# *PERFORMANCE APPRAISAL OF REAL ESTATE INVESTMENT TRUSTS (REITs): A PRACTICE IN ISTANBUL STOCK EXCHANGE*

**Assoc. Prof. Dr. Murat KIYILAR**
Istanbul University
Faculty of Business Administration
**Dr. Ali HEPŞEN**
Istanbul University
Faculty of Business Administration

## ABSTRACT

The primary purpose of this research is to examine real estate investment trust (REIT) risk-adjusted return performance versus the average performance of common stocks as measured by the Istanbul Stock Exchange (ISE). The sample for this study is composed of 8 REITs whose stocks were traded on the ISE for the period January 2000 through December 2008: Alarko GMYO, Dogus GE GMYO, Is GMYO, Nurol GMYO, Ozderici GMYO, Nurol GMYO, Vakıf GMYO and Yapı Kredi Koray GMYO. The Sharpe Index and the Jensen Index are employed to measure the performance of each REIT relative to the market portfolio. The results of this study indicate that Pera GMYO performs better than the other RIET stocks for both Sharpe and Jensen Indices over the study period.

**Key Words:** Real Estate Investment Trusts, Sharpe Index, Jensen Index, Performance Ranking
**JEL Classification:** G12, G23, G29

## ÖZET

Bu çalışmada, Istanbul Menkul Kıymetler Borsası'nda Ocak 2000-Aralık 2008 dönemleri arasında işlem gören gayrimenkul yatırım ortaklıklarının (Alarko GMYO, Dogus GE GMYO, Is GMYO, Nurol GMYO, Ozderici GMYO, Nurol GMYO, Vakıf GMYO and Yapı Kredi Koray GMYO) performans değerlendirmesi yapılmıştır. Çalışmada, portföy performans değerlendirmesinde yaygın olarak kullanılan Sharpe ve Jensen performans ölçütlerine yer verilmiş ve her bir performans endeksine göre çalışma kapsamında yer alan 8 adet gayrimenkul yatırım ortaklığının araştırma dönemi itibariyle performans durumları ortaya konmuştur. Çalışmanın bulguları incelendiğinde ise, gerek Sharpe gerekse de Jensen

performans ölçütleri bakımından en başarılı hisse senedinin Pera GMYO olduğu sonucuna ulaşılmıştır.

**Anahtar Sözcükler:** Gayrimenkul Yatırım Ortaklıkları, Sharpe Performans Ölçütü, Jensen Performans Ölçütü, Performans Sıralaması
JEL Sınıflandırması: G12, G23, G29

## INTRODUCTION

A real estate investment trust (REIT) is a financial intermediary that provides individual investors with the opportunity to own a portfolio of real estate investments. They are managing portfolios composed of real estates, real estate based projects and capital market instruments based on real estates. REITs are important investment vehicles in direct real estate ownership and lending. (Waters and Payne, 2007) Investment in real estate through REIT ownership does not require the large and long term financial commitment typical of other real estate investment alternatives. (Yat-Hung, Chun-Kei Joinkey, and Bo-Sin, 2008) The ownership of most REITs can also be easily transferred with very low transaction costs, since shares of REITs are publicly traded. (Basse and Friedrich, 2009) As a result of this, the returns of these shares are observable on a daily basis. This provides a unique opportunity to assess the risk and return relationship for a real estate based assets. (Titman and Warga, 1986)

REITs are generally categorized as equity, mortgage and hybrid trusts. The equity trusts own real estate. Their revenue comes principally from rent. These types of REITs are the most common. Investors have a relatively steady dividend payout, and the real estate often provides capital appreciation. Traditional investments include office buildings, houses, apartments, and shopping centers. Mortgage REITs loan money to real estate owners. Revenues are derived from interest earned on mortgage loans. Also some mortgage REITs invest in residuals of mortgage-based securities. Mortgage REITs generally do not own property, and income can be affected by fluctuations in interest rates and loan defaults. A combination of equity and mortgage REITs are hybrid REITs. They own property and also loan funds to owners of real estate. Hybrid REITs has all advantage of equity REITs and mortgage REITs. While it has the potential for both capital appreciation and loss, it also provides income but does not mature with a repayment of principal. It can provide the long term investor with an attractive yield at relatively low risk, and an opportunity to diversify into income generating commercial real estate. (Grupe and DiRocco, 1999)

