Performances Appraisal of Real Estate Investment Trust in Borsa Istanbul

Songul Kakilli Acaravci [1][*][†], Ali Acaravci[2], Yunus Karaomer[3]

[1]Department of Business, Faculty of Economics and Administrative Sciences, Hatay Mustafa Kemal University, Turkey, [2]Department of Economics, Faculty of Economics and Administrative Sciences, Hatay Mustafa Kemal University, Turkey, 3Department of Business, Faculty of Economics and Administrative Sciences, Hatay Mustafa Kemal University, Turkey. *Email: sacaravci@mku.edu.tr

ABSTRACT

The real estate investment trusts (REITs) have an important role in the development of the real estate sector. For investors, the REITs are financial institution that offer service such as professional portfolio management, risk reduced through diversification, and utilization of scale economies. The REITs offer new opportunities for investors by making liquidity high securities the real estate properties in their portfolios. In this paper, the performances of firms traded as the REITs in borsa istanbul (BIST) during July 2005 - June 2016 are investigated by employing 4 different regression models (the capital asset pricing model, Fama-French 3 factor model, FF Four F model, and FF five F model. In this manner, regression model is estimated in which returns of the REITs are used as dependent variable; whereas market premium, size premium, value premium, profitability premium, and investment premium are used as independent variables. The Jensen Alpha which is a risk-adjusted performance measure is estimated as fixed term (alpha) between related returns and factors in regression equation. Positive alpha value refers to the risk-adjusted high performance, while negative alpha value refers the risk-adjusted low performance. It is also tested whether the alpha value is different from zero in performance appraisal. Empirical findings suggest that the alpha coefficient is not statistically significant in four different regression models. This result indicate that the REITs do not seem to over perform than market premium, size premium, value premium, profitability premium, and investment premium during the analysis period. Thus, analysts or investors will be able to estimate expected returns by considering these premiums.

Keywords: Real Estate Investment Trust, Jensen Alpha, Capital Asset Pricing Model, Fama-French Factor Models
JEL Classifications: C19, D53, G14[†]

1. INTRODUCTION

Investors want to get high returns with low risk. For this reason, investors try to reduce the risk by diversifying instead of investing in a single security as it increases the risk. Investors should decide which assets will invest in and how much each asset will invest in. However, small investors do not have this knowledge. Accordingly, collective investment institutions that provide professional portfolio management services to investors have been established. Real estate investment trusts (REITs) are also one of the collective investment institutions. They must provide good performance to their managed portfolio. It is important to appraise their performance in order to lose the funds they have and collect new funds.

REITs were first established in the USA in 1961. REITs have been the most important institutional investors in the world real estate markets since their establishment, ın Turkey, they began their activities in 1995 after the announcement related to the establishment of REITs by capital markets board (Hayta, 2009).

Performances appraisal of the REITs have been one of the most important and remarkable topics in the field of finance. This paper has two main contributions. First, this paper contributes that the performances of firms traded as the REITs in borsa istanbul (BIST) during July 2005 - June 2016 are investigated by employing four different regression models (the capital asset pricing model (CAPM), Fama-French 3 factor model - [FF(3)F], FF Four F model - (FF(4)F], and FF five F model - [FF(5)F]). Second, this paper contributes to the literature on performances appraisal of the REITs (Smith and Shulman, 1976; Titman and Warga, 1986; Han and Liang, 1995; Buttimer et al., 2001; Hayta, 2009; Erdogan et al., 2016). Smith and Shulman (1976) investigated performance appraisal of 16 REITs from 1963 to 1974 periods for USA using the CAPM. According to the finding, the REITs performed better than other financial indicators for 1963-1973. Titman and Warga (1986) investigated performance appraisal of the REITs from 1973 to 1982 periods using the CAPM and the arbitrage pricing model. According to the analysis results, it was found that the REITs performed similar to the market portfolio. Han and Liang (1995) investigated performance appraisal of the REITs from 1970 to 1993 periods using the CAPM. According to the finding, it was determined that the REITs performed similar to market portfolio and quarterly treasury bills. Buttimer et al. (2001) investigated performance appraisal of the REITs from 1980 to 1999 periods using the FF(3)F and Carhart (1997) Model. According to the findings, it was found that the REITs indicated significant return performance especially at the beginning of 1990s. Hayta (2009) investigated the performance appraisal of 8 REITs from July 2002 to June 2007 and July 2003-June 2008 periods for BIST using the CAPM, FF[3]F. According to the analysis results, it was determined that the CAPM and FF[3]F no explain the variations in stock returns. Erdogan et al. (2016) investigated appraisal of the 12 REITs from 2011 to 2015 periods for BIST the multi criteria decision making methods. According to the analysis results, Yesil GYO was the REITs which indicated worst financial performance.

