

**IS THERE A RELATIONSHIP BETWEEN PORTFOLIO  
DIVERSIFICATION OF TURKISH REITS AND THEIR  
OPERATIONAL PERFORMANCES?**

A Dissertation

by

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Submitted to the

Institute of Administration

In Partial Fulfillment of the Requirements for  
the Degree of

Master of Science

in the

Financial Engineering and Risk Management

Özyeğin University

March, 2017

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## **ABSTRACT**

Diversification has been a major topic in the academic literature for a very long time. Controversial results have been found by different researchers in different contexts. To investigate the issue for the Turkish real estate market, I focus on the Turkish REITs. I collect and set up a data set of annual property portfolios of REITs and create portfolio diversification measures. To be able to assess the impact of diversification of REITs in Turkey on their operational performance, I evaluate the relationship in two dimensions. Property type diversification and regional diversification will be my trivets to build this study on. In terms of geographic diversification, I specifically concentrate on an Istanbul vs non-Istanbul focus. I find that there is a positive contribution of İstanbul-focused portfolio investments and property type focus. In the end, I suggest policy implications.

## ÖZET

Çeşitlendirme akademik dünya tarafından çokça tartışılan bir konu olagelmıştır. Farklı alanlarda farklı dönemlerde yapılan çalışmalar sonucunda birbirinden farklı sonuçlar bulunmuştur. Konuyu Türkiye Gayrimenkul Pazarı açısından araştırmak adına Türk Gayrimenkul Yatırım Ortaklıklarına odaklandım. Gayrimenkul Yatırım Ortaklıkları tarafından her yıl paylaşılan Gayrimenkul Değerleme Raporlarından yola çıkarak detaylı bir yıllık GYO Portföyleri veri seti oluşturdum. Bu veri setinden yola çıkarak portföy çeşitlendirme ölçütleri geliştirdim. Çeşitliliğin Türk GYO'larının operasyonel performansına olan potansiyel etkisini saptayabilmek için çeşitliliği iki açıdan ele aldım: Taşınmaz türü çeşitliliği ve bölgesel çeşitlilik. Taşınmaz türü çeşitliliğinde Konut, Ofis, AVM gibi gayrimenkul türlerini ele alırken, bölgesel çeşitlilik kapsamında İstanbul içi yatırımlar – İstanbul dışı yatırımlar karşılaştırması gerçekleştirdim. Çalışmamın sonucunda, taşınmaz tipi açısından tek bir taşınmaz tipine odaklanmak ve İstanbul içi yatırımlara odaklanmanın operasyonel performanslara olumlu yansıdığını buldum.

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## I. INTRODUCTION

Real estate sector has been 5 % of Turkey's GDP in the last decade and only in 2015, 26 % of FDIs are to real estate sector. Specifically, for Istanbul, the existence of mega projects like Marmaray, Kanal Istanbul, 3. Airport and 3. Bridge and North İstanbul Highway, Eurasia Tunnel signals that urban renewal and transformation projects will increasingly continue. It is estimated that in the next two decades, 6.7 million of houses will be destroyed and rebuilt through urban renewal and transformation projects. This accounts for 350 thousand of houses per year. In Turkish housing market, 1,289,320 houses have been sold in 2015. There are 368 shopping malls in Turkey. The newly issued licenses for office buildings have risen by 27% in 2015. All these numbers indicate that the momentum on the real estate sector is likely to proceed. JLL's retail attraction index reports that İstanbul is the 7th most attractive real estate market after London, Paris, Moscow, Milano, Madrid and Roma.

In such a high volume and hot real estate market, the vital need for corporate and regulated approach is filled by Real Estate Investment Trusts (REITs). REITs are listed property companies encouraged to do business in every segment of real estate sector. There are now 31 actively running REITs in the Turkish real estate market. As laws require them to, once they are legally established, they have to be publicly offered in 3 years. Therefore, they all trade on Borsa Istanbul stock exchange.

Besides REITs have to obey strict legal rules such as the partnership structure or other fiscal requirements, they are liberal to run various investment strategies, business



models and portfolio structure. For example: (i) They have no regional restriction to do business. Though, 90% of Turkish REITs locate their headquarters in İstanbul and 10 % of them are based in Ankara. They have real estate investments in 28 cities and 6 geographic regions of Turkey. (ii) They do not have a competitive regulation such as segmentation. While a REIT can build and operate a mall, at the same time, it can build houses and sell them in the primary market. (iii) They have no trading frequency restrictions. They are free to buy and sell properties or land as frequent as they decide if they see any business opportunity, premium or competitive advantage. (iv) They are allowed to run different business models. They can buy and sell properties to enjoy dealing spread. They can buy and lease properties. They can rent and lease properties or lands. They can operate properties. They can cooperate with building operation and maintenance companies.

This liberal environment for REITs might indicate that property companies can disperse in real estate market potentially having subtle effects on their operational indicators such as ROA, ROE or Tobin's Q ratio.

Diversification is discussed widely by both academic and business literature not only as a risk reduction method but also as a business model. It is a very well accepted fact that the most common way of decreasing a prevailing risk is to put the "eggs into different baskets". By exposing different proportions of a value to different levels of risk in different risk environments, investors somehow obtain less risk. Despite, it is also a well-known fact that less risk means less return, controlling the risk exposed to some extent is necessary. In our context, we might expect to reveal risk reducing effect

of diversification on Turkish REITs' investments. Risks, such as demand fall, economic crisis, resource or human capital shortage may prevail in Real Estate sector more than it does in some other particular sectors like utilities. REITs which give weight on more risky business models might generate more income, -or less. We also might see that REITs which give equal weight to risky and less risky business models together generate moderate level of income.

Another very common purpose of diversification is to capture business opportunities in different customer segments. To be able to spread horizontally and be more profitable companies might prefer to branch out in other segments in the same industry or in other industries or even sectors. This strategy might work for some sectors, however for labor intensive businesses such as construction and heavy industry, to run businesses which require different type of know how might be costly. To keep equipment-qualified human resource for different business lines in the company and managing different project dynamics and different cash flows might be costlier than it is profitable. We might also discover such an impact on Turkish REITs who focus on a single line and has business investments in different segments.

