THE CAPITAL STRUCTURE OF TURKISH REAL ESTATE
INVESTMENT TRUSTS

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ABSTRACT

THE CAPITAL STRUCTURE OF TURKISH
REAL ESTATE INVESTMENT TRUSTS (REITS)

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To the best of my knowledge, there has not been any academic study about capital structure of Turkish REITs so far. This study attempts to fulfill this gap in the literature by analyzing the capital structure choices of Turkish REITs which are listed in Istanbul Stock Exchange (ISE) over the period of 1998 - 2007. The key contribution of this study is to understand whether the firm specific, institutional and country specific factors that affect the capital structures of all institutional firms including REITs in developed and developing countries are also applicable to the Turkish REITs sector. The data analysis demonstrates that Turkish REITs employ little long term debt in their capital structure and there exists strong short term debt dominance in the sector. Employing Tobit regression and panel data models, it is concluded that capital structure determinants that are significant in developed and developing countries are also significant in Turkish REITs' debt financing choices. However, we observe inconsistency in the sign and significance of some factors which give a way to understand the different institutional and country specific factors of Turkish real estate market and Turkish REITs.

Keywords: Capital Structure, REITs, Tobit Regression, Panel Data.

ÖZ

TÜRK GAYRİMENKUL YATIRIM ORTAKLIKLARININ (GYO) SERMAYE YAPISI

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Yüksek Lisans, Finansal Matematik Bölümü

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Bilgimiz dahilinde, şuana kadar Türk GYO' ların sermaye yapıları hakkında akademik bir çalışma yapılmamıştır. Literatürdeki bu boşluğu doldurmak için yapılan bu çalışmada 1998–2007 yılları arasında İstanbul Menkul Kıymetler Borsasında yer alan Türk GYO' larının sermaye yapıları incelenmektedir. Bu çalışmanın en önemli katkısı, gelişmiş ve gelişmekte olan ülkelerdeki şirketlerin – GYO' lar da dahil olmak üzere – sermaye yapılarını etkileyen şirkete özgü, kurumsal ve ülkeye özgü faktörlerin Türk GYO' larının sermaye yapılarında da etkin rol oynayıp oynamadıkları sorusuna yanıt aramasıdır. Veri analizi, Türk GYO sektöründe oldukça düşük miktarda uzun dönemli borçlanmanın olduğu ve dolayısıyla sektörde çoğunlukla kısa dönemli borçlanmanın hakim oluğunu göstermektedir. Tobit ve Panel veri regresyon sonuçlarına göre gelişmiş ve gelişmekte olan ülkelerdeki şirketlerin sermaye yapılarını etkileyen faktörler Türk GYO' larını da etkilemektedir. Tahmin edilen parametrelerin büyüklükleri ve istatistiksel etkilerindeki bazı farklılıklar Türk GYO ve gayrimenkul piyasasında diğer ülkelerden farklı kurumsal ve ülkeye özgü faktörlerin olduğunu göstermektedir.

Anahtar Kelimeler: Sermaye Yapısı, GYO, Tobit Regresyon, Panel Veri

To my mother and father

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1   Motivation of Research

Real estate, besides its function to illustrate prosperity and power for centuries, is also a demanded tool for investors due to its diversification and hence inflation hedging benefit in a portfolio. However, unfavorable characteristics of real estate investment such as illiquidity and lack of transparency, requirement of specialization in this field and high amount of financing limit its prevalence especially for small investors. Real Estate Investment Trusts (REITs) are founded to make real estate investments more liquid and available for all investors. In addition, investment in REIT industry provides investors with inflation hedging, high total return and professional management of real estates.

Basically, REITs are publicly traded companies that buy, develop, manage and sell residential and commercial real assets as their primary business. With very diverse investment opportunities the REIT industry offers investors a broad range of alternatives including residential properties, office buildings, shopping centers, regional malls, hotel, resorts, health care facilities …etc.

REITs have their own peculiar characteristics. First, REITs, especially REITs in developed markets, do not pay any taxes if 90% to 95% of taxable earnings are paid out as dividends.[1] Second, high payout implies that REITs have low free cash flow, such that managers have little opportunity to waste cash on non value-maximizing

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[1] There is not such a dividend pay out requirement for Turkish REITs. See in detail in chapter 2

acquisitions.

REITs have become one of the crucial elements of economies with their contributions to many subsectors, aggregate production and unemployment not only in developed countries but also in developing countries. Due to its importance in economies, capital structure determinants of REITs have been a controversial subject of the extensive empirical literature. Although, capital structure of Turkish industrial firms is considerably examined in the academic literature, there is no academic research on the capital structure decisions in Turkish REITs.

Turkey and a sample of Turkish REITs offer so far untested and unique angles for the capital structure literature. First, having total flexibility in their dividend policy choices distinguishes fundamentally Turkish REITs from REITs in other countries. Yet, Turkish REITs, like their counterparts, maintain their non-taxable corporate entity status. The entire untaxed taxable income of Turkish REITs remains available to finance their new investments. Thus, Turkish REITs are likely to behave in a manner consistent with Myers and Majluf's (1984) pecking order theory, which postulates that internal equity is the cheapest source of financing and that firms should deploy their internal equity resources first, followed by debt financing and then external equity financing in undertaking new projects.[2] Turkish REITs should reduce the amount of their long-term debt financing since they are in a position to dip into a much deeper and also *cheaper* pool of internal equity than REITs in other countries can.

Second, drastic, sudden and unexpected changes in the inflation rate in Turkey also offer another unique angle for this study. Turkey went through a persistent and painful high inflation period between mid 1970s and early 2000s. The annual inflation rate suddenly and unexpectedly plummeted from around a range of 80%-120% per year to a range of 15%-20% per year. Contracting, especially long-term debt under such high inflationary conditions is challenging, to say the least, for

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[2] Evidence in Brown and Riddiough (2003) and Feng et al. (2007) indicates that REIT managers turn to debt financing before they consider external equity financing.

lenders and borrowers. This study's sample period moves from the high to the moderate inflation era and offers evidence on the inflation's overall effects on Turkish REITs' borrowing patterns.

Third, Turkey experienced an extremely painful financial meltdown in 2001. To the best of my knowledge, this thesis puts forth evidence *for the first time* on the effects of a severe financial crisis on firms' leverage decisions. Introducing an innovation variable to examine both the short- and long-term effects of this severe financial crisis is another new angle of the present study.

Finally, Turkey is an emerging economy and evidence, especially from REITs in emerging countries, is either scarce or non-existent. It is worth to note that Turkey established her REIT structure in 1998 and observed the trading of REIT shares since then. Thus, Turkey has been ahead of even developed countries, such as France, UK, Singapore, Japan and several other European countries in embracing the REIT structure as part of the development of her emerging financial markets.

This thesis offers findings to fill some of this large gap in the empirical literature by analyzing the Turkish REIT market deeply and concluding which factors have significant impacts on Turkish REITs debt financing choices. Furthermore, this study tries to reveal whether capital structure of Turkish REITs are affected by the same variables of REITs and other institutional firms as in the developed and developing countries. These factors can be classified as the firm specific factors, institutional factors and country specific (macro) factors. To analyze the effects of these factors on Turkish REITs capital structure decisions, Tobit regression and panel data models are employed.

Empirical results overall suggest that debt financing choices of Turkish REITs seem to be affected by the same type of variables that are significant in developed and other emerging countries. However, impact and magnitude of some independent variables show differences from other countries' debt financing choices, which imply that besides well known firm specific characteristics, there exists some institutional and country specific factors shaping the capital structure decisions of Turkish REITs.

1.2 Organization of the Thesis

The rest of the thesis proceeds as follows. Chapter 2 describes the real estate sector and Real Estate Investment Trust industry over the world and in Turkey, respectively. Chapter 3 firstly explains the financial leverage types and then overviews the capital structure theories that are commonly used in the existing literature. Chapter 4 reviews the capital structure literature under 3 groups: i) capital structure of corporations both in developed and developing countries ii) capital structure of REITs iii) capital structure of Turkish firms. Chapter 5 analyzes the data with tables and figures. Chapter 6 describes the statistical methods which are used to analyze data with their powerful and weak sides. Chapter 7 presents the empirical results of regression analyzes and gives evidence concerning the relationship between debt ratios and characteristics of Turkish REITs. Finally, Chapter 8 presents the concluding remarks.

CHAPTER 2

REAL ESTATE SECTOR
AND
REAL ESTATE INVESTMENT TRUSTS

2.1 Real Estate Markets and the History of Real Estate Investment Trusts

Real estate has traditionally been a popular investment tool in all centuries. Prior to the industrial revolution, for long years, wealth and power were measured primarily in terms of the amount of land owned by an individual or family. Although the image of wealth and investment opportunities have changed over time and the twentieth century saw the rise of stock and bond ownership and securitization, real estate investment can still prove a common way to utilize wealth.

In addition, real estate has long been a critical element of the institutional investor's portfolio since it can offer diversification benefits due to its low correlation with other asset classes. Because of its low correlation feature, real estate is also a good hedge against expected and even unexpected inflation. Rental increases provide protection in an inflationary environment and can deliver strong cash flows through rental income.[1] Not surprisingly, empirical findings are

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[1] Erol, I. and D. Tirtiroglu (December 2007) The Inflation-Hedging Properties of Turkish REITs, *Applied Economics*, *DOI: 1080/0003684060097023.*

supportive of hedging benefit of real estate. Hartzell et al. (1987) [1] documented that a portfolio of commercial real estate provides an effective hedge against components of inflation between 1973 and 1983. An earlier study by Fama and Schwert (1977) [2] suggested that residential real estate is a complete hedge against components of inflation. Rubens et al. (1989) [3] found that residential, commercial and farmland real estate provide at least partial hedging against inflation.

Furthermore, according to the NAREIT researches, real estate returns can achieve a risk premium above the risk-free rate; indeed in the United States (US) 10-year annual returns have been in excess of 12% which is attractive for many investors.

Despite its benefits, investing in real estate can present significant challenges. In contrast to investing in traditional equity investments, investing in direct real estate—whether office buildings, industrial properties, retail centers or apartment buildings—requires a broad set of specialized skills, which can often be a severe challenge especially for smaller investors.[3] Apart from requiring specialized skills, small investors also can not find adequate financing to invest in real estate. Thus, only wealthy individuals and corporations have the financial resources and specialization necessary to invest in real estate investments.

The creation of Real Estate Investment Trusts (REITs) in the US in 1960 opened the door for making real estate investments more widely available to small investors. With this system, it was hoped that all investors, small or wealthy, would pool their resources together to form companies with significant real estate assets, making investments in larger scales, providing the same opportunities to the average American as were available to the elite with professional management facilities.

Actually, the origins of REITs date back to the 1880s. At that time, investors could avoid double taxation because trusts were not taxed at the corporate level if income was distributed to beneficiaries. This tax advantage, however, was reversed in the 1930s when all passive investments were taxed first at the corporate level and then taxed again as a part of individual incomes. After Great Depression and World

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[3] Corin Frost, Amy Schioldager, Scott Hammon (2005) Real Estate Investing, The REIT Way, *The Investment Research Journal from* Barclays Global Investors 8(7)

War II, the demand for real estate funds in the country skyrocketed and President Eisenhower signed the 1960 real estate investment trust tax provision.[4] The legislation exempted these special-purpose real estate companies from corporate income tax if certain criteria were met.[5]

REIT investments increased with an increasing trend throughout the 1980s with the elimination of corporate income tax. However, the original legislation had some significant drawbacks that it required the executives in charge of the business to hire third parties to provide management and property leasing services. These restrictions were lifted in the Tax Reform Act of 1986 and allowed REITs to manage their properties directly. In 1993 REIT investment barriers to pension funds were eliminated. Six years later, in 1999, the REIT Modernization Act, which allows REITs to form taxable subsidiaries in order to provide specialized services to tenants that normally fall outside the purview of real estate investing, was passed. [6]

Trend of reforms continued to increase the interest in and value of REIT investment and today there are more than 200 publicly traded REITs operating in the United States with total assets of over $500 billion.[7] USA has the largest and the most well organized real estate investment market over world.

2.1.1 Advantages of the REIT Investments

REITs are publicly traded companies that buy, develop, manage and sell commercial real estate assets as their primary business. Some of them also engage in financing real estate. REITs are a practical way for all investors, especially the ones who do not have sufficient money to invest in real estate but have desire to own a piece of property, to invest in large-scale, income-producing and professionally managed

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[4] High Yield Investment Alternatives (article)
(www.privatemortgagefinancing.com/files/HIGHYIELDINVESTMENtALTERNATIVES.pdf -)
[5] See these criteria in detail in part 2.1.3. "REITs in the United States (US)"
[6] Joshua Kennon- Real Estate Investing Through REITs - The Benefits of Property Ownership without the Hassle (http://beginnersinvest.about.com/od/reit/a/aa101404.htm)
[7] Transterra Financial Wealth   (http://www.ttfwreit.com/faq.htm)

companies that own commercial real estate.[8] For only a few thousands of dollar as the minimum investment, a REIT investor can take advantage of ownership of a diversified properties portfolio, whereas, direct property ownership would not be financially feasible unless the investor took on excessive leverage or business partners.

Investment in REITs offers several advantages not found in companies across other industries. These benefits are part of the reason that REITs have become increasingly popular over the past decade. Undoubtedly, the best benefit that can accrue is the fast and easy liquidation of investments in the real estate market, and then follows the portfolio diversification, inflation hedging, strong and reliable dividends, solid long-term performance, transparency and good management.

REITs offer the most *liquid* way to invest in real estate. Shares of publicly traded REITs are traded daily on national stock exchanges, so, unlike actual real estate, they can be bought and sold at any time as easily as the shares in any other publicly traded company. In addition, REITs have the flexibility in their portfolio management that they can take advantage of other investment opportunities and can provide liquidity by being able to sell their holdings quickly without any restrictions to raise cash. This allows the REIT managers to be able to invest in other real estates that might be hot at the moment.[9]

REITs provide a great way for investors to *diversify* their holdings. The returns of REITs historically have a low correlation to the returns of stocks and bonds thus, adding REITs to a portfolio with exposure to stocks and bonds can improve returns and decrease risk. For instance, a study by Ibbotson Associates covering 1972 through 2000 shows that investors with a portfolio of S&P 500 stocks, 20 year U.S. government bonds and 30-day T-bills can increase returns and reduce risk 10% or 20% by adding REITs to their portfolio.

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[8] UBS Real Estate Research -Global Real estate Investment Going Main Stream
(www.irei.com/uploads/marketresearch/55/marketResearchFile/Global_Real_Estate.pdf -)
[9] Michael Russell, The Advantage of REITs
(http://ezinearticles.com/?The-Advantages-of-REITs&id=618091)

The long-term relative performance of US REITs versus the S&P 500 can be seen in Figure 2.1. Certainly, this figure shows that REITs act as a diversifying influence upon an overall portfolio of assets and behave differently than stocks.

Figure 2.1: *NAREIT Equity REIT Index less the S&P 500, 1963-2004[10]*

As Figure 2.2 illustrates, a significant decrease in correlation between REITs and equities occurs throughout the nineties when the number and size of the REITs in the US start increasing. During this same period, REITs are also becoming more diversified across property types and geographic markets.
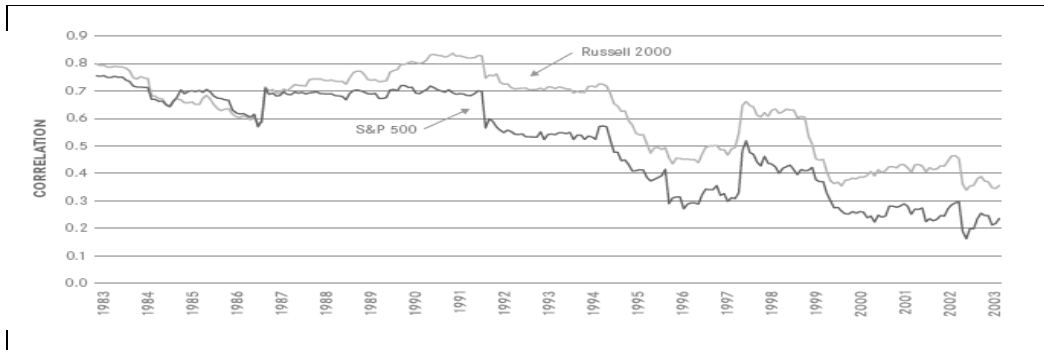
Figure 2.2: *Correlation of REITs with US Equities, 1983-2003[11]*

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[10] Goldman Sachs
[11] *Barclays Global Investors*

By investing mostly in tangible, real assets, REITs can provide an *inflation hedge*. When inflation rises, corporate profits become relatively lower. Stocks of the companies, therefore, are exposed to inflation risks. However, REITs can act like inflation hedges. While the cost of living rises, rental income can rise as well, so, rising rental income can offset the inflation factor.[12] In other words, because rental rates tend to rise during periods of inflation, REITs dividends tend to be protected from the long-term destructive effect of rising prices.

Since REITs are exempt from corporate income taxes, as long as they distribute at least 90% to 95% of their net taxable income (profit) as dividends to shareholders, they are usually labeled as *high dividend yield* instruments. For instance, average annual dividend yields typically range from 5% for shopping center REITs to 6.6% for office REITs in US.[13] Significantly higher than other equities on average, the REIT industry dividend yields generally produce a steady stream of income through all market conditions.[14]

Figure 2.3 clearly shows that US REITs dividend yield has been significantly higher than the dividend yield of S&P 500 over the last 20 years. At the same time, as seen in Figure 2.4, US REITs share prices have been matching (between 1980 – 2002) or exceeding the Consumer Price Index over the last two decades, protecting shareholders' capital (after 2002) from the negative effects of inflation.

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[12] Michael Russell, The Advantage of REITs
(http://ezinearticles.com/?The-Advantages-of-REITs&id=618091)
[13] National Association of Real Estate Investment Trusts
[14] http://www.bondsonline.com/Investor_Tools/REITs.php
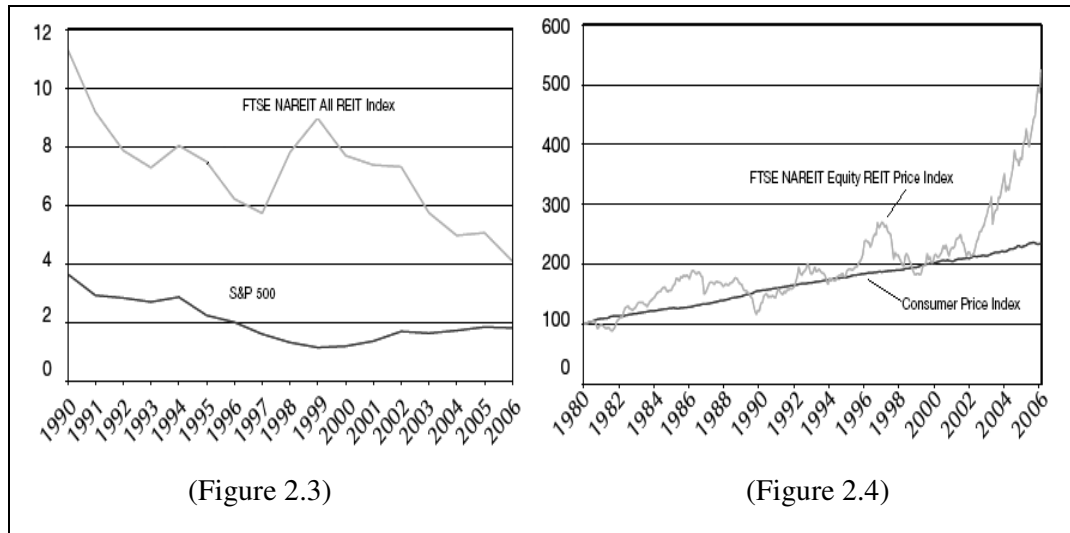
(Figure 2.3)   (Figure 2.4)

Figure 2.3: *REIT Dividend Yield versus S&P 500 Dividend Yield, 1990-2006[15]*

Figure 2.4: *FTSE NAREIT Equity REIT Price Index versus CPI, 1980-2006*

The combination of income returns from high dividends and capital gains from moderate, long-term share price appreciation can result in *high total returns* for REIT investors. Analysis by Ibbotson Associates demonstrates that the combination of high level of dividends and long term share price appreciation has made REIT returns competitive with other major investments, including a broad range of large cap stocks, small-cap stocks and fixed income securities. Figure 2.5 clearly shows that total return of publicly traded equity REITs outperform the leading US Benchmarks.

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[15] NAREIT and Standard and Poor's 30 June, 2007

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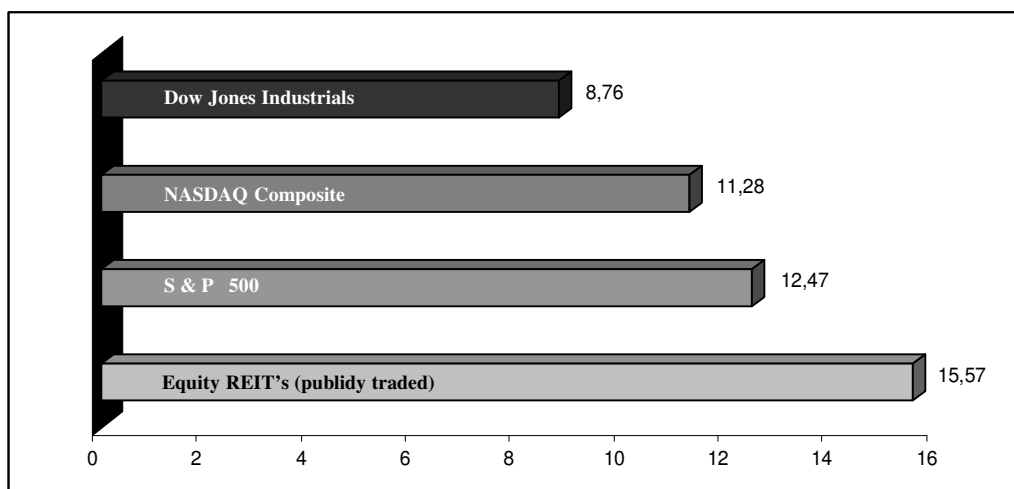
Figure 2.5: *Compound Annual Total Returns in Percent, Dec 1976 – Dec. 2006[16]*

In most cases, the investor who buys a rental property is left to her own devises. However, REITs allow the investors the opportunity to have their properties *managed by a professional* real estate team that knows the industry, understands the business and can take advantage of opportunities.[17]

REITs, like other public companies in the US, are required to provide regular financial disclosures to the investment community, including quarterly and yearly audited financial statements to the Securities and Exchange Commission. Moreover, independent directors of the REIT, independent analysts, independent auditors, and the business and financial media always monitor a publicly traded REIT's financial reporting on a regular basis. These disclosure obligations provide investors with *transparency,* healthy inspection and consequently with healthy investment. [18]

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[16] NAREIT
[17] Joshua Kennon, Real Estate Investing Through REITs-The Benefits of Property Ownership without the Hassle
[18] Joshua Kennon, Real Estate Investing Through REITs, The Benefits of Property Ownership without the Hassle

2.1.2 Types of REITs

The REIT industry has a diverse profile offering many investment opportunities and is classified in three categories. As seen in Figure 2.6., majority of REITs are equity REITS with 91% share, which is followed by mortgage REITs (7%) and hybrid REITs (2%), respectively.[19]

Equity REITs are real estate operating companies which are engaged in a wide range of real estate activities including the acquisition, management, building, renovation, and sale of real estate. Comprising more than 90% of the REIT market, equity REITs generate earnings mostly from the rental income received on their holdings and capital gains from the sale of properties. The types of equity REITs are residential, retail, office and industrial, health care, self storage, hotel and resort REITs. Revenues come principally from rents.

Mortgage REITs, the second largest category of REITs, provide financing for commercial and residential properties. Mortgage REITs mostly lend money directly to real estate owners and operators or extend credit indirectly through the acquisition of loans or mortgage-backed securities. Revenues come principally from interest on mortgages.

Lastly, as the name suggests, a hybrid REIT both owns properties and makes loans to real estate owners and operators. In other words, hybrid REITs combine the investment strategies of equity and mortgage REITs

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[19] National Association of Real Estate Investment Trusts
(http://www.answers.com/topic/real-estate-investment-trust)
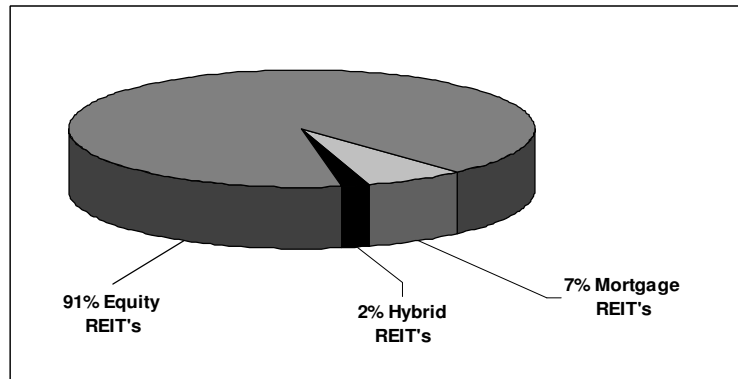
Figure 2.6: *Types of REITs*[20]

2.1.3 REITs in the United States (US)

With a very diverse profile, the REIT industry in the US offers investors many alternatives across a broad range of specific real estate property sectors, including apartment communities, office properties, shopping centers, regional malls, storage centers, industrial parks and warehouses, lodging facilities (hotels and resorts), health care facilities, natural resources…etc. All types of properties that US REITs invest in can be seen with percentage shares in Figure 2.7. Office buildings, apartments, regional malls and shopping centers, with total of 53 %, constitute the majority of all investments.

The legislation system in the US provides REITs with significant benefits which are not warranted to other kind of companies. In general, corporations are subject to corporate income taxes at the corporate level. When they pay dividends to shareholders, those dividends are also treated as income on each shareholder's individual income tax return. As a result, corporate investments tend to be subject to double taxation. However, if a corporation qualifies for REIT treatment – when at least 90% [21] of the profits (taxable income) is paid out directly to the investors- the

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[20] NAREIT June 30, 2007

[21] They are obliged to pay out most of their realized profits to their shareholders. 90 % in the US, 95 % planned for UK, 90 % planned for Germany, Australia: 100 %.

REIT does not pay federal taxes and avoids the double taxation.[22] With corporate tax rates as high as 38%, this can be a substantial incentive for companies that focus on real estate investments. By taxing income only at the shareholder level, REITs mimic one characteristic of direct property ownership.
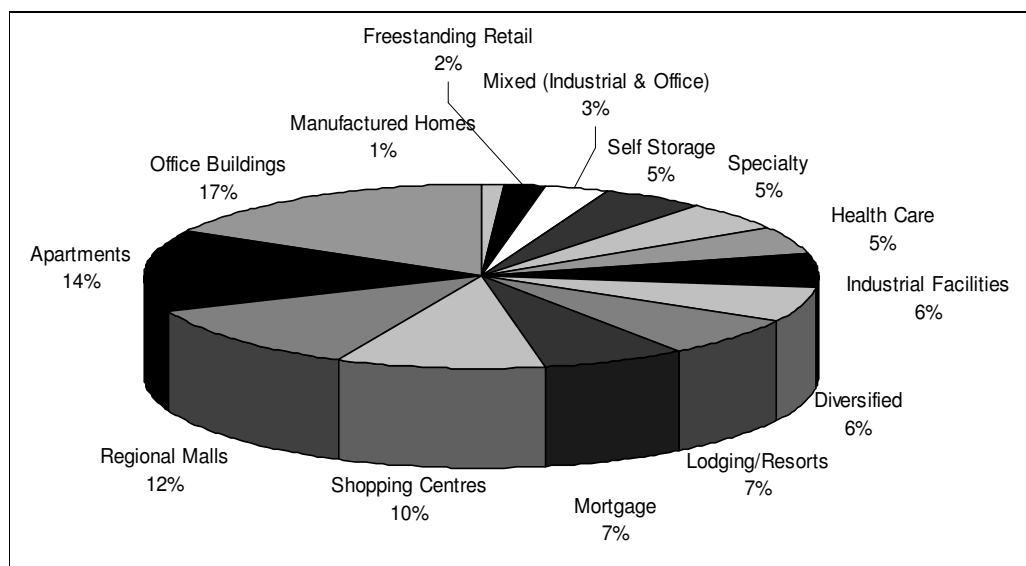
Figure 2.7: *Listed US REITs Invest In All Property Types as of June 30, 2007*[23]

Moreover, to qualify as a REIT in the US, REITs must invest at least 75% of its total assets in real estate, mortgage loan, shares in other REITs, cash or government securities and must derive at least 75% of their gross income from real estate rents, mortgage interest, or gains from the sale of real property.[24] Moreover, at least 95 percent of income must come from these sources, together with dividends, interest and gains from securities sales. To promote stability, REITs may derive no more than 30% of their gross income from the sale of real property held for less than four years

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[22] National Association of Real Estate Investment Trusts - Real Estate Investment Trust Simplification Act of 1997 ("REITSA")

[23] NAREIT

[24] There are national regulations on the minimum REIT income from and/or investment in real estate. USA, UK (planned): minimum 75 % of earnings, Canada: 90 % of earnings, Honkong: 90 per cent of fixed assets, Japan: 75 % of fixed assets, France: only earnings from rentals, Germany(planned):75 %.

or securities held for less than one year. To ensure that they fulfill their purpose in broadening real estate ownership, REITs are required to have at least 100 shareholders and they may have no more than 50% of the outstanding shares held by five or fewer shareholders during the second half of each taxable year.[25]

2.1.4 The Global REIT Market

The global REIT market in 2007 as a whole has grown against all key indices, including market capitalization, volume of trading over the year, and total rates of return. The global REIT market has grown to a total market capitalization of US$764 billion which is a 25% increase comparing to a market capitalization of US$608 billion 12 months ago. In addition, the average leverage (interest-bearing debt over total assets) of world REITs is now 40.29%, up from 34.24% 12 months ago. When taking this increased leverage into account, the total real estate owned by REITs globally stands at US$1.273 trillion.[26]

Inclusion of the UK to the REIT market and rapid growth of Asian REIT market in 2007 have been the key instruments in this global growth. However, North America has experienced a significant contraction in REIT numbers and US REITs have performed poorly in total returns compared to the rest of the global REIT market. As seen from Figure 2.8, in 2006, North America was home to 253 public REITs compared to 198 REITs throughout the rest of the world. As of June 2007, the rest of the world housed 253 REITs compared to 195 in North America. However, the United States remains the largest single REIT market with 169 REITs. Figure 2.9 demonstrates that in October 2007, with 58 total REITs Australia comes after the United States. France and Japan follow Australia with 42 and 41 REITs, respectively.

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[25] USA: At least 100 shareholders, the five largest shareholders must hold below 50 % together; Canada: At least 150 shareholders; Korea: max. 10 % of shares by one shareholder; Singapore: At least 500 shareholders; Britain: below 10 %; Germany (planned): share of one holder limited to 10 %, at least 15 % of the shares must be owned by small shareholders with max. 3 %; France, Belgium: no regulations, France for 2007 plans limits. (NAREIT)
[26] Ernst & Young Global REIT Report 2007

Asia and Europe have more than offset the contraction in the US REIT market in 2007. The dominant reason for growth in the number of REITs within the Europe region is Turkey and inclusion of the UK in 2007.[27] Again, as seen from Figure 2.8, except for North America, total number of REITs has increased from 2006 to 2007 in EMEA, Pacific and Asia regions. The analyzed countries in the corresponding regions are explained in Table 2.1.
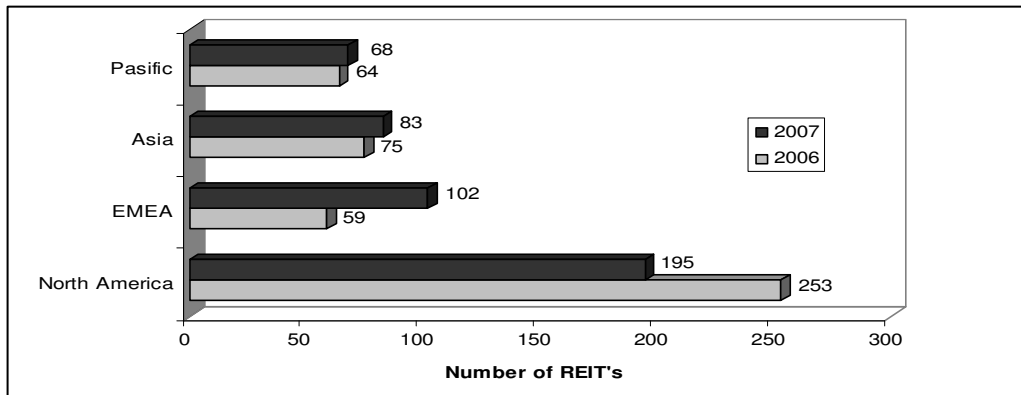
Figure 2.8: *Total Number of REITs by Region, 2007[28]*
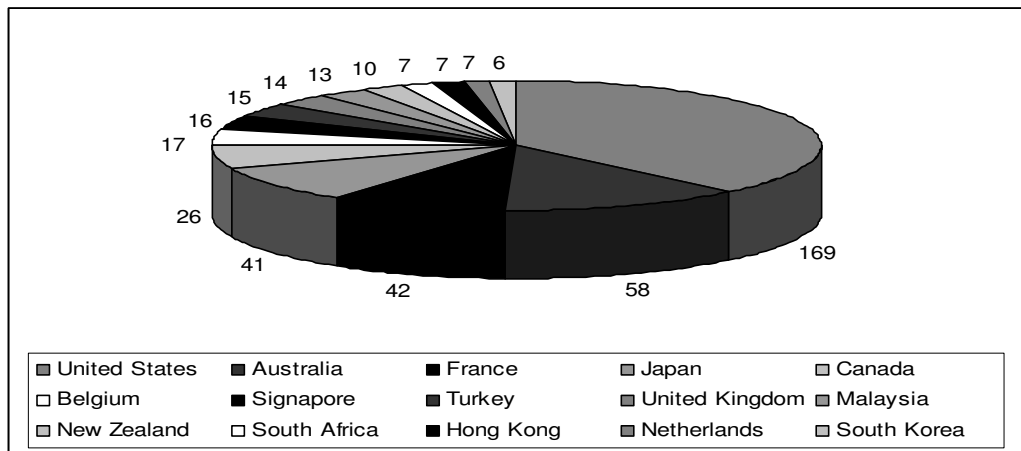
Figure 2.9: *Total number of REITs by Country, 2007[29]*

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[27] Ernst & Young Global REIT Report 2007
[28] Ernst a & Young, Global Real Estate Center, October 2007
[29] Ernst a & Young, Global Real Estate Center, October 2007

Table 2.1: *Countries in the Regions*

Global Region	Country
North America	US-Canada
Europe, Middle East and Africa	France-UK-Belgium-Turkey-Netherland-South Africa
Pasific	Australia-New Zealand
Asia	Hong Kong-Singapore-Japan-South Korea-Malaysia

Source: Ernst a & Young, Global Real Estate Center, October 2007

REIT market is also popular in Asian countries. In fact, three of the top five performers by total return are Asian countries. REIT markets in Japan, Hong Kong, Singapore, Malaysia and Taiwan have experienced strong performance particularly in stock prices, total returns and dividend yields according to 2006. Singapore's attractive regulatory environment in REIT sector has provided the platform for it to reach first place in the rankings, with a total rate of return of 72.92 % in 2007, up from 1.70 % in 2006. The Singapore REIT market witnessed by an almost 50 % increase in the number of REITs over the prior year and a threefold increase in total market capitalization to US $22 billion. Japan's REIT market, with US$40 billion market capitalization[30], has been boosted by increased activity in the stock market and from foreign investors who have shown a keen interest in Japanese real estate and have faced a 42% increase in total rate of return. Despite the relatively small size of the South Korean REIT market, it has achieved impressive dividend yields due to increasing office rentals, as well as rising debt levels.[31]

REIT industry is also well structured in Canada where they were first introduced in 1993. REIT was first listed in the Australian Stock Exchange (ASX) in as early as the 1970's. The legislation for setting up REIT in the UK, which has been recognized by the FSA (Financial Services Authority), came into effect in the beginning of 2007. India and Italia are yet to allow to setting up of REIT and are coming on board in the next years.

