



3Q2008 to 3Q2009: What on Earth Happened to Fundamentals?

An Analysis of Beta, Leverage and Their Impact on the Market

January 2010

Summary

This paper examines the extraordinary period of 3Q2008 through 3Q2009 in the US and global real estate equity market, which encompassed the collapse in the global capital markets and the ensuing emergence from the abyss. Specifically, this study attempts to answer the following questions: 1) Was there a structural change in the determinants of property stock performance during this period? 2) What fundamental characteristic, if any, was most closely associated with the technical driver of stock returns during the period? and 3) If there were indeed structural changes in the property stock performance drivers during the period, how significant were the changes in a historical context and is the fundamental characteristic associated with this performance driver a recipe for long-term outperformance?

Using US REIT data since 1987 and global real estate stock data since 1991, the study provides evidence for the following conclusions:

- 1) A structural change in stock performance indeed took place during the 5-quarter period as stock beta overtook stock-specific factors to become the most important (accounting for roughly 60% of the attribution, triple historical average) stock performance determinant;
- 2) During the sub-sample period of 3Q2008-3Q2009, US REIT beta was highly correlated with financial leverage, in the range of 50-80%, which again was a significant deviation from the historical norm of about 10% for the long-term average prior to 2Q2008; and finally
- 3) the REITs with higher leverage have historically traded at significantly lower P/B ratios (P/B multiples) relative to their peers. Historically, the above-average use of leverage has been an inferior means to achieving premium stock price valuation.

This report provides data to suggest that relative real estate stock performance in the period of 3Q2008-3Q2009 was chiefly attributable to stock beta (i.e., not traditional stock level fundamentals such as growth, valuation, dividend yield, etc.), which became highly correlated with leverage. Both of these relationships showed significant deviations from historical market behavior. Finally, over the long-term, the equity market has not generally rewarded highly-leveraged companies with premium valuation. In fact, the valuation discount has widened for the more highly-levered REITs in recent years. Therefore, over time, one might expect a reversion to historical norms and more rational market behavior, where stock-level research and analysis are again rewarded. In the near future, all else equal, a highly-levered REIT would need to generate a wider earnings growth lead over its less-levered counterparts in order to produce outperformance for its investors.

The following three sections provide details on the analyses performed and the outcome.

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Section 1: Source of US and global real estate stock performance during 3Q2008-3Q2009: beta or fundamentals?

Based on quarterly regressions of stock returns for global and US real estate stocks against their respective baskets of independent variables, consisting of beta, sector and country (for global), the analysis detects a distinct change in the structural composition of the sources to stock returns starting in the third quarter of 2008. The analysis shows that while over the long term (83 quarters for the US sample and 67 quarters for the global sample) stock-specific factors are the main determinant (55-60%) of stock performance, during the period of 3Q2008 through 3Q2009 the most powerful determinant of a real estate stock's performance was its beta. The explanatory power of beta was roughly three times its long-term average in the 5-quarter period, while the explanatory power of stock-specific factors declined to 50-60% of their long-term level. These findings are consistent in both the US and the global samples.

Methodology

A quarterly regression was run using 3-month return as the dependent variable. The independent variables are beta and sector for the US model and beta, country and sector for the global model. Beta for each security was obtained by using time series regressions with the preceding 8 quarters of data. The market return used for beta computation is the average return of all real estate securities, which are in the universe and which have available return data. Country and sector are binary variables, which take a value of 1 for the securities belonging to the given country or sector, and 0 otherwise. To remove potential distortion of results from extreme outliers, boundaries of (-80%, +200%) were imposed so that stocks with returns of below -80% in a period have their returns reset to -80%, while the stocks with returns of over 200% are reset to +200%. The imposition of the outlier control does not meaningfully alter the outcome.

The R-squared of the regression was examined to assess the contribution by each factor. This statistic indicates how important beta, sector and country are in explaining return variations over time. Assuming that stock-specific factors capture the remainder of the return variation, the return attributable to the stock-specific element is computed as 1 minus the R-squared. Results are presented in Table 1.