The aim of this paper, the performances of firms traded as the REITs in BIST by employing four different regression models (the CAPM, FF[3]F, FF[4]F, and FF[5]F) is investigated. This paper is organized as follows: In section 2, we present data, research methods and asset prıcıng models, in section 3, we present our results, and in section 4, concludes.

2. DATA, RESEARCH METHODS AND ASSET PRICING MODELS

The Jensen alpha criterion is an important method used to measure portfolio performance. Developed by Jensen (1969). The aim of this method is to evaluate portfolio performance considering risk. The Jensen criterion is based on the CAPM. The Jensen Alpha which is a risk-adjusted performance measure is estimated as fixed term (alpha) between related returns and factors in regression equation. Positive alpha value refers to the risk-adjusted high performance, while negative alpha value refers the risk-adjusted low performance. It is also tested whether the alpha value is different from zero in performance appraisal. It is based on the following regression equation (Ural, 2010):

$$R_{pt} - R_{ft} = \alpha_p + b_p(R_{mt} - R_{ft}) + \varepsilon_{pt} \tag{1}$$

Where R_{pt}, are returns on the analyzed asset p at time t, R_{mt} and R_{ft} are market portfolio and risk-free asset at time t; α_p and b_p are regression parameters. The intercept α_p (Jensen-alpha) measures the average abnormal return. ε_{pt} is a zero-mean residual at time t.

In this paper, The Jensen Alpha value will be estimated using the FF(3)F, FF(4)F, and FF(5)F. These models are used as an alternative way of estimating the alpha. These regression equations are shown as follow:

FF[3]F: $R_{pt} - R_{ft} = \alpha_p + b_p(R_{mt} - R_{ft}) + s_{pt}(SMB_t) + h_p(HML_t) + \varepsilon_{pt}$ (2)

FF[4]F: $R_{pt} - R_{ft} = \alpha_p + b_p(R_{mt} - R_{ft}) + s_{pt}(SMB_t) + h_p(HML_t) + r_p(RMW_t) + \varepsilon_{pt}$ (3)

FF[5]F: $R_{pt} - R_{ft} = \alpha_p + b_p(R_{mt} - R_{ft}) + s_{pt}(SMB_t) + h_p(HML_t) + r_p(RMW_t) + c_p(CMA_t) + \varepsilon_{pt}$ (4)

Where R_{pt} is the return on the analyzed asset p at time t; R_{mt} and R_{ft} are market portfolio and risk-free asset at time t; SMB_t is the return on a diversified portfolio of small stocks minus the return on a diversified portfolio of big stocks; HML_t is the difference between the returns on diversified portfolios of high and low market value/book value (ME/BE) stocks; RMW_t is the difference between the returns on diversified portfolios of stocks with robust and weak profitability; CMA_t is the difference between the returns on diversified portfolios of the stocks of low and high investment firms, which we call conservative and aggressive; ε_{pt} is a zero-mean residual at time t; the "α_p, b_p, s_p, h_p, r_p, and c_p" are regression parameters, the intercept α_p (Jensen-alpha) measures the average abnormal return (Fama and French, 2015).