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[30] Yuka Hayashi - Japan's REIT Market May Not Be a Bargain, The Wall Street Journal Online, February 22, 2005
[31] Ernst & Young Global REIT Report 2007

As seen from Figures 2.10a and 2.10b, in market capitalization both for total per region and average per region, almost without exception, the trend has been a growth in market size in the last 12 months. However, North America has marginally decreased in terms of its total market capitalization, since 2006.
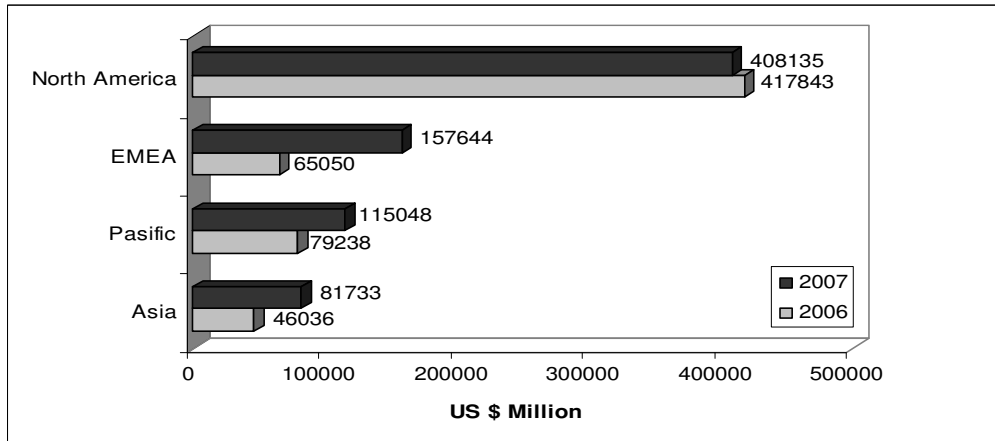
Figure 2.10a: *Market Capitalization-Total per Region and Average per Region[32]*
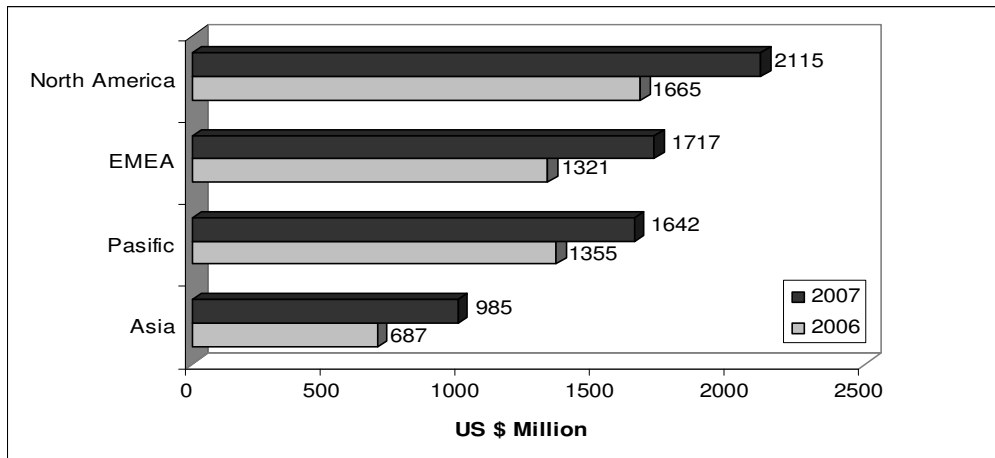
Figure 2.10b: *Market Capitalization Average per Region[33]*

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[32] Ernst & Young, Global Real Estate Center, October 2007
[33] Ernst & Young, Global Real Estate Center, October 2007

Figures 2.11a and 2.11b show that Asia has been the standout performer for total returns over one year in 2007, with an average rate of return of 44.26% across all five countries in this region. However, over the three-year period, Europe continues to be the top regional performer, with a combined average return of 28.50% over the three years to 30 June 2007. Over the three year period, North America faces a decrease in total rate of return from 17.89 percent to 7.20 percent.
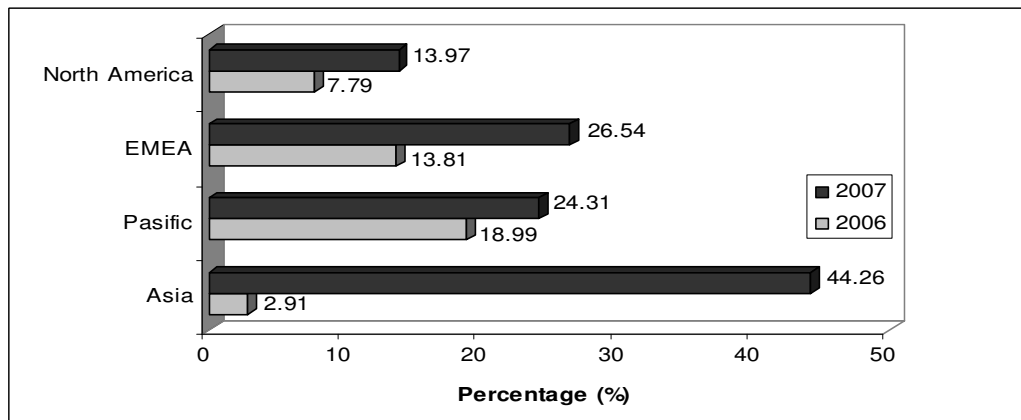
Figure 2.11a: *Total Rate of Return – one year to June 2007*
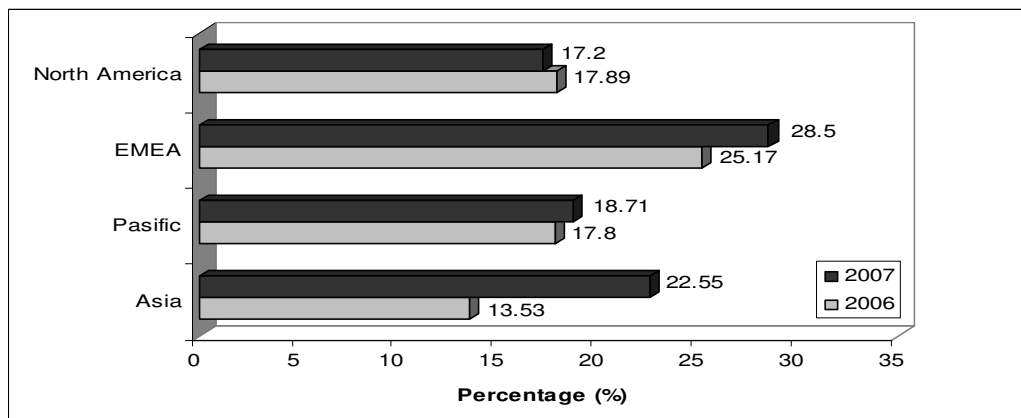
Figure 2.11b: *Total Rate of Return - three year to June 2007[34]*

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[34] Ernst a & Young, Global Real Estate Center, October 2007
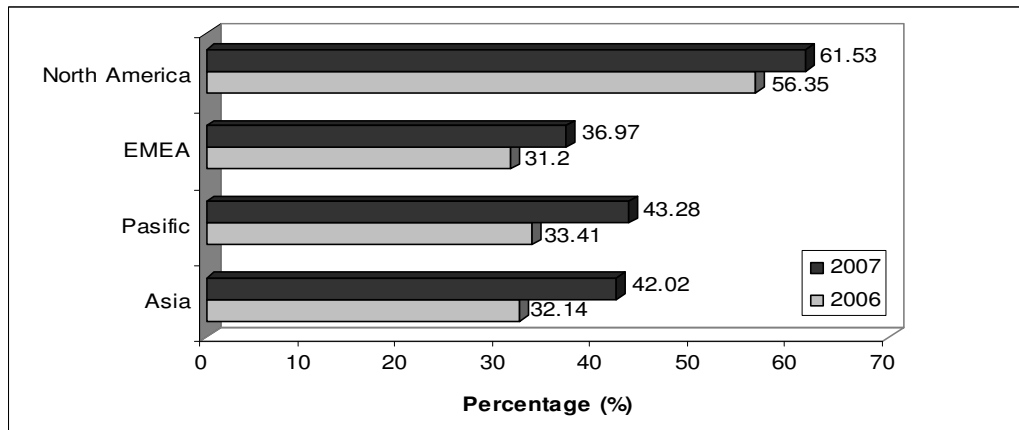
Figure 2.12: *Total Debt to Gross Assets 2007*[35]

Figure 2.12 indicates that across all regions, there have been increases in levels of gearing (debt) compared with last year. Asia comes first with 32.6% increase in total debt to gross assets, while Pacific and EMEA regions follow Asia with 29.5 % and 18.5% increases respectively. North American growth has been more modest with 9.37% increase, although still positive.
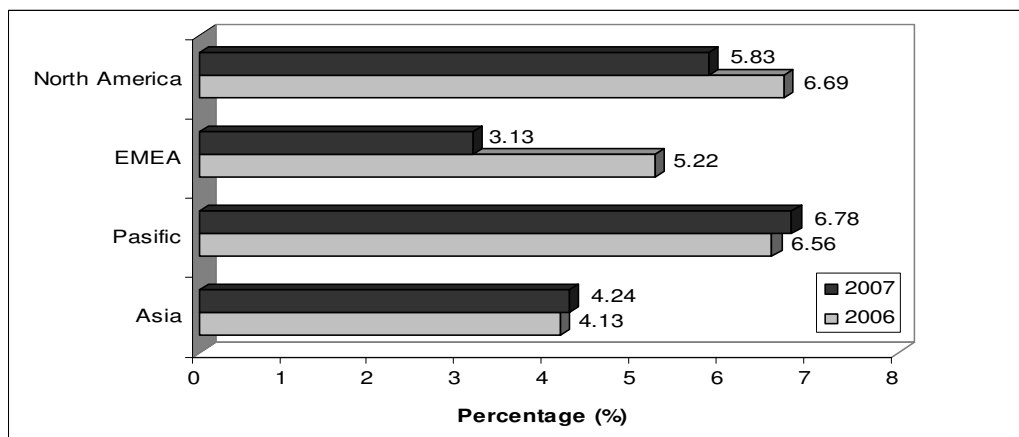
Figure 2.13: *Dividend yields of REITs*[36]

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[35] Ernst a & Young, Global Real Estate Center, October 2007
[36] Ernst a & Young, Global Real Estate Center, October 2007
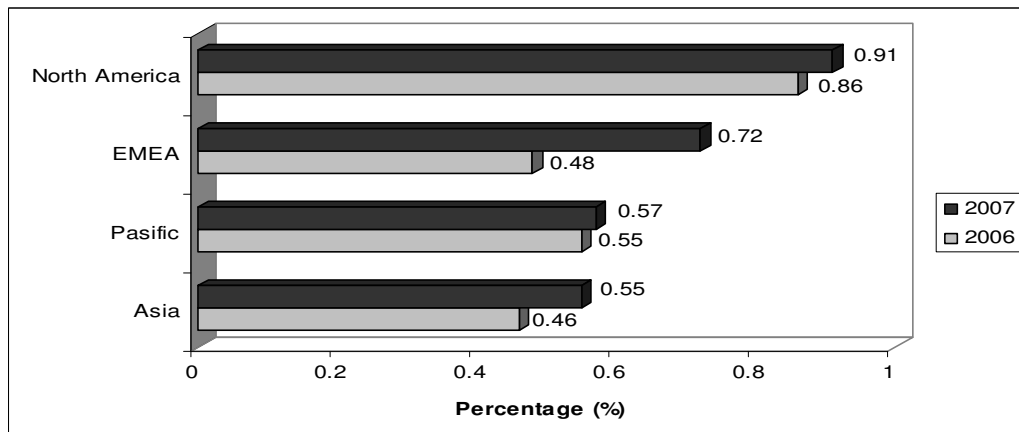
Figure 2.14: *Volatility of REITs* [37]

Figure 2.13 presents the dividend yields of REITs across regions. It illustrates that the movement in dividend yields has generally been down across the regions, reflecting the general tightening in property cap rates that has occurred in most REIT countries in 2007. Only Pacific and EMAE regions have increased dividend yields and it is also very slight. Not surprisingly, as given in Figure 2.14, due to the significant business activity within many REITs and rising levels of gearing, REIT volatility has increased across all four regions. It seems that current market uncertainty will further push up this volatility level in 2008.

2.2 Real Estate Sector in Turkey

Real estate is one of the leading sectors of Turkish economy since it is a labor concentrated sector and feeds about 240 sub-sectors. For this reason, it has a great role in the fight against unemployment and in increasing the aggregate production and income.[38] According to the data from State Planning Organization 1 unit of

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[37] Ernst a & Young, Global Real Estate Center, October 2007
[38] Tuhral, M (2005) Real Estate Development Process in Turkey, Master of Science Thesis, Department of Infrastructure, Division of Building and Real Estate Economics, Royal Institute of Technology, Stockholm

investment into real estate sector comes back to the national economy as 2.5 units.

Real estate sector in Turkey has been increasing tremendously in recent years. In fact, in recent years real estate and construction sectors have made up about 10 percent of Gross National Product, which has been growing to YTL 539.9 billion ($381 billion according to government calculations). Moreover, real estate is estimated to have a share of 40% of the total capital investment in Turkey.[39]

One of the most significant reasons behind the rapid increase of real estate is that Turkey has a local demand of young and dynamic population. According to the State Institute of Statistics, more than half of Turkey's population is under the age of 30 and these individuals grow up, marry, take jobs and seek housing. Thus, they consistently push up demand for property particularly in big cities such as Istanbul, Ankara, Izmir, Bursa, and Adana where almost half of Turkey's population is already housed.

Parallel to this fact, there has been an explosion in the number of urban households between 1996 and 2006 to 10.6 million, an increase of 33% in this period. Big part of the increase in urban households is due to the migration from the countryside to find jobs as traditional labor intensive farming methods are replaced by machines. Conversely, rural households have only increased by 3% in the same time period to 5.1 million. The rise in household numbers in whole country can also be attributed to a rise in the population, an increase of 8% between 2001 and 2006. Especially, since 1996 there has been a dramatic increase in the number of households in Turkey with the total standing at 15.7 million in 2006, a rise of 22% in that period. [40]

Figure 2.15 illustrates that due to high population growth and urbanization rate, the demand for residential units is climbing rapidly and a slowdown is not seen in this trend in the near term. Linked to the boom in the construction sector the housing

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[39] Teker, Murat B., Real Estate Finance and Investment through Capital Markets Instruments, Ankara Sermaye Piyasası Kurulu September 2000, p.1
[40] Euromontior International
(http://www.euromonitor.com/Population_growth_in_Turkey_driving_increase_in_households)

gap declined significantly, but it is still above 150.000 units per year. Recent reports from Reuters present a need for an average of 600,000 new residential units on annual basis to provide shelter for this dynamic, young, and migrating population and especially it's estimated that in Istanbul alone some 6 million units need to be constructed and completed by 2012 to meet demand at its current levels. According to an analysis of property investment expert Amberlamb, on November 2006, the Turkish property sector is on track to become one of the top five performing European markets in terms of capital appreciation in 2007.

Besides the local demand of young and increasing population, there are many other important factors positively affecting the demand towards Turkish real estate market in the last two decades. The most crucial one is the growing Turkish economy with decreasing inflation rate and increasing GNP in this period. Good economic conditions in Turkey in the last years have attracted the attention of foreign direct investment and improved Turkish international relations. In addition, initiating the mortgage system and rapid increase in REIT market can be attributed to recent economic improvements.
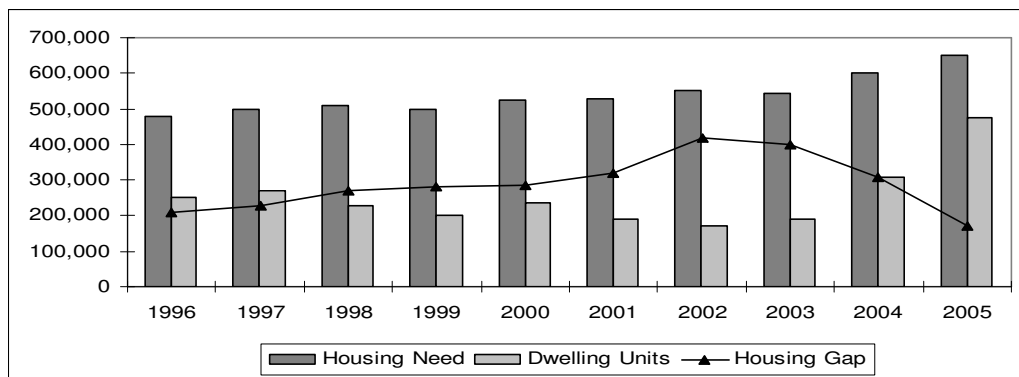
Figure 2.15: *Housing Gap in Turkey*[41]

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[41] State Planning Organization

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2.2.1 Foreign Investment in Turkey

Since investment opportunities into the real estate markets in developed regions are limited due to the settling prices, international funds and investors are gearing towards developing countries like Turkey in recent years.[42] There are also several other factors contributing to the popularity and demand of Turkish real estate market by foreign investors such as recent good economic conditions, reforms and new legislations for foreign investments.

Economic figures after the 2001 economic crisis and the regulatory reforms in the banking sector enabled the improving Turkish economy to get on a better level compared to last years. As seen in Figure 2.16a and 2.16b, the decrease in the inflation rate and the increase in the GNP growth rate after 2001 crisis are the most significant signs of the improvement in Turkish economy. All of these macroeconomic figures and reforms show that Turkey is on the way to have a stable and growing economic environment. Subsequently, this good economic environment provides favorable conditions for the foreign investment.
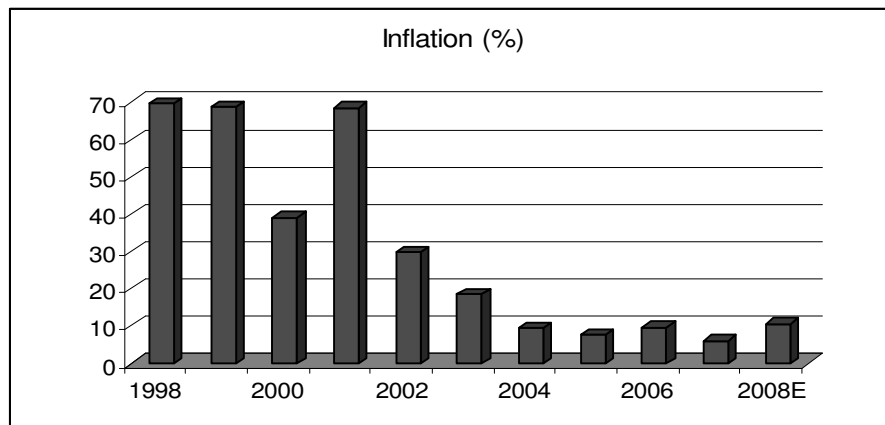
Figure 2.16a: *The Turkish Economy Inflation Rate between 1998 and 2008[43]*

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[42] Real Estate Market Review Issue 1- Colliers Resco
(www.bridgehouseinternational.com/docs/ColliersReviewTurkeyIssue.pdf -)
[43] TUIK
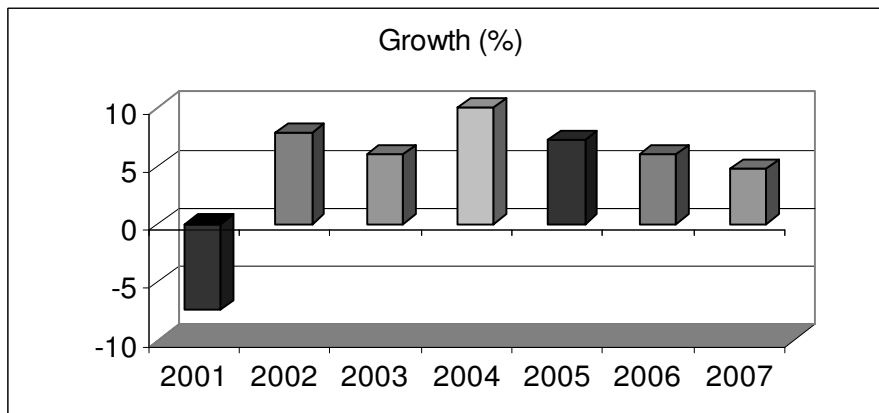
Figure 2.16b: *The Turkish Economy GNP Growth Rate[44]*

Besides being a more stable economy, Turkey has kindled the interest of foreign investment with recent reforms. First of all, the 2003 legislation allows many foreign country citizens to purchase real estate in Turkey. The principles governing purchase of property by non-Turkish nationals in Turkey is governed by the 1934 Property Act and this legal framework was modified for a first time dated 3 July 2003. With this new legislation, citizens of countries, whose governments allow Turkish nationals to purchase real estate in their country, were to be allowed to purchase real estate in Turkey.[45]

Non-Turkish citizens from the following countries have the legal right to own real estate property in Turkey: United Kingdom, Ireland, Germany, Netherlands, Norway, Switzerland, Denmark, Sweden, Belgium, USA, Spain, Italy, Canada, Luxemburg, France, Greece, Portugal, Poland, Israel, Finland, Estonia, Hungary, and some countries of Africa and South America.[46]

The limitations for the foreign purchasers in 2003 legislation are (1) a foreign national can not purchase more than 25,000m² (6 acres) of land (constructed or not) in Turkey without special consent from the Turkish Council of Ministers. The

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[44] TUIK
[45] Foreign Purchases of Real Estate in Turkey- wikipedia
[46] Stacie Leone, Real Estate Boom Sweeps Turkey (taik)
(www.turkey-now.org/Default.aspx?pgID=301&langid=1 - 60k -)

council of Ministers is authorized to increase this limit up to 300,000m2 per person, (2) foreign national ownership of real estate can not exceed 5/1000 of land in any designated province, (3) the property also has to be within a municipality. Foreigners can not buy in villages.[47]

In two years time following the 2003 legislation, 15842 parcels of property (2931 among these being unbuilt land) were acquired by non-Turkish legal or private persons in Turkey. The purchasers constituted a total of 18959 legal or private owners or co-owners from a total of 68 different countries. In the forefront came British nationals (8625 persons acquiring 6333 parcels), who were followed by Germans (3482 persons for 3210 parcels), with Dutch nationals, Danes, Norwegians, Greeks, Irish nationals, Swedes and Belgians respectively occupying the next places. According to official figures, foreign real estate purchases from 68 countries account for approximately $2 billion which is more than half of the total foreign direct investment in Turkey at the end of 2004.[48]

This new legislation has especially affected the holiday resorts which are on the coast of the Mediterranean and the Aegean. It was observed that, during this 2-year period, the districts most favored by foreign buyers were Alanya, Fethiye, Didim, Bodrum, Kuşadası along the coastline, as well as Ürgüp in Cappadocia. Alanya is a particularly preferred location for Germans and Scandinavians, while the British purchases highly concentrate in Fethiye and Didim. Besides purchasing holiday resorts in the Southern Turkish coastline, a vast amount of foreign institutional investors are currently investing into fixed income properties in Turkey. They are seeking to purchase office, retail and industrial buildings with long term rent leases by credible tenants in big cities, especially in Istanbul.[49]

Moreover, on December 17, 2004, the EU decided to begin membership negotiations with Turkey and presented October 2005 as the start date. Essentially, in parallel to the application to join the European Union, Turkey has tightened its fiscal

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[47] Foreign Purchases of Real Estate in Turkey- Wikipedia
[48] Foreign Purchases of Real Estate in Turkey- Wikipedia
[49] Foreign Purchases of Real Estate in Turkey- Wikipedia

policy more and pushed for major improvements in its economic environment and governmental reforms within the last few years. Not surprisingly, this development has increased the foreign investment interest in Turkey. Foreign direct investments climbed in 2006 to a record high of roughly 18 billion US-Dollars, and more than 80 percent of these investments came from EU countries.[50]

The Turkish government, realizing the financial potential of this phenomenon, has continued to make it easier for non-Turks to own property. Thus, from 7 January 2006 when the new law on "purchase of property by foreigners in Turkey" was put into effect to mid-April 2006, 588 British Citizens purchased 420 properties in Turkey. Secondly, 265 Germans bought 258 properties in Turkey. In the same period, on 25 April 2006 total property sale to foreigners and total foreigners bought property in Turkey reached 1,206 and 1,565 respectively. As a result of the government's efforts between January and October in 2006 alone almost USD 16 billion was committed to Turkey in the form of foreign direct investment. Moreover, with the revisions in existing laws to encourage foreign investment, after January 2008, foreign investors became able to apply for a mortgage within Turkey.[51]

As it is seen from Figure 2.17 there has been a rapid increase in real estate sales to foreigners after 2001. All these foreign direct investments in the last years show that foreign capital has begun to consider Turkey as a market for long term investments.

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[50] JP Morgan – Expo Real Magazine- October 2007,
[51] Stacie Leone, Turkish-US Business Council
(http://www.turkey-now.org/Default.aspx?pgID=301&langid=1)
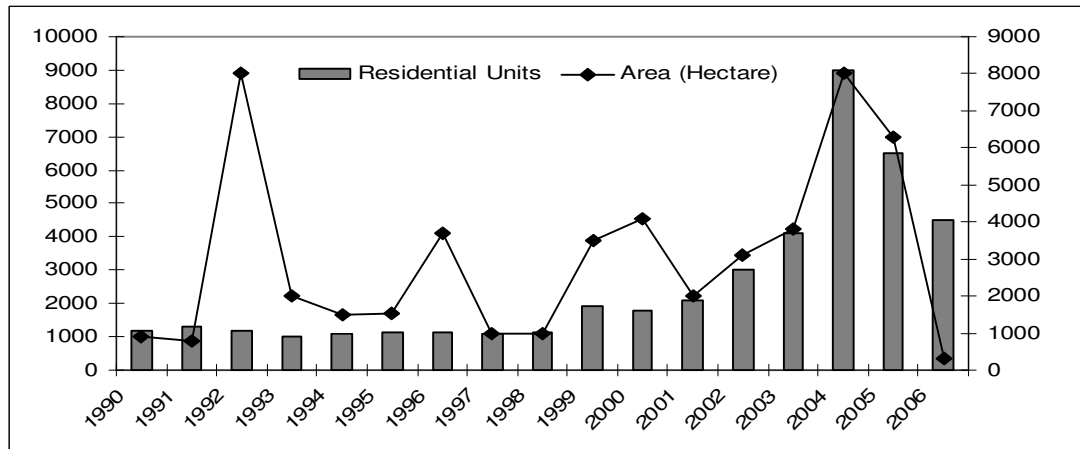
Figure 2.17: *Real Estates Sales to Foreigners*[52]

2.2.2 Mortgage System in Turkey

Mortgage system provides affordable payment conditions to buy new houses for low-mid income group and thus it is an essential vehicle for the growth of the residential demand. Before the mortgage system, the on going housing credit system in Turkey addressed a very small high income group because the purchasing power in Turkey is relatively insufficient. Recognizing this severe housing problems due to lack of a housing finance system, the government had appointed the Capital Markets Board (CMB) to establish the legal framework for the mortgage business back in mid-2004 and the proposed mortgage law was passed by the Parliament in February 2007.[53] With this new system in Turkey, it is assumed that home buyers will be assured an adequate supply of mortgage financing with competitive interest rates and new mortgage lenders such as commercial and participation banks, leasing and consumer finance companies will come into the scene.

Although, the mortgage system is new and immature so far, the associated growth

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[52] Ministry of Economy
[53] Tuhral, M (2005) Real Estate Development Process in Turkey, Master of Science Thesis, Division of Building and Real Estate Economics, Royal Institute of Technology, Stockholm

prospects show that new mortgage law will provide an increase for the real estate sector in Turkey. According to the survey prepared by CMB to analyze the effect of the mortgage system on the Turkish construction sector, 7 million households out of 17.5 million would be able to pay monthly installments provided that the 75% of the cost of a typical house (having a size of 90sqm) is met via a housing loan. Furthermore, the number of households those could be able to pay monthly installments will increase to 7.9 million given that the housing loan rates decline below 1% per month, while this figure could go up to 10.5 million if the rates fall below 0.5% per month. Indeed, Figure 2.18 clearly shows that there is an increasing trend in total loan volumes and a decreasing trend in hosing loan rates since 2005. If these trends continue like this the target of 1% monthly housing loan rate will be able realized.
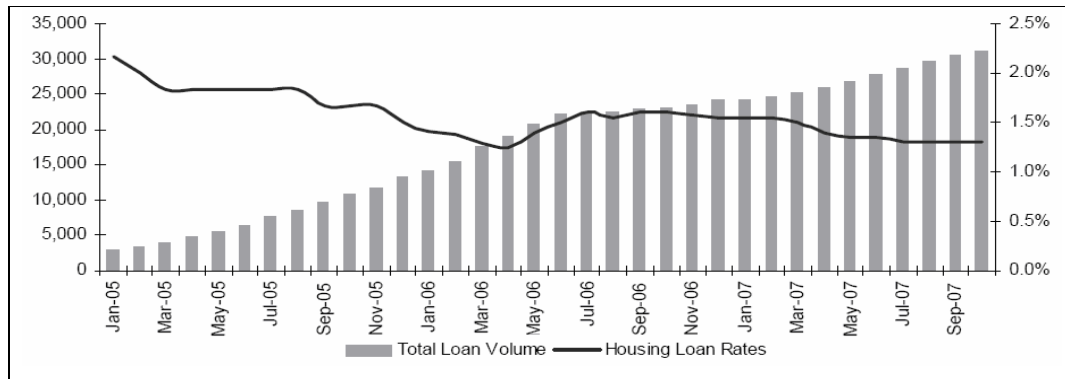
Figure 2.18: *Total Loan Volumes and Housing Loan Rates*[54]

According to the expectations of GYODER, as seen from Figure 2.19, mortgage loans will continue to increase rapidly and reach to 23 percent of GDP in 2010. However, despite this rapid recent increase in total housing loan and decrease in mortgage loan rates, total housing loan volume is still minimal with only 5% of GDP

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[54] Banking Regulatory and Supervision Agency

compared to European countries such as Denmark (90%), England (79%) and USA (52%).[55]

Turkey's current economic picture is similar to that of Spain's in 1980's. High interest rates and inflation, mortgage system still being at early stages and high home ownership ratio are main similar points to Turkey. Following the decline in interest rates and inflation, Spain experienced a boom in housing finance system as the mortgage loans/GDP reached 45% in 2004 from 12% in 1990s resulting with a significant growth figures in both construction and real estate sectors. Consequently, Turkey also can gather significant growth in the construction and real estate sectors, if it achieves to lower interest rates and inflation.[56]
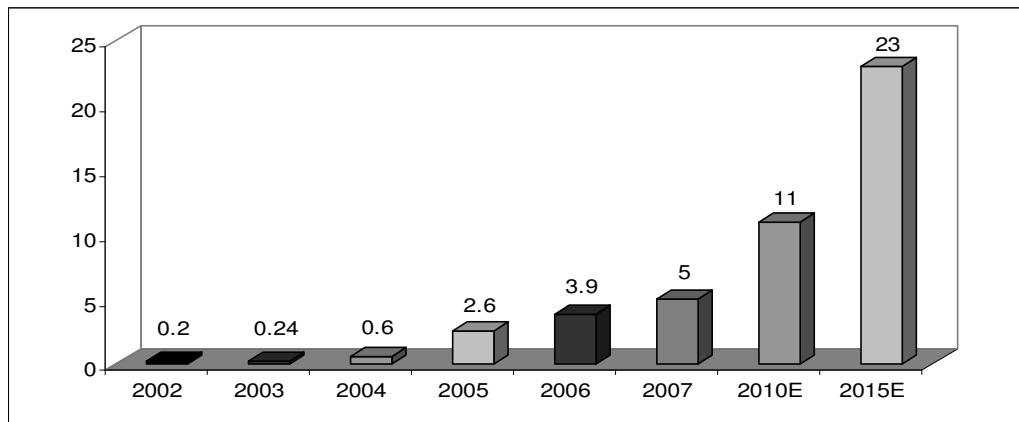
Figure 2.19: *Housing Loan to GDP in Turkey[57]*

In spite of the high demand for real estate assets, absence of an efficient mortgage market until 2007 was mainly due to a long-running process of high inflation and high interest rates.[58] In the last 4 years (2004-2007), however, inflation has steadily dropped to the lowest levels of the past decades. This suitable environment gave way

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[55] Express Invest, REIT Sector- Positive Outlook Resurfacing, November 26, 2007
[56] Express Invest, REIT Sector- Positive Outlook Resurfacing, November 26, 2007
[57] Source: GYODER
[58] NAREIT, Real Estate Portfolio, Special Issue, 2005

for the mortgage system to be launched. However, the formation of the secondary market will be the key for the effective functioning of the mortgage system. Most important contribution of the secondary market will be the creation of an international market for resale of residential mortgages.[59] In that context, mortgage lenders will be able to offer more favorable terms to more borrowers and this will consequently increase the usage of mortgage loans by the higher share of the population.

Mortgage is also a particular catalyst for the REIT sector, since the constructions to be subject to mortgage utilization will have to be licensed. Here, it is important to note that more than 50% of houses are unlicensed in Istanbul, and fully legitimate projects of the REITs will eventually be favored by the system. This will be an important and effective way to deal with "gece kondu" and unlicensed real estate problem in Turkey.

In the short term, it is not expected a significant impact of mortgage system, especially until the first half of 2009. The applicability of mortgage system will take time to be fully effective considering the current long-term housing loan rates of 1.40% per month. In order for the mortgage system to be fully efficient, rates should come down to the levels below, at least 1% per month.[60]

However, in the long term, it is believed that potential of the mortgage market is remarkable in Turkey. Falling interest rates, expected drop in the down payment requirement and rising consumer confidence with a more stable economy will be the key for a healthy mortgage system. With the full application of the mortgage system and declining interest rate environment, the housing loan rates will also diminish and the mortgage loan usage in Turkey will obviously increase. Subsequently, the home affordability will be improved for the mid and low income group. Furthermore, new longer-life mortgages will be available to potential house buyers making borrowing

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[59] This guarantees that mortgage originators have access to pools of capital that is managed by pension funds, insurance companies, and other institutional buyers of mortgage-backed securities.
[60] Express Invest, REIT Sector- Positive Outlook Resurfacing, November 26, 2007

more affordable. Turkey could also see more demand of foreign homeowners, as the law makes it easier for foreigners to secure a mortgage**.**[61]

2.3 Turkish REIT System

Inadequacy of capital in Turkey was one of the most important problems of Turkish real estate sector. Except for the publicly financed development projects, real estate sector had been developed by co-operatives and private construction companies with limited possibilities. In addition, due to the illiquid nature of real estate, the capital invested in land and buildings has not been contributed to the Turkish economic growth. REITs have entered the scene as a perfect tool to solve these capital and liquidity problem as well as to attract both small and large investors. [62]

REIT system was also a major step forward to bring international investment standards with reliable and quality information to Turkish real estate market in order to attract foreign investments. It is said that all the portfolio investments in the whole world is worth 95-100 trillion US dollars and %10 of these funds is accepted as real estate investments.[63] REITs in Turkey have been applied as a way of capturing a share from this global capital.

Another important role of REITs for Turkish real estate sector is bringing transparency and discipline in the real estate activities. REITs achieve this in cooperation with appraisal firms. All transactions and portfolio valuations of REITs are based on appraisal reports. The appraisers are professional institutions certified by Capital Market Board (CMB) so all the transactions and portfolio details are continuously known by public.[64]

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[61] Express Invest, REIT Sector- Positive Outlook Resurfacing, November 26, 2007
[62] Tuhral, M (2005) Real Estate Development Process in Turkey, Master of Science Thesis, Department of Infrastructure, Division of Building and Real Estate Economics, Royal Institute of Technology, Stockholm
[63] Tuhral, M (2005) Real Estate Development Process in Turkey, Master of Science Thesis, Department of Infrastructure, Division of Building and Real Estate Economics, Royal Institute of Technology, Stockholm
[64] Aydinoglu, C. (2004) Turkish REITs: An Overview of the Industry and Its Performance, Master Thesis, Department of Architecture, Massachusetts Institute of Technology.

