AN ANALYSIS OF THE COMMERCIAL REAL ESTATE MARKET OVER THE PAST DECADE
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INTRODUCTION

Investors are faced with many choices. Should they stick to government bonds or take the dive into the stock market? Which investment vehicle is the most stable, most lucrative, or least volatile?

This research paper investigates the relationships and correlations of commercial real estate capitalization rates (cap rates) and various other investment opportunities such as the S&P 500 stock index, corporate bonds, Treasury bills, and real estate investment trusts (REITs). The complex relationship between these investment vehicles is explained and illustrated in order to provide an understanding of future changes in the commercial real estate market. This paper also allows potential investors to better understand the many investment opportunities that exist and can serve as a guideline for choosing the type of commercial real estate investment that is best suited for their individual requirements.

A comprehensive evaluation of the developments and market changes over the past decade (2001-2011). Due to the two recessionary periods that occurred during this timespan, this research paper strives to explain the various events that caused changes in the market, how they affected the value of real estate investments at the time and most importantly how the market was permanently altered.

Due to the similarities that REITs share with direct investment in commercial real estate, this paper compares and contrasts cap rates and REIT dividend yields. Also, a few distinctions between publicly traded and private REITs are discussed to further aid investors in their decision making process.

Commercial real estate is divided into broad sectors, which can be split into various subcategories. Each property sector and type has its benefits and caveats. Risk is rewarded with higher returns and stability tends to correlate with lower cap rates. Part of this research report is dedicated to an investigation of the correlations between various commercial real estate investment opportunities in comparison to one another, as well as Treasury bill yields, S&P 500 average yields, and AAA corporate bonds yields.

As a result of the two recessionary periods during the data’s timespan, certain anomalies, such as a sudden spike in REIT yields, are treated as outliers and removed from the equation. These results are discussed separately with the intention of creating a “what if” analysis that assumes the REIT yield spike to be a phenomenon that will not occur again any time soon.

The findings of this research report will hopefully assist investors in their decision-making process. Several suggestions are made regarding: Whether direct investment in commercial real estate or REITs are the best investment strategy, which type of REIT to invest in, and what property sectors one should consider over others.
The capitalization rate, also known as cap rate, is a way of quoting an investment property’s price in relation to its expected first year net operating income (NOI). This is an essential tool that investors and brokers use on a daily basis to allow them to quickly compare multiple properties potential profitability regardless of their dollar price points. Cap rates are easily calculated via dividing the first years NOI by the value (V) of the property. Assuming a fixed NOI, there is an inverse relationship between a property’s cap rate and its value. A lower cap rate implies a higher property value, while a higher cap rate means that the property’s value decreased.

\[
\text{Cap Rate} = \frac{\text{NOI}}{V}
\]

This also explains the negative correlation between investment property transaction volume and their respective cap rates. If investors shy away from buying property, cap rates increase to make the market more attractive. When the demand for income property increases, owners sell their properties for lower cap rates because the value increased with the number of transactions for the period.

1 “Capitalization Rate Definition”. Investopedia ULC. http://www.investopedia.com/terms/c/capitalizationrate.asp#ixzz1b474yke8.
Cap rates are cyclical. The commercial real estate investment market is heavily influenced by macroeconomic conditions such as changes in employment levels, gross domestic product (GDP) and inflation. The long-term average for commercial real estate cap rates is 7.62% and most of the cyclical movement has been in the 6.75% to 8.75% range.\(^2\) The chart provided highlights all movement within one standard deviation of the mean. That means 68.2% of all movement is within the 6.75% to 8.75% range (34.1% above and below the 7.62% mean). Between 2005 and 2007, cap rates started to bottom out at around 5.5% to 6%, which is well outside of the normal range. This era was distinctive in that commercial real estate prices reached unsustainable all-time highs, before cap rates spiked up past 8% to levels that have not been seen since the last recession in 2001. Towards the end of 2011, smaller deals were completed that once again fell in the 5.5% to 6% range. NCREIF cap rate data between 1979 and 2009 show that cap rates rise above the mean, and then fall below the mean approximately every eleven years. While a dataset spanning across 30 years is not enough to conclude that this theory will hold true for the next three decades, there certainly is possibility of this becoming a regular cycle for cap rates.

