Defensiveness of US Equity REITs

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Abstract

Much has been said about the defensiveness of REITs. However, it appears that there is not enough empirical evidence to substantiate the claim. Therefore the paper sets out to investigate the defensiveness of US Equity REITs over four periods of market decline – July 1990-March 1991, March 2001-November 2001, December 2007-December 2008 and 26-30 September 2008 – as defined by the US National Bureau of Economic Research. The paper uses two return and two "spread" metrics, ANOVA and Post Hoc tests to examine the defensiveness of US Equity REITs over the sampled periods. The results of the metrics generally support the view that US Equity REITs are defensive investment vehicles on the basis of minimax. In particular, the decline in REITs' return on 29 September 2008 was lower than the decline in non-REITs' return. Thus, it is defensive in the same way as the one-eyed man is the champion in an island of the blind.

Key words: *Equity REITs, defensive, return, bid-ask spread, US.*

Introduction

The virtues of REIT – liquidity, transparency, diversification benefits and good performance – have been trumpeted over the years. The spectacular performance of Equity REITs relative to well-known benchmark indexes over the past three decades is evident from Exhibit 1. It may not be therefore surprising that REIT and its cousin Listed Property Trust (LPT) has become a buzzword in real estate securitization and investment. The number of papers devoted to REITs at real estate conferences and in real estate journals, as well as the number of seminars and executive courses on REIT attest to how REIT has bowled over real estate researchers (both academic and practitioners), consultants and the investment community, at least, until the recent financial turmoil which began in late 2007. Even in the midst of the financial market meltdown when real estate, (thanks to asset securitization through CMBS, RMBS, CDOs) became a toxic asset to send the financial markets into a tailspin, REIT appears to have remained the darling of real estate consultants and advisers – The virtue of REIT as a defensive investment began to resonate in several corners of the investment community. Analysts reportedly alleged on 22nd September, 2008 on Channel NewsAsia (http://www.channelnewsasia.com/stories/singaporebusinessnews, Channel Newsasia, 2008) "that REITs are good defensive play in the current turbulent market". Nonetheless, the analysts did not adduce any empirical evidence to substantiate the claim.

Indeed, if REIT can outperform the leading benchmark indexes as shown in Exhibit 1 and serve as a defensive investment as well, it will deserve the adoration of the investment community. Thus, this paper is aimed at verifying the defensive of REITs during periods of market decline to help investors to make informed investment decisions on REITs. The emphasis is on US Equity REITs. In addition, the relative uncertainty of REIT and non-REIT stocks during market decline will be investigated. The paper therefore proceeds as follows. The next section deals with a brief review of the literature on defensive investment.

This is followed by data sourcing and management after which is presented the results of the data analysis and discussion thereof. The final section is devoted to concluding remarks.

Literature Review

Lamfalussy (1961) classifies investment into two groups: enterprise and defensive. Enterprise investment occurs in growing markets when profits are both high and rising, and market uncertainty is relatively low. It is the result of a deliberate expansion policy which leads to major technological innovations and substantial increases in capacity. Defensive investment, on the other hand, is carried out as a protective devise in stagnating or declining markets when profits are squeezed, competition is active and the lowering of cost (loss) becomes a matter of survival. Although defensive investment is aimed at insulating oneself against losses, it may also enlarge capacity and increase profits (Lamfalussy, 1961). According to Lamfalussy (1961), while defensive investment will enable some firms to maintain a satisfactory standard of efficiency for some years, it will not in all cases lead to a definite improvement in their competitive position. Thus, defensive investment does not seem to be an optimal long-term strategy as the benefits it entails are only limited to a short term.

According to Alexander (1999), defensiveness just means that such assets are likely to go down less than the darlings of the preceding bull market. This sentiment is echoed by InvestorWords (2009) which defines a defensive stock as an investment instrument whose demand does not decrease/increase as dramatically as other sectors during market downswing/upswing. According to this definition, defensiveness is a question of relativity. Notwithstanding the implications of this definition (relativity which could fling the door to defensive investment wide open), it may still be difficult to claim that REITs are technically defensive investments. From December, 2007 to December, 2008, figures from NAREIT (2009) show that the return indexes for US Equity REITs and S & P 500 fell from 127.72 and 128.15 to 79.54 and 80.74 – a decline of 37.72% and 37% respectively. The decline in both indexes for the period September 2008 to December 2008 was 38.8% and 21.95% respectively. Certainly, this is not indicative of defensiveness even by the stretch of definition. It must be noted also that REITs were among the darlings of the bull market.

Correia et al (2007) state that defensive stocks have low risk due to sustained demand regardless of the state of the economy. This is concurred by Aon Consulting Property Limited (2009) which defines defensive investments as assets that have a low risk of capital loss, and have a high proportion of their returns coming from income. Strong (2008) classifies defensive stocks as the direct opposite of cyclical stocks, i.e. when the economic cycle is heading south, prices of such assets do not follow a similar downward trend. Moreover, Investopedia (2009) considers “defensive stock” to be synonymous to “non-cyclical stock”. The performances of such assets are not highly correlated with the larger economic cycle. Thus they are often seen as good investments whenever the economy sours. During recessions they tend to perform better

than the market; however, during an expansion phase they perform below the market (see Indomitus Industries, 2006). Once again, the definition seems to disqualify REITs from being defensive investments given their spectacular performances during the bull market (see Exhibit 1) and their terrible performances during the financial crisis.

