REIT Financing Choices: Preparation Matters

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Abstract

Sun, Titman, and Twite (2014) find that risky capital structure characteristics, such as high leverage, a high share of debt due in the near future and a high share of variable-rate debt, significantly reduce the cumulative total returns of US REITs over the 2007-2009 financial crisis. In this paper we show that preparing ahead of the crisis significantly improved the cumulative return over the crisis period even after controlling for the levels of the relevant capital structure characteristics at the start of the crisis. Specifically, we document that REITs which reduced leverage and increased maturity prior to the crisis fared better during the crisis. For instance, a one standard deviation reduction in leverage generated a five percent higher cumulative return during the crisis. We further find that US REITs with the highest capital structure risk (high leverage and short maturities) were more likely to prepare for the crisis ahead by reducing leverage and extending maturity. This effect is especially large for REITs with strong governance. We also document that none of our findings hold for European REITs. This suggests that since European firms did not experience or observe the levels of market excess that occurred in the US before the crisis, whether or not they prepared for the crisis had no impact on their returns during the crisis.

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1 Introduction

REIT managers can mitigate the risk in the capital structure of their firms in two fundamental ways: they can always be conservative, or they can dynamically adjust the capital structure in anticipation of future market conditions. Sun, Titman, and Twite (2014) find that firms with a conservative capital structure at the start of the 2007-2009 financial crisis fared better during the crisis. We extend this work by documenting that REITs which adjusted their capital structure prior to the crisis fared particularly well during the crisis, even when controlling for their capital structure as of the start of 2007. In other words, shareholders rewarded those REIT managers who correctly anticipated the crisis and took precautionary actions to prepare for it. This result highlights a unique method through which REIT managers can add value to their firms. In addition to selecting good properties, repositioning/redeveloping them, and managing them, REIT managers can add substantial value through dynamically adjusting the capital structure of their firms. For instance, our estimates suggest that one standard deviation reduction of leverage before the crisis generated five percent higher cumulative return during the crisis.

More specifically, Sun, Titman, and Twite (2014) find that several risky capital structure characteristics, namely high leverage, a high share of debt due two and three years in the future, and a high share of variable-rate debt, significantly reduce the cumulative total returns of US REITs over the 2007-2009 financial crisis. In this paper we replicate these findings. We extend this analysis further and document that REITs which reduced leverage and increased maturity prior to the crisis (over 2006) fared better during the crisis (2007-2009). These results hold even when controlling for the capital structure levels at the start of 2007.

We further find that US REITs with the highest capital structure risk (high leverage and short maturity) were more likely to take precautions by reducing leverage and extending maturity. This effect is especially strong for REITs with strong governance. In other words, preparation for the crisis was not a random event. Instead, REITs with good governance and high exposure were the ones most likely to take mitigating action.

As a robustness check, we investigate whether any of the effects can be observed in European REITs. Since the real estate excesses prior to 2007 were mostly a U.S. phenomena, shareholders of European REITs should not expect or reward prepa-

ration. Indeed, we document that none of the above findings hold in our European sample. In other words, European firms that reduced their leverage or increased their maturity before the crisis received no benefit at all during the crisis. The finding of no effect in Europe tentatively suggests that shareholders are as interested in the signal that preparation sends as in the capital structure adjustment itself. Put differently, US REIT managers were in the midst of numerous excesses and were able to observe numerous warning signals. They should have adjusted their capital structure prior to 2007, and doing so was perceived as a positive signal. European markets were not subject to the same excesses, at least not to the same extent, so adjusting the capital structure in Europe was not expected and/or rewarded.

The above findings paint a consistent and intuitive picture of REIT management and shareholder behaviour. Good managers dynamically adjust the capital structure to balance the benefits of leverage against its costs, and shareholders reward this appropriately. Nonetheless, we note that some of our conclusions are based on relatively small samples and are subject to omitted variable bias. In the conclusion we offer several avenues for extending the results reported here to mitigate these deficiencies.

We proceed as follows. Section 2 outlines the related literature. Section 3 describes our data and empirical method. Section 4 discusses results. Section 5 concludes.

2 Related literature

Corporate capital structure choices are a topic of intense academic debate in the literature. The three main approaches to analysing capital structure in general are the trade-off between benefits and costs of debt, the hierarchy of funding choices as suggested by the pecking order theory, or the choice of funding depending on the underlying capital market conditions as proposed by the market timing theory. Costs and benefits of debt are often examined in the context of agency conflicts, such as risk-shifting from managers to outside debt holders. Our work adds primarily to the literature on market timing and risk-shifting.

Managers may try to time the market when it is subject to behavioural biases (Baker, Ruback, and Wurgler, 2008; Frank and Nezafat, 2013; Huang and Ritter, 2009).[1] Managers may issue debt when investors offer especially favourable terms

[1] Cochrane (2011) argues that market timing may also arise in a rational framework as managers optimally respond to time-varying funding opportunities.

(Stein, 1996). Baker and Wurgler (2002) develop the market timing theory as a first-order determinant of capital structure. In this framework, managers are generally indifferent between debt and equity. Their choice depends on the relative value of these forms of capital in the financial markets at the time of issuance. Observed capital structure then represents the cumulative outcome of managerial attempts to time the market.

