in the data, threshold values are set according to the percentile distribution of the underlying sample data.

Our first set of independent variables is included in the model to capture the effect of stock price valuation on REIT's financing decisions. They are namely, market-to-book ratio, divided yield, price-earning ratio and price appreciation of the individual stocks. Numerous empirical studies, such as Hovakimian, Opler, and Titman (2001) and Baker and Wurgler (2002), have found these variables to influence the debt-equity choice of firms. With respect to the REIT sector, it is not uncommon to hear remarks such as “the real estate market is currently trading at a slight premium to NAV, as a result, we are seeing more equity issuance in the public capital markets and less of an interest in accessing private equity, raising capital from the public market is generally simpler, faster and cleaner. If your stock is trading at or above NAV and you have a good, identified use of proceeds, it is a very efficient way of raising capital”.5 Another important price indicator of REIT stocks is the dividend yield, which due to the high payout requirements of REITs, is closely linked to the price-earning ratio which is probably the most widely adopted valuation benchmark for common stocks. Firms whose stocks have appreciated in value in the recent periods are also more likely to raise funds from the capital markets (Ghosh, Nag and Sirmans, 1997b; Hovakimian, Opler and Titman, 2001).

The second set of independent variables is included in the model to capture the effects of the performance of the general equity capital market on REIT's financing decisions.

We use the first difference of S&P 500 Index to proxy the general stock market performance, and the first difference of NAREIT equity-REITs Index to proxy the aggregate REIT sector’s performance. Huang and Ritter (2004) further argued that firms’ financing decisions are also affected by changes in investors’ preference for different types (or “style”) of equity, such as small vs. large cap stocks, as well as value vs. growth stocks. We, therefore, employ the returns for Fama-French size and growth factors to capture the dynamics of investors’ preference for small vs. large, as well as value vs. growth equity class. Huang and Ritter (2004), in particular, observe that the size factor is significantly positively associated with a higher propensity to issue equity over debt. This indicates that firms are more likely to choose equity when investors favor small cap stocks, which potentially reflect period of increased risk appetite.

The third set of independent variables represents the market-wide relative costs of debt capital. They include risk-free rate, real risk-free rate, term spread, credit spread and inflation rate. Debt capital market variables include inflation, real short-term interest rate, long-term government bond yield, term-spread of interest rate and credit-spread of corporate bond yield.

- **Inflation** - Quarterly percentage changes in CPI (Consumer Price Index) are used as proxy for inflation. Fisher effect suggests that inflation premium is embraced in nominal interest rate and is largely independent of the real rate of interest rate, which is supposed to reflect the marginal rate-of-return on the nation's capital stock. Since debt interest and principal payments are expressed in normal rather than real terms, inflation will affect the real cost of debt borrowing and consequently influence firm’s borrowing decision. Baker, Greenwood and Wurgler (2003) demonstrated that inflation has significant predictive power of excess bond returns. They further showed that the portion of long-term debt in aggregate debt issue is negatively related to inflation. In a more recent study, Huang and Ritter (2004) used inflation as one of the controlling variables in modeling firm’s debt-equity choice. They found consistent negative relation between inflation and the propensity to issue equity. The authors suggested that inflation is potentially linked to the relative cost of external equity versus debt.