Defensive investment is defined by Peters and Egan (2001) as those asset classes that attract funds during periods of stock market weakness. Examples of defensive asset classes include cash, gold, and government bonds which benefit most when passive investment take a flight-to-quality. Other defensive asset classes such as commodities and real estate are more proactively employed by investors to take advantage of the cause of equity weakness during inflationary periods (Peters and Egan, 2001). In view of this definition, one can hardly say that REITs are defensive investments in the light of the recent global financial market meltdown. Given that the number of US Equity REITs fell from 138 in 2006 to 113 in 2008 with attendant fall in market capitalization – which may be mostly due to falling prices - (from US$400,741.4 million in 2006 to US$176,237.7 million in 2008) (NAREIT, 2009), one could hardly argue that REITs attracted funds (as a safe haven) during the recent financial crisis.

Notwithstanding the disqualification of REITs from being defensive on definitional basis, Glascock et al. (2004) use the bid-ask spread to conclude, after examining the riskiness of REITs over three days during the October 1997 stock market decline, that REITs are defensive investments. This accords with Glascock (1991) where it is found that REIT betas behave pro-cyclically with a lower/higher beta during recession/boom. In contrast, Goldstein and Nelling (1999) conclude that REIT betas during periods of market decline are higher than their corresponding betas during market expansion. This implies that REITs are not defensive. There is therefore a need for more studies to verify the defensiveness of REITs during market decline.

Data Sourcing and Management

The study period for this paper covers three main periods, July 1990 – March 1991, March 2001 – November 2001 and December 2007 – December 2008, that are classified as recessions by U.S. National Bureau of Economic Research (NBER). Exhibit 2 depicts the number of stocks, duration of the study periods for each sample. In addition, a sub-period, 26-30 September 2008, is examined as 29 September, 2008 demonstrates stock market weakness as evidenced by the DOW dipping by 777 points on that single day (Reuters Investor, 2009). An equally-weighted sample data is constructed for REITs, utility stocks, non-REITs/non-utility stocks and non-REITs respectively for each of the three periods.

Exhibit 2

The data for this study, extracted from Bloomberg database, consist of US Equity REITs and common stocks that are traded on the New York Stock Exchange (NYSE).

The riskiness of REIT stocks, common stocks and utility stocks is examined by observing returns and width of the bid-ask spread. Utility stocks are used as a benchmark for defensive investment against REITs since utility stocks are considered as defensive stocks by practitioners, and in various academic studies.The returns are calculated by using a number of methods to reflect alternative investor horizons. Close-to-close return, R_i, reflects the interest of long-term investors (Glascock et al., 2004) and is calculated as:

$$\frac{p_{ct} - p_{c(t-1)}}{p_{c(t-1)}} \qquad \text{(Equation 1)}$$

Open-to-close, R_v, returns reflect the investment horizon of short-term traders and speculators (Glascock et al., 2004). It is computed as:

$$\frac{p_{ct} - p_{ot}}{p_{ot}} \qquad \text{(Equation 2)}$$

where,

p_{ct} = closing price on day t

$p_{c(t-1)}$ = closing price on day t-1

p_{ot} = opening price on day t

The width of the bid-ask spread is observed by calculating two alternative measures of bid-ask spread, i.e. the dollar spread and the percentage spread.

$$\text{Dollar bid-ask spread} = Ask\ price - Bid\ price$$

$$\text{Percentage bid-ask spread} = \frac{Dollar\ spread}{Average\ Daily\ price} \qquad \text{(Equation 3)}$$

Both percentage spread and dollar spread are included in the analysis as the former is the metric of most concern to investors – it measures the effect of liquidity while the later provides a clue to whether any change(s) in the percentage spread is/are attributable to change(s) in the dollar spread or to change(s) in share prices (Ziering et al., 1999). The width of spread provides a natural measure of liquidity in any market environment. Larger spread between what buyers are willing to pay for a security and what sellers are asking are consistent with less liquidity. Conversely, smaller spreads between the buying and selling price are consistent with greater liquidity.

The close-to-close return is based on closing transaction prices on consecutive days. It is affected by a combination of changes in the bid-ask spread and changes in the tendency of the closing price to occur at bid price or ask price.

One-way Analysis of variance Model (ANOVA) is performed using Statistical Package for Social Science (SPSS) software. A confidence level of 95% is used for this study. Thus, a p-value of less than 0.05 indicates a statistically significant difference in means. As the one-way ANOVA test does not specifically indicate which pair of groups exhibits statistical differences, Post Hoc tests – Least significant difference (LSD) test - is also used in this situation to determine which specific pair/pairs are differentially expressed.

The September 29, 2008 returns are calculated on the bases of open-to-close and close-to-close returns to reflect alternative horizons. These returns, and dollar and percentage bid-ask spreads are calculated via Equations (1) to (3). The relative uncertainty of REIT stocks is examined by comparing the width of the bid-ask spread with that of other stocks before, during and after the decline.