The empirical evidence for the market timing hypothesis is mixed. Baker and Wurgler (2002) show that an indicator measuring issuance decisions during favourable periods in the equity and debt markets is persistently related to observed firm leverage over long periods of time post-issuance. Baker, Greenwood, and Wurgler (2003) find that firms study debt market conditions in an effort to determine the lowest-cost maturity at which to borrow. Barry, Mann, Mihov, and Rodriguez (2008) present evidence that firms issue more debt when interest rates are low relative to historical levels. Kaya (2012) shows that when the equity market is "hot", firms tend to choose equity financing over common forms of debt financing. However, Alti (2006) studies initial public offerings and finds that the effect of market timing on leverage levels vanishes after two years. DeAngelo, DeAngelo, and Stulz (2010) conclude that market-timing opportunities exert only an ancillary influence on seasoned equity offerings. Butler, Cornaggia, Grullon, and Weston (2011) present evidence that, inconsistent with the implication of the market timing theory, measures of managerial market timing are unrelated to future returns.

Within the real estate literature, several studies investigate the impact of current market conditions or historical performance on the choice of capital structure. Boudry, Kallberg, and Liu (2010) highlight that real estate is valued in the public and private markets. They propose that REITs issue public equity when the relative cost is low and the price-to-NAV ratio is high. Empirically, Feng, Ghosh, and Sirmans (2007) find little support for market timing in REIT leverage choices. However, Harrison, Panasian, and Seiler (2011), Ooi, Ong, and Li (2010) and Boudry, Kallberg, and Liu (2010) find evidence consistent with some broader implications of this theory. Their results suggest a significant influence of the relative cost of debt, market-wide default risk premia and firm-level default risk on REIT leverage levels. Mori, Ooi, and Wong (2013) also present evidence that REITs time their capital structure changes in response to conditions in the capital markets. Alcock, Baum, Colley, and Steiner (2013) investigate the effect of leverage on private equity fund performance. They study a global sample of direct real estate funds, using a mea-

sure of overall leverage, with the main focus being the effect on returns of changes in leverage incurred in anticipation of the future performance of the underlying real estate market. They find that leverage on average has a negative impact on excess return performance, and that private equity real estate fund managers are not successfully timing their leverage choices to match the future market environment.

The risk-shifting hypothesis is also well established in the literature. Allen and Gale (1999), Herring and Wachter (1999) and Pavlov and Wachter (2004, 2006, 2009, 2011) find significant evidence of risk-shifting in real estate markets and document the implication of this behaviour for the underlying markets. Furthermore, Chung, Na, and Smith (2013) document that firms appear to increase leverage when they face attractive growth opportunities or when poor operating performance undermines equity value.

This paper extends the above literature in a specific way. We conjecture that good REIT managers adjust their capital structure in anticipation of real estate market downturns because this minimises the negative effects of leverage. Such dynamic behaviour maximises the potential benefits of leverage and minimises its costs. It also reduces the risk-shifting problem, so it is likely beneficial to all parties involved - mangers, shareholders, and lenders. As discussed above, numerous works investigate the dynamic aspects of capital structure. However, we are not aware of any studies that investigate the simple and intuitive question of whether REIT mangers adjust ahead of anticipated market downturns, and whether shareholders reward this behaviour. Our findings also suggest that shareholders use capital structure adjustments ahead of a market downturn as a signal for managerial quality that has implications well outside the immediate consequences of the adjustments.

3 Data and method

3.1 Data set and descriptive statistics

We begin by considering all listed US and European equity REITs on *SNL Financial* as of the end of 2005. We analyse capital structure choices in the year leading up to the beginning of the recent financial crisis in 2007, i.e. capital structure choices over the year 2006. Individual firm data is obtained from *SNL Financial*. The firms in our sample cover the sectors Diversified, Health Care, Hotel, Office, Residential, Retail and Specialty.

Sun, Titman, and Twite (2014) document the impact of leverage, debt maturity (measured as the share of debt due in 2-3 years, corresponding to the share of debt due during the crisis) and, to some extent, variable-rate debt on REIT performance during the crisis period 2007 to 2009. We measure the variables in our analysis following Sun, Titman, and Twite (2014). Performance during the crisis is measured as the cumulative monthly rates of total return for the time period January 2007 to February 2009. The cumulative total return is winsorised at the 2nd and 98th percentiles to mitigate any undue influence of outliers.

We focus on the leverage and maturity components of capital structure as the evidence for the impact of variable-rate debt presented in Sun, Titman, and Twite (2014) is mixed. We measure the change in leverage over the year 2006 as the first difference of market leverage. The evolution of leverage may be driven by denominator effects through the market cycle. However, we assume that REIT managers are aware of this effect and factor it into their capital structure choices through time. Market leverage is defined as the ratio of total debt (book value of short-term and long-term interest bearing debt) to market value of invested capital. Market value of invested capital is defined as the sum of total debt, preferred stock and market capitalisation, calculated as the number of shares outstanding multiplied by the end-of-period share price. For US REITs, we measure the change in debt maturity as the first difference of the share of debt due in 2-3 years. For European REITs, we have to measure the change in debt maturity as the first difference of the share of debt due in 1-5 years, as European REITs do not report a year-by-year debt schedule.

The control variables considered in our study are the level of leverage and the share of debt due in 2-3 years, further the log of firm size (measured as market capitalisation), Tobin's Q (ratio of firm market value, i.e. market capitalisation plus total assets less book value of equity, to total assets), and the cash-to-assets ratio (cash and cash equivalents to total assets).