I execute the analysis by examining whether diversification influences REITs operational performances over the sample period between 2012 and 2015 using measures of diversification by both property type and location after controlling for a wide range of firm characteristics. In the end, I find that both property type focus and locational concentration in Istanbul of Turkish REITs has a positive impact on their Tobin's Q and ROA ratio.

## **I. LITERATURE REVIEW**

Focus, not only in terms of product line, but also geographically has been, probably, one of the most visited topics by researchers and practitioners. Potential outcomes obtained from focused or less diversified business models have been compared to diversified or decentralized ones from many different aspects.

### **1. Property Type Diversification**

As it is stated by early research, there are both adverse and favorable impacts of diversification in different contexts. Capozza and Seguin (1999) find no evidence that diversification leads to limited or overextended expertise. Their estimates suggest that diversification does not cause underperformance. Actually, their findings reveal that that more diversified firms make better gross returns from their properties. In the same study, Capozza and Seguin (1999) concludes that an evidence which implies that focus impacts cash flow available to stakeholders does not exist. Despite more diversified firms earn higher project-level yields, corporate-level costs also increase with diversification. They also claim that they suggest findings that managers are aware of the penalty diversified firms are exposed, specifically, those which separates on property type. Their calculations on the average property type and Herfindahl for each year in their sample shows an obvious rise in property type level focus (rising from 0.59 to 0.72) over their time interval.

Diversification can provide managers with potentially valuable timing options, allowing them to move factors of production (e.g., capital and labor) to more productive uses in response to external shocks. The timing option, however, matters only in case of a management which is done effectively for goodness of their stakeholders. Poorly managed companies tend to move capital in abnormal manners, such as utilizing resources from the best functioning units to balance those rotten eggs. Hence, the benefit of diversification is likely to be affected by both the ability and incentives of managers to exploit timing options in ways that benefit shareholders. (Hartzell, Sun and Titman 2013)

Hartzell, Sun and Titman (2013) conclude that REITs with greater geographically diversification trade at a discount, but they also do not reveal correlation between value and asset type diversification.

Apart from corporates and conglomerates, which have operations in various industries or sectors, in this thesis, product line of the companies –REITs- in a single industry –commercial real estate- will be applied. Concordantly, Berger and Ofek (1995) argue that diversification impacts firms both adversely and positively in terms of value. Better operational efficiency, more impulsion to hold positive NPV projects, higher borrowing ability, and lower taxes are some of probable advantages of doing business in various lines of business within one firm. Use of higher optional resources to undergo value-alleviative decisions, inter-replacement helping weak parts to take sources from high performer parts, and mismatch of incentives among central and field-unit managers can be showed as likely expenses of diversification.

A more pessimistic approach to the issue is proposed by Montgomery (1994). He indicates an indifferent or adverse, not a positive, correlation among diversification and company results.

The potential connection between change in focus and stock performance was studied by Comment and Jarrell (1995). A rise in focus around 0.1 helps shareholder wealth increase by 3.5% in over a two-year period.

The topic is evaluated by Lang and Stulz (1993) by using Tobin's q ratio, their study indicates that less focused firms possess strikingly fewer average and median q-ratios than a highly focused company. Moreover, less focused firms obtain mean and median Q ratios below 1 and below the sample mean and median each year in their sample period. Such findings strongly indicate that being a less focused company may cause to be valued less than focused firms.

It is shown by another study that the sectoral dynamics and economic situation may cause company financial value to be different among companies. It is claimed by Santalo and Becerra (2008) that the potential effect of diversification may differ from sector to sector. This indicates that less focused companies may be appraised less in some particular sectors, however may be over valued in some others.

Other works examining the diversification find that diversification is more effective when exterior financial markets do not function well (e.g., Dimitrov and Tice, 2006; Yan et al., 2010; Hovakimian, 2011). In such conditions, outer capital provision is going to be strikingly short, making less focused companies to enjoy the inner financial sphere, specifically, in the times of stagnation and shocks. Kuppuswamy and Villalonga (2010) find that the relative value of diversified firms increased significantly during the financial crisis from 2007 to 2009. It is proved in the results that adverse market conditions inevitably impacts the net value of focus - diversification.

It is also a proven fact that companies that prefer to diversify do differentiate from its counterparts in some critical points. (Lemelin, 1982; MacDonald, 1985; Montgomery and Hariharan, 1991; Rondi, Sembenelli, and Ragazzi, 1996; Merino and Rodríguez, 1997; Silverman, 1999).

To make the points more clear; diversification might help administrators to: expand their financial gains, reputation (Jensen and Murphy, 1990); decrease their risk (Amihud and Lev, 1981); or get more powerful by diversification such that their own skills match with it (Shleifer and Vishny, 1989). Some claims that being less focused generates ineffective interior financial sphere by investing too much in weak business lines (Stulz, 1990); or due to strength issues which creates impact on expenses (Rajan, Servaes and Zingales, 2000). These claims are obviously parallel to results about diversification discount; Actually, most have risen to understand it. However when we take the point into account from a financial perspective, it is not simple to justify the

reason that it is so effective in financial results -if less focused companies do perform poorer.

There are different findings found by different researchers. For example, as a result of their study, -a study covering Singaporean, Japanese, Hong Konger and Malaysian REITs- Cheok, Sing and Tsai (2011) state that Asian REITs which are geographically diversified might show varying costs and risk levels however this study do not reveal important impact of diversification on property type.

## **2. Geographical Diversification**

The other issue that will be analyzed is the potential influence of geographical dispersion to company's operational performance in real estate markets. While it is a previously emphasized point that regional diversification decreases the risk exposed, one should ask whether it works in the same way for REITs. However, one should also take into account the previously stated fact that interacting at a distance is costly (Behrens and Sharunova, 2015). Here, positive impacts of investor proximity to local markets and informational added value derived from local resources are dramatic subjects to consider in this direction. Eichholtz, Holtermans, and Yönder (2015) emphasize that due to the nature of the business, location is a key factor. Specially, in the real estate markets, to perform well in a local market, managers do require regional key contacts and know-how on regional market dynamics.

Ling, Naranjo and Scheick (2016) document substantial cross-sectional and time series variation in the ability of MSA exposures explains the cross-section of REIT returns. The lack of a clear pattern in these MSA effects suggests that while MSA allocations matter in the return generating process, the return enhancing (or destroying) abilities of particular MSA allocations appear to change rapidly as local market information is incorporated into property values.

Through formal analysis, it is also found that a very tiny part of yield can be understood by MSA allocations. However, investment period and property type may effect the direction and magnitude of this point.

These results are robust to a number of alterative assumptions and investment horizons. Overall, this result suggests decisions to distribute to a specific MSA are more insignificant than the administrators skills to choose, and administrate buildings in that MSA (Ling, Naranjo and Scheick, 2016).

In this thesis, besides that I investigate Turkish REITs by the impact of geographic region-based diversification I also descend the question into Istanbul vs non-Istanbul distinction. Specially, in recent years Istanbul is exposed to an intense real estate “transformation” with mega projects, Infrastructure projects and urban transformation projects.



It is also showed that investors make higher returns by investments made in close areas by Coval and Moskowitz (2001). Ivkovic and Weisbenner (2001) tries to answer the question that does “local bias” work for individual investors too? The answer is yes it does and the results are more consistent as they move away from S&P 500 companies. The fact that when investors and their assets are not far away to each other informational lack decrease is reaffirmed by the authors.

The similar point was tried to be understood by Bodnaruk (2009) utilizing using stock ownership data in Wseden. The author, as a reference for closeness uses the distance to the nearest establishment of the particular firm. He covers striking findings for local expertise, and confirms that investing local matters.

To understand the local bias topic better Seasholes and Zhu (2010) made investigation by investor data of US from 1991 to 1996. It is proven that investors yield no extreme return by the authors. The authors conclude that individual investors may not possess value driven information.

On some research about firm-level financial results and impact on proximity Bronnenberg (2009) shows distance has impact on the market proportion of consumer packaged goods industries: the revailing rate are bigger in markets close to a firm’s head quarter.

Giroud (2013) shows that a decline in air travel time between a corporation's headquarters and its production plants leads to more investment in these plants, and an increase in total factor productivity. Bernstein et al. (2014) focus on the effects of distance between venture capital firms and the companies they invest in, and also use reductions in air travel time to identify these effects. They show that reductions in travel time lead to increased innovation and a higher initial public offering likelihood, and they attribute this to increased monitoring by the venture capital firm.

Dahl and Sorensen (2012) investigate the geographic choice of Danish companies, and reveals evidence about their ventures yield higher—in terms of time, cash flows and profits—when they are located in regions where the entrepreneurs have lived longer. They attribute this to better access to local information and social capital.

The previous studies provide us with various results. Since the facts change as context changes, in this thesis, I attempt to fill this void by examining the effect of geographical portfolio concentration in Turkish real estate market between 2012 and 2015.

## II. PROPERTY PORTFOLIOS AND DIVERSIFICATION

### 1. Property Portfolios and Data

In order to investigate the relationship between the geographical portfolio diversification and property type focus and operational performance of REITs, I observe geographical dispersion of their assets, the property type they have in their portfolios and their operational performances. Since there is not a REIT database for us to obtain and work with, I had to generate the data on my own. To do that I observed annual appraisal reports of properties in the portfolio of REITS announced by REITs at the end of each year on [www.kap.gov.tr](http://www.kap.gov.tr) (Public Disclosure Platform). Since REITs are forced to go public by the laws, they are publicly trading companies on the stock market, therefore, they have to announce the appraisal report of each property in their portfolios each year.

To generate the data, I visit the announcement page of each REIT on KAP and downloaded appraisal reports of all assets in the REITs' portfolios chronologically. I observe 1828 appraisal reports. I study each report and wrote down a specific set of information on an excel worksheet. I have columns for;

Table 1

- |                  |                   |                       |
|------------------|-------------------|-----------------------|
| • property name  | • surface area    | • project start date  |
| • REIT name      | • project area    | • project finish date |
| • parent company | • expertise value | • construction period |

- property type
- acquisition date
- city, county
- land owner/hirer
- selling date
- operation type
- building
- holding period

Despite I did not benefit every column on the sheet during the study, at the end of the data gathering process, I have a detailed Turkish REITs portfolio database. I have scanned 1828 appraisal reports belonging to 510 individual properties of 31 REITs years from 2011 to 2015. The list of Turkish REITs is provided in the Appendix.

My two main diversification categories are property type and geographic location. I have 7 main property type categories: Residential, Retail, Office, Industrial, Hotel, Specialty and Land. In Turkey, there are 7 geographical regions: Marmara, Ege, Akdeniz, İç Anadolu, Karadeniz, Doğu Anadolu, Güneydoğu Anadolu<sup>1</sup>. In terms of geographical allocation I did a comparison not only intra-geographic regions but also a comparison for Istanbul vs non-Istanbul concentration.

I also have the operation type as sub-sample to infer some useful information. I have 3 main operation type: rental income seekers, developers – to sell in the primary market- and property holders for various goals.

The values of 1828 properties, in TL owned by REITs over the sample periods, were collated. Among the sample properties, the largest real estate was Ağaoğlu 1453 – a mixed development project including luxury residences, shopping mall and hotels in

Istanbul owned by Emlak Konut GYO, which is valued at 2.50 billion ₺ in 2015. The smallest real estate is a residence in Ankara owned by Nurol GYO which was valued at 24 thousand ₺ in 2012. The values of properties in the portfolios of REITs were aggregated each year to derive at 134 observations. The annual operational data were then mapped into the pooled observations. After removing the samples with missing financial data, I have a final sample of 113 pooled observations for empirical tests.