Furthermore the degree of reversal of a stock's return on the following day after a specific market decline (September 29, 2008) is supposed to reflect the defensiveness of the stock. Thus, the degree to which the September 29, 2008 return was reversed on September 30, 2008 is provided as a correlation coefficient in Panel B of Exhibit 8 (Glascock et al., 2004).

Results

Sample 1

The results for Sample 1 are shown in Exhibit 3a. Three of the four metrics indicate that REITs were not defensive stocks over the period. Only one metric, "Open-to-close return" depicts REITs as defensive investment. Given that the mean figures reported in Exhibit 3a are statistically significant (Exhibit 3b), and the statistical significance of the Least Significant Difference test (Exhibit 3c) for percentage Spread and Dollar Spread, one may conclude that REITs investment was fraught with more uncertainty than the others in the sample and thus, were not defensive.

Exhibits 3a-c

Sample 2

The results for Sample 2 that are reported in Exhibits 4a-c attest to the relative defensiveness of REITs. The percentage Spread (6.19%) for REITs (Exhibit 4a) is the highest in the sample but that cannot detract from the superior performance of REITs as evidenced by the "Close-to-close" and "Open-to-close" returns.

.Exhibits 4a-c)

Sample 3

The figures in Exhibits 5a-c demonstrate the relative defensiveness of REITs during the sample period. REITs were the only investments that provided positive returns and had the second lowest percentage Spread. However, it must be cautioned that most of the difference in means (Exhibits 5b & 5c) are not statistically significant at any of the conventional statistical significance levels. The difference in means for the "Open-to-close" return is the only one that is statistically significant.

Exhibits 5a-c

Notwithstanding the statistical insignificance of the differences in mean, a positive return (no matter how small) is preferable to negative returns from the other stocks.

Although the results for Samples 2 & 3 support the relative defensiveness of REITs, the percentage Spread (a measure of uncertainty) for REITs over the three sample periods exhibits inconsistency apart from being a cause for concern in Samples 1 and 2 (Exhibit 6).

Exhibit 6

The evidence in Exhibit 6 suggests that price effect may not be a credible explanation for the relatively high REITs' percentage Spread. Apart from Sample 3 where REITs percentage Spread is lower than non-REITs in every price range, REITs percentage Spread is higher than non-REITs in virtually every price range for Samples 1 and 2.

Sample 4

Exhibit 7 show that all the stocks virtually move in the same direction. REITs category was the best performer. The difference in means for the returns is statistically significant (see Exhibit 7). Although the uncertainty about each category of stock increased over the Sample 4 period, there is no statistical significant difference between the uncertainties as proxied by the "% Spread". Thus, on the basis of relativity, vis-à-vis the defensiveness metrics being used, REITs is defensive.

Exhibit 7

The degree to which the losses on 29 September, 2008 were reversed on 30 September, 2008 are presented as correlation coefficients in Exhibit 8. Panel B of Exhibit 8 reveals that REITs had the lowest/highest degree of reversal of losses on the basis of "close-to-close" return/"Open-to-close" return. If reversal of losses is a valid basis for defensiveness, REITs are either not defensive or defensive, depending on which metric, "close-to-close" or "Open-to-close" is used.

Exhibit 8

The findings of the study are summarized in Exhibits 9a and 9b.

Exhibits 9a & 9b

Conclusion

The evidence in Exhibit 9a suggests that EREITs are generally defensive. It must be noted, however, that they are defensive on the basis that on the island of the blind, the one-eyed man is the champion – EREITs move in synchrony with the market and thus, their defensiveness merely hinges a choice between evils – It is a minimax option (minimizing maximum loss). Furthermore, EREITs emerge defensive in Samples 2 and 3 – They are not found to be defensive in Sample 1. Moreover, there is a statistical significant difference between the means of EREITs and others only in the "open-to-close" metric. It must be noted also that on the basis of the degree of reversal, EREITs are defensive only the basis of the "open-to-close" metric. They are found otherwise on the basis of "close-to-close" metric which is of much significance to long-term investors. Finally, it is difficult to contend that EREITs are defensive investments on technical definitional basis as they do not meet the criteria for defensiveness – noncyclical, better performance than the market in recession and poorer performance than the market during expansion/boom, and attracting funds when there is capital flight to quality. EREITs are very good investment vehicles by all standards but classifying EREITs as defensive investments appears to be a misnomer.