We obtain information on the firm's corporate governance provisions from SNL. The provisions covered by SNL are staggered board, poison pill, and supermajority requirements. The presence of these provisions restricts shareholder rights. We calculate a governance score by starting from zero and adding a point for the presence of each provision. A higher governance score thus indicates a more dictatorial firm with weaker shareholder rights. This variable allows us to assess the impact of corporate governance on capital structure choices in the run-up to the crisis.

The findings by Sun, Titman, and Twite (2014) show the differential impact of the crisis on firms with different capital structures. Therefore, we first employ an unconditional analysis to explore the question of what characterises REIT capital structure choice going into the crisis. Summary statistics as of the end of 2006 are presented in Table 1. On average, the firms in the US part of our sample have reduced leverage and short-term debt (due in 2-3 years) marginally over the year 2006. However, the variation around the mean is significant, with a standard deviation of 0.07 for leverage and 0.24 for debt maturity, suggesting that capital structure choices during 2006 varied substantially across firms. The European firms in our sample have on average reduced leverage over the year 2006 by the same amount as US firms, with the same standard deviation. It appears that the European firms have increased the share of debt due in the short-to-medium term. However, this measure is a noisy indicator of the debt due during the crisis, as reporting rules only require European firms to disclose the amount of debt due in 1 to 5 years, rather than on an annual basis.

The levels of leverage are similar across the US and European firms (0.39 versus 0.35), but the maturity measures are not comparable, due to reporting differences. The mean of the SNL governance score is lower in the US than in Europe (0.34 versus 0.59), suggesting strong shareholder rights in the US. European REITs are on average slightly smaller than their US counterparts (log of firm size of 13.98 to 14.20), have a lower Tobin's Q (1.15 versus 1.55), hold similar levels of cash-to-assets (0.03) and have experienced similar cumulative total returns over the period of the crisis 2007 to 2007 (-0.56 and -0.59).

[Insert Table 1 here.]

Furthermore, Table 2 below shows levels of correlation below 0.8 among the main predictors of interest, alleviating concerns about multicollinearity.

[Insert Table 2 here.]

3.2 Empirical method

Capital structure choices in 2006 and performance during the crisis

In order to tie our analysis in with the findings in Sun, Titman, and Twite (2014), we first examine the extent to which the capital structure adjustments that REIT managers made during 2006 are related to REIT performance in terms of cumulative

total returns during the subsequent crisis period 2007 to 2009. In order to explore the effect of leverage choices, we estimate the following cross-sectional regression for the US REITs in our sample using OLS:

$$CTR_i = \beta_0 + \beta_1 D.MLev_i + \beta_2 MLev_i + \beta_3 LNSize_i + \beta_4 Q_i + \beta_5 Cash_i + u_i \quad (1)$$

where β_0 is a constant, β_j is the regression coefficient corresponding to the explanatory variable j and u is the residual. Subscript i refers to firm i. CTR is the cumulative total return 2007-2009. $D.MLev$ is the change in leverage during 2006. $MLev$ is the level of leverage at the end of 2006, capturing the effect documented in Sun, Titman, and Twite (2014). $LNSize$ is the log of firm size, Q is Tobin's Q, and $Cash$ is the cash-to-assets ratio, all measured as of the end of 2006. We also include sector fixed-effects and report heteroskedasticity-robust standard errors.

In order to explore the effect of changes in maturity during 2006, we run regression (1) and replace the leverage-related variables with the change in the share of debt due in 2-3 years during 2006, $D.Mat23$.

$$CTR_i = \beta_0 + \beta_1 D.Mat23_i + \beta_2 LNSize_i + \beta_3 Q_i + \beta_4 Cash_i + u_i \quad (2)$$

Further, in order to explore the relationships between capital structure choices and performance during the crisis in the European firms in our sample, we run the regressions for these firms separately. In the maturity equation, we replace the variable measuring the change in debt due in 2-3 years during 2006 with the change in debt due in 1-5 years during 2006, $D.Mat15$.

$$CTR_i = \beta_0 + \beta_1 D.Mat15_i + \beta_2 LNSize_i + \beta_3 Q_i + \beta_4 Cash_i + u_i \quad (3)$$

Cross-sectional analysis

The analysis in Sun, Titman, and Twite (2014) provides empirical evidence that the firms that are most exposed to the adverse effects of a financial shock during the crisis are those with high leverage and short maturity. Therefore, we examine the question whether those firms that were most at risk were aware of their situation and were more likely to adjust their capital structure to a more robust position in the run-up to the crisis.

We estimate the following logit model for the US REITs in our sample:

$$Red_i = \beta_0 + \beta_1 L.MLev_i + \beta_2 L.LNSize_i + \beta_3 L.Q_i + \beta_4 L.Cash_i + u_i \qquad (4)$$

where β_0 is a constant, β_j is the regression coefficient corresponding to the explanatory variable j and u is the residual. Red is the likelihood that a firm reduced leverage by 0.05 or more in 2006. While the specific cut-off level of 5 percent is arbitrary, it does capture the notion that the leverage reduction needs to be substantial to be identified as a clear managerial choice. As we report below, the significance of β_1 is robust to a very wide range of cut-off levels for the leverage reduction variable, including including its mean and median. $L.MLev$ is the lag of leverage, measured at the end of 2005. $LNSize$ is the lagged log of firm size, Q is lagged Tobin's Q, and $Cash$ is the lagged cash-to-assets ratio, all measured as of the end of 2005. If the firms with higher leverage were aware of their situation and took precautionary measures to de-lever in the run-up to the crisis, then β_1 will be positive and significant. We also include sector fixed-effects. As before, we run the regressions for the US and European sample firms separately.

