

LEASE - DEBT RELATIONSHIP IN CORPORATIONS

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ABSTRACT

This study is about the relationship between lease propensity and debt in corporations. We investigated whether there is a substitutionary or complementary relationship between lease and debt. Two different samples are used such as a sample of Turkish public companies traded on Borsa Istanbul (BIST) and a sample of public companies from the BRICS countries. The BIST sample consists of 147 firms and 62 quarterly data between the years 2004Q3-2019Q4. As a result, there are 9114 firm-level data. The BRICS sample consists of annual data for 760 public firms from Brazil, Russia, India, China, and South Africa between 2009 and 2018. Totally, 7600 firm-level data. Panel tobit regression method which is proper for limited dependent variable model ran to investigate the relationship between lease and debt for both samples.

In both samples, the relationship between lease and debt decisions in corporations was examined. While examining the relationship between leasing and debt, other financial and economic factors were also used as control variables for robustness. Size of the firms, the collateral amount, the liquidity, the tax rate, the profitability, retained earnings, the growth opportunities, the financial distress level, age of the company, exchange rate difference and interest rate of companies are the factors we control when examining the relationship between leasing and debt. In the second part of the study, it was checked whether there was a significant change on the lease propensity according to the sectors. In the third part of the study, it was investigated whether factors such as size of the firms, the collateral amount, the liquidity, the tax rate, the profitability, retained earnings, the growth opportunities, the financial distress level, age of the company, exchange rate difference and interest rate of companies have an effect on the leasing propensity when the firms are at the same debt level. In the fourth part of the study, it was investigated whether there is a significant change according to the sectors in which the companies with the same debt

level are included. Finally, the above-mentioned analyses were repeated using the subsamples of small & medium enterprises (SMEs) and large enterprises (LEs) for both BIST and BRICS firms.

In the sample of Borsa Istanbul, the relationship between lease and debt is complement. Strong and significant relationships were found between lease and collateral amount, past and current profitability, financial distress, firm age, changes in interest rates, firm size, and USD-TL exchange rate change. According to industry research, we found that in the consumer staples, consumer discretionary, information technology, real estate sectors, they resort to borrowing rather than lease. For companies with the same debt level, a significant relationship was found between the lease and firm age, the amount of collateral, the interest rate, and the effective tax rate. Moreover, the effect of the change in VAT rates between 2007 and 2018, which is a factor that was studied for the Borsa Istanbul sample and not for the Brics sample, was found to be significant and negative. For the SMEs listed on the BIST, no significant result could be reached when the relationship between the lease and the debt is examined. When the relationship between leasing and debt for LEs listed on BIST is examined, it is concluded that there is a complementary relationship.

In the empirical study, we conducted with the sample of Brics countries listed firms, the relationship between lease and debt was substitute. Strong and significant results were also obtained between the other financial and economic factors that we used in order to obtain more robust results and the lease propensity. Of these, significant and strong results emerged between profitability, firm age, exchange rate and leasing. At the same debt level, significant and strong results were obtained between leasing and exchange rate difference, interest rate, and firm age. We conducted the research among SMEs and LEs to check which financial factors are changing the leasing trends of SMEs and LEs. For SMEs, no significant relationship was found between

lease and debt. The results of the relationship between lease and debt for LEs differ according to debt definitions, and strong results have been achieved. In addition, for the BRICS sample, the relationship between Gross Domestic Product (GDP) as a measure of development level and lease propensity is examined. We see that as the annual gross domestic product of the countries increases, they tend to lease more. Furthermore, lease rates of companies with the same debt level increase significantly with the increase in the annual gross domestic product GDP values of the countries. Firms with the same level of debt from countries with higher levels of development tend to use more leases.

To this author's knowledge, we expand prior research on debt-lease relationships by considering a sample of all BRICS countries as well as Turkish public firms, and including interaction terms in the analyses. The findings of this study would be a guide for creditors and leasing companies in terms of identifying potential customers, and for investors in terms of understanding corporate decisions.

Keywords: Lease, complementary, substitutary, BRICS, BIST, Tobit, limited dependent variable model, random effects tobit model

JEL Classification: G30

ÖZET

Bu çalışma, şirketlerde kiralama eğilimi ile borç arasındaki ilişki hakkındadır. Kiralama ile borç arasında ikame veya tamamlayıcı bir ilişki olup olmadığı araştırılmıştır. Borsa İstanbul'da (BİST) işlem gören halka açık Türk şirketleri örneği ve BRICS ülkelerinden halka açık şirketler örneği olmak üzere iki farklı örneklem kullanılmıştır. BİST örneklemini 2004Ç3-2019Ç4 yılları arasında 147 firma ve 62 adet üç aylık veriden oluşmaktadır. Sonuç olarak 9114 firma düzeyinde veri bulunmaktadır. BRICS örneklemini beş ülke Brezilya, Rusya, Hindistan, Çin ve Güney Afrika borsa verilerinden oluşmaktadır. Örnekleimde 2009-2018 yılları arasında 760 firma yer almaktadır. Toplam 7600 firma düzeyinde veri vardır. Sınırlı bağımlı değişken modeli olan rastgele etkiler tobit regresyon metodu, her iki örneklem için de kiralama ve borç arasındaki ilişkiyi araştırmak için kullanılmıştır.

Her iki örneklem içinde, öncelikle temel araştırma konusu olan kiralama ile borç arasındaki ilişki incelenmiştir. Kiralama ve borç arasındaki ilişki incelenirken diğer finansal ve ekonomik faktörler de daha sağlam bir çalışma olması açısından kontrol değişkeni olarak kullanılmıştır. Kiralama ve borç arasındaki ilişkiyi incelerken firmaların ölçeği, teminat miktarı, likidite, vergi oranı, kârlılık, dağıtılmamış kârlar, büyüme fırsatları, finansal sıkıntı düzeyi, şirketin yaşı, kur farkı ve faiz oranı kontrol ettiğimiz faktörlerdir. Çalışmanın ikinci kısmında, sektörlerle göre kiralama eğiliminde anlamlı bir değişim olup olmadığı kontrol edildi. Çalışmanın üçüncü kısmında, firmalar aynı borç seviyesindeyken firmaların ölçeği, teminat miktarı, likidite, vergi oranı, kârlılık, dağıtılmamış kârlar, büyüme fırsatları, finansal sıkıntı düzeyi, şirketin yaşı, kur farkı ve faiz oranı gibi faktörlerin kiralama eğilimine etkisi olup olmadığı araştırıldı. Çalışmanın dördüncü kısmında, aynı borç seviyesine sahip firmaların dâhil oldukları sektörlerle göre anlamlı bir değişim olup olmadığı araştırıldı. Son olarak yukarıda saydığım çalışma basamakları hem BIST hem BRICS için Kobiler ve Büyük ölçekli firmalar olarak ikiye ayırdığımız örneklem üzerinde de çalışıldı.

BIST örnekleminde, kiralama ile borç arasındaki ilişki tamamlayıcı olarak çıkmıştır. Kiralama ve teminat tutarı, geçmiş ve cari karlılık, finansal sıkıntı, firmanın yaşı, faiz oranlarındaki değişiklikler, firma büyüklüğü, USD-TL kuru değişimi arasında güçlü ve anlamlı ilişkiler bulunmuştur. Sektör araştırmamıza göre, tüketici temelleri, tüketici takdiri, bilgi teknolojisi, gayrimenkul sektörlerinde kiralamadan ziyade borçlanma yoluna başvurdıklarını tespit edildi. Aynı borç düzeyine sahip şirketler için kiralama ile firmanın yaşı, teminat tutarı, faiz oranı, efektif vergi oranı arasında anlamlı bir ilişki bulunmuştur. BIST örneklemini çalışıp Brics örneklemini çalışılmayan bir faktör olan, 2007 ile 2018 yılları arasında KDV oranlarındaki değişimin, kiralama üzerindeki etkisi anlamlı ve negatif bulunmuştur. BIST'e kote olmuş KOBİler için, kiralama ile borç arasındaki ilişki incelendiğinde anlamlı bir sonuca ulaşılamamıştır. BIST'e kote olmuş büyük ölçekli şirketler için, kiralama ile borç arasındaki ilişki incelendiğinde tamamlayıcı bir ilişki olduğu sonucuna ulaşılmıştır.

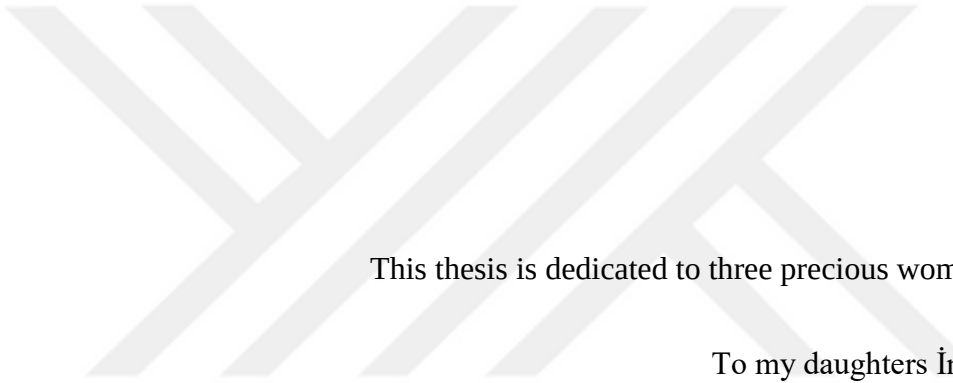
Brics ülke örneklemini ile yapmış olduğumuz ampirik çalışmada, kiralama ile borç arasındaki ilişki ikame çıkmıştır. Daha sağlam sonuçlar elde etmek adına kullanmış olduğumuz diğer finansal ve ekonomik faktörlerle kiralama eğilimi arasında da güçlü ve anlamlı sonuçlara ulaşılmıştır. Bunlardan karlılık, firmanın yaşı, döviz kuru ile kiralama arasında anlamlı ve güçlü sonuçlar çıkmıştır. Aynı borç seviyesinde şirketlerin, kiralama ile kur farkı, faiz, firmanın yaşı arasında anlamlı ve güçlü sonuçlar elde edilmiştir. Küçük-orta ölçekli ve büyük ölçekli şirketlerin kiralama eğilimlerini hangi finansal faktörlerin değiştirdiğini kontrol etmek için araştırmayı, örneklemini KOBