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US Real Estate Investment Performance: 1983-2012

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Abstract

This study provides an overview of real estate investment performance over a 1983-2012 time period. The results show that although equity REITs outperformed all other assets on average annual return, on a risk-adjusted basis both private retail and apartment real estate outperformed all other assets. The study also found a recent trend in increased correlation between common stocks and REITs.

Keywords

Real Estate, REIT, Sharpe Ratio, Performance, Risk-Adjusted, Diversification, PAUL, Accounting anf Finance, Business Administration

Subject Categories

Finance and Financial Management | Portfolio and Security Analysis | Real Estate

US REAL ESTATE INVESTMENT PERFORMANCE: 1983-2012

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This study provides an overview of real estate investment performance over a 1983-2012 time period. The results show that although equity REITs outperformed all other assets on average annual return, on a risk-adjusted basis both private retail and apartment real estate outperformed all other assets. The study also found a recent trend in increased correlation between common stocks and REITs.

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INTRODUCTION

Real estate has been used as a wealth accumulating asset for thousands of years. Within the past half-century real estate has been used increasingly as another investment asset in many investor's portfolios. The two main types of real estate that will be addressed in this report are securitized and unsecuritized real estate. Unsecuritized real estate refers to private direct real estate. Securitized real estate refers to Real Estate Investment Trusts (REITs). REITs trade on major stock exchanges and invest in real estate directly, either through properties or mortgages. In the United States REITs are required to return at least 90% of their taxable income to shareholders in order to receive special tax considerations. The two main types or REITs are equity REITs and mortgage REITs. Equity REITs are real estate companies that acquire commercial properties and lease the space in the structures to tenants. Equity REITs pay out annually the bulk of the income they collect to their shareholders as dividends. Equity REITs also include capital appreciation from the sale of properties in the dividends they pay. Mortgage REITs invest in real estate mortgages or mortgage-backed securities, earning income from the interest on these investments, as well as from the sales of mortgages.

There have been a great number of studies on real estate as an asset in a diversified portfolio over the past 30 years. The studies have examined risk-adjusted returns, diversification, and inflation hedging for real estate against other assets. In the 1980s to mid-1990s, they focused primarily on direct real estate. In the middle-to-late 1990's to early-2000s the main focus was on REITs, specifically after the "REIT Boom," or "Modern REIT Era" of 1992 and 1993. Overall, previous studies of real estate, both direct investment and REITs, show that real estate plays an

important role in investor's portfolios and serves as a good hedge against inflation. However, they report conflicting results.

This thesis gives an update of real estate's performance over the past 30 years. It will specifically look into: *a)* real estate's risk-adjusted return against other real estate types, common stocks, bonds, and bills, *b)* the correlation of real estate by investment type against stocks, bonds, and bills, and *c)* specifically the correlation between direct real estate, REITs, and common stocks. The ultimate goal is to see what type of real estate will provide the best performance and diversification benefits based on historical return data.

LITERATURE REVIEW

The basis of this study comes from an extensive literature review. There is an immense amount of research on various types of real estate and how it acts as a diversifiable asset in a portfolio. The literature review helped to formulate the goals of this thesis outlined in the previous section.

The use of real estate as a hedge against inflation is well documented and, for the most part, it has shown to protect against unexpected inflation (Benjamin, Sirmans and Zietz, 2001). Real estate in the past has also shown low correlation to other assets. The low correlation coupled with its inflation hedging abilities is what has historically led investment professionals to include real estate in their portfolios.

In the 1990s a number of research was done on direct real estate performance and risk. (Reference: Dilmore (1998); Graff (1998); Gordon, Maher & Page (1997); Lai & Wang (1998); Ling & Naranjo (1999); Londerville (1998); Pagliari, Lieblich, Canter & Webb (1998); Tuluca, Seiler, Myer & Webb (1998); Young (1994) for various studies on the topic). The reports use

different techniques and property data in order to assess real estate as it performs against various types of real estate and other financial assets. Through the assortment of techniques and theories there is a discrepancy as to where real estate falls from a risk-and-return standpoint. Many reports find that direct real estate outperforms all other assets on a risk-adjusted basis. Some research questions the return calculation of real estate claiming it lowers the volatility. These results show that direct real estate does not outperform on a risk-adjusted basis (This debate is addressed in the Limitations and Criticisms section of this thesis). Overall the results are conflicting, and the topic needs further review.