In order to explore the likelihood that a firm extends risky short maturity, we run regression (4) and replace the dependent variable with the likelihood that a firm extends debt maturity through reducing the share of debt due in 2-3 years by 5 percent or more in 2006. Similarly to the reduction in leverage, the choice of 5 percent is very specific. As we note in the results section, the significance of β_1 is again robust for a wide range of cut-off values, including the mean and the median of the independent variable. The dependent variable is then labelled $Ext23$. The main variable of interest is the lagged share of debt due in 2-3 years, $L.Mat23$. If firms with short maturities were aware of their refinancing risk and adjusted capital structure accordingly, then the coefficient on the variable $L.Mat23$ will be positive and significant. As before, we include sector fixed-effects.

$$Ext23_i = \beta_0 + \beta_1 L.Mat23_i + \beta_2 L.LNSize_i + \beta_3 L.Q_i + \beta_4 L.Cash_i + u_i \qquad (5)$$

Further, in order to explore the precautions in the run-up to the crisis in the European firms in our sample, we run the regressions for these firms separately. In the maturity equation, we replace the $Ext23$ variable with the likelihood that a firm extended debt maturity through reducing the share of debt due in 1-5 years by 5 percent or more in 2006, $Ext15$, with the main dependent variable of interest be-

ing the share of debt due in 1-5 years in 2005, $L.Mat15$. If the European REITs with short maturities were aware of their refinancing risk and adjusted capital structure accordingly, then the coefficient on the variable $L.Mat15$ will be positive and significant. As before, we include sector fixed-effects.

$$Ext15_i = \beta_0 + \beta_1 L.Mat15_i + \beta_2 L.LNSize_i + \beta_3 L.Q_i + \beta_4 L.Cash_i + u_i \quad (6)$$

Finally, we explore the role of corporate governance on the extent to which REITs with risky capital structures took precautionary measures to create more robust capital structures in the run-up to the crisis. In this analysis, we create interaction terms with the capital structure variables that put firms at risk from a financial shock as suggested in Sun, Titman, and Twite (2014). For the US part of the sample, we create a dummy/interaction term for those firms that had above-median leverage or above-median shares of debt due in 2-3 years at the end of 2005. We estimate the following logit model for the sample of US REITs:

$$\begin{aligned} Red_i = \beta_0 + \beta_1 HighLev_i * StrongGov_i + \beta_2 L.MLev_i + \beta_3 L.SNLGov_i \quad (7) \\ + \beta_4 L.LNSize_i + \beta_5 L.Q_i + \beta_6 L.Cash_i + u_i \end{aligned}$$

where $L.SNLGov$ is the lag of the SNL governance score calculated as of the end of 2005, and the other coefficients and variables are defined as in (4). If stronger shareholder rights had an effect in reining in the refinancing risk of excessively leveraged firms, then we will observe a positive and significant coefficient on the interaction variable with a dummy based on below-average values of $L.SNLGov$, where a higher governance score indicates weaker shareholder rights. Similarly to (7), we estimate this regression for the likelihood to extend maturity for the sample of US REITs:

$$\begin{aligned} Ext23_i = \beta_0 + \beta_1 ShortMat23_i * StrongGov_i + \beta_2 L.Mat23 + \beta_3 L.SNLGov_i \quad (8) \\ + \beta_4 L.LNSize_i + \beta_5 L.Q_i + \beta_6 L.Cash_i + u_i \end{aligned}$$

where coefficients and variables are defined as in (7). As before, we include sector fixed effects in all of these regressions.

For the European firms in the sample, replicate this analysis as follows:

$$RedEur_i = \beta_0 + \beta_1 HighLev_i * StrongGov_i + \beta_2 L.MLev_i + \beta_3 L.SNLGov_i \quad (9)$$
$$+ \beta_4 L.LNSize_i + \beta_5 L.Q_i + \beta_6 L.Cash_i + u_i$$
$$Ext15_i = \beta_0 + \beta_1 ShortMat15_i * StrongGov_i + \beta_2 L.Mat15 \quad (10)$$
$$+ \beta_3 L.SNLGov_i + \beta_4 L.LNSize_i + \beta_5 L.Q_i + \beta_6 L.Cash_i + u_i$$

4 Results

The main result of our analysis is that reducing leverage before the crisis (over 2006) helped US REITs during the crisis (2007-2009). This result holds even when we control for leverage just before the crisis (end of 2006). The first column of Table 3 reports the regression estimates behind this result. As discussed above, change in leverage is the change in market leverage from end of 2005 to end of 2006. This coefficient is negative and significant at the 5 percent level. A negative coefficient implies that a reduction in leverage was associated with higher cumulative returns during the crisis. This is robust to including market leverage at the end of 2006 and typical control variables. It is also robust to including 2005 market leverage (not reported in the table).

The impact of a change in leverage before the crisis on cumulative returns during the crisis is not only statistically significant and robust, but also of substantial economic magnitude. The estimated coefficient of -.783 implies that a one percentage point reduction in leverage before the crisis generated 78 basis points higher return during the crisis. Reducing leverage by one standard deviation (seven percentage points) increases cumulative returns during the crisis by 5.5 percent. Given the size of the REIT industry, this change alone translates into well over ten billion dollars of additional market value at the end of the crisis. Of course we realise that if all REITs reduced leverage more than they did before the crisis, the market response on average would have likely been more muted. Even with this caveat, the impact of leverage reduction is economically meaningful and substantial.