Data

For the US model, the study covers the period from 4Q1987 to 3Q2009. The sample for 4Q1995-3Q2009 is based on index constituent data from Wilshire factor database. The sample from 4Q1987 to 3Q1995 is based on all the securities, which ever existed on the Wilshire index and which have available return data. For the global model, the study covers from 4Q1991 to 3Q2009. The sample is based on all the securities which ever existed on the EPRA/NAREIT Global Real Estate index and have available return data.

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**Table 1:
Summary of R² Results***

Sample Period	Beta	Stock	Country	Sector	Total
Global with Outlier Control					
All periods	21.4%	56.0%	18.8%	3.9%	100.0%
Subsample 1: 4Q1991-2Q2008	18.5%	57.7%	19.7%	4.1%	100.0%
Subsample 2: 3Q2008-3Q2009	59.5%	32.8%	6.6%	1.0%	100.0%
Ratio(Subsample 2/Subperiod 1)	3.2	0.6	0.3	0.2	
Global without Outlier Control					
All periods	21.5%	56.1%	18.6%	3.8%	100.0%
Subsample 1: 4Q1991-2Q2008	18.6%	57.8%	19.6%	4.0%	100.0%
Subsample 2: 3Q2008-3Q2009	59.9%	33.4%	5.7%	1.0%	100.0%
Ratio(Subsample 2/Subperiod 1)	3.2	0.6	0.3	0.3	
US with Outlier Control					
All Periods	22.0%	60.2%		17.7%	100.0%
Subsample 1: 4Q1987-2Q2008	19.9%	61.9%		18.2%	100.0%
Subsample 2: 3Q2008-3Q2009	57.5%	32.8%		9.7%	100.0%
Ratio(subsample 2/subsample 1)	2.9	0.5		0.5	
US without Outlier Control					
All Periods	23.4%	57.9%		18.7%	100.0%
Subsample 1: 4Q1987-2Q2008	21.3%	59.4%		19.3%	100.0%
Subsample 2: 3Q2008-3Q2009	58.6%	32.0%		9.4%	100.0%
Ratio(subsample 2/subsample 1)	2.8	0.5		0.5	

Sources: Wilshire Associates, FactSet, Bloomberg and SNL Financial

*R² indicates what proportion of the stock return was explained by beta versus other factors considered (stock, country and/or sector).

In summary, these results suggest that over the long run, stock-specific factors, hence fundamentals are the most important determinant of stock performance in both the global and US real estate equity universes. However, during the period of 3Q2008 through 3Q2009, beta became the single most important explanatory factor of stock returns, nearly triple its long-term average contribution.

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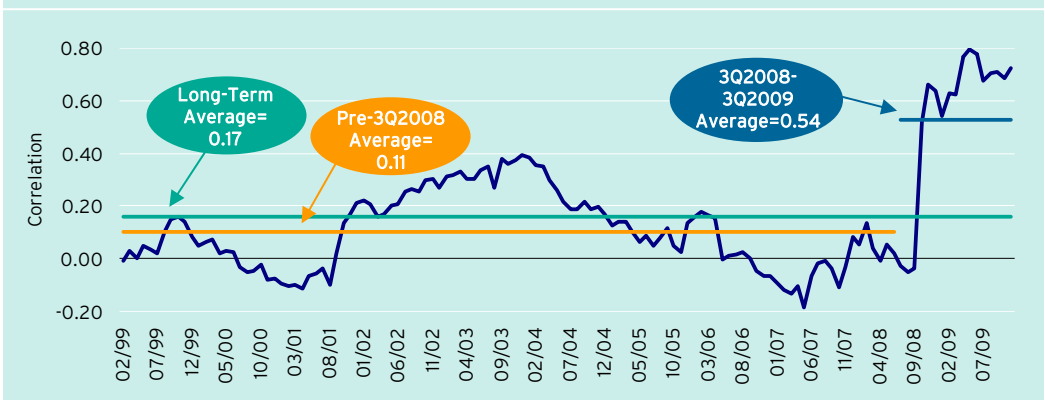
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Section 2: What Fundamental Characteristic Was behind Beta during 3Q2008-3Q2009?