- **Interest Rate** - Consistent with previous literatures, we consider real short-term
interest rate and long-term government bond yield in modeling REITs financing decisions. Real short-term interest rate is proxied by the difference between 3-month T-bill rate and the inflation during the corresponding period, while long-term interest rate is proxied by 10-year government bond yield. Although nominal short-term rate has a high correlation (0.80) with long-term government bond yield, the correlation between real short-term rate and 10-year bond yield is relatively low (0.27). The importance of interest rates in firm’s financing decisions can never be overstated. Interest rates are the most important variables in gauging debt capital market conditions. They also affect the valuation of equity shares through their role in determining the required rate-of-return by investors. Besides the issue timing choice, interest rates also affects issuer’s choice between debt and equity. For instance, in an extremely low interest rate environment, firm may prefer debt securities even if the equity market performs well and shares are valued at a relatively high level, as what happens in 2003 in the U.S. market. For REITs industry in particular, interest rates affect their financing decisions in various dimensions. First and most importantly, interest rates serve as benchmarks for the cost of both debt and equity capital. Second, interest rate partially reflects the state of the economy in general and the outlook of real estate market in particular. Specifically, rising interest rate may increase financing cost of REITs, however, it may also indicate improvement in future cash-flows generated by underlying property investments. Thirdly, interest rate affects the desirability of REITs as a particular asset class and the flows of capital into the industry. Generally speaking, a lower interest rate environment will increase the relative attractiveness of REITs in comparison to other asset classes such as fixed-income. There is a perception that REITs share prices are unusually inversely correlated with interest rates, and that REITs will suffer disproportionately if rates rises, just as the way many think insurance company or bank stocks will behave in face of rising interest rates. In fact, a number of REITs investors and analysts found that it’s not necessarily true. They argue that there is an impact of rates rise on REITs shares, just as there's an impact on all stocks. However, the impact on REITs stocks is no worse than the average stock and less than other financials stocks. Empirically, Frank and Goyal (2003b) found that a high T-bill rate is followed by increased leverage, partially due to issuers rushing to lock in current rate level before it goes higher. Baker, Greenwood and Wurgler (2003) showed that real short-term rate is predictive of
future excess bond returns, and the portion of long-term debt to total debt issued is negatively correlated with real short-term rate, indicating that firms time debt capital market conditions in their debt maturity choices. In addition, Ooi (1998) provided strong evidence that interest rate has a significant influence on U.K. property firm’s financing decisions. In particular, he showed that property company times its debt issues to coincide with periods of low interest rates. His results further show that these debts are generally of longer maturity and collateralized.

- **Term Spread** - Term spread, measured as the spread between 10-year constant-maturity government-bond and 1-year constant-maturity treasury-bill yield, is another important barometer in determining debt capital market condition. According to the pure expectation theory, term spread reflects investors’ expectation of future interest rate movement and therefore affects their current risk appetite. Term spread is one of the three debt capital market variables found significant in predicting future excess bond returns and affecting firm’s debt maturity choices in Baker, Greenwood and Wurgler (2003). Frank and Goyal (2003b) also considered this factor in their empirical examinations.

- **Credit Spread (Default Risk Premium)** - Default risk premium reflects the dynamics of investors’ demand for high-yield (risky) assets vis-à-vis high-quality (low risk) assets, which depends on prevailing economic conditions. Specifically, when the economy experiences a recession or a period of uncertainty, demand for “quality” assets increases while that for “risky” assets decreases. Consequently, the required yields for high-quality assets (such as investment-grade bonds or REITs) decrease as investors bid up their prices, resulting in higher credit spread. The mechanism works in the opposite direction during periods of benign economic conditions when investors walk up the risk spectrum and show greater demand for riskier assets which potentially offer higher yield. Therefore, from an issuer’s perspective, different credit spread implies different windows-of-opportunity to come to the market for capital. Credit spread is used in a number of previous studies about firm financing activities. For instance, Baker, Greenwood and Wurgler (2003) included credit spread in their debt maturity timing study. However, they didn’t detect significant predictive power of this variable for future excess bond return, neither did they find significant link between credit spread and firm debt
timing activities. Similarly, Frank and Goyal (2003b) concluded that, neither credit spread nor term spread has important effect on firm’s leverage in their study. Nonetheless, for REITs sector in particular, credit spread dynamics in the debt capital market might be an important consideration in their financing decisions. In recent years, a combination of perception of major event risk, accounting restatement fraud and inadequate corporate governance in the broader, non-real estate corporate world has resulted in a significant widening of bond spreads for larger investment-grade corporations across an array of industries (Chart 6.6). In contrast, investors perceive REITs to be more insulated from deteriorating credit quality and rating agency downgrades. As a result, corporate unsecured bond market for REITs flourished. In this study, credit spread is measured as the difference between Aaa-rated and Baa-rated corporate bond yield, expressed in basis point.