Column 3 of Table 3 reproduces this basic result for European REITs. As discussed in the introduction, one would not expect a decrease in leverage to benefit European REITs at all. In fact, we find that leverage reduction before the crisis hurt European firms. Given the small number of observations for this regression, we do not have very

high confidence in the positive coefficient. However, it appears that this coefficient is almost certainly not negative, which is consistent with our expectation.

Our next result, reported in Column 2 of Table 3, shows that a decrease in debt due in 2 or 3 years (over 2006) benefitted US REITs during the crisis. Once again, this suggests that preparation for the crisis helped during the crisis. Again, this result is not present in the European sample, consistent with our overall hypothesis. We do note that this particular result is not robust to including the level of debt due in 2 or 3 years at the start of the crisis. If both the change and the level are included in the regression, neither is significant. This may be due to the significant negative correlation between the change in debt due in 2 or 3 years and its level at the start of the crisis. While this particular result in itself is inconclusive, its combination with the market leverage result discussed above supports our main hypothesis that preparation for the crisis helped during the crisis.

Next, we investigate which firms were more likely to prepare for the crisis. This is interesting in itself, but more importantly it has the potential to further shed light on our main hypothesis. If firms prepare at random, then our conjecture that preparation matters becomes less significant as it lacks any prescriptive implications. However, as reported in Table 4, firms that were most exposed prior to the crisis were the ones most likely to prepare. Column 1 reports that firms with high leverage were more likely to reduce leverage prior to the crisis. Column 2 presents the result that firms with the highest proportion of debt due in years 2 and 3 were most likely to reduce this exposure. Both coefficients are significant at the 1 percent level, and robust to the inclusion of standard controls. While this specific result is based on the 5 percent cut-off used to identify firms that reduced leverage or reduced debt maturing in years 2 or 3, the significance of the market leverage and debt maturing in years 2 and 3 variables is robust to a very wide range of cut-off values for the dependent variable, including its mean and median. Furthermore, consistent with our main hypothesis, neither result holds for our European sample.

We further investigate whether firms with better governance were more likely to prepare for the crisis. While appealing and precisely measured, the SNL governance score is likely an imperfect measure of management quality. Therefore, we proceed very cautiously with this step. Even with this caveat, we find that highly levered firms that had better governance were most likely to reduce leverage. Column 1 of Table 5 reports that an interaction variable that takes the value of 1 if market leverage

and governance are above average and 0 otherwise is significant at the 10 percent level. This result holds even when market leverage and the raw governance score are included in the estimation. Therefore, the effect of good governance is above and beyond the market leverage effect reported in Table 4 and discussed above. Again, as expected, this result is not present in the European sample.

To summarise our findings, US REITs that prepared for the crisis did better during the crisis. Furthermore, REITs that were most exposed, particularly if they had strong governance, were most likely to prepare. None of these results are present in the European sample. Taken together, these results suggest that preparation for the crisis was expected and rewarded for US REITs, especially the ones that really needed it.

While the results reported here paint a consistent and intuitive picture, we acknowledge some limitations in our methodology. First and foremost, our samples are small. The US sample consists of 126 firms (as low as 81 in some regressions). The European sample is even smaller, with 40-50 observations in the various setups. Furthermore, while our results are robust to modifications in the exact regression equations or to changes in the cut-off levels used to define some of the variables, we likely face higher than typical model specification error. The relationships we try to investigate are complex and subject to numerous interactions that we are unable to consider due to the limited sample. Moreover, we inevitably rely on accounting measures, which are prone to measurement error and often do not fully reflect the variable of interest. We also use the SNL governance score, which is widely accepted in industry but an imperfect measure of management quality. Finally, our models may omit important variables. In the conclusion we propose several avenues to addressing some of these shortcomings.

5 Conclusion

Our main conclusion is that US REITs that adjusted their capital structure ahead of the 2007-2009 financial crisis outperformed their peers during the crisis. This result holds even when controlling for the capital structure characteristics at the start of the crisis. In other words, it was not purely the state of a firm's capital structure at the start of the crisis that mattered, but also, and perhaps more importantly, how the firm reached that state. This result highlights the importance of REIT management. Our findings are consistent with the view that not only can REIT

managers add value through property selection and management, but they can also add substantial value to their shareholders by dynamically adjusting the capital structure of their firms. For instance, our results suggest that one standard deviation reduction in leverage resulted in five percent higher cumulative return during the crisis. This interpretation highlights the importance of understanding and managing capital structure choices, through academic research and implementation in industry practice.

Specifically, Sun, Titman, and Twite (2014) find that risky capital structure characteristics, such as high leverage, high share of debt due in the near future and high share of variable-rate debt, significantly reduce the cumulative total returns of US REITs over the 2007-2009 financial crisis. Our work extends this finding by documenting that preparing ahead of the crisis also significantly influenced the cumulative return over the crisis period. We document that REITs which reduced leverage and increased maturity prior to the crisis fared better during the crisis. We further find that US REITs with the highest capital structure risk (high leverage and short maturities) were more likely to take precautions by reducing leverage and extending maturity. This effect is especially strong for REITs with strong governance. We also document that none of our findings hold for European REITs. This suggests that since European firms did not experience the levels of market excess observed in the US before the crisis, whether they took precautions or not had no impact on their returns during the crisis.