Intrigued by the pattern of significant underperformance of the more highly-levered REITs during the market decline prior to the March 2009-trough and the same group's significant outperformance off the bottom, we set out to examine the relationship between leverage and beta.

Using monthly US REIT return data since 1994, rolling 5-year historical betas were calculated against the Wilshire REIT Index. The analysis is not performed on global real estate stocks due to data constraints. Chart 1 depicts the historical pattern of correlation between beta and leverage for the US REITs.

Chart 1:
Correlation between Leverage and Rolling 5 Year Beta



Sources: Wilshire Associates, FactSet, Bloomberg and SNL Financial

As indicated in chart 1, over the long-term the correlation between leverage and beta had fluctuated between -20% and +40% prior to 3Q2008, with the pre-3Q2008 average level of 11%. However, the pattern changed significantly in October 2008, when the correlation spiked from 0 in the previous month to 55% and continued rising. Although the correlation has declined somewhat since reaching the peak of 80% in May 2009, it has remained at around the 70% level in recent months.

Combined with the findings in Section 1, these results suggest that during the recent market turmoil, at least in the US, leverage became a close proxy for beta, which in turn drove the majority of stock performance. Both the high correlation between beta and leverage and beta being the main driver of stock performance are significant deviations from historical norm. In the following section, we ask the question: is leverage rewarded by the market over the long term?

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Section 3: Is Leverage Rewarded by the Market over the Long-Term?

In this section we examine the statistical significance of the relationship between FFO multiple and leverage for US REITs. Using monthly US REIT data since 1994, we performed a regression analysis of FFO multiple on the independent variables of leverage, growth, market capitalization and sector. The analysis suggests that leverage is a major driver of REIT valuation (measured by FFO multiple) and the answer to the question of whether leverage is rewarded by the market over the long term is emphatically “NO”.

The major conclusions from the regression analysis are three-fold:

First, **leverage is an important determinant of FFO multiples.** As demonstrated by the R-squared summary in Table 2, over the long-term, the combination of leverage, sector, market cap and growth explain approximately 62% of the FFO multiple a REIT is ascribed in the market. Within this basket of variables, leverage is by far the most significant explanatory variable, as it accounts for about 46% of the explanatory power of the basket.

Table 2:
Summary of R² Results from FFO Multiples Regression

Absolute					
	Leverage	Sector	Market Cap	Growth	Total
1/1996-9/2009	0.28	0.22	0.05	0.05	0.62
1/1996-6/2008	0.26	0.24	0.06	0.06	0.62
7/2008-9/2009	0.47	0.1	0.01	0.02	0.6
Percentage					
	Leverage	Sector	Market Cap	Growth	Total
3/1994-9/2009	46%	36%	9%	9%	100%
3/1994-6/2008	43%	38%	9%	9%	100%
7/2008-9/2009	78%	16%	2%	3%	100%

Sources: Wilshire Associates, FactSet, Bloomberg and SNL Financial

Secondly, **REITs with higher leverage are punished by the market in the form of lower FFO multiples.** Chart 2 demonstrates the value of the regression coefficient for leverage over time--it has been consistently negative through the entire sample period. Over the full sample period of January 1996 through November 2009, the average regression coefficient for leverage of -11.37 suggests that all else equal, a REIT with 0.01 higher leverage than another REIT is expected to have a multiple -0.1137 lower.

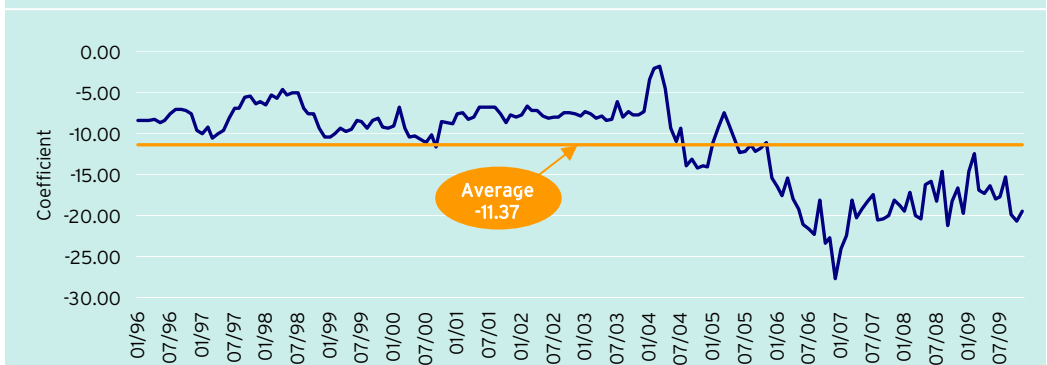
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Additionally, leverage is a consistently significant determinant within the basket of independent variables tested, as suggested by the very low p-value (the closer to 0, the more statistically significant the independent variable is) associated with the regression coefficient for leverage through all time periods. Over the entire sample period, the average p-value for the coefficient associated with leverage is 0.79%. In other words, if leverage were not a significant contributing factor, there is an average 0.79% probability of obtaining a leverage coefficient as extreme as the ones obtained in the regressions.

Chart 2:
Regression Coefficient for Leverage in Explanation of FFO Multiple



Sources: Wilshire Associates, FactSet, Bloomberg and SNL Financial

Thirdly, it appears that **market aversion to REITs with high leverage has intensified** over the past few years. Since mid-2007, the coefficient for leverage has stayed in the broad range of -15 to -20, which compares to the general range of -5 to -10 from 1996 to early 2004. This suggests that, all else equal, **a REIT with high-leverage would need to produce a wider earnings growth edge over its less-levered peer to produce the same total return** for its investors due to the steeper FFO discount assigned by the market compared to the previous up-cycle.

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Conclusion

As the global capital market experienced one of the most extreme periods of decline and ascent in 2008 and 2009, a statistical study was conducted to detect changes in the structure of real estate stock performance drivers. First, the study discovered that during the period of 3Q2008-3Q2009, the importance of stock beta escalated three-fold from its historical norm in explaining stock performance, explaining approximately 60% of the performance in both the US REITs and global real estate stocks. Secondly, during the period of 3Q2008-3Q2009, particularly 4Q2008-3Q2009, beta became a close proxy for leverage as the correlation between the two rose over four-fold from the pre-3Q2008 average of 11%. Finally, despite these significant deviations from historical norm, a regression of FFO multiples on leverage, among other variables, showed that leverage is one of the most significant determinants of valuation, in the negative sense. US REITs with higher leverage were generally ascribed lower multiples historically.

A potential intuitive explanation for the significant deviations from historical norms found here is that as the period of 2008 and 2009 was characterized by extreme uncertainty of capital availability, investment outcome in some real estate companies was essentially binomial—survival or demise, with leverage being one of the chief governors. At these times of extreme distress, real estate stock performance became more a reflection of the macro speculation of capital availability, rather than a reflection of an individual company's merit in a stable capital availability environment. However, one might expect that as the market environment returns to normal over time, rather than being dominated by beta, the main drivers of real estate stock performance should revert to the historical norm, i.e., the more fundamental differentiators such as a company's growth profile, ability to create shareholder value, etc., and fundamental research and stock analysis would regain value in real estate stock investment. A historical pattern that has not changed directions during the 2008-2009 period is that leverage remains an unfavorable factor when investors assign valuation multiples among REITs. Therefore, although high-leverage REITs may have led performance during the rally off the March 2009 trough, all else equal, for these high-leverage REITs to produce outsized future returns, a much higher earnings growth may be required to overcome the larger valuation discount that they are assigned by the market over the past three year.

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