## **2. Diversification**

### **i. Property Type Diversification**

I categorize the properties in the portfolios of REITs in 7 main type: Hotel, Industrial, Residential, Retail, Office, Land, and Specialty. To measure the property type diversification of a REIT in a particular year, I utilize Herfindahl index. To put it simply: first, I collate expertise value of all properties in the portfolio of the REIT in the subject year. Then to assess the weight of each property in overall portfolio value, I divide the expertise value of each property by total value of portfolio. I then, have portfolio weight of each property in that particular year. Now to be able to see the weight of each property type in the total portfolio in a year, I simply sum the weight of each property in the same type. After this step, I have portfolio weight of each property type in the portfolio of each REIT by year. Having the square of each property type weight, I reach to the index. To see the final index value I sum the squares of property type weights. At this point I have a value between 0 and 1. Having an index value closer to 0 means that company has a diversified portfolio at property type level. Concurrently, having an index value closer or equal to 1 means that subject REIT has a focused

product line. By applying the same process to each year in the sample period for each REIT I obtain a sample set composed of 113 observation.

To obtain property type HHI for a REIT in year t:

$$\text{Property Type HHI}_{i,t} = \sum_{j=1}^7 \left( \frac{\text{Total Book Value of Type } j \text{ Properties } (t)}{\text{Portfolio Book Value } (i,t)} \right) \quad (1)$$

Where i stands for REIT i, t stands for year t and j stands for the property type j.

## ii. Geographic Diversification

During this thesis study I used two approaches to measure geographic diversification. First, I classify REITs' investment according to 7 geographic regions commonly accepted in Turkey. Those regions are Marmara, Ege, Akdeniz, İç Anadolu, Karadeniz, Doğu Anadolu, Güneydoğu Anadolu. Second I classify REIT's portfolio compositions by an Istanbul - Non-Istanbul approach. To assess the geographic diversification of REITs I utilized book value of each property in the REITs portfolio. I first divide each property's book value by the total book value of the REIT in that particular year. By summing up the weights of each property in a specific region in that year, I acquire regional portfolio weight of each REIT in a particular year. At the end of this process I have 113 annual observations indicating regional asset allocation of each REIT. This phase revealed us that 69.4 % of total assets belonging to Turkish REITs are located in Marmara region. I use this variable set as independent variable during the regression tests. More interestingly, 63.0 percent of total REITs investments are concentrated in one city: İstanbul. Therefore, I decide to ask a more specific second

question at this point: Does investing in Istanbul have a positive impact on REITs' valuation? In this sense, I executed the same operation for the İstanbul / Non İstanbul approach. At the end, I acquire the information of what percentage of the REITs' properties are located in Istanbul and what percentage of their assets are located out of Istanbul. To be able to use in the regressions I create Istanbul weight dummy variable by assigning 1 to observations above 0.50, 0 to observations below 0.5<sup>2</sup>. At the end of this process I obtain 113 Istanbul weight dummy variable observations covering 31 REITs between 2012 - 2015 year by year. Finally I have the second variable set to use as independent variable during the regressions.

### III. DATA STATISTICS

Table 2

Descriptive Statistics, Property Type Diversification, Regional  
Diversification and Financial Characteristics

Panel A: Property Type Measures

	<b>Mean</b>	<b>Std</b>	<b># of Obs</b>
<b>Property Type</b>			
Hotel	0.090	0.221	113
Industrial	0.056	0.195	113
Land	0.145	0.207	113
Office	0.084	0.148	113
Residential	0.215	0.357	113
Retail	0.381	0.411	113
Specialty	0.030	0.116	113
<b>Property Type</b>			113
<b>HHI</b>	0.679	0.259	

Panel B: Regional Diversification Measures

**Location**

**Regional Weight**

Marmara	0.694	0.332	113
Ege	0.051	0.184	113



Akdeniz	0.088	0.175	113
İç Anadolu	0.111	0.233	113
Karadeniz	0.049	0.165	113
Doğu Anadolu	0.000	0.000	113
G. Anadolu	0.004	0.018	113

**İstanbul vs Non-**

**İstanbul**

İstanbul Weight	0.630	0.363	113
Non Istanbul Weight	0.370	0.363	113

Panel C: Operation Type Diversification Measures

**Operational Type**

**Weight**

Development	0.449	0.340	113
Rent Income	0.551	0.403	113

Panel D: Financial Measures

**Financial**

**Measures**

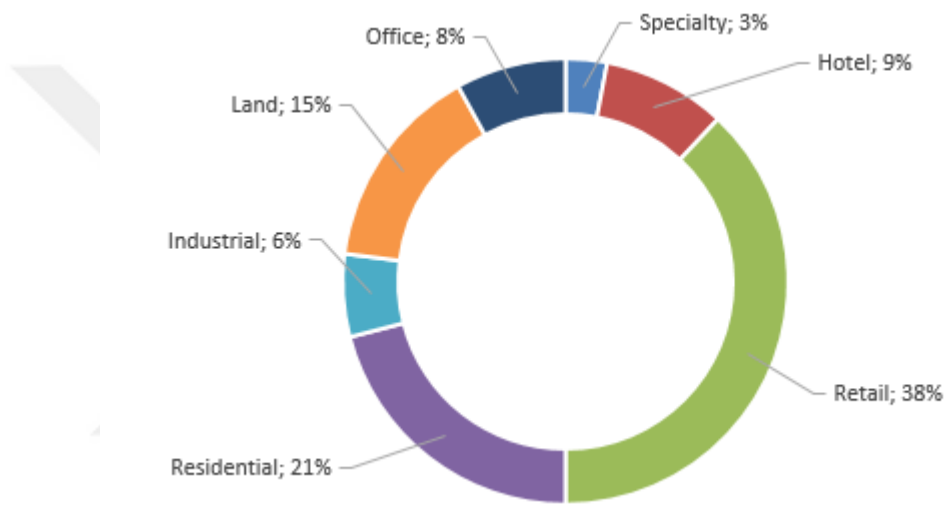
ROA	0.057	0.327	113
ROE	0.061	0.102	113
Tobin's Q	1.005	0.805	113