Cap rates are a function of opportunity risk, represented by the risk-free yield \((k_{RF})\) of long-term Treasury bills, the risk premium \((RP)\) that investors demand for real estate investments, and the expected income growth rate \((g)\) that is a combination of rent increases over time and changing vacancy rates. Taking these factors into consideration, the formula for calculating cap rates will look like this:

\[
\text{Cap Rate} = (k_{RF} + RP) - g
\]

While one may think that changes in vacancy rate and rent are the most volatile components of this formula, it is important to note that the three variables are interdependent and do not change without affecting another. The interaction of these components is complex and there are countless reasons why one of these factors may change, inadvertently causing the others to change as well.

TREASURY BILLS & CAP RATE SPREADS

While growth rates and risk premiums are rather difficult to calculate, Treasury bill (T-bill) yields are quoted daily and readily accessible to everyone. Since Treasury rates play an important part in determining cap rates, investors look at the cap rate – Treasury spread.

Even though it is possible to have a negative spread between cap rates and Treasury bill yields, it is normally a positive value that is composed of the risk premium and growth expectations. From the late 90s until 2003, the cap rate – Treasury spread was relatively wide in comparison to recent years during which the spread continued to tighten rapidly even as Treasury bill yields tumbled. After a quick spike of T-Bill yields that lasted from 2006 to 2007, the spread began to widen again.

The reason for the decline in cap rates since 2002 was heavily debated. Some say it was due to commercial real estate becoming a more widely acknowledged form of investment. Others argue that it was merely the effect of high demand and low supply driving up the prices. Researchers’ general consensus is that the increase in property values was due to “market fundamentals and rational pricing of real estate relative to other asset classes. The re-pricing of risk and resulting reductions in risk premiums and spreads was an economy-wide phenomenon affecting all risky asset classes not just real estate.”

While Treasury yields and the interest rate on corporate bonds (with Moody’s Baa rating) declined since 1990, the spread between Treasuries and cap rates began to decrease in 2003, reaching its lowest point in 2006 and 2007, just before the recession hit towards the end of 2007, during which it spiked up again. While Baa-rated corporate bonds tend to have lower yields than the cap rates of less liquid real estate investments, their relationship reversed towards the end of 2005, providing an early indication that the real estate market became too aggressive and property prices needed to be adjusted.

**RECESSIONS**

It is important to note that the time period being analyzed contains two recessions. According to the National Bureau of Economic Research (NBER), the largest private economic research organization in the United States of America, “a recession is a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales.” The first of the two recessionary periods of this decade occurred between March and November of 2001, followed by the second economic downturn that started in December 2007 and officially ended June 2009.

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The 2001 recession was relatively mild in comparison to past recessions and depressions that the United States economy experienced. The main factors that contributed to this short downturn, were the tech bubble burst, the terrorist attacks on the World Trade Center and a series of very much publicized accounting scandals, such as that of Enron. The real estate market was only slightly affected by this recession. Cap rates increased slightly while many investors shied away from the volatile stock markets and decided to put more money into real estate and especially the attractively liquid REIT market which proved to be a quick and easy way to hedge risk.

Despite the NBER officially declaring June 2009 as the end of the 2007 recession, the data shows that GDP has not reached average quarterly growth level of 3.28% until the first quarter of 2010 and even showed a declining trend starting after the first half of 2010. In comparison, the year over year growth did not reach the median until mid-2010.

Researchers agree that the recent recession was caused by “the collapse of the housing market and the resulting sub-prime mortgage crisis that led to bank failures in the US and Europe.” Businesses had a difficult time obtaining credit for real estate acquisitions, refinancing, or new developments. Record high oil prices are also quoted as a reason for the worldwide economic downturn. The impact of this international recession could be seen in the stock-, as well as the real estate markets. As the liquidity crisis forced many businesses to sell part of their real estate portfolios, the situation worsened due to the already saturated real estate market being flooded with many more properties that had to be foreclosed or sold at sometimes half their prior values.

(NCREIF data was only available until 2009. Real Capital Analytics only includes deals greater than $5million.)