## HISTORY OF REIT INDUSTRY IN TURKEY

According to the Turkish Association of Real Estate Investment Companies (GYODER), REITs are professional investment companies that will shape the real estate industry of the future in Turkey and they are one of the most important innovations to appear on financial markets in recent years. REITs are important investment vehicles for bringing corporate capital to the financing resource-starved real estate sector as well as developing large and quality projects. REITs have eliminated the problem of liquidity, the most fundamental problem facing investments in real estate. Moreover, by bringing together the savings of individual and corporate investors into a common pool, they are able to realize large profit-generating real estate projects.

**Table 1. Historical Consolidated Portfolio Structure of REITs in Turkey**

| All Real Estate Investment Trusts | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | Month | Number of Trusts | Net Asset Value Thousand TRY | Market Capitalization Thousand TRY | R (%) | RP (%) | GB (%) | RR (%) | MM (%) | Other (%) |
| 1997 | 12 | 2 | 8,800 | 15,000 | 45.00 | 0.00 | 0.00 | 55.00 | 0.00 | 0.00 |
| 1998 | 12 | 5 | 135,799 | 37,519 | 84.71 | 10.67 | 2.72 | 1.90 | 0.00 | 0.00 |
| 1999 | 12 | 8 | 418,513 | 421,028 | 17.62 | 65.17 | 4.39 | 12.81 | 0.00 | 0.00 |
| 2000 | 12 | 8 | 531,873 | 313,307 | 47.16 | 43.87 | 3.62 | 4.36 | 0.99 | 0.00 |
| 2001 | 12 | 8 | 890,575 | 475,975 | 72.97 | 25.36 | 1.12 | 0.36 | 0.19 | 0.00 |
| 2002 | 12 | 9 | 1,081,125 | 338,714 | 72.80 | 23.08 | 2.37 | 0.23 | 1.53 | 0.00 |
| 2003 | 12 | 9 | 1,178,915 | 543,092 | 72.16 | 20.09 | 5.35 | 0.01 | 2.39 | 0.00 |
| 2004 | 12 | 9 | 1,382,911 | 1,445,753 | 90.63 | 0.00 | 0.00 | 0.00 | 9.37 | 0.00 |
| 2005 | 12 | 9 | 2,209,379 | 2,489,225 | 84.86 | 0.00 | 0.00 | 0.00 | 14.71 | 0.43 |
| 2006 | 12 | 11 | 2,480,857 | 2,081,671 | 93.79 | 0.21 | 6.01 | 0.00 | 0.00 | 0.00 |
| 2007 | 12 | 13 | 3,886,043 | 3,189,974 | 82.18 | 0.14 | 17.54 | 0.00 | 0.00 | 0.00 |
| 2008 | 12 | 14 | 4,269,388 | 3,045,946 | 86.75 | 3.43 | 4.30 | 0.01 | 5.51 | 0.00 |
| 2009 | 03 | 14 | 4,134,304 | 3,846,530 | 84.66 | 4.33 | 6.20 | 0.00 | 4.81 | 0.00 |
| 2009 | 06 | 14 | 4,250,812 | 2,761,017 | 85.52 | 5.64 | 3.83 | 0.02 | 4.04 | 0.95 |
| 2009 | 09 | 14 | 4,263,803 | 2,688,706 | 70.06 | 16.00 | 4.46 | 0.00 | 0.00 | 9.49 |

**Notes:** R %: Proportion of "Real Estates" in the Portfolio; RP %: Proportion of Real Estate "Projects" in the Portfolio; GB %: Proportion of "Public Debt Instruments" in the Portfolio; RR %: Proportion of "Reverse Repo" in the Portfolio; MM %: Proportion of "Money Market Instruments" in the Portfolio.
**Source:** www.tcmb.gov.tr

The main goal of REITs in Turkey is to create a source of financing for the real estate sector, which has been experiencing problems in this area. Permitting public investment and directing the funds collected to the real estate sector are just two new sources. They are also enabling investors with limited savings to benefit from the increased value created by pooling of their resources, which enables them to invest in large, productive real estate investments, which would otherwise be beyond the reach of small-scale investors. Furthermore, REITs want to be able to form a corporate and professional investment base in Turkey. They also have, as one of their goals, the creation of an alternative and transparent model to various inadequate practices that have been going on in the real estate sector.

As of September 2009, the number of REITs carrying out transactions on the Istanbul Stock Exchange (ISE) since January 2nd, 1997 had reached fourteen. However, apart from the ones already on the ISE, this number is expected to rise and the total market size to grow with new public offerings in the years ahead.

## LITERATURE ON REIT PERFORMANCE

Kim, Mattila and Gu (2002) investigated the performance of hotel real estate investment trusts (REITs) over the 1993–1999 period in comparison with the overall market and six other REIT sectors (office, industrial, residential, health care, retail and diversified). The Jensen Index was employed to measure the performance of each REIT sector relative to the market portfolio. A one-way analysis of variance (ANOVA) was conducted and the Turkey multiple comparison method was used to enable performance comparisons across the REIT sectors. The results indicate that hotel REITs carried the highest market risk as compared to other REIT sectors. The risk-adjusted return of hotel REITs was in line with that of the overall market.

Redman and Manakyan (1995) examine the risk-adjusted performance of REITs from 1986 to 1990 in relation to financial and property characteristics of their portfolios. The Sharpe measure of risk-adjusted rate of return was regressed against financial ratios (gross cash flow, leverage, asset size) and property investment ratios for a sample of equity and mortgage REITs. The result of their study is financial ratios, location of properties (more specifically, in the western United States) and types of real estate investment determine the risk-adjusted performance.

Han and Liang (1995) evaluated the long term (1970-1993) performance of REITs by using a specific performance measure, the Jensen index. They indicated that REIT performance was similar to three-month Treasury bills and a stock market portfolio (S&P 500 Index). They also investigated that equity REITs performed much better than mortgage REITs.

Cannon and Vogt (1995) examined possible agency problems in Real Estate Investment Trusts (REITs) by contrasting the performance, structure and compensation of the two REIT forms ("self administered REITs" and "advisor REITs") from 1987 through 1992. The market performance of the two REIT forms was analyzed by using the Jensen measure and the Sharpe measure. Results show that "self administered REITs" outperformed "advisor REITs" over the sample period.

Chan, Hendershott and Senders (1990) analyzed monthly returns on an equally weighted index of eighteen to twenty-three equity REITs that were traded on major stock exchanges over the 1973-1978 period. They employed a three-factor Arbitrage Pricing Model (APM) as well as Capital Asset Pricing Model (CAPM). They found that with CAPM there was an evidence of excess real estate returns, especially in the 1980s; but with APM, this evidence disappeared.

Howe and Shilling (1990) focused on the Jensen alpha for measuring the monthly returns of 105 REITs over the period 1973 to 1987. They classified REITs into different categories; but all categories exhibited zero or negative abnormal returns. They also suggested that firm size, property location and REIT type might explain REIT performance.

Goebel and Kim (1989) compared the performance of REITs (especially, the finite-life REITs) with the S&P Index. They found negative and significant Jensen indexes of performance for equally weighted portfolios of thirty-two survivor REITs. They concluded that the finite-life REITs underperformed compared to the S&P index over the 1984–1987 period.

Titman and Warga (1986) analyzed the returns of sixteen equity REITs and twenty mortgage REITs that were listed on either the New York Stock Exchange or American Stock Exchange from 1973 through 1982. Their investment performances (monthly returns) were measured by both CAPM-based, single index Jensen measures and by APM based, multiple-index versions of the Jensen measure. They found that the performance of

REIT stocks is similar to S&P 500 Index, which means the observed differences in investment performance are not statistically significant. The authors also investigated that APT does not provide better fit on data than the CAPM.
Kuble, Walther and Wurtzebach (1986) investigated the risk-adjusted return performances of 102 REITs whose shares traded on various stock exchanges over the period 1973-1985. Share performance was measured through a comparative analysis with the S&P 500 Index, using the Jensen measure for excess returns. The results of the research indicated that significant Jensen alpha or excess returns occurred during ten years of the thirteen-year period analyzed.