There has also been research on the use of real estate to diversify a portfolio. My academics agree that there are benefits to using real estate to diversify a portfolio. (See Bond & Seiler (1998); Eichholtz, Hoesli, MacGregor & Nanthakumaran (1995); Fisher and Sirmans (1994); Hartzell, Strivers, Ludgin & Pire (1999); Hudson-Wilson & Elbaum (1995)) However, other academics have found there to be little to no diversification benefits that significantly improve the portfolios return. (See Cheng, Ziobrowski, & Caines (1999); Liu & Mei (1998); Stevenson (2000); Rubens, Louson & Yobaccio (1998) Therefore the need for further investigation into the use of real estate as a diversification mechanism is required.

REITs were established in 1960 through Cigar Excise Tax Extension of 1960. Initially the majority of REITs were mortgage REITs, and the overall REIT market was small in comparison to private real estate (see Figure 4). In the mid-1980s the market cap of equity REITs began to surpass mortgage REITs. It was in 1992 and 1993 when the explosion of equity REITs began. This time period is often referred to as the "REIT Boom," or "Modern REIT Era." The rapid growth in the use of equity REITs to invest in real estate caused a shift in focus for academic reports. The more recent research has focused on REITs as measure of real estate

performance, the linkage between direct real estate and REITs, and how REITs compare to the stock market in general. Once again depending on the time horizon, the techniques and theories applied, and the specific assets evaluated, the results are mixed.

Many reports are on the relationship between the REITs and the stock market, considering they are a securitized version of real estate. Glascock, Lu and So (2011) and Paladino and Mayo (1998) found a significant relation between the stock market and REITs, reducing their benefits in a diversified portfolio. Chandrashekaran (1999), and Chen and Peiser (1999) found little to no correlation with the stock market. Their conclusions stated that REITs help mitigate risk and are an important component in a diversified portfolio.

Overall the research in the past 30 years has covered a number of topics in real estate. There are some topics which have been widely accepted to be true by academia. However, as mentioned above, there are a great deal of reports with conflicting results. This report aims to give an update to many of these questions. This report does not attempt to give a definitive answer to the use of real estate as an investment, but hopefully a number or inferences can be made from the results outlined in this thesis.

METHODOLODY

This study used a number of different metrics in order to assess Real Estate's and other financial asset's investment performance. A cumulative wealth index was created for each asset in order to compare total return for each asset (Figure 1). Basic statistics were conducted on the total return data in order to assess the risk-adjusted return (Table 1). Both the Treynor and Sharpe Ratios were used as a means to evaluate the risk-adjusted return. The definition and formulas for these ratios are discussed in the Calculations section. The correlation coefficients in

Table 2 were calculated using the annualized total return for all the assets in the table. The correlation coefficients in Table 3 were calculated using quarterly total return data in order to attain an effective sample size.

Data Sources

The data used in this study runs from 1983 to 2012. The total return data came from multiple sources in either monthly or quarterly time intervals. The quarterly total return data for the S&P 500, T-bonds (10-year Treasury) and T-bills (1-year Treasury) came from Morningstar Inc.

The national property price index (NPI), apartment, office, hotel and retail data represent the private direct real estate. This data was collected from the National Council of Real Estate Investment Fiduciaries (NCREIF). The NCREIF data is reported on an unlevered basis, although it does include properties that have leverage. The properties in the index are income-producing. The quarterly total return data used in the study is a combination of both income and capital appreciation.

The US REIT Composite, Equity REITS and Mortgage REITS total return data come from The National Association of Real Estate Investment Trusts (NAREIT). The REIT composite is composed of both equity and mortgage REITS, having equity REITS taking up the vast majority of the index. These properties are also income producing. The data was reported as total monthly returns. The monthly returns were then compounded into both quarterly and annual total return for the various analyses.