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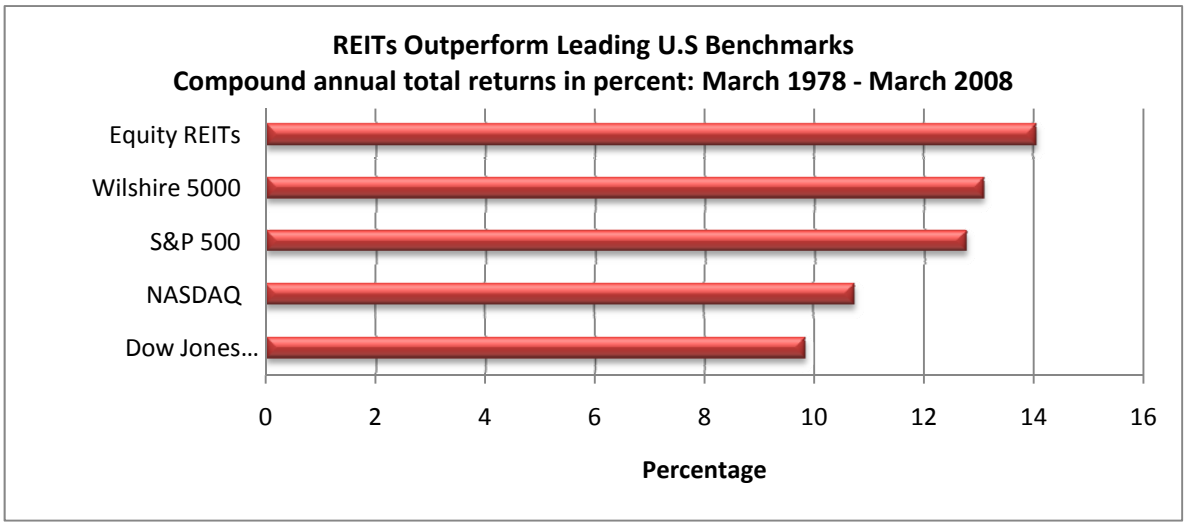
Exhibit 1: Equity REITs versus Benchmark Indexes (March 1978-March2008)



Source: Based on figures from NAREIT, 2008

Exhibit 2a: Study Periods

	Study period	Duration	Components
Sample 1	July 1990 – March 1991	8 months	REITs (n=35) Utility stocks (n=65) Non-REITs/non-utility stocks (n=592) Non-REITs (n=722)
Sample 2	March 2001 – November 2001	8 months	REITs (n=93) Utility stocks (n=78) Non-REITs/non-utility stocks (n=1014) Non-REITs (n=1092)
Sample 3	December 2007 – December 2008	12 months	REITs (n=100) Utility stocks (n=89) Non-REITs/non-utility stocks (n=1199) Non-REITs (n=1281)

Exhibit 2b: Study Sub-Period

	Study period	Duration	Components
Sample 4	26 – 30 September 2008	3 days	REITs (n=100) Utility stocks (n=87) Non-REITs/non-utility stocks (n=1199)

Exhibit 3a: Sample 1 Performance

Types of Stock	Close-to-close return	Open-to-close return	Dollar spread	% Spread*
Non-REITs/non-utilities	0.06%	0.16%	0.24	3.40%
n=657				
% positive	65.20%	78.04%		
% zero	0.00%	0.00%		
% negative	34.80%	21.96%		
REITs	0.05%	0.21%	0.44	5.34%
n=35				
% positive	62.86%	68.57%		
% zero	0.00%	0.00%		
% negative	37.14%	31.43%		
Utilities	0.04%	0.09%	0.24	1.83%
n=65				
% positive	83.08%	78.46%		
% zero	0.00%	0.00%		
% negative	16.92%	21.54%		
Non-REITs	0.06%	0.15%	0.25	3.25%
N=722				
% positive	66.97%	78.08%		
% zero	0.00%	0.00%		
% negative	33.03%	21.92%		

*Significant at the 0.05 level

Exhibit 3b: ANOVA F-test for Sample 1

		Sum of Squares	df	Mean Square	F	Sig.
Close-to-close return	Between Groups	.000	3	.000	.155	.926
	Within Groups	.014	1475	.000		
	Total	.014	1478			
Open-to-close return	Between Groups	.000	3	.000	.091	.965
	Within Groups	.186	1475	.000		
	Total	.186	1478			
Dollar spread	Between Groups	1.312	3	.437	2.347	.071
	Within Groups	274.820	1475	.186		
	Total	276.132	1478			
% Spread	Between Groups	.029	3	.010	7.890	.000*
	Within Groups	1.835	1475	.001		
	Total	1.865	1478			

Exhibit 3c: ANOVA Post Hoc test – Least significant difference (LSD) test for Sample 1

Multiple Comparisons

LSD

Dependent Variable	(I) category	(J) category	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
close-to-close return	non-REITs/non-utilities	REITs	.0000947	.0005326	.859	-.000950	.001139
		Utilities	.0002671	.0003992	.504	-.000516	.001050
		non-REITs	.0000240	.0001655	.885	-.000301	.000349
	REITs	non-REITs/non-utilities	-.0000947	.0005326	.859	-.001139	.000950
		Utilities	.0001723	.0006437	.789	-.001090	.001435
		non-REITs	-.0000707	.0005314	.894	-.001113	.000972
	Utilities	non-REITs/non-utilities	-.0002671	.0003992	.504	-.001050	.000516
		REITs	-.0001723	.0006437	.789	-.001435	.001090
		non-REITs	-.0002430	.0003976	.541	-.001023	.000537
	non-REITs	non-REITs/non-utilities	-.0000240	.0001655	.885	-.000349	.000301
		REITs	.0000707	.0005314	.894	-.000972	.001113
		Utilities	.0002430	.0003976	.541	-.000537	.001023
open-to-close return	non-REITs/non-utilities	REITs	-.0005138	.0019466	.792	-.004332	.003305
		Utilities	.0006272	.0014591	.667	-.002235	.003489
		non-REITs	.0000565	.0006050	.926	-.001130	.001243
	REITs	non-REITs/non-utilities	.0005138	.0019466	.792	-.003305	.004332
		Utilities	.0011410	.0023526	.628	-.003474	.005756

