

Do REITs Have an Advantage When Credit is Tight?

Executive Summary. *Real estate investment trusts (REITs) have access to capital sources that other real estate investors do not: public markets for equity and debt. Access to capital may give REITs an advantage over other commercial real estate investors when credit is tight. This paper examines whether markets perceive this to be true and show that REITs' premia to net asset value (NAV) increase when credit is tight. Thus, it appears that the markets do see REITs as having an advantage when credit is tight, although there is a lag between credit tightening and markets reacting. In Japan, where J-REITs are far more passive than in the United States, the relationship between credit conditions and REIT premia to NAV is exactly the opposite.*

by Greg MacKinnon*

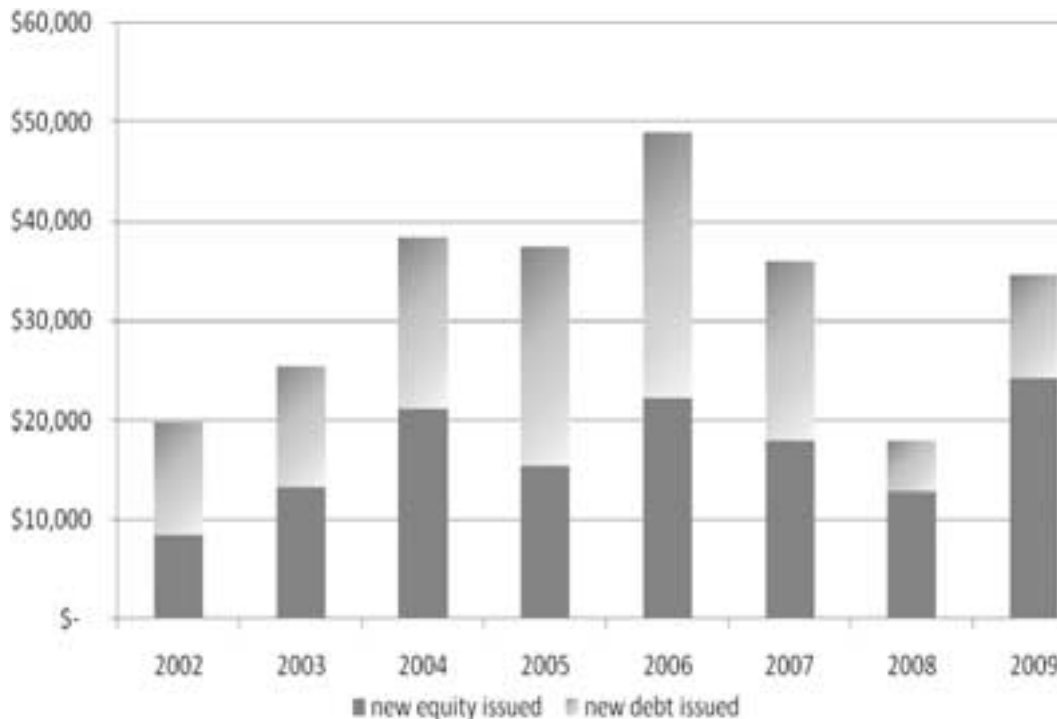
In early 2010 the credit crunch continued to hold sway in the commercial real estate market. Banks remained reluctant to lend as they rebuilt their balance sheets, and the new issue commercial mortgage-backed securities (CMBS) market was almost non-existent. Estimates of the amount of commercial mortgage debt scheduled to mature over the next five years stood around \$2.1 trillion (Lee, 2009). Given lower property values and lower loan-to-value ratios (LTVs), a significant funding gap existed; a report by Prudential Real Estate Investors put the gap in the \$300–\$320 billion range even when excluding construction loans and taking into account losses by debt holders.¹ Overall, the scarcity of capital was the major driving factor in the property markets.

Might an investor with access to capital have an advantage in such conditions? A lack of capital means reduced competition in the bidding for available properties, including distressed properties coming to market. Investors having access to capital when others do not could be positioned to take advantage such market conditions, potentially creating value. This paper considers one group of investors that may fall into this category, namely real estate investment trusts (REITs).