Our sample comprised the 14 REITs which traded in BIST during the periods between July 2005 and June 2016. We used monthly data from July 2005 to June 2016 as the sample period. Data on share returns (R_p), It was gathered from data in which Finnet (http://www.finnet.com.tr). The BIST national-100 indices were used as the market return (R_m). It was gathered from data in which finnet (http://www.finnet.com.tr). Monthly interest rates derived from the annual interest rates of central government domestic debt stock and used as a risk-free interest rate (R_f) in the paper, it was gathered from republic of Turkey prime ministry undersecretariat of treasury (http://www.hazine.gov.tr).

While the CAPM performs performance analysis only on the basis of the market risk factor, the FF[3]F, FF[4]F, and FF[5]F perform performance analysis on SMB, HML, RMW and CMA risk factors. Various data of stocks traded in BIST are needed to construct these risk factors. When these factors are construct, firms' ME, ME/BE ratio, profitability, and investment factor ratio are needed. This data was gathered from data in which Finnet (http://www.finnet.com.tr).

We construct portfolios following the portfolio construction methodologies of fama and French for construct the factors (Fama and French, 1993, 2012, and 2015). Firstly, after the firms

in the sample group are divided into 2 groups (based on median value, small and big; S, B) portfolios are determined for the size effect and 3 groups (high, medium, and low; H, M, L) portfolios are determined for the ME/BE ratio effect. A total of 6 (2 × 3) intersection portfolios are constructed for the size effect and the ME/BE ratio effect (based on the breakpoint bottom 30%, middle 40%, and top 30%) and (SMB and HML) are used for the calculation of (SL, SM, SH, BL, BM, BH) risk factors. Later on, the firms in the sample group are divided into 2 groups (based on median value, small and big; S, B) portfolios are determined for the size effect and 3 groups (robust, medium, and weak; R, M, W) portfolios are determined for the net income/book equity ratio effect. A total of 6 (2 × 3) intersection portfolios are constructed for the size effect and the net income/book equity ratio effect (based on the breakpoint bottom 30%, middle 40%, and top 30%) and (SMB and RMW) are used for the calculation of (SW, SM, SR, BW, BM, BR) risk factors.

Lastly, the firms in the sample group are divided into 2 groups (based on median value, small and big; S, B) portfolios are determined for the size effect and 3 groups (conservative, medium, and aggressive; C, M, A) portfolios are determined for the investment ratio effect. A total of 6 (2×3) intersection portfolios are constructed for the size effect and the investment ratio effect (based on the breakpoint bottom 30%, middle 40%, and top 30%) and (SMB and CMA) are used for the calculation of (SC, SM, SA, BC, BM, BA) risk factors. We use the investment variable which is the growth of total assets for the fiscal year ending in "t−1" divided by total assets at the end of "t−2".

Portfolio construction periods have calculated between at the end of July of each year t and end in June of each year t+1. Thus, in the calendar year t−1 are matched with the returns for July of year t to June of year t+1 for the portfolio construction see Table 1. (R_m-R_f) represents the market premium and it is the return of the market over the risk-free interest ratio. SMB represents the size premium. HML represents the value premium, RMW represents the profitability premium, and CMA represents investment premium.

3. RESULTS

The CAPM is first used in the paper. In the regression model, it is estimated in which returns of the REITs are used as dependent variable; whereas return of the market over the risk-free interest ratio (R_m-R_f) are used as independent variables. Table 2 shows the alpha value, t-statistics, adjusted R^2, and F statistical values of this

regression model. In Table 2, it is seen that the alpha coefficients are statistically insignificant in regression models. Accordingly, there are no successful performance the REITs in the analysis period. In other words, these the REITs do not seem to over perform than market premium during analysis period. Moreover, the results of the regression equations for the ATAGY, DZGYO, NUGYO, VKGYO are not evaluated due to statistically insignificant F statistics.