Smith and Shulman (1976) compared the performance (quarterly returns) of sixteen REITs to the S&P index, savings accounts, and fifteen closed-end funds over the 1963–1974 periods by using the Jensen measure. They found that equity REITs outperformed savings accounts and the S&P index for the 1963–1973 periods. However, the performance of REIT stocks was so bad in 1974 that their REIT sample underperformed the S&P index for the entire 1963–1974 period if the recession year of 1974 was included. That was the first study to investigate the REIT performance in literature.

## METHODOLOGY AND DATA

According to investment theory, the primary goal of an investor is to maximize the utility he or she obtains from the investment. To maximize utility, investors attempt to derive the greatest possible return from their investment. In order to measure the investment performance of different portfolios, investors typically judge them on the basis of their average rate of return over previous years. However, rankings based on average historical return tend to be biased because the position in such a ranking depends on the target risk level of that portfolio and the performance of the market. (Ooi, Wang and Webb, 2009) A portfolio's performance should be investigated using a measure that is not sensitive to the relative risk and the strength of the market. Such a risk-adjusted performance measure adjusts the portfolio's return by the amount attributable to the relative risk of the portfolio, given the strength of the market in the period that the performance is investigated. Using such a measure, there will be no propensity for portfolios with abnormally high or low levels of risk to earn abnormally high or low return marks, irrespective of the performance of the market. (Haugen, 1997)

In investment theory, there are three indexes that are mostly used for measuring the risk-adjusted performance of the portfolio: the Treynor Index (Treynor, 1965), the Sharpe Index

(Sharpe, 1966), and the Jensen Index (Jensen, 1968). In constructing these three risk adjusted performance measures, it is generally assumed that stocks are priced according to the Capital Asset Pricing Model (CAPM) (Lintner, 1965; Sharpe, 1964). The model states that the expected rate of return on a risk asset is composed of the risk-free rate plus the systematic risk (measured by beta) multiplied by the market risk premium of the expected market return minus the risk free rate. While the first two indexes are based on the ratio of return to risk, the third index is a measure of the relative performance based on the Security Market Line (SML).

In this study, the Sharpe Index and the Jensen Index of performance are used to estimate the performance of REIT stocks. Mathematically, the Sharpe Index is described as:

$$S_i = \frac{(R_{i,t} - R_{f,t})}{\sigma_{i,t}} \quad (1)$$

where, $S_i$ is the Sharpe Index measure of performance; $R_{i,t}$ is the return on the $i$th stock at time $t$; $R_{f,t}$ is the risk-free rate of return at time $t$; and $\sigma_{i,t}$ is the standard deviation of the $i$th stock at time $t$.
However, the Jensen Index is described as:

$$(R_{i,t} - R_{f,t}) = \alpha_i + \beta_i * (R_{m,t} - R_{f,t}) + \varepsilon_{i,t} \quad (2)$$

where, $R_{i,t}$ is the return on the $i$th stock at time $t$; $R_{f,t}$ is the risk-free rate of return at time $t$; $\alpha_i$ is the Jensen Index (or Alpha) measure of performance; $\beta_i$ is the beta or systematic risk of the $i$th stock; $R_{m,t}$ is the return of market portfolio at time $t$; and $\varepsilon_{i,t}$ is the random error terms with $E(\varepsilon_{i,t})=0$.

The Jensen index of abnormal return can be estimated by regressing the excess return on a portfolio, or an individual stock, over the risk-free rate against the excess return on the market portfolio over the risk-free rate. As decribed above, when deriving the Jensen index for a portfolio, alpha ($\alpha_i$) is estimated by the intercept in the regression model. If the alpha ($\alpha_i$) is significantly different from zero and is positive, the portfolio (or an individual stock) is regarded as over-performing the overall market because its risk-adjusted return is higher than that of the market portfolio. Conversely, if the alpha ($\alpha_i$) is significantly different from

zero and is negative, this suggests an inferior performance by the REIT portfolio in comparison with the overall market.