With access to the public markets, REITs have a built-in advantage in times of constrained credit through the ability to raise capital via seasoned equity or unsecured bond issues. A seasoned equity offering can be arranged and capital raised in very little time to take advantage of market conditions [see Gao and Ritter (2010) for a discussion of timing of seasoned equity offerings]. While this in no

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Exhibit 1
REIT Capital Raising Activity (millions)



Source: NAREIT.

way means that REITs can always create value by issuing equity given possible dilutive effects, it does mean that REITs may be able to side-step certain effects of a credit crunch that others cannot. Exhibit 1 shows capital raising activity, both debt and equity, for REITs from 2002 to 2009. While total capital raised did dip somewhat during the depths of the credit crisis in 2008 (although the capital environment even then was relatively good for REITs as compared to the near total collapse in financing activity for commercial real estate in general), REIT capital raising activity bounced back quickly in 2009 and, in fact, REITs raised more equity capital during 2009 than in any other year since 2002. The first quarter of 2010 saw over \$10 billion of fresh capital (debt plus equity) raised by REITs.

Given REITs ability to access capital during times when other investors face more severe credit constraints, the question of interest is whether the capital markets perceive REITs to have an advantage when credit is tight. If markets believe such

an advantage to exist, this should be reflected in REITs' premia to net asset value (NAV)—the gap between public and private market pricing of REIT assets.

Using data on REIT returns, real estate returns, and REIT leverage, this study estimates the percentage change in premium to NAV for the REIT market as a whole. Using survey results from the Fed as a measure of credit conditions, this paper examines whether premiums vary systematically depending on credit availability. The results are consistent with markets perceiving REITs to have an advantage in times of tight credit; returns to NAV premiums are significantly larger when credit is tighter. However, the effect exhibits a lag; REIT prices are most affected by credit conditions three quarters in the past. This is consistent with there being some level of inefficiency in the REIT market as investors' reaction to tighter credit is delayed. Perhaps markets only react once evidence of a REIT advantage begins to be seen in the underlying property markets and in actual deals.

In order to more fully explore whether the results are truly due to a market perception that REITs have an advantage in tight credit conditions, the tests are replicated in a market where that is unlikely to hold, namely Japan. Japanese REITs (J-REITs) trade in much the same way as do U.S. REITs, however, institutional issues in the Japanese market limit J-REITs' ability to issue equity to take advantage of market conditions. Hence, while J-REIT prices would be influenced by many of the same factors related to trading on equity markets as U.S. REITs, it is unlikely that investors would perceive J-REITs as having any advantage in dealing under conditions of scarcer credit. The results show that J-REIT NAV premia are negatively affected by tighter credit conditions, exactly the opposite relationship as observed in the U.S.

The remainder of the paper is set up as follows: the next section details the data and methodology employed. Results for the U.S. REIT market are then presented, followed by results for the JREITs. The paper closes with concluding remarks.

Data and Methodology

REITs' prices do not equal their NAVs as public markets incorporate information much more efficiently into pricing than the real estate market. REIT premia or discounts to NAV can arise based on the market's perception of the direction of the underlying commercial real estate (CRE) market—the reason that the REIT market tends to lead changes in the private CRE market [see Geltner and Rodriguez (1997) for early evidence of this]. Of course, the frequent trading that allows REIT prices to more quickly reflect market conditions is a double-edged sword; it can also lead to excess volatility where REIT prices get pushed around by general volatility in the stock market rather than information related to the underlying assets. But beyond how the public and private markets react differentially to information, there are fundamental reasons that one should expect REITs to trade at a value different from the underlying real estate, including a premium to reflect the liquidity of the REIT shares and the skills of REIT management. Further, if public equity markets perceive an advantage in REITs due to their ability to access

public capital when other property investors cannot, then this should also be reflected in REIT pricing through changes in the premium to NAV. One would expect this effect to vary depending on how scarce capital is for other investors.