We focus on capital structure because this is one avenue through which REIT managers can mitigate the downside exposure of their firm without giving up upside potential. Alternatively, managers are able to sell properties, but this choice is costly. As the timing and magnitude of the crisis was likely unknown even to the most informed industry insiders, capital structure adjustments were the preferred and less costly preparation method.

While our empirical conclusions paint a consistent and intuitive picture of REIT managerial behaviour and investor expectations, our analysis does suffer from several potential shortfalls and should be taken with caution. First and foremost, our sample sizes are small. Second, our analysis potentially suffers from omitted variable bias and from errors in variables. Future research may address many of these concerns by investigating the REIT industry actions using property-level data. For instance, one might investigate if REITs that experienced the largest underlying property

price declines adjusted their capital structure ahead of the crisis the most. Or, one might study the capital structure adjustment while considering the property price declines. At the very least, this amounts to controlling for property price evolution for each REIT in the regression models we estimate. But it can go further - one might investigate whether the financing arrangements for particular properties were altered ahead of the crisis. These extensions would certainly solve the sample size issue as well as eliminate some of the omitted variables. In short, our work at the very least brings up the possibility that preparation for the crisis matters and makes the additional effort and expense associated with collecting property-level data of interest.

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6 Figures and Tables

Descriptive statistics for listed equity REITs, 2006

US								
Variable	N	Mean	SD	P5	P25	Median	P75	P95
Change in leverage	126	-0.02	0.07	-0.11	-0.06	-0.03	0.00	0.08
Change debt due in 2-3 years	99	-0.02	0.24	-0.41	-0.12	-0.02	0.11	0.30
Market leverage	130	0.39	0.16	0.05	0.31	0.39	0.49	0.63
Share of debt due in 2-3 years	104	0.20	0.17	0.00	0.07	0.16	0.30	0.56
SNL governance score	136	0.34	0.53	0.00	0.00	0.00	1.00	1.00
Log of firm size	132	14.20	1.54	10.90	13.65	14.39	15.15	16.40
Tobin's Q	130	1.55	0.46	1.11	1.24	1.48	1.66	2.32
Cash to assets	132	0.03	0.05	0.00	0.00	0.01	0.03	0.12
Cumulative return 2007-2009	113	-0.59	0.26	-0.93	-0.80	-0.62	-0.43	-0.12

Europe								
Variable	N	Mean	SD	P5	P25	Median	P75	P95
Change in leverage	52	-0.02	0.07	-0.11	-0.07	-0.03	0.00	0.15
Change in debt due in 1-5 years	43	0.04	0.16	-0.18	-0.07	0.02	0.16	0.34
Market leverage	59	0.35	0.19	0.00	0.26	0.33	0.44	0.78
Share of debt due in 1-5 years	49	0.42	0.31	0.00	0.22	0.37	0.61	1.00
SNL governance score	68	0.59	0.50	0.00	0.00	1.00	1.00	1.00
Log of firm size	60	13.98	1.37	12.03	13.10	13.92	14.89	16.23
Tobin's Q	59	1.15	0.30	0.75	1.03	1.12	1.20	1.68
Cash to assets	59	0.03	0.04	0.00	0.01	0.02	0.04	0.15
Cumulative return 2007-2009	63	-0.56	0.23	-0.88	-0.72	-0.58	-0.37	-0.19

Table 1
The table shows the summary statistics for the sample firms, all US and European listed equity REITs on SNL, at the end of 2006. Variables are defined as outlined below. We measure the change in leverage over the year 2006 as the first difference of market leverage. Market leverage is defined as the ratio of total debt (book value of short-term and long-term interest bearing debt) to market value of invested capital. Market value of invested capital is defined as the sum of total debt, preferred stock and market capitalisation, calculated as number of shares outstanding multiplied by the end-of-period share price. For US REITs, we measure the change in debt maturity as the first difference of the share of debt due in 2-3 years. For European REITs, we have to measure the change in debt maturity as the first difference of the share of debt due in 1-5 years, as European REITs do not report a year-by-year debt schedule. The control variables considered in our study are the level of leverage and the share of debt due in 2-3 years, further the log of firm size (measured as market capitalisation), Tobin's Q (ratio of firm market value, i.e. market capitalisation plus total assets less book value of equity, to total assets), and the cash-to-assets ratio (cash and cash equivalents to total assets). We obtain information on the firm's corporate governance provisions from SNL. The provisions covered by SNL are staggered board, poison pill, and supermajority requirements. The presence of these provisions restricts shareholder rights. We calculate a governance score by starting from zero and adding a point for the presence of each provision.