The poverty and unemployment in rural areas has led the immigration to urban areas, especially big cities such as Istanbul, Ankara and Izmir, in the last decades. With this high scaled migration, illegal and unsecure real estate development started to come up. Today unsystematic and unlicensed housing is a serious problem in most of the big cities of the country. Furthermore, in Turkey a large share of real estate transactions are unrecorded and values of properties are widely understated in order to avoid taxes. Only way to deal with unhealthy and disorganized housing in Turkey is through institutionalization of real estate industry, in other words by growing of REIT system effectively.

Even though REITs sector is a newly developing sector in Turkey, a considerably high capital has been gathered to the sector since its first establishment and Turkish REITs have a remarkable growth potential in the near future due to the high expectations placed on them to bring transparency and professionalism to the real estate industry. In order to create a favorable growth environment for the industry, authorities have provided REITs with some important tax incentives as well as flexibility in managing their portfolios.

First of all, to promote the formation and growth of the industry, REITs are exempt from both corporation and income taxes. Other kinds of firms with floating common stocks in ISE do not have currently the same tax breaks that REITs enjoy.[65] However, Turkish REITs have to pay value added tax or VAT on acquisitions and/or disposals.

One other important feature of Turkish REITs is that they are not required to distribute their profits to the shareholders as dividend on an annual basis. In other words, Turkish REITs have freedom to choose their dividend policy. REITs' complete freedom over their dividend policies may enhance their growth through 100% plowback of profits into new investments.[66] This allows Turkish REITs to

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[65] Aydinoglu, C. (2004) Turkish REITs: An Overview of the Industry and Its Performance, Master Thesis, Department of Architecture, Massachusetts Institute of Technology.

[66] Erol, I. and D. Tirtiroglu (December 2007) The Inflation-Hedging Properties of Turkish REITs, Applied Economics, DOI: 1080/0003684060097023.

enjoy the financial flexibility to accumulate dividends, if needed, for further investments.[67] However, for US REITs the system is somehow different. To qualify as a REIT, US REITs have to pay out at least 90% of its taxable income as dividends to their shareholders. Because US REITs can only reinvest up to at most 10% of their annual profits back into their core business lines each year, Turkish REITs have a higher chance of rapid growth according to the US peers.

In fact, with those two incentives, REITs are likely to have some advantages over the ISE listed common stocks and their counterparts in developed emerging capital markets. Not paying corporate taxes along with some other tax benefits and dividend policy advantages, especially under high inflationary conditions, give REIT managers a lot of inexpensive capital for investment and asset management possibility. These advantages contribute positively to REITs' dominance both in inflation-hedging and total returns over the ISE common stock indices.

2.3.1 Activities and Limitations of Turkish REITs

The Capital Market Board (CMB) has set the first legal framework governing the real estate investment trust structure as a capital market establishment in the "Principles Communiqué Pertaining to Real Estate Investment Trusts" published on July 22, 1995.

Turkish REITs can engage in a variety of activities. For the purposes of generating capital gains or earning rental income, REITs can 1) purchase and sell real estate, 2) lease real estate from third parties and rent them in return to generate rental income, 3) purchase and sell capital market tools and do reverse repo transactions with such tools, 4) buy land in order to carry out real estate development projects and 5) purchase foreign real estate on the condition of obtaining ownership

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[67] The only dividend payout requirement for Turkish REITs is that the first dividend ratio cannot be less than 20% of the remaining distributable profit (the profit leftover after the necessary deductions of legal, tax, fund and financial payments, as well as prior year loss deductions, are made).

and investment in real estate-backed foreign marketable securities, however, the total value of foreign investments may not exceed 10% of its portfolio.[68]

Although they exist in real estate sector, Turkish REITs are not permitted to get in construction or real estate agency activities. For these kinds of activities they have to sign contracts with contractors. They also can not engage in construction work on their property and can not provide consultancy to third parties. Moreover, REITs are not permitted to invest in gold or valuable metals and capital market tools that are not quoted on the stock exchange or on any other organized market for the portfolio

According to amendment introduced in 1998 by the Capital Markets Board (CMB), REITs should float at least 49% of the total shares within one-year after the commercial legislation (in one year if their paid-in-capital is up 50 million TRY, in 3 years if between 50 million – 100 million TRY and in five years if in excess of 100 million TRY). The minimum public offering of 49% is intended as a "control mechanism to create a balanced partnership structure and accordingly allow all shareholders, especially small shareholders to equally benefit from the profits generated from real estate markets.

REITs must invest at a minimum 50% of their portfolios in real estate and real estate-backed securities. Earlier, this ratio was 75% in 1998 Communiqué.[69] This reduction has given them further flexibility to construct a more diversified portfolio with short and long term fixed income securities and equity. The remainder of REITs portfolio may be invested into; certificates, mortgage backed securities, and other similar securities, capital market instruments, bonds, REPO, bank deposits, equity participations, type A funds (25% equity content).

REITs must be founded with a minimum initial capital of 5.85 million YTL (app. USD 4 Million), 25 % of which must be contributed in cash. Real estate investments

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[68] Erol, I. and D. Tirtiroglu (December 2007) The Inflation-Hedging Properties of Turkish REITs, *Applied Economics*, *DOI: 1080/0003684060097023.*

[69] Aydinoglu, C. (2004) Turkish REITs: An Overview of the Industry and Its Performance, Master Thesis, Department of Architecture, Massachusetts Institute of Technology.

tend to be huge and highly capital intensive, thus the requirement is intended to ensure REITs to have sufficient capital for effective portfolio diversification.[70]

According to 2004 Communiqué, REITs may borrow up to an amount 3 times as much as the total equity amount stated on their last balance sheet in order to meet short term fund or cost related to their portfolio. This limit was twice the equity amount in the 1998 Communiqué. In the appropriate economic conditions, this amendment can provide REITs with higher return and more effective portfolio because of the leverage effect.

REITs' properties must be valued by an independent appraisal company authorized by the Capital Market Board (CMB). Use of independent appraisers is of vital importance for REITs. From the minority shareholder's perspective, independent appraisal is a protection in case of a conflict of interest with the management or controlling shareholders. From the CMB perspective, independent appraisal is crucial for the proper monitoring of compliance with portfolio restrictions. Specifically the transactions that require independent appraisals are purchase and sale of real estate holdings, development projects, leasing of real estate holdings, leasing of real estate for lease, renewal or extension of rental contracts, mortgage contracts, commencement of construction of development projects, assessment of the year-end values of portfolio assets.

According to 1998 Communiqué, REITs may be founded either for a specific period to realize a certain project or for a specific or unlimited period to invest in specific areas or for a specific or unlimited period without any limitation of objectives.[71] The first type of REIT has a finite life and is either liquidated at the completion of the project for which it was established or transformed into one of the other two types. The second type of REIT specializes in a certain type of product or geographic region, while this is a popular model in developed economies such as US and Australia. All Turkish REITs are of the third type; so, they are not limited by a

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[70] Aydinoglu, C. (2004) Turkish REITs: An Overview of the Industry and Its Performance, Master Thesis, Department of Architecture, Massachusetts Institute of Technology.
[71] 1998 Communiqué, Article 5.

certain product type or geographic location but are still bound by the general principles set by the CMB.[72]

2.3.2 A Detailed Analysis of the Turkish REITs

Main indicators of listed companies as well as REITs traded in the stock exchanges are portfolio value, net asset value, market capitalization and number of outstanding shares. Specifically for the REITs, the total portfolio value is defined as total appraisal based market values of buildings, land, development projects and liquid assets held in portfolio. The net asset value (NAV) is defined as the sum of the total portfolio value and non-portfolio liquid assets less total debt. The market capitalization is the number of shares outstanding multiplied by price per share on that day.[73]

The real estate sector in Turkey established the REIT structure in 1998 and today there are 13 REIT companies which are traded in Istanbul Stock Exchange (ISE) with a total portfolio of TRY4.12 billion and a total NAV of TRY3.89 billion.[74] According to the reports of CMB of Turkey in December 2007, REITs make up approximately 1.6 % of the total Turkish stock market capitalization with TRY3.19 billion implying an 18% discount to NAV. Listed Turkish REITs are Alarko, Akmerkez, Atakule, EGS, Doğuş (Garanti), Is, Nurol, Pera, Sağlam, Sinpaş, Vakif, Y&Y (Ihlas), Yapi Kredi REITs.

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[72] Currently, there is no specialization of Turkish REITs in a certain area like residential, office and retail REITs as the US REITs. However, with no doubt, Turkish REITs give place to residential, office and retail projects in their portfolios. However it is expected a further segmentation for the coming years in different industries such as; healthcare, logistics and tourism (hotel).
[73] Aydinoglu, C. (2004) Turkish REITs: An Overview of the Industry and Its Performance, Master Thesis, Department of Architecture, Massachusetts Institute of Technology.
[74] At the beginning of this study, Ozderici REIT was not established, so it is not included to this study.

Table 2.2: *Annual Change of Indicators of Listed Turkish REITs*

	Number of REIT	NAV (TRY)	Market Cap (TRY)	Portfolio Value (TRY)
1997	2	8,800,000	15,000,000	8,800,000
1998	5	135,799,000	37,519,000	135,799,000
1999	8	418,513,000	421,028,000	418,513,000
2000	8	531,873,000	313,307,000	531,873,000
2001	8	890,575,000	475,975,000	890,575,000
2002	9	1,081,125,000	338,714,000	1,081,125,000
2003	9	1,178,915,000	543,092,000	1,179,000,000
2004	9	1,382,911,000	1,445,753,000	1,383,000,000
2005	9	2,209,379,000	2,489,225,000	2,209,000,000
2006	11	2,480,857,000	2,081,671,000	2,480,857,000
2007	13	3,886,043,000	3,189,974,000	4,117,754,000

Source CMB of Turkey 31.12.2007

Both recent developments in real estate due to the strong economic trends and government efforts to create a favorable growth environment for the REIT industry has made Turkish REITs to face a remarkable growth in recent years. As seen in table 2.2, in the last 6 years after 2001 crisis, total NAV and portfolio values of REITs have increased more than 350 percent, while market capitalization has increased 570 percent. Moreover, this excessive increase of REITs industry can be seen in Figure 2.20 below. There is a significant jump in all three indicators from 2006 to 2007. NAV increases 56 percent, market capitalization increases 53 percent and portfolio value increases 66 percent relative to previous year. Notably, NAV and portfolio value of REITs have shown a continuous increase since 1999, however, market capitalization is somehow cyclical and sensitive that it increases and decreases according to economic environment.

39

Table2.3: *Main Indicators of Listed REITs in ISE*

Name of Company	Outstanding Share	NAV (TRY)	Market Cap.(TRY)	Portfolio Value (TRY)
AKMERKEZ REIT	13,700,000,000	929,051,479	530,053,000	933,919,757
%	1.43	23.91	16.62	22.68
ALARKO REIT	5,490,100,000	211,237,705	145,377,848	242,825,556
%	0.57	5.44	4.56	5.90
ATAKULE REIT	63,000,000,000	161,149,147	137,340,000	160,920,497
%	6.59	4.15	4.31	3.91
EGS REIT	50,000,000,000	20,187,212	26,500,000	36,365,267
%	5.23	0.52	0.83	0.88
DOĞUŞ-GE REIT	73,800,000,000	136,246,928	101,844,000	157,202,957
%	7.71	3.51	3.19	3.82
İŞ REIT	450,000,000,000	1,139,669,771	774,000,000	1,140,663,150
%	47.04	29.33	24.26	27.70
NUROL REIT	10,000,000,000	47,365,823	30,700,000	46,941,129
%	1.05	1.22	0.96	1.14
PERA REIT	48,000,000,000	40,619	106,560,000	54,613
%	5.02	0.00	3.34	0.00
SAĞLAM REIT	14,000,000,000	61,423,956	16,660,000	79,448,926
%	1.46	1.58	0.52	1.93
SİNPAŞ REIT	136,974,510,000	878,886,537	1,106,754,041	945,316,574
%	14.32	22.62	34.69	22.96
VAKIF REIT	18,480,000,000	82,148,711	44,906,400	82,367,583
%	1.93	2.11	1.41	2.00
Y & Y REIT	33,162,530,000	26,399,830	36,478,783	22,957,212
%	3.47	0.68	1.14	0.56
YAPI KREDİ REIT	40,000,000,000	192,234,941	132,800,000	268,770,193
%	4.18	4.95	4.16	6.53
TOTAL	956,607,140,000	3,886,042,660	3,189,974,072	4,117,753,414

Source CMB of Turkey 31.12.2007
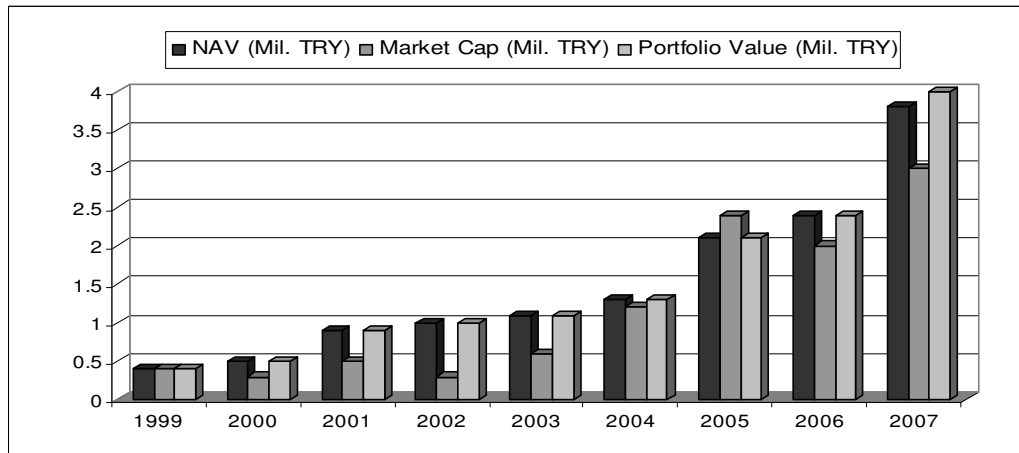
Figure 2.20: *Turkish REIT Indicators*[75]

Table 2.3 clearly presents that Is REIT is the leading REIT of Turkish financial market in the categories of outstanding shares and NAV. Especially, with a 47.04% of outstanding shares, nearly half of the REITs shares trading in secondary market, is belong to Is REIT. Again with a large portion of 29.33%, Is REIT is the market leader according to the net asset value (NAV). With a 23.91% and 22.62% of NAV, Akmerkez REIT and Sinpas REIT follow Is REIT. In table 2.4, it is obviously seen that Is REIT's main part of NAV comes from the buildings with US$806 million. Similarly, the source of high NAV of Akmerkez REIT is its buildings with US$635 million. However, Sinpas REIT's NAV is portioned out between land and cash and market securities. Table 2.3 shows that Sinpas REIT is the leader REIT according to the market capitalization (market value) with 34.69%. Despite the lower percentage of outstanding shares, the reason why Sinpas REIT's market value is the highest may be its high share price. Is REIT and Akmerkez REIT follow Sinpas REIT with 24.26 and 16.62 percent of market values. According to the portfolio values, with 27.7 percent Is REIT comes first and it is followed by Sinpas REIT and Akmerkez REIT with 22.96 and 22.68 percent.

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[75] GYODER

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Table 2.4: *Value of Assets in Net Asset Value Portfolios as of September 2007*[76]

Name of Company	Land	Building	Projects	Participations	Cash&Market Sec	Net Receivables
Alarko REIT	33 (20%)	52 (31%)	38 (23%)	0 (0%)	66 (40%)	-23 (-14%)
Is REIT	17 (2%)	806 (88%)	0 (0%)	0 (0%)	99 (11%)	-9 (-1%)
Yapı KK REIT	55 (43%)	19 (15%)	45 (35%)	2 (2%)	65 (51%)	-68 (-44%)
Atakule REIT	0 (0%)	108 (86%)	0 (0%)	0 (0%)	18 (14%)	0 (0%)
Akmerkez REIT	0 (0%)	635 (98%)	0 (0%)	0 (0%)	14 (2%)	-3 (1%)
Garanti REIT	0 (0%)	109 (107%)	7 (6%)	3 (3%)	0 (0%)	-17 (-17%)
Ihlas REIT	1 (4%)	0 (0%)	13 (57%)	0 (0%)	6 (27%)	3 (13%)
Nurol REIT	0 (0%)	26 (73%)	0 (0%)	0 (0%)	9 (26%)	0 (0%)
Vakıf REIT	5 (9%)	35 (60%)	0 (0%)	0 (0%)	19 (32%)	0 (0%)
Sinpas REIT	299 (41%)	0 (0%)	146 (20%)	0 (0%)	358 (50%)	-82 (-11%)

Source CMB of Turkey 31.12.2007

Since REITs are publicly traded companies that buy, develop, manage and sell commercial real estate assets as their primary business, the largest proportion of Turkish REITs are comprised by real estates which is higher than 70 percent for all REITs after 2001 and takes the highest portion in 2006 with 96 percent of real estate (although, 2004 Communiqué provides REITs with further flexibility of holding minimum 50% of real estate in their portfolio to construct more diversified portfolio). As it is seen from the Figure 2.21, although, real estate projects were holding a large place in Turkish REITs' portfolios early on, recently its significance almost disappears. Money market and government debt instruments, short term and more liquid assets, are taking higher portion after 2004, which shows 2004 Communiqué' s further flexibility effect in portfolio management.

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[76] Numbers in table 2.4 are in million US$ and numbers in parentheses are percentage values of the number in the same cell.
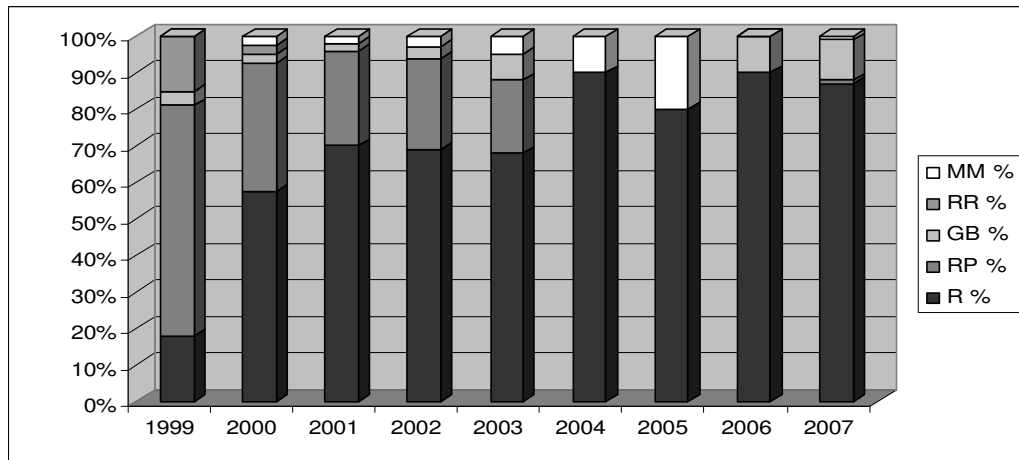
Figure 2.21: *Turkish REITs Portfolio Details* [77]

Turkish REITs prefer new project development instead of distributing dividends when excess cash is in pocket.[78] REITs are exempt from corporate and income taxes like US peers, but unlike US peers, there is no specific dividend requirement for Turkish REITs. According to the CMB regulatory, when REITs pay REIT, they have to pay either cash or bonus shares at a minimum of 20% of the distributable profit. In that context, the REITs generally prefer to use their excess cash to develop new projects with an expectation of increasing their NAVs further. As seen in table 2.5, Is REIT, Alarko REIT, Yapı Kredi Koray REIT, Atakule REIT and Akmerkez REIT do not distribute any dividends in 2004. Moreover, Alarko REIT and Yapı Kredi Koray REIT have not been distributing dividends since 2004.

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[77] (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 % : Proporiton of Reverse Repo in the Portfolio, MM % : Proportion of Money Market Instruments in the Portfolio)
[78] Express Invest, REIT Sector- Positive Outlook Resurfacing, November 26, 2007. (*Source CMB of Turkey 31.12.2007*)

Table 2.5: *Cash Dividends Distributed by REIT Companies*

	Distributed Cash Dividend (US$mn)			Dividend Yield (%)		
Company	2004	2005	2006	2004	2005	2006
IS REIT	n.a.	12.8	10.4	n.a	2.9	2.1
Alarko REIT	n.a.	n.a	n.a	n.a	n.a	n.a
Yapı Kredi REIT	n.a.	n.a	n.a	n.a	n.a	n.a
Atakule REIT	n.a.	1	1	n.a	3.3	1.9
Akmerkez REIT	n.a.	41.9	15.1	n.a	4.6	4.3

Source: ISE

Table 2.6: *REITs Historical Average Premium/Discount to NAV* [79]

REITs	Market cap.	NAV	2007	2006	2005	2004	2003	2002	2001	2000	1999
IS	698	913	-11%	15%	-4%	-33%	-53%	-45%	1%	116%	n.a.
ALARKO	137	167	-16%	-3%	-10%	-52%	-66%	-59%	-44%	1%	-30%
YKK	137	129	28%	57%	15%	-41%	-67%	-67%	-63%	-8%	-39%
GARANTI	119	102	25%	39%	14%	-10%	-72%	-72%	-61%	23%	81%
ATAKULE	122	125	-23%	-10%	-36%	-59%	-74%	-65%	n.a.	n.a.	n.a.
NUROL	27	36	-13%	9%	5%	-26%	-46%	-8%	42%	56%	n.a.
IHLAS	31	22	54%	41%	-4%	29%	41%	-34%	-63%	-21%	n.a.
EGS	18	7	146%	140%	-69%	-86%	-93%	-85%	-72%	-37%	-67%
VAKIF	39	58	-28%	-9%	-24%	-60%	-72%	-63%	-48%	7%	-16%
AK MERKEZ	459	646	-30%	-20%	1%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SAGLAM	61	50	99%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PERA	86	39	34%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SINPAS	844	721	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	2.781	3.01									

Source: ISE

REITs with stable dividends generally trade with significant discounts to NAV. For instance, REITs having only stable rental revenues such as Akmerkez REIT and Atakule REIT generally pay regular dividends to their shareholders, however, as seen

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[79] Market Capitalization and NAV values are in million US Dollar

from table 2.6, these REIT stocks have always traded with large discounts to their NAVs due to lack of potential projects to enhance their portfolios. On the other hand, these REITs' stock prices are less volatile than their peers, which are exposed to residential projects. Is REIT has an exceptional place among other REITs as the company pays regular dividends although it also develops new projects. This is due to its steady and high rental revenue generation capability.[80]

Figure 2.22: *Turkish REIT index relative to ISE 100[81]*
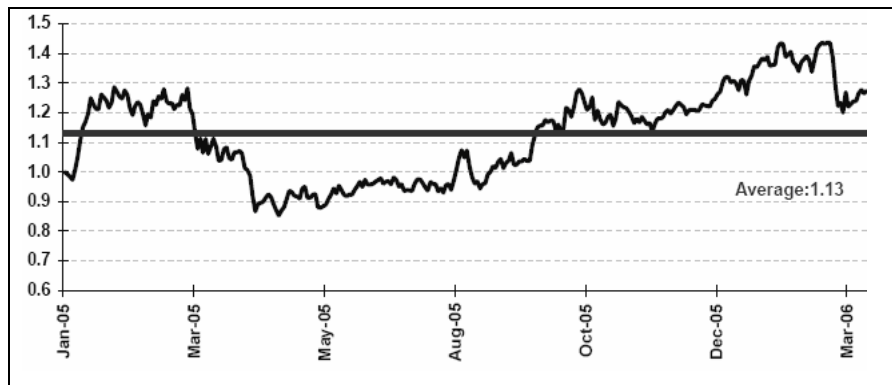
Figure 2.23: *Relative Performance of TR REIT Index vs US REIT Index*

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[80] Express Invest, REIT Sector- Positive Outlook Resurfacing, November 26, 2007
[81] Source: Raymond James Securities

Figures 2.22 and 2.23 compare Turkish REIT index with ISE100 index and the US REIT index during 2005 and first half of 2006. Turkish REIT index in this period is in a band of 0.9 and 1.10 which shows that there is high correlation between Turkish REITs returns and the ISE100 companies' returns in the given period. (However, this is inconsistent with the expected behavior of REITs stocks in a portfolio). However, this band enlarges to 0.85 and 1.4 when TR REIT index is compared to US REIT index. Much more important result from Figure 2.23 is that there is a significant increasing trend of Turkish REIT performance relative to US REIT after April 2005.

Currently, there are no restrictions on foreign ownership of Turkish REITs stocks. Since 2004, parallel to the recent good economic conditions, reforms and new legislations for foreign investments in Turkey, foreign investors have increased their exposure in Turkish REIT stocks. The ratio of foreign owned shares are exhibited in Figure 2.24. Four out of nine REITs have roughly 0% foreign ownership. The rest of the REITs have less than 1/3 foreign ownership with the exception of NUGYO, which has almost 70% foreign ownership.[82]
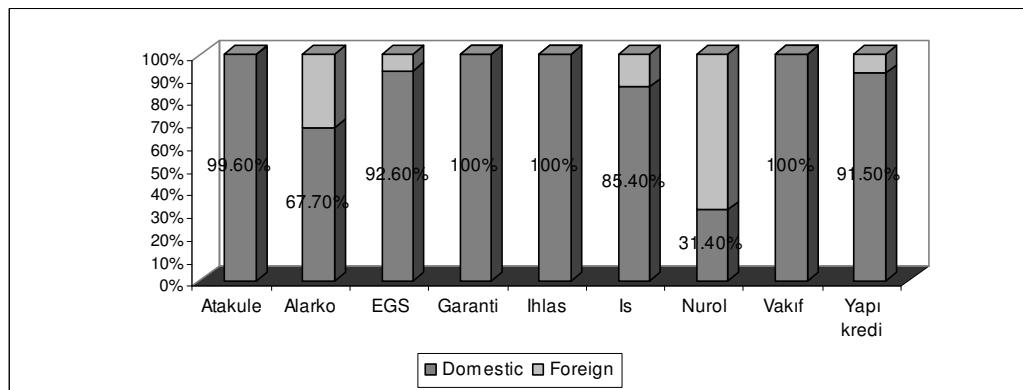
Figure 2.24: *Domestic versus Foreign Ownership of REIT[83]*

[82] Aydinoglu, C. (2004) Turkish REITs: An Overview of the Industry and Its Performance, Master Thesis, Department of Architecture, Massachusetts Institute of Technology.
[83] www.forex.com

CHAPTER 3

FINANCIAL LEVERAGE
AND
THE THEORY OF CAPITAL STRUCTURE

3.1 Introduction

Capital structure theory answers the basic questions of whether a unique combination of debt and equity capital exists that maximizes firm value, and, if so, what factors determine a firm's optimal capital structure.

Early researches in the capital structure area of corporate finance show that, under certain restrictive assumptions, the choice of capital structure has no impact on firm's value (Modigliani and Miller Irrelevance Theory). Modigliani and Miller (1963) [4] accept a world where there are no taxes, no bankruptcy costs and no agency costs. Under these assumptions, their mathematical model proves that capital structure is unimportant. Relaxing these assumptions and using real-world data, however, their model concludes that optimal capital structures do exist. If capital structure decisions affect market value, they must do so through tax effects, changes in bankruptcy or agency costs, or changes in the firm's investment program.[1]

Debt financing and equity financing, both, have advantages and disadvantages over each other. Basically, firms choose to include or not include debt in their capital

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[1] Barclay, M. J., Smith, C. W. and Watts, R. S. (1995) The Determinants of Corporate Leverage and Dividend Policies, *Journal of Applied Corporate Finance*, 7(4): 4-19.

structure for a variety of reasons. First of all, interest payments on debt are tax deductible so that the tax shield adds value to the firm.[2] In addition, mandatory interest payments on debt reduce the agency cost of managerial tendency to waste cash on poor investments.[3] Lastly, debt is the cheapest way of external financing since debt issue does not bring out information asymmetry and thus does not cause discount of share values. On the negative side, high amount of borrowing causes financial distress (bankruptcy costs). Costs of financial distress include the legal and administrative costs of bankruptcy, moral hazard, monitoring and contracting costs and also lawyers/judges/consultants are involved. Further, high leverage may induce managers to avoid profitable investments to minimize transfer of wealth to bondholders (underinvestment problem). Moreover, too much debt also subjects the firm to conflict between shareholders and debtholders.[4] Shareholders may start to prefer riskier projects that they can maximize their payoff at the expense of debtholders.[5] On the other hand, like debt, equity raises cash, but issue costs can be significant if investors discount the value of shares with a belief that managers issue shares only when they are overvalued; information asymmetry.[6]

At this point, it is useful to give brief explanation about tax, financial distress and agency cost to understand the above explanations. *Taxes* matter since interest payments are tax deductible so the higher the amount of debt in the capital structure, the greater the tax "shield. However, increasing the amount of debt in a firm's capital structure increases the probability that a firm will experience *financial distress*. Costs of financial distress include the legal and administrative costs of bankruptcy, moral hazard, monitoring and contracting costs and also lawyers/judges/consultants are involved. The phrase *agency costs* refer to the fact that, the incentives of managers

[2] Barclay, M. J., Smith, C. W. and Watts, R. S. (1995) The Determinants of Corporate Leverage and Dividend Policies, *Journal of Applied Corporate Finance*, 7(4): 4-19.

[3] Williamson, O.E. (1988) Corporate finance and corporate governance, *Journal of Finance*, 43(3) 567-91.

[4] Gonenc, H. (2003) Capital Structure Decisions Under Micro Institutional Settings: The Case of Turkey, *Journal of Emerging Market Finance,* 2(1): 57-82.

[5] According to Barclay, M. J., C. W. Smith and R. S. Watts (1995)) besides agency and contracting costs, benefit of debt using can also be offset by personal tax and other features of tax code.

[6] See in detail in the next section Pecking Order Hypothesis (Myers and Majluf 1984)

differ from the incentive of maximizing shareholder wealth. For example, managers whose contracts are based on income or assets under management may engage in empire building by purchasing negative net present value (NPV) projects.[7] When this occurs, the managers' total compensation package may increase while shareholder wealth is simultaneously reduced.

3.2 Capital Structure Theory

The three important theories of capital structure are the Pecking-Order Theory, the Tradeoff Theory, and the Market Timing Theory. While Myers and Majluf (1984) [5] introduced the pecking order theory of capital structure, Shyam - Sunder and Myers (1999) [6] is the first study to formally introduce empirical models for the Tradeoff and Pecking- Order Theories. The Market Timing Theory of Capital Structure was first introduced by Baker and Wurgler (2002) [7].

Pecking Order Theory

Pecking order theory is based on information asymmetry between firms and the market. Information asymmetry assumes that managers have advantaged information about the firm value that investors do not have. This induces opportunistic managers to sell equity only when it is overvalued. The new shareholder will avoid or discount equity with a belief that only poor (overvalued) firms will have the incentive to issue equity. Thus, stock prices always react negatively to equity issues. As Myers and Majluf (1984) point out, managers who avoid this cost of informational asymmetries use equity issue as a last source and prefer debt issue to equity as an external financing since debt is less costly than equity due to its less information sensitive

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[7] Jensen, M. 1986, Agency costs of free cash flow, corporate finance and takeovers, American Economic Review 76, 323-339, and Williamson, O.E. (1988) Corporate finance and corporate governance, *Journal of Finance*, 43(3) 567-91.

nature. Since internal financing is the cheapest and risk free way of financing, under pecking order theory, managers prefer using retained earnings first than issue debt and issue equity as last source.

Shyam-Sunder and Myers, (1999) states that pecking order theory predicts that firms' financing deficit and information asymmetry are the main determinants of securities issue and therefore, firms use external financing only if internal funds are not sufficient to finance the firms' growth opportunities and the information asymmetry cost is low.

In addition, according to Flannery (1986) [8], under pecking order theory, firms with higher information asymmetry rely more on issuing debt to finance their external financing needs, given that the financial distress cost is low. Short–term debt is less sensitive to the information asymmetry problem relative to long-term debt.

According to pecking order theory, no optimal capital structure exists, rather capital structure changes continuously with firms' investment opportunities. Under pecking order theory, if profitability and investments are persistent; leverage is lower for profitable firms and higher for firms with more investment opportunities. Especially more dynamic version of pecking order theory states that high growth firms may reduce leverage and use retained earnings for current investments to avoid issuing equity when need for additional fund raises in the future.[8]

Static Trade off Theory

The trade-off models predict that firms will seek to maintain an optimal capital structure by balancing the benefits and costs of debt. The benefits include tax shield, the reduction of free cash flow problems and other potential conflicts between managers and shareholders, whereas the costs include expected financial distress costs, costs associated with underinvestment and asset substitution problems. The

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[8] Feng, Z., G. Chinmoy and C. F. Sirmans (2007) On the Capital Structure of Real Estate Investment Trusts (REITs), *Journal of Real Estate Finance and Economics*, 34(1): 81-105.

implication of the trade-off theory is that as also seen from Figure 3.1, firms have optimal capital structure and they adjust their leverage toward the optimum over time. In other words, the firm is supposed to substitute debt for equity or equity for debt until the value of the firm is maximized. Firms deviate from optimal capital structure in the short term in response to fluctuations in valuation of the firm but long term capital structure is invariant since capital structure regresses to the optimal level in the long run.[9]

Under trade off theory, leverage is higher for more profitable firms. To minimize agency cost of free cash flow, profitable firms use higher leverage and pay back high interest to get rid of firm's excess cash. Conversely, according to Feng et al. (2007) [9] firms with more investment opportunities have less free cash flow and can have low leverage ratio.
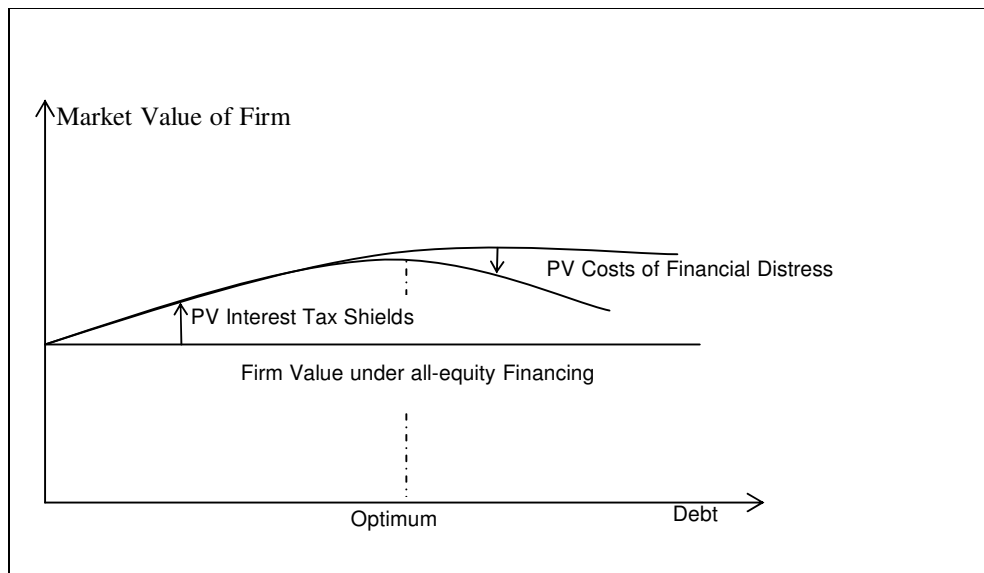
Figure 3.1: *The Stattic-tradeoff Theory of Capital Structure[10]*

[9] Joseph Farhat, Carmen Coteib , Benjamin Abugric, The Pecking Order Hypothesis vs. the Static Trade-off Theory under Different Institutional Environments
[10] Source: Myers, Steward C. (1984) Capital Stucture Puzzle

Market Timing Theory

The Market Timing Theory of Baker and Wurgler (2002) suggest that firms issue securities depending on the relative costs. If cost of equity is low relative to the cost of other forms of capital, they are more likely to issue equity. In other words, this theory suggests that firms are more likely to issue equity when their market values (share prices) are high, relative to book and past market values, and to repurchase equity when their market values are low. This theory also implies that, for external financing decisions, firms prefer external equity when the cost of equity is low, and prefer debt otherwise.

