



Reference-dependent analysis of capital structure and REIT performance



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ABSTRACT

Using prospect theory, we develop a theoretical framework to examine the relationship between leverage and Real Estate Investment Trust (REIT) returns by introducing the concept of reference point. We postulate that firms' capital structure decisions are affected by target leverage (i.e., the reference point) as well as the observed leverage. Market conditions combined with firms' capital structure will put firms in either loss or gain domains, where firms behave differently. In general, the leverage–return relationship is positive in the gain domain and negative in the loss domain. Firms are then subject to asymmetric risk preference in different domains. Our empirical evidence shows strong support for the theoretical model. Compared to the conventional approach where only observed leverage is used, our model is more flexible and realistic in revealing the underlying structure of the leverage–returns relationship.

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1. Introduction

A considerable amount of literature has investigated the relationship between leverage and returns (a measurement of firm performance) since Bhabdari (1988). Whether a consistent relationship exists between leverage and returns remains unclear. The findings from previous literature often vary greatly among sampling periods, sectors, or measurements of leverage. For example, using U.S. stock market data between 1962 and 1989, Fama and French (1992) find that leverage and returns are positively related when market leverage is used, and the relationship is reversed when book leverage is adopted. Gomes and Schmid (2010) extend the sampling period to 2006, and find the leverage–returns relationship to be insignificant when book leverage is used in their analysis. No consensus has been reached regarding the reason for the mixed results.

This study considers a behavioral element that has been largely overlooked in the capital structure literature. Using prospect theory (Kahneman and Tversky, 1979), we introduce the reference-dependence concept to the stock return model of Fama and French (1992) and apply the model in the Real Estate Investment Trust (REIT) sector. The challenge facing researchers when apply-

ing prospect theory is the lack of well-defined reference points and the over-reliance on laboratory experiments (see, for example, the discussions in Barberis, 2013). However, in financial settings, plausible reference points are easier to be identified (e.g., the risk-free rate in investment return analysis) and field data are more readily available in good quality and quantity. Consequently, prospect theory has been widely adopted to explain puzzles and anomalies in the finance literature, such as the low long-term average return on IPO stocks (Barberis and Huang, 2008), equity premium puzzle (Benartzi and Thaler, 1995) and disposition effect (Barberis and Xiong, 2009). Building upon existing literature, we reconcile some puzzling results of leverage–return relationship by acknowledging reference-dependence and asymmetric risk preferences in firms' capital structure decisions.

The central idea of our paper is that firms' capital structure decisions are affected by target leverage (i.e., the reference point) as well as the observed leverage. Firms adjust their current leverage based on its deviation from the target leverage. Considering that target leverage is firm-specific, a given observed leverage can put a firm in either the over-leveraged or the under-leveraged position, depending on the value of the target leverage. Moreover, the cost of financing varies based on market conditions. Over-leveraged firms can enjoy the benefits of leveraging in up markets where capital is abundant, whereas they may suffer from the downside of leveraging when credits dry out in down markets. The opposite is true for under-leveraged firms. Consequently, firms may exhibit

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asymmetric risk preferences under different combinations of market conditions and leverage positions. The relationship between return and leverage should not be simply identified as positive, negative, or insignificant unconditionally. The relationship should be studied by considering relative leverage positions (over- or under-leveraged) and market conditions (up or down market). Based on prospect theory, we develop a model to capture this non-linear and asymmetric relationship between leverage and return. Compared to the conventional approach where only observed leverage is used, our model is more flexible and realistic in revealing the underlying structure of the leverage–returns relationship. It is also a potential solution to reconcile conflicting findings in the literature.

Our theoretical model is validated with data from the REIT sector.¹ Most of the existing leverage–returns studies exclude the real estate sector due to its unique corporate tax requirements. The relationship between capital structure and REIT performance remains an under-researched area. However, stylized facts indicate that the level of debt-financing affects REITs performance significantly (Sun et al., 2015). We derive the theoretical model with the REITs sector specifically in mind in order to bridge this gap in the literature.

Specifically, we choose the REIT sector to test our theoretical model for the following reasons. First, to meet the special dividend payout requirement, REITs have to raise capital more frequently to ensure sufficient cash flow (Devos et al., 2014; Hardin and Wu, 2010). Thus, capital structure decisions are particularly important to capital-intensive REITs. Second, REITs is one of the few industries where the underlying assets are traded in secondary markets (Boudry et al., 2010). Hence the REITs sector is more likely to be closely linked to local market conditions and underlying assets performance. This makes REITs an ideal and unique sector to test our theoretical model. Last, investors have been increasingly aware of the benefits of REITs as a vehicle to tap in the fast-growing real estate markets around the world. Between 2005 and 2014, the S&P REITs index shows a gain of 259% (or an annualized growth rate of 10%) compared to a 221.39% (or an annualized growth rate of 8.27%) increase in the S&P 500 index. In November 2014, S&P Dow Jones Indices and MSCI Inc. decided to create a new headline sector for real estate. Equity REITs and listed real estate companies will be moved from the Financial Sector to the newly created Real Estate Sector.² With all the interesting developments in the REIT sector, research on the relationship between capital structure and REIT performance will benefit all stakeholders involved. This statement is particularly true given the fact that existing studies primarily focus on REIT capital structure determinants (Alcock et al., 2014; Ertugrul and Giambona, 2010; Harrison et al., 2011) or the relationship between REIT capital structure and corporate governance (Alcock et al., 2013; Striwe et al., 2013). The relationship between capital structure and REIT performance has largely been overlooked.