**Control Measures**

Total Asset	1,749	3.376	113
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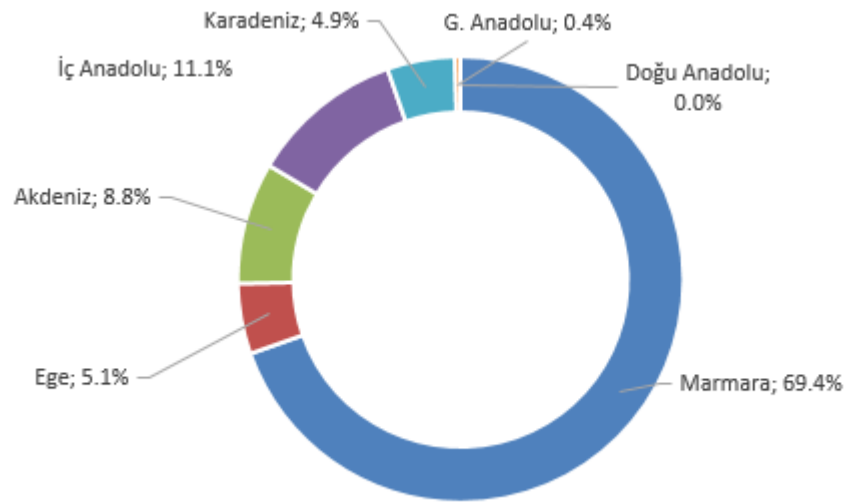
Debt Ratio	0.292	0.252	113
MB Ratio	1.005	0.805	113

*Panel A of Table 1 shows descriptive statistics of property type diversification measures. Panel B shows descriptive statistics of regional diversification measures. In Panel C I provide operational type statistics and in Panel D, I provide operating performances for the full sample.*



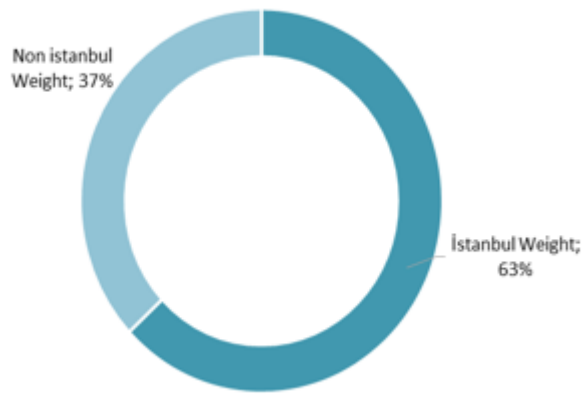
*Figure 1 : Weights of property types in the portfolios REITs during 2012 – 2015 period.*

In panel A of Table 1, I provide descriptive statistics of Turkish REITs among property types. The mean average weight of hotel, Industrial, Land, Office, Residential, Retail, Specialty type properties in the portfolios of REITs annually are -in the same order- 9.0 %, 5.6 %, 14.5 %, 8.4 % 21.5 % 38.1 % and 3.0 %. Most common property types are residential and retail. The average property type HHI value of the Turkish REITs is 0.679. It can be clearly said that they mostly have concentrated product line.



*Figure 2 : Regional portfolio weight of REITs during 2012 – 2015 period.*

Panel B of table one shows the statistical descriptives about regional diversification of the REITs. Investments of the Turkish REITs are concentrated in Marmara region by 69.4 percent. Second most invested geographic region in Turkey is İç Anadolu with 11.1 percent. The least preferred region is Doğu Anadolu. None of Turkish REITs have investment in Doğu Anadolu Region. I reckon that low volume of economic activity and safety concerns prevailing in the region are the most prominent factors for such a nonbeing.



*Figure 3 : Portfolio weight of REITs as İstanbul – Non-İstanbul during 2012 – 2015 period.*

In panel C, statistics about operation type of REITs are shared. The most common practice among Turkish REITs is to obtain rental income from properties. REITs attain rental returns from 51.4 % of the properties in their portfolios. The ratio of developers is 23.4 %. When I consider portfolios of REITs as a single portfolio, 23.4 % of it is composed of development projects such as Mass Housing Projects, Mega mixed Projects, Hotel and Luxury Residence Projects. Remaining 21.5 % of the properties in the REITs’ portfolio provides no income. They are mostly idle lands to be leveraged for development projects or strategic buildings added to portfolio with appreciation expectations.

Panel D of table shows the financial statistics of the REITs. The mean return on assets (ROA) of Turkish REITs in the subject period is 5.7 percent while return on equity (ROE) is 6.1 percent. Average Tobin’s Q ratio of Turkish REITs for 2012 – 2015

period is 1.005. Panel D also provides some other financial control variables including the debt to asset ratio, the logarithm of total assets and the price to book ratio.



## IV. METHOD AND RESULTS

I aim to investigate whether property type diversification and regionally diversified investments of REITs has an impact on their operational performances. The debate about the issue has a very long history, for example Berger and Ofek (1995) argues that diversification has both value-enhancing and value-reducing effects. In contrast to many other industries, in real estate sector, financial and operational dynamics do vary at the very project level. The cash flows, supply cost management and market conditions fluctuate strikingly by a tiny change. Another point to consider is that in case of geographic decisions, local market know how and local relations do add value during investment decisions.

I regress ROA, ROE and Tobin's Q on measures of property Type Diversification, Geographic Diversification by region and Geographic Diversification by İstanbul / Non-İstanbul plus controls- Logarithm of Total Assets, Debt Ratio and Year Dummy as time fix control. To be able to capture the true relationship between variables, I preferred to use lagged changes. I regress the change in ROE, ROA and Tobin's Q on t property type diversification measure and t-1 geographic diversification measures.

Model:

$$\text{Financial Performans}_{it} = \alpha_0 + \beta_1(\text{Property Type HHI}) + \beta_2(\text{Debt Ratio}_{t-1}) + \beta_3(\text{Size}_{t-1}) + \beta_4(\text{YD11}) + \beta_5(\text{YD12}) + \beta_6(\text{YD13}) + \beta_7(\text{YD14}) + \beta_8(\text{Geographic Diversification Measure by İstanbul}_{t-1})$$

*Where i stands for REIT i, t stands for year t, property Type stands for the property type diversification measure which is Herfindahl index derived from property type weight of REITs, geographic diversification measure by region is regional portfolio weight of each REIT derived from book value of the properties in their portfolios. Geographic diversification measure by İstanbul is İstanbul – Non İstanbul portfolio weight of each REIT derived from book value of the properties in their portfolios. Debt ratio is total debt divided by total assets, Size is logarithm of total assets, YD11, is year dummy for 2011, YD12 is year dummy for 2012, YD is year dummy for 2013, YD14 is year dummy for 2014.*