Correlation table for main variables, 2006

	US	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Cumulative return 2007-2009	1.0000									
(2) Change in leverage	-0.1046	1.0000								
(3) Change in debt due in 2-3 years	-0.2753*	0.0800	1.0000							
(4) Market leverage	-0.3162*	0.1699	0.0701	1.0000						
(5) Share of debt due in 2-3 years	-0.2493*	0.0704	0.6466*	-0.0248	1.0000					
(6) SNL governance score	0.1382	-0.0673	0.0061	-0.2204*	-0.0211	1.0000				
(7) Log of firm size	-0.2932*	-0.1573	0.1425	0.1318	0.1275	-0.2720*	1.0000			
(8) Tobin's Q	0.1699	-0.2017*	-0.1165	-0.6663*	0.0411	0.1458	-0.1245	1.0000		
(9) Cash to assets	0.0421	-0.1410	-0.0947	-0.1658	-0.2069*	0.1845*	-0.1762*	0.2251*	1.0000	
	Europe	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Cumulative return 2007-2009	1.0000									
(2) Change in leverage	0.2721	1.0000								
(3) Change in debt due in 1-5 years	0.0590	0.2105	1.0000							
(4) Market leverage	-0.1569	0.0756	0.3073*	1.0000						
(5) Share of debt due in 1-5 years	-0.0235	-0.0289	0.4626*	-0.0151	1.0000					
(6) SNL governance score	0.2866*	0.3055*	0.1520	-0.0731	-0.0537	1.0000				
(7) Log of firm size	-0.1486	-0.6040*	-0.1336	0.1556	-0.1751	-0.0474	1.0000			
(8) Tobin's Q	0.1501	-0.2858*	-0.3864*	-0.4090*	-0.0088	0.1199	0.2475	1.0000		
(9) Cash to assets	0.0599	0.2221	0.2311	-0.1221	0.1551	-0.0019	-0.3513*	0.0819	1.0000	

Table 2: The table shows the Pearson pairwise correlation coefficients between the variables included in our analysis. Variables are defined as outlined below. We measure the change in leverage over the year 2006 as the first difference of market leverage. Market leverage is defined as the ratio of total debt (book value of short-term and long-term interest bearing debt) to market value of invested capital. Market value of invested capital is defined as the sum of total debt, preferred stock and market capitalisation, calculated as number of shares outstanding multiplied by the end-of-period share price. For US REITs, we measure the change in debt maturity as the first difference of the share of debt due in 2-3 years. For European REITs, we have to measure the change in debt maturity as the first difference of the share of debt due in 1-5 years, as European REITs do not report a year-by-year debt schedule. The control variables considered in our study are the level of leverage and the share of debt due in 2-3 years, further the log of firm size (measured as market capitalisation), Tobin's Q (ratio of firm market value, i.e. market capitalisation plus total assets less book value of equity, to total assets), and the cash-to-assets ratio (cash and cash equivalents to total assets). We obtain information on the firm's corporate governance provisions from SNL. The provisions covered by SNL are staggered board, poison pill, and supermajority requirements. The presence of these provisions restricts shareholder rights. We calculate a governance score by starting from zero and adding a point for the presence of each provision. Significance is indicated as follows: * $p<0.05$.

Regression results for cumulative total return, 2007-2009

Dependent variable: Cumulative total return 2007-2009	(1)	(2)	(3)	(4)
VARIABLES	US	US	Europe	Europe
Change in leverage	-0.783**		1.296**	
	(-2.06)		(2.11)	
Change in share of debt due in 2-3 years		-0.333***		
		(-2.90)		
Change in debt due in 1-5 years				0.347
				(1.39)
Market leverage	-0.455**		-0.194	
	(-2.31)		(-0.89)	
Log of firm size	-0.055***	-0.056**	0.006	-0.048*
	(-2.95)	(-2.06)	(0.16)	(-1.95)
Tobin's Q	-0.062	0.125**	0.153	0.261***
	(-0.99)	(2.29)	(1.58)	(2.81)
Cash to assets	-0.206	0.141	-0.461	-0.912
	(-0.58)	(0.57)	(-0.61)	(-1.01)
Constant	0.686**	0.337	-0.892*	-0.372
	(2.44)	(0.91)	(-1.96)	(-1.13)
Observations	106	81	47	40
R-squared	0.367	0.431	0.209	0.194
Sector effects	Yes	Yes	Yes	Yes

Table 3
The table shows the results of the OLS model estimated for the sample firms, the listed equity REITs on SNL in the US and in Europe. The dependent variable is the cumulative total return over the period 2007/2009. All independent variables are measured at the end of 2006, with the exception of the variables measuring the changes in capital structure, which are measured during the year 2006. Variables are defined as follows. We measure the change in leverage over the year 2006 as the first difference of market leverage. Market leverage is defined as the ratio of total debt (book value of short-term and long-term interest bearing debt) to market value of invested capital. Market value of invested capital is defined as the sum of total debt, preferred stock and market capitalisation, calculated as number of shares outstanding multiplied by the end-of-period share price. For US REITs, we measure the change in debt maturity as the first difference of the share of debt due in 2-3 years. For European REITs, we have to measure the change in debt maturity as the first difference of the share of debt due in 1-5 years, as European REITs do not report a year-by-year debt schedule. The control variables considered in our study are the level of leverage and the share of debt due in 2-3 years, further the log of firm size (measured as market capitalisation), Tobin's Q (ratio of firm market value, i.e. market capitalisation plus total assets less book value of equity, to total assets), and the cash-to-assets ratio (cash and cash equivalents to total assets). We account for property sector effects using dummy variables. The t-statistics, calculated using heteroskedasticity-robust standard errors, are shown in parentheses. Significance is indicated as follows: *** p<0.01, ** p<0.05, * p<0.10.

