REIT Leverage Puzzle

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Real Estate Investment Trusts (REITs) utilize significant financial leverage, with a typical REIT employing around 40 percent of debt financing. For non-taxable entities like REITs, the absence of tax benefits raises questions about the optimal level of financial leverage. This study explores the effects of leverage on shareholder returns in REITs and provides empirical evidence supporting the trade-off theory of capital structure. Our findings indicate that some REITs may have reached their optimal level of financial leverage, beyond which the marginal benefit diminishes. Additionally, the study reveals that high leverage can create agency conflicts between managers and shareholders, leading to a market penalty on REITs with excessive financial leverage. Importantly, we also find that the impact of financial leverage on REIT performance varies depending on the economic context, showing divergent trends pre- and post-financial crisis and during the COVID-19 pandemic recovery phase. The implications of these findings are critical for understanding REITs' governance and financial management.

Keywords: REIT, leverage, returns, cost of borrowing

INTRODUCTION

This paper examines the financial leverage ratios of REITs and shareholder returns. REITs do not benefit from the tax-deductible interest payments since they are not taxed so long as they qualify as REITs. Despite the lack of interest tax shield benefit, REITs use significant debt financing, around 40 percent of total financing. While we do not delve into the reasons behind REITs' use of financial leverage, our focus is on exploring the consequential relationship between this leverage and equity returns. This line of inquiry is motivated by two primary factors. First, it enables us to test the applicability of established financial theories like the trade-off and agency cost theories in the context of REITs, which have unique tax structures. Second, understanding this relationship is crucial for investors and policymakers alike, as it can offer insights into the risk-reward dynamics associated with varying levels of financial leverage in REITs.

Theories on financial leverage indicate that shareholders of firms with greater financial leverage should earn returns to compensate for the financial risk they face because equity cash flows in a levered firm have greater volatility (Modigliani and Miller, 1958; Jensen and Meckling, 1976; Myers, 1984). While Cheng and Roulac (2007) and Green Street Advisors (2009) have previously reported on the relationship between financial leverage and equity returns in REITs, our study aims to contribute to the literature in several ways. We employ updated datasets and advanced statistical models to reexamine this relationship. Additionally,

our research tests the applicability of established financial theories to REITs, offering theoretical and empirical enrichment to the existing body of work. We also explore the relationship across various sub-segments of REITs and consider the global context to provide a more comprehensive understanding.

We first document the association between the financial leverage of REITs and market returns by forming quintile portfolios based on financial leverage levels. The performances of these quintile portfolios indicate that REITs with relatively high leverage ratios perform poorly, and this poor performance has been notably dramatic post-financial crisis. The implications of these results are twofold. First, it calls into question the common practice among REITs to maintain high levels of financial leverage, suggesting that such strategies may be suboptimal for maximizing shareholder returns. Second, the pronounced poor performance after the financial crisis suggests that high-leverage strategies could expose REITs to greater risks during economic downturns, potentially leading to financial distress or even bankruptcy. We then investigate the association between financial leverage and equity return in a multivariate setting. We use pooled regressions to explain levered equity returns of REITs using pure asset returns, financial leverage, cost of borrowing and a period indicator. In general, these results show a positive association between financial leverage and levered equity returns of REITs. In addition, we find that financial leverage does not explain returns to low-financial-leverage REITs and that financial leverage is positively associated with returns to high-leverage REITs.

The remainder of the paper is organized as follows. The next section provides a literature review. Section 3 describes the sample dataset and methodology. Section 4 shows results, and section 5 explores alternative specifications of multivariate models. Finally, section 6 concludes the paper.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The financial leverage of Real Estate Investment Trusts (REITs) and its impact on equity returns has been a topic of ongoing debate in financial literature. While several theories offer general explanations for the capital structure decisions of firms, the unique regulatory environment and operational characteristics of REITs necessitate a more nuanced understanding. This section reviews the principal theories commonly applied to explain firms' capital structure, and then adapts these theories to the specific context of REITs. Following this, we develop hypotheses to guide our empirical investigation.

Trade-Off Theory

The Trade-off Theory, initially laid out by Modigliani and Miller in their seminal papers in 1958 and 1963, posits that firms seek an optimal level of financial leverage that balances the benefits and costs of debt financing. In a perfect capital market, financial leverage does not affect a firm's cost of capital or value (Modigliani and Miller, 1958; 1963). However, when market imperfections like taxation and financial distress costs are introduced, the theory suggests that firms aim for a level of financial leverage that maximizes firm value (Myers, 1984).