Second phase of this thesis study is about business model of the Turkish REITs. I see a correlation between the operation type of REITs and their operational performance. I define 3 main business model; (i) developmental, (ii) Rental Income (iii) Holder. I categorize the properties in the portfolios of REITs according to their revenue production model. If a property is built from scratch and sold in the primary market I mark that property as developmental operation type. If a REIT generates rental revenue from a property I classify that property as Rental Income operation type. If the property generates no revenue, it is being held in an idle condition I classify that property as Holder operation type. After deciding the operation type at each property level. To obtain the data that I use on the tests, I divide expertise value of each property in year t

by total book value of that REIT in year  $t$ . In this manner, I have the operational portfolio weight of each property in the portfolio of a REIT in year  $t$ . By summing up same operation types in a portfolio in year  $t$ , I obtain the portfolio weight of REIT  $i$ 's operational type in year  $t$ . By executing the same process for 31 REIT in sample period, I generate a sample data set of 113 observation. To be able to capture potential impact of a particular business model, I regress two of the three independent variables (Weight of Developmental, Rental and Holder Operation Type) on the dependent variables (ROA, ROE, Tobin's Q) each time by excluding one of them.

Model:

$$\begin{aligned} \text{Financial Performance}_{it} &= \alpha_0 + \beta_1(\text{Rental Income}) + \beta_2(\text{Holder}_{it}) + \beta_3(\text{Debt Ratio}_{t-1}) + \beta_4(\text{Size}_{t-1}) \\ &+ \beta_5(\text{YD11}) + \beta_6(\text{YD12}) + \beta_7(\text{YD13}) + \beta_8(\text{YD14}) \end{aligned}$$

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$$\begin{aligned} \text{Financial Performans}_{it} &= \alpha_0 + \beta_1(\text{Developmental}) + \beta_2(\text{Holder}_{it}) + \beta_3(\text{Debt Ratio}_{t-1}) + \beta_4(\text{Size}_{t-1}) \\ &+ \beta_5(\text{YD11}) + \beta_6(\text{YD12}) + \beta_7(\text{YD13}) + \beta_8(\text{YD14}) \end{aligned}$$

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*Where  $i$  stands for REIT  $i$ ,  $t$  stands for year  $t$ , Holder stands for the portfolio weight of holder operation type properties in the portfolio of REIT  $i$  in year  $t$ , Rental income stand for portfolio weight of rental income generating properties in the portfolio of REIT  $i$  in year  $t$ . Developmental is the portfolio weight of developmental operation type in the portfolio of REIT  $i$  in year  $t$ . Debt ratio is total debt divided by total assets, Size is logarithm of total assets, YD11, is year dummy for 2011, YD12 is year dummy for 2012, YD is year dummy for 2013, YD14 is year dummy for 2014.*



## **1. Property Type Diversification and Operational**

### **Performances:**

In the analyses I address operating performances which are ROA, ROE and Tobin's Q ratio. I regress this three main operational performance indicator on 3 different measure of diversification. While one of them is on property type diversification, two of them are on geographic diversification. In some of the estimations I can reject the null hypothesis while in some of the regressions, I am not able to reject null hypothesis. The test results are presented in relevant tables.

Empirical results of property type diversification measure on operational performances are presented in table 2. I observe statistically significant and positive relationship between property type focus and Tobin's Q ratio and ROA ratio of sample REITs. A one percent increase in portfolio concentration of REITs in a particular property type causes an increase Tobin's Q ratio by 0.9 percent. Control variables Debt ratio and asset size of REITs has no significant impact on company's Q ratio. The control variables on year is not reported here however, as expected it has no significant impact on Tobin's Q. On the tests, I could not find a significant correlation between Property type diversification measure and ROE of REITs. My regression tests produce p-values above the acceptable thresholds on ROE for Property type diversification of REITs. Additionally, coefficients of the tests for ROE is small enough to be neglected. Despite I observe statistically significant correlation on debt ratio and size control variables, their impact is limited. The impact of property type diversification of Turkish REITs on their ROA ratios is also statistically significant. A one percent increment in portfolio focus of Turkish REITs increase ROA a 6 percent. Control variables debt ratio

and size has also minor explanation power on ROA. The empirical results are presented in table 2.

Table 3

Regression Results, Property Type Diversification Measure and Operating Performances

	ROA	ROE	Q
<b>Variables</b>			
<b>Property Type</b>	0.06*[0.03]	-0.07[-0.10]	1.23****[0.27]
<b>HHI</b>			
<b>Debt Ratio</b>	0.04***[0.01]	0.10**[0.04]	-0.34**[0.11]
<b>Log of Assets</b>	-0.11***[0.03]	-0.44***[0.11]	0.15[0.29]
<b>Y11</b>	Y	Y	Y
<b>Y12</b>	Y	Y	Y
<b>Y13</b>	Y	Y	Y
<b>Y14</b>	Y	Y	Y
<b>Observation</b>	113	113	113
<b>Rsquared</b>	0.10	0.06	0.11
<b>Log Likelihood</b>	111.40	-21.6	-111.5

*Notes: Table 2 shows regression results for the REIT data ranging from 2012 to 2015. Property type diversification measure (Herfindahl Index) and operational performances by REIT by year. Standard errors are in brackets.*

*\* indicates significance at the 10 percent level.*

*\*\* indicates significance at the 5 percent level.*

*\*\*\* indicates significance at the 1 percent level.*

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## **2. İstanbul Weighted Portfolios and Operational Performances**

Empirical results of tests about geographic diversification measure for İstanbul on operational performances are presented in table 3. I create a dummy variable from the yearly portfolio weight of REITs. I assign 1 for the observations above 0.50 portfolio weight located in İstanbul. I observe statistically significant and positive relationship between İstanbul-based focus of REITs and Tobin's Q and ROA ratio of them. When they increase the weight of İstanbul located properties in their portfolios by one percent, their Tobin's q ratio increase by 52 percent and their ROA rises by 3 percent. While I find no significant effect coming from indebtedness of REITs, there is a negative correlation between total asset size and Tobin's Q ratio of the REITs during the subject period 2012 – 2015. Year dummy is not reported here since it has no significant information.