Secondly, The FF[3]F is used in the paper. In the regression model, it is estimated in which returns of the REITs are used as dependent variable; whereas return of the market over the risk-free interest ratio (R_m-R_f), SMB and HML factors are used as independent variables. Table 3 shows the alpha value, t-statistics, adjusted R^2, and F statistical values of this regression model. In Table 3, it is seen that the alpha coefficients are statistically insignificant in regression models. Accordingly, there are no successful performance the REITs in the analysis period. In other words, these the REITs do not seem to over perform than market premium, size premium and value premium during analysis period. Moreover, the results of the regression equations for the ALGYO, ATAGY, DGGYO, DZGYO, VKGYO are not evaluated due to statistically insignificant F statistics.

Third, the FF(4)F is used in the paper. In the regression model, it is estimated in which returns of the REITs are used as dependent variable; whereas return of the market over the risk-free interest ratio (R_m-R_f), SMB, HML, and RMW factors are used as independent variables. Table 4 shows the alpha value, t-statistics, adjusted R^2, and F statistical values of this regression model. In Table 4, it is seen that the alpha coefficients are statistically insignificant in regression models. Accordingly, there are no successful performance the REITs in the analysis period. In other words, these the REITs do not seem to over perform than market premium, size premium, value premium and profitability premium during analysis period. Moreover, the results of the regression equations for the ALGYO, ATAGY, DGGYO, DZGYO, VKGYO, YKGYO are not evaluated due to statistically insignificant F statistics.

Lastly, The FF(5)F is used in the paper. In the regression model, it is estimated in which returns of the REITs are used as dependent variable; whereas return of the market over the risk-free interest ratio (R_m-R_f), SMB, HML, RMW, and CMA factors are used as independent variables. Table 5 shows the alpha value, t-statistics, adjusted R^2, and F statistical values of this regression model. In Table 5, it is seen that the alpha coefficients are statistically insignificant in regression models. Accordingly, there are no

Table 1: Construction of portfolios and factors

Size	ME/BE ratio			Net income/book equity ratio (Op.)			Investment ratio (Invs.)		
	High (H)	Medium (M)	Low (L)	Robust (R)	Medium (M)	Weak (W)	Conserv (C)	Medium (M)	Aggress (A)
Big (B)	BH	BM	BL	BR	BM	BW	BC	BM	BA
Small (S)	SH	SM	SL	SR	SM	SW	SC	SM	SA
Factors and their components									
$-SMB_{ME/BE}=(SH+SM+SL)/3-(BH+BM+BL)/3-$				$-HML=(SH-SL)/2+(BH-BL)/2-RMW=(SR-SW)/2+(BR-BW)/2-$					
$SMB_{Op}=(SR+SM+SW)/3-(BR+BM+BW)/3-$				$CMA=(SC-SA)/2+(BC-BA)/2$					
$SMB_{invs}=(SC+SM+SA)/3-(BC+BM+BA)/3-$									
$SMB=(SMB_{ME/BE}+SMB_{Op}+SMB_{invs})/3$									

Source: Fama and French, 2015

Table 2: Regressions for 14 REITs market portfolio results

CAPM: $R_{pt}-R_{ft}=\alpha_p+b_p(R_{mt}-R_{ft})+\varepsilon_{pt}$			
R_p-R_f	α	Adj.R²	F-statistic
AGYO	0.537 (0.532)	0.087	12.497* [0.000]
AKSGY	0.586 (0.606)	0.042	5.829** [0.017]
ALGYO	1.023 (0.928)	0.025	3.434** [0.006]
ATAGY	2.131 (1.187)	0.000	0.002 [0.961]
AVGYO	1.844 (1.037)	0.048	6.690* [0.001]
DGGYO	2.077 (1.393)	0.032	4.352* [0.001]
DZGYO	4.413 (1.302)	0.000	0.005 [0.940]
ISGYO	0.477 (0.505)	0.069	9.686** [0.002]
NUGYO	2.018 (1.367)	0.013	1.843 [0.179]
OZGYO	1.618 (1.068)	0.041	5.656* [0.001]
PEGYO	−0.194 (−0.151)	0.064	8.946* [0.000]
VKGYO	1.241 (0.702)	0.003	0.443 [0.506]
YGYO	0.168 (0.124)	0.021	7.321* [0.001]
YKGYO	0.207 (0.152)	0.057	7.913* [0.001]
Observation number 132			