According to Market Timing Theory, managers are able to identify certain time periods during which equity issuance is less costly due to the high valuation of company's stock. This lowers the firm's cost of equity and benefits current shareholders at the expense of new shareholders.

Market Timing Theory also states that, the market timing of equity issuances has long-lasting effects on capital structure. Baker and Wurgler (2002) find that low leverage firms are those that raised funds when their market valuations were high, as measured by the market-to-book ratio, while high leverage firms are those that raised funds when their market valuations were low.

3.3 A Critical Review of Capital Structure Theories

There are many researches supporting or opposing these three theories. For instance, Rajan and Zingales (1995) [10] finds some evidence consistent with tradeoff theory while explaining the correlation of size, tangibility and profitability effect on capital structure. Shyam-Sunders and Myers (1999) present evidence favoring the pecking order theory over the trade-off theory. Frank and Goyal (2003) [11] does not support pecking order theory, and similarly, Welch (2002) presents evidence that observed capital structures can not be explained by any of the existing theories of value maximization. Fama and French (2002) [12] report findings consistent with, and contrary to both trade off and pecking order stories. Baker and Wurgler (2002)

interpret the evidence to be in conformity with the market timing theory to the exclusion of the other two. In the study of Hammes and Chen (2004) [13], in which they analyze factors influencing firm leverage of seven countries (Canada, Denmark, Germany, Italy, Sweden, the UK, and the US), the findings are in conventional capital structure theories the pecking order theory and the static trade-off theory. Chen, Linda H.; Lensink, Robert; Sterken, Elmer (1999) [14] find evidence suggesting the relevance of the pecking order hypothesis in explaining the financing choice of Dutch firms, which implies the importance of asymmetric information models in explaining capital structure choice of Dutch firms. Bruinshoofd and Haan (2007) [15] conduct a transatlantic comparison of corporate capital structures, using some 45,000 observations on US, UK, and continental European firms and concludes result consistent with pecking order and market timing theory. Especially, Korajczyk and Levy (2002) [16], Alti, A (2006) [17], Flannery and Rangan (2004) [18], Hovakimian (2004) [19], Kayhan and Titman (2007) [20] and O'Brien, Klein, and Hilliard (2007) [21] support Baker and Wurgler' (2002) market timing theory. Alti A. (2006) shows how powerful the market timing theory to explain capital structure decisions of firms reported by the Securities Data Company (SDC) between 1971 and 1999.

CHAPTER 4

A REVIEW OF THE CAPITAL STRUCTURE LITERATURE

4.1 Introduction

There is a considerable amount of studies examining the capital structure determinants of firms and comparing the determinants with those of other countries. A common point of almost all capital structure studies is that factors affecting the firm's capital structure decisions can be grouped in three categories. These are;

-Firm Specific Factors
-Institutional Differences
-Country Specific Factors (Macro Economic Factors)

General theory asserts that firm specific factors are the main features determining the firm's capital structure by dealing with the cross-sectional differences between firms in a country and between countries. Indeed, many studies about the US firms show that capital structure is cross-sectionally correlated with certain firm specific factors. Empirical evidence from many studies[1] shows that firm size, tangibility of assets, profitability, growth rate of assets and market to book ratio are important and

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[1] See Smith and Watts (1992); Rajan and Zingales (1995); Titman and Wessels (1988); Demirguc-Kunt and Maksimovic (1999); Wald (1999); and Booth et al. (2001), among others.

most common firm specific determinants of capital structure choice.

Institutional differences are also essential because they may affect the within-country cross-sectional correlation between leverage and firm specific factors. The answer of the question "why do firms in countries such as Japan and the United States with such diverse institutions have a similar amount of leverage, while firms in countries such as the United Kingdom and the United States with similar capital markets and financial institutions have such different levels of debt?" is simply the differences of institutional factors.[2] Analyses show that the most common institutional differences that cause different financial patterns across counties, in either developed or developing countries are banking system and stock market development, tax code, bankruptcy laws, agency costs, pattern of ownership, being bank oriented vs. market oriented country and government subsidies.

Country Specific Factors such as economic growth (growth of GDP or GPD/Capita) and inflation have direct effects on firms' debt ratios. In the study of Booth et al. (2001) [22] it is clearly explained that higher real economic growth causes the book debt ratios to increase, and higher inflation causes them to decrease. Indeed, Demirgüçkunt-Maksimoviç (1999) [23] emphasizes the importance of country-specific factors and states that knowing the country of origin is more important than knowing the size of all the independent variables for both the total and long-term book-debt ratios.

4.2 Definition of Financial Leverage

In the study of Rajan and Zingales (1995), three different leverage ratios are highlighted. *Stock leverage*, the ratio of total liabilities to total assets, can be viewed as what is left for shareholders in case of liquidation. However, it may overstate the amount of leverage since total liabilities also includes accounts payable. *Financial*

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[2] Rajan, R.G., and Zingales L. (1995) What do we know about capital structure? Some evidence from international data, *Journal of Finance*, 50, 1421-1460.

leverage is the ratio of short term or long term debt to total assets. However, accounts payable and accounts receivable again cause the miscalculation of leverage. *Leverage* is the ratio of total debt to net assets (net assets are total assets less accounts payable and other liabilities). The effects of past financing decisions are probably best represented by the ratio of total debt to capital (total debt plus equity). Wald (1999) [24] uses the ratio of long term debt to book value of assets as the debt ratio. According to Wald, the long-term debt is issued infrequently and measures a more long run relation. Total debt to total asset ratio is more sensitive to unobserved financial crises, whereas long term debt ratio will change less if firm suffers losses.

Similarly, Booth et al. (2001), which investigates the capital structure decisions of 10 developing countries, uses total debt ratio (total liabilities divided by total liabilities and net worth), long term book debt ratio (total liabilities minus current liabilities divided by total liabilities minus current liabilities plus net worth) and market long term debt ratio. Although total debt ratio has some problems again, it is the only ratio that can be calculated for all ten countries.

4.3 Capital Structure Analysis for Developed Countries: Firm Specific Characteristics

Rajan and Zingales (1995) and Wald (1999) are two leading studies trying to reveal the capital structure in developed countries, especially; they investigate whether the capital structure choices of firms in the developed countries are similar to those influencing the capital structure of the US firms. Rajan and Zingales (1995) concentrate in G7 countries (US, Japan, Germany, France, Italy, United Kingdom and Canada) during the period of 1987 and 1991, while Wald (1999) analyzes the debt financing decisions of firms in US, France, Germany, Japan, UK on the period of 1991 and 1992. Overall, it can be concluded that the factors which are correlated with the leverage ratios in US firms are similarly correlated in other G7 countries as well and countries have similar amount of leverage, with only the UK and Germany being relatively less levered.

Rajan and Zingales (1995) focus on four firm specific factors, namely tangibility, market to book ratio, firm size and profitability and suggest that institutional differences between G7 countries are mainly due to differences in tax code, bankruptcy laws, the state of development of bond markets, pattern of ownership and market or bank orientedness. Similarly, in Wald (1999), the differences appear in the correlation between long term debt/asset ratios and the firm riskiness, profitability, size and growth. These differences in firm specific factors may be explained by the institutional differences in tax policies, agency problems such as bankruptcy cost, information asymmetry and shareholder/creditor conflicts.

At this step of the study, firm specific factors affecting financing choices will be examined in detail. Although two studies above construct the basis of the discussion, many other researches will also be discussed.

Growth Opportunity (Market to Book Ratio)

Rajan and Zingales (1995) consider market to book ratio (market value of assets to the book value of assets) as an indicator of future growth opportunities of the firms and finds a negative and strong relationship between future growth opportunities and leverage ratios in G7 countries for all debt ratios employed. Consistent with Myers (1977) and pecking order theory of Myers and Majluf (1984), Rajan and Zingales (1995) states that firms with high market to book ratio have higher financial distress because they are more vulnerable to the fluctuations in businesses. Therefore, firms expecting high future growth should use a greater amount of equity issue or less amount and short term debt to keep their financing flexibility and to protect the lenders against the greater levels of uncertainty.

Another aspect from Jung, Kim, and Stulz (1994) [25] is that since firms have a tendency to issue stock instead of debt when their stock price or market value is high relative to book values, a negative relationship between market to book ratio and leverage can be observed (market value theory). Similarly, in the study of Barclay and Smith (1995) [26], in which the determinants of the corporate debt maturity are

examined, it is concluded that firms with considerable growth opportunities use lower leverage and shorter maturity debt. Moreover, Titman and Wessels (1988) [27], Fama and French (2002) and Smith and Watts (1992) [28] suggest a negative relationship between market leverage and investment opportunities. Similarly, Myers (1977) [29] concludes that firms with substantial growth opportunities use lower leverage and shorter maturity debt.

However, Stonehill et al. (1974) [30] finds a positive effect of growth opportunities on debt ratios of firms in Holland, Norway, Japan and US. The reason for the positive relation of growth and leverage may be that high growth firms that need more external capital end up with high leverage ratio. Wald (1999) finds a negative and significant coefficient for growth opportunities with US firms. However, in the second part of the study, where the independent variables correlated with the US firms are applied to the other developed countries, growth opportunity is positively related to long term debt ratio for these countries.[3]

Size

In the study of Rajan and Zingales (1995), where firm size is measured as natural logarithm of total assets, leverage increases with size in all G7 countries except for Germany. A possible explanation for this positive correlation for the majority of countries is that, large firms are better diversified and have a lower probability of being financial distress. Lower expected bankruptcy costs enable them to take on more leverage. Interestingly, Germany is the only country where larger firms have lower leverage. Similarly, Fama and French (2002) argue that larger firms may have less volatile earnings and this may induce a lower financial distress and a higher leverage ratio.

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[3]To explain the difference between the U.S. and Japan, Wald (1999) refers to Hoshi et al.'s (1990) work on Japanese firms. Hoshi et al.'s (1990) states that "Japanese firms experience lower costs of financial distress and thus increase debt financing even in a high growth environment because most of them are member of keiretsu which is an organization giving additional information about firms' status that make them invest profitably in recessions.

Wald (1999) gets a similar conclusion as Rajan and Zingales (1995) that Germany and France are the only countries where large firms have smaller long term debt/asset ratio. According to Wald (1999), size affects firms' financial decisions in such a way that larger firms may be able to reduce the transaction costs associated with long term debt issuance. Wald (1999) also states that the participation of banks in firms' governance may be effective to reduce the control problems and make the use of debt needless as a control mechanism. Thus, large firms in France and Germany, which are bank oriented countries, do not need to use debt as a control tool so they have lower debt financing relatively to market oriented countries such as US, Japan and UK. Similarly, Jensen (1986) [31] and Williamson (1988) [32] emphasize that high debt financing in the US is because large firms in US use debt to better control management behaviors.

The study of Barclay and Smith (1995) also provide evidence of a strong association between size and debt maturity that large firms issue a significantly higher proportion of long term debt and small firms usually rely on bank debt which has typically shorter maturity than public debt. Moreover, Barclay and Smith (1995) state that issuance costs for public issues may be high for smaller firms, thus they typically prefer private debt (bank debt) over public debt because of the lower cost.

Profitability

Rajan and Zingales (1995) suggest that profitability is negatively correlated with all G7 countries except for Germany. Similarly, Myers and Majluf (1984) predicts a negative relationship and gives an explanation consistent with pecking order theory that firms prefer to finance with internal funds rather than debt or equity. Another reason by Myers and Majluf is that managers of profitable firms issue less debt to avoid the disciplinary role of debt on them. Wald (1999) also finds a significantly negative relation for profitability in all five countries and states that profitability has the largest single effect on debt ratios by using EBIT divided by total assets as a proxy of profitability. Donaldson (1963) [33] gives a similar conclusion by using

financing hierarchy that the retained earnings should be used as the preferred source of financing.

In addition, Rajan and Zingales (1995) implies that leverage of larger firms is more negatively correlated with profitability than for smaller ones in US, Japan, Italy, and Canada, while in the U.K. it is more positively correlated. There is no this kind of relationship in Germany and France.

Alternatively, in Jensen's (1986) model, companies with high free cash flow or high profitability will be most subject to takeover and increased leverage. Thus, once these takeovers have occurred, more profitable firms will have higher debt/asset ratios.

Tangibility:

In Rajan and Zingales (1995) tangibility, which is measured as the ratio of fixed to total assets, is always positive with leverage in all countries both for the book leverage and market leverage ratios. The reason for this positive correlation is that if a large fraction of a firm's assets are tangible, then assets should serve as collateral and diminish the risk of the lender who suffers from the agency costs of debt. Moreover, tangible assets may show that the firm's assets are productively employed and will retain more value in liquidation. Therefore, the greater the proportion of tangible assets in the capital structure, the more loans is supplied, and leverage becomes higher.

Myers (1977) states that the expected cost of financial distress depends on the value of lost if trouble comes and intangible assets are more likely to lose value in financial distress. Thus, Myers (1977) suggests that firms holding valuable intangible assets should borrow less than the firms holding mostly tangible assets. Similarly, Long and MaLitz (1983) [34] find a significant negative relationship between rate of investment in advertising and research and development (R&D) and the level of borrowing. They also found a significant positive relationship between the rate of capital expenditure on tangible assets (fixed plant and equipment) and the level of

borrowing. Williamson (1988) determines a firm's intangibles as the difference between the market value of its debt and equity securities and the replacement cost of its tangible assets. The higher the intangibility, he found, the less the firm's debt to value ratio. In Wald (1999) study, where tangibility and intangibility are analyzed by the ratio of PPE to total assets and the ratio of R&D expenses to sales respectively, similar results are gathered as general theory.

Myers (1977) presents a model in which outstanding debt causes underinvestment problem in future opportunities. Jensen and Meckling (1976) shows that firms take greater risk after issuing debt to switch possible gains from debtholders to equityholders. In both studies, if firms have tangible assets, the potential for underinvestment or excessive risk taken by management is reduced.

However, there is also some indirect evidence. For instance, Berger and Udell (1994) indicate that firms having a close relationship with their creditors, especially bank oriented countries, need less collateral in obtaining debt financing, thus they suggest either a weakly positive or no influence of tangibility on a firm's debt ratio.

4.4 Capital Structure Analysis for Developing Countries: Firm Specific Characteristics

Investigating the capital structure of developing countries takes great attention and many researchers have been trying to show the similarities and differences between developed and developing countries. General conclusion about recent researches is that there are many similarities in the underlying factors of firms' debt-to-equity choices both in developed and emerging countries. These results are striking, given that there is considerable variation across markets in terms of their legal and institutional frameworks, market capitalization, and degree of market maturity.[4]

The studies of Demirgüçkunt-Maksimoviç (1996-1999) [36]and Booth et al.

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[4] Erol, I (2008) "Capital Structure Decisions in Turkish REITs" Proceeding of 13th AsRES Conference in Shanghai, China

(2001) give extensive information about debt financing choices in developing countries and make comparison of these with developed countries. Especially, a recent study by Booth et al. (2001) analyzes ten developing countries over the period of 1980-1990 and tries to find whether the variables that are relevant for explaining capital structures in US and European countries are also relevant in developing countries.[5]

Overall, their findings suggest that firms in developing countries have less long term debt than do firms in developed ones. Almost all the developing countries have a debt level, regardless of whether it is book or market, below the median of the G-7 countries. Although debt ratios differ across countries, the financial factors which are significant in developed countries such as tangibility, size, profitability, market to book ratio and business risk are again significant in capital structure decisions in developing countries. The importance and signs for size, tangibility and profitability in these studies are similar to results in Rajan and Zingales (1995) study, however sign on business risk and market to book ratio are sometimes opposite of the expected.

Although factors have the expected sign, their overall impact is low and the signs sometimes vary across countries, which imply significant institutional and country specific differences between countries. Thus, Booth et al. (2001) reaches an important conclusion that "knowing the country of origin is usually at least as important as knowing the size of the independent variables for both the total and long-term book-debt ratios."

Bhabra et al. (2002) [37] studies Chinese debt financing choices during the period 1993-1997 and makes comparison between developed and other developing countries. In general, Chinese firms employ relatively little long term debt and the amount of long term debt is positively related to firm size and tangibility and negatively related to profitability. In addition, growth rate of assets and ownership structure are significant determinants.

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[5] Booth et al. (2001) studies India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan, and Korea.

Since China is an immature market with high levels of information asymmetry and the credit market has not developed yet, borrowing ability and debt ratio is limited. Thus, the use of long-term debt by publicly traded Chinese firms is the lowest among all the countries despite the fact that Chinese economy is much bigger than many of the emerging markets that have been studied so far. These findings are consistent with the contracting-cost arguments of Barclay and Smith (1995) which notes that firms operating with high levels of information asymmetry are more likely to use short-term debt.

Growth Opportunity (Market to Book ratio)

Booth et al. (2001) uses market to book ratio as a proxy of growth opportunities and finds a positive correlation between leverage and growth opportunity except for South Korea and Pakistan. However, this result is inconsistent with results of developed country studies such as Myers (1977) and Barclay and Smith (1995) and Rajan and Zingales(1995) where they argue that firms with more growth opportunities should finance their operations with short-term debt to keep their financing flexibility and to protect the lenders against the greater levels of uncertainty. The explanation for this inconsistency could be the greater dependence of developing country firms on short term debt. Similarly, Bhabra et al. (2002) finds a positive relationship between the growth rate of the firms' assets long-term leverage for 1995 and 1996 and finds no relationship for other years.

On the other hand, Gönenc, H. (2003), in his study of capital structure decisions of Turkish industrial companies listed in Istanbul Stock Exchange (ISE) for the period from 1990 to 1999, states that improvements in a firm's growth opportunities lead to increase in the agency costs of debt and therefore, a negative relationship between debt ratio and growth opportunities should be observed.

Profitability

Booth et al. (2001) and Demirguckunt and Maksimovic (1996) suggest that correlation of profitability with debt ratio is consistently negative and highly significant (with only exception is Zimbabwe) and conclude that the more profitable the firm, the lower the debt ratio. This is consistent with Myers and Majluf pecking order hypothesis and other developed countries studies such as Rajan and Zingales (1995), Wald (1999), Titman and Wessel (1988). However, this finding does not sit well with static trade off theory, under which high profitable firms would use more debt to lower sector tax bill. In addition, Booth et al. (2001) states that highly profitable slow-growing firms should generate enough internally funds to sustain their growth, but less profitable fast-growing firms will need significant external financing.

In Bhabra et al. (2002) study, it is seen that since the listed Chinese firms are still in early growth state and the capital markets are immature, there exist significant asymmetry information and agency cost. These negative market conditions cause negative relationship between leverage ratios and profitability. Profitability is measured as the ratio of operating income before depreciation over total assets in this study.

Tangibility

In the study of Booth et al. (2001), tangibility tends to be associated with decreases in the total-debt ratio, however, it is associated with increases in the long-term debt ratio.

This implies that a firm with more tangible assets uses more long term debt, but that overall its debt ratio goes down. According to Booth et al. (2001) a high proportion of tangible assets increase long term debt capacity, not only because of the reduction in distress costs, but also because it can reduce the proportion of growth opportunities and subsequently the agency costs of managerial discretion.

Similarly, Bhabra et al. (2002) states that firms with higher levels of tangible assets have significantly more long-term debt. These results are consistent with the results reported in Rajan and Zingales (1995) and Wald (1999) for the G-7 countries.

Gönenç, H (2003) [38] determines the tangibility of the firm's assets as a proxy for agency costs. The more tangible the firm's assets, the lesser the agency cost and the greater firm's ability to issue secured debt. Thus, firms with a high ratio of fixed assets should have greater borrowing capacity.

Demirgüçkunt-Maksimoviç (1999) provides some conclusion about effects of fixed assets and firm size on debt ratio. High ratios of net fixed assets to total assets are positively related to the use of long-term debt by both large and small firms and less short-term borrowing by large firms only. This finding suggests that large firms can more easily use fixed assets to obtain long-term debt.

A parallel topic to tangibility is asset liquidity since tangible assets' liquidation value is higher than intangible assets in bankruptcy. Shleifer and Vishny (1992) [39] and Benmelech (2005) [40] argue that asset liquidation value should influence capital structure. Their model predicts a positive relationship between asset liquidity and leverage and debt maturity. In other words, firms with less liquid assets will use lower leverage and shorter maturity because of the costs associated with suboptimal liquidation.

Size

The positive relation between debt levels and firm size has been documented in many studies on developed countries as well as in the emerging country studies. According to Booth et al. (2001), smaller firms are likely to have higher monitoring costs than larger firms and large firms have lower risk of bankruptcy and greater access to debt markets.

Thus, larger firms report higher ratios of long term debt ratios than smaller ones. These results are consistent with pecking order hypothesis and with recent the studies on developed countries. Similarly, Gönenç, H. (2003) looks at the size as an inverse

proxy for the probability of bankruptcy because larger firms are more diversified and fail less often. In this condition, a positive sign for size may be expected.

Bhabra et al. (2002) states that in China large firms are major employers for the local economies, thus government supports them to remain employer of the local population and provides them with safe conditions to borrow high amount of leverage. As a result, in China large listed firms are able to access more debt and finance with longer terms relatively to small firms.

Demirgüçkunt-Maksimoviç (1996-1999) monitors the effect of legal system effect on large and small firms and concludes that when the legal system is inefficient or costly to use, short term debt is more likely to be employed than long term debt. In addition, large firms in countries with effective legal systems have lower short term liabilities. For small firms, evidence of a relation between the effectiveness of the legal system and the ratio of long-term debt to assets is weaker perhaps because small firms tend to use less long-term debt than large firms.

4.5 Capital Structure Analysis Both for Developed and Developing Countries: Country Specific and Institutional Differences

In this part, factors causing institutional differences in the capital structure of firms between countries will be presented. Booth et al. (2001) shows different institutional factors can result in different corporate governance system and consequently different financing patterns in different countries. Specifically, differences appear in the correlations between debt ratios and the firm specific factors across countries may be explained by differences in the institutions such as stock market and banking sector development, agency cost, bankruptcy cost and financial distress, ownership and being bank oriented vs. market oriented country.

4.5.1 Stock Market and Banking Sector Development

According to general theory, stock markets provide liquidity and a less costly way for investors to monitor firms since stock trading transmits information about firms. This revelation of information makes external financing of a publicly quoted firm less risky. Therefore, the existence of active stock markets increases the ability of firms to obtain long-term credit.

Demirgüçkunt-Maksimoviç (1996), which is the first paper empirically exploring the effect of stock market development on firm financing choices, investigates thirty developed and developing economies for the period 1980-1991. This study measures stock market development as the ratio of market capitalization to gross domestic product. In their study, opposite to the general theory, there is a significant negative correlation between stock market development and the ratios of long term and short term debt ratios for the whole sample of 30 countries. However, when the effect of stock market is analyzed in two parts, in developed and developing markets, the results are different. For developed markets, further stock market development leads to a substitution of equity for debt financing especially for long term debt. In developing markets, large firms become more levered as the stock market develops whereas the small firms are not significantly affected by market development. The reason why stock market development initially affects the large firms may be because large firms are easier to be monitored with market activities.

In many developing countries with emerging stock markets, banks are fearful of stock market development because stock market development may reduce the volume of their business. Instead, the results of Demirgüçkunt-Maksimoviç (1996) show that initial stock market development produce high debt equity ratio for firms and consequently more business for banks.

Bhabra et al. (2002) examines if there is any evidence of an increase in the listed firms' long term debt ratios during the study period of 1993 and 1997 in China. This period is important to study since two national stock exchanges begin their operation, the stock market size increases, the number of listed firms grow by nearly 320%. In

spite of the substantial increases in the stock market, the annual long term debt of the listed Chinese firms does not increase during the sample period. It seems that information revealed through the trading of tradable issues has provided only insignificant transparency in China.

In addition, there is also a significantly positive relationship between size of the banking sector and leverage in emerging countries. The ratio of bank loans made to the private sector to the Gross Domestic Product (GDP) measures the importance of banking sector in a country. The development of the banking system would improve the access of smaller firms to long-term credit. Similarly, Diamond (1984) [41] argues that intermediaries have economies of scale in obtaining information, thus, developed banking sector would facilitate access to external finance, particularly among smaller firms. The study of Rajan and Zingales (1995) suggests that the banking sector is more important in bank-oriented economies

4.5.2 Agency Cost

The corporate finance literature has identified several cases in which reliance on outside debt financing increases the incentives of the firm owners to act opportunistically or to harm the creditors, customers and suppliers. Booth et al. (2001) suggests that conflicts between principals (shareholders) and the agents (managers) affect the capital structure choices in both the developed and emerging economies. According to the Jensen- Meckling (1976) and Myers (1977), a highly debt-financed firm might forego good investment opportunities due to the debt overhang problem (underinvestment) or take on risky and expected negative net present value projects. Especially, Myers (1977) concludes that firms with significant risky growth opportunities may forgo profitable projects if the resulting increases in value are mostly captured by the firms' creditors (debt holders).

According to Myers (1977) the underinvestment or agency cost problem can be reduced by using shorter maturity debt. If the debt matures before the payoff from the investment is realized, the problem of sharing the payoff between debt holder and

shareholder is eliminated. According to their researches, firms with significant growth opportunities will use lower leverage and shorter maturity debt than few growth opportunity firms. On the other hand, Barclay, Marx and Smith (2003) shows that both long maturity debt and higher leverage work to limit management's flexibility to waste free cash flow to overinvest, however, higher leverage and longer maturity also contribute to the underinvestment problem. The optimal capital structure must balance these costs and benefits and also balance the maturity and leverage.

Agency theory according to Jensen and Meckling (1976) also suggests that when corporate managers have a significant ownership stake, managerial incentives are more closely aligned with shareholders and agency costs are reduced. As Jung, Kim and Stulz (1996) shows, when management pursues growth objectives, external common equity is valuable for firms with strong investment opportunities, since management and shareholder interests coincide. In contrast, for firms without strong investment opportunities, debt serves to limit the agency costs of managerial discretion.[6]

4.5.3 Ownership and Control

Gonenc, H. (2003) states that beside the capital structure choice, another way of reducing agency problems between managers and outside shareholders is equity ownership by managers. Increased managerial ownership aligns interests of managers with the interests of outside shareholders and reduces the role of debt as an agency-conflict-mitigating device. Therefore, the larger the stock holding of managers in the firm, the greater the desire of managers to minimize capital structure risks. Similarly, Jensen and Meckling (1976) also agree in the fact that managerial ownership reduces the agency cost between managers and shareholders. Oppositely,

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[6] Jung, Kim, and Stulz explain this effect: "First, management has less control over the firm's cash flows since these cash flows have to be used to repay creditors. Second, management is monitored by creditors who want to make sure that they will be repaid.

as Harris and Raviv (1988) [42] and Stulz (1988) [43] suggest, managers can easily use debt financing to inflate their voting power of their equity stakes and reduce the possibility of takeover attempts.

The effect of various ownership structures on firms' long-term debt ratios are examined in Bhabra et al. (2002) and they find no relationship between the percentage of shares held by the State, by legal person and by individual investors and leverage. Aggarwal and Mandelker (1987) [44] find a positive relationship between the percentages of shares held by insiders and US firms' leverage while Friend and Hasbrouck (1988) [45] report a negative managerial ownership effect on a sample of US firms.

It is also suggested that the monitoring by an external corporate control market is an effective factor for minimizing managers' opportunistic behavior. Rajan and Zingales (1995) note that countries with diffused ownership, such as the US, UK, and Canada, have a much more active market for corporate control while countries with more concentrated ownership such as Japan and Germany, do not have a significant market for corporate control. Jensen and Mecking (1976) [46] show a similar conclusion that the management of a firm with diffused ownership (large number of shareholders) in management would increase monitoring and reduce the agency cost of equity and enhance the use of equity as a source of financing. This concludes a negative relationship between number shareholders and the firms' long term debt ratio. However, according to Rajan and Zingales (1995) the effect of ownership concentration on capital structure for some countries is far from obvious. On the one hand, the presence of large shareholders on the board of directors should reduce the extent of agency costs between managers and shareholders and facilitate equity issues. On the other hand, if some of these large shareholders are banks, they might have a vested interest in reducing the amount of outside sourcing of their clients, forcing them into borrowing from them.

4.5.4 Bank Oriented – Market Oriented

Gönenç, H. (2003) briefly highlights the important specialties of these two systems. In market based systems, managers are monitored and disciplined by the market to perform in accordance with shareholder interest. Market based systems such as UK and US are characterized by more dispersed ownership, in other words, there exist lower levels of shareholders involment in direct corporate governance. These systems are more dependent to equity financing and less relationship with banks and board of directors are not independent of management. On the other hand, in bank centered systems, there exists more active role of shareholders in corporate governance, relatively more reliance on debt financing, longer term and more relations with banks and board of directors are more independent of management.

Researchers have been studying whether there is a difference in choice between public (stock and bond) and private financing (bank loans) for bank oriented and market oriented countries. Rajan and Zingales (1995) do not find any differences between the leverage ratios in bank oriented countries (Japan, Germany, France, Italy) and market oriented countries (USA, UK, Canada). However, they state that banking sector is more important in bank-oriented economies and bank oriented countries have very small financial markets (the exception is Japan). It might appear that the closer monitoring and control of firm management provided by banks should make more debt financing available in bank oriented countries.

4.5.5 Financial Distress and Business Risk

Capital structure theory states that firms with a larger variance of earnings (business risk) have a larger probability of going bankruptcy and therefore, to prevent this, should use less debt. Scott (1976) [47] and Castanias (1983) [48] show that, if bankruptcy is costless, the variance of earnings does not affect the debt/equity ratio and firms can issue debt with a higher interest rate and high interest rate does not

limit debt issuance. However, with positive bankruptcy cost, a large variance in earnings implies a lower debt ratio.

Wald (1999) uses the standard deviation of the first differences in the ratio of EBIT divided by total asset as the measure of risk and consistent with the general theory, finds a significantly negative relationship between risk and debt ratio for the US firms. However, in Wald (1999) study, Japan, UK and France use more debt when risk increases. Moreover, Stonehill et. al (1974) finds a significantly positive effect of earning volatility for Norway, the US and Japan. These results may be due to a high correlation between risk and some excluded variables such as PPE, governmental effects or any other country specific factors. For example, in Japan, firms in a more risky business join a *keiretsu* and avoid financial distress and this activity may cause issue more debt. Furthermore, according to Hoshi, Kashyap and Scharfstein(1990) [49], the reason may be the less bankruptcy cost in other countries than the US or more sensitivity of US firms to default risk than Japanese firms.

4.6 Capital Structure in Real Estate Investment Trusts

REITs provide an interesting framework to analyze different theories about capital structure. REITs do not pay any taxes if 90% of taxable earnings are paid out to shareholders as dividends. In addition, high payout implies that REITs have low free cash flow, thus, managers have little opportunity to waste cash on non value-maximizing acquisitions. At first sight, under trade off theory, disappearance of these two significant benefits of debt, tax deductibility of debt (tax shield) and reduced agency conflict, suggest that REITs should have no debt in their capital structure.[7] However, empirical evidence is clearly inconsistent with this idea.[8]

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[7] Feng, Z., G. Chinmoy and C. F. Sirmans (2007) On the Capital Structure of Real Estate Investment Trusts (REITs), *Journal of Real Estate Finance and Economics*, 34(1): 81-105.
[8] For instance, Brown and Riddiough (2003) reports that over the period September 1993 to March 1998, REITs made a 120 debt offerings of $133m each, on average.

On the other hand, equity brings out the cost of adverse selection which is caused by the information asymmetry between existing shareholders and managers. The main reason of adverse selection for equity financing is the lack of transparency. Since REITs are involved in real property transactions including heterogeneous and illiquid assets and since analysis of REIT assets requires special skills and knowledge, it is difficult for shareholders to determine the fair market values of these transactions. Consequently, the lack of transparency problem makes the equity issue a costly choice for REITs. In essence, issuing equity is a particularly costly proposition for REITs. Under this scenario, pecking order theory predicts financing first with retained earnings, then debt, and equity last. Since retained earnings are very low for REITs, pecking order leans heavily towards debt financing.[9]

Brown and Riddiough (2003) [50] analyze public issues by REITs over the years 1993-1998 and suggest that despite no obvious tax advantage, as long as they can attain minimum investment-grade credit rating, REITs prefer issuing debt and choose equity only as a last recourse. Similarly, in Feng et al. (2007), REITs issue more debt than equity in nine out of ten years after IPO. Consistent with the pecking order theory, these results suggests that REIT managers turn to debt financing first, before they consider equity financing.

Howe and Shilling (1988) [51] states that, as a non-tax-paying enterprise, the tax gain to corporate borrowing is strictly negative for REITs because the non-taxpaying REIT can not compete in the debt markets with firms for which interest expense results in tax savings. However, Jaffe (1991) [52] refutes the above argument and uses a proof similar to that of Modigliani and Miller's leverage irrelevance theory to show that the value of a REIT is invariant to leverage decisions due to the absence of corporate taxes, and less agency and bankruptcy cost. Feng et al. (2007) also support leverage relevance theory for REITs capital structure.

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[9] Feng, Z., G. Chinmoy and C. F. Sirmans (2007) On the Capital Structure of Real Estate Investment Trusts (REITs), *Journal of Real Estate Finance and Economics*, 34(1): 81-105.

Modigliani and Miller's leverage irrelevance theory can be adapted to REITs easily. Modigliani and Miller suggest that capital structure should matter, but only for taxes, agency cost and bankruptcy cost. If none of the three factors are present, then capital structure should be irrelevant for the use of debt. This theory is close to the case with REITs. First of all, REITs are *non-taxable* entities, as long as 90% of taxable income is paid annually in the form of dividend. Secondly, *bankruptcy cost* is also matter less for REITs than other industries since a large and economically significant type of bankruptcy cost is not probable for REITs. There is an active, liquid market for underlying real estate assets and managers of a distressed REIT can liquidate the assets at prices without large discounts from the normal market value. Finally, REIT structure can lessen *agency costs*. The market for real assets, providing benchmark prices for assets, allow external shareholders to determine quickly whether managers are engaging in empire building by overspending on real assets and the transparency of the income statement makes it difficult for managers to engage in wealth destroying activities.[10]

According to Capozza and Sequin (2000) [53], consistent with irrelevance theory, bankruptcy costs, agency costs and taxes are either irrelevant for REITs to reveal why apartment REITs employ greater amounts of debt. Thus, they investigate some other determinants and suggest that dividend policy, the size of the asset pool, institutional organization (internal- versus external-managed, finite- versus infinite-life), and the degree of diversification of assets play a role to explain the relatively more debt ratio for apartment REITs.

Capozza and Sequin (2000) also suggest that, although the famous Modigliani-Miller paradigm states that a link should not exist between dividends and capital structure, there is a negative link between dividend payout ratio and amount of leverage used. Since interest expense is a deductible expense in calculating net income, if high debt is used there will be greater actual cash outflows to debt holders

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[10] Capozza, D. R. and P.J. Seguin (1999) Leverage and Value in Apartment REITs, National Multi Housing Council (NMHC)

and declared net income will be reduced. As the amount of debt increases, interest expenses increase and cash flows available to shareholders become more volatile. As a result, dividend payout ratios are lower for more levered REITs.

The model of Allen, M. (1995) [54], which is also consistent with Modigliani and Miller's theory of the relevance of leverage, shows that if an optimal capital structure exists for non-taxed firms (REITs), it is a function of personal tax effects, costs of financial distress and non debt tax shields. Allen, M (1995) states that an increase in the personal tax rate imposed on equity holders would encourage higher leverage at the firm level. Likewise, an increase in the tax rate on returns to debt holders would discourage investors from committing capital to the debt market.