Calculations

The AMR in Table 1 is the Arithmetic Mean Return. The Sharpe and Treynor ratios were calculated in order to assess the risk-adjusted returns for the various assets. The Sharpe Ratio is a risk-adjusted performance ratio that shows return per unit of standard deviation. The Treynor Ratio is also a risk-adjusted performance ratio that shows return based on the assets beta or level of market risk. The following formulas were used to calculate each ratio:

$$\textbf{\textit{Sharpe Ratio}} = \frac{r_p - r_f}{\sigma_p} \qquad\qquad \textbf{\textit{Treynor Ratio}} = \frac{r_p - r_f}{\beta_p}$$

$r_p = Average\ Portfolio\ Return$

$r_f = Risk\ Free\ Rate$

$\sigma_p = Portfolio\ Standard\ Deviation$

$\beta_p = Portfolio\ Beta$

The total return data was calculated by using a simple Time Weighted Return (TWR) Linking formula. The calculation links together the sub-period returns to produce the total return for the desired time period.

$$\textbf{\textit{Period Return}} = [(1 + s_1) * (1 + s_2) * \ldots * (1 + s_n) - 1] * 100$$

$s_n = Subperiod\ Return$

Limitations and Criticism

NCREIF data is subject to self-reporting bias due to the nature of the way the data is collected. Only real estate investment firms that choose to contribute performance data make up the NCREIF indices. The NPI also includes historical returns of new contributors. The addition

of new contributors and their historical data results in historical returns that change over time. So previous real estate research regarding the NPI can have different historical returns and results.

Secondly, appraisal-based returns can smooth the volatility of returns and can cause a bias resulting in lower variance and covariance in private real estate (Geltner 1989, 1991). However, there is a debate as to whether or not appraisal based smoothing is an actual market based phenomenon (See Lai & Wang (1998); Webb (1994)). Furthermore the long-term time horizon in this study reduces the impact.

Both the NCREIF and NREIT indices change in dynamic based on, the increased number of companies included in each index (See Figure 2 and Figure 3) and the change in weight of each property type also affects the return on a quarter to quarter basis. The change in mix can have a large performance impact on both indices. For the NPI, as displayed in Figure 1, different property types have a wide range of returns and that change in property mix has an impact on total performance. The same issue arises for the NAREIT data. The change in composition of equity to mortgage REITS impacts the index performance on a year to year basis.

RESULTS

Cumulative Wealth Index (CWI)

The CWI's used in this study started with a base value of $1,000 at the beginning of 1983. The annual total return used the compounded, chain-linked quarterly returns from for the SBBI and NCREIF data, and monthly returns for the NAREIT data. As shown in Figure 1, the asset with the highest CWI at the end of the 30-year time period was Equity REITs, with an initial investment of $1,000 compounded to $28,732. This was followed by $21,728 for common stocks, $16,982 for bonds, $16,598 for the REIT composite, $14,624 for retail, $14,211 for

apartments, $9,979 for the NPI, $8,663 for hotels, $6,852 for offices, $4,045 for mortgage REITs and $3,534 for bills.

Average Return

As shown in Table 1, Equity REITs had the highest annual AMR return of 13.46%, followed by 12.27% for common stocks, 11.54% for the REIT composite, 10.53% for bonds, 9.60% for retail, 9.53% for apartments, 8.72% for mortgage REITs, 8.28% for the NPI, 7.97% for hotels, 7.08% for offices, and then 4.33% for bills. As expected bills had the least return with both the CWI and AMR, while having the least volatility of 2.75%.

Risk-Adjusted Return

Although REITs outperformed on an annual average and for the CWI, they lag when adjusted for risk. When using both the Sharpe and Treynor ratio, private retail real estate had the highest return per unit of risk at 0.72 and 1.50, respectively. All categories of private real estate outperformed all other assets when using the Treynor Ratio (Table 1). When using the Sharpe Ratio, retail and apartment direct real estate showed the highest risk-adjusted return. Mortgage REITs and office real estate preformed the worst, with a Sharpe Ratio or .15, and .38, respectively. The risk-adjusted return portion of this study reiterated direct real estate's superior risk-adjusted return.

Total Correlation

Over the 30-year period the NPI had minimal correlation with common stocks, bonds and bills at +.126, +.114, +.199, respectively (Table 2). This indicates that direct real estate works well as a way to diversify against these other financial assets. The REIT index showed minimal negative correlation with bonds, and bills at -.133 and -.127, respectively. Surprisingly, the NPI

showed some significant correlation to common stocks, +.446, over the 30-year period. This result lead to further investigation (see the following section).

Of note, stocks were positively correlated with all assets except for bonds, which had a correlation of -.065 (Table 2). Mortgage REITs were negatively correlated with all direct real estate indices and the T-bill. Mortgage REITs also saw little correlation with common stocks, with a correlation of +.184.