Regression results for likelihood to reduce leverage or extend maturity, 2006

REGION	US		Europe	
	(1)	(2)	(3)	(4)
VARIABLES	Leverage	Maturity	Leverage	Maturity
Market leverage	6.230***		4.216	
	(2.82)		(1.51)	
Share of debt due in 2nd & 3rd year		10.022***		
		(3.85)		
Share of debt due in 1-5 years				1.662
				(1.10)
Log of firm size	0.225	-0.415*	0.867**	-0.293
	(1.37)	(-1.81)	(2.46)	(-0.86)
Tobin's Q	1.491	0.101	2.59	3.195
	(1.33)	(0.09)	(0.99)	(1.61)
Cash to assets	5.654	-0.649	5.052	-8.08
	(1.12)	(-0.11)	(0.77)	(-0.84)
Constant	-9.941***	4.126	-17.390***	-1.019
	(-3.07)	(1.41)	(-2.72)	(-0.22)
Observations	126	90	48	41
Sector effects	Yes	Yes	Yes	Yes
Pseudo-R squared	0.127	0.26	0.278	0.162

Table 4
The table shows the results of the logit model estimated for the sample firms, the listed equity REITs on *SNL* in the US (columns (1) and (2)) and in Europe (columns (3) and (4)). The dependent variable is the likelihood to reduce leverage (columns (1) and (3)) or extend maturity (columns (2) and (4)) by 0.05 or more during 2006. Independent variables are lagged by one year, i.e. they are measured at the end of 2005. Variables are defined as follows. Market leverage is defined as the ratio of total debt (book value of short-term and long-term interest bearing debt) to market value of invested capital. Market value of invested capital is defined as the sum of total debt, preferred stock and market capitalisation, calculated as number of shares outstanding multiplied by the end-of-period share price. For US REITs, we measure debt maturity as the share of debt due in 2-3 years. For European REITs, we have to measure debt maturity as the share of debt due in 1-5 years, as European REITs do not report a year-by-year debt schedule. The control variables considered in our study are the level of leverage and the share of debt due in 2-3 years, further the log of firm size (measured as market capitalisation), Tobin's Q (ratio of firm market value, i.e. market capitalisation plus total assets less book value of equity, to total assets), and the cash-to-assets ratio (cash and cash equivalents to total assets). We account for property sector effects using dummy variables. The z-statistics are shown in parentheses. Significance is indicated as follows: *** p<0.01, ** p<0.05, * p<0.10.

Regression results for likelihood to reduce leverage or extend maturity as a function of corporate governance, 2006

REGION	US		Europe	
	(1)	(2)	(3)	(4)
VARIABLES	Leverage	Maturity	Leverage	Maturity
High leverage * Strong governance	1.217*		-0.155	
	(1.88)		(-0.10)	
Short maturity * Strong governance		0.46		29.597
		(0.52)		(0.01)
Market leverage	4.510*		4.18	
	(1.92)		(1.18)	
Share of debt due in 2nd & 3rd year		9.262***		
		(3.17)		
Share of debt due in 1-5 years				0.837
				(0.48)
SNL governance score	0.291	0.403	-1.216	29.602
	(0.51)	(0.50)	(-1.06)	(0.01)
Log of firm size	0.185	-0.406*	0.919**	-0.287
	(1.11)	(-1.77)	(2.49)	(-0.83)
Tobin's Q	1.87	-0.065	3.492	2.704
	(1.63)	(-0.06)	(1.15)	(1.38)
Cash to assets	5.87	-0.791	6.739	-8.473
	(1.18)	(-0.14)	(0.97)	(-0.90)
Constant	-9.799***	4.095	-18.380***	-29.726
	(-2.93)	(1.39)	(-2.60)	(-0.01)
Observations	126	96	48	41
Sector effects	Yes	Yes	Yes	Yes
Pseudo-R squared	0.153	0.298	0.308	0.202

Table 5
The table shows the results of the logit model estimated for the sample firms, the listed equity REITs on *SNL* in the US (columns (1) and (2)) and in Europe (columns (3) and (4)). In the US sample, we focus on the interaction between high (above-median) leverage (column (1)) or below-median shares of debt maturing in 2-3 years (column (2)). The dependent variable is the likelihood to reduce leverage (columns (1) and (3)) or extend maturity (columns (2) and (4)) by 0.05 or more in 2006. Independent variables are lagged by one year, i.e. they are measured at the end of 2005. For Europe, the analysis is analogous to the US, only we replace the maturity variable with the above-median share of debt maturing in 1-5 years. Variables are defined as follows. We obtain information on the firm's corporate governance provisions from *SNL*. The provisions covered by *SNL* are staggered board, poison pill, and supermajority requirements. The presence of these provisions restricts shareholder rights. We calculate a governance score by starting from zero and adding a point for the presence of each provision. Market leverage is defined as the ratio of total debt (book value of short-term and long-term interest bearing debt) to market value of invested capital. Market value of invested capital is defined as the sum of total debt, preferred stock and market capitalisation, calculated as number of shares outstanding multiplied by the end-of-period share price. For US REITs, we measure debt maturity as the share of debt due in 2-3 years. For European REITs, we have to measure debt maturity as the share of debt due in 1-5 years, as European REITs do not report a year-by-year debt schedule. The control variables considered in our study are the level of leverage and the share of debt due in 2-3 years, further the log of firm size (measured as market capitalisation), Tobin's Q (ratio of firm market value, i.e. market capitalisation plus total assets less book value of equity, to total assets), and the cash-to-assets ratio (cash and cash equivalents to total assets). We account for property sector effects using dummy variables. The z-statistics are shown in parentheses. Significance is indicated as follows: *** p<0.01, ** p<0.05, * p<0.10.