		non-REITs	.0005703	.0019422	.769	-.003239	.004380
	Utilities	non-REITs/non-utilities	-.0006272	.0014591	.667	-.003489	.002235
		REITs	-.0011410	.0023526	.628	-.005756	.003474
		non-REITs	-.0005708	.0014531	.695	-.003421	.002280
	non-REITs	non-REITs/non-utilities	-.0000565	.0006050	.926	-.001243	.001130
		REITs	-.0005703	.0019422	.769	-.004380	.003239
		Utilities	.0005708	.0014531	.695	-.002280	.003421
% Spread	non-REITs/non-utilities	REITs	-.0193856*	.0061193	.002	-.031389	-.007382
		Utilities	.0157465*	.0045867	.001	.006749	.024744
		non-REITs	.0014176	.0019020	.456	-.002313	.005148
	REITs	non-REITs/non-utilities	.0193856*	.0061193	.002	.007382	.031389
		Utilities	.0351321*	.0073957	.000	.020625	.049639
		non-REITs	.0208032*	.0061054	.001	.008827	.032779
	Utilities	non-REITs/non-utilities	-.0157465*	.0045867	.001	-.024744	-.006749
		REITs	-.0351321*	.0073957	.000	-.049639	-.020625
		non-REITs	-.0143289*	.0045681	.002	-.023289	-.005368
	non-REITs	non-REITs/non-utilities	-.0014176	.0019020	.456	-.005148	.002313
		REITs	-.0208032*	.0061054	.001	-.032779	-.008827
		Utilities	.0143289*	.0045681	.002	.005368	.023289
Dollar spread	non-REITs/non-utilities	REITs	-.1963874*	.0748798	.009	-.343270	-.049505
		Utilities	-.0117380	.0561251	.834	-.121832	.098356
		non-REITs	-.0010567	.0232734	.964	-.046709	.044596
	REITs	non-REITs/non-utilities	.1963874*	.0748798	.009	.049505	.343270

		Utilities	.1846494*	.0904977	.041	.007132	.362167
		non-REITs	.1953306*	.0747091	.009	.048783	.341878
	Utilities	non-REITs/non-utilities	.0117380	.0561251	.834	-.098356	.121832
		REITs	-.1846494*	.0904977	.041	-.362167	-.007132
		non-REITs	.0106813	.0558972	.848	-.098965	.120328
	non-REITs	non-REITs/non-utilities	.0010567	.0232734	.964	-.044596	.046709
		REITs	-.1953306*	.0747091	.009	-.341878	-.048783
		Utilities	-.0106813	.0558972	.848	-.120328	.098965

*. The mean difference is significant at the 0.05 level.

Exhibit 4a: Sample 2 Performance

Types of Stock	Close-to-close return*	Open-to-close return*	Dollar spread	% Spread
Non-REITs/non-utilities	0.03%	0.08%	1.02	5.84%
n=1092				
% positive	60.55%	70.91%		
% zero	0.00%	0.00%		
% negative	39.45%	29.09%		
REITs	0.07%	0.10%	0.94	6.19%
n=93				
% positive	81.72%	75.27%		
% zero	0.00%	0.00%		
% negative	18.28%	24.73%		
Utilities	-0.04%	-0.007%	0.90	3.72%
n=78				
% positive	41.03%	42.31%		
% zero	0.00%	0.00%		
% negative	58.97%	57.69%		
Non-REITs	0.03%	-0.08%	1.02	5.84%
n=1092				
% positive	59.16%	69.97%		
% zero	0.00%	0.00%		
% negative	40.84%	31.13%		

*Significance at 0.05 level

Exhibit 4b: ANOVA F-test for Sample 2

		Sum of Squares	df	Mean Square	F	Sig.
Close-to-close return	Between Groups	.000	3	.000	5.050	.002*
	Within Groups	.009	2351	.000		
	Total	.009	2354			
Open-to-close return	Between Groups	.000	3	.000	3.465	.016*
	Within Groups	.014	2351	.000		
	Total	.014	2354			
Dollar spread	Between Groups	1.452	3	.484	.138	.937
	Within Groups	8242.010	2351	3.506		
	Total	8243.462	2354			
% Spread	Between Groups	.036	3	.012	1.838	.138
	Within Groups	15.180	2351	.006		
	Total	15.215	2354			

Exhibit 4c: ANOVA Post Hoc test – Least significant difference (LSD) test for Sample 2