Having access to capital via public equity and unsecured debt markets can create value for REITs because it can allow them to bid on properties at a time when other potential bidders may be unable to do so because of capital constraints. Hence, the advantage depends on the capital markets, at least for other parties who are more capital constrained than REITs, being imperfect. Given the recent financial crisis during which large parts of the economy were left, or were close to being left, without access to credit, this does not seem an unreasonable assumption. If REITs are able to bid on properties at a time of decreased competition, and at a time when owners of property may be forced into distressed sales because of their own capital constraints, then REITs may obtain properties at advantageous prices and thereby create value for shareholders. This study does not test whether REITs do, in fact, possess such an advantage or act upon it; rather it examines whether the market perceives REITs to have such an advantage.

If markets perceive REITs to have an advantage when credit conditions are tight, then this should be reflected in the premium of REIT stock prices over NAV. Even if REIT purchases of property were to eventually affect values in the underlying real estate market and therefore be reflected in NAV, due to the greater informational efficiency of the REIT market the initial reaction would be in REIT prices, resulting in a rise in NAV premium. Also note that the effect being examined is a relative one. Due to minimum dividend payouts, REITs are often seen as lacking significant free cash flow with which to invest. However, this constraint holds throughout the cycle and is independent of credit conditions. If REITs are judged by the markets to be in a relatively better position than usual during credit constrained periods, then the NAV premium effect should be observed.

The study examines how a proxy for the premium to NAV varies across different credit market conditions to test whether the market perceives REITs

to have an advantage when credit conditions are tight. If capital markets do perceive REITs to have an advantage, then one would expect premia to be larger when credit is tight. Of course, REIT pricing (and therefore the premium or discount to NAV) is driven by changes in the broader capital markets, as well as the underlying property markets (Clayton and MacKinnon, 2003). The tests therefore control for equity market conditions as REIT prices can be directly affected by the market in which they trade, as well as controlling for bond market conditions. It is important to control for changes in the bond markets as not only is it known that REIT returns are related to bond returns, but also the variable of interest, credit market conditions, has an obvious effect on debt markets; therefore, confounding influences need to be addressed.

A REIT's share price is made up of two components: the NAV and the percentage premium (or discount) added by the market. The approach of Chiang (2009) is followed to define the "premium return." A REIT's share price can be represented simply as:

$$\text{REIT Price} = \text{NAV} \times \text{Premium.}$$

There are therefore two factors that drive REIT returns: changes in the underlying NAV and changes in the premium.² Based on the above:

$$\begin{aligned} (1 + \text{REIT Return}) \\ = (1 + \text{NAV Return})(1 + \text{Premium Return}), \end{aligned}$$

where NAV Return and Premium Return are simply the percentage changes in the NAV and premium, respectively. This relationship simply says that returns to a REIT investor are created by changes in the underlying assets of the REIT (NAV Return) and changes in how the public markets value those underlying assets (Premium Return); the two effects are compounded together to get the overall return to the REIT shares.

The premium return can be isolated by rearranging the relationship:

$$\text{Premium Return} = \frac{1 + \text{REIT Return}}{1 + \text{NAV Return}} - 1.$$

Returns to REIT shares (REIT Return) are easily measured. This approach shows that if the returns on the REITs' underlying real estate assets (NAV return) can be estimated, then the percentage change in the premium (NAV Return) can easily be estimated.

To operationalize this for the U.S. REIT market, REIT Return is defined as the quarterly return to the FTSE/NAREIT Equity REIT index. The quarterly return to the TBI index produced by the MIT Center for Real Estate is used as a proxy for NAV returns. As an index based on property transaction prices, the TBI is better suited for comparison to public market REIT prices than the more common appraisal-based real estate indices. While this index does not represent the actual properties owned by REITs, since the concern is with percentage changes as long as returns to the properties represented by the TBI are similar to returns to REIT-owned properties, then it should serve as a reasonable proxy.

As the TBI represents unlevered returns and the above formulation is based on NAVs, a levered version of the TBI is estimated, adjusting each quarter's TBI return to approximate the effect of the average REIT debt levels using the formula:

$$R_{\text{TBI levered}} = \frac{R_{\text{TBI}} - R_{\text{debt}} \text{LTV}}{1 - \text{LTV}},$$

where R_{debt} is approximated each quarter by the yield on the B of A Merrill Lynch BBB Corporate Bond Index (Source: Datastream), and LTV is the average debt-to-total market cap ratio of equity REITs in the FTSE/NAREIT index that quarter (Source: NAREIT).