4.6.1 Firm Specific Characteristics of REITs

Capozza and Sequin (2000) demonstrate that larger REITs have higher optimal leverage ratios, regardless of type, for two main reasons. First, there exists a fixed cost to run a REIT, such as cost of managing bank and public debt, reporting fees and debt rating agency and trustee fees. If a REIT is too small, these costs outweigh benefits of debt in the capital structure. As a result, only larger REITs would benefit from having significant debt in their capital structure. Secondly, the firm size could also affect the capital structure through diversification. If larger asset REITs have a greater number of properties under management and the cash flows from these properties are not perfectly correlated, then larger REITs should have less volatile cash flows and will employ a greater proportion of debt in their capital structure. Feng et al. (2007) use the natural logarithm of total revenue as a proxy for firm size and states that as large REITs are less likely to suffer financial distress, thus, they should be associated with high leverage.[11] Maris and Elayan (1990) [55] present an empirical examination of the cost of capital of REITs which employs cross-section,

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[11] However, in their study the non-significance coefficient of firm size does not support the implications of the tradeoff theory.

time series regression analysis. They report a positive coefficient for size variable for both mortgage and equity REITs.

In Highfield et al. (2007) [56] study, contrary to the theory, larger firms issue shorter-term debt although the result is not statistically significant. However, when the weighted-average maturity of debt is analyzed, firm size is statistically significant, and the sign is consistent with Myers (1977) and Fama and French (2002) suggestions that larger firms have less volatile earnings inducing a higher leverage ratio. Moreover, larger firms actually have longer weighted-average maturities than their smaller counterparts.

Feng et al. (2007) use percentage of real estate investment as proxy for asset tangibility. Tangible assets may be used as collateral and may be associated with higher leverage. Since REITs are expected to have most of the assets as tangible assets, much variability is not expected in the data. Hence, they do not expect a relationship between tangible assets and leverage ratios.[12] However, Brown and Riddiough (2003) state that REITs with higher total assets and revenues are more likely to issue debt, which is consistent with pecking order theory. According to Giambona et al. (2007) [57], REITs tend to have high levels of tangible assets because they are restricted to owning real estate and Treasury securities. They also operate with much longer maturity debt and higher leverage than the typical industrial firm.

Feng et al. (2007) suggest that REITs with high market to book ratio (growth opportunity) raise most of their needed funds through long term debt issuance. Despite no apparent benefits of debt financing, management prefers issuing debt to equity to raise funds because the adverse selection costs due to information asymmetry of equity issue exceeds the potential costs of financial distress. In Highfield et al. (2007) study, where the weighted-average maturity of all debt is analyzed, the market-to-book ratio is significantly negative which is consistent with

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[12] In their study the negative and significant coefficient of real estate does not support the tradeoff theory.

76

Myers' (1977) hypothesis. Moreover, in their study there is evidence that agency problems play a significant role in determining the average debt maturity that REITs with more growth options shorten their debt maturity to reduce agency cost, but inconsistent with Myers' (1977) there is no evidence that REITs match their debt maturity to their asset maturity.[13] In the REIT capital structure study of Maris and Elayan (1990) the growth opportunity has positive coefficients for mortgage REITs but negative effects for equity REITs. Similarly, Giambona et al. (2007) shows that REITs with significant growth opportunities, as proxied by market-to-book ratio, use lower leverage and shorter maturity debt.

For a typical institutional firm, profitability is associated with the availability of internal cash flows, which implies lower leverage ratio under the pecking order theory. However, REITs are required to pay out 90 percent of the earnings as dividends. Hence, there is limited free cash flow and a significant relationship between profitability and leverage may not emerge. According to Feng et al. (2007), the evidence on profitability is nonsignificant and contracts with trade off theory.

Capozza and Sequin (2000) specifically examine the apartment REITs. They show that apartment REITs have higher optimal leverage ratios and significantly more long-term debt in their capital structure than other types of REITs. Apartment REITs have two financial advantages over others that make greater use of debt. First, lenders are willing to lend a greater percentage of asset value for apartments because apartments are more "liquid" than other properties. The number of potential apartment property buyers is relatively large because the average property size is smaller than an office building or shopping mall. Moreover, real prices of apartment react less to inflationary or interest rate shifts than do prices for other real estate assets with less flexible cash stream flows. The second financial advantage is that they can access forms of debt financing at costs (interest cost) below those faced by non-apartment REITs. Lastly, apartment REITs can access to the mortgage giants

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[13] Myers (1977) suggests that high growth firms tend to issue at shorter maturity and reduce agency costs by matching debt and asset maturity as closely as possible.

Fannie Mae and Freddie Mac that broaden the base of mortgage financing to apartment REITs and reduces its cost. These characteristics of apartments combine to make higher debt levels appropriate for apartment REITs.

Modeling the effect of liquidation value of REIT assets on the choice of their capital structure is very crucial since in a financially problematic time liquid assets are more valuable. Giambona et al. (2007) search the asset liquidation values and the choice of debt maturity of 136 publicly traded equity REITs in the period of 1997-2003 and find that firms specializing in the most (least) liquid assets use more (less) leverage and longer (shorter) maturities. These suggestions are consistent with Shleifer-Vishny (1992) and Benmelech's (2005) that firms with lower liquidation values use lower leverage and debt maturity is positively related to asset liquidation value. However, Highfield et al. (2007) and Riddiough (2003) reveal that there is little to no evidence for the liquidity. Giambona et al (2007) also suggest that while, industrial REITs have the most liquid assets, office REITs have the least liquid assets. Office and retail REITs, having the lowest liquidation values, have negative coefficients and indicate that office REITs use lower leverage and shorter debt maturity than other types of REITs. Overall, REITs with less liquid assets would use lower leverage and shorter maturity debt.

One of the significant factors causing agency cost is whether the REIT is an externally advised or internally advised one. Theory suggests that externally advised REITs underperform their internally managed counterparts. Howe and Shilling (1990) demonstrate that externally managed REITs experience negative abnormal returns over the 1973 to 1987 period on average. Hsieh and Sirmans (1991) [58] found that ``noncaptive'' REITs (i.e., those REITs that do not have business relationships with external sponsors or advisors) outperformed captive ones over the 1968 to 1986 period. Capozza and Sequin (2000), consistent with previous studies, find that REITs managed by external advisors underperform internally managed ones by over 7 percent per year. The majority of external advisors are compensated as a percentage of assets under management or property-level cash flows while managers of internally-managed trusts are compensated based on the performance of the

REIT's equity. This makes advisor managers to increase the asset base by issuing debt even if the interest costs are unfavorable and higher than market. Consequently, high interest expenses underperform the externally advised REITs.

Cannon and Vogt (1995) [59] examine possible agency problems in REITs from 1987 through 1992 and explore whether ownership structure reduces such conflicts. According to Cannon and Vogt (1995), ownership structure significantly influences market performance of advisor REITs that if ownership structure helps align manager and stockholder interests, advisor REITs with high managerial ownership or high outside ownership concentration should outperform those with low inside ownership. However, ownership structure does not affect returns or market risk of self-administered REITs. [14]

4.7 Review of Studies on the Capital Structure Decisions of the Turkish Firms

Turkey provides a good case to examine the effect of capital structure determinants in developing countries. In terms of legal rights and economic conditions, Turkey is much different from developed countries, but it has settings close to developing countries.[15]

Financial markets in Turkey have some unique characteristics that influence financial leverage decisions. First, financial markets are largely dominated by banks and there are limited resources in capital markets. Second, debt financing is the dominant source of financing rather than equity financing. The main reason of high

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[14] Prior to 1986, the typical REIT hired an advisor who then hired managers, leasing agents, and other subcontractors. Potential conflicts between REIT advisors and shareholders emerged when advisors hired property management firms affiliated with the advisor. In the Tax Reform Act of 1986, Congress clarified that a REIT may directly select, hire, and compensate those independent contractors who will provide customary services that may be provided by a REIT, rather than hiring an independent contractor to hire other independent contractors.

[15] Gonenc, H. (2003) Capital Structure Decisions Under Micro Institutional Settings: The Case of Turkey, *Journal of Emerging Market Finance,* 2(1): 57-82.

debt financing may be the advantage of leverage in inflationary periods and the erosion of equity in such periods. In addition, there exists almost no opportunity for firms to issue debt instruments.[16]

Gönenc, H (2003) examines the impact of profitability, asset tangibility, size, and growth opportunities on the capital structure and debt maturity decisions of Turkish industrial firms on the period of 1990-1999. Overall, Turkish industrial firms use a high percentage of short term debt. Gönenc, H (2003) states the reason for this short term debt as inflation, volatility, political and economic uncertainty. As a result of these economic conditions, high internal debt occurs and this internal debt is also short term. Moreover, he suggests that profitability, size, and asset tangibility show similar effect as in developed and other developing countries but growth opportunities do not. There is a positive relationship between debt ratios and growth opportunities for both total debt and long-term debt ratio. Size has a significant effect on debt maturity. Large firms use more long term and total debt and less short term debt than small firms. Although short term debt ratio stays stable for large firms over the years, it increases for small and large firms. In addition, similar to the results of Demirguc-Kunt and Maksimovic (1996, 1999), Gönenc, H (2003) finds that stock market activities of firms are correlated with debt levels. In countries with developing financial markets debt-equity ratios increase with an increase in stock market size and activity.

Gönenc, H (2003), in addition, states that Turkey can be classified in a bank-centered system with highly concentrated equity ownership and with a special role of banks. Since, Turkish companies don't have a chance to borrow from bond market[17]; the only source of debt is banks and other financial institutions. Higher equity ownership held by financial institutions should create a lower debt ratio. Yurtoglu, B

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[16] Sevil G.,Sayılır Ö.,Yıldırım S.,(2006) The Determinants of Capital Structure: Evidence from Turkish Manufacturing Firms, Academy of World Business Marketing and Management Development (AWBMAMD), Paris, France

[17]The main reason for not having private bond market in Turkey is high internal debt occurred because of the requirement of borrowing by the government. This debt is almost all-short term with high interest rates. In this condition, Turkish companies don't have opportunities to raise capital utilizing a private bond market.

(2000) also empirically shows that equity ownership in Turkey is highly concentrated that most of the Turkish companies have five (or few) large shareholders with at least 50% of the outstanding equity under their control. The results for equity ownership variables of Yurtoglu, B (2000), consistent with Gönenç, H. (2003) imply that firms with high equity participation of financial institutions and government use less debt.

From the point of view of agency conflict, Gönenc, H (2003) states that the legal protection provided to shareholders is lower than provided to creditors in Turkey. This suggests that the agency conflict between managers and debtholders are more effective. Consequently, managers in Turkish companies can easily use debt financing to inflate their voting power of their equity stakes which is also suggested by Harris and Raviv (1988) and Stulz (1988).

Sevil, Sayılır, Yıldırım (2006) [61] attempt to analyze the determinants of capital structure of manufacturing firms in Turkey focusing on the period 2000-2004 by using 42 manufacturing firms listed at ISE (Istanbul Stock Exchange) 100 Index. On average 74% of total debt is made up of short-term debt. Empirical studies show that the long term leverage is negatively related to sales growth rate but not the short-term leverage. It may be because firms growing fast in an inflationary environment are more tended to use short-term debt to finance their growth since short term bank loans are more flexible and easily available at a lower cost. Moreover, there is negative relationship between short term and total leverage ratios and profitability in Turkey, but not for long-term leverage. This is because the general tendency of banks to offer long-term funds to firms, which have better profitability performance, as these firms are more likely to receive high credit ratings from banks. In addition, the general theory for the relationship between leverage and tangibility holds true for long-term leverage in Turkey, but not for total and short-term leverage. Firms with more fixed assets are more likely to use long-term bank loans because they have more acceptable collaterals required for long-term credits than the others.

Aydin et al. (2006) [62] discusses the financial structure of the corporate sector in Turkey using the Company Sector Accounts compiled by the Central Bank of the Republic of Turkey (CBRT). Overall, corporate sector in Turkey appears to be

highly leveraged with relatively lower asset tangibility. The high level of leverage ratios can be a potential source of risk, as higher indebtedness increases the premium that has to be paid on external finance, and can affect investment adversely. High leverage ratios can also be an indicator of the vulnerability of corporations to macroeconomic shocks. Moreover, debt maturity of corporate sector in Turkey appears to be very short compared to those of emerging economies. This is believed to be stemmed mainly from macroeconomic instability reflected in form of high inflation, thus Turkish corporate sector is more vulnerable to external shocks. Therefore, Turkish corporate sector tends to stay more liquid compared to countries with longer debt maturity even Turkey experiences high inflation during the period. Moreover, the firms rely heavily on foreign currency denominated and short-term debt instruments making them vulnerable to both exchange rate and interest rate shocks through currency and maturity mismatches.

In Aydin et al.'s (2006) study, it is also highlighted that small sized companies which are expected to be bank dependent are less likely to have access to bank finance in Turkey. In general, small firms rely heavily on trade credits while large firms tend to use more bank loans and internal funds. Moreover, small firms have the lowest collateral ratios but not the lowest leverage ratios. This is not consistent with the general theory of the known relation of leverage ratio, tangibility and firm size.

CHAPTER 5

DATA ANALYSIS

5.1 Introduction

This thesis uses both the Tobit and panel data model regressions to examine the capital structure determinants of Turkish REITs. In this study, a broad range of semiannual data set of Turkish REITs, which are listed on Istanbul Stock Exchange (ISE) for the period 1998 to 2007, is used. The basic factors affecting the capital structure of Turkish REITs are grouped in three categories. These are namely; firm specific characteristics, institutional factors and country specific factors.

Firm specific characteristics consist of firm size, tangibility, profitability, market value to book value (as a proxy of growth opportunity), dividend payout ratio, having construction projects and being a bank affiliated REIT or not.

The extant literature shows that dividend payout ratio is not analyzed in REITs capital structure in many developed and developing countries. This is because, especially in the US and many other countries the primary requirement of being a REIT is distributing the 90% to 95% of the taxable income to shareholders as dividends annually. However, for Turkish REITs there is not that kind of obligation and this gives Turkish REIT managers extensive inexpensive capital for investment and asset management possibility. Capozza and Sequin (2000) briefly explain the relationship between debt and dividend payout ratio. Since interest expense is a deductible expense in calculating net income, if high debt is used there will be greater actual cash outflows to debt holders and cash flows available to shareholders become more volatile. As a result, dividend payout ratios are lower for more levered

firms. Different from peers in other countries, establishment of REITs by commercial banks as parent companies is common in Turkey. There are 5 bank affiliated REITs in Turkey; namely, Is REIT, Garanti REIT, Yapi Kredi Koray REIT, Vakif REIT and Atakule REIT. For this reason, this study adds a bank-affiliation dummy variable to the regression models and analyzes the effect of bank affiliation on REITs' debt financing choices. Moreover, it is also crucial to consider the effect of construction projects of REITs on their capital structure decisions. This study controls for the likely effects of growth options in two ways. The empirical models include the market-to-book ratios of Turkish REITs and an indicator variable, labeled "Construction Project" with a value of 1 for REITs with development activities of housing, shopping centers and other construction projects on urban land, 0 otherwise. The indicator variable follows from Geltner and Miller (2001) [63], who suggest that development constitutes the main source of growth options for REITs. For this reason a construction projects dummy variable is also included to the regression models.

In the present study, asset tangibility is measured by the ratio of fixed assets to total assets. Natural logarithm of total assets is used as a proxy for the firm size. Profitability is measured by the ratio of net income before interest and taxes to total assets. Market value to book value ratio is calculated by the ratio of market value of shareholders' equity to book value of equity. In order to evaluate firm specific factors, each REIT's financial information, including long-term debt, total debt, total equity, fixed assets, net income, total sales, stock price, total number of outstanding shares, dividend payout ratios and portfolio details are obtained from the balance sheets, income statements, portfolio tables and company year books in the Istanbul Stock Exchange and Capital Markets of Board reports.[1]

Equity ownership characteristics are analyzed under the institutional factors group in this study. Equity ownership characteristics are categorized into four groups as

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[1] http://www.imkb.gov.tr/bilanco/mtablodonem.htm
http://www.spk.gov.tr/apps/aylikbulten/index.aspx

84

ownership of managers (individual investors), ownership of financial institutions, ownership of government and ratio of shares traded in the secondary market (free float). Data on the equity ownership is gathered from the issue of the Yearbook of Companies published by the documentation department of the ISE at the end of each year. The name of the owners, the number of shares declared and the percentage ownership are listed in this document.[2]

Country specific factors affecting Turkish REITs capital structure consist of stock market development, banking system development and 2001 financial crisis. Stock market and banking system development are also significant factors in other developed and emerging markets. Rajan and Zingales (1995), Demirgüçkunt-Maksimoviç (1996) and Bhabra et al. (2002) give great importance to stock market and banking system development. Financial crisis factor is special to countries which have vulnerable economies and which exposed to financial crises in the past. Especially Turkey witnessed the destructive impact of 2001 crisis on all economy including real estate market and REIT sector. In general, after experiencing a financial crisis, it is expected that countries decrease their long term debt and depend on mostly short term debt or completely try to avoid debt due to the uncertain economic conditions of the country and the potential financial distress of debt burden.

To the best of our knowledge, the present study puts forth evidence for the first time on the effects of a severe financial crisis on firms' leverage decisions. Introducing an empirical innovation to examine both short and long term effects of this severe financial crisis is an important contribution of this thesis.

This study introduces one indicator variable – 2002 and 2003 Short Term Financial Crisis – to test for the short term effects of the 2001 financial crisis. This indicator variable assumes a value of 1 for the years of 2002 and 2003 and 0 for all other years. The reason we use dummy variable 1 for years 2002 and 2003 is that, in these years none of the REITs (except for Atakule REIT and Alarko REIT in 2002)

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[2] http://www.imkb.gov.tr/bilanco/mtablodonem.htm

distribute dividends to the shareholders. To our knowledge, this is the first application of this empirical innovation in the capital structure. Obviously, the coefficient estimates for these variables are expected to be negative.

This study also introduces an important variable – 2001 Long Term Financial – to test for the long term effects of the 2001 financial crisis. This variable measures the foreign exchange rate (FX rate) between US Dollar and New Turkish Lira. In macroeconomic theory, when a country is going through an economic crisis, its currency depreciates and the foreign exchange rate increases, since the demand shifts to the foreign currency instead of domestic currency. In other words, foreign currency appreciates and local currency depreciates relatively. It is expected that when crisis factor effective on debt ratios, at the same time US Dollar exchange rate is also significant and has a negative impact on especially for long term debt ratios. The reason why US dollar exchange rate is analyzed instead of other currencies is that in Turkey real estate sales are made mostly in US dollar.[3]

Moreover, the number of banks in a country may be one of the indicators of how well the financial systems go and how firms benefit from banks, because banks are effective in the country's economy and make loans to the firms and other institutions. For this reason, this study also checks for the effects the number of banks on financial leverage ratios.

Banking sector development is measured by the ratio of bank loans to private sector over GDP, while stock market development is measured by the ratio of stock market capitalization over GDP. The semiannual data for GDP, stock market capitalization and loans to private sector are gathered from statistics records of Central Bank of the Republic of Turkey.[5]

For the present study, in calculating the Turkish REITs' leverage ratios at any given time, four different methods are followed in line with the existing literature;

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[3] Capital – Mortgage, September 2008
[5] http://evds.tcmb.gov.tr/

1) Book Value of Long-Term Debt Ratio (LTD1): Long-term debt / Book value of total assets

2) Market Value of Long-Term Debt Ratio (LTD2): Long-term debt / (Book value of debt + Market value of equity)

Market Value of Equity = End of Semiannual Year Price * Total Number of All Outstanding Shares

3) Book Value of Total Debt Ratio (TD1): Total debt / Book value of total assets.

4) Market Value of Total Debt Ratio (TD2): Total debt / (Book value of debt + Market value of equity)

5.2 A Detailed Analysis of the Data Set

The number of Turkish REITs in the sample is only 5 in 1998 (see Table 5.1). Because of the recent developments in real estate and REIT sector, number of REITs has increased to 13 in 2007. Obviously a time series data is very limited for young REITS which are established recently.

Table 5.1: *Number of Listed Turkish REITs from 1998 to 2007*

Year	Name of REITs												
1998	Alarko	Vakif	EGS	Osmanli	Y.K.K.								
1999	Alarko	Vakif	EGS	Osmanli	Y.K.K.	Ihlas	IS	Nurol					
2000	Alarko	Vakif	EGS	Osmanli	Y.K.K.	Ihlas	IS	Nurol					
2001	Alarko	Vakif	EGS	Garanti	Y.K.K.	Ihlas	IS	Nurol					
2002	Alarko	Vakif	EGS	Garanti	Y.K.K.	Ihlas	IS	Nurol	Atakule				
2003	Alarko	Vakif	EGS	Garanti	Y.K.K.	Ihlas	IS	Nurol	Atakule				
2004	Alarko	Vakif	EGS	Garanti	Y.K.K.	Ihlas	IS	Nurol	Atakule				
2005	Alarko	Vakif	EGS	Garanti	Y.K.K.	Ihlas	IS	Nurol	Atakule	Akmerkez			
2006	Alarko	Vakif	EGS	Garanti	Y.K.K.	Ihlas	IS	Nurol	Atakule	Akmerkez	Pera		
2007	Alarko	Vakif	EGS	Garanti	Y.K.K.	Ihlas	IS	Nurol	Atakule	Akmerkez	Pera	Saglam	Sinpas

Source: Istanbul Stock Exchange

Table 5.2 reports the descriptive statistics (mean and standard deviation) of alternative leverage ratios and firm specific characteristics in semiannual periods

during the period of 1998 and 2007. Bold numbers in the table 5.2, which present the average leverage ratios for our sample firms, provide evidence on how leverage ratio varies over time. It is seen that semiannual means of LTD1 vary from a low of 0.00951 in 2003 to a high of 0.137 in 1999 with an overall 10-year mean of 0.071. Standard deviations of LTD1 appear to vary significantly from 0.0193 to 0.222 during the 10-year period. On the other hand, semiannual means of LTD2 vary from a low of 0.016 in 2000 to a high of 0.185 in 1998 with an overall 10-year mean of 0.078. Standard deviations of LTD2 exhibit more variability than standard deviations of LTD1 with a considerable variation between 0.024 and 0.3349. While 10-year means of total debt ratios, TD1 and TD2, are 0.166 and 0.23 respectively, standard deviations of TD2 are always higher than TD1.

Overall, these results indicate that the Turkish REITs use significantly low levels of long-term and total debt, especially lower levels of long term debt than REITs in developed countries. This finding becomes more evident when Turkish REITs debt ratios are compared with those of US REITs. Capozza and Seguin (1999, 2001) report that long-term debt ratios are 43.1 per cent for apartment REITs and 36 per cent for non-apartment REITs during the period 1989 to 1998. Capozza and Seguin (1999, 2001) also report that, the ratio of total debt-to-assets for apartment REITs is around 54 per cent and 47.6 per cent for non-apartment trusts during the same period. Similarly, Feng et al. (2007) reports that, book leverage (book debt to total assets) of REITs ranges from 50.19 per cent to 65.44 per cent for the period 1994 to 2003 and market leverage (book debt to market value of the firm) ranges from 40.86 per cent to 61.63 per cent for the same time period.

Table 5.2: *Semiannual Descriptive Statistics of Leverage and Firm Characteristics* [5]

	TD1	LTD1	TD2	LTD2	Firm Size	Tangibility	Profitability	M/B
1998 Q2	**0.2669**	**0.175**	**0.1681**	**0.1285**	**15.6268**	**0.0815**	**0.0964**	**2.5362**
	0.2125	0.228	0.1648	0.1605	1.6567	0.1155	0.0862	1.7735
1998 Q4	**0.204**	**0.1024**	**0.3426**	**0.1856**	**16.0587**	**0.0617**	**0.1303**	**0.6767**
	0.2125	0.188	0.269	0.2467	1.2072	0.0933	0.1359	0.1145
1999 Q2	**0.2467**	**0.1467**	**0.3047**	**0.2223**	**16.4331**	**0.0542**	**0.179**	**0.9883**
	0.235	0.2102	0.268	0.2219	1.2348	0.0679	0.0773	0.13
1999 Q4	**0.1362**	**0.1378**	**0.1216**	**0.1341**	**17.1367**	**0.0355**	**0.1228**	**1.5989**
	0.1758	0.2226	0.137	0.2395	1.148	0.0556	0.1556	0.7671
2000 Q2	**0.2283**	**0.1309**	**0.1944**	**0.0974**	**14.9169**	**0.0906**	**0.0692**	**1.4129**
	0.2727	0.2184	0.214	0.1603	6.9733	0.1384	0.0531	0.682
2000 Q4	**0.1658**	**0.0142**	**0.2434**	**0.0162**	**17.5224**	**0.1867**	**0.0995**	**0.7344**
	0.2256	0.0193	0.2945	0.0249	0.9139	0.3094	0.0924	0.4317
2001 Q2	**0.3129**	**0.0311**	**0.5289**	**0.0451**	**17.7595**	**0.261**	**0.0787**	**0.6596**
	0.2469	0.0489	0.2613	0.0592	1.1028	0.3563	0.1001	0.2922
2001 Q4	**0.1313**	**0.0441**	**0.3395**	**0.186**	**17.462**	**0.1934**	**0.1381**	**0.654**
	0.1474	0.0558	0.3837	0.335	0.8773	0.2907	0.1514	0.4161
2002 Q2	**0.162**	**0.0316**	**0.298**	**0.057**	**15.428**	**0.4298**	**0.0355**	**0.3709**
	0.2255	0.051	0.3916	0.0932	7.8124	0.3327	0.0486	0.2807
2002 Q4	**0.1694**	**0.0137**	**0.2765**	**0.0234**	**17.7207**	**0.4804**	**-0.0037**	**0.4206**
	0.266	0.0203	0.4056	0.0321	1.415	0.3209	0.1266	0.3231
2003 Q2	**0.1395**	**0.0099**	**0.2374**	**0.0164**	**18.0193**	**0.4901**	**0.0075**	**0.465**
	0.2436	0.016	0.3742	0.0239	1.1271	0.3025	0.0365	0.3165
2003 Q4	**0.0612**	**0.0095**	**0.1572**	**0.0626**	**18.1984**	**0.4638**	**0.0152**	**0.4498**
	0.1377	0.0241	0.2999	0.1799	1.0131	0.3095	0.067	0.2653
2004 Q2	**0.1204**	**0.0152**	**0.2482**	**0.0311**	**17.8689**	**0.4871**	**-0.0258**	**0.4186**
	0.176	0.0299	0.3582	0.0567	2.3064	0.2585	0.0677	0.2302
2004 Q4	**0.1312**	**0.0631**	**0.2669**	**0.1069**	**18.3013**	**0.5637**	**-0.0102**	**0.5644**
	0.1544	0.0901	0.3264	0.1183	1.1533	0.3363	0.0798	0.2749
2005 Q2	**0.1583**	**0.0996**	**0.2677**	**0.1307**	**17.6645**	**0.6113**	**0.0077**	**0.9896**
	0.1875	0.1628	0.2899	0.1848	2.9221	0.3372	0.0331	1.151
2005 Q4	**0.1701**	**0.0806**	**0.2042**	**0.0743**	**18.5174**	**0.6**	**0.0023**	**1.4566**
	0.1869	0.1497	0.2268	0.1162	0.9093	0.3714	0.1656	1.0983
2006 Q2	**0.1879**	**0.0601**	**0.2692**	**0.0719**	**18.3534**	**0.5505**	**0.0022**	**1.0554**
	0.1993	0.116	0.2648	0.1155	1.089	0.3837	0.1235	0.9666
2006 Q4	**0.18**	**0.0754**	**0.1977**	**0.05**	**17.8277**	**0.6622**	**-0.0349**	**1.0791**
	0.2428	0.1637	0.2437	0.0996	2.3603	0.3472	0.2484	1.0708
2007 Q2	**0.1729**	**0.0565**	**0.1861**	**0.0609**	**18.6122**	**0.5408**	**0.0182**	**1.4058**
	0.1824	0.1113	0.2217	0.112	0.8947	0.3663	0.1333	1.5015
2007 Q4	**0.1532**	**0.0193**	**0.2109**	**0.0311**	**19.0136**	**0.5752**	**-0.013**	**1.1639**
	0.1827	0.0405	0.228	0.0809	0.9877	0.352	0.2614	1.2754

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[5] Bold numbers represent mean values and ordinary numbers represent the standard deviation values of debt ratios and capital structure determinants

Data summary statistics, especially long-term debt ratios, imply that financial structure of Turkish REITs is heavily dependent on short-term debt. The reason for the high percentage of short-term debt can be explained with the lack of well-developed credit markets and a substantial amount of inflation, volatility, and political and economic uncertainty in Turkey during the study period. This high degree of uncertainty in the economy makes investors to invest for very short-terms and makes firms to stay liquid.[6] Secondly and more importantly, since Turkish REITs do not have to pay out dividends to the shareholders on an annual basis, they are able to finance their new investments through 100 per cent plow back of profits instead of borrowing from the market. Thus, they do not need or need relatively lower levels of long term debt than peers in other countries. Moreover, as a result of these economic conditions, high internal debt, which is a short term debt, has also occurred because of the requirement of government internal debt policy. In conclusion, if Turkish REITs have an optimum capital structure, it includes relatively short term debt.

Lower leverage ratio for Turkish REITs is consistent with tradeoff theory. Tradeoff Theory predicts lower book leverage for REITs due to the tax exempt status. The business nature of REITs makes it harder for their shareholders to discover the market values of investment transactions, which usually involves a wide range of heterogeneous, illiquid assets. According to the pecking order model, firms with high asymmetric information tend to resort to debt when they need external funds, and are more likely to have high leverage ratios.[7] This causes contradiction with pecking order theory. However, since Turkish REITs do not have to payout high dividends, mostly retained earnings are used instead of external financing which is consistent with pecking order theory.

Barclay and Smith (1995) note that firms, which operate with high levels of information asymmetry are more likely to use short-term debt. This is also consistent

[6] Gonenc, H. (2003) Capital Structure Decisions Under Micro Institutional Settings: The Case of Turkey, *Journal of Emerging Market Finance,* 2(1): 57-82.
[7] Feng, Z., G. Chinmoy and C. F. Sirmans (2007) On the Capital Structure of Real Estate Investment Trusts (REITs), *Journal of Real Estate Finance and Economics*, 34(1): 81-105.

with Demirguc-Kunt and Maksimovic (1999) suggestions that short-term debt is more likely to be employed than long-term debt to minimize borrowers' opportunistic behavior in countries with inefficient or costly-to-use legal systems. The use of low levels of long-term debt is also consistent with the findings documented by Booth et al. (2001) for other emerging markets. In addition, according to Gönenç, H (2003), there should be a significant relationship between capital structure choice of Turkish firms and financial institution since Turkey is a bank-centered country. Turkish companies don't have a chance to borrow from bond market; the only source of debt is banks and other financial institutions. Gönenç, H (2003) concludes that higher equity ownership held by financial institutions should create a lower debt ratio.
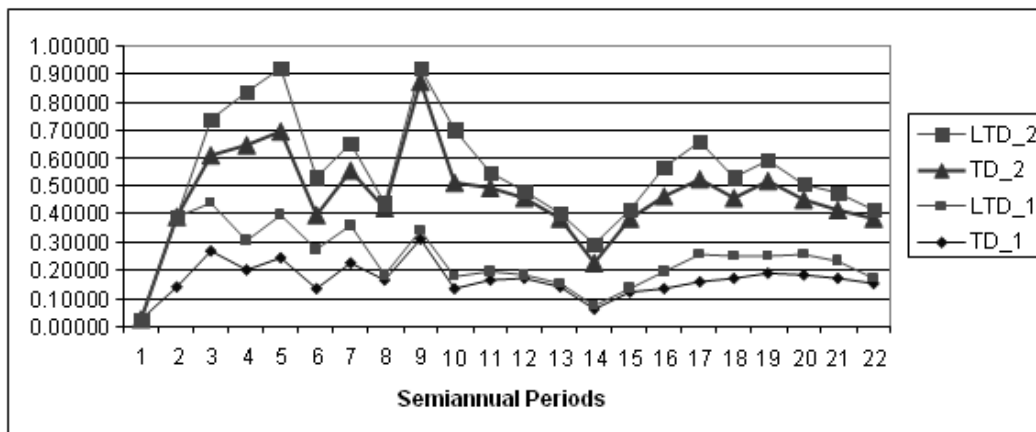
Figure 5.1: *Mean Leverage Ratios*

It is also important to note that, as seen in Figure 5.1, market value of long-term debt ratio (LTD2) and total debt ratio (TD2) are found to be significantly higher than book value of those ratios (LTD1 and TD1, respectively). Market value of debt ratios are scaled by the market value of the firm. Highly volatile stock prices in ISE may result in significantly lower stock prices during some periods, and this may lead to lower market values of the firms and mathematically greater market debt ratios.

Furthermore, inconsistent with Baker and Wurgler (2002) and Feng et al. (2007), as it is seen in Figure 5.1, a significantly increasing or decreasing trend is not observed in debt ratios as the maturity of REIT firm increases. If firms have a target capital structure in mind, it may change the debt ratio over the years prescribed by the trade off theory. Thus, it can be said that Turkish REITs do not follow a target debt ratio prescribed by the trade off theory.

Table 5.2 also presents the descriptive statistics on firm characteristics of tangibility, firm size, profitability, market-to-book value semiannually from 1998 to 2007. It is observed that the firm size appears to be stable around 15-17 (except for 1998 an 2007) during 10-year period. The tangibility ratios show a significant variation with a low of approximately 6 per cent in 1998 to a high of 66.08 per cent in 2006. The average tangibility ratio during the last five years is 57.5 per cent. Market-to-book value ratio, which is a proxy for growth opportunities, appears to increase significantly since 2004. This considerable increase in market-to-book ratio is basically due to the significant growth potential of Akmerkez REIT, which was listed on ISE in April 2005.[8] In table 5.2 dividend payout ratios are not presented since averaging the dividend yields when there are many zero values does not give meaningful results. However, from the dividend payout raw data it can be stated that dividend pay out ratios change between 0.92 percent and 48.25 percent semiannually. In 2003 none of the REITs paid dividends and in 2002 only Atakule and Alarko REITs paid dividends.

Equity ownership data in Appendix Part A indicates that financial institutions and shares traded in secondary market compose the majority of ownerships in REITs capital structure. Since Turkish REITs are required to float at least 49% of the total shares within one-year after the commercial legislation (in one year if their paid-in-capital is up to YTL50mn, in 3 years if between YTL50mn- YTL100mn and in five years if in excess of YTL100mn) according to amendment introduced in 1998 by the Capital Markets Board (CMB), the free float percentage changes between 30% in Is

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[8] Akmerkez GYO has one asset in its portfolio, the Akmerkez complex. It is a shopping centre in Istanbul with 246 separate shops and office spaces as well.

REIT in 2002 and 75% in Pera REIT in 2004. Only Vakıf REIT and Atakule REIT have governmental ownership in their capital structures. Since Is REIT, Garanti REIT, Yaki Kredi Koray REIT, Vakif REIT and Atakule REIT are bank affiliated REITs, equity ownership of financial institutions in their capital structure is significant. Besides, Alarko, Akmerkez, EGS, Ihlas and Nurol REITs also have high ratio of financial institutional holdings ownership although they are not bank affiliated.

Table 5.3 provides cross sectional descriptive statistics of debt ratios and firm specific characteristics among individual REITs. Saglam REIT, EGS REIT and Yapi Kredi Koray REIT have the highest values for both long-term debt ratios and the total debt ratios. Firm characteristics show that Is REIT, Akmerkez REIT and Atakule REIT are the largest firms (in terms of total assets) with higher tangibility ratios. In addition, Pera REIT, Saglam REIT and Sinpas REIT, which have been listed on ISE recently, have considerably higher growth rates of 30 per cent to 123 per cent. It is clear that market-to-book ratios are generally stable around 0.9 and 1.0. Since market to book ratio is treated as potential growth, Turkish REITs in general do not show significant growth probability in the near future except for Akmerkez REIT and Sinpas REIT. Akmerkez REIT has a significantly high growth potential with a market-to-book ratio of 4.4 and Sinpas REIT, although a new REIT, has the second highest growth potential with a market-to-book ratio of 1.81

Table 5.4 presents the time series behavior of two country specific factors namely stock market development and banking system development along with the stock market capitalization, bank loans to private, GDP, number of banks and foreign exchange rate between USD and TRY.