Multiple Comparisons

LSD

Dependent Variable	(I) category	(J) category	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
close-to-close return	non-REITs/non-utilites	REITs	-.0004055*	.0002061	.049	-.000810	-.000001
		Utilities	.0007158*	.0002236	.001	.000277	.001154
		non-REITs	.0000000	.0000816	1.000	-.000160	.000160
	REITs	non-REITs/non-utilities	.0004055*	.0002061	.049	.000001	.000810
		Utilities	.0011214*	.0002929	.000	.000547	.001696
		non-REITs	.0004055*	.0002061	.049	.000001	.000810
	Utilities	non-REITs/non-utilities	-.0007158*	.0002236	.001	-.001154	-.000277
		REITs	-.0011214*	.0002929	.000	-.001696	-.000547
		non-REITs	-.0007158*	.0002236	.001	-.001154	-.000277
	non-REITs	non-REITs/non-utilities	.0000000	.0000816	1.000	-.000160	.000160
		REITs	-.0004055*	.0002061	.049	-.000810	-.000001
		Utilities	.0007158*	.0002236	.001	.000277	.001154
open-to-close return	non-REITs/non-utilities	REITs	-.0002259	.0002665	.397	-.000749	.000297
		Utilities	.0008731*	.0002892	.003	.000306	.001440
		non-REITs	.0000000	.0001056	1.000	-.000207	.000207
	REITs	non-REITs/non-utilities	.0002259	.0002665	.397	-.000297	.000749
		Utilities	.0010991*	.0003788	.004	.000356	.001842

		non-REITs	.0002259	.0002665	.397	-.000297	.000749
	Utilities	non-REITs/non-utilities	-.0008731*	.0002892	.003	-.001440	-.000306
		REITs	-.0010991*	.0003788	.004	-.001842	-.000356
		non-REITs	-.0008731*	.0002892	.003	-.001440	-.000306
	non-REITs	non-REITs/non-utilities	.0000000	.0001056	1.000	-.000207	.000207
		REITs	-.0002259	.0002665	.397	-.000749	.000297
		Utilities	.0008731*	.0002892	.003	.000306	.001440
Dollar spread	non-REITs/non-utilities	REITs	.0713898	.2022538	.724	-.325224	.468004
		Utilities	.1179209	.2194444	.591	-.312404	.548246
		non-REITs	.0000000	.0801298	1.000	-.157132	.157132
	REITs	non-REITs/non-utilities	-.0713898	.2022538	.724	-.468004	.325224
		Utilities	.0465311	.2874746	.871	-.517199	.610261
		non-REITs	-.0713898	.2022538	.724	-.468004	.325224
	Utilities	non-REITs/non-utilities	-.1179209	.2194444	.591	-.548246	.312404
		REITs	-.0465311	.2874746	.871	-.610261	.517199
		non-REITs	-.1179209	.2194444	.591	-.548246	.312404
	non-REITs	non-REITs/non-utilities	.0000000	.0801298	1.000	-.157132	.157132
		REITs	.0713898	.2022538	.724	-.325224	.468004
		Utilities	.1179209	.2194444	.591	-.312404	.548246
% Spread	non-REITs/non-utilities	REITs	-.0034803	.0086798	.688	-.020501	.013541
		Utilities	.0212536*	.0094175	.024	.002786	.039721
		non-REITs	.0000000	.0034388	1.000	-.006743	.006743
	REITs	non-REITs/non-utilities	.0034803	.0086798	.688	-.013541	.020501

		Utilities	.0247339*	.0123371	.045	.000541	.048927
		non-REITs	.0034803	.0086798	.688	-.013541	.020501
	Utilities	non-REITs/non-utilities	-.0212536*	.0094175	.024	-.039721	-.002786
		REITs	-.0247339*	.0123371	.045	-.048927	-.000541
		non-REITs	-.0212536*	.0094175	.024	-.039721	-.002786
	non-REITs	non-REITs/non-utilities	.0000000	.0034388	1.000	-.006743	.006743
		REITs	-.0034803	.0086798	.688	-.020501	.013541
		Utilities	.0212536*	.0094175	.024	.002786	.039721

* The mean difference is significant at the 0.05 level.

Exhibit 5a: Sample 3 Performance

Types of Stock	Close-to-close return	Open-to-close return**	Dollar spread	% Spread
Non-REITs/non-utilities	-0.11%	-0.09%	2.74	3.89%
n=1193				
% positive	25.46%	44.91%		
% zero	0.00%	0.00%		
% negative	74.54%	55.09%		
REITs	0.08%	0.04%	0.95	0.23%
n=100				
% positive	34.00%	65.00%		
% zero	0.00%	0.00%		
% negative	66.00%	35.00%		
Utilities	-0.08%	-0.02%	0.25	0.18%
n=89				
% positive	17.98%	47.19%		
% zero	0.00%	0.00%		
% negative	80.90%	51.69%		
Non-REITs	-0.11 %	-0.09%	2.93	4.75%
n=1281				
% positive	45.20%	25.00%		
% zero	0.00%	0.00%		
% negative	54.80%	75.00%		

**Significant at the 0.05 level

Exhibit 5b: ANOVA F-test for Sample 3

		Sum of Squares	df	Mean Square	F	Sig.
Close-to-close return	Between Groups	.000	3	.000	1.874	.132
	Within Groups	.008	2658	.000		
	Total	.008	2661			
Open-to-close return	Between Groups	.000	3	.000	6.064	.000*
	Within Groups	.027	2658	.000		
	Total	.027	2661			
Dollar spread	Between Groups	980.580	3	326.860	.143	.934
	Within Groups	6090528.138	2658	2291.395		
	Total	6091508.718	2661			
% Spread	Between Groups	1.478	3	.493	1.028	.379
	Within Groups	1273.340	2658	.479		
	Total	1274.817	2661			