Equity REIT returns and the levered version of the TBI are used to calculate premium returns for each quarter from Q4:1999 to Q2:2009. The start date of the period examined is constrained by the availability of the REIT capital structure data. In the results, total returns (including income as well as price change) are used for all asset classes. As the NAV premium relationship is based on the relationship between price and NAV, the tests were

Exhibit 2
REIT Premia Returns and the Level of Credit Conditions

Variable	Level of Credit Conditions				
Constant	-0.0866** (-2.14)	-0.0876** (-2.11)	-0.0902** (-2.33)	-0.0907** (-2.29)	-0.0762* (-2.00)
S&P 500 total return	0.6744* (2.01)	0.8177** (2.23)	0.8690** (2.46)	0.9179** (2.34)	0.7569** (2.22)
BBB Corp. total return	4.0955** (2.04)	3.8263** (2.13)	3.6023** (2.24)	3.3614** (2.28)	3.4768** (2.13)
Fed Survey	0.0020* (1.76)				
Fed survey, 1Q lag		0.0024* (1.85)			
Fed survey, 2Q lag			0.0027* (1.93)		
Fed survey, 3Q lag				0.0030* (1.93)	
Fed survey, 4Q lag					0.0025 (1.58)
N	39	38	37	36	35
Adj. R ²	0.441	0.472	0.497	0.505	0.464
SC	0.037	0.036	0.035	0.036	0.040
AIC	0.031	0.030	0.030	0.030	0.033

Notes: The table presents the results of regressions in which the REIT Premium Return is the dependant variable. The returns to the S&P 500 and the B of A ML BBB Index are used to control for capital market conditions. Credit market tightness is measured by the level of the net response to the question of whether commercial real estate lending standards are becoming tighter from the Federal Reserve Board's Survey of Senior Loan Officers (a higher number indicates tighter credit). *t*-Statistics are in parentheses and are estimated using White's heteroscedasticity consistent covariance matrix. SC and AIC are the Schwartz and Akaike Information Criteria, respectively.

*Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

repeated using price-only returns and the same results were obtained.

If the hypothesis that capital markets see REITs as having an advantage when capital is scarce is true, then the premium return is expected to be positively related to the tightness of the credit markets. The net percentage of respondents reporting tightening standards for commercial real estate loans from the Federal Reserve Board's Survey of Senior Loan Officers is used as a measure of credit market conditions. A higher number from the survey indicates tighter credit conditions.

Finally, returns to the S&P 500 are used to control for equity market conditions, and total returns to the B of A Merrill Lynch BBB Corporate Bond Index are used to control for bond market conditions (Source: Datastream).

Results

The regressions relating NAV premium returns to credit market conditions are performed with the Fed survey results in both levels and differences. There is an examination of whether the level of credit constraint in the economy affects REITs, as well as whether REITs react to a change in credit conditions.³

Exhibit 2 presents the results of regressing REIT premium returns on the level of the Fed survey. Results are presented using both contemporaneous and lagged Fed survey results so as to capture possible lags in the adjustment process of REIT prices to credit conditions. Given the high correlation in the level of the survey through time, the effects of the lagged values are estimated within separate regressions.

In all cases, the results for the control variables representing the capital markets are as expected; REIT premia are positively related to returns in the equity and the bond markets. Looking at the coefficient on the level of the Fed survey of credit market conditions in commercial real estate shows evidence consistent with REITs performing well when credit is tight. The first regression of Exhibit 1 shows that REIT premium return is positively related to the level of the survey, indicating REIT premia are higher when credit is perceived to be tighter. However, consistent with market reaction to credit conditions occurring with a delay, significantly positive coefficients are also seen on the level of the credit conditions survey at one, two, and three quarter lags. Comparing the results when using different lags on the Fed survey, the regressions using one, two, and three quarter lags all have the same Akaike criteria and almost identical Schwartz criteria (although the two quarter lag regression does have a slightly lower value of the Schwartz). Given that three quarters is the earliest period at which credit market conditions as represented by the survey results have a significant relationship to REIT premia returns and that the regression employing a three quarter lag on the survey results has the highest adjusted R^2 , it seems that the relationship between REIT premia and credit market conditions is best characterized as occurring at a lag of approximately three quarters.