For the companies which have concentrated portfolio investment in İstanbul, I do not find a significant positive correlation on ROE.

Table 4

Regression Results, Dummy Variable of Istanbul Weight and Operating Performances

	ROA	ROE	Q
<b>Variables</b>			
<b>Istanbul Weight</b>	0.03***[0.01]	0.06[0.05]	0.52***[0.14]
<b>Dummy</b>			
<b>Debt Ratio</b>	0.03**[0.01]	0.09**[0.04]	-0.30*[-0,11]
<b>Log of Assets</b>	-0.13*[0.03]	-0.46***[0.11]	-0.17[-0.29]
<b>Y11</b>	Y	Y	Y
<b>Y12</b>	Y	Y	Y
<b>Y13</b>	Y	Y	Y
<b>Y14</b>	Y	Y	Y
<b>Observation</b>	113	113	113
<b>Rsquared</b>	0.10	0.06	0.13
<b>Log Likelihood</b>	103.38	-23.92	-121.01

*Notes: Table 3 shows regression results for the REIT data ranging from 2012 to 2015.*

*Dummy variable of Istanbul Weight and operational performances by REIT by year.*

*Standard errors are in brackets.*

*\* indicates significance at the 10 percent level.*

*\*\* indicates significance at the 5 percent level.*

*\*\*\* indicates significance at the 1 percent level.*

### **3. Rental Income vs Development**

As part of this thesis study I investigate a potential relationship between the operation type of Turkish REITs and their operational performances. Since each pre-defined operation type consists of idiosyncratic risk and return dynamics, a REIT which has a concentrated business model on any of the operation types (Developmental and Rental Income) may have generated higher return than a REIT which gives weight to other business type in its portfolio during the sample period.

To be able to capture the potential impact of operational focus, I run the regression tests for both development type and rental income type independent variables. I classified the properties in the construction phase and complete but being kept in the stock as development type. Dependent variable in the regression is composed of the weight of I classified the properties which generate rent income as rental income type. Empirical results for development type are presented in table 6.

When I regress “development” operational type portfolio weight on ROA, ROE and Tobin’s Q of the REITs. I observe that there is statistically significant positive correlation between development type portfolio weight and Tobin’s Q of REITs. Holding an extra one percent development type asset in the portfolio decreases the Tobin’s Q of Turkish REITs by 51 percent. This result can be interpreted as holding an extra one percent rental income generator property in the portfolio decreases Tobin’s Q

by 51 percent. The results reveal no significant correlations between development type portfolio weight and ROA and ROE of Turkish REITs.

Table 5

Regression Results, Development Weight on Operating Performances

	ROA	ROE	Q
<b>Variables</b>			
<b>Development</b>	0.09[0.02]	0.08[0.07]	0.51***[0.19]
<b>Debt Ratio</b>	0.04***[0.01]	0.11[0.04]	-0.21**[-0.11]
<b>Log of Assets</b>	-0.18***[-0.03]	-0.51**[-0.12]	-0.28**[-0.32]
<b>Y11</b>	Y	Y	Y
<b>Y12</b>	Y	Y	Y
<b>Y13</b>	Y	Y	Y
<b>Y14</b>	Y	Y	Y
<b>Observation</b>	113	113	113
<b>Rsquared</b>	0.20	0.12	0.08
<b>Log Likelihood</b>	118.31	-17.96	123.87

*Notes: Table 4 shows regression results for the REIT data ranging from 2012 to 2015.*

*Development Weight and Rental Income Weight on operational performances by REIT by year. Standard errors are in brackets.*

*\* indicates significance at the 10 percent level.*

*\*\* indicates significance at the 5 percent level.*

*\*\*\* indicates significance at the 1 percent level.*

#### **4. Robustness**

To be able to test the robustness of the results, I run the regression tests by excluding Emlak GYO, the biggest REIT in turkey, which has a quite large portfolio due to government backed business model. Turkish government has a partnership with the company to run government's mega housing projects as part of social state campaigns. Company has very high profitability and very low indebtedness ratio due to its unlimited access to funds and utilizable land on projects. To be able to remove the potential misleading impact of the company in the sample period, I run the tests by excluding the company from the sample data.

Results of the tests for robustness check are presented in table 5, 6 and 7. The positive relation between Property type focus and Istanbul based regional focus on Tobin's Q and ROA has not changed when Emlak GYO is excluded. Positive relationship between development type operational model and Tobin's Q has not change also.

Table 6

Regression Results, Property Type Diversification Measure and Operating Performances Emlak GYO excluded

	ROA	ROE	Q
<b>Variables</b>			
<b>Property Type</b>	0.06*[0.03]	-0.07[0.11]	0.79***[0.28]
<b>HHI</b>			
<b>Debt Ratio</b>	0.04***[0.01]	0.10**[0.05]	-0.32[0.13]
<b>Log of Assets</b>	-0.12***[0.03]	-0.44***[0.11]	0.05[0.29]
<b>Y11</b>	Y	Y	Y
<b>Y12</b>	Y	Y	Y
<b>Y13</b>	Y	Y	Y
<b>Y14</b>	Y	Y	Y
<b>Observation</b>	109	109	109
<b>R-squared</b>	0.11	0.060	0.11
<b>Log Likelihood</b>	106.3	-22.8	-118.6

*Notes: Table 5 shows regression results for the REIT data ranging from 2012 to 2015.*

*Property Type Diversification Measure (Herfindahl Index) and operational performances by REIT by year. Standard errors are in brackets.*

*\* indicates significance at the 10 percent level.*

*\*\* indicates significance at the 5 percent level.*

*\*\*\* indicates significance at the 1 percent level.*



Table 7

Regression Results, Dummy Variable of Istanbul Weight and Operating Performances  
Excluding Emlak GYO

	ROA	ROE	Q
<b>Variables</b>			
<b>İstanbul Weight</b>			
<b>Dummy</b>	0.04**[0.01]	0.06[0.05]	0.51***[0.14]
<b>Debt Ratio</b>	0.04***[0.01]	0.09**[0.51]	-0.39***[0.12]
<b>Log of Assets</b>	-0.13***[0.03]	-0.46***[0.11]	-0.12[0.29]
<b>Y11</b>	Y	Y	Y
<b>Y12</b>	Y	Y	Y
<b>Y13</b>	Y	Y	Y
<b>Y14</b>	Y	Y	Y
<b>Observation</b>	109	109	109
<b>Rsquared</b>	0.11	0.06	0.14
<b>Log Likelihood</b>	106.4	-23.92	-116.94

*Notes: Table 6 shows regression results for the REIT data ranging from 2012 to 2015.*

*Dummy Variable of Istanbul Weight and operational performances by REIT by year.*

*Standard errors are in brackets.*

*\* indicates significance at the 10 percent level.*

*\*\* indicates significance at the 5 percent level.*

*\*\*\* indicates significance at the 1 percent level.*

Table 8

Regression Results, Development Weight on Operating Performances Excluding Emlak  
GYO

	ROA	ROE	Q
<b>Variables</b>			
<b>Development Weight</b>	0.01[0.02]	-0.01[0.08]	0.44**[0.21]
<b>Debt Ratio</b>	0.05***[0.01]	0.11**[0.05]	-0.28**[0.13]
<b>Log of Assets</b>	-0.19***[0.04]	-0.52***[0.13]	-0.21[0.34]
<b>Y11</b>	Y	Y	Y
<b>Y12</b>	Y	Y	Y
<b>Y13</b>	Y	Y	Y
<b>Y14</b>	Y	Y	Y
<b>Observation</b>	109	109	109
<b>Rsquared</b>	0.21	0.12	0.08
<b>Log Likelihood</b>	113.1	-23.92	-120.62

*Notes: Table 7 shows regression results for the REIT data ranging from 2012 to 2015.*

*Weight of development operation type and operational performances by REIT by year.*

*Standard errors are in brackets.*

*\* indicates significance at the 10 percent level.*

*\*\* indicates significance at the 5 percent level.*

*\*\*\* indicates significance at the 1 percent level.*

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## V. CONCLUSION AND REMARKS

To see the impact of property type focus / diversification and geographic diversification of Turkish REITs I made a research by investigating the assets in their portfolios. In the regression tests I find statistically significant results that property type focus and Istanbul based portfolio construction increases the Tobin's q ratio of REITs. These results are economically meaningful as well. Since gaining experience on a specific property type is about (i) building relations with particular suppliers correspondingly gaining advantage against competitors, (ii) possessing and keeping qualified human resources in the organization and (iii) ability to know sub-industry based supply demand dynamics, to be competent to actualize these conditions should have paid off economically.

Despite I do not observe statistically significant results inflicting from geographical focus of REITs, the study reveals that the REITs which give weight to Istanbul-located investments produces significantly higher Tobin's Q ratio. This result also has economically reasonable interpretation. According to Turkey House Price Index (TKFE) published in Electronic Data Distribution System of Turkish Central Bank (EVDS) House price index moved to 252.7 from 119.2 by 111 % increase in January 2012 – December 2015 period. During the same period, House Price Index of Ankara – the second most populated city in Turkey after İstanbul increased 51% by moving to 170 from 112. The situation is not very different from Ankara when I look at the figures of İzmir –the third most populated city in Turkey. The HPI of İzmir rises by 64% by

increasing from 117 to 193. The change in House price index of other cities around Turkey is approximately same with Ankara and İzmir in the sample period. I observe that İstanbul enjoys a very obvious price hike. It is not hard to project the price increase in house market of İstanbul to other property type markets. REITs having investment in İstanbul during the sample period take advantage of this “gold rush”.

Beside this, I investigate the impact of Turkish REITs’ business model. As a result of the tests, I find that while holding a property for regular and fixed rental income has negative impact on Tobin’s Q, developing projects and selling the units in the primary market has statistically significant positive impact on Tobin’s. As expected, higher risk existing in the build-and-sell business model pays off thanks to low production costs and excessive demand in the market in the sample period.

Seeking limited rental income has lower risk consequently yields negative lower return; rental income portfolio weight has significantly negative impact on Tobin’s Q of Turkish REITs.

## **VI. POLICY IMPLICATION**

To be able to justify this striking movement in the prices, some criteria can be investigated such as population increase, economic growth and etc. However, beyond the authenticity doubts of this price increase issues, it should be questioned that investing into a single market, or economic or geographic region as a whole sector may carry too much risk that is very costly to be undone in case of a natural disaster or political crisis. Potential outcomes of such events should be taken into account to economically design regions or cities.

This thesis study has been one of the first research made on Turkish REITs' investment and business strategies. To my knowledge, it is also the first full-fledged approach to Turkish real estate market from Istanbul predominant portfolio allocation perspective. These findings can pave the way for public policy implications to be challenged.

## VII. APPENDIX, FIGURES, TABLES

List of Turkish REITs.

No	REIT Name	Head Office
1	Akfen Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
2	Akiş Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
3	Akmerkez Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
4	Alarko Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
5	Ata Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
6	Atakule Gayrimenkul Yatırım Ortaklığı A.Ş.	Ankara
7	Avrasya Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
8	Deniz Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
9	Doğuş Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
10	Emlak Konut Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
11	Halk Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
12	İdealist Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
13	İş Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
14	Kiler Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
15	Körfez Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
16	Martı Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
17	Nurol Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
18	Özak Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
19	Özderici Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
20	Panora Gayrimenkul Yatırım Ortaklığı A.Ş.	Ankara

21	Pera Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
22	Reysaş Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
23	Saf Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
24	Servet Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
25	Sinpaş Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
26	Torunlar Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
27	TSKB Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
28	Vakıf Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
29	Yapı Kredi Koray Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
30	Yeni Gimat Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul
31	Yeşil Gayrimenkul Yatırım Ortaklığı A.Ş.	Istanbul

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**Footnotes:**

- 1) Turkish REITs do not have property investments in Doğu Anadolu region.
- 2) I attempted to construct a dummy variable by basing the threshold to mean weight of all REITs in Istanbul which is .63 When I regress the dummy variable created from this threshold ROA, I found much weaker relation than the one which is created from 0.5 threshold.