Exhibit 5c: ANOVA Post Hoc test – Least significant difference (LSD) test for Sample 3

Multiple Comparisons

LSD

Dependent Variable	(I) cat	(J) cat	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Close-to-close return	non-REITs/non-utilities	REITs	-.0003350	.0001851	.070	-.000698	.000028
		Utilities	-.0003189	.0001964	.105	-.000704	.000066
		non-REITs	-.0000219	.0000715	.759	-.000162	.000118
	REITs	non-REITs/non-utilities	.0003350	.0001851	.070	-.000028	.000698
		Utilities	.0000161	.0002599	.950	-.000493	.000526
		non-REITs	.0003131	.0001846	.090	-.000049	.000675
	Utilities	non-REITs/non-utilities	.0003189	.0001964	.105	-.000066	.000704
		REITs	-.0000161	.0002599	.950	-.000526	.000493
		non-REITs	.0002970	.0001959	.130	-.000087	.000681
	non-REITs	non-REITs/non-utilities	.0000219	.0000715	.759	-.000118	.000162
		REITs	-.0003131	.0001846	.090	-.000675	.000049
		Utilities	-.0002970	.0001959	.130	-.000681	.000087
Open-to-close return	non-REITs/non-utilities	REITs	-.0012612*	.0003299	.000	-.001908	-.000614
		Utilities	-.0007086*	.0003500	.043	-.001395	-.000022
		non-REITs	-.0000487	.0001275	.703	-.000299	.000201
	REITs	non-REITs/non-utilities	.0012612*	.0003299	.000	.000614	.001908

		Utilities	.0005526	.0004631	.233	-.000356	.001461
		non-REITs	.0012125*	.0003290	.000	.000567	.001858
	Utilities	non-REITs/non-utilities	.0007086*	.0003500	.043	.000022	.001395
		REITs	-.0005526	.0004631	.233	-.001461	.000356
		non-REITs	.0006599	.0003492	.059	-.000025	.001345
	non-REITs	non-REITs/non-utilities	.0000487	.0001275	.703	-.000201	.000299
		REITs	-.0012125*	.0003290	.000	-.001858	-.000567
		Utilities	-.0006599	.0003492	.059	-.001345	.000025
Bid-ask spread	non-REITs/non-utilities	REITs	1.7933553	4.9834377	.719	-7.978453	11.565163
		Utilities	-2.7133263	5.2876536	.608	-13.081658	7.655006
		non-REITs	-.1863956	1.9259945	.923	-3.962995	3.590204
	REITs	non-REITs/non-utilities	-1.7933553	4.9834377	.719	-11.565163	7.978453
		Utilities	-4.5066816	6.9966086	.520	-18.226030	9.212666
		non-REITs	-1.9797509	4.9701817	.690	-11.725566	7.766064
	Utilities	non-REITs/non-utilities	2.7133263	5.2876536	.608	-7.655006	13.081658
		REITs	4.5066816	6.9966086	.520	-9.212666	18.226030
		non-REITs	2.5269307	5.2751621	.632	-7.816907	12.870769
	non-REITs	non-REITs/non-utilities	.1863956	1.9259945	.923	-3.590204	3.962995
		REITs	1.9797509	4.9701817	.690	-7.766064	11.725566
		Utilities	-2.5269307	5.2751621	.632	-12.870769	7.816907
% Spread	non-REITs/non-utilities	REITs	.0366102	.0720566	.611	-.104682	.177903
		Utilities	-.1250213	.0764553	.102	-.274939	.024897
		non-REITs	-.0085885	.0278484	.758	-.063195	.046018

	REITs	non-REITs/non-utilities	-.0366102	.0720566	.611	-.177903	.104682
		Utilities	-.1616315	.1011655	.110	-.360002	.036739
		non-REITs	-.0451987	.0718649	.529	-.186116	.095718
	Utilities	non-REITs/non-utilities	.1250213	.0764553	.102	-.024897	.274939
		REITs	.1616315	.1011655	.110	-.036739	.360002
		non-REITs	.1164328	.0762747	.127	-.033131	.265997
	non-REITs	non-REITs/non-utilities	.0085885	.0278484	.758	-.046018	.063195
		REITs	.0451987	.0718649	.529	-.095718	.186116
		Utilities	-.1164328	.0762747	.127	-.265997	.033131

*The mean difference is significant at the 0.05 level.