Table 5.3: *Descriptive Statistics of Leverages and Firm Characteristics of REITs*[9]

	TD_1	LTD_1	TD_2	LTD_2	M/B	Firm Size	Tangibility	Profitability
AGYO	**0.0075**	**0.002**	**0.0157**	**0.0032**	**0.5257**	**18.4914**	**0.9262**	**0.0603**
	0.0033	0.0027	0.0062	0.0037	0.2875	0.2675	0.0366	0.0606
AKMGY	**0.0636**	**0.0001**	**0.0153**	**0**	**4.3971**	**18.7457**	**0.665**	**0.2941**
	0.0535	0.0001	0.0103	0	0.9022	0.1344	0.2912	0.1009
ALGYO	**0.1837**	**0.0365**	**0.2238**	**0.029**	**0.7884**	**17.3253**	**0.1195**	**0.1102**
	0.1362	0.0779	0.1704	0.0643	0.3181	4.3212	0.1324	0.1143
EGYO	**0.4367**	**0.2043**	**0.6859**	**0.2786**	**0.5816**	**18.4857**	**0.3842**	**-0.0432**
	0.2085	0.2196	0.2182	0.2475	0.7116	0.503	0.387	0.1086
GRGYO	**0.1274**	**0.0802**	**0.1314**	**0.0839**	**0.8751**	**17.8572**	**0.5537**	**0.0613**
	0.1637	0.143	0.1456	0.1321	0.4394	1.0073	0.1889	0.0647
IHGYO	**0.1334**	**0.0329**	**0.135**	**0.0423**	**0.9666**	**14.1636**	**0.6292**	**-0.009**
	0.1612	0.0852	0.2034	0.1129	0.389	6.4428	4.5392	0.2279
ISGYO	**0.0661**	**0.0188**	**0.0848**	**0.0275**	**1.0302**	**19.7941**	**0.7425**	**-0.005**
	0.104	0.0332	0.1117	0.0431	0.6213	1.1367	0.3071	0.0574
NUGYO	**0.2072**	**0.0124**	**0.5787**	**0.0294**	**0.1201**	**17.025**	**0.3738**	**0.0421**
	0.1802	0.0314	0.3322	0.0685	0.0783	0.9084	0.4134	0.0806
PEGYO	**0.0172**	**0.0008**	**0.0058**	**0.0006**	**0.8109**	**17.2438**	**0.3764**	**-0.0623**
	0.0184	0.0006	0.0007	0.0002	0.0453	0.2134	0.5146	0.1598
SAGYO	**0.4235**	**0.3446**	**0.4607**	**0.3033**	**0.7426**	**17.3312**	**0.5514**	**0.024**
	0.1709	0.2042	0.1273	0.042	0.6505	0.7729	0.0353	0.015
SNGYO	**0.0974**	**0.0277**	**0.0861**	**0.0246**	**1.8084**	**19.3075**	**0.0124**	**-0.0334**
	0.0845	0.0243	0.0043	0.0014	0.142	1.4735	0.0031	0.0853
VKGYO	**0.0157**	**0.0026**	**0.0149**	**0.0044**	**1.0719**	**16.4108**	**0.3772**	**0.0928**
	0.0411	0.0018	0.019	0.0046	1.0384	1.3695	0.34	0.1084
YKGYO	**0.3052**	**0.1479**	**0.3393**	**0.1591**	**1.0054**	**17.8807**	**0.1241**	**0.0169**
	0.2261	0.1584	0.1792	0.1368	0.4863	1.3144	0.1138	0.1907

Table 5.4 shows that stock market capitalization and bank loans to private sector have an increasing trend although this increasing trend slows relatively between years 2001 and 2003. This is the period when 2001 financial crisis shows its negative consequences on whole the economy. In a good economical environment, both stock market capitalization and bank loans to private sector increases with an increasing rate after 2004. However, as the most sensitive to market influences, stock market capitalization shows persistent fluctuations.

Table 5.4: *Semiannual Country Specific Factors*

Periods	Bank Loans	Stock market capitalization	GDP	Banking System Development	Stock Market Development	Number of Banks	US Dollar Exchange Rate(YTL/$)
1998Q2	10827409	16265640	15629441	0.692757	1.040705	72	0.2452
1998Q4	12399178	10611820	20505584	0.604673	0.517509	75	0.3061
1999Q2	15623781	23764629	23401020	0.667654	1.015538	80	0.4906
1999Q4	19335634	69428773	31757931	0.608844	2.186187	81	0.4811
2000Q2	24369536	66108249	38344610	0.63554	1.724056	81	0.6200
2000Q4	30373887	46692373	46709016	0.650279	0.999644	79	0.6703
2001Q2	36733821	54022417	55122680	0.666401	0.98004	74	1.2520
2001Q4	39094281	68603041	69640328	0.561374	0.985105	61	1.4574
2002Q2	38391129	49293803	78985100	0.486055	0.62409	56	1.5854
2002Q4	39469442	56370247	1.00E+08	0.39448	0.563396	54	1.6674
2003Q2	45711075	58035612	1.06E+08	0.432424	0.549013	52	1.4185
2003Q4	57170313	96072774	1.23E+08	0.466623	0.784144	50	1.4044
2004Q2	74560308	95225365	1.31E+08	0.569169	0.726919	49	1.4845
2004Q4	88544332	1.33E+08	1.51E+08	0.587	0.87877	48	1.3485
2005Q2	1.04E+08	1.41E+08	1.54E+08	0.676138	0.919124	48	1.332
2005Q4	1.31E+08	2.18E+08	1.73E+08	0.757938	1.26554	47	1.3504
2006Q2	1.66E+08	2.01E+08	1.84E+08	0.904004	1.095559	47	1.5899
2006Q4	1.83E+08	2.30E+08	2.01E+08	0.907646	1.142359	46	1.4168
2007Q2	2.02E+08	2.89E+08	2.10E+08	0.960172	1.373158	46	1.3085
2007Q4	2.28E+08	3.36E+08	2.21E+08	1.030859	1.518548	46	1.1703

Source: Central Bank of the Republic of Turkey

Moreover, as seen from the Figures 5.2 and 5.3, significantly increasing trend after 2004 is again seen in the banking sector and stock market development ratio. This period can be considered as the recovery and improvement period of the

economy after 2001 financial crisis. In this period, increasing GNP and decreasing inflation along with decreasing interest rates affect most of the economic activities positively. However after 2001 crisis until 2004 a sharp decrease is observed in both stock market and banking sector development. In addition, as it is seen from Figure 5.4, there has been a decrease in the number of banks after 2001 crisis. This decrease is sharp just after the 2001 crisis and smoothens in the last years.

Lastly, the Figure 5.5 indicates that there is an increasing trend in the foreign exchange rate between US Dollar over New Turkish Liras over the period 1998 and 2004 and this increasing trend becomes significantly steep between 2001 and 2004 showing the increasing impact of 2001 crisis on the foreign exchange rate. To sum up, 2001 financial crisis in Turkey has very important effects on the whole economy and subsequently on all country specific (macro) effects.
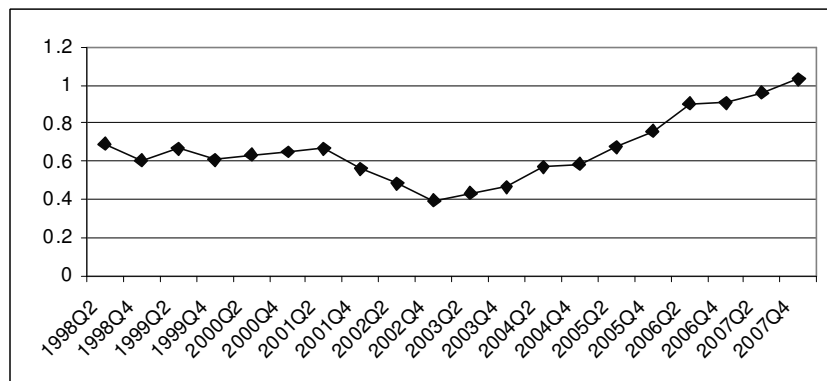
Figure 5.2: *Banking Sector Development*

96
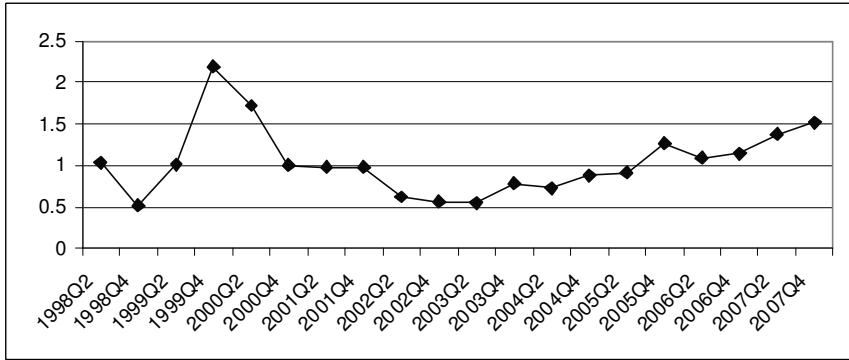
Figure 5.3: *Stock Market Development*
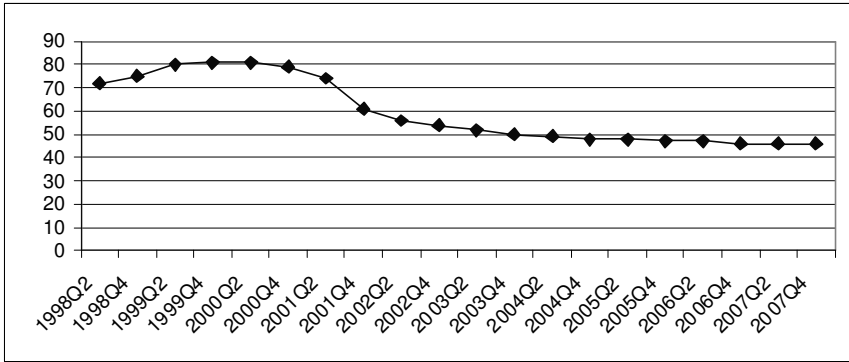
Figure 5.4: *Number of Banks*
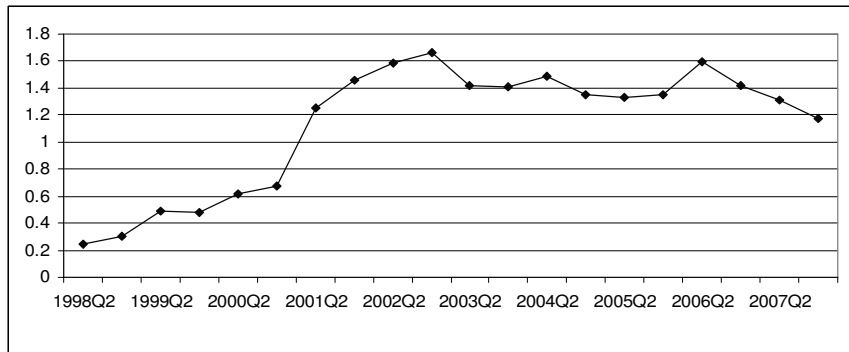
Figure 5.5: *Foreign Exchange Rate (YTL/US$)*

97

CHAPTER 6

METHODOLOGY

6.1 Introduction

In this study, two main regression analyses are used to assess the significance and directions of the effects of firm specific, institutional and country specific factors on Turkish REITs' debt financing choices. These methods are

 -Tobit regression model
 -Balanced panel data model

Basically, we try to find out whether the capital structure determinants and theories, which are relevant for the firms in developed and emerging markets, are also applicable for Turkish REITs. Several Tobit and panel data regressions are performed to measure the effect of market to book ratio, firm size, tangibility, profitability, bank affiliation, construction projects and dividend pay out ratios on total debt and long-term debt ratios in firm specific factors analysis. Moreover, the analysis is extended for the institutional effects on capital structure by analyzing equity ownership characteristics. Equity ownership characteristics are examined under four categories: i) ownership of managers, ii) ownership of financial institutions (banks, insurance, and other financial institutions), iii) government participation, and iv) percentage of shares traded in the secondary market are focused. Lastly, as country specific factors, especially effects of banking sector

development, stock market development and both the short term and long term effects of 2001 financial crisis are analyzed.

The raw data of independent and dependent variables (4 different debt ratios, firm specific, institutional and country specific factors) of Turkish REITs are initially in an unbalanced data set form since not every REIT has been active since 1998. For this reason, the most efficient way to analyze an unbalanced data is through Tobit regression model since Tobit model does not require any data elimination and thus not cause any loss of important information. As long as Tobit model realizes the assumption that error term ε is homoscedastic and normally distributed, Tobit model estimator (MLE of β) is a consistent estimator[1] and Tobit model can better deal with unbalanced data.

On the other hand, in order to gather a balanced data set to be able to apply balanced data regression models, fixed effects or random effects models, some data should be threw away from the initial data set and some missing data imputation methods should be used. However, these applications may disturb the nature of the data and results of the panel data regressions may be somewhat misleading due to information loss and possible inefficiency of imputation method. On the other hand, if panel data regression models can be applied truly and related assumptions are realized, panel data regressions can also give efficient results. In fact, there are many academic researches using panel data methods.[2] For this reason, in this study, both models are employed and the results are compared.

6.2 Tobit Regression Model

Tobit regression model estimates a linear regression model for a left-censored dependent variable, where the dependent variable is censored from below. In other

[1] Lexin Li, Jeffrey S. Simonoff, Chih-Ling Tsai (2007) Tobit Model Estimation and Sliced Inverse Regression, *Statistical Modelling 7(2)* 107- 123
[2] See other studies with panel data regression model in Chapter 6.4. A Critical Review of Tobit Regression and Panel Data Regression Models

words, Tobit regression models are a specific example of such a situation where for some observations the observed response is not the actual response, but rather the censoring value (often zero).[3]

In this study, the dependent variables, long term and total debt ratios (LTD1, LTD2, TD1, and TD2), are bounded on the lower end by zero, especially long term debt ratios are very close to zero. Therefore, a Tobit estimation procedure is effectively applicable to assess the firm specific, institutional and country specific effects on the dependent variables.[4] In addition, Tobit regression is one the most efficient way to deal with unbalanced data sets. The Tobit regression specifies the relationship between debt ratios and the explanatory variables as follows:

$$y_i = \beta_0 + x_{ij}^{'}\beta + \varepsilon_i \qquad \text{if yi} > 0$$
$$= 0 \qquad \qquad \text{otherwise,}$$

where, y_i is one of the alternative debt ratios, $x_i^{'}$ is the matrix of explanatory variables that comprises firm specific, institutional and country specific factors, β is the vector of parameter estimates and ε_i is an error term with a mean 0.

The comprehensive explanation of Tobit model and methodology of the proving of parameter estimations with assumptions can be seen in Appendix Part B.

6.3 Panel Data Regression Model

Missing observations in the data set reduce the number of observations and puts the data in an unbalanced form. Unbalanced data occurs because not all the REITs in Turkey have been active since 1998. Some REITs such as Pera REIT, Saglam REIT

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[3] Lexin Li, Jeffrey S. Simonoff, Chih-Ling Tsai (2007) Tobit Model Estimation and Sliced Inverse Regression, *Statistical Modelling* 107- 123
[4] See other studies with panel Tobit regression model in Chapter 6.4. A Critical Review of Tobit Regression and Panel Data Regression Models

and Sinpas REIT have recently been established. These REITs are only 2 or 3 years old companies. With this unbalanced data form the "Stata program", which is used in this study to perform regression analyses, gives inefficient and biased panel data regression results. To prevent this problem, the initial data set is transformed into a balanced data set with eliminating the data for recently established REITs and using imputation techniques.

Firstly, data of Pera REIT, Saglam REIT and Sinpas REIT (new REITS) are dropped from the data set since there are only 3 or 4 semiannual observations for these 3 REITs out of twenty periods and none of the imputation methods can deal with so much missing values. In addition, since there are very few REITs having observation in the year 1998, the whole data set for the remaining ten REITs is started from 1999 instead of 1998. In this way, it is aimed to prevent repeating during imputations. Lastly, to fill the still missing data, a suitable missing data imputation technique is used to get a balanced panel data set and to obtain meaningful results. The most known and suitable imputation technique was to input the missing data according to the "mean imputation technique". In mean imputation, simply, every single missing data is evaluated as a mean value of all other REITs' corresponding semiannual observations. Despite the efficient imputation method, loss of information due to the data dropped in the first year and for the 3 new REITs limits the scope and interpretation of the results.

Other missing data imputation method used in this analysis is the regression mean imputation method by Stata programme. Under multivariate normal assumptions, (the assumption for ordinary least squares regression) the imputed value will be the mean of the variable, multiplied by its associated coefficient.[5] Regressions mean imputation can generate unbiased estimates of means and coefficients in a much wider range of settings than simple mean imputation. However, one important problem remains. The variability of the imputations is too small, so the estimated precision of regression coefficients may be wrong and inferences may be

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[5] http://courses.washington.edu/hsanalys/hs525/missing_data_solutions.doc

misleading.[6] Regression mean imputation gives inefficient results in this study. Inefficient results may be due to the small variability of imputations or may be the limited number of observations in the date set. For this reason, only the regression results of the data that is imputed according to the mean imputation method are presented.

Panel data set contains a series of observations per each of *N* REITs. Each REIT includes *T* observations (from 1999 to 2007 semiannually). Thus, the total number of observations is *NT* for each variable. The panel data regression model is as below;

$$y_{it} = \beta_0 + X_{it}^{'}\beta + u_{it} \qquad i = 1,........, N; \ t = 1,........,T \qquad \textit{(N=10, T=18)}$$

with *i* denoting REITs and *t* denoting time (semiannual periods). The *i* subscript denotes the cross-sections dimension whereas t denotes the time series dimension. Specifically in our study, y_{it}, dependent variable, measures one of the alternative debt ratios of REITs such as LTD1, LTD2, TD1, TD2. X_{it}, the *it* th observation on K explanatory variables, denotes the set of independent variables such as tangibility, firm size, profitability, market-to book ratio, equity ownership variables and stock market, banking sector development and financial crisis. β_0 is scalar (intercept), β is K x 1. One-way error component model for the disturbances is;

$$u_{it} = \mu_i + v_{it}$$

For each *t,* u_{it} is the sum of the unobserved effect and an idiosyncratic error. The unobservable firm-specific effects will be captured by the μ_i. Note that μ_i is time-invariant and it accounts for any individual specific effect that is not included in the regression. The remainder disturbance v_{it}, however, varies with individuals and time.

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[6] http://www.lshtm.ac.uk/msu/missingdata/simple_web/node5.html

v_{it} can be thought of as the usual disturbance in the regression.

Panel data models examine group effects, time effects, or both. These effects are either fixed effect or random effect. Functional forms of one-way panel data models are as follows.

Fixed group effect model: $y_{it} = (\alpha + \mu_i) + X_{it}^{'}\beta + v_{it}$, where $v_{it} \approx IID(0,\sigma_v^2)$

Random group effect model: $y_{it} = \alpha + X_{it}^{'}\beta + (\mu_i + v_{it})$, where $v_{it} \approx IID(0,\sigma_v^2)$

The key point here is whether μ_i will be treated as a fixed effect or random effect, in other words, whether the unobserved effect is uncorrelated with explanatory variables. In econometric jargon, random effect is synonymous with zero correlation between the observed explanatory variables and the unobserved effect: $Cov(x_{it},\mu_i) = 0$ $t=1,2,…,T$. However, the term fixed effect does not usually mean that μ_i is being treated nonrandom, rather means that the unobserved effect μ_i is correlated with explanatory variables x_{it}.

According to the nature of the data and variables, one of these models explains the dependent variables better and Hausman Specification [64] test is used to select the more efficient one.[7] The broad details of Panel Data models and methodology of the proving of parameter estimations with assumptions can be seen in Appendix Part C.

6.4 A Critical Review of Tobit Regression and Panel Data Regression Models

Tobit regression analysis is broadly used in capital structure researches. For instance, Wald (1999) uses Tobit regressions to find out the capital structure determinants of

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[7] See Hausman Specification Test in detail in Appendix Part C

five developed countries (France, Germany, Japan, the United Kingdom, and the United States). Liu-Tirtiroglu-Bhabra (2002) again mainly uses Tobit regressions to analyze Chinese listed firms debt financing behaviors in the period of 1993 and 1997. In the study of Wald and Song (2005) mostly Tobit and probit regression analyses are used to conclude the effect of state laws on debt financing choices of US manufacturing firms. Shumi Akhtar (2004) employs cross-sectional Tobit regression analysis to investigate the significance of the determinants of capital structure on a sample of Australian multinational corporations and Australian domestic corporations over the period 1992 to 2001. In the study of Yinghong Chen (2004), owner control and corporate governance on Swedish listed firms' capital structure are analyzed by Tobit model. In the study of Machin and Scaramazzino (1994) the relationship between the firm's choice of capital structure and the unionization status of the labor force between 1986 and 1990 is explained empirical estimates of Tobit models. The relation between the capital structure of a firm and the tax benefits realized from the exercise of stock options in the study of Kahle and Shastri (2004) is again analyzed by Tobit regressions.

On the other hand, there are also vast amount of capital structure researches that use panel data model. In the study of Trabelsi and Bouallegui (2004) the dynamic of the capital structure of new high-tech German Firms over the period 1998-2002 is investigated by panel data model. Viviana Rernandez (2005) analyzes the driving forces of capital structure in Chile for the period 1990-2002. Their econometric specification is based on a random-effects panel data model for censored data and they also devise specification tests for non-nested random-effects models. Using two variants of panel data analysis Shah and Khan (2007) attempt to find the determinants of capital structure of KSE (Pakistan) listed non-financial firms for the period 1994-2002. Chen and Hammes (2005) compares factors that influencing firm leverage using unbalanced panel data of seven countries: Canada, Denmark, Germany, Italy, Sweden, the UK, and the US. Chen, Linda H.; Lensink, Robert; Sterken, Elmer (1999) studies the determinants of capital structure choice of Dutch firms by estimating a panel data model. González and González (2007) uses dynamic

panel data tests in a sample of 3,439 Spanish firms over the period 1995-2003 to analyze the debt financing choices in Spain.

6.5 Regression Models in Analysis

To test the significance and effects of each factor on Turkish REITs debt financing choices, many combinations of regression equations are performed for each of the four debt ratios.

Tobit regression models analyzed in this study are as below

(1) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ bank-affiliation $+ \beta_{i6}$ construction $+ \varepsilon_i$

(2) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ bank-affiliation $+ \beta_{i6}$ construction $+ \beta_{i7}$ dividend-payout $+ \varepsilon_i$

(3) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ bank-affiliation $+ \beta_{i6}$ construction $+ \beta_{i7}$ managerial $+ \beta_{i8}$ institutional $+ \beta_{i9}$ free-float $+ \varepsilon_i$

(4) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ bank-affiliation $+ \beta_{i6}$ construction $+ \beta_{i7}$ dividend-payout $+ \beta_{i8}$ managerial $+ \beta_{i9}$ institutional $+ \beta_{i10}$ free-float $+ \varepsilon_i$

(5) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ bank-affiliation $+ \beta_{i6}$ construction $+ \beta_{i7}$ managerial $+ \beta_{i8}$ institutional $+ \beta_{i9}$ government $+ \beta_{i10}$ free-float $+ \varepsilon_i$

(6) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ bank-affiliation $+ \beta_{i6}$ construction $+ \beta_{i7}$ dividend-payout $+ \beta_{i8}$ bankingsector $+ \beta_{i9}$ stockmarket $+ \beta_{i10}$ banknumber $+ \beta_{i11}$ ST-crisis $+ \beta_{i11}$ exchangerate $+ \varepsilon_i$

(7) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ bank-affiliation $+ \beta_{i6}$ construction $+ \beta_{i7}$ managerial $+ \beta_{i8}$ institutional $+ \beta_{i9}$ government $+ \beta_{i10}$ free-float $+ \beta_{i11}$ bankingsector $+ \beta_{i12}$ stockmarket $+ \beta_{i13}$ banknumber $+ \beta_{i14}$ ST-crisis $+ \beta_{i15}$ exchangerate $+ \varepsilon_i$

Y_i represents four different debt ratios which are TD1, TD2, LTD1 and LTD2. The reason of performing 7 different regression models instead of only one model that includes all factors is to analyze incremental effects of firm specific, institutional and country specific factors deeply.

Models 1 and 2 analyze the firm specific effects on REIT debt ratios. The difference between model 1 and 2 is that model 2 includes dividend payout ratio but model 1 does not. Turkish REITs do not distribute dividends regularly on an annual base, thus there are many missing values in the data set. With these two different models, it is aimed to find out how additional dividend pay out ratio to the model affects the model and other firm specific factors.

Models 3, 4 and 5 indicate firm specific and institutional effects, in particular equity ownership characteristics together. In model 3 and 4 ownership of government is not included. When looked to the equity ownership data it is seen data, very few REITs, only Atakule and Vakif REITs, have governmental ownership. For this reason it is wise to perform regressions with and without governmental ownership factor to realize whether or not it has significant effects to the model. In addition, in models 3 and 5, dividend payout ratio is excluded again to see its marginal effect on dependent variable and other independent variables.

Lastly, in equation 6 all firm specific and country specific factors are analyzed, while in equation 7 all three factors, firm specific, institutional and country specific

factors, affecting Turkish REIT capital structures are included. One exception is dividend payout ratio.

In panel data model, similar seven different regression equations are performed. Different from Tobit regression models, panel data models do not include dummy variables (bank affiliation dummy variable, construction projects dummy variable and ST financial crisis dummy variable) since Stata programme directly drops dummy variables from the model in fixed effects models and dummy variables have almost insignificant effects in random effects models. In addition, when dummy variables are included in the model they decrease the significance of other independent variables.

(1) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \varepsilon_i$

(2) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ dividend-payout $+ \varepsilon_i$

(3) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ managerial $+ \beta_{i6}$ institutional $+ \beta_{i7}$ free-float $+ \varepsilon_i$

(4) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ dividend-payout $+ \beta_{i6}$ managerial $+ \beta_{i7}$ institutional $+ \beta_{i8}$ free-float $+ \varepsilon_i$

(5) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ managerial $+ \beta_{i6}$ institutional $+ \beta_{i7}$ government $+ \beta_{i8}$ free-float $+ \varepsilon_i$

(6) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+ \beta_{i5}$ dividend-payout $+ \beta_{i6}$ bankingsector $+ \beta_{i7}$ stockmarket $+ \beta_{i8}$ banknumber $+ \beta_{i9}$ exchangerate $+ \varepsilon_i$

(7) $Y_i = \alpha + \beta_{i1}$ size $+ \beta_{i2}$ tangibility $+ \beta_{i3}$ profitability $+ \beta_{i4}$ growth $+$ β_{i5} managerial $+ \beta_{i6}$ institutional $+ \beta_{i7}$ government $+ \beta_{i8}$ free-float $+$ β_{i9} bankingsector $+ \beta_{i10}$ stockmarket $+ \beta_{i11}$ banknumber $+ \beta_{i12}$ exchangerate $+ \varepsilon_i$

Models 1 and 2 study the impact of firm specific characters on debt ratios, models 3, 4 and 5 analyze firm specific and equity ownership characteristics together , model 6 analyzes the firm specific and country specific factors and lastly models 7 interprets the all factors together. Similar to the Tobit regression analyses, in panel data regression analyses, models are performed with and without dividend payout ratio and governmental ownership factors to comprehend their incremental effects.

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CHAPTER 7

EMPIRICAL RESULTS

As explained in detail in chapter 6, two different regression model analyses are used to compare the results of capital structure behaviors of Turkish REITs. Although both models give efficient results under their assumptions, the results of Tobit regression model are thought to be more reliable since Tobit model can deal with unbalanced and missing data better. Tobit model does not require any loss of information caused by throwing away data to get balanced data set.

However, both models give very similar results especially for the firm specific and institutional factors. This indicates the reliability and power of this study and models. Some minor differences in the country specific factors may be due to the loss of information in the panel data set. For this reason, the results of Tobit regression models are attached more importance. The results of regressions are presented in Appendix Part D and E.

7.1 Empirical Results of Tobit Regression Models

In the Tobit regression results, there is a perfect consistency in the sign of all factors' coefficients. As seen in Appendix Part F, if an independent variable is significant, it always takes the same sign for all seven regression equations under the same debt ratio. However, while some variables always have the same sign across all four different debt ratio regressions, some variables change their signs. Firm size, construction projects, managerial ownership, free float, number of banks and US Dollar exchange rate have always positive signs, whilst tangibility, institutional and

governmental ownership, stock market capitalization and crisis have always negative signs in all regressions under four different debt ratios. However, profitability, market to book ratio and bank affiliation show differences in signs across long term or total term debt ratios and book value or market value of debt ratios.

Tobit regression results overall show that the determinants of capital structure which are identified for the developed and developing financial markets are also relevant for Turkish REITs. However, the importance and signs on the coefficients of some characters do not support the general capital structure theory. For instance, the negative and significant coefficient of tangibility in total debt regressions is inconsistent with the results of studies in developed and developing countries, especially inconsistent with findings of Rajan and Zingales (1995) and Wald (1999) in their sample of G-7 countries. Other independent variables almost have similar effects to general theory. In addition to common capital structure determinants, some country specific factors which are special to Turkey and Turkish real estate market are also analyzed in this study.

Firm Specific Factors

In accordance with trade off theory, estimated coefficient of firm size is consistently positive and highly significant for all long and total debt ratios. As a result, it can be clearly concluded that large Turkish REITs are able to use more debt than small REITs. This positive relationship is consistent with Ang et al. (1988), Rajan and Zingales (1995), Barclay and Smith (1995), Booth et al. (2001) and with others who suggest that large firms are more diversified and less risky and thus enable to support higher debt levels. Although firm size is only insignificant for the equations 3, 5 and 7 of LTD1 regressions, again the estimated coefficients are positive.

According to Rajan and Zingales (1995), Myers (1977), Wald (1999), tangible assets may be used as collateral and hence may be associated with higher leverage for institutional firms. However, as Feng et al. (2007) states, REITs are expected to have most of their assets as tangible assets due to their nature of job. Thus, instead of

a significant and positive effect of tangibility, in this study an insignificant effect is expected. Consistent with expectations and Feng et al. (2007), tangibility has insignificant effect on long term debt ratios. However, it has significant negative effect on total debt ratios. As a result, it can be concluded that tangibility has no collateral effect for Turkish REITs rather it decreases the amount of short term debt financing.

Similarly, Berger and Udell (1994) state that firms which have a close relationship with their creditors, especially bank oriented countries, need less collateral in obtaining debt financing, thus they suggest either a weakly positive or no influence of tangibility on a firm's debt ratio. In addition, Gönenç, H (2003) also finds significantly negative relationship between total debt ratio and asset tangibility.[1]

Profitability is associated with the availability of internal cash flows, which implies lower leverage ratio under the pecking order theory. Consistent with general theory, profitability has a negative and significant effect on total book debt ratio in the equations 1, 6 and full model 7 implying the importance of pecking-order hypothesis and informational asymmetries for Turkish REITs. In fact, the stock market of Turkey ISE, is a very volatile market due to economic and political turmoil. In these conditions, it is very difficult to find external equity, thus internal sources are mainly used to support growth, instead of debt or equity financing. This negative impact of profitability on total debt ratio is also related to no availability of long-term private bond market in Turkey. However, profitability has generally insignificant effect on LTD1 and LTD2. Only positive significant effect of profitability on LTD2 is in equation 4 where only firm specific and equity ownership characteristics are analyzed. As a result, Turkish REITs with higher profitability will use less long term debt but the total debt ratio is ambiguous implying the insignificant effects of profitability on short term debt financing of Turkish REITs.

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[1] In his study, the industries depending on high tangible assets such as textile, clothing and leather; paper and paper products; chemicals, petroleum, rubber; and tourism are lower total debt ratios than industries such as retail and wholesale trade.

The market-to-book ratio, as a proxy of growth opportunity, has negative and significant effects only on market total debt ratio that is consistent with the Myers (1984) dynamic form of pecking order theory which states that in expectation of funding requirements for higher investments in the future, firms may preserve debt capacity by using retained earnings for current needs. Moreover, Myers (1977) and

Barclay and Smith (1995) argue that firms with more growth opportunities should issue lower levels of debt to maintain their financing flexibility and to protect the lenders against the greater levels of uncertainty. Similarly, Highfield et al. (2007) shows that agency problems play a significant role in determining the average debt maturity that REITs with more growth options shorten their debt maturity to reduce agency cost. Furthermore, Turkish REITs, unlike US peers, do not have to pay out dividends to the shareholders on an annual basis, thus they can finance their short term needs with internal earnings. However, significant and positive effect of market to book ratio on long term book debt ratio is inconsistent with general theory.[2] The reason may be that in the long term REITs should continue growing up by investing in new projects to be stable in the fierce real estate market, thus they need more debt financing. Similarly, Booth et al. (2001), Bhabra et al (2002), Stonehill et al. (1974) finds a positive relationship between long term debt and growth opportunity.

Expecting a significant effect of dividend payout ratio is not a subject under discussion in develop and developing countries where REITs have to distribute 90% to 95% of taxable earnings annually. However, for Turkish REITs there is not such a limitation. Tobit regression results show that dividend payout ratio has significant and negative effects for all long and total debt ratios. Consistent with pecking order theory, these results imply that highly profitable REITs which can distribute dividends to shareholders, have low leverage ratios. On the other hand, our empirical results for dividend payout ratios are not consistent with trade – off theory, which states leverage is higher for more profitable (thus more dividend payout) firms.

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[2] In addition, the estimated coefficients of market to book ratio in total book debt and long term market debt ratios are positive insignificant

Wald (1999) states that the participation of banks in firms' governance may be effective to reduce the control problems and make the use of debt needless as a control mechanism. Similarly, Gönenç, H (2003) emphasizes that in countries especially bank centered countries like Turkey, where financial institutions have high equity participation, firms use less debt. Consistent with Wald (1999) and Gönenç, H (2003) bank affiliation factor has negative effect on total debt ratios, however it has positive effect on long term debt ratios. The reason may be that REITs which are bank affiliated do not need much debt in the short run since banks can provide them with enough source of credit and loans when needed, thus their short term debt amount is low.

However, effects of bank affiliation on the long term debt ratios is positive, implying that even bank affiliated REITs need longer term debt under highly volatile environment without proper bond market. It can also be suggested that bank affiliated REITs less care about the financial distress of using more debt in the long run. Similarly, Yurtoglu (1998) explains that Turkish large corporations are affiliated with each other within a business group. The most of the business groups are formed or acquired by a bank in later stages of their development. Thus, they can in principal neglect short-term considerations and pursue long-term growth and financing strategies.

The effect of construction projects in portfolio is always positive on all long and total debt ratios. Specifically, the estimated coefficient of construction projects dummy is positive significant in book debt regression equations and positive insignificant in market debt regression equations. Since constructions projects require high amount of financing and subsequently provide the REITs with high returns, REITs with high construction portion in their portfolios eager to demand more debt, both in the short term and in the long term.

Institutional Factors (Equity Ownership Characteristics)

Equity ownership characteristics are analyzed as institutional factors. Tobit regression results show that the estimated coefficient for equity ownership of managers is positive but insignificant in all total and long term debt regressions. This finding is contracting with Gönenc, H. (2003) and Jensen and Meckling (1976) results that when managers have a significant ownership stake, managerial incentives are more closely aligned with shareholders and agency costs are reduced, consequently less debt is issued. However, positive coefficient in this study consistent with Harris and Raviv (1988) and Stulz (1988) that managers can easily use debt financing to inflate their voting power of their equity stakes and reduce the possibility of takeover attempts.

Equity ownership of institutions has negative and significant effect on all four debt ratios, while ratio of shares traded in secondary market has significantly positive effects. The negative sign on equity ownership of institutions is consistent with Gönenç, H. (2003) results that in bank-centered countries where financial institutions have high equity participation, firms use less debt. The positive effect of percentage of shares traded in secondary market shows that, consistent with the general theory, liquidity and information revelation from stock market helps Turkish REITs to increase debt, in other words, benefits of stock market make REITs managers can compete with negative effects of information asymmetries of using high debt.