The results of the regression indicate that REIT premia to NAV have tended to increase when credit conditions are tight. This evidence is consistent with capital markets pricing REITs as having a potential advantage in times of tighter credit conditions. The results also indicate that the premium effect can be economically significant given a large swing in credit conditions. Based on the observed relationship between the Fed survey results and REIT premia returns, if credit conditions as represented by the Fed survey were to swing by 30 points (with 30 being a one standard deviation move in the credit survey results over the time period examined, representing, for instance, a move from loosening credit at -15 to tightening credit at $+15$) then this would equate to an extra 9% return to REITs, three quarters hence, due to premium changes. However, a caveat is in order. The

test does not indicate that REIT prices will increase when credit gets tighter, as tighter credit may result in a slide in NAVs, which would work to pull REIT prices down, *ceteris paribus*. For instance, while above there is an estimated 9% extra return to REITs based on the historical relationship, if the Fed credit survey were to swing by thirty points, this is only the return due to premium changes and does not account for the fact that equity markets and NAVs could decrease substantially in those circumstances. The net return to REITs could very well be negative if credit tightened, with the premium effect simply offsetting some of the loss. What the result does indicate is that in the past the public market's valuation of real estate assets (i.e., REIT prices) has increased *relative* to the private market's valuation (i.e., NAVs) when capital has been in short supply. This would be consistent with the argument that capital markets see REITs as having an advantage in credit constrained environments.

Exhibit 3 shows the results when using the quarterly change in the Fed survey result as an explanatory variable. The results are consistent with those found when looking at survey levels. The only change in survey results with a significant affect on REIT premia is at a four quarter lag. When credit conditions tighten, there is a lagged positive effect on REIT premia. The results for changes in credit conditions thus reinforce two findings: (1) REITs are perceived to benefit from tighter credit conditions, and (2) this market perception lags, with credit conditions three to four quarters in the past affecting REIT pricing. It seems that there may be some inefficiency in the REIT market in that REIT prices do not react immediately to changing credit conditions. Perhaps markets only react once evidence of a REIT advantage begins to be seen in the underlying property markets and in actual deals; REITs cannot immediately take advantage of tightening credit conditions as it takes time for conditions in the underlying property markets to reflect these conditions and time for REITs' potential advantage in bidding on deals to materialize.

Are J-REITs Different?

In order to determine whether the results observed for REITs in the U.S. can be generalized to REIT

Exhibit 3
Changes in Credit Conditions and REIT Premia Returns

Variable	Changes in Credit Conditions					
Constant	-0.0276 (-0.98)	-0.0252 (-0.90)	-0.0339 (-1.08)	-0.0403 (-1.42)	-0.0551* (-1.94)	-0.0500* (-1.73)
S&P 500 total return	0.4142 (1.48)	0.4081 (1.47)	0.4061 (1.51)	0.5376 (1.48)	0.5774 (1.68)	0.4754* (1.73)
BBB Corp. total return	3.9580* (1.89)	3.8814* (1.89)	4.0122* (1.94)	4.0512** (2.11)	4.4098** (2.35)	4.5537* (1.99)
Change in Fed Survey	-0.0026 (-1.02)	-0.0024 (-0.96)	-0.0027 (-1.071)	-0.0032 (-1.17)	-0.0036 (-1.32)	
Change in Fed survey, 1Q lag		-0.0013 (-0.68)	-0.0018 (-0.9799)	-0.0015 (-0.69)	-0.0017 (-0.68)	
Change in Fed survey, 2Q lag			0.0019 (0.9668)	0.0016 (0.62)	0.0016 (0.64)	
Change in Fed survey, 3Q lag				0.0045 (1.19)	0.0038 (1.16)	
Change in Fed survey, 4Q lag					0.0049* (1.99)	0.0050* (1.74)
N	38	37	36	35	34	34
Adj. R ²	0.398	0.381	0.377	0.402	0.431	0.433
SC	0.041	0.046	0.051	0.054	0.057	0.044
AIC	0.034	0.037	0.039	0.040	0.040	0.036