Values in parentheses are the corrected t statistics according to newey-west method for the heteroscedasticity problem. Values in brackets are probability values, ** and * denote significance at the 5% and 1% levels, respectively

Table 3: Regressions for 14 REITs size ME/BE, portfolios results

FF[3]F: $R_{pt}-R_{ft}=\alpha_p+b_p(R_{mt}-R_{ft})+s_p(SMB_t)+h_p(HML_t)+\varepsilon_{pt}$			
R_p-R_f	α	Adj.R²	F-statistic
AGYO	0.191 (0.198)	0.114	5.524* [0.001]
AKSGY	−0.133 (−0.137)	0.105	5.052* [0.001]
ALGYO	1.067 (0.905)	0.035	1.589 [0.195]
ATAGY	1.689 (0.960)	0.006	0.282 [0.837]
AVGYO	1.974 (1.174)	0.151	7.626* [0.000]
DGGYO	2.259 (1.441)	0.037	1.685 [0.173]
DZGYO	4.097 (1.227)	0.001	0.067 [0.977]
ISGYO	0.506 (0.472)	0.116	5.552* [0.001]
NUGYO	1.727 (1.086)	0.085	3.979** [0.009]
OZGYO	1.338 (0.956)	0.074	4.343* [0.001]
PEGYO	−0.286 (−0.234)	0.069	3.205** [0.002]
VKGYO	1.570 (0.915)	0.033	1.468 [0.226]
YGYO	−0.178 (−0.135)	0.106	5.072** [0.002]
YKGYO	0.175 (0.123)	0.065	4.014** [0.003]
Observation number 132			

Values in parentheses are the corrected t statistics according to newey-west method for the heteroscedasticity problem. Values in brackets are probability values, ** and * denote significance at the 5% and 1% levels, respectively

Table 4: Regressions for 14 REITs size ME/BE, size-Op., portfolios results

FF (4) F: $R_{pt}-R_{ft}=\alpha_p+b_p(R_{mt}-R_{ft})+s_p(SMB_t)+h_p(HML_t)+r_p(RMW_t)+\varepsilon_{pt}$			
R_p-R_f	α	Adj.R²	F-statistic
AGYO	0.275 (0.310)	0.115	4.412** [0.003]
AKSGY	−0.040 (-0.039)	0.107	3.807* [0.001]
ALGYO	0.959 (0.785)	0.037	1.234 [0.299]
ATAGY	2.071 (1.116)	0.011	0.384 [0.819]
AVGYO	2.357 (1.287)	0.157	5.959* [0.000]
DGGYO	2.037 (1.284)	0.040	1.357 [0.252]
DZGYO	4.780 (1.455)	0.011	0.358 [0.825]
ISGYO	0.315 (0.289)	0.176	4.619** [0.006]
NUGYO	1.690 (1.050)	0.085	3.969** [0.003]
OZGYO	1.377 (0.970)	0.074	4.343* [0.001]
PEGYO	−0.554 (−0.441)	0.075	3.608** [0.003]
VKGYO	1.368 (0.862)	0.036	1.185 [0.320]
YGYO	0.103 (0.078)	0.111	3.980** [0.004]
YKGYO	0.355 (0.237)	0.068	1.344 [0.154]
Observation number 132			

Values in parentheses are the corrected t statistics according to newey-west method for the heteroscedasticity problem. Values in brackets are probability values, ** and * denote significance at the 5% and 1% levels, respectively

Table 5: Regressions for 14 REITs size-ME/BE, size-Op., and size Invs., portfolios results

FF(5)F: $R_{pt}-R_{ft}=\alpha_p+b_p(R_{mt}-R_{ft})+s_p(SMB_t)+h_p(HML_t)+r_p(RMW_t)+c_p(CMA_t)+\varepsilon_{pt}$			
R_p-R_f	α	Adj.R²	F-statistic
AGYO	0.244 (0.287)	0.123	3.556** [0.004]
AKSGY	−0.049 (−0.049)	0.108	3.054** [0.005]
ALGYO	0.908 (0.784)	0.066	1.783 [0.120]
ATAGY	2.090 (1.100)	0.013	0.334 [0.891]
AVGYO	2.384 (1.287)	0.160	4.822* [0.000]
DGGYO	2.068 (1.271)	0.045	1.207 [0.309]
DZGYO	4.682 (1.457)	0.028	0.743 [0.592]
ISGYO	0.300 (0.276)	0.079	3.168** [0.003]
NUGYO	1.612 (1.090)	0.118	3.373** [0.002]
OZGYO	1.318 (0.967)	0.091	3.178** [0.003]
PEGYO	−0.632 (−0.548)	0.116	3.328* [0.001]
VKGYO	1.294 (0.850)	0.065	1.774 [0.122]
YGYO	0.104 (0.078)	0.111	3.159* [0.001]
YKGYO	0.299 (0.205)	0.090	3.178** [0.002]
Observation number 132			

Values in parentheses are the corrected t statistics according to newey-west method for the heteroscedasticity problem. Values in brackets are probability values, ** and * denote significance at the 5% and 1% levels, respectively

successful performance the REITs in the analysis period. In other words, these the REITs do not seem to over perform than market premium, size premium, value premium, profitability premium and investment premium during analysis period. Moreover, the results of the regression equations for the ALGYO, ATAGY, DGGYO, DZGYO, VKGYO are not evaluated due to statistically insignificant F statistics.

4. CONCLUSION

The REITs have an important role in the development of the real estate sector. The REITs are financial institutions that provide investors with services such as professional portfolio management, risk mitigation through diversification, and utilization of scale economies. The REITs offer new opportunities for investors by transforming liquidity high securities on the real estate in their portfolios. Although there are so studies related to performances

appraisal of mutual funds and collective investment funds in Turkey, studies investigating the performances appraisal of the REITs in Turkey is quite limited.

The aim of this study is to performances appraisal of firms traded as the REITs in BIST during the period of 132 months between July 2005 and June 2016 are investigated by employing four different regression models (the CAPM, FF[3]F, FF[4]F, and FF[5]F). Within the scope of the study, the performances of the REITs are examined and the Jensen Alpha which is a risk-adjusted performance measure is estimated as fixed term (alpha) between related returns and factors in regression equation. In this manner, regression model is estimated in which returns of the REITs are used as dependent variable; whereas market premium, size premium, value premium, profitability premium and investment premium are used as independent variables. Empirical findings suggest that the alpha coefficient is not

statistically significant in four different regression models. This result indicate that the REITs do not seem to over perform than market premium, size premium, value premium, profitability premium, and investment premium during the analysis period. Thus, analysts or investors will be able to estimate expected returns by considering these premiums. Moreover, the results of the four different regression equations for the ATAGY, DZGYO, VKGYO are not evaluated due to statistically insignificant F statistics.

Performances appraisal of the REITs have been one of the most important and remarkable topics for academics, investors and analysts in the field of finance in recent years. In this respect, when studies on Turkey and international studies are investigated, it is seen that the CAPM models are used more performances appraisal of the REITs. However, when the studies relating to the FF[4]F and FF[5]F are investigated, it is determined that the study on Turkey has not been done yet. Thus, this study aims to fulfill this gap and contributes to empirical literature on this subject. It is also expected that this study will make a significant contribution to researchers and analysts.

Thanks to this work, analysts or investors will be able to investigate the relationship between expected risk and return while investing in the REITs. Thus, they will be able to carry out their analysis with a more accurate calculation of the expected return and risk. Moreover, they will be able to make better speculations with strategies which are presented in the model. Furthermore, for further empirical investigations, we propose that researchers will be able to contribute to finance literature by trying different measures and variables at different periods.

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