When equity ownership of government is included to the equations 5 and 7, its impact on debt ratios are negative significant or negative insignificant. Before performing the regressions, it was expected that governmental ownership can provide collateral for Turkish REITs and short term debt and subsequently total debts are affected positively by governmental ownership. However, the negative insignificant regression results do not support our expectations. The negative estimate for the governmental ownership coefficients may present that Turkish government does not have enough protectionist roles to lower the financial distress costs of REITs.

Country Specific Factors

In the country specific factors, especially the effects of banking sector development, stock market development, number of banks, and 2001 financial crisis on debt ratios are examined. These factors are analyzed in equation 6 and 7.

According to general theory, stock market development provides liquidity and a less costly way for investors to monitor firms since stock trading transmits information about firms which makes external financing of firms less risky. Thus firms increase their ability to obtain more debt. However, in the equations 6 of the total debt ratios, it is seen that stock market development has negative and significant effect on total debt ratio. Moreover, stock market development has insignificant and negative effects in the equation 7 of all four debt ratios. This negative relationship shows that stock market development in Turkey is not able to make external debt financing less risky. Either

Turkish REITs are not able to benefit from stock market development and its subsequent risk reduction advantage or stock market in Turkey is not developed enough to monitor of firms and cause liquidity. Similarly, Demirgüçkunt-Maksimoviç (1996) finds significant negative correlation between stock market development and the ratios of long term and short term debt before analyzing the countries according to the size.[2]

Banking system development has positive and significant effect on total debt ratio according to equation 6, while its effect is again positive but insignificant on market total debt ratio in the equations 6 and 7. However, the effect of banking system development on long term debt ratios is insignificant and negative. The positive and significant effect on total debt ratios and insignificant and negative

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[2] However, in Demirgüçkunt-Maksimoviç (1996) when the effect of stock market is analyzed in two parts, in developed and developing markets, the results are different. For developed markets, further stock market development leads to a substitution of equity for debt financing especially for long term debt. In developing markets, large firms become more levered as the stock market develops whereas the small firms are not significantly affected by market development.

effect on long term debt ratios shows that banking system development improve the access of REITs to external finance but only to short term debt. However, Diamond (1984) and Demirgüçkunt-Maksimoviç (1996) suggest that the development of the banking system would improve the access of smaller firms to long-term credit. This relation shows that Turkish REITs are not able benefit from banking system development in the long term. The negative insignificant effect on long term debt ratios are most probably due to Turkish REITs' heavily dependence on short-term debt because of the inflation, volatility, and political and economic uncertainty in the Turkish economy during the study period.

A similar variable to the banking system development in this study is the effect of number of banks on debt ratios. The number of banks in a country indicates how well the financial systems go and how firms benefit from banks. As seen from equations 6 and 7, number of banks has positive and significant effect on total debt ratios and negative insignificant effect on long term debt ratios which means that similar to the banking system development factor, increase in number of banks can only enable Turkish REITs to give place higher short term debt. However, in the long term the financial distress of using high amount of debt overwhelms the advantage of debt and REITs issue less long term debt despite the increase in number of banks. Again the negative long term debt ratio is also due to the fragile economic conditions of Turkey.

The other country specific factor 2001 financial crisis tries to reveal both short term and long term effects of this severe financial crisis on debt ratios. 2002 & 2003 ST Financial Crisis dummy variable, as a proxy to analyze the short term effects of financial crisis, has negative and significant effect on long term debt ratios and again negative but insignificant effect on total debt ratios. The negative estimated coefficients in the regression equations show that when Turkey goes through a financial crisis, REITs directly decrease amount of debt especially long term debt due to unknown future economic conditions of the country and due to the fear of financial distress of not being able to pay back their debts. Although the aim of including this factor to the model is to analyze short term effect of 2001 financial

116

crisis on debt ratios, the significant negative relation in the long term but insignificant negative relation in the short term shows that crisis especially effects long term debt financing, since firms can not guess how bad the economic conditions will be in the long term.

Similar to the 2002 & 2003 ST Financial Crisis dummy variable, the foreign currency exchange rate, as a proxy to analyze the long term effect of 2001 financial crisis, is also an important indicator of the economic condition of a country since according to the macroeconomic theory, when a country goes through a financial crisis, its currency depreciates and the foreign exchange rate increases. Thus, the appreciation of foreign currency is expected to decrease debt ratios, especially the long term debt ratios. Consistent with our expectations, foreign exchange rate variable has negative and significant impact on long term debt ratios. In other words, less valuable domestic currency mainly decreases the long term debts. However, in the short term the positive and significant effect of exchange rate may show that despite the negative economic conditions, in the short run REITs have to use debt financing to finish the ongoing projects.

7.2 Empirical Results of the Panel Data Models

Parallel to the Tobit regression results, panel data regressions emphasize that factors which are significant in the capital structures of firms in developed and developing countries are also significant in Turkish REIT capital structure. Although, some factors affect the Turkish REITs debt financing choices in the same way as in the other countries, some other factors have completely inverse effects which are the signs of different institutional and country specific factors of Turkey and Turkish real estate sector than other countries.

According to Hausman specification test, in almost all cases the assumptions of the random effects model are violated, thus the results from fixed effects model for the regressions are reported in this study. Indeed, the fixed effects model is the appropriate specification when focusing on a specific set of firms. Since all the

REITs in ISE are used, not a sample taken a randomly, the fixed effect is much more suitable for our model.

Panel data regression results are in a very high accordance with Tobit regression results which indicates the power of the study and results. Especially firm specific characters and equity ownership characters cause this unity. Contradictions between Tobit and panel data regression results may be due to the loss of information occurred in the panel data set. In addition, none of the dummy variables (bank affiliation, construction projects and economic crisis) that are employed in Tobit models are included in panel data regression models since when dummy variables are included to the model, Stata programme does not give sufficient results.

Similar to Tobit regressions, firm size has significant positive effects and tangibility has significant negative impact on all debt ratios regardless of long term or total debt. Profitability' negative impact on total debt ratios and positive effect on long term debt ratios are parallel to the results in Tobit regressions. In addition, market to book ratio again has negative impact on total market debt ratio and positive impact on long term debt ratios, however its effect on total book debt ratio is ambiguous. Thus, according to panel data regressions, Turkish REITs with higher market to book ratio will use more long term debt, but overall its debt ratio goes down. This result is consistent with those found in Rajan and Zingales (1995) and Wald (1999) for the G-7 countries and Booth et al. (2001) for India, Korea, Malaysia, and Turkey, and with Toy et al.'s (1974) results for Holland, Norway, Japan and the United States. Moreover, dividend payout ratio has negative significant effect nearly in all equations as Tobit regressions results.

In the equations where institutional factors are included it is seen that there exists positive effects of equity ownership of managers and ratio of shares traded in secondary market along with negative effects of institutional and governmental ownership. These results are again parallel to the results in Tobit regressions.

However, there are some inconsistent results with Tobit regression results in the country specific analyses. Banking system development has positive and significant effect on total debt ratios and has negative significant effect on long term market

debt in equation 7 and insignificant negative effect on long term market debt in equation 6. The effect of stock market development only has negative effect on total book debt ratio which is also insignificant. However, its impact is positive and insignificant on long term debt ratios and total market debt ratio. Number of banks has positive and significant effect on total debt ratios and positive and insignificant effect on long term debts. One exception is equation 6 of long term book debt ratio where number of banks has positive insignificant effect. Lastly, exchange rate has positive effect on all debt ratios except equation 6 of long term book debt ratio regressions.

CHAPTER 8

CONCLUSION

The understanding of the determinants of capital structure in Turkey has been the focus of a broad research for the past few decades. However, none of these researches have included REITs since REIT sector is a new sector still in its infancy and has a unique regulatory environment. This study analyzes for the first time the capital structure decisions, especially the general attitude to debt and equity financing of Turkish REITs. In addition, this study also attempts to suggest that whether the variables which are relevant for explaining capital structures in U.S. and other developed and developing countries are also applicable in Turkish REITs debt financing decisions.

The legal framework of Turkish REITs was introduced by the Capital Market Board (CMB) on July 22, 1995 in "Principles Communiqué Pertaining to Real Estate Investment Trusts". Basically, Turkish REITs, for the purposes of generating capital gains and rental income, can purchase and sell real estate, lease real estate from third parties and rent them, purchase and sell capital market tools, do reverse repo transactions with such tools, buy land in order to carry out real estate development projects and purchase foreign real estate.

Factors which are thought to affect the capital structure of Turkish REITs are grouped in three categories as firm specific factors, institutional factors and country specific factors. Besides the effect of these characteristics on debt financing decisions, this study also presents how unique regulatory requirements of Turkish REITs influence their capital structure decisions. Turkish REITs just as US peers are exempt from corporate and income taxes to promote their growth. The tax-exempt

status of REITs eliminates the tax shield advantage of debt financing. With no tax shield benefit of debt financing, bankruptcy costs imply one hundred percent equity financing under trade off theory. On the other hand, REIT shareholders are vulnerable to information asymmetries due to illiquid and less transparent nature of real estate assets. Moreover, regulatory restrictions on sources of income and choices of assets that REITs are allowed to invest in worsen the information asymmetry. If shareholders recognize the severity of this agency problem, new share issues would be discounted. According to this scenario, debt financing is the preferred choice under pecking order theory.

In order to conduct this study, semiannual data set of all REITs, which are listed in Istanbul Stock Exchange (ISE) for the period from 1998 to 2007, is analyzed. From the raw data of Turkish REITs it is suggested that short term debt has high percentage in total debt, in other words, financial structure of Turkish REITs is heavily dependent on short-term debt. The reason for this short-term debt dependence can be explained with the inflation, volatility, and political and economic uncertainty in the Turkish economy during the study period. Subsequently, in this high uncertain economic condition investors invest for very short-terms. In addition, Turkish REITs, different from peers in other countries, are not required to distribute their profits to the shareholders as dividend on an annual basis. This allows Turkish REITs to enjoy the financial flexibility of profits and to keep dividends for further investments. Thus, they do not need so much long term debt.

Mainly, Tobit regression and panel data models are employed to find out whether firm specific characters; growth opportunity, firm size, asset tangibility, profitability, bank affiliation status, construction projects and dividend payout ratio are significant in capital structure decisions of Turkish REITs. The analysis is extended by analyzing the influence of the equity ownership of managers, financial institutions, government and ratio of shares traded in secondary market on Turkish REITs debt ratios. Lastly, the effects of stock market and banking system development along with the short term and long term effects of 2001 financial crisis are included to the model to prevent the biases occurred due to country specific factors.

Regression results overall confirm that debt financing choices of Turkish REITs seem to be affected by the same type of variables that are significant in developed and other emerging markets. However, impact and sign of some independent variables show differences from other countries' financial markets, which imply that besides well known firm specific characters, there exists some institutional and country specific factors which are effective in shaping the capital structure decisions of Turkish REITs.

Both Tobit and panel data regression models give same results for firm specific and equity ownership factors. This great consistency of results of two methods shows the power and reliability of our research. For the firm specific characters a generalization can be made for Turkish REITs such that large REITs with fewer tangible assets, lower dividend pay out ratio and with high amount of construction projects issue more short term and long term debt. In addition, bank affiliated Turkish REITs with high profitability and high growth opportunity issues more long term debt however their total debt ratios decrease due to high dependence on short term debt.

From Tobit and panel data regression results a similar generalization can also be applied for equity ownership characters. While high ratio of managerial and governmental equity ownership make Turkish REITs decrease both total and long term debt ratios, high ratio of equity ownership of financial institutions and high ratio of shares traded in secondary market allow Turkish REITs to issue more total and short term debt.

Tobit results across different seven regressions are much more consistent than panel data results. Since Tobit regression model can deal with unbalanced and missing data better and do not cause any loss of information due to data cutting. For this reason, it is wise to depend on Tobit model results. The positive and significant effect on total debt ratios and insignificant and negative effect on long term debt ratios of banking system development and number of banks under Tobit regression model show that these factors can improve the access of REITs to external finance but only to short term debt. In addition, sock market development and 2002&2003

short term financial crisis have negative impact on both total and long term ratios. Different from ST financial crisis effect, US Dollar stock exchange rate has positive significant effect on total debt ratios and negative significant effect on long term debt ratios under Tobit regression model.

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Appendix Part A: EQUITY OWNERSHIP DATA

VKGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.1998	0	3.34	54	42.66
31.12.1998	0	3.34	54	42.66
30.06.1999	0	3.34	48.96	47.7
31.12.1999	0	3.34	48.96	47.7
30.06.2000	0	3.34	54.3	42.37
31.12.2000	0	3.34	54.3	42.37
30.06.2001	0	3.34	54.3	42.37
31.12.2001	0	3.34	54.3	42.37
30.06.2002	0	3.34	54.3	42.37
31.12.2002	0	3.34	54.3	42.37
30.06.2003	0	3.34	54.3	42.37
31.12.2003	0	3.34	54.3	42.37
30.06.2004	0	3.34	54.3	42.37
31.12.2004	0	3.34	54.3	42.37
30.06.2005	0	3.34	54.3	42.37
31.12.2005	0	3.34	51.63	45.03
30.06.2006	0	3.34	51.63	45.03
31.12.2006	0	3.34	51.63	45.03
30.06.2007	0	3.34	51.63	45.03
31.12.2007	0	3.34	51.63	45.03

YKGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.1998	0	51	0	49
31.12.1998	0	51	0	49
30.06.1999	0	51	0	49
31.12.1999	0	51	0	49
30.06.2000	0	51	0	49
31.12.2000	0	51	0	49
30.06.2001	20	31	0	49
31.12.2001	20	31	0	49
30.06.2002	20	31	0	49
31.12.2002	20	31	0	49
30.06.2003	20	31	0	49
31.12.2003	20	31	0	49
30.06.2004	20	31	0	49
31.12.2004	20	31	0	49
30.06.2005	20	31	0	49
31.12.2005	20	31	0	49
30.06.2006	20	31	0	49
31.12.2006	20	31	0	49
30.06.2007	20	31	0	49
31.12.2007	20	31	0	49

EGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.1998	0	51	0	49
31.12.1998	0	51	0	49
30.06.1999	8.8	42.2	0	49
31.12.1999	8.8	42.2	0	49
30.06.2000	13.45	36.46	0	50.09
31.12.2000	13.45	36.46	0	50.09
30.06.2001	0	26.64	0	73.36
31.12.2001	0	26.64	0	73.36
30.06.2002	0	26.64	0	73.36
31.12.2002	0	26.64	0	73.36
30.06.2003	0	26.64	0	73.36
31.12.2003	0	26.64	0	73.36
30.06.2004	0	26.64	0	73.36
31.12.2004	0	26.64	0	73.36
30.06.2005	0	26.64	0	73.36
31.12.2005	0	26.64	0	73.36
30.06.2006	0	26.64	0	73.36
31.12.2006	0	26.64	0	73.36
30.06.2007	0	26.64	0	73.36

NUGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2000	0.03	50.97	0	49
31.12.2000	0.03	50.97	0	49
30.06.2001	0.03	50.97	0	49
31.12.2001	0.03	50.97	0	49
30.06.2002	0.03	50.97	0	49
31.12.2002	0.03	50.97	0	49
30.06.2003	0.03	50.97	0	49
31.12.2003	0.03	50.97	0	49
30.06.2004	0.03	50.97	0	49
31.12.2004	0.03	50.97	0	49
30.06.2005	0.03	50.97	0	49
31.12.2005	0.03	50.97	0	49
30.06.2006	0.03	50.97	0	49
31.12.2006	0.03	50.97	0	49
30.06.2007	0.03	50.97	0	49
31.12.2007	0.03	50.97	0	49

IHGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2000	0	50.99	0	49.01
31.12.2000	0	50.99	0	49.01
30.06.2001	0	50.99	0	49.01
31.12.2001	0	50.99	0	49.01
30.06.2002	0.12	41.18	0	58.7
31.12.2002	0.12	41.18	0	58.7
30.06.2003	0.075	30.76	0	69.15
31.12.2003	0.075	30.76	0	69.15
30.06.2004	0.075	30.76	0	69.15
31.12.2004	0.075	30.76	0	69.15
30.06.2005	0.075	30.76	0	69.15
31.12.2005	0	30.7	0	69.3
30.06.2006	0	30.7	0	69.3
31.12.2006	0	30.7	0	69.3
30.06.2007	0	30.7	0	69.3

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AGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2001	0	16.1	83.9	0
31.12.2001	0	16.1	83.9	0
30.06.2002	0	8.22	42.78	49
31.12.2002	0	8.22	42.78	49
30.06.2003	0	8.22	42.78	49
31.12.2003	0	8.22	42.78	49
30.06.2004	0	8.22	42.78	49
31.12.2004	0	8.22	42.78	49
30.06.2005	0	8.22	42.78	49
31.12.2005	0	8.22	42.78	49
30.06.2006	0	8.22	42.78	49
31.12.2006	0	8.22	42.78	49
30.06.2007	0	0.026	50.974	49
31.12.2007	0	0.026	50.974	49

GRGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2002	0	51	0	49
31.12.2002	0	51	0	49
30.06.2003	0	51	0	49
31.12.2003	0	51	0	49
30.06.2004	0	51	0	49
31.12.2004	0	51	0	49
30.06.2005	0	51	0	49
31.12.2005	0	51	0	49
30.06.2006	0	51	0	49
31.12.2006	0	51	0	49
30.06.2007	0	51	0	49
31.12.2007	0	51	0	49

ISGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2002	0	65.54	0	34.46
31.12.2002	0	65.54	0	34.46
30.06.2003	0	70.21	0	29.79
31.12.2003	0	70.21	0	29.79
30.06.2004	0	69.09	0	30.91
31.12.2004	0	69.09	0	30.91
30.06.2005	0	58.55	0	41.45
31.12.2005	0	58.55	0	41.45
30.06.2006	0	58.27	0	41.73
31.12.2006	0	58.27	0	41.73
30.06.2007	0	58.27	0	41.73
31.12.2007	0	58.27	0	41.73

AKMGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
31.12.2004	0	100	0	0
30.06.2005	27.07	23.92	0	49.01
31.12.2005	27.07	23.92	0	49.01
30.06.2006	27.07	23.92	0	49.01
31.12.2006	27.07	23.92	0	49.01
30.06.2007	27.07	23.92	0	49.01
31.12.2007	27.07	23.92	0	49.01

PEGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
31.12.2004	0	24.89	0	75.11
30.06.2005	0	7.51	0	92.49
31.12.2005	0	36.16	0	63.84
30.06.2006	0	34.34	0	65.66
31.12.2006	0	34.34	0	65.66
30.06.2007	0	56.05	0	43.95

SNGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2007	20.1	30.9	0	49
31.12.2007	35.8	22.9	0	41.3

SAGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2007	26.8	25.92	0	47.28
31.12.2007	25	25.15	0	49.85

SNGYO	Managerial (%)	Financial institutions (%)	Governmental (%)	Secondary Market (%)
30.06.2007	20.1	30.9	0	49
31.12.2007	35.8	22.9	0	41.3

Appendix Part B: TOBIT MODEL IN DETAIL

The Tobit Model is an econometric, biometric model proposed by James Tobin (1958) to describe the relationship between a non-negative dependent variable y_i and an independent variable (or vector) x_i and the Tobit regression model is simply presented as equation

$$y_i = x_i' \beta + \varepsilon_i \qquad \text{if yi} > 0 \tag{B.1}$$
$$= 0 \qquad\qquad \text{otherwise,}$$

Let y_i^* be the latent variable which is distributed with stochastic component $y_i^* \approx Normal(\mu_i, \sigma^2)$, then equation (7.1) can also be interpreted as

$$y_i = \begin{cases} y_i^* & if & y_i^* \phi\, 0 \\ 0 & if & y_i^* \leq 0 \end{cases} \tag{B.2}$$

$$y_i^* = x_i' \beta + \varepsilon_i \quad \text{and} \quad \varepsilon_i \approx i.i.d.N(0, \sigma^2) \tag{B.3}$$

where x_i is the vector of K explanatory variables for observation i and β is the vector of coefficients. In this model, the true response is y^* and only the left censored version y of y^* is observable. Important to realize also that β estimates the effect of x on y^*, the latent variable, not y .

The Tobit regression model uses maximum likelihood estimator (MLE) method to estimate both β and σ. However, MLE of β is not consistent if the error term ε is not homoscedastic and normally distributed. Likelihood-function consists in two parts, probit and linear part.

Probit Part:

For cencored observations

$$\Pr(y_i = 0) = \Pr(y_i^* \le 0) = \Pr(\varepsilon_i \le -x_i^{'}\beta) =$$

$$\Pr\left(\frac{\varepsilon_i}{\sigma} \le -\frac{x_i^{'}\beta}{\sigma})\right) = \phi\left(-\frac{x_i^{'}\beta}{\sigma}\right) = 1 - \phi\left(\frac{x_i^{'}\beta}{\sigma}\right) \tag{B.4}$$

β and σ are asymptotically normal.

Linear part:

For uncensored observations

$$\lim_{\mu \to 0} \Pr(y_i \ \pi \ Y_i \Leftarrow y_i + \mu | y_i \ \phi \ 0, \mu \ \phi \ 0) =$$

$$\lim_{\mu \to 0}\left(\phi\left(\frac{y_i - x_i^{'}\beta - \mu}{\sigma}\right) - \phi\left(\frac{y_i - x_i^{'}\beta}{\sigma}\right)\right) = f(\varepsilon_i) = \frac{1}{\sigma}\phi\left(\frac{y_i - x_i^{'}\beta}{\sigma}\right) \tag{B.5}$$

Marginal effect on the latent variable

$$\frac{\partial E(y^*|x)}{\partial x_i} = \beta_i \tag{B.6}$$

$$E(y|x) = \phi\left(\frac{x\beta}{\sigma}\right)x\beta + \sigma\phi\left(\frac{x\beta}{\sigma}\right) \tag{B.7}$$

Marginal effect on the actual variable:

$$\frac{\partial E(y|x)}{\partial x_k} = \beta_k \phi\left(\frac{x\beta}{\sigma}\right) \tag{B.8}$$

and $\phi\left(\dfrac{x\beta}{\sigma}\right)$ is the probability that an observation is different from zero if $\phi\left(\dfrac{x\beta}{\sigma}\right)$ is equal to 1 then OLS= Tobit.

Likelihood- and Log-Likelihood-function are as below:

$$L = \prod_{y_i=0}\left[1-\phi\left(\frac{x_i^{'}\beta}{\sigma}\right)\right]\prod_{y_i=0}\frac{1}{\sigma}\phi\left(\frac{y_i-x_i^{'}\beta}{\sigma}\right) \tag{B.9}$$

$$\ln L = \sum_{y_i=0}\ln\left[1-\phi\left(\frac{x_i^{'}\beta}{\sigma}\right)\right] + \sum_{y_i=0}\ln\left[\frac{1}{\sigma}\phi\left(\frac{y_i-x_i^{'}\beta}{\sigma}\right)\right] \tag{B.10}$$

Log-Likelihood-function, ln L, is maximized with respect to β and σ, and then FOC yields estimator for β and σ, $\hat{\beta}$ and $\hat{\sigma}$. Takeshi Amemiya (1973) has proven that the likelihood estimator suggested by Tobin for this model is consistent.

The Tobit model makes the same assumptions about error distributions as the OLS model[1003] to estimate parameters, but it is much more vulnerable to violations of those assumptions.

In a Tobit model with heteroskedastic errors, the estimate of the error distribution, to determine the chance that a case would be censored, is badly estimated and also the coefficient is badly biased, while in an OLS model with heteroskedastic errors, the estimated standard errors can be too small.[1]

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[1] Logistic & Tobit Regression, David Madigan Rutgers, Based in part on Web Notes by Kathleen Kerr, University of Washington & Thomas Love, CWRU

Appendix Part C: PANEL DATA MODEL ANALYSIS IN DETAIL

Panel data regression model is as below;

$$y_{it} = \beta_0 + X_{it}'\beta + u_{it} \qquad t = 1,........,T \qquad (C.1)$$

$$u_{it} = \mu_i + v_{it} \qquad (C.2)$$

The Unobserved Effect Problem

It will be useful to show here how panel data can be used to obtain consistent estimators in the presence of unobserved variables. Let y and $x = (x_1, x_2,..., x_K)$ be observable random variables, and let μ be an unobservable random variable (not a parameter to estimate); the vector $(y, x_1, x_2,..., x_K, \mu)$ represents the population of interest. We are interested in the partial effects of the observable explanatory variables x_j in the regression function

$$E(y|x_1, x_2,..., x_K, \mu) \qquad (C.3)$$

We would like to hold μ constant when obtaining partial effects of the observable explanatory variables. The assumption that μ is constant over time is crucial to the following analysis. An unobserved, time constant variable is called an unobserved effect in panel data analysis. Assuming a linear model we have

$$E(y|x, \mu) = \beta_0 + x\beta + \mu \qquad (C.4)$$

where interest lies in the $Kx1$ vector β. For simplicity, suppose we can observe y and x at two different time periods $t = 1,2$.

$$E(y_t | x_t, \mu) = \beta_0 + x_t\beta + \mu \qquad t = 1,2 \tag{C.5}$$

write model (B.1) in error forms as

$$y_t = \beta_0 + x_t\beta + \mu + v_t \qquad t = 1,2 \tag{C.6}$$

where by the key conditions of OLS to consistently estimate β

$$E(v_t | x_t, \mu) = 0 \qquad t = 1,2 \tag{C.7}$$

this means that v_t has zero mean and uncorrelated with regressors x_t. One implication of condition (C.7) is

$$E(x_t' v_t) = 0 \qquad t = 1,2 \tag{C.8}$$

If we were to assume also $E(x_t'\mu) = 0$, we could apply pooled OLS. However, if μ is correlated with any element of x_t, then pooled OLS is biased and inconsistent. To eliminate time constant unobservable, μ, we can difference equation (1.4) across the two time periods. Define $\Delta y = y_2 - y_1$, $\Delta x = x_2 - x_1$, and $\Delta v = v_2 - v_1$. Then differencing equation (C.8) gives

$$\Delta y = \Delta x\beta + \Delta v \tag{C.9}$$

Importantly, the parameter of interest, β, appears directly in equation (C.9), and its presence suggests estimating equation (C.9) by OLS. Now, we will see under which assumptions the OLS estimator from equation (C.9) will be consistent.

The first key condition for OLS to consistently estimate β is the orthogonality condition that

$$E(\Delta x' \Delta v) = 0 \qquad (C.10)$$

which means that Δv has mean zero and is uncorrelated with differenced regressors Δx. The second conditon is the rank condition that

$$\text{rank } E(\Delta x' \Delta v) = K \qquad (C.11)$$

which means there are no exact linear relationships among the regressors in the population. Consider equation (C.10) first. It is equivalent to $E[(x_2 - x_1)'(v_2 - v_1)] = 0$ or after simple algebra,

$$E(x_2' v_2) + E(x_1' v_1) - E(x_1' v_2) - E(x_2' v_1) = 0 \qquad (C.12)$$

The first two terms in equation (C.12) are zero by the condition (C.8), but condition (C.7) does not guarantee that x_1 and v_2 or x_2 and v_1 are uncorrelated. However, according to the strict exogeneity assumption in panel data model, v_t is uncorrelated with x_1 and x_2 that $Cov(x_t, v_s) = 0$ for all t and s. Under these assumptions OLS estimators are consistent.

We will use these assumptions and the procedure of eliminating unobserved effect directly in the fixed effects and random effects models.

The Fixed Effects Models

Fixed effects models assist in eliminating unobservable cross-sectional individual differences (omitted variables that differ between cases but are constant over time) that would result in biased estimates and incorrect statistical tests

$$y_{it} = (\alpha + \mu_i) + X_{it}'\beta + v_{it}, \text{ where } v_{it} \approx IID(0, \sigma_v^2) \tag{C.13}$$

The fixed effects model does not include time-invariant observed variables, but rather holds them into μ_i , the unobserved time invariant variable term. In this case, the μ_i are assumed to be fixed parameters correlated with explanatory variables x_{it} and the remainder disturbances are stochastic with v_{it}, $v_{it} \approx IID(0, \sigma_v^2)$. The X_{it} is assumed independent of v_{it} for all i and t. The fixed effects model like the random effects model assumes that the error variance is constant over time $\sigma_{\varepsilon i}^2 = \sigma_\varepsilon^2$. Violation of this assumption can lead to inaccuracy of the estimates.

In vector form (C.1) can be written as

$$y = \beta_0 I_{NT} + X\beta + u = Z\delta + u \tag{C.14}$$

where y is NT x 1, X is NT x K, Z= [I_{NT} X], $\delta' = (\beta_0', \beta')$ and I_{NT} is the vector of ones of dimension NT. Also, (C.2) can be written as

$$u = Z_\mu \mu + v \tag{C.15}$$

One can substitute the disturbances given by (C.15) into (C.14) to get

$$y = \beta_0 \lambda_{NT} + X\beta + Z_\mu \mu + v = Z\delta + Z_\mu \mu + v \tag{C.16}$$

Note that Z is NT x (K+1) and Z_μ, the matrix of individual dummies, is NT x N. If N is large (C.16) will include too many individual dummies and the matrix inverted by OLS will be large and of dimension (N+K).

By premultiplying the model by Q and performing OLS on the resulting transformed model, one can obtain the estimates of β_0, β and μ.

$$Qy = Q\alpha\lambda_{NT} + QX\beta + QZ_\mu\mu + Qv = QZ\delta + QZ_\mu\mu + Qv \qquad \text{(C.17)}$$

$$Qy = QXB + Qv \qquad \text{(C.18)}$$

This uses the fact that $QZ_\mu = Q\lambda_{NT} = 0$. The Q matrix, fixed effect transformer, wipes out the individual time invariant effects (Q matrix performs the algorithm similar to equations from (C.9) to (C.12)). In other words, the heterogeneity can be removed from the data by the Q matrix by subtracting each individual's means from each of his observations before estimating the model. So the model regresses yi,t – mean(yi) on xi,t – mean(xi). Stata has a canned procedure that transforms variables in this way and then corrects the standard errors to reflect the fact that N of your observations bring no new information.

Note that for the simple panel data regression, we can see what Q matrix achieves in detail;

$$y_{it} = \beta_0 + \beta x_{it} + \mu_i + v_{it} \qquad \text{(C.19)}$$

FE transformation is obtained by first averaging equation (1.19) over t=1, 2,…, T to get cross section equation

$$\bar{y}_{i.} = \beta_0 + \beta\bar{x}_{i.} + \mu_i + \bar{v}_{i.} \qquad \text{(C.20)}$$

where $\bar{y}_i = T^{-1}\sum_{t=1}^{T} y_{it}$, $\bar{x}_i = T^{-1}\sum_{t=1}^{T} x_{it}$, $\bar{v}_i = T^{-1}\sum_{t=1}^{T} v_{it}$. Then subtracting (C.20) from (C.19) for each t gives the FE transformed equation

$$y_{it} - \bar{y}_i = \beta(x_{it} - \bar{x}_i) + (v_{it} - \bar{v}_i) \qquad t=1,2,...,T \qquad (C.21)$$

or $\ddot{y}_{it} = \beta\ddot{x}_{it} + \ddot{v}_{it}$ $\qquad\qquad t=1,2,...,T$

where we utilize the restriction that $\sum_{i=1}^{N} \mu_i = 0$ and consequently, the individual specific effect μ_i is removed. This is an arbitrary restriction on the dummy variable coefficients to avoid the dummy variable trap, or perfect multicollinearity. With μ_i out of the picture, we can estimate equation (C.21) by pooled OLS.

To see whether pooled OLS estimation will be consistent, we need to show the key pooled OLS assumption (*Orthogonality Assumption*) hold in equation (C.21).

$$E[(x_{it} - \bar{x}_i)'(v_{it} - \bar{v}_i)] = 0 \quad \text{or} \quad E[(\ddot{x}_{it}\ddot{v}_{it})] = 0 \qquad t=1,2,...,T \qquad (C.22)$$

In addition, other fixed effects assumptions to get consistent estimators are

Assumption FE1: *(Strict Exogeneity Assumption)*

$$E(v_{it}|x_i, \mu_i) = 0 \quad t = 1,2,...,T \qquad (C.23)$$

Now, under assumption FE1, v_{it} is uncorrelated with x_{is}, for all s,t=1,2,...,T. It follows that v_{it} and $\bar{v}_i$ are uncorrelated with x_{it} and $\bar{x}_i$. Therefore, assumption (C.22) holds under assumption FE1 and so pooled OLS applied to equation (C.21) can be expected to produce consistent estimators.

146

Thus, the fixed effects (FE) estimator denoted by $\hat{\beta}_{FE}$, is the pooled OLS estimator from the regression $(y_{it} - \bar{y}_i)$ on $(x_{it} - \bar{x}_i)$ t=1,2,…,T and i= 1,2,…,N. Note that by subtracting the means, all of the action in the regression is restricted to within-REIT action. This is often called "within" estimator because it looks at how changes in the explanatory variables cause y to vary around a mean within the unit (or it uses the time variation within each cross section).

To study fixed effect estimator a little more closely, write the equation (C.21) for all the time periods as

$$y_i - \bar{y} = \beta(X_i - \bar{X}) + (v_i - \bar{v}) \quad \text{or} \quad \ddot{y}_{it} = \ddot{X}_i \beta + \ddot{u}_{it} \tag{C.24}$$

Assumption FE2:

$$rank(\sum_{t=1}^{T} E(\ddot{x}_{it}\ddot{x}_{it})) = rank[E(\ddot{X}_i \ddot{X}_i)] = K \tag{C.25}$$

After performing OLS on (C.26), the fixed effect estimator under all these assumptions is

$$\hat{\beta}_{FE} = (\sum_{i=1}^{N} \ddot{X}_i \ddot{X}_i)^{-1} (\sum_{i=1}^{N} \ddot{X}_i \ddot{y}_i) = (\sum \sum \ddot{x}_{it}\ddot{x}_{it})^{-1} (\sum \sum \ddot{x}_{it}\ddot{y}_{it}) \tag{C.26}$$

or

$$\hat{\beta}_{FE} = (\sum_{i=1}^{N} [(X_i - \bar{X})'(X_i - \bar{X})]^{-1}) (\sum_{i=1}^{N} [(X_i - \bar{X})'(y_i - \bar{y})])$$

which can also be written in full matrix form as $\hat{\beta}_{FE} = (X'QX)^{-1} X'Qy$, where X is the Nt x K data matrix of regressors and y is NT x 1.

Fixed effects model, however, besides given many advantages have some limitations. For large panel data, where N is very large, regression like (C.16) may not be feasible, since one is including (N-1) dummies in the regression. This least squares dummies variables (LSDV) suffer from a large loss of degrees of freedom. We are estimating (N-1) extra parameters, and too many dummies may worsen the problem of multicollinearity among the regressors. However, in our study N is not so large to cause large loss of degrees of freedom.

The Random Effects Models

The loss of degrees of freedom in the fixed effects model, which is caused by too many parameters and dummies, can be avoided if the μ_i can be assumed random. Instead of trying to estimate N parameters as in fixed effects, random effects model estimates parameters that describe the distribution from which each unit's intercept is drawn. If N is large, random effects model will be more efficient than fixed effects since it has N more degrees of freedom.

A random effects model explores differences among groups in error variances while a fixed effects model examines if intercepts vary across groups or time periods. Similarly, the parameter estimate of a dummy variable is a part of error in the random effect model and is a part of the intercept in a fixed effect model.

$$y_{it} = \beta_0 + X_{it}^{'}\beta + (\mu_i + v_{it}), \text{ where } v_{it} \approx IID(0, \sigma_v^2) \qquad \text{(C.27)}$$

The random effects model assumes that μ_i is a random unobservable variable that is uncorrelated with v_{it}, x_{it}. In this case $\mu_i \approx IID(0, \sigma_\mu^2)$, $v_{it} \approx IID(0, \sigma_v^2)$ and the X_{it} are independent of the μ_i and v_{it} for all i and t. Similar to the fixed effects model the error variance does not change over time $\sigma_{\varepsilon t}^2 = \sigma_\varepsilon^2$.