Notes: The table presents the results of regressions in which the REIT Premium Return is the dependant variable. The returns to the S&P 500 and the B of A ML BBB Index are used to control for capital market conditions. Credit market tightness is measured by the changes in the net response to the question of whether commercial real estate lending standards are becoming tighter from the Federal Reserve Board's Survey of Senior Loan Officers (a higher number indicates tighter credit). *t*-Statistics are in parentheses and are estimated using White's heteroscedasticity consistent covariance matrix. SC and AIC are the Schwartz and Akaike Information Criteria, respectively.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

markets in other jurisdictions, the tests were repeated on Japanese REITs (J-REITs), which have been in existence since 2001. J-REITs must follow rules on assets and dividends similar to those for U.S. REITs and, as they also represent commercial real estate holdings traded on equity markets, are likely exposed to similar influences from capital markets. However, J-REITs are required to be externally managed and, in fact, are prohibited from even hiring employees.⁴ Although not required, many J-REITs are associated with a "sponsor" firm, which is often the source of the original assets placed in the J-REIT and is usually considered a source of ongoing financing for the J-REIT. Finally, J-REITs can issue only one class of equity and are, relative to U.S. REITs, restricted in their equity issuance options [see Association for Real Estate Securitization (2009) for a discussion].

Capozza and Sequin (2000) showed that externally managed REITs in the U.S., during a time period when external management was more common there than it is today, were biased against using equity as a source of financing as compared to internally managed REITs. They attribute this to agency issues with an external management arrangement. If the same agency issues arise with J-REITs then this would indicate that J-REITs are likely less likely to take advantage of tight credit conditions by issuing equity relative to U.S. REITs (which are generally internally managed now). Furthermore, discussions with J-REIT analysts and industry researchers on the Japanese market indicate that there are other institutional barriers to the issuance of equity by J-REITs. As a market with a short track record (having started in 2001), investors lack experience with how J-REITs perform over the full course of a cycle and therefore

new issues of REIT equity are less marketable during a downturn in Japan than they would be in the U.S. This effect is compounded by the fact that 50% of J-REIT shares are required to be held domestically, meaning that any major new issue of equity could not rely on foreign demand and would require significant interest from the domestic Japanese market. Further, institutional ownership of J-REIT shares is very high and Japanese pension funds, given their generally high proportion of beneficiaries currently collecting pensions, are extremely concerned with J-REITs providing a steady dividend yield. As the spread between the cost of debt and the yield on property is quite high in Japan, issuing equity will dilute the dividend yield (especially if shares are issued at a discount to NAV) and such issuances are usually strongly resisted by J-REITs' pension fund shareholders.

All of this implies that J-REITs are likely to be far less able than their U.S. counterparts to use public equity issuance strategically in reaction to market conditions. This can also be seen in the outcomes for REITs in the two countries following the financial crisis. While U.S. REITs responded by issuing equity, J-REITs faced a continuing and almost total inability to access capital, to the point that the Japanese government created a ¥1 trillion bailout fund from which J-REITs could borrow.

If the results reported above for U.S. REITs are, in fact, due to their ability to access equity capital strategically in order to gain an advantage when debt availability is low then one would expect this effect to be less for J-REITs.

The same methodology as before is followed and uses the total returns on the TOPIX REIT Index to represent J-REIT returns. NAV returns are estimated by total returns on the ARES J-REIT Property Price Index (AJPPPI). The AJPPPI is produced by the Association for Real Estate Securitization (ARES) in Japan and is based on appraised values of properties held by J-REITs. Unlike the use of the TBI for the U.S. market, the use of the AJPPPI means that the properties in the index used to represent NAV match those actually held by the REITs. A levered version of the AJPPPI is created using the market weighted average debt-to-assets

ratio of J-REITs in the TOPIX REIT index.⁵ The levered AJPPPI and the TOPIX REIT index are then used to calculate the premium return to J-REITs.