Real Estate Correlation

Table 3 shows the NPI, REIT and S&P quarterly return correlations in 5-year segments over the past 20 years. The most significant trend that resulted from this analysis was the gradual increased correlation between REITs and the S&P 500. From 1993-1997 the correlation coefficient was -.034. From 1998-2002 the correlation increased to +.006. From 2003-2007 the correlation continued to increase to +.558. During the 2008-2012 period the correlation between the REIT index and the S&P 500 was +.886.

The correlation between the NPI and S&P 500 varied over the different time periods, but in general was relatively low. The correlation between the NPI and the REIT Index remained relatively low over the 20 year period.

CONCLUSIONS

This analysis of historical real estate returns provides investors with important insight about real estate investments. An institutional or large investor with enough resources and real estate knowledge could see significant benefits from diversifying their portfolio with direct real estate. Direct real estate, specifically apartment and retail, provides excellent risk-adjusted

returns and has relatively low correlation compared to stocks, bonds, and bills. This analysis reinforces that investors with the ability should diversify their portfolios with direct real estate.

REITs, on the other hand, are more liquid and take less due diligence than direct real estate. They give the average investor the ability to diversify their portfolios with real estate, without the need for large amounts of capital and research. Equity REITs outperformed all other assets from a cumulative wealth perspective, while having strong risk-adjusted return. However, investors should recognize the drastic increase in correlation between REITs and common stocks over the past 20 years. The increased correlation with the stock market reduces the diversification benefits of holding REITs. This trend should continue to be monitored over the next five to ten years.

To conclude, investors with sufficient capital and resources should diversify their portfolio with private direct real estate in order to maximize their return while reducing risk. Smaller investors can turn to REITs, however the increased correlation with the market reduces the desired diversification benefits investors seek with real estate.

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*The techniques and analysis used in this report is a continuation of Dr. Ahmad Etabari's research into real estate as an asset in a diversified portfolio.

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TABLES
Table 1: Risk-Reward Statistics: 1983-2012

| | T-Bill | T-Bond | S&P 500 | Private Real Estate | | | | | REITS | | |
				NPI	Office	Retail	Apartment	Hotel	REIT Composite	Equity REITS	Mortgage REITS
AMR	4.33%	10.53%	12.27%	8.28%	7.08%	9.60%	9.53%	7.97%	11.54%	13.46%	8.75%
Risk Premium (T-Bill)		6.20%	7.94%	3.94%	2.75%	5.27%	5.20%	3.64%	7.21%	9.13%	4.42%
Risk Premium (T-Bond)			1.74%	-2.25%	-3.45%	-0.93%	-1.00%	-2.56%	1.01%	2.93%	-1.78%
STD	2.75%	11.90%	17.25%	7.98%	9.71%	7.37%	7.62%	10.50%	18.80%	18.16%	29.81%
Beta	0.04	-0.05	1.00	0.06	0.07	0.04	0.06	0.17	0.49	0.53	0.32
Sharpe Ratio		0.52	0.46	0.49	0.28	0.72	0.68	0.35	0.38	0.50	0.15
Treynor Ratio	N/A	-1.37	0.08	0.68	0.38	1.50	0.91	0.22	0.15	0.17	0.14

Table 1: Correlation Coefficients: 1983-2012

Correlation (1983-2012)

	NPI	Office	Retail	Apartment	Hotel	T-Bill	T-Bond	S&P 500	REIT Composite	Equity REITs	Mortgage REITs
NPI	1										
Office	0.970	1									
Retail	0.871	0.753	1								
Apartment	0.935	0.871	0.798	1							
Hotel	0.740	0.787	0.464	0.722	1						
Tbill	0.199	0.181	0.139	0.210	0.148	1					
T-Bond	0.114	0.076	0.105	0.125	0.050	0.170	1				
S&P 500	0.126	0.128	0.082	0.130	0.272	0.250	-0.065	1			
REIT Composite	0.043	0.009	0.065	0.130	0.165	-0.127	-0.133	0.446	1		
Equity REITS	0.079	0.030	0.123	0.165	0.153	-0.021	-0.119	0.500	0.982	1	
Mortgage REITS	-0.130	-0.153	-0.102	-0.040	-0.021	-0.158	0.029	0.184	0.757	0.689	1

*Annualized returns compounded from quarterly return data

Table 2: Correlation Coefficients: S&P 500, REIT, and NPI

Correlation (2008-2012)

	S&P	*REIT*	*NPI*
S&P	1		
REIT	0.886	1	
NPI	0.268	0.325	1

Correlation (2003-2007)