The primary purpose of this research is to examine REIT risk-adjusted return performance versus the average performance of common stocks as measured by the Istanbul Stock Exchange (ISE). The sample for this study was composed of 8 REITs whose stocks were traded on the ISE for the period January 2000 through December 2008: Alarko GMYO, Dogus GE GMYO, Is GMYO, Nurol GMYO, Ozderici GMYO, Nurol GMYO, Vakıf GMYO and Yapı Kredi Koray GMYO. Monthly REIT stock price changes are calculated over the nine-year period for them. The return of the ISE-100 Index and the Treasury Bill rates were also used as proxy measures of the stock market and the risk-free rate of return. Monthly returns for REIT stocks listed on the ISE are calculated using price and dividend data. The following formula is used to calculate the monthly returns on the REIT stocks:

$$R_{i,t} = [P_{i,t} * (BDL + BDZ + 1) - (R * BDL) + D_{i,t} - P_{i,t-1}]/P_{i,t-1} \quad (3)$$

where, $R_{i,t}$ is the monthly rate of return on REIT $i$ in the period $t$; $P_{i,t}$, $P_{i,t-1}$ are the stock prices at the end of month $t$ and $t-1$ respectively; $BDL$ is the number of rights issues received during the month; $BDZ$ is the number of bonus issues received during the month; R is the price for exercising rights (i.e. subscription price) and $D_{i,t}$ is the amount of net dividends received during the month for a stock with a nominal value of 1 TL. (ISE Companies Monthly Price and Return Data, http://www.ise.org/Data/fiyat_getiri_aciklama.aspx)

**Table 2. Summary of Basic Performance Statistics during January 2000-December 2008**

| | Monthly Mean Return | Standard Deviation | Coefficient of Variation | Sharpe Index |
|---|---|---|---|---|
| ISE-100 | 1.24% | 10.71% | 8.61 | --- |
| ALARKO GMYO | 1.55% | 16.36% | 10.53 | 0.0190 |
| DOGUS GE GMYO | 2.25% | 19.15% | 8.50 | -0.0184 |
| IS GMYO | 0.62% | 15.39% | 24.95 | -0.1290 |
| NUROL GMYO | 1.05% | 17.50% | 16.72 | -0.0889 |
| OZDERICI GMYO | 2.32% | 20.29% | 8.75 | -0.0140 |
| PERA GMYO | 3.40% | 30.23% | 8.89 | 0.0264 |
| VAKIF GMYO | 1.50% | 16.35% | 10.87 | -0.0672 |
| YK KORAY GMYO | 1.36% | 19.52% | 14.32 | -0.0635 |

Table 2 summarizes the basic performance statistics for the eight REIT stocks and the stock market (ISE-100) during 2000 and 2008 periods. A comparison of these statistics suggests that most of the REIT stocks' performance is higher than that of the stock market portfolio over the sample period. Only Is GMYO and Nurol GMYO provide lower mean returns and the rest of them perform better than ISE-100. Seven of eight REIT stocks have higher volatility per unit of mean return, measured by the coefficients of variation (CV) and six of them have lower total risk-adjusted excess returns, measured by the Sharpe Index, than the stock market portfolio over the period studied.

**Table 3. Performance of REITs Relative to ISE-100 by Using Jensen Index during January 2000-December 2008**

| Dependent Variable | Alpha (t-Stat) | Beta (t-Stat) | Adjusted $R^2$ | F-Value | Durbin-Watson |
|---|---|---|---|---|---|
| ALARKO GMYO | 0.000 (0.014) | 0.237 (0.125) | 0.024 | 3.63 | 2.43 |
| DOGUS GE GMYO | 0.009 (0.016) | 0.940 (0.144) | 0.281 | 42.78 | 2.42 |
| IS GMYO | -0.010 (0.013) | 0.728 (0.119) | 0.255 | 37.66 | 2.64 |
| NUROL GMYO | -0.007 (0.144) | 0.624 (0.144) | 0.143 | 18.90 | 2.39 |
| OZDERICI GMYO | 0.007 (0.018) | 0.703 (0.166) | 0.137 | 18.03 | 2.08 |
| PERA GMYO | 0.027 (0.025) | 1.428 (0.229) | 0.261 | 38.83 | 2.03 |
| VAKIF GMYO | 0.000 (0.013) | 0.838 (0.121) | 0.306 | 48.08 | 2.61 |
| YK KORAY GMYO | 0.002 (0.015) | 1.088 (0.138) | 0.364 | 62.32 | 2.53 |

Table 3 demonstrates the Jensen Index of each REIT estimated by the cross-time regression. The Durbin Watson values of eight regression models, ranging from 2.03 to 2.64, indicate that the regression residuals in all eight REIT stock are first-order serially independent. All regression models, except for Alarko GMYO, exhibited reasonably good explanatory power, as indicated by the adjusted R-square value, ranging from 0.137 to 0.364.