Empirical evidence provides strong support for our theoretical model. By testing the three hypotheses on target leverage formation and leverage–returns relationship, we conclude that 1) firm characteristics are useful in the estimation of target leverage; 2) reference point (or target leverage) plays an important role in the leverage–returns relationship; and 3) firms are subject to asym-

metric risk preference in loss and gain domains. Specifically, firm-specific and time-varying target leverage determines a firm's leverage position. Such a situation, combined with market conditions, will put the firm in either loss or gain domains, where firms behave differently. In general, the effect of leverage on returns is positive in the gain domain and negative in the loss domain. Moreover, firms are risk averse in gain domain but risk seeking in loss domain. As an application of behavioral economics in capital structure decisions, this paper considers the role of reference point and the heterogeneity of firm behaviors in the loss and gain domains. We also verify the robustness of the findings by considering alternative measurements of observed leverage. Overall, our model is not sensitive to alternative definitions of leverage.

The remainder of this paper is organized as follows: the theoretical model is presented and the testable hypotheses are derived in Section 2. The empirical implementation of the theoretical framework is discussed in Section 3. Discussions on the empirical findings are given in Section 4, followed by conclusions provided in Section 5.

2. Theoretical framework and testable hypotheses

This study not only investigates the formation of a reference point in capital structure decisions, but also more importantly determines the way a reference point operates in the leverage–returns relationship.

The topic of capital structure decisions can be traced back to Modigliani and Miller's first proposition (Modigliani and Miller, 1958). They proposed that firm value should be irrelevant to its capital structure decisions in the absence of taxes, information asymmetry, transaction costs, and bankruptcy costs, among others. The assumptions above are strong with respect to the imperfect market conditions in reality. Subsequent research has tested this proposition vigorously by answering two fundamental questions. First, is a capital structure decision relevant to firm performance? If yes, then second, what effect should leverage have on firm performance?

Conventionally, researchers use observed leverage as a factor in investigating the leverage–returns relationship (Bhabdari, 1988; Fama and French, 1992; George and Hwang, 2010; Gomes and Schmid, 2010). Specifically,

$$R_{i,t+1} = f(L_{i,t} | C_{i,t}) \quad (1)$$

where $R_{i,t+1}$ is the shareholders return of firm i at time $t+1$, $L_{i,t}$ is the observed leverage of firm i at time t , and $C_{i,t}$ is a vector of control variables.

Bhabdari (1988) is the first to empirically test the relationship between leverage and return using the above-stated model. Until now, most of the available empirical evidence is inconsistent with the irrelevance proposition. The violation of its friction-free market environment assumption determines that firm performance depends on the way firms finance their operations. However, the exact relationship between leverage and returns is less clear (Gomes and Schmid, 2010). Findings often vary greatly among sampling periods, sectors, or measurements of leverage (Bhabdari, 1988; Fama and French, 1992; George and Hwang, 2010; Gomes and Schmid, 2010; Livdan et al., 2009; Penman et al., 2007; Trigeorgis and Lambertides, 2014). To solve this puzzle, some researchers consider firms' leverage targeting behaviors in the basic model by Bhabdari (1988). It has been established in the capital structural literature that firms gradually adjust their capital structure towards an optimal leverage (e.g., Chang and Dasgupta, 2009; Flannery and Rangan, 2006). Consequently, capital structure decisions should be based on the deviation of a firm's leverage from its target leverage. A recent study by Caskey et al. (2012) introduce this concept into the leverage–return relationship studies by considering 'excess

¹ Evidences show that REITs behave like stocks in many ways (see, for example, Case, Yang, and Yildirim, 2012; Glascock, Lu, and So, 2000). Therefore, our findings not only shed light on capital structure decisions in this unique and under-researched sector, but also can be generalized beyond the US REIT industry. We tested our models by using US stock market data from 1998 to 2013. The results (not presented here for the sake of brevity but available from the authors upon request) are consistent with findings from the REIT sector.

² <https://www.reit.com/investing/reit-basics/reit-industry-timeline#55>.

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