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After a consistent five-year decline, cap rates immediately adjusted towards the end of 2007, when it was clear that a recessionary period was about to begin. As with other recessions in the past, cap rates shot upwards and were expected to level out just north of the 7.6% range, the historical average. Generally, the real estate market lags the economy; but when the most recent recession started in 2007, cap rates hovered around 7% and did not begin to drastically spike up until November 2008, almost a year after the recession began. Cap rates continued to rise to 8.1% in October 2009, past the official June 2009 ending date of the recession, and then started to gradually revert back to 7% in the last quarter of 2011.8

Overall, transactions involving commercial real estate have increased dramatically since 2001 until they reached its highest point in Q3 of 2007. GDP year-over-year growth has been consistent during this time, hovering around 2%. Once the recession started in the fourth quarter of 2007, GDP growth, as well as transaction volume for commercial real estate plummeted. Although the NBER declared the recession to be over by the end of the second quarter of 2009, transaction volume has not picked up while GDP year-over-year growth continued to climb into positive territory.

The commercial real estate market, as well as most other financial sectors, has been vastly affected by the 2007 recession. Even though the recession was officially declared to be over, cap rates and other economic measurements did not recover until many months after June 2009. Demand for commercial real estate and GDP growth over the past decade have not been highly correlated. Despite a relatively stable growth in the United States’ gross domestic product, commercial real estate transaction volume skyrocketed until mid-2007 and then began to steeply decline, indicating that investors put too much trust in the unsustainably increasing prices of real estate. A valuable lesson than can be learned from this, is for investors to have a realistic outlook on the future of their investments. Real estate is not, as it is commonly thought of, a “safe bet”. However, it is one of the most stable and profitable investments one can make relative to S&P 500 stocks, which lost over 56% of their value in the 2007 market crash and only recovered 63% of that loss over a course of almost three years.

REAL ESTATE INVESTMENT TRUSTS

There are many types of investments that participate in the commercial real estate market. Besides the traditional direct investment, one of the more popular methods to get involved in the commercial real estate market is the investment in real estate investment trusts. Investigating the benefits and caveats of real estate investment trusts is essential to aiding potential investors in making informed decisions.

Real estate investment trusts (REITs), which have existed for over a century, are investment opportunities that are traded as shares on major stock exchanges such as the New York Stock Exchange (NYSE). Investors seek safe, bond-like investments with consistent dividends; and REITs fall into that category. While mortgage REITs are considered higher risk equities, equity REITs use their investors’ capital to purchase real estate and distribute at least 90% of the taxable rent income as dividends to avoid corporate taxes. Some of the benefits that attract investors to REITs are the avoidance of double taxation, stable and predictable cash flow in form of high dividend yields, and their ability to provide a highly liquid method of investing in real estate.9

REIT dividend yield data shows an extreme spike between September 2008 and May 2009. During this time, dividend yields for equity REITs reached their highest point since 1990, creating a spread between Treasury bills and REIT yields that has never been seen before.10

In a Seeking Alpha article from September 21st, 2011, Brad Thomas talked to several professionals who work well-known investment companies. They explained the equity REIT dividend yield spike in the following way:

“A dividend that high indicates the market doesn’t believe that dividend is sustainable. Yields in the 20s and 30s (and higher) often reflect a view by the market that this dividend is likely to be cut. When investors get jittery about a REIT’s ability to cover its dividend, they tend to sell shares, which causes the yields to jump. Some REITs have suspended their dividends, while others have either trimmed them or opted to pay a portion of them in stock.”11

9 “Real Estate Investment Trust (REIT) Definition”. Investopedia ULC. http://www.investopedia.com/terms/r/reit.asp#axzz1dnD7O6IT.
However, one particular kind of REIT remained unharmed by the recession. Healthcare REITs, such as Universal Health Realty Income Trust (NYSE:UHT), continued to perform well due to rising demand for nursing homes and doctors. The medical industry seems to be the most stable one, as it remains unchanged even during economic downturns.12 Surprisingly, industrial REITs have come out of the recession as winners as well. While cap rates for industrial properties have been higher than most other property sectors, REIT dividend yields were below average but started to yield higher than retail and office REITs, which used to be regular winners.

One indicator that is being used to evaluate REITs, is the spread between REIT dividend payouts and Treasury bill yields. Since Treasury bills are virtually risk-free and only represent a combination of liquidity and inflation risk, most other investments should produce higher yields, as investors demand a premium for the potential default risk of non-government securities. When REIT yields drop below T-Bill rates, REIT prices can be expected to fall. Inversely, when the spread is too wide, REIT prices need to rise. The most recent recession was essentially forecasted by the spread between REIT and Treasury yields: “When the yield spread became negative in 2007, REIT prices began to decline, well before the 2008 stock market crash.”

According to mean reversion theory, REIT dividends and Treasuries will gradually go back to their long-term mean. That means REITs should yield closer to their 38-year median dividend yield of 7.44% and Treasury rates will rise as well until they have reached 7.03%. This, however, would reduce REIT prices even further.13

<table>
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<tr>
<th>REITs</th>
<th>Treasuries</th>
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<tr>
<td>Average:</td>
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</tr>
<tr>
<td>Median:</td>
<td>7.44%</td>
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<tr>
<td>Maximum:</td>
<td>13.07%</td>
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<tr>
<td>Minimum:</td>
<td>3.40%</td>
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Compared to most other non-real-estate-related investment opportunities, REITs that focus on single-tenant triple net leases provide the most stable incomes. They tend to be highly correlated with “the risk-adjusted premiums of a well-balanced bond portfolio”, which makes them very attractive to investors who want to safely invest in the commercial real estate sector without having to own real property. A well-managed REIT provides a diversified and sustainable investment opportunity that is based on three factors: credit quality of the tenants, the lease contracts’ terms and duration, and future rent increases. While investing in a REIT will not yield as much as directly owning commercial real estate, a balanced REIT can be a low-risk and medium-return alternative without having to manage one’s own portfolio of income properties.

Investopedia fittingly describes asset diversification as “the only free lunch you will find in the investment game”. While REITs can diversify their portfolio through investing in various property sectors (office, retail, industrial etc.) with tenants that have high credit ratings, there are certain risks that cannot always be hedged against. Private REITs allow investors to escape the volatility of the stock markets, while public REITs provide a very liquid investment opportunity that is similar to owning shares of corporate stocks.¹⁴

### US SINGLE-TENANT TOP BUYERS (PRIOR 24 MONTHS)

<table>
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<tr>
<th>RANK</th>
<th>PUBLICLY TRADED</th>
<th>BUYER</th>
<th>ACQUISITION VOLUME</th>
<th>DOLLAR AMOUNT (IN MILLIONS)</th>
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<td>1</td>
<td>No</td>
<td>Cole Real Estate Investments</td>
<td>270</td>
<td>$2,860.70</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>Dividend Capital Trust</td>
<td>30</td>
<td>$1,150.70</td>
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<td>3</td>
<td>No</td>
<td>American Realty Capital</td>
<td>126</td>
<td>$1,013.30</td>
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<td>5</td>
<td>Yes</td>
<td>Realty Income Corp</td>
<td>41</td>
<td>$713.20</td>
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<td>6</td>
<td>No</td>
<td>WP Carey</td>
<td>53</td>
<td>$679.90</td>
</tr>
<tr>
<td>7</td>
<td>No</td>
<td>CB Richard Ellis Realty Trust</td>
<td>20</td>
<td>$669.80</td>
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<td>10</td>
<td>Yes</td>
<td>Government Properties Income Trust</td>
<td>24</td>
<td>$529.40</td>
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<tr>
<td>11</td>
<td>Yes</td>
<td>Digital Realty Trust</td>
<td>7</td>
<td>$524.50</td>
</tr>
<tr>
<td>14</td>
<td>No</td>
<td>Industrial Income Trust (IIT)</td>
<td>24</td>
<td>$466.60</td>
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<td>16</td>
<td>Yes</td>
<td>Senior Housing Properties Trust</td>
<td>20</td>
<td>$435.50</td>
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<td>17</td>
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<td>18</td>
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<td>20</td>
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<td>7</td>
<td>$338.90</td>
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</table>

The majority of the top 20 U.S. buyers of single-tenant commercial real estate were REITs, amounting to just over 10 billion dollars in transactions over the past two years. While there were 6 publicly traded and 7 private REITs on the list, private REITs tended to be the higher ranked buyers in terms of both transaction volume and invested dollar amount. On average, private REITs purchased close to four times the number of properties and invested more than twice the amount of money than public REITs did.

Private REITs are less liquid than their public counterparts but tend to be less volatile while hedging against inflation and providing a stable dividend income that can be compared to corporate bond investments. The private REIT investment is probably the one that is comparable to directly investing in commercial real estate.

PROPERTY SECTORS

Investors who want to buy commercial real estate have several property sectors to choose from. The traditional categories are apartments (or multifamily homes), hotels, industrial buildings, office spaces and retail centers. Other classifications, sometimes defined as subcategories of the retail sector, are dollar stores, pharmacies, malls and services such as medical offices and self-storage facilities.