Finally, we also include four variables to control for firm-specific attributes, namely credit rating, profitability, size and leverage of the individual firms. Previous studies identified a number of firm-specific variables as significant determinants of firm leverage ratio. It is reasonable to assume that these intrinsic factors also weigh heavily in individual firm’s financing decisions, even if they face the same external capital market conditions. For instance, a firm with already high debt-ratio or poor interest service ability may find it still very costly to issue new debt securities even the external debt capital market condition is very favorable. Similarly, larger firms may have higher bargaining power over investors and possess certain advantages in timing their issuance. Thus, we include a number of REITs specific variables in our study to control for such firm-specific characteristics, namely firm size, profitability, debt rating, and leverage ratio.

Data from COMPUSTAT shows that, although not all REITs have investment-grade rating (49 out of the 62 rated by S&P at as 2002), cases of rating downgrade are also rare for REITs. Their credit ratings are unusually stable. Sam Zell, chairman of Equity Group Investments of Chicago, gave three reasons why publicly-held REITs have escaped the recent wave of corporate scandals. First is the necessity to create cleaner companies after the 1989-92 recession that played havoc with the real estate industry. The second reason is that the nature of REITs business doesn’t lend itself to the same amount of managerial discretion as firms in other industries, especially due to the high dividend payout requirement. The third reason is the high level of ownership by management. No other segment in S&P 500 has a higher concentration of ownership by management than the REITs do. So the “principal and agent” problem is reduced and there is less incentive for REITs managers to cheat investors. From Why Real Estate Escaped the Recent Wave of Scandals, Knowledge at Wharton, June 2004.

Federal Reserve Database only provides bond portfolio returns using Moody’s rating system. Moody’s Aaa and Baa rating corresponding to S&P AAA and BBB rating, which is from COMPUSTAT.
• **Firm Size** - Harris and Raviv (1991) showed that leverage increases with firm size. Similarly, Hovakimian, Opler and Titman (2001) suggested that firm target leverage ratio is positively correlated with its size. They argued that cash-flows of larger and more diversified firms are more stable, and this reduced cash-flow volatility increases the probability that the firm will be able to fully use tax shields from interest payments, while at the same time reduces the probability and expected costs of bankruptcy. Furthermore, survey evidence of Graham and Harvey (2001)’s also found that CFOs of large-cap and dividend-paying firms are more likely to time treasury rate. In addition, firm size may also relates to the degree of information asymmetries, as larger firms are more likely to have the resources to disseminate more information about their firms to investors. Consistent with previous studies, we use natural logarithm of REIT total asset to proxy for firm size, lagging one period (i.e. the beginning-quarter asset size of the REIT).

• **Profitability** - Profitability is found to be another significant determinant of capital structure in previous studies. However, different theories have different predictions about the relationship between profitability and firm leverage. For instance, the trade-off theory posits that profitable firms should be more levered to take full advantage of the debt tax shield. In contrast, pecking-order theory predicts that more profitable firms have more financial slacks and use less external debt, thus end up with lower debt-ratio. Empirical evidence, however, seems to support the latter one. Both Harris and Raviv (1991) and Rajan and Zingales (1995) demonstrated negative relation between leverage and firm profitability. Moreover, Titman and Wessels (1998) showed that highly profitable firms often use their earnings to pay down debt and are usually less levered than their less profitable counterparts. Studying the effect of profitability on firm financing decisions, Hovakimian, Opler and Titman (2001) found that more profitable firms are more likely to issue debt rather than equity and more likely to repurchase equity rather than retire debt. They argued that such behavior is consistent with their conjecture that the most profitable firms become under-levered and that firms’ financing choices tend to offset these earning-driven changes in their capital structures. There are several metrics evaluating a REIT’s profitability, among them are fund from operation (FFO), net income, free cash-flow, as well as operating cash-flow. Consistent with previous researches, we use net income scaled by total asset in our study to proxy for REITs profitability.
• **Debt Rating** - It is reasonable to assume that REITs with better rating have better access to external capital, possibly due to less information asymmetry problem. Chart 6.7 gives a snapshot of REITs rating profile at 2002. Overall, less than half of REITs in the U.S. are rated by credit agencies such as S&P and Moody's. However, near 80 percent of the rated ones are of investment-grade, though normally at the lower-end of the spectrum (among the 144 REITs studied, 62 are rated by Standard & Poors, of which 49 are investment-grade issuers). We use a dummy variable to capture the potential effect of strong debt rating on REIT's financing decisions\(^8\). The variable is coded 1 if a REIT is rated investment-grade, 0 if it is non-investment grade or not rated. Although bigger firms tend to get better rating, Chart 6.8 demonstrates that the correlation is far less from perfect.

• **Firm Leverage** - Consistent with Baker and Wurgler (2002), current debt ratio is used to control for any leverage-related motivation for REITs financing decisions. For instance, a REIT already with debt overhanging problem may find it unfeasible to issue more debt even if debt market condition are favorable. Similarly, a REIT with extremely low debt-ratio may wish to issue debt even though its stocks appear to be overvalued. In this study, the ratio of total-liability over total-assets is used as a simple measure of REIT leverage. As in previous literature, the variable is lagged on period.

• **Asset Tangibility** - Both pecking-order hypothesis and trade-off theory suggest asset tangibility to be an important factor in firm leverage decision, even though the relationships they predict are different. Specifically, pecking-order hypothesis suggests that firms with fewer tangible assets would have greater asymmetric information problem. Consequently, these firms will accumulate more debt over time and become more highly levered. In other words, asset tangibility and firm leverage are negatively related. In contrast, trade-off theory argues that tangible assets naturally serve as collaterals and intuitively, more tangible assets are associated with more borrowing. Empirically, asset tangibility is shown to be positively correlated with leverage ratio in Harris and Raviv (1991). However, for REITs companies, there are not much cross-sectional variations in the ratio of asset

---

\(^8\) The S&P Long-Term Domestic Issuer Credit Rating at the end of 2002 from COMPUSTAT is used.
tangibility, as the vast majority of REITs assets are property investment. Balance-sheet data shows that property-related investments account for more than 90% of total-assets for the industry as a whole. Firm-level asset tangibility averages at 89%, with a standard deviation of less than 13%. Hence, we drop this variable in our later regression.

5. Estimation Results

Summary statistics of the multinomial logistic model in Table 3 suggest that the model fits the observed data nicely. Likelihood-ratio test in Table 4 further indicates that the explanatory variables specified are significantly related to the five types of REITs financing activities. As in Table 3, REITs stock offering decisions are shown to be significantly driven by temporarily high equity valuation. Specifically, this valuation effect is mainly taken on by P/E multiplier, as high P/E ratios are found to be significantly associated with greater tendency to issue equity. In contrast, market-to-book ratios, although emphasized in some previous studies for its role in firms' market-timing activities, are found to have no statistically significant impact in either the equity issuance or repurchase decisions of REITs. Thus, our result indicates that REITs pay more attention to P/E rather than M/B in timing the market valuation of their shares.

High and stable dividend-yield of REITs vis-à-vis other asset classes is one of the most important attractions offered by REITs stocks. However, our results suggest that REITs have no tendency to time dividend-yield when making their securities offering decisions, as dividend-yield is found to be insignificant in both equity issuance and net debt increase cases (probably due to the fact that REITs dividends are sticky and less volatile than equity valuations such as P/E ratio, as we pointed out in Section 6.3.). In contrast, we found that low current period dividend-yield increases the probability of both equity and debt repurchases. Anecdotal evidence suggests that REITs tend to repurchase preferred shares that are paying high dividends when current investor-demanded dividend yield in the market place is low. Nevertheless, the rationale for the negative coefficients in the net debt reduction cases is less obvious and warrant further investigation.
Results from the three share price-return related variables, namely individual REIT share return, S&P500 index return and NAREIT e-REITs index return, provide the most compelling evidence of REITs market-timing. For instance, REITs equity offering decisions (including the special cases of dual offering) are significantly driven by appreciations in REIT's own share price and run-ups in general stock market (proxied by S&P500 index return) during the four quarters prior to the offering decisions. These results are consistent with Hovakimian, Opler and Titman (2001), Masulis and Korwar (1986) and Asquity and Mullins (1986), in which U.S. firms are found to have a higher propensity to issue equity following an increase in stock price. However, although conventional wisdom suggests that firm also considers the performance of other equities in the same sector when deciding an equity offer, the regression results indicate that REITs sector share-performance proxied by NAREIT index return is not important at all in individual REIT's financing decisions. This is consistent with our previous observation in Section 5.1 of the stronger correlation between REITs sector-aggregate equity offering and broader equity market performance than with the share performance of REITs sector itself. This finding indicates that general stock market sediment is more important than sector specific performance in REITs equity issues timing. In other words, when the whole stock market is in a state of “exuberance” (maybe “over-exuberance” as in 1998), REITs will have higher propensity to issue equity despite dismal share performance of the sector itself.

The regression results further suggest that, even REITs' net debt issuance decisions are strategically coincided with favorable conditions in the general stock market. However, firm level share performance plays a less important role in the net debt issuance cases, as the weight of individual REITs share return quickly diminishes (only significant at 10% level). This is consistent with Frank and Goyal (2003b)s’ finding that firms increase their leverage (indicating debt offerings) when stock market as a whole rises.

On the other hand, the negative coefficient for general stock market return in equity repurchase decisions indicates that, continuous decline in the broader market significantly increases the probability for REITs managers to repurchase equity. This outcome is consistent with the empirical observations in Hovakimian, Opler and Titman (2001). However, the repurchase is probably triggered by the deteriorations in
market sentiment rather than by stock valuation considerations (as none of the two valuation-metrics is found significant in the equity repurchase cases).

The outcome from the multinomial regression further suggests that REITs time the dynamics in investors’ risk appetite and preference in their security offering. Specifically, REITs are found to refrain from issuing equity when the Fama-French size factor-return (i.e. SMB--the difference between the return of small-cap portfolio over large-cap portfolio) is high. This holding-back in REITs equity offering runs in contrast to the finding of Huang and Ritter (2004), who showed a positive relationship between SMB factor-return and the propensity of industrial firms to issue equity. Similarly, high SMB factor-return significantly reduces the possibility of REITs making net debt increase decisions. High SMB factor-returns, most likely resulted from strengthened demand for small-cap shares vis-a-vis larger-cap ones, reflect the increases in the risk appetite of investors. As a result, the potential demand for security offered by less-risky sectors such as REITs may effectively drop, as investors are pulling their money out of safer sectors to venture in riskier ones, thus explaining the opposite direction of effect for SMB factor found in our study with that in Huang and Ritter (2004).

However, coefficient for HML factor-return (i.e. the difference between the return of value-stock portfolio over growth-stock portfolio), although have the expected positive sign in the equity issuance regression, is not statistically significant. This indicates that investors’ preference for value vs. growth stock has little effect in affecting REITs equity offering decisions. Some real estate industry practitioners suggest that, although REITs stocks are perceived as value stocks for most of the period, during certain periods, especially those periods when REITs actively issue shares to acquire properties into their portfolios (often at a deep discount to the book-value of the properties after the real estate sector depressions), REITs actually exhibit characteristics of growth-stocks from a technical perspective. For instance, in term of the growth rate in their earnings, which is far greater than the long-term average. These shifts in the “style” of REITs stock might result in the insignificance of the HML factor-return in the equity issuance regression.
Results regarding interest rates and bond spreads show further indications of REITs market-timing. Firstly, REITs are less likely to issue both debt and equity securities when long-term government bond yields are high. In particular, net debt increase is most sensitive to higher long-term interest, while the negative relationship between long-rates and the likelihood of REITs equity offering is less pronounced (significant at 5% level). As long-term government bond yield is often considered as benchmark for the yield of other asset class, a higher long-rate translates into higher financing cost for both equity (through it's role in determining the level of dividend yield REITs stocks have to offer) and debt for REITs, and thus reduces firms’ willingness to issue securities during such periods. This finding is consistent with Barry et. al (2003) on U.S. industrial firms as well as Ooi (1998) about UK property companies.

Current period term-spread is found to be a statistically significant driver of REITs equity issuance decisions. The expectation theory suggests that a high current yield spread points to the possibility of rising interest rates in the future. In addition, Baker, Greenwood and Wurgler (2003) demonstrated that higher term-spreads predict higher excess bond returns, which translate into higher cost from the issuers' perspective. Consequently, instead of offering debt securities, REITs choose to issue equity when they need external capital. This is another evidence that REITs opportunistically switch between debt and equity according to their relative cost.

REITs are shown to have greater tendency to issue equity in the face of high real short-term interest rates. Real interest rate is closely associated with economic conditions in general and property market outlook in particular. Specifically, high real-rates indicate better outlook for the property market as improved economic conditions will result in increasing future income for investment-properties, while at the same time, high rates also put pressure on property valuations (through capitalization rate). Consequently, the combination of the two effects translates into better buying opportunities for REITs, which drive them to issue equity to fund new property purchases. This preference of equity over debt for property acquisitions is consistent with Brown and Riddiough (2003)'s argument that proceeds from REITs equity offers are more likely to fund investment, whereas public debt offers are typically used to reconfigure the liability structure of the firm.
Table 3. Multinomial Logistic Regression of REITs Financing Activities

This table presents the results of multinomial-logistic-regression modeling the probability of the occurrence of a certain type of financing activity in a given quarter. The probability of such financing activity taking place is linked to two groups of explanatory variables reflecting debt and equity capital market conditions, as well as one group of firm-characteristic controlling variables. Firm-quarter observations during which no financing activities are observed are taken as baseline scenario.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>C</td>
<td>-1.928**</td>
<td>-2.621***</td>
<td>-10.259***</td>
<td>-9.133***</td>
</tr>
<tr>
<td>M/B Ratio</td>
<td>MB</td>
<td>0.053</td>
<td>0.053</td>
<td>0.081</td>
<td>0.023</td>
</tr>
<tr>
<td>Dividend Yield</td>
<td>DY</td>
<td>--</td>
<td>-0.013</td>
<td>--</td>
<td>-0.145***</td>
</tr>
<tr>
<td>P/E Ratio</td>
<td>PE</td>
<td>0.013***</td>
<td>--</td>
<td>-0.006</td>
<td>--</td>
</tr>
<tr>
<td>Firm Price Return Previous 4Q</td>
<td>PR_4Q</td>
<td>1.300***</td>
<td>1.229***</td>
<td>0.928</td>
<td>0.443</td>
</tr>
<tr>
<td>S&amp;P 500 Return Previous 4Q</td>
<td>SP_R4Q</td>
<td>3.272***</td>
<td>3.321***</td>
<td>-3.142**</td>
<td>-3.447***</td>
</tr>
<tr>
<td>NAREIT Return Previous 4Q</td>
<td>NAREIT_R4Q</td>
<td>0.151</td>
<td>0.102</td>
<td>1.515</td>
<td>1.970</td>
</tr>
<tr>
<td>Return for Fama-French Size Factor</td>
<td>FF_SMB</td>
<td>-4.864***</td>
<td>-4.473***</td>
<td>-1.060</td>
<td>-1.055</td>
</tr>
<tr>
<td>Return for Fama-French Growth Factor</td>
<td>FF_HML</td>
<td>1.175</td>
<td>1.025</td>
<td>-6.823**</td>
<td>-7.072**</td>
</tr>
<tr>
<td>10-Year Gov. Bond Yield</td>
<td>GB_10Y</td>
<td>-0.160**</td>
<td>-0.147**</td>
<td>0.091</td>
<td>0.101</td>
</tr>
<tr>
<td>Term Spread of Interest Rate</td>
<td>GB_TS</td>
<td>0.473***</td>
<td>0.441***</td>
<td>-0.893</td>
<td>-1.131***</td>
</tr>
<tr>
<td>Real Short Term Interest Rate</td>
<td>REAL_GB_3M</td>
<td>0.111***</td>
<td>0.106***</td>
<td>-0.077</td>
<td>-0.077</td>
</tr>
<tr>
<td>Credit Spread of Corp. Bond Yield</td>
<td>CS</td>
<td>-0.007*</td>
<td>-0.007*</td>
<td>0.027***</td>
<td>0.028***</td>
</tr>
<tr>
<td>Long Term Debt Rating</td>
<td>RATING</td>
<td>0.600***</td>
<td>0.578***</td>
<td>0.224</td>
<td>0.118</td>
</tr>
<tr>
<td>Firm Size (lagging one period)</td>
<td>LN_TA</td>
<td>-0.039</td>
<td>0.098</td>
<td>0.550***</td>
<td>0.573***</td>
</tr>
<tr>
<td>Firm Leverage (lagging one period)</td>
<td>LEVERAGE</td>
<td>-0.265</td>
<td>-0.178</td>
<td>0.393</td>
<td>0.185</td>
</tr>
</tbody>
</table>