Exhibit 6: Percentage Spread by Price Range

	Sample 1 (Dec 07-Dec 08)	Sample 2 (Mar 01-Nov 01)	Sample 3 (July 90-March 91)
Full Sample:			
REITs	5.34%	6.19%	0.23%
Non-REITs	3.25%	5.84%	4.75%
Stocks priced below $5:			
REITs	9.17%	32.13%	0.42%
non-REITs	4.85%	17.59%	3.80%
Stocks priced between $5 and $10:			
REITs	5.50%	7.07%	0.28%
non-REITs	2.89%	7.80%	1.35%
Stocks priced between $10 and $20:			
REITs	3.01%	6.26%	0.24%
non-REITs	2.13%	5.03%	0.30%
Stocks priced above $20:			
REITs	4.36%	4.19%	0.20%
non-REITs	2.41%	3.92%	7.40%

Exhibit 7: Sample 4 Performance

	26-Sep-08 (Friday)			29-Sep-08 (Monday)			30-Sep-08 (Tuesday)		
	Close-to-close return**	Open-to-close return**	% Spread	Close-to-close return	Open-to-close return	% Spread	Close-to-close return**	Open-to-close return**	% Spread
	-0.9272%	1.1563%	0.7077%	-7.59%	-6.07%	2.9908%	3.9395%	1.788%	1.8147%
Non-REITs/non-utility									
n=1349									
% positive	39.44%	66.57%		3.78%	6.82%		81.47%	65.90%	
% zero	1.33%	0.96%		0.44%	0.00%		1.11%	0.96%	
% negative	59.23%	32.47%		95.77%	92.81%		17.42%	33.14%	
REITs	2.2726%	4.6698%	0.1795%	-6.54%	-4.467%	2.4192%	5.957%	3.111%	1.3796%
n=98									
% positive	90.00%	96.00%		4.08%	0.08%		96.94%	80.61%	
% zero	0.00%	1.00%		0.00%	0.00%		1.02%	2.04%	
% negative	10.00%	3.00%		95.92%	91.84%		0.02%	17.35%	
Utility	-0.66%	0.62%	0.1302%	-5.22%	-4.19%	0.35%	1.559%	0.548%	0.1908%
n=87									
% positive	34.48%	71.26%		2.30%	4.60%		81.61%	58.62%	
% zero	5.75%	0.00%		0.00%	0.00%		0.01%	2.30%	
% negative	59.77%	26.44%		97.70%	95.40%		17.24%	39.08%	
Non-REITs	-0.9113%	1.1238%	0.6726%	-7.44%	-5.942%	2.8320%	3.796%	1.713%	1.7166%
n=1436									
% positive	39.14%	66.85%		3.69%	6.69%		81.48%	65.46%	
% zero	2.23%	0.91%		0.42%	0.35%		1.11%	1.04%	
% negative	58.64%	32.24%		95.89%	92.97%		17.41%	33.50%	

**significant at a level of 5%

Exhibit 8: Degree of Reversal

Panel A: Stock returns	September 29, 2008		September 30, 2008	
	close-to-close return	open-to-close return	close-to-close return	open-to-close return
non-REITs/non-utility	-7.59%	-6.97%	3.94%	1.79%
REITs	-6.54%	-4.47%	5.96%	3.11%
Utility	-5.22%	-4.19%	1.56%	0.55%
non-REITs	-7.44%	-5.94%	3.80%	1.71%

Panel B: Return reversal correlations	Return reversal correlations of September 30 returns with September 29 returns	
	close-to-close return	open-to-close return
non-REITs/non-utility	-0.575*	-0.261*
significance (2-tailed)	0	0
REITs	-0.209*	-0.46*
significance (2-tailed)	0.039	0
Utility	0.008	0.008
significance (2-tailed)	0.636	0.692
non-REITs	-0.566*	-0.285*
significance (2-tailed)	0	0

*Significant at 0.05 level

Exhibit 9a: Summary of EREITs Defensiveness Matrix by Relative Performance

Sample	Metric	Defensive	Not Defensive
1	Close-to-close		X
	Open-to-close	X	
	Dollar Spread		X
	% Spread		X
2	Close-to-close	X	
	Open-to-close	X	
	Dollar Spread	X	
	% Spread		X
3	Close-to-close	X	
	Open-to-close	X	
	Dollar Spread	X*	
	% Spread	X*	
4 26/9/08	Close-to-close	X	
	Open-to-close	X	
	% Spread	X*	
4 29/9/08	Close-to-close	X*	
	Open-to-close	X*	
	% Spread	X*	
4 30/9/08	Close-to-close	X	
	Open-to-close	X	
	% Spread	X*	

*Excluding Utilities.

Exhibit 9b: Defensiveness of EREIT by Definition

Definition	Market Condition	Period	Item	Performance (%)	Is EREIT Defensive?
Insulation against capital loss (Lamfalussy, 1961; Aon Consulting Pty Ltd., 2009).	Upswing/Boom	Jan 05 to Dec 06	EREIT	8.67 (75.15)	No
			S&P 500	4.95 (24.52)	
			Russell 2000	5.4 (29.15)	
Demand does not decrease/increase as dramatically as other sectors during market down/upswing (Alexander, 1999; InvestorWords, 2009)		Dec 08 to Dec 09	EREIT	27.99	No
			S&P 500	26.46	
			Russell 2000	27.17	
Direct opposite of cyclical stocks. Performs better/worse than market during recession/boom (Strong, 2008; Investopedia , 2009; Indominus Industries, 2006)	Downswing/Recession	Dec 07 to Dec 08	EREIT	-37.72	No
			S&P 500	-37.0	
			Russell 2000	-33.79	
Attracts funds during stock market weakness (Peters & Egan, 2001).		Sep 08 to Dec 08	EREIT	-38.8	No
			S&P 500	-21.95	
			Russell 2000	-26.11	

Based on figures from NAREIT, 2009

Note: Figures in brackets under performance are cumulative figures.