Each property sector has different availability, lease terms and required levels of landlord involvement, rendering them more or less attractive to investors, depending on their individual preference and risk adversity. In order to get an objective analysis of the many property sectors, investors need to compare and contrast their respective average cap rates, transaction volumes, REIT yields and volatility levels. For the purpose of this research report, each sector’s performance is measured against another, as well as Treasury bill rates, S&P 500 average yields, and AAA-rated corporate bonds.

The property’s cap rate is the first piece of information that investors require when purchasing commercial real estate. On average, Industrial cap rates tend to be higher than office cap rates, closely followed by retail cap rates. Apartment building cap rates have consistently been the lowest with an average spread of approximately 100 basis points below industrial and office cap rates. Of course, the spread between the property sectors’ cap rates compressed to nearly 50 basis points due to the high demand for commercial real estate during the time between mid 2006 and the end of 2007. However, the ranking of the sectors from highest to lowest average cap rates has remained roughly the same throughout the past decade.
Despite industrial cap rates being the highest, industrial REITs have had the lowest returns until the fourth quarter of 2008, when returns spiked past 20% and then dropped sharply just 3 months later. Surprisingly, industrial REIT yields remained higher than other REIT returns at least until May 2011. Industrial REITs are also by far the most volatile. The most stable REITs seem to be investing in apartment and office buildings, though retail REITs are following closely while generating very good returns.

The spike in REIT dividend yields between August 2008 and March 2009 is explained by a huge market sell-off that occurred during the previous quarter. Throughout that time, REIT prices saw an enormous drop. When investors suspect a dividend yield to be unsustainable, they sell shares, which cause the yields to temporarily rise even higher. Industrial REITs shot past 20% returns and retail REITs only reached a relatively conservative 9.75%.

In regard to transaction volume, industrial properties are predictably traded the least and apartment buildings tend to have the highest transaction volume. There a few outliers, frequently a 100% increase in transaction volume from the previous period, which may be as a result of deals being completed in the last months before years end.

Investors have to decide which risks they like to hedge against. Some property sectors, such as medical offices, are less affected by recessions due to the high demand for medical specialists that does not typically curb in economic downturns. Apartment buildings are traded the most, meaning they are more liquid than low-demand industrial properties. The law of risks and returns applies to commercial real estate as much as it does to other investments: The high liquidity risk associated with industrial real estate is rewarded with high cap rates, while more stable property sectors yield lower cap rates.

CORRELATIONS

To better understand the relationship between cap rates, REIT yields, Treasury bills, etc., a correlation table can be used to quantify the many possible comparisons that can be made. This method is entirely mathematical and does not take into consideration any qualitative information.

Correlation is defined as the statistical measure of how two investments move in relation to another. Correlation is expressed as correlation coefficient, which ranges between -1.00 and +1.00. Perfect positive correlation is expressed through a co-efficient of +1.00 and implies the two investments move in unison either up or down. Perfect negative correlation suggest that as investment moves up, the other one will move down and vice versa. When the correlation is close to 0, the movements of the investment are independent from another. 

“Correlation Definition”. Investopedia ULC. http://www.investopedia.com/terms/c/correlation.asp#axzz1aUrE1Ind.
Correlations are one of the tools that are being used to make important investment decisions. For example, there is a high correlation between income and education. People with higher income tend to have more years of education than people with lower income. Knowing there is a correlation between two variables, one can make a prediction. Given a person’s income, one can roughly predict their years of education. The higher the correlation between the data, the more precise is the prediction that can be made with it. Due to the strong correlation between high income and years of education, many people decided to invest in education with the goal of receiving high incomes once they graduate.

In some cases a correlation of |0.50| is considered very high. However, for the purpose of this research paper, a correlation coefficient of less than |0.50| is identified as very low since most of the investment vehicles discussed in this report are expected to show relatively high correlations with one another due to their common ties to the commercial real estate market.

The correlation chart shows that all property sectors’ cap rates had a very high correlation of +0.90 and above. Furthermore, each property sector’s transaction volume was negatively correlated to their respective cap rates. All showed moderate to somewhat high negative correlations between -0.60 and -0.70. This is expected, as lower demand for commercial real estate causes cap rates to increase and vice versa.