Observations 252 268 43 46 1094 1197 243 310 142 148

Pseudo R-Square | Model Fitting Information | Total Observations
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Specification(1) [excluding DY]</td>
<td>0.170</td>
<td>0.191</td>
</tr>
<tr>
<td>Specification(2) [excluding P/E]</td>
<td>0.164</td>
<td>0.186</td>
</tr>
</tbody>
</table>

*, **, *** denote significance at 10%, 5% and 1% respectively.
Two reasons account for the reduction in the number of financing activities included in the regression than the number of events identified in Section 6.2. Firstly, multinomial logistic model can only accommodate mutually-exclusive events, while in our sample, many firm-quarter observations witness two types of financing activities taking places simultaneously. Except for the dual offering scenario, these observations are excluded from the regression. Secondly, the sample sizes (number of observations) are automatically adjusted in the econometric software to include only those observations for which all explanatory variables are available.

Table 4. Likelihood Ratio Tests of the Multinomial Logistic Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Variable Abbr.</th>
<th>Specification (1)</th>
<th>Specification (2)</th>
<th>Chi-Square</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>C</td>
<td>--</td>
<td>--</td>
<td>22.345</td>
<td>0.000</td>
</tr>
<tr>
<td>M/B Ratio</td>
<td>PB</td>
<td>56.413</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividend Yield</td>
<td>DY</td>
<td>20.658</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P/E Ratio</td>
<td>PE</td>
<td>--</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm Price Return Previous 4Q</td>
<td>PR_4Q</td>
<td>44.117</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S&amp;P 500 Return Previous 4Q</td>
<td>SP_R4Q</td>
<td>75.748</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAREIT Return Previous 4Q</td>
<td>NAREIT_R4Q</td>
<td>5.111</td>
<td>0.439</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return for Fama-French Size Factor</td>
<td>FF_SMB</td>
<td>38.191</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return for Fama-French Growth Factor</td>
<td>FF_HML</td>
<td>18.497</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Year Gov. Bond Yield</td>
<td>GB_10Y</td>
<td>45.043</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term Spread of Interest Rate</td>
<td>GB_Ts</td>
<td>40.705</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Short Term Interest Rate</td>
<td>REAL_GB_3M</td>
<td>9.142</td>
<td>0.086</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit Spread of Corp. Bond Yield</td>
<td>CS</td>
<td>36.263</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Term Debt Rating</td>
<td>RATING</td>
<td>17.145</td>
<td>0.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm Profitability</td>
<td>PROFIT</td>
<td>109.689</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm Size (lagging one period)</td>
<td>LN_TA</td>
<td>27.596</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm Leverage (lagging one period)</td>
<td>LEVERAGE</td>
<td>63.130</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistics obtained from SPSS. Likelihood ratio test examine whether the independent variables specified in the final model is significantly related to the dependent variable. The Chi-Square statistics is the difference in log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.
Lastly, results from firm-characteristics controlling variables offer a number of interesting observations. First, investment-grade credit rating is shown to be an important characteristic associated with REITs equity issuers, indicating that such REITs are more active equity market players. However, better rating is surprisingly not significant in the debt increase decisions. Second, the significant negative coefficients for firm profitability recorded in all fund raising activities (equity issuance, net debt increase and dual offering) suggest that REITs financing activities are closely related to their operating performance. The negative signs indicate that, poor performance propels REITs to tap external capital while insufficient cash flow is generated during the corresponding period. This confirms Fama and French (2002)’s proposition that external capital is used to absorb the short term variation in earnings and investments. Third, REITs of larger size are more inclined to repurchase equity and less likely to issue debt in comparison to smaller REITs. This finding is different from Graham and Harvey (2001)’s survey results that CFOs of large-cap industrial firms are more likely to attempt debt market-timing, indicating that size doesn’t matter in market-timing in the REITs sector. Finally, coefficient for firm-leverage suggests that debt overhanging plays important role in debt reduction decisions, as high leverage ratio is associated with greater tendency to reduce debt obligation.

6. Conclusion

This paper examines REITs financing activities from various perspectives of market-timing. The previous section employs multinomial logistic model to simultaneously examine REITs’ strategic choices of the time to issue/repurchase and the choices between debt and equity form. Results about the equity valuations variables show that, REITs stock offering decisions are shown to be significantly driven by temporarily high equity valuation. Specifically, when current P/E ratios are high, REITs are more inclined to issue equity and favor equity over debt once they decide to raise external capital. In addition, consistent with Hovakimian, Opler and Titman (2001), REITs are shown to issue significant larger amount of equity and debt when their market-to-book ratios is high.

Evidences about stock returns further reveal REITs initiatives in market-timing. REITs
tend to issue equity securities when their own share price as well as the general stock market experienced significant appreciations during the four quarters prior to the issuance. In addition, REITs choices of the time to issue debt are also significantly affected by general stock market returns. Results for Fama-French size factor-return suggest that, REITs also time the dynamics in investors' risk appetite in their security offering. Specifically, REITs are found to refrain from issuing either equity or debt when the Fama-French size factor-return is high, indicating that REITs hold-back their security offerings when investors rotate out of safer sectors into more riskier asset classes.

REITs defer their decisions to raise external capital (both debt and equity capital) when the long-term government bond yield is high, and choose shorter term debt securities if they issue public debt in periods of high long-term rate. On the other hand, our results suggest that REITs are more likely to issue equity securities (most likely to buy new properties) in the face of rising real short-term rate, which is potentially associated with brighter outlook of the investment-property sector.

The empirical results reveal that term-spread of interest rate is among the most important factors REITs consider in their market-timing. Specifically, REITs are more likely to issue equity and raise a significant larger amount when current term-spread is high. In addition, REITs tend to choose long-term over short-term debts in the face of a steeper yield curve.

REITs financing activities, particularly debt offerings, are sensitive to changes in bond market credit spread: REITs defer their decisions to increase debt in periods of high credit spread. Even if debt capital is finally chosen, a shorter maturity-term is chosen during such period.

Results for firm characteristic controlling variables suggest that investment-grade rated REITs tend to be more active equity issuers. In addition, they favor equity to debt capital when raising external capital. However, better rated REITs as well as larger REITs are shown to raise less equity capital relative to their total asset size compared with their non-investment grade or smaller counterparts. REITs profitability, measured as net income, is shown to be negatively associated REITs propensity to raise external capital. This result confirms our prior discussion about the reliance on external capital of REITs due to the
high pay-out requirement: REITs that generate less cash-flow from operations tend to be more active capital market visitors. Finally, our results suggest that REITs seem to try to stay within an optimal debt range in that higher pre-offer leverage ratio significantly increases the probability of REITs debt reduction.

References


Hovakimian Armen., Hovakimian Gayane., and Tehranian Hassan, 2004, Determinants of Target Capital


Myers Stewart C., 2003, Financing of Corporations, Chapter 4 in Handbook of the Economics of Finance edited by G.M. Constantinides, Milton Harris, and Rene Stulz, Amsterdam, North-Holland.


Real Estate Portfolios, bimonthly magazine on the real estate investment trust industry, National Association of Real Estate Investment Trusts, various issues. Available at http://www.nareit.org/portfoliomanag/


REITs Watch, monthly statistical report on the real estate investment trust industry, National Association of Real Estate Investment Trusts, various issues. Available at http://www.nareit.com/researchandstatistics/index.cfm


University of Florida.