	S&P	*REIT*	*NPI*
S&P	1		
REIT	0.558	1	
NPI	-0.024	-0.046	1

Correlation (1998-2002)

	S&P	*REIT*	*NPI*
S&P	1		
REIT	0.006	1	
NPI	0.261	-0.169	1

Correlation (1993-1997)

	S&P	*REIT*	*NPI*
S&P	1		
REIT	-0.034	1	
NPI	0.360	0.313	1

*Quarterly total return data

FIGURES AND GRAPHS

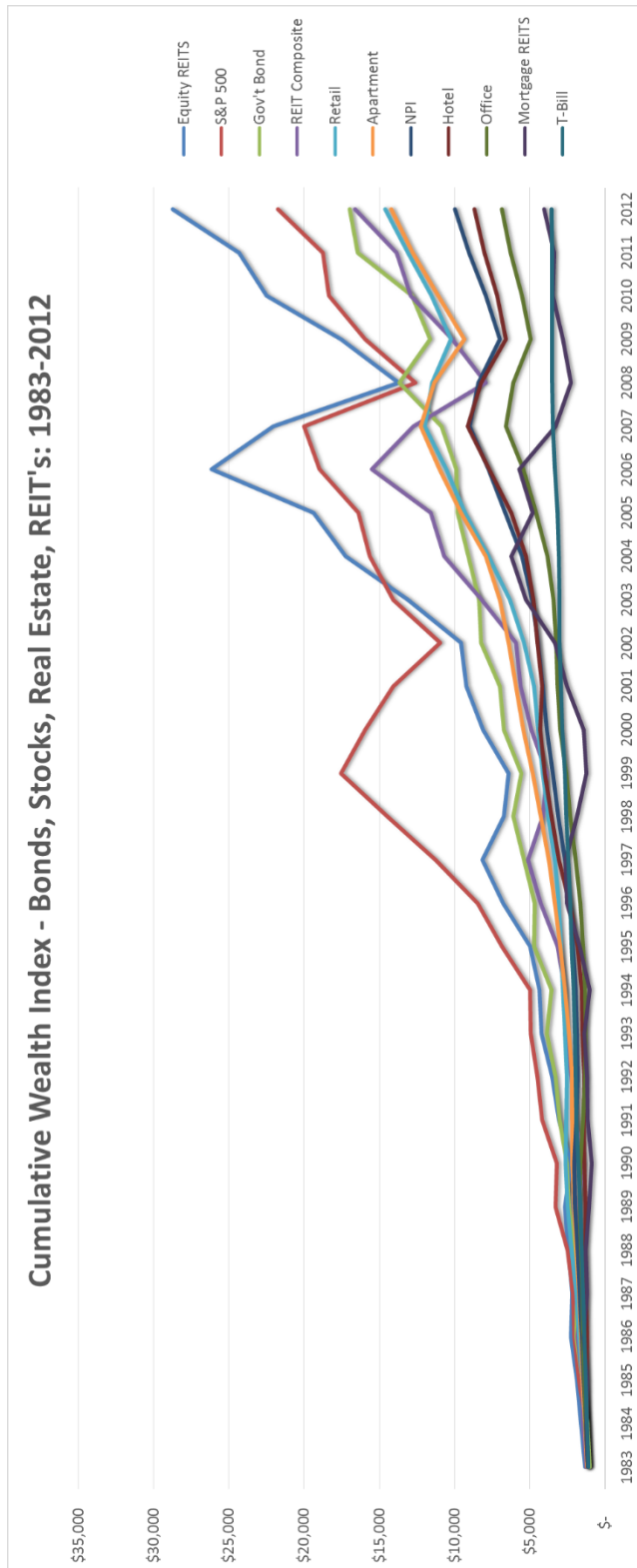*Figure 1: Cumulative Wealth Index - Real Estate, Stocks, and Bonds: 1983-2012*