148

Random effects model is estimated by generalized least squares (GLS) when the Ω matrix, a variance structure among groups, is known. The feasible generalized least squares (FGLS) method is used to estimate the variance structure when Ω is not known. To get consistent random effects estimators, required assumptions are as below

Assumption 1:

(a) $E(v_{it}|x_i,\mu_i) = 0$ $t=1,2,...,T$ *(strict exogeneity assumption)*

(b) $E(\mu_i|x_i) = E(\mu_i) = 0$ *(orthogonality assumption between μ_i and each x_{it})*

where $x_i \equiv (x_{i1}, x_{i2},..., x_{iT})$. Orthogonality assumption is always implied by the assumption that μ_i is independent of x_i. Under Assumption 1, we can write

$$E(u_{it}|x_i) = 0, \qquad t=1,2,...,T \qquad\qquad\qquad (C.28)$$

where

$$y_{it} = x_{it}\beta + u_{it} \quad \text{and} \quad u_{it} = \mu_i + v_{it} \qquad\qquad (C.29)$$

Equation (C.28) shows that x_{it} satisfies the strict exogeneity assumption in the model (C.29), therefore, we can apply GLS method.

Write the model (C.29) for all T time periods as

$$y_i = X_i\beta + u_i \qquad\qquad\qquad\qquad (C.30)$$

And u_i can be written as $u_i = \mu_i I_T + v_i$, where I_T is the T x 1 vector of ones. Define the variance matrix of u_i as $\Omega \equiv E(u_i u_i')$ a positive definite T x T matrix. For consistency of GLS, we need also the usual rank condition for GLS:

Assumption 2:

$$rankE(X_i'\Omega^{-1}X_i) = K.$$

A standard random effects analysis (different from fixed effects model) adds assumptions on the idiosyncratic errors that give Ω a special form. The first assumption is that the idiosyncratic errors v_{it} have a constant unconditional variance across t:

$$E(v_{it}^2) = \sigma_v^2 \qquad t=1,2,...,T \qquad\qquad (C.31)$$

The second assumption is that the idiosyncratic errors are serially correlated:

$$E(v_{it} v_{is}) = 0 \quad \text{for all } t \neq s \qquad\qquad (C.32)$$

Under all these assumptions, we can derive the variances and covariances of the elements of u_i.

Under assumption RE1(a), $E(\mu_i v_{it}) = 0$, $t=1,2,...,T$ and so

$$E(u_{it}^2) = E(\mu_i^2) + 2E(\mu_i v_{it}) + E(v_{it}^2) = \sigma_\mu^2 + \sigma_v^2 \qquad\qquad (C.33)$$

Also, for all $t \neq s$,

$$E(u_{it}u_{is}) = E[(\mu_i + v_{it})(\mu_i + v_{is})] = E(\mu_i^2) = \sigma_\mu^2 \tag{C.34}$$

Therefore, under assumption RE1, and assumptions (C.31) and (C.32), Ω takes the special form

$$\underset{TXT}{\Omega} = E(u_i u_i^{'}) = \begin{bmatrix} \sigma_\mu^2 + \sigma_v^2 & \sigma_\mu^2 & \dots & \sigma_\mu^2 \\ \sigma_\mu^2 & \sigma_\mu^2 + \sigma_v^2 & \dots & \sigma_\mu^2 \\ & & \dots & \dots \\ \sigma_\mu^2 & \sigma_\mu^2 & & \sigma_\mu^2 + \sigma_v^2 \end{bmatrix} \tag{C.35}$$

When Ω is known or given, GLS based on the true variance components is BLUE and all the feasible GLS estimators considered are asymptotically efficient as either n or T approaches infinity (Baltagi 2001).

$\Omega \equiv \sigma_v^2 I_T + \sigma_\mu^2 J_T J_T^{'}$ a T x T matrix that we assume to be positive definite.

In GLS, you need to compute θ using the Ω matrix:

$$\theta = 1 - \sqrt{\frac{\sigma_v^2}{T\sigma_\mu^2 + \sigma_v^2}} \; . \tag{C.36}$$

Then transfer variables as follows,

$$y_{it}^* = y_{it} - \theta\bar{y}_{i.} \tag{C.37}$$

$$x_{it}^* = x_{it} - \theta\bar{x}_{i.} \text{ for all } X_k$$

Finally, run OLS on the transformed variables:

$$y_{it}^* = x_{it}^*\beta^* + u_{it}^* \tag{C.38}$$

or

$$y_{it} - \theta \bar{y}_i = \beta(x_{it} - \theta \bar{x}_i) + (v_{it} - \theta \bar{v}_i)$$

In a full matrix form, consistent random effect estimator can be shown as below

$$\beta_{RE} = (\sum_{i=1}^{N} X_i^{*'} X_i^*)^{-1} (\sum_{i=1}^{N} X_i^{*'} y_i^*) \tag{C.39}$$

$$= (\sum_{i=1}^{N} X_i' \Omega^{-1} X_i)^{-1} (\sum_{i=1}^{N} X_i' \Omega^{-1} y_i)$$

In simple linear regression, the usual motivation for the GLS estimator is to transform a system of equations where the error has nonscalar variance-covariance matrix into a system where the error vector has a scalar variance-covariance matrix. We obtain this by multiplying the equation by $\Omega^{1/2}$:

$$\Omega^{1/2} y_i = (\Omega^{1/2} X_i) \beta + \Omega^{1/2} u_i \quad \text{or} \quad y_{it}^* = x_{it}^* \beta^* + u_{it}^* \tag{C.40}$$

Feasible Generalized Least Squares (FGLS)

Since Ω is often unknown, FGLS is more frequently used than GLS. For efficiency of feasible GLS, we also assume that the variance matrix of u_i conditional on x_i is constant:

$$E(u_i u_i' | x_i) = E(u_i u_i') \tag{C.41}$$

$$\hat{\Omega} \equiv \hat{\sigma}_v^2 I_T + \hat{\sigma}_\mu^2 J_T J_T' \tag{C.42}$$

If Ω is unknown, first you have to estimate $\hat{\Omega}$ and θ using $\hat{\sigma}_\mu^2$ and $\hat{\sigma}_v^2$:

The $\hat{\sigma}_v^2$ is derived from the SSE (sum of squares due to error) or the within effect model or from the deviations of residuals from group mean of residuals.

$$\hat{\sigma}_v^2 = \frac{SSE\,within}{nT-n-k} = \frac{e'e\,within}{nT-n-k} = \frac{\sum_{I=1}^{n}\sum_{i=1}^{T}(v_{it}-\bar{v}_{i.})^2}{nT-n-k}. \tag{C.43}$$

The $\hat{\sigma}_\mu^2$ comes from the between effect model (group mean regression):

$$\hat{\sigma}_\mu^2 = \hat{\sigma}_{between}^2 - \frac{\hat{\sigma}_v^2}{T}, \text{ where } \hat{\sigma}_{between}^2 = \frac{SSE_{between}}{n-K} \tag{C.44}$$

$$\hat{\Omega} \equiv \hat{\sigma}_v^2 I_T + \hat{\sigma}_\mu^2 J_T J_T' \tag{C.45}$$

and

$$\hat{\theta} = 1 - \sqrt{\frac{\hat{\sigma}_v^2}{T\hat{\sigma}_\mu^2 + \hat{\sigma}_v^2}} = 1 - \sqrt{\frac{\hat{\sigma}_v^2}{T\hat{\sigma}_{between}^2}} \tag{C.46}$$

Next, transform variables using $\hat{\theta}$ $y^*_{it} = y_{it} - \hat{\theta}\bar{y}_{i.}$

$$x^*_{it} = x_{it} - \hat{\theta}\bar{x}_{i.} \text{ for all } X_k \tag{C.47}$$

and then run OLS on transferred variables:

$$y^*_{it} = x^*_{it}\beta^* + u^*_{it} \quad \text{or} \quad y_{it} - \hat{\theta}\bar{y}_i = \beta(x_{it} - \hat{\theta}\bar{x}_i) + (v_{it} - \hat{\theta}\bar{v}_i) \tag{C.48}$$

In a panel data context, the consistent FGLS estimator that uses the variance matrix (C.42) is

$$\hat{\beta}_{RE} = (\sum_{i=1}^{N} X_i'\hat{\Omega}^{-1}X_i)^{-1}(\sum_{i=1}^{N} X_i'\hat{\Omega}^{-1}y_i) \tag{C.49}$$

153

As long as the assumption1 and the appropriate rank condition hold, $\hat{\beta}_{RE} \overset{p}{\longrightarrow} \beta$ as $N \longrightarrow \infty$ (Consistency of GLS).

The core difference between fixed and random effect models lies in the role of dummies (unobserved effects). If dummies are considered as a part of the intercept, this is a fixed effect model. In a random effect model, the dummies act as an error term. Another important difference is that the fixed effects model allows μ_i to correlate with X_{it} whereas the random effects model forces this correlation to be zero (Mundlak 1978). Moreover, fixed effects are tested by the (incremental) F test, while random effects are examined by the Lagrange Multiplier (LM) test (Breusch and Pagan 1980). However, both models assume that the coefficients of the time-varying variables β do not change over time, meaning that these variables have the same effect in each wave of data and the μ_i variables have the same effect on *yit* for each time period.

Choosing Between Fixed and Random Effects - Hausman Test

Statistically, fixed effects always give consistent results; however, they may not be the most efficient model to run. Random effects will give you better P-values as they are a more efficient estimator, so you should run random effects if it is statistically justifiable to do so. The Hausman specification test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results.

H_0 = Individual effects are uncorrelated with the other regressors (random effect model is more suitable)

If individual effects are correlated (H_0 is rejected), a random effect model produces biased estimators, so fixed effect model is preferred. The test

statistic, $T_{Hausman}$, follows a chi-square distribution in large samples with degrees of freedom equal to the number of coefficients for the time-varying variables.

APPENDIX PART D: TOBIT MODEL REGRESSION RESULTS

Appendix Part D1: *Total Market Debt Ratio (TD2)*

Dependent Variable: TD2							
Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Intercept	.0339038 (0.26)	.0403066 (0.30)	-.105043 (-0.68)	-.221101 (-0.77)	.094384 (0.45)2	-.6933391 (-1.86)	-.5754791 (-1.31)
Size log(assets)	.0204642 (2.88)***	.0224172 (3.07)***	.0205226 (3.00)***	.0207792 (2.87)***	.0192741 (2.80)***	.0229585 (3.18)***	.0220954 (3.19)***
Tangibility	-.119104 (-2.10)**	-.109724 (-1.74)**	-.073383 (-1.27)	-.098461 (-1.33)*	-.101321 (-1.48)*	-.036102 (-0.48)	.0296182 (0.35)
Profitability	-.201775 (-1.49)*	-.155926 (-0.97)	.034572 (0.25)	.0451862 (0.25)	-.019641 (-0.14)	-.256222 (-1.56)*	-.155471 (-1.06)
Growth Opportunity	-.082870 (-3.82)***	-.071988 (-2.43)***	-.077452 (-3.20)***	-.094254 (-2.75)***	-.095319 (-3.39)***	-.052439 (-1.61)*	-.083105 (-2.66)***
Dummy-Bank affiliation	-.195555 (-4.88)***	-.207786 (-4.69)***	-.177462 (-4.19)***	-.164492 (-2.69)***	-.142394 (-2.35)***	-.215622 (-4.94)***	-.152572 (-2.51)***
Dummy-Construction	.106491 (2.05)**	.0817357 (1.37)*	.3584746 (4.63)***	.2055829 (0.94)	.1524238 (0.88)	.0733889 (1.26)*	.1821512 (1.05)
Dividend payout		-.392868 (-1.79)**		-.169379 (-0.61)		-.499860 (-2.29)**	
managerial			.3431587 (1.39)*	.4538892 (1.20)	.1531836 (0.49)		.2914263 (0.93)
institutional			-.561130 (-4.17)***	-.252407 (-0.56)	-.570509 (-4.24)***		-.618301 (-4.64)***
Government					-.454304 (-1.27)		-.45038 (-1.25)**
Secondary			.203659 (1.75)**	.4883739 (0.98)	.2888235 (2.03)***		.2612762 (1.89)**
Banking Sector Development						.1764711 (0.82)	.030731 (0.17)
Stock Market Development						-.127622 (-1.85)**	-.053238 (-0.68)
Number of Banks						.0033947 (2.64)***	.0085464 (2.49)***
ST Financial Crisis						-.085207 (-1.16)	-.064003 (-1.01)
Foreign Exchange Rate						.1751997 (1.87)**	.1118712 (1.19)
Pseudo R^2	1.2882	1.2247	1.6042	1.3700	1.5986	1.3992	1.7544
LR chi^2	72.55	70.70	91.05	78.58	91.27	80.78	100.17
# of Observations	162	141	153	133	147	141	147

*Reject H_0 at 10% level of significance, **Reject H0 at 5% level of significance, ***Reject H0 at 1% level of significance.

Appendix Part D2: *Long Term Book Debt Ratio (LTD1)*

Dependent Variable: LTD1							
Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Intercept	-.088719 (-1.33)	-.120881 (-1.88)	-.125550 (-1.54)	.0534424 (0.39)	-.081133 (-0.82)	.0027909 (0.02)	.392404 (2.00)
Size log(assets)	.0046735 (1.30)*	.0067535 (1.96)**	.0042224 (1.17)	.0074754 (2.17)**	.0029574 (0.91)	.0068006 (2.03)**	.0025184 (0.81)
Tangibility	-.055411 (-1.94)**	-.042414 (-1.42)*	-.032915 (-1.08)	.0116127 (0.33)	-.034779 (-1.08)	-.020234 (-0.58)	-.012626 (-0.34)
Profitability	-.010990 (-0.16)	.0287706 (0.38)	.0670717 (0.91)	.1328739 (1.57)*	.0699233 (1.04)	-.015233 (-0.20)	.0126476 (0.19)
Growth Opportunity	.0255311 (2.34)***	.0693518 (4.96)***	.028018 (2.19)**	.0861155 (5.28)***	.0196784 (1.49)*	.051075 (3.38)***	-.002328 (-0.17)
Dummy-Bank affiliation	.0213298 (1.06)	.0195275 (0.93)	.0329305 (1.47)*	-.002194 (-0.08)	.056009 (1.96)**	.0223237 (1.10)	.0722995 (2.67)***
Dummy-Construction	.0755003 (2.89)***	.0553964 (1.97)**	.1714876 (4.21)***	.3215866 (3.08)***	.1238482 (1.52)*	.0466363 (1.72)**	.0495618 (0.64)
Dividend payout		-.450161 (-4.35)***		-.429663 (-3.26)***		-.484414 (-4.77)***	
managerial			.2025713 (1.56)*	-.075397 (-0.42)	.1134517 (0.76)		.1556472 (1.11)
institutional			-.192869 (-2.72)***	-.574059 (-2.67)***	-.191259 (-3.02)***		-.221555 (-3.72)***
Government					-.100384 (-0.60)		-.299770 (-1.86)**
Secondary			.0363427 (0.59)	-.416189 (-1.75)**	.0725877 (1.09)		.0741334 (1.20)
Banking Sector Development						.0149801 (0.15)	-.096253 (-1.18)
Stock Market Development						.0146143 (0.46)	-.009725 (-0.28)
Number of Banks						-.000551 (-0.35)	-.001765 (-1.15)
ST Financial Crisis						-.032196 (-0.94)	-.048996 (-1.73)**
Foreign Exchange Rate						-.075618 (-1.73)**	-.151524 (-3.60)***
Pseudo R^2	-0.0974	-0.2509	-0.1652	-0.3427	-0.1434	-0.3256	-0.2516
LR chi^2	20.81	44.27	32.16	54.90	32.07	57.45	56.27
# of Observations	162	141	153	133	147	141	147

*Reject H_0 at 10% level of significance, **Reject H0 at 5% level of significance, ***Reject H0 at 1% level of significance.

157

Appendix Part D3: *Long term Market Debt Ratio (LTD2)*

Dependent Variable: LTD2							
Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Intercept	-.07078 (-0.88)	-.094745 (-1.14)	-.195567 (-2.04)	-.154081 (-0.90)	-.036373 (-0.30)	.0506834 (0.22)	.4172224 (1.72)**
Size log(assets)	.0073175 (1.68)**	.0092938 (2.10)**	.007660 (1.81)**	.0099835 (2.30)**	.005622 (1.45)*	.0091214 (2.06)**	.0053178 (1.39)*
Tangibility	-.055268 (-1.59)*	-.047507 (-1.24)	-.018416 (-0.52)	.0069845 (0.16)	-.047733 (-1.24)	-.023911 (-0.52)	-.017333 (-0.38)
Profitability	-.017800 (-0.22)	.0046677 (0.05)	.1411646 (1.62)*	.1989189 (1.86)**	.1318945 (1.64)*	-.035937 (-0.36)	.0687522 (0.85)
Growth Opportunity	.0005769 (0.04)	.0344715 (1.91)**	.0089892 (0.60)	.0458411 (2.23)**	-.010814 (-0.68)	.0243566 (1.22)	-.026324 (-1.53)*
Dummy-Bank affiliation	-.013691 (-0.56)	-.014164 (-0.53)	.0107748 (0.41)	.0011967 (0.03)	.0699106 (2.04)**	-.013715 (-0.51)	.0808859 (2.42)***
Dummy-Construction	.0615793 (1.94)**	.0440259 (1.21)	.2367182 (4.95)***	.3043499 (2.31)**	.0635095 (0.65)	.0360346 (1.01)	.0027398 (0.03)
Dividend payout		-.398705 (-2.99)***		-.319041 (-1.92)**		-.435859 (-3.26)***	
managerial			.1989023 (1.30)*	.0474548 (0.21)	-.051519 (-0.29)		.0037449 (0.02)
institutional			-.374624 (-4.50)***	-.551369 (-2.03)**	-.37443 (-4.93)***		-.401915 (-5.46)***
Government					-.391785 (-1.94)**		-.557238 (-2.80)***
Secondary			.1515003 (2.11)**	-.010679 (-0.04)	.2557275 (3.19)***		.2505528 (3.28)***
Banking Sector Development						-.096325 (-0.73)	-.158658 (-1.57)*
Stock Market Development						.0092465 (0.22)	-.017505 (-0.40)
Number of Banks						-.000287 (-0.14)	-.001408 (-0.74)
ST Financial Crisis						-.072077 (-1.60)*	-.076873 (-2.20)**
Foreign Exchange Rate						-.038501 (-0.67)	-.122768 (-2.36)***
Pseudo R^2	-0.0912	-0.1959	-0.2419	-0.3535	-0.2410	-0.2480	-0.3373
LR chi^2	14.20	24.14	34.78	40.27	39.27	30.57	54.94
# of Observations	162	141	153	133	147	141	147

*Reject H_0 at 10% level of significance, **Reject H0 at 5% level of significance, ***Reject H0 at 1% level of significance.*

158

APPENDIX PART E: PANEL DATA REGRESSION RESULTS

Appendix Part E1: *Total Book Debt Ratio (TD1)*

Dependent Variable: TD1							
Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Intercept	-.618478 (-2.06)	-.574998 (-2.07)	-.922904 (-2.68)	-1.03177 (-3.57)	dropped	-1.32507 (-3.37)	Dropped
Size log(assets)	.0489209 (2.90)***	.0499471 (3.16)***	.0478608 (2.71)***	.0494267 (3.11)***	.0439281 (3.00)***	.0517169 (3.66)***	.0493341 (3.37)***
Tangibility	-.209313 (-3.98)***	-.258241 (-4.81)***	-.197201 (-3.59)***	-.191315 (-3.37)***	-.182375 (-3.52)***	-.211922 (-3.78)***	-.117765 (-2.13)**
Profitability	-.226341 (-2.31)**	-.275859 (-2.24)**	-.179622 (-1.70)**	-.102996 (-0.79)	-.12553 (-1.16)	-.423464 (-3.26)***	-.231316 (-2.07)**
Growth Opportunity	.0040512 (0.14)	-.012919 (-0.40)	.0115319 (0.39)	-.005434 (-0.17)	-.017074 (-0.60)	-.0612387 (-1.60)*	-.043216 (-1.27)
Dividend payout		-.283838 (-2.14)**		-.176126 (-1.30)*		-.504311 (-3.70)***	
Managerial			.001705 (0.45)	.0048214 (1.71)**	-.002285 (-0.59)		-.008926 (-1.90)**
institutional			.0018101 (1.15)	.000937 (1.05)	-.008518 (-2.95)***		-.016441 (-4.05)***
Government					-.009785 (-3.73)***		-.017708 (-4.57)***
Secondary			.00476 (1.86)**	.0073892 (4.11)***	-.002060 (-0.83)		-.009415 (-2.49)***
Banking Sector Development						.379698 (2.92)***	.2155136 (1.94)**
Stock Market Development						-.014645 (-0.19)	-.023172 (-0.32)
Number of Banks						.0073999 (2.91)***	.0074549 (3.34)***
Foreign Exchange Rate						.0828174 (0.77)	.0915344 (0.92)
R^2 within	0.1346	0.1038	0.1293	0.0814	0.0719	0.1944	0.1498
R^2 between	0.4197	0.6578	0.6062	0.8175	0.8203	0.8166	0.8660
R^2 overall	0.2491	0.3061	0.3450	0.3985	0.4028	0.4054	0.4663
Wald chi^2	26.77	41.05	30.63	77.52	260.2	79.08	292.28
# of Observations	144	144	144	144	144	144	144

*Reject H_0 at 10% level of significance, **Reject H0 at 5% level of significance, ***Reject H0 at 1% level of significance.

Appendix Part E2: *Total Market Debt Ratio (TD2)*

Dependent Variable: TD2							
Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Intercept	-.258196 (-0.65)	-.305545 (-0.75)	-.992348 (-2.11)	-1.21436 (-2.96)	dropped	-1.77693 (-3.03)	
Size log(assets)	.0393665 (1.76)**	.0470179 (2.03)**	.043685 (1.92)**	.0474277 (2.10)**	.0383915 (1.87)**	.0533108 (2.53)***	.050076 (2.52)***
Tangibility	-.228976 (-3.31)***	-.290462 (-3.74)***	-.223709 (-3.22)***	-.177984 (-2.21)**	-.168164 (-2.32)***	-.21050 (-2.51)***	-.045210 (-0.60)
Profitability	-.163058 (-1.27)	-.239002 (-1.37)*	-.069703 (-0.53)	.0473629 (0.26)	.001313 (0.01)	-.530859 (-2.74)***	-.202382 (-1.33)*
Growth Opportunity	-.113167 (-2.92)***	-.164925 (-3.56)***	-.089066 (-2.37)***	-.163043 (-3.67)***	-.169632 (-4.29)***	-.255856 (-4.48)***	-.207200 (-4.47)***
Dividend payout		-.192466 (-1.02)		-.026135 (-0.14)		-.5560357 (-2.74)***	
Managerial			-.000832 (-0.16)	.0042179 (1.05)	-.003993 (-0.73)		-.017482 (-2.75)***
institutional			.0032932 (1.26)*	.0026279 (2.07)**	-.007705 (-1.91)**		-.023381 (-4.25)***
Government					-.010475 (-2.86)***		-.026113 (-4.97)***
Secondary			.0101331 (2.64)***	.014347 (5.62)***	.0034624 (1.00)		-.011086 (-2.17)**
Banking Sector Development						.4544423 (2.34)***	.2588113 (1.72)**
Stock Market Development						.0484496 (0.42)	.0086518 (0.09)
Number of Banks						.0132437 (3.49)***	.0137991 (4.56)***
Foreign Exchange Rate						.2574789 (1.60)*	.2441665 (1.80)**
R^2 within	0.0738	0.0522	0.1045	0.0757	0.0570	0.1220	0.1677
R^2 between	0.4677	0.6040	0.5184	0.6709	0.7038	0.1220	0.7744
R^2 overall	0.2223	0.2543	0.3607	0.4166	0.4217	0.1220	0.5125
Wald chi^2	16.36	28.01	23.95	83.54	296.91	66.44	360.57
# of Observations	144	144	144	144	144	144	144

*Reject H_0 at 10% level of significance, **Reject H0 at 5% level of significance, ***Reject H0 at 1% level of significance.

Appendix Part E3: *Long term Book Debt Ratio (LTD1)*

Dependent Variable: LTD1							
Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Intercept	-.398920 (-2.32)	-.434452 (-2.53)***	-.376992 (-1.97)	-.378795 (-2.40)	dropped	-.320180 (-1.39)	dropped
Size log(assets)	.0207919 (2.16)**	.0237148 (2.46)***	.0159357 (1.63)*	.0129368 (1.49)*	.0084139 (1.03)	.0178293 (2.15)**	.0124382 (1.47)*
Tangibility	-.004020 (-0.14)	-.017380 (-0.57)	.002767 (0.09)	.0112683 (0.36)	.0174125 (0.60)	-.032974 (-1.00)	.0355351 (1.11)
Profitability	.075414 (1.42)*	.0185799 (0.29)	.0741497 (1.27)	.067779 (0.95)	.1122876 (1.86)**	-.038468 (-0.50)	.0749652 (1.16)
Growth Opportunity	.095006 (5.87)***	.1079241 (6.31)***	.0921795 (5.61)***	.1016241 (5.95)***	.0820233 (5.20)***	.0779802 (3.47)***	.0664782 (3.36)***
Dividend payout		-.170621 (-2.49)		-.181216 (-2.45)***		-.279682 (-3.50)***	
Managerial			.0031072 (1.49)*	.0060408 (3.91)***	.0034576 (1.59)*		.0029634 (1.09)
institutional			.0007932 (0.89)	.0001053 (0.22)	-.003104 (-1.93)**		-.004095 (-1.74)**
Government					-.003568 (-2.44)***		-.004497 (-2.01)**
Secondary			.0005934 (0.41)	.0022585 (2.30)**	-.000588 (-0.43)		-.001360 (-0.62)
Banking Sector Development						.018404 (0.24)	-.099889 (-1.55)*
Stock Market Development						.0397731 (0.88)	.0553969 (1.32)*
Number of Banks						-.000128 (-0.09)	.0002609 (0.20)
Foreign Exchange Rate						-.010332 (-0.16)	.0077428 (0.13)
R^2 within	0.2651	0.3297	0.2598	0.2503	0.1729	0.2992	0.1854
R^2 between	0.0477	0.2026	0.2455	0.7291	0.7285	0.4032	0.7574
R^2 overall	0.1669	0.2838	0.2461	0.4074	0.3488	0.3262	0.3677
Wald chi^2	46.69	54.75	46.54	80.45	124.23	56.17	125.32
# of Observations	144	144	144	144	144	144	144

*Reject H_0 at 10% level of significance, **Reject H0 at 5% level of significance, ***Reject H0 at 1% level of significance.*

Appendix Part E4: *Long term Market Debt Ratio (LTD2)*

Dependent Variable: LTD2							
Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Intercept	-.468168 (-2.05)	-.552494 (-2.27)	-.728474 (-2.74)	-.919511 (-4.43)	dropped	-.615398 (-1.91)	dropped
Size log(assets)	.0265571 (2.08)**	.0316425 (2.32)**	.027164 (2.08)**	.0314438 (2.75)***	.0244455 (2.30)**	.027563 (2.38)***	.030674 (2.81)***
Tangibility	-.022800 (-0.59)	-.022911 (-0.55)	-.020200 (-0.51)	.0183289 (0.45)	.0175043 (0.47)	-.046426 (-1.01)	.050193 (1.22)
Profitability	.1890215 (2.67)***	.1823254 (2.13)**	.2489553 (3.26)***	.290351 (3.10)***	.2744882 (3.47)***	.05453 (0.51)	.2190257 (2.62)***
Growth Opportunity	.0808835 (3.64)***	.0978604 (4.06)***	.0860888 (3.87)***	.0960928 (4.09)***	.072508 (3.39)***	.0746135 (2.31)**	.069335 (2.66)***
Dividend payout		-.171108 (-1.84)**		-.153466 (-1.58)*		-.294229 (-2.63)***	
Managerial			.0035416 (1.19)	.006030 (2.97)***	-.001118 (-0.40)		-.003579 (-1.02)
institutional			.0004944 (0.34)	-.000110 (-0.17)	-.007835 (-3.74)***		-.010752 (-3.55)***
Government					-.008095 (-4.25)***		-.010932 (-3.79)***
Secondary			.0042809 (2.00)**	.0067379 (5.22)***	-.001348 (-0.75)		-.003845 (-1.37)*
Banking Sector Development						-.073057 (-0.68)	-.192707 (-2.30)**
Stock Market Development						.0820443 (1.29)*	.084032 (1.55)*
Number of Banks						.0005716 (0.27)	.0014193 (0.85)
Foreign Exchange Rate						.0840627 (0.95)	.080568 (1.08)
R^2 within	0.1780	0.2122	0.1776	0.1919	0.1729	0.1670	0.1675
R^2 between	0.0022	0.0875	0.4565	0.7137	0.7285	0.2910	0.7317
R^2 overall	0.0820	0.1602	0.2772	0.3829	0.3488	0.2049	0.3689
Wald chi ^{2}	26.84	29.45	31.84	71.99	124.23	29.64	130.70
# of Observations	144	144	144	144	144	144	144

*Reject H_0 at 10% level of significance, **Reject H0 at 5% level of significance, ***Reject H0 at 1% level of significance.

Appendix Part F: SIGNS OF INDEPENDENT VARIABLES UNDER TOBIT REGRESSION MODELS[1],

Panel F1

TD1	1	2	3	4	5	6	7
Size log(assets)	+	+	+	+	+	+	+
Tangibility	-	-	-	-	-	1-	0(-)
Profitability	-	0(-)	0(-)	0(+)	0(-)	-	-
Growth Opportunity	0(+)	+	0(+)	1+	0(+)	+	0(+)
Dummy-Bank affiliation	-	-	0(-)	0(-)	0(-)	-	0(-)
Dummy-Construction	+	+	+	+	+	+	1+
Dividend payout		-		1-		-	
Managerial			1+	0(+)	0(+)		0(+)
institutional			-	1-	-		-
Government					0(-)		0(-)
Secondary			+	0(+)	+		+
Banking Sector Development						+	0(+)
Stock Market Development						-	0(-)
Number of Banks						+	+
ST Financial Crisis						0(-)	0(-)
Foreign Exchange Rate						1+	0(+)

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[1] + sign represent the significant and positive coefficients

 - sign represents the significant and negative coeffcients

 (+) sign represent the insignificant and positive coefficients

 (-) sign represents the insignificant and negative coeffcients

 1+ sign represents the positive and significant coefficients according to the 0.10 alpha error

 1- sign represents the positive and significant coefficients according to the 0.10 alpha error

Panel F2

TD2	1	2	3	4	5	6	7
Size log(assets)	+	+	+	+	+	+	
Tangibility	-	-	0(-)	1-	1-	0(-)	0(+)
Profitability	1-	0(-)	0(+)	0(+)	0(-)	1-	0(-)
Growth Opportunity	-	-	-	-	-	1-	-
Dummy-Bank affiliation	-	-	-	-	-	-	-
Dummy-Construction	+	1+	+	0(+)	0(+)	1+	0(+)
Dividend payout		-		0(-)		-	
Managerial			1+	0(+)	0(+)		0(+)
institutional			-	0(-)	-		-
Government					0(-)		-
Secondary			+	+	+		+
Banking Sector Development						0(+)	0(+)
Stock Market Development						-	0(-)
Number of Banks						+	+
ST Financial Crisis						0(-)	0(-)
Foreign Exchange Rate						+	0(+)

Panel F3

LTD1	1	2	3	4	5	6	7
Size log(assets)	1+	+	(0)+	+	(0)+	+	(0)+
Tangibility		1-	0(-)	0(+)	0(-)	0(-)	0(-)
Profitability	0(-)	0(+)	0(+)	1+	0(+)	0(-)	0(+)
Growth Opportunity	+	+	+	+	1+	+	0(-)
Dummy-Bank affiliation	0(+)	0(+)	1+	0(-)	+	0(+)	+
Dummy-Construction	+	+	+	+	1+	+	0(+)
Dividend payout		-		-		-	
Managerial			1+	0(-)	0(+)		0(+)
institutional			-	-	-		-
Government					0(-)		-
Secondary			0(+)	-	0(+)		0(+)
Banking Sector Development						0(+)	0(-)
Stock Market Development						0(+)	0(-)
Number of Banks						0(-)	0(-)
ST Financial Crisis						0(-)	-
Foreign Exchange Rate						-	-

Panel F4

LTD2	1	2	3	4	5	6	7
Size log(assets)	+	+	+	+	1+	+	1+
Tangibility	1-	0(-)	0(-)	0(+)	0(-)	0(-)	0(-)
Profitability	0(-)	0(+)	1+	+	1+	0(-)	0(+)
Growth Opportunity	0(+)	+	0(+)	+	0(-)	0(+)	1-
Dummy-Bank affiliation	0(-)	0(-)	0(+)	0(+)	+	0(-)	+
Dummy-Construction	+	0(+)	+	+	0(+)	0(+)	0(+)
Dividend payout		-		-		-	
Managerial			1+	0(+)	0(-)		0(+)
institutional			-	-	-		-
Government					-		-
Secondary			+	0(-)	+		+
Banking Sector Development						0(-)	1-
Stock Market Development						0(+)	0(-)
Number of Banks						0(-)	0(-)
ST Financial Crisis						1-	-
Foreign Exchange Rate						0(-)	-

165

Appendix Part G: SIGNS OF INDEPENDENT VARIABLES UNDER PANEL DATA MOELS

Panel G1

TD1	1	2	3	4	5	6	7
Size log(assets)	+	+	+	+	+	+	+
Tangibility	-	-	-	-	-	-	-
Profitability	-	-	-	0(-)	0(-)	-	-
Growth Opportunity	0(+)	0(-)	0(+)	0(-)	0(-)	1-	0(-)
Dividend payout		-		1-			
Managerial			0(+)	+	0(-)		-
institutional			0(+)	1+	-		-
Government					-		-
Secondary			+	+	0(-)		-
Banking Sector Development						+	+
Stock Market Development						0(-)	0(-)
Number of Banks						+	+
Foreign Exchange Rate						0(+)	0(+)

Panel G2

TD2	1	2	3	4	5	6	7
Size log(assets)	+	+	+	+	+	+	+
Tangibility	-	-	-	-	-	-	0(-)
Profitability	0(-)	1-	0(-)	0(+)	0(+)	-	1-
Growth Opportunity	-	-	-	-	-	-	-
Dividend payout		0(-)		0(-)		-	
Managerial			0(-)	0(+)	0(-)		-
institutional			1+	+	-		-
Government					-		-
Secondary			+	+	0(+)		-
Banking Sector Development						+	+
Stock Market Development						0(+)	0(+)
Number of Banks						+	+
Foreign Exchange Rate						1+	+

Panel G3

LTD1	1	2	3	4	5	6	7
Size log(assets)	+	+	1+	1+	0(+)	+	1+
Tangibility	0(-)	0(-)	0(+)	0(+)	0(+)	0(-)	0(+)
Profitability	1+	0(+)	0(+)	0(+)	+	0(-)	0(+)
Growth Opportunity	+	+	+	+	+	+	+
Dividend payout		-		+		-	
Managerial			1+	+	1+		0(+)
institutional			0(+)	0(+)	-		-
Government					-		-
Secondary			+	+	0(-)		0(-)
Banking Sector Development						0(+)	1-
Stock Market Development						0(+)	1+
Number of Banks						0(-)	0(+)
Foreign Exchange Rate						0(-)	0(+)

Panel G4

LTD2	1	2	3	4	5	6	7
Size log(assets)	+	+	+	+	+	+	+
Tangibility	0(-)	0(-)	0(-)	0(+)	0(+)	0(-)	0(+)
Profitability	+	+	+	+	+	0(+)	+
Growth Opportunity	+	+	+	+	+	+	+
Dividend payout		-		1-		-	
Managerial			0(+)	+	0(-)		0(-)
institutional			0(+)	0(-)	-		-
Government					-		-
Secondary			+	+	0(-)		1-
Banking Sector Development						0(-)	-
Stock Market Development						1+	1+
Number of Banks						0(+)	0(+)
Foreign Exchange Rate						0(+)	0(+)