In the regressions, capital market factors are controlled for using the total returns to the TOPIX Index and to the B of A Merrill Lynch Japan BBB Corporate Bond index (Source: Datastream). The measure of credit market conditions in Japan is based on the Bank of Japan's Senior Loan Officer Survey on Bank Lending Practices at Large Japanese Banks. The average response to the question asking about changes in credit standards for loan applications from medium-sized firms is used. The Bank of Japan presents the average response to its credit standards question such that a higher number indicates easier credit; the negative of the Bank of Japan's reported average response is employed to make the interpretation of the results consistent with those already presented for the U.S. (where a higher number indicates tighter credit).

Regressions using the J-REITs' estimated premium return as the dependant variable are estimated on a quarterly basis over the period from Q4:2003 to Q4:2008. The start of the time period is based on availability of the TOPIX REIT Index returns and the end is based on availability of the AJPPPI. The results for J-REITs are presented in Exhibit 4. Given the lack of degrees of freedom in the regressions, the result should be interpreted with care; however, one clear trend emerges from Exhibit 4: J-REIT premia are negatively affected by tight credit conditions. The coefficient on the credit conditions survey response is significantly negative contemporaneously, as well as at one and two quarter lags. Hence, there is a relationship between J-REIT premia returns and credit conditions, but it is exactly the opposite as observed in the U.S. Again, there may be a lag in the equity market response to credit conditions, possibly with a somewhat different lag structure than in the U.S., although given the lack of data, not too much should be read into the details of the Exhibit 4 results.

Exhibit 5 presents the results for J-REITs using the change in credit conditions rather level. Due to

Exhibit 4
J-REITs and the Level of Credit Conditions

Variable	Level of Credit Conditions				
Constant	-0.0994** (-2.80)	-0.0994** (-2.56)	-0.1136** (-2.75)	-0.0800 (-1.24)	-0.1211* (-1.24)
TOPIX total return	0.2547 (1.28)	0.2748 (1.31)	0.2456 (1.35)	0.4081* (1.81)	0.3038 (1.24)
BBB Corp. total return	0.6956** (2.77)	0.8137** (2.69)	0.5607** (2.77)	3.3345 (1.04)	1.98 (0.74)
B of J Survey	-0.0054** (-2.86)				
B of J survey, 1Q lag		-0.0049** (-2.41)			
B of J survey, 2Q lag			-0.0050** (-2.85)		
B of J survey, 3Q lag				-0.0023 (-0.68)	
B of J survey, 4Q lag					-0.0042 (-1.23)
N	21	20	19	18	17
Adj. R ²	0.285	0.258	0.200	0.142	0.162
SC	0.013	0.014	0.013	0.015	0.014
AIC	0.010	0.011	0.011	0.012	0.012

Notes: The exhibit presents the results of regressions in which the J-REIT Premium Return is the dependant variable. The returns to the TOPIX and the B of A ML Japan Corporate BBB Index are used to control for capital market conditions. Credit market tightness is measured by the level of the net response to the question of whether credit standards have become easier for medium-sized firms from the Bank of Japan Senior Loan Officer Survey (the negative of the reported number has been used in the regression so that a higher number indicates tighter credit). *t*-Statistics are in parentheses and are estimated using White's heteroscedasticity consistent covariance matrix. SC and AIC are the Schwartz and Akaike Information Criteria, respectively.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

the lack of degrees of freedom, only one lag of the change in credit conditions variable is included in each regression. The only statistically significant effect of lagged changes in Japanese credit conditions comes at a two quarter lag. Again, the effect is negative. As noted previously, the results on J-REITs suffer from low degrees of freedom and should be interpreted with caution, but at the very least the results for J-REITs are very much unlike those for U.S. REITs.

While some difference between the U.S. and Japanese results might be expected given that a transaction-based index (TBI) was used to proxy for NAV returns in the U.S. and an appraisal-based index (AJPPPI) was used in Japan, the difference expected would be in the timing of the relationship

or perhaps the observed strength of the relationship due to appraisal smoothing in the AJPPPI. The difference between an appraisal-based index and a transaction-based index does not account for results that are opposite in sign.