While the S&P 500 index did not seem to be significantly correlated with any of the other real estate data, neither did Treasury bills. In fact, only corporate bonds showed moderate to somewhat high correlations with cap rates.
The 2007 recession increased REIT volatility. When comparing U.S. REITs to the Dow Jones, their beta is merely 0.72; in the past REITs had higher correlations with the stock market, resulting in a much higher beta value. Just two years ago, in 2009, most REITs beta values were +1.00 and higher. On the other hand, this can also be interpreted as a suggestion for REIT investments as a method for hedging against stock market volatility.

All REITs, except the volatile industrial REITs, had high to very high correlations with another ranging between +0.81 and +0.93. Yet, this seems to be too big a spread considering that all property sector cap rates’ correlations have consistently been very high.

Most property sector’s REITs had *moderate* positive correlations with their respective cap rates; only industrial REITs had a *very low* correlation below +0.50. Industrial REITs and cap rates appear to be very volatile throughout. While a positive correlation between REITs and cap rates is not surprising, one would expect the correlation to be higher between the two.

The REIT data between October 2008 and August 2009, as well as the retail property volume spike seem to be anomalies. Once these are removed from the data, the correlations involving REIT yields and transaction volume will somewhat normalize. Even though excluding these outliers standardizes the data, it is important to note that future events could very well paint a picture that would encourage for the outliers to be included in the calculations.

### CORRELATIONS (EXCLUDING OUTLIERS)

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<th>BOND</th>
<th>S&amp;P500</th>
<th>CAP V</th>
<th>VOL</th>
<th>RET</th>
<th>OFFICE V</th>
<th>VOL</th>
<th>RET</th>
<th>INDUSTRIAL V</th>
<th>VOL</th>
<th>RET</th>
<th>APARTMENT V</th>
<th>VOL</th>
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Cases: Very Low < 0.30, Low < 0.50, Moderate < 0.70, Somewhat High < 0.80, High > 0.80, Very High > 1.00, Negative Test = Insignificant, Test = Relevant.

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Since cap rates were not affected by exclusion of any outliers, the highest correlations could still be seen amongst most of the property sectors’ cap rates. While these all stayed roughly the same, the correlation between cap rates and their respective REITs increased drastically from having low correlations to being in the 0.70 to 0.85 range on the positive side. All REIT yields remained highly correlated between +0.79 and +0.97 and property transaction volumes still showed high positive correlations in the 0.80s.

Due to taking out the retail property transaction volume spike in June 2011, correlation between transaction volume and cap rates increased for the retail sector. Transaction volume data seems to have a somewhat high negative correlation of -0.70 with their respective cap rates. Interestingly, industrial REITs were had a moderate -0.68 correlation with industrial property transaction volume and apartment REITs showed a low -0.51 correlation with the respective data while retail and office building transaction volumes were much less correlated with REIT yields. One possible reason for this phenomenon may be that industrial and apartment buildings tend to be held by REITs rather than private investors.

S&P 500 yields had a -0.74 correlation with Treasury bills and showed a moderate -0.68 correlation with corporate bonds, while corporate bonds and T-Bills had a high positive correlation of 0.89. Even though transaction volume seems to have no relation to S&P 500 yields, Treasury bills, corporate bonds, REIT yields, as well as cap rates show moderate to high negative correlation with S&P 500 yields. Industrial property REITs and cap rates seem to be the exception with very low correlations of -0.44 and -0.45 respectively. Cap rates have very low correlations with Treasury bills but show higher correlations when compared to corporate bonds. Generally, REITs showed low to moderate positive correlations in the 0.55 to 0.68 range, when compared to Treasury bills, while their correlation with corporate bonds fell in the 0.67 to 0.86 range. Only industrial REITs fell short when comparing them to Treasury bills.

Despite the slight spread between property sectors’ cap rates, their movement is roughly the same as they are influences by the same market conditions. The dividend yields between REITs also vary but the correlations are roughly the same. However, the correlation of REITs’ movements is more spread out and volatile than that of cap rates. While REITs and cap rates do not show very significant correlation with S&P 500 performance, publicly traded REITs definitely behave similar to stocks rather than direct investment in commercial real estate. REIT have been extremely volatility in the past and lacked a definite correlation with cap rate data unless potential outliers were removed from the equation, skewing the results to potentially falsely predict future data. It seems that REITs do not necessarily provide a true alternative to direct real estate investment, but can supplement corporate stock investments as a method of hedging against stock market volatility.
CONCLUSION

Even though direct investments in real estate, as well as REITs, were affected by the 2007 recession, REITs and corporate stocks took a much bigger hit while having generated less return in the years prior to the economic downturn. The U.S. economy is still recovering from the recession and will most likely remain in this state for another year or so, while cap rates are expected to rise and revert to their healthy and sustainable median values.