Figure 2: Market Value and Property Count for the NPI from 1983-2012
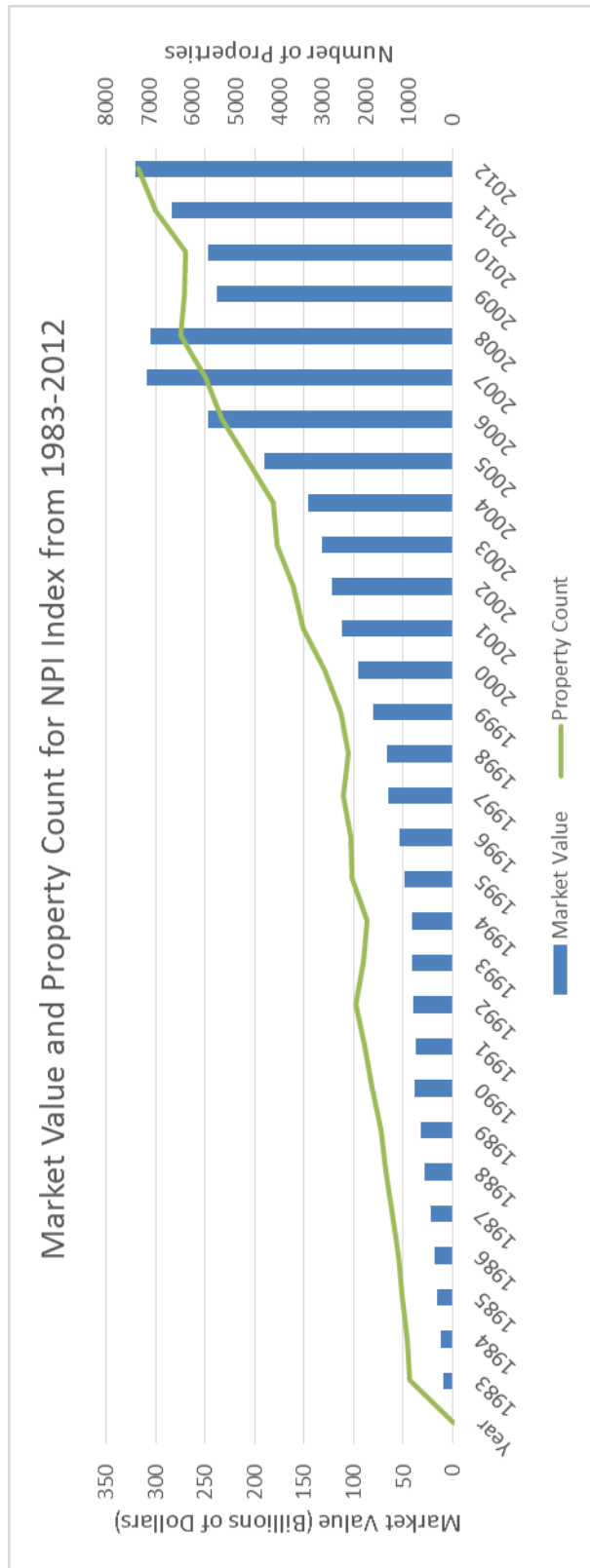
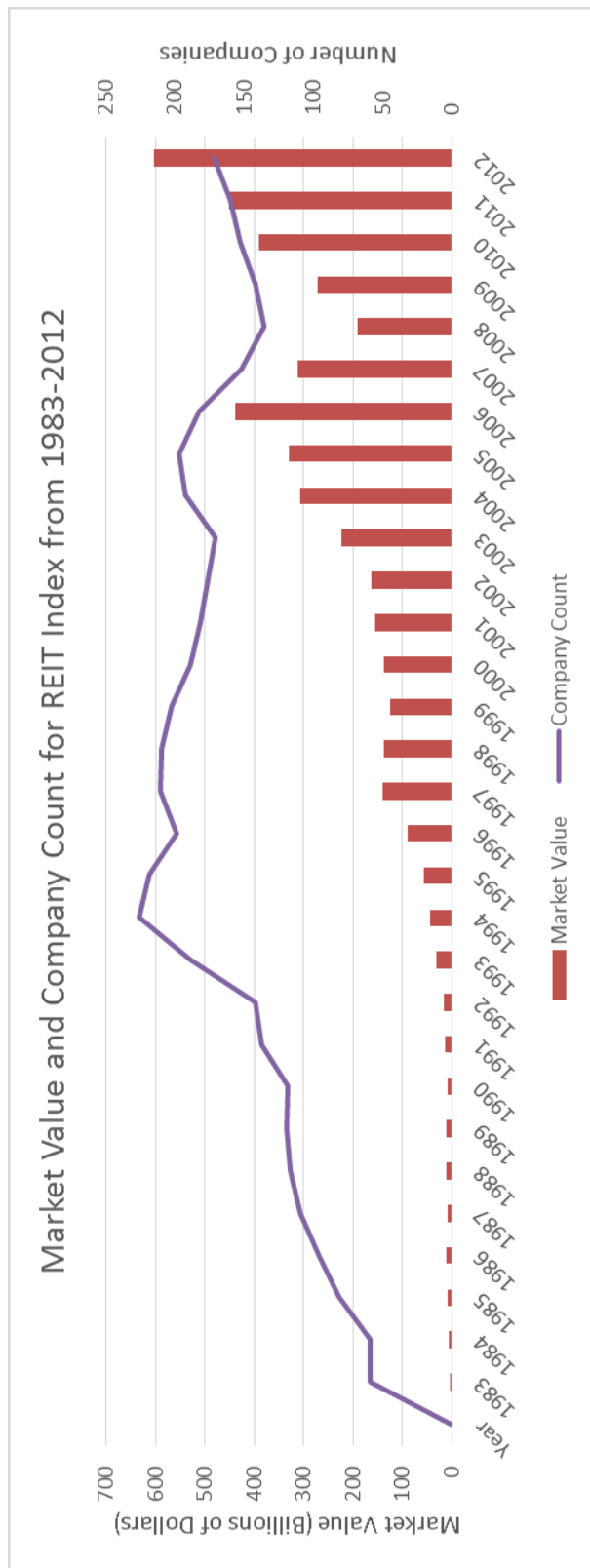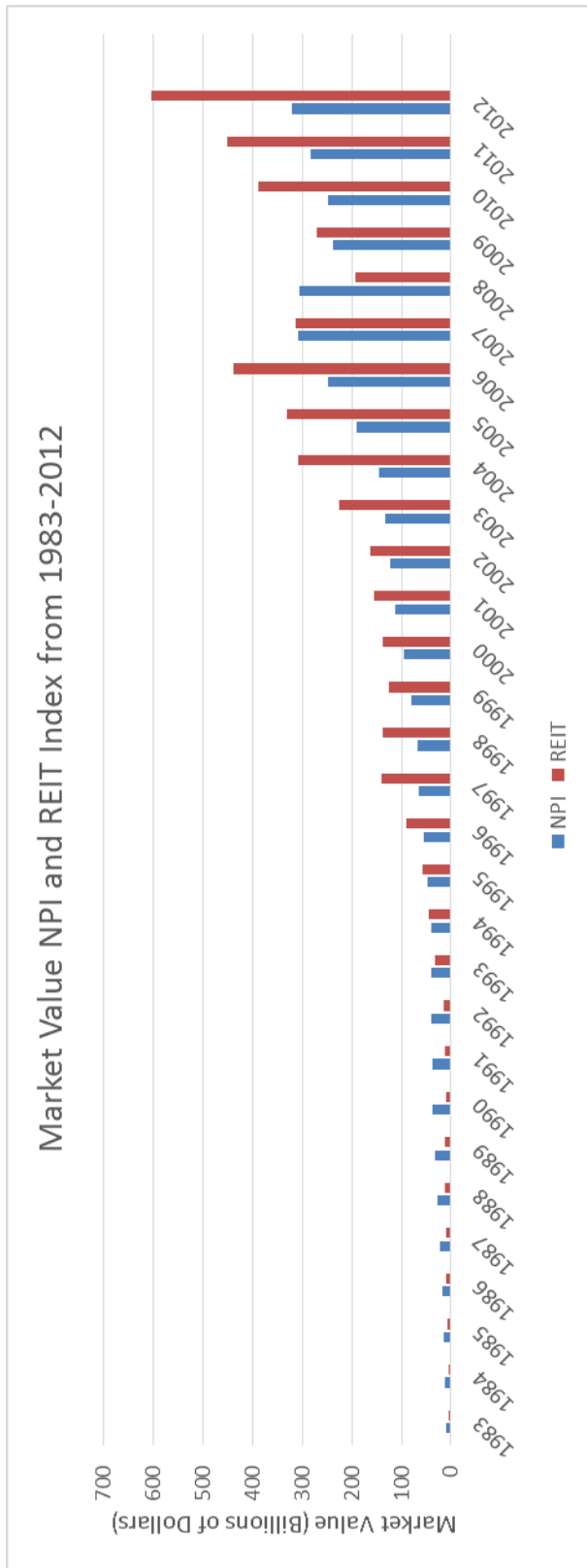*Figure 3: Market Value and Property Count for the REIT Index from 1983-2012*

Figure 4: Market Value for the NPI and REIT Index from 1983-2012

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