The J-REIT results are consistent with REITs in Japan, unlike those in the U.S., being unable to take advantage of credit conditions due to their passive nature and the obstacles to their issuance of new equity. Tighter credit then simply means that it is more difficult to raise capital and rollover loans for Japanese REITs. In the U.S., where REITs do not face such obstacles, tighter credit conditions are actually perceived by the market as being of benefit to REITs because their access to public equity and unsecured debt markets may

Exhibit 5 J-REITs and Changes in Credit Conditions

Variable	Changes in Credit Conditions				
Constant	-0.0226 (-0.97)	-0.0370 (-1.55)	-0.0285 (-1.53)	-0.0519 (-2.74)**	-0.0607 (-2.92)**
TOPIX total return	0.5201 (2.58)**	0.4682 (2.53)**	0.5577 (3.76)***	0.5219 (3.41)***	0.5952 (3.61)***
BBB Corp. total return	0.5713 (1.64)	0.3286 (1.11)	4.6304 (2.14)*	3.58 (1.42)	4.77 (1.71)
Change in B of J Survey	-0.0024 (-0.60)				
Change in B of J survey, 1Q lag		0.0035 (0.39)			
Change in B of J survey, 2Q lag			-0.0099 (-3.81)***		
Change in B of J survey, 3Q lag				0.0040 (0.59)	
Change in B of J survey, 4Q lag					0.0110 (1.71)
<i>N</i>	20	19	18	17	16
Adj. <i>R</i> ²	0.146	0.060	0.257	0.144	0.261
SC	0.016	0.015	0.0129	0.015	0.013
AIC	0.013	0.013	0.011	0.012	0.011

Notes: The table presents the results of regressions in which the J-REIT Premium Return is the dependant variable. The returns to the TOPIX and the B of A ML Japan Corporate BBB Index are used to control for capital market conditions. Credit market tightness is measured by changes in the net response to the question of whether credit standards have become easier for medium-sized firms from the Bank of Japan Senior Loan Officer Survey (negatives of the initially reported numbers are used so that a higher number indicates tighter credit). *t*-Statistics are in parentheses and are estimated using White's heteroscedasticity consistent covariance matrix. SC and AIC are the Schwartz and Akaike Information Criteria, respectively.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

give them an advantage over other participants in the commercial property markets.

Conclusion

Because REITs have access to alternate sources of capital that other commercial real estate investors do not, namely the public capital markets, REITs may have an investing advantage in times of tight credit. By being able to raise capital at times that more distressed sellers are coming to market with properties, and when competition on the buying side is reduced because of a lack of capital for other potential bidders, REITs may be able to create value through their investments in the underlying property market. This study looked for evidence that the market perceives this to be true.

The evidence indicates that the markets do perceive REITs to have an advantage during periods when credit is considered tight, as REIT premia to NAV are positively associated with tighter credit conditions. The results are both statistically and economically significant, with a one standard deviation tightening in credit conditions (as measured by the Federal Reserve Board survey) associated with a 9% increase in REIT values, *ceteris paribus*. However, there would appear to be a degree of inefficiency in the REIT market as REIT premia react to tighter credit conditions, with a lag of approximately three quarters.

Conversely, in Japan, where J-REITs have severe impediments to accessing equity markets to take advantage of opportunities, the results are the

polar opposite of the U.S., where J-REIT NAV premia are negatively related to tighter credit conditions.

Going back to the question in the title of the paper; Do REITs have an advantage when credit is tight? As far as the market's perception, the answer would appear to be yes...but with a lag...and not in Japan.

Endnotes

1. "Life After Debt: Coming to Grips with the Funding Gap." Prudential Real Estate Investors, September 2009.
2. Note that Premium to NAV is defined slightly differently here than in normal practice. Here Premium is defined to be 1 plus the percentage difference between REIT share price and NAV (normal usage of the term NAV Premium does not add one). If a REIT price is 20% more than its underlying NAV, then Premium would equal 1.2 under the definition used here.
3. Note that there is no a priori reason to believe that the level of the Fed survey measuring credit conditions would be non-stationary in the mean; one would not expect credit conditions to trend over a long period of time.
4. See EPRA Global REIT Survey, August 2007.
5. Source: Bloomberg. As the debt-assets ratios are available only semi-annually, missing quarterly values were obtained by assuming a straight-line change from one value to the next.

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