Undeniably, owning a property has the disadvantage of being much less liquid. However, it is much better, and safer to own real estate than to invest in REITs. REITs tend to be much more volatile than direct investment in real estate. REIT shares, similar to corporate stocks, are overly exposed to market scares and investor selloffs. Some investors may elect to put their money into private equity REITs, as they are just slightly less liquid but tend to generate higher returns. Due to the recent decrease of REITs beta, they also can be a good way of hedging against stock market volatility.

Commercial real estate is divided into several sectors and subcategories that have their individual advantages and caveats. Thankfully, having the choice between so many categories allows all types of investors to create a real estate portfolio that is tailored to their specific requirements. Healthcare properties are stable, industrial real estate has high returns, followed by office spaces and retail centers.

For investors with a preference for relatively safe and profitable long-term investments, direct investment in real estate presents itself as the best option. Triple-net leases provide a stream of annual income with minimum landlord involvement required. To help avoid any type of trouble that could possibly be associated with direct investment in commercial real estate, companies such as Calkain provide asset management services to ensure that all matters are taken care of.

Whether one chooses to directly buy property or invests in a REIT, the commercial real estate market offers numerous options to all types of risk-averse investors. With enough research done prior to investing, these investment vehicles can be anything from high-risk and very lucrative to extremely stable while delivering a constant flow of income.
DISCLAIMERS & OTHER CITATIONS

This document was created in Adobe InDesign CS5.\textsuperscript{18}

All final charts, tables, and other visuals were created with Microsoft Excel 2011.

Some of the data that was used to create the excel graphs, was extracted from other image sources using ByteScout Graph Digitized Scout Trial Version.\textsuperscript{19} None of the extracted data was used for calculations but rather to create visuals that would illustrate the behavior of certain types of real estate data in comparison to one another.

Long-Term Treasury bill yield averages are from the official website of the United States Department of the Treasury.\textsuperscript{20}

AAA Corporate Bond yields were retrieved from research done by the Federal Reserve Bank of St. Louis.\textsuperscript{21}

S&P 500 dividend yields are from a website that publishes data created by Dr. Robert Shiller of the Department of Economics at Yale.\textsuperscript{22}

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\item \textsuperscript{18} http://www.adobe.com/products/indesign.html.
\item \textsuperscript{19} http://www.bytescout.com/products/enduser/graphdigitizerscout/graphdigitizerscout.html.
\item \textsuperscript{20} http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=longtermrateAll.
\item \textsuperscript{21} http://www.research.stlouisfed.org/fred2/series/AAA.
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United States quarterly GDP growth rates are from Trading Economics, which provides its users with accurate information for 232 countries including historical data for more than 300,000 economic indicators.\(^23\)

The average returns for all equity REITs, as well as all individual REIT sectors, were collected from the official website of the National Association of Real Estate Investment Trusts (NAREIT), the worldwide representative voice for REITs and publicly traded real estate companies with an interest in U.S. real estate and capital markets.\(^24,25\)

NCREIF data came from the official website of the National Council of Real Estate Investment Fiduciaries (NCREIF), an association of institutional real estate professionals who share a common interest in their industry.\(^26\)

Cap rates and transaction volume data for all property sectors were provided by Real Capital Analytics, a global research and consulting firm that provides proprietary research, focused exclusively on the investment market for commercial real estate.\(^27\) The National Council of Real Estate Investment Fiduciaries (NCREIF) only collects cap rate data provided by institutional investors, while Real Capital Analytics covers “all transactions of $5 million or more, of which institutional transactions are one component.” Because Real Capital Analytics’ data tends to be a more comprehensive representation of average cap rates, this research report was mainly based on their data. The caveat to using Real Capital Analytics’ data is that it only dates back up to 10 years.

\(^{24}\) http://www.reit.com/IndustryDataPerformance/FTSENAREITUSRealEstateIndexHistoricalValuesReturns/
MonthlyPropertyIndexValuesReturns.aspx.