As shown in Table 3, the Jensen alphas, except for Is GMYO and Nurol GMYO, are positive. That is, the risk-adjusted performances of six REIT stocks (Alarko GMYO, Dogus GE GMYO, Ozderici GMYO, Pera GMYO, Vakıf GMYO and Yapı Kredi Koray GMYO) perform better than the overall market portfolio during the period of January 2000-December 2008. Table 3 also shows the estimated beta coefficients of all REIT stocks. All betas, except for Pera GMYO and Yapı Kredi Koray GMYO, are less than one. This finding indicates that Pera GMYO and Yapı Kredi Koray GMYO have a slightly higher market risk than the market portfolio, while the other REIT stocks are less risky relative to the market portfolio over the study period.

**Table 4. Performance Ranking of REIT Stocks Traded at ISE**

| | Sharpe Index | Rank | Jensen Index | Rank |
|---|---|---|---|---|
| ALARKO GMYO | 0.0190 | 2 | 0.000 | 6 |
| DOGUS GE GMYO | -0.0184 | 4 | 0.009 | 2 |
| IS GMYO | -0.1290 | 8 | -0.010 | 8 |
| NUROL GMYO | -0.0889 | 7 | -0.007 | 7 |
| OZDERICI GMYO | -0.0140 | 3 | 0.007 | 3 |
| PERA GMYO | 0.0264 | 1 | 0.027 | 1 |
| VAKIF GMYO | -0.0672 | 6 | 0.000 | 5 |
| YK KORAY GMYO | -0.0635 | 5 | 0.002 | 4 |

The individual performance ranking results of REIT stocks are presented in Table 4. Pera GMYO is ranked first with Sharpe and Jensen performance measures over the study period. There are also cases where both performance measures and the rankings differ substantially. For example, Alarko GMYO is ranked second with Sharpe index but is

ranked sixth with Jensen index; Dogus GE is ranked fourth with Sharpe index but is ranked second with Jensen index.

## SUMMARY AND CONCLUSION

The primary purpose of this study is to examine real estate investment trust (REIT) risk-adjusted return performances. The sample for this study was composed of 8 REITs whose stocks were traded on the ISE for the period January 2000 through December 2008: Alarko GMYO, Dogus GE GMYO, Is GMYO, Nurol GMYO, Ozderici GMYO, Nurol GMYO, Vakıf GMYO and Yapı Kredi Koray GMYO. Monthly REIT stock price changes are calculated over the nine-year period for them. The return of the ISE-100 Index and the Treasury Bill rates were also used as proxy measures of the stock market and the risk-free rate of return. REIT stock performances are measured through a comparative analysis with the Istanbul Stock Exchange (ISE) by using the Sharpe and the Jensen performance measures.

According to the Sharpe Index, except for Alarko GMYO and Pera GMYO, six of eight REIT stocks have lower total risk-adjusted excess returns than the stock market portfolio over the period studied. However, the results of the Jensen alphas indicate that, except for Is GMYO and Nurol GMYO, REIT alphas are positive. That is, the risk-adjusted performances of six REIT stocks (Alarko GMYO, Dogus GE GMYO, Ozderici GMYO, Pera GMYO, Vakıf GMYO and Yapı Kredi Koray GMYO) perform better than the overall market portfolio during nine years of the period analyzed.

Finally, it is also interesting to examine the relative rankings of the two performance measures. Pera GMYO is ranked first with Sharpe and Jensen performance measures over the study period. Our results presented in this paper, therefore, provide only an initial step for evaluating the investment performances of REIT stocks.

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