For REITs, the absence of corporate taxation eliminates the interest tax shield as a benefit of leverage. Yet, financial distress costs still limit how much debt is optimal. Maris and Elayan (1990) have argued that REITs may employ leverage to respond to a clientele effect, where investors restricted from establishing levered positions on their own prefer to invest in levered REITs.

The primary concern of this study is to explore how financial leverage affects REIT returns. Prior research by Cheng and Roulac (2007) and Green Street Advisors (2009) has indicated a weak negative or poor association between high financial leverage and REIT returns. Contrary to these findings, Giacomini, Ling, and Naranjo (2016) suggest that over-levered REITs perform better than under-levered ones, implying a positive relationship between financial leverage and returns.

Our main hypothesis is built upon the Trade-off Theory, which suggests a positive association between financial leverage and equity returns, owing to the increased risk to shareholders as the firm employs more debt financing.

Signaling Theory

Signaling Theory, first put forth by Ross (1977), posits that managers may use financial decisions, such as leverage, to signal information about the firm's true value to external investors (Ross, 1977; Leland and Pyle, 1977). In the context of REITs, leverage could signal management's confidence in the underlying real estate assets and future cash flows (Flannery, 1986).

Additional research by Harris and Raviv (1991) supports the idea that a firm's capital structure can serve as a credible signal to the market. They argue that only firms with strong future prospects would dare to take on high levels of debt, as they are confident in their ability to service it.

Bhattacharya (1979) further adds that signaling can distinguish between high-quality and low-quality firms. In the REIT market, where information asymmetry can be high due to the complex nature of real estate investments, signaling through financial leverage could be particularly relevant (Myers and Majluf, 1984).

Given the mixed findings in existing literature on REITs — some indicating poor performance for highly levered REITs (Cheng and Roulac, 2007; Green Street Advisors, 2009) and others suggesting the opposite (Giacomini, Ling, and Naranjo, 2016) — it becomes imperative to test whether financial leverage serves as a reliable signal for REIT performance.

Agency Cost Theory

Agency Cost Theory, initially proposed by Jensen and Meckling (1976), focuses on the conflicts of interest between shareholders and managers, particularly when the firm employs debt. According to this theory, managers may take on excessive leverage to maximize their own utility, often at the expense of shareholders (Jensen and Meckling, 1976; Fama, 1980).

In the context of REITs, these agency issues can become particularly pronounced due to the nature of real estate investments, which often involve large, illiquid assets and long-term financing (Brick and Chidambaran, 2010). As a result, the capital structure decisions of REITs could be heavily influenced by managerial incentives, possibly leading to suboptimal levels of financial leverage (Hermalin and Weisbach, 1991).

Research by Titman and Wessels (1988) suggests that firms with high agency costs tend to have lower debt levels, which might explain why some REITs prefer lower financial leverage despite the absence of corporate taxes.

Given the potential for agency conflicts in REITs, our study aims to investigate how such conflicts could influence the relationship between financial leverage and equity returns; this aligns with prior studies but adds a layer of complexity by considering the unique structure and regulations surrounding REITs (Capozza and Seguin, 2000).

Pecking Order Theory

The Pecking Order Theory, initially developed by Myers and Majluf in 1984, posits that firms have a specific preference order for financing: first using internal funds, then debt, and finally issuing new equity (Myers and Majluf, 1984; Frank and Goyal, 2003). This hierarchy is driven by the costs associated with asymmetric information between managers and investors (Fama and French, 2002).

In REITs, the Pecking Order Theory might operate differently due to the regulatory requirement to distribute a large portion of income as dividends, thereby limiting internal funds for reinvestment (Harrison, Panasian, and Seiler, 2011). This unique structure could make REITs more reliant on external financing, possibly skewing their pecking order towards debt (Ghosh, Giambona, Harding, and Sirmans, 2011).

Given that REITs are constrained in using retained earnings, understanding how they navigate their financing options in light of these limitations is essential. Our study aims to examine whether the Pecking Order Theory holds for REITs by observing how financial leverage correlates with equity returns, particularly when internal funds are limited.

Hypothesis Development

Building on the theories discussed, our study aims to test the following hypotheses:

H1: *Trade-off Theory: There is a positive association between financial leverage and equity returns in REITs, reflecting the increased risk borne by shareholders (Modigliani and Miller, 1958; Myers, 1984).*

H2: *Signaling Theory: REITs with higher levels of financial leverage are perceived as higher quality by the market, leading to better equity returns (Ross, 1977; Bhattacharya, 1979).*

H3: *Agency Cost Theory: The level of financial leverage in REITs is influenced by agency conflicts, and these conflicts may hurt equity returns (Jensen and Meckling, 1976; Hermalin and Weisbach, 1991).*

H4: *Pecking Order Theory: REITs that are constrained in their use of internal funds will exhibit a different relationship between financial leverage and equity returns, possibly leaning more on debt as a financing option (Myers and Majluf, 1984; Ghosh et al., 2011).*

These hypotheses serve as the foundation for our empirical tests and will guide the analysis of our data. By addressing these hypotheses, we aim to contribute to the existing literature on the capital structure of REITs and its impact on shareholder returns.

DATA AND METHODOLOGY

Data

We use COMPUSTAT and CRSP to identify a sample of REITs between 1990 and 2022. There are 15,170 firm-years in the initial data set from COMPUSTAT. We then search for the initial sample of REITs in the CRSP database. Characteristics of REITs identified in COMPUSTAT database are shown in Table 1. The variables reported in the table are computed similarly to Maris and Elayan (1990). The market capitalization is based on the stock price and common shares outstanding at the fiscal year's end. Debt-to-equity ratio is the long-term debt divided by the market value of equity. The debt-to-to-total assets ratio is determined as the long-term debt divided by the total assets.

An alternative version of this ratio incorporates the market value of equity. Net cash flow is net income, interest expense and depreciation. The cost of capital is the net cash flow divided by the sum of long-term debt and the market value of equity. In our analysis, we compute two measures of borrowing costs to provide a comprehensive understanding of the financial implications of leverage for REITs. The first measure is based on the interest payment divided by debt, offering a direct assessment of the cost of borrowing. This captures the basic interest rate obligations of the REIT on its debt. The second measure incorporates interest and related expenses divided by debt, providing a broader view of the true economic cost of borrowing. This measure includes additional costs such as fees, charges, and penalties that may be incurred. By using both measures, we aim to capture different aspects of borrowing costs, enhancing the robustness of our analysis and allowing for more nuanced interpretations of our findings.

The sample median market value of equity is $560.09 million. The sample median debt-to-equity ratio is 0.72, while median debt-to-total asset and debt-to-debt plus equity ratios are 0.44 and 0.42, respectively. The sample characteristics are generally similar to those of Maris and Elayan (1990); however, there are some extremely low equity market values leading to extremely high debt-to-equity ratios.

TABLE 1
DESCRIPTIVE STATISTICS

Variable	N	Mean	Median	Standard Deviation	Minimum	Maximum
Market Capitalization	5,163	1,247.23	360.45	2,975.17	0.01	56,597.60
Debt / Equity	5,163	37.17	0.74	1,493.63	0.00	81,814.90
Debt / Total Assets	5,704	0.41	0.44	0.26	0.00	4.14
Debt / (Debt + Equity)	5,163	0.42	0.43	0.25	0.00	1.00
Net Cash Flow	1,562	86.69	15.65	226.46	-2,710.00	2,430.00
Cost of Capital	1,378	0.03	0.06	1.09	-31.85	12.69
Interest Paid / Debt	4,782	0.08	0.06	0.08	0.00	0.99
Interest and Related Expense / Debt	4,920	0.09	0.07	0.08	0.00	0.96

This table shows the characteristics of REITs included in the initial sample. COMPUSTAT and CRSP databases are used to identify a sample of REITs between 1990 and 2021. There are 15,170 firm-years in the initial data set from COMPUSTAT. The variables shown in the table are computed in a similar fashion to Maris and Elayan (1990). The market capitalization is based on the stock price and common shares outstanding at the fiscal year's end. Debt-to-equity ratio is the long-term debt divided by the market value of equity. Debt-to-total assets ratio is determined as the long-term debt divided by the total assets. An alternative version of this ratio incorporates market value of equity. Net cash flow is the sum of net income, interest expense and depreciation. The cost of capital is the net cash flow divided by the sum of long-term debt and market value of equity. Two measures of borrowing costs are also reported. The first measure is based on the interest payment while the second measure uses interest and related expenses. Dollar values (market capitalization and net cash flow) are in millions.

Methodology

We use debt-to-equity ratios to form five portfolios of REITs every year in December and track the monthly performance of these portfolios for the following twelve months. Then we repeat the portfolio formation and return computation process. The performance measure is the market value-weighted return on each portfolio. The first portfolio includes REITs that use no leverage, and the remaining four portfolios are formed based on the quartiles of debt-to-equity ratios every year when portfolios are formed. Returns to no leverage portfolio represent the pure asset returns not affected by financial leverage. Modigliani and Miller (1958) suggest that the equity in a levered firm is riskier leading to higher expected return on equity with the use of financial leverage. Therefore, we would expect the portfolio of REITs using no financial leverage to have the lowest return and that as financial leverage increases; the portfolio returns will be higher.

In addition, we examine the effects of financial leverage on equity returns using a multivariate model. The model posits that equity returns are explained by pure asset returns, financial leverage, cost of borrowing and period. Asset returns serve as the benchmark returns for levered REITs without using financial leverage. Financial leverage makes the equity riskier, leading to higher returns for levered firms. The cost of borrowing reflects the interest burden on borrowing. The cost of borrowing is relevant because the financial leverage will positively impact equity returns if asset returns exceed the cost of borrowing. The period dummy reflects potential time-specific changes in the association between shareholder returns and variables used in the multivariate analysis. We initially use pooled ordinary least squares models, followed by robustness checks with cross-sectional time series models. We estimate the following pooled ordinary least squares model:

$$R_{i,t} = \beta_0 + \beta_1(AR_t) + \beta_2\left(DE_{i,t}\right) + \beta_3\left(CB_{i,t}\right) + \beta_4(PC_t) + \beta_5(P_t) + \varepsilon_{i,t} \quad (1)$$

where, $R_{i,t}$ = equity return for firm i in year t
AR_t = pure asset return in year t
$DE_{i,t}$ = debt-to-equity ratio of firm i in year t
$CB_{i,t}$ = cost of borrowing for firm i in year t
PC_t = 1 for years after 2007 and 0 otherwise
P_t = 1 for 2020 and 0 otherwise
ε = random residual error term
$\beta_0 - \beta_5$ = coefficient estimates

RESULTS

We report the performance of portfolios formed based on financial leverage in Table 2. Portfolio 0 includes REITs without financial leverage and, on average, comprises 10 monthly REITs. The return to Portfolio 0 represents unlevered or asset returns, with an average monthly return of 0.76 percent, or 9.13 percent per year. The remaining four portfolios (1 – 4) are formed based on quartiles of debt-to-equity ratios. Interestingly, we observe that equity returns generally increase with financial leverage, moving upward from Portfolio 0 to Portfolio 3. However, Portfolio 4, which includes REITs in the top quartile of financial leverage, performed poorly compared to other leveraged portfolios. This portfolio also experienced the greatest volatility among levered REITs. This evidence supports the notion that REITs using a high degree of financial leverage did not compensate investors for the risks they took (Jensen and Meckling, 1976; Fama and French, 2002).

TABLE 2
RETURN CHARACTERISTICS OF PORTFOLIOS FORMED BASED ON FINANCIAL LEVERAGE

Portfolio number =>	0 Unlevered	1 Low leverage	2	3	4 High leverage
Mean	0.0091	0.0083	0.0100	0.0124	0.0087
Median	0.0078	0.0123	0.0127	0.0162	0.0153
Standard Deviation	0.0612	0.0495	0.0578	0.0666	0.0684
Minimum	-0.2236	-0.2765	-0.2869	-0.3773	-0.4291
Maximum	0.3923	0.2454	0.3234	0.3905	0.3957
Average N	11	33	34	34	33

This table shows the return characteristics of five portfolios formed based on financial leverage. Debt-to-equity ratios are used to form five portfolios of REITs. The monthly performances of these portfolios are recorded for the following twelve months. Then the portfolio formation and return computation process is repeated. The performance measure is the market value-weighted portfolio returns. The first portfolio (portfolio 0) includes REITs that use no leverage and the remaining four portfolios (1 - 4) are formed based on the quartiles of debt-to-equity ratios in a given year. Returns to no leverage portfolio represent the pure asset returns not affected by financial leverage.

These findings' economic implications primarily support the Agency Cost Theory. The underperformance and higher volatility of Portfolio 4 suggest that agency conflicts may influence the capital structure decisions in these high-leverage REITs, leading to suboptimal outcomes for investors (Jensen and Meckling, 1976). Additionally, the results also echo aspects of the Trade-off Theory, as they indicate that there might be an optimal level of leverage for REITs beyond which the costs, in terms of financial distress and increased volatility, outweigh the benefits (Modigliani and Miller, 1958; Myers, 1984).

We report the cumulative performance of leverage-based portfolios in Figure 1. Cumulative performance refers to the aggregated total returns of a portfolio over a specific period, taking into account not just the capital gains but also any reinvested dividends or other earnings. It is generally expressed as a

percentage and calculated by compounding the periodic returns over the time frame of interest. This measure provides a comprehensive view of how the portfolio has performed over the long term, capturing both the volatility and the growth in the portfolio's value. The figure shows that the best-performing portfolio is the portfolio of REITs in the third quartile of financial leverage. The figure also shows that portfolios 3 and 4 performed better than the other financial leverage portfolios before the financial crisis. The performance of unlevered REITs was the worst before the financial crisis.

Except for the slight ranking order between the third and fourth quartile portfolios, these results before the financial crisis period are consistent with the notion that there is a positive association between financial leverage and equity returns. Economically, this suggests that before the financial crisis, REITs were able to effectively manage the risks associated with higher leverage, possibly because of a more favorable economic environment and easier access to credit. Investors seemed adequately compensated for taking on higher risks, supporting the Trade-off Theory (Modigliani and Miller, 1958; Myers, 1984).

The divergence in results pre- and post-crisis could be attributed to several factors. First, the financial crisis led to tightening credit markets, making it more expensive and challenging for REITs to roll over or refinance their debt. This would have disproportionately affected REITs with higher leverage, potentially leading to financial distress or even bankruptcy. Second, investor sentiment likely shifted post-crisis, with greater skepticism and risk-aversion towards highly levered investment vehicles, which could have led to higher required returns for such REITs. Lastly, regulatory changes post-crisis may have also made high leverage less appealing or feasible, aligning more closely with the Agency Cost Theory (Jensen and Meckling, 1976).

FIGURE 1
MARKET RETURNS OF PORTFOLIOS FORMED BASED ON FINANCIAL LEVERAGE, JANUARY 1990 - MARCH 2022

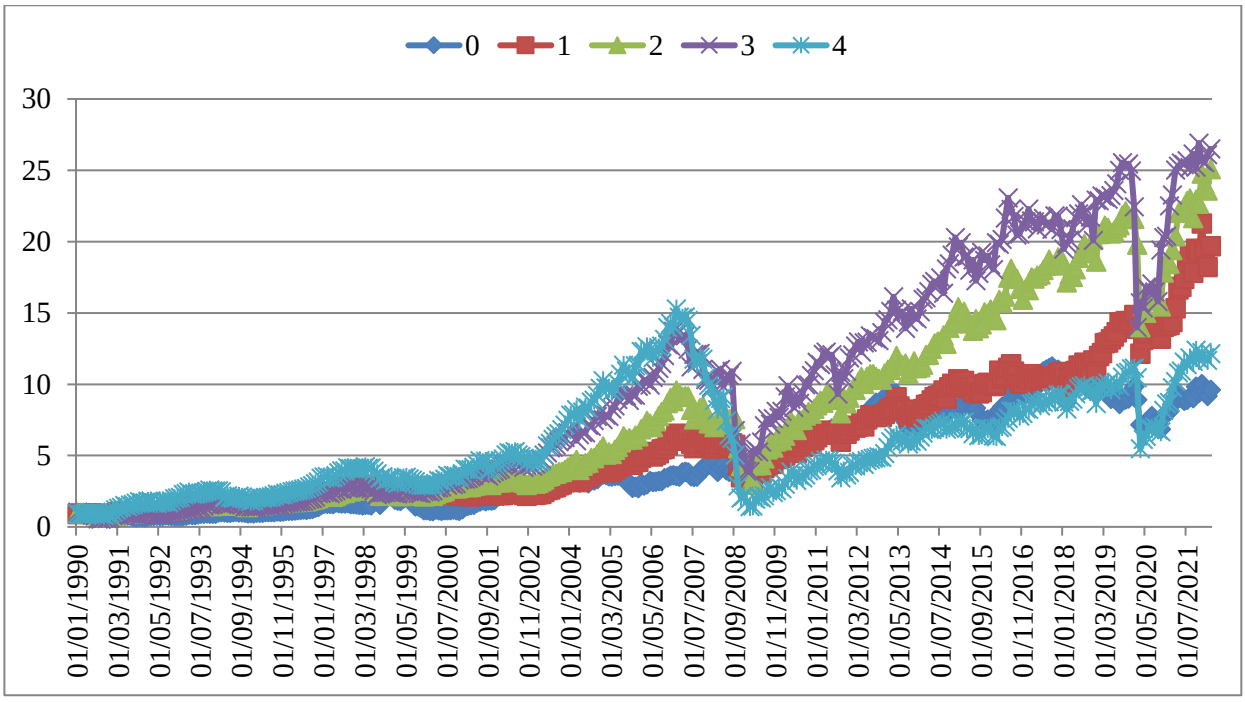

Figure 1 also highlights the drastic change in performance rankings after the financial crisis. In fact, highly levered REITs performed the worst compared to all other portfolios during most of the post-financial crisis period. This poor performance can be attributed to several factors. First, the financial crisis led to a contraction in credit markets, making refinancing or rolling over debt more challenging and costly for

highly levered REITs (Ghosh, Giambona, Harding, and Sirmans, 2011). Second, investor sentiment likely shifted towards risk aversion post-crisis, leading to higher discount rates and consequently lower valuations for riskier, highly levered REITs (Brunnermeier and Pedersen, 2009). Third, tighter regulatory frameworks introduced after the crisis could have imposed constraints that made high leverage less feasible or attractive (Acharya, Engle, and Richardson, 2012).

These findings have important implications. They strongly support the Agency Cost Theory, suggesting that the capital structure choices in these high-leverage REITs may have been driven more by managerial incentives than by the aim to maximize shareholder value (Jensen and Meckling, 1976). Additionally, the results indicate that the Trade-off Theory's premise of an optimal level of debt may be even more critical in volatile or constrained economic environments (Myers, 1984).

However, the highest quartile financial leverage REITs recovered somewhat after the pandemic, posting returns better than no-leverage REITs. This recovery can be attributed to multiple factors. First, government stimulus measures and accommodative monetary policy likely eased liquidity constraints for these highly levered REITs, enabling them to stabilize their balance sheets (Guerrieri et al., 2020). Second, the post-pandemic environment saw a rebound in asset values, particularly in industrial and residential real estate sectors, benefiting REITs with high exposure to these assets (Harrison, Panasian, and Seiler, 2021). Third, the recovery phase often entails higher risk-taking by investors, leading to a rally in higher-risk, high-leverage REITs as investor sentiment improved (Baker et al., 2020).

Our findings suggest that external factors like government intervention and market sentiment can significantly impact the performance of highly levered REITs. This supports the Signaling Theory, as the strong post-pandemic performance could signal management's effective risk management during crises (Ross, 1977). Additionally, these findings suggest that optimal leverage levels for REITs may vary across different economic cycles, supporting the dynamic aspects of the Trade-off Theory (Myers, 1984).

The cumulative performance of the highest financial leverage REITs (Portfolio 4) indicates that investors have not earned enough compensation for the financial risk they have taken. This underperformance could be due to many factors, such as higher borrowing costs, financial distress, and agency conflicts between management and shareholders (Jensen and Meckling, 1976; Fama and French, 2002).

The question then arises: why do investors continue to invest in these high-leverage REITs? One possible explanation could be the allure of high potential returns, as financial leverage can amplify gains as well as losses (Modigliani and Miller, 1958). Some investors may be betting on a turnaround or a favorable market shift that could disproportionately benefit these high-leverage portfolios. Another possibility is that of 'yield chasing,' where investors are attracted to the higher yields often associated with riskier assets, without fully appreciating the associated risks (Brunnermeier and Nagel, 2004). Lastly, information asymmetry might be at play, where investors may not fully understand the risks associated with such high-leverage strategies (Myers and Majluf, 1984).

This raises concerns about the efficiency of the market in pricing the risks associated with high financial leverage in REITs, potentially supporting the Behavioral Finance Theory that suggests that investor sentiment and cognitive biases can distort asset prices (Barberis, Shleifer, and Vishny, 1998). It is very likely that performance of portfolio 4 is the driving force of results reported by Cheng and Roulac (2007) and Green Street Advisors (2009).

We then investigate possible explanations of univariate results. We estimated a model that explains equity returns of individual REITs using unlevered returns, financial leverage, cost of borrowing and dummy variables for time periods. Results of the pooled ordinary least squares regression analysis are shown in Table 3. The table shows that the asset return has a positive significant explanatory power of equity returns of levered REITs. The table also shows that there is a positive association between financial leverage and equity returns. The financial crisis dummy indicates that the equity returns are higher post-financial crisis period. This result may reflect superior performance of financial leverage portfolios 2 and 3. These portfolios include REITs that use moderate levels of financial leverage. We also note the negative returns during the pandemic across all REITs.

Unfortunately, these results do not offer any evidence on the potential detrimental effects of high leverage observed with the univariate results. Several factors could explain this discrepancy. First, multivariate analysis may control for variables that mitigate the risks associated with high leverage, such as asset quality, diversification, or managerial expertise (Titman and Wessels, 1988). Second, the multivariate model might capture the effects of external factors like economic conditions or market sentiment, which can disproportionately affect highly levered REITs but are accounted for in the analysis (Fama and French, 2002).

TABLE 3
MULTIVARIATE ANALYSES OF FINANCIAL LEVERAGE AND RETURNS

	Dependent variable: Equity return								
Variable	Model 1		Model 2		Model 3		Model 4		
Intercept	0.0825		0.0639		0.0643		0.0254		
	14.7300	***	8.0800	***	4.2600	***	1.1500		
Asset return	0.3649		0.3718		0.3602		0.3685		
	14.4400	***	14.8700	***	14.1000	***	14.6800	***	
Debt / Equity	0.0050		0.0050		0.0050		0.0049		
	3.7000	***	3.7500	***	3.6300	***	3.6500	***	
Cost of borrowing					0.2771		0.5647		
					1.2200		2.1200	**	
Post crisis			0.0365				0.0491		
			3.3100	***			3.7900	***	
Pandemic			-0.1080				-0.1026		
			-8.5800	***			-8.0800	***	
R squared	0.0644		0.0681		0.0646		0.0692		

* Significant at 10 percent level.
** Significant at 5 percent level.
*** Significant at 1 percent level.
This table reports regressions where the dependent variable is the equity return during a 12-month period after fiscal year end between January 1990 and March 2022. Asset return represents return to a portfolio of REITs that has no financial leverage. Each firm's equity and asset return period is the same. The debt-to-equity ratio and cost of borrowing is based on COMPUSTAT data for firms' fiscal year. The cost of borrowing is based on interest and related expenses divided by the long-term debt. Post crisis and pandemic are dummy variables set to 1 for the fiscal years after 2007 and fiscal year 2020, respectively. The t values are below coefficient estimates and are based on heteroskedasticity-consistent standard errors.

Another explanation could be model misspecification or omitted variable bias, where the multivariate model does not include important variables that interact with financial leverage. Lastly, it's also possible that the lack of detrimental effects in the multivariate results is due to the timeframe of the study. Different periods may exhibit different relationships between financial leverage and returns, and the multivariate analysis might capture a period less sensitive to leverage risks (Ghosh et al., 2011).

Economically, these findings suggest that the relationship between financial leverage and REIT performance is complex and may be influenced by a multitude of factors, both internal and external. This complexity underscores the need for investors to consider a broad set of variables when assessing the risks and returns associated with REIT investments.

We group the sample firms into high and low financial leverage groups based on the median of the sample debt-to-equity ratios to investigate the effects of financial leverage closely. We use the same models estimated through pooled ordinary least squares regressions.

TABLE 4
MULTIVARIATE ANALYSES OF FINANCIAL LEVERAGE GROUPS AND RETURNS

Panel A: Low financial leverage								
	Dependent variable: Equity return							
Variable	Model 1		Model 2		Model 3		Model 4	
Intercept	0.0958		0.0855		0.0409		0.0245	
	2.0500	**	1.7400	*	0.5800		0.3100	
Asset return	0.2609		0.2666		0.2669		0.2755	
	2.4100	***	2.5000	**	2.5200	**	2.6500	***
Debt / Equity	-0.0063		0.0061		0.0651		0.0764	
	-0.0100		0.0100		0.1300		0.1600	
Cost of borrowing					0.5545		0.5956	
					1.0500		1.0700	
Post crisis			0.0386				0.0464	
			1.0600				1.2000	
Pandemic			-0.2422				-0.2199	
			-7.0700	***			-6.1600	***
R squared	0.0559		0.0521		0.0551		0.519	
Panel B: High financial leverage								
	Dependent variable: Equity return							
Variable	Model 1		Model 2		Model 3		Model 4	
Intercept	0.0820		0.0682		0.0655		0.0256	
	14.2200	***	7.6700	***	4.1200	***	1.0900	
Asset return	0.3689		0.3761		0.3643		0.3722	
	14.2400	***	14.6700	***	13.8800	***	14.4300	***
Debt / Equity	0.0050		0.0050		0.0050		0.0049	
	3.6900	***	3.7500	***	3.6200	***	3.6300	***
Cost of borrowing					0.2541		0.5573	
					1.0300		1.9200	*
Post crisis			0.0368				0.0491	
			3.2400	***			3.6500	***
Pandemic			-0.1064				-0.1015	
			-8.3700	***			-7.9200	***
R squared	0.0645		0.0681		0.0645		0.069	

* Significant at 10 percent level.
*** Significant at 1 percent level.
This table reports regressions where the dependent variable is the equity return during 12 months after the fiscal year ends between January 1990 and March 2022. Asset return represents a return to a portfolio of REITs that has no financial leverage. Each firm's equity and asset return period is the same. The debt-to-equity ratio and cost of borrowing is based on COMPUSTAT data for firms' fiscal year. The cost of borrowing is based on interest and related expenses divided by the long-term debt. Post crisis and pandemic are dummy variables set to 1 for the fiscal years

after 2007 and fiscal year 2020, respectively. The t values are below coefficient estimates and are based on heteroskedasticity-consistent standard errors.

The results of these regressions are reported in Table 4. Panel A of the table reports results for low financial leverage REITs. Results show that financial leverage has no explanatory power for the equity returns of these REITs. The only consistently significant variable is the asset or unlevered return. Panel B of Table 4 reports results for the high financial leverage REITs. In addition, we observe that equity returns are higher after the financial crisis and lower during the pandemic. The results show that asset return, and financial leverage are positively associated with equity returns of high financial leverage REITs.

At moderate levels of financial leverage, there may not be a significant incremental increase in risk to shareholders' investment. However, at relatively high levels of financial leverage, there is a positive association between financial leverage and equity returns.

ALTERNATIVE SPECIFICATIONS

In this section, we explore the alternative specifications of our multivariate models. We use panel regressions to check our pooled ordinary least squares regressions. We observe that we can easily reject the null hypothesis (m value of 29.79) under the Hausman test of random effects in favor of fixed effects specification. Regarding fixed effects, the F test for no fixed effects could not be rejected (F value is 1.03). This means that our pooled ordinary least squares specification is appropriate.

CONCLUSIONS

We investigate the relationship between financial leverage and Real Estate Investment Trusts (REITs) equity returns. Our findings corroborate the notion that greater financial leverage generally enhances shareholder returns, provided it does not reach excessive levels. This observation is consistent with the Trade-off Theory, which posits an optimal level of debt that balances the benefits and costs of financial leverage (Modigliani and Miller, 1958; Myers, 1984).

Our multivariate analysis further highlights the complexity of this relationship. It reveals that asset returns are positively associated with equity returns and become increasingly important for moderately levered REITs. Conversely, financial leverage becomes more significant in explaining the equity returns for REITs with a higher degree of leverage. This supports the Agency Cost Theory, suggesting that the underperformance of highly levered REITs may be influenced by agency conflicts between management and shareholders (Jensen and Meckling, 1976).

Interestingly, the impact of financial leverage on REIT performance varies depending on the economic context, showing divergent trends pre- and post-financial crisis and during the COVID-19 pandemic recovery phase. These temporal variations emphasize the need to understand how external factors can influence the leverage-return relationship (Ghosh et al., 2011; Baker et al., 2020).

While our study offers valuable insights, the consistently poor performance of highly levered REITs warrants further investigation. Factors such as financial distress costs or agency costs of debt could clarify the underlying reasons for this underperformance (Giacomini, Ling, and Naranjo, 2016).

In summary, our study contributes to the literature by exploring the complex relationship between financial leverage and REIT equity returns, with particularly relevant implications for investors and policymakers. However, the interplay between financial leverage and various internal and external factors signifies that more detailed studies are needed to fully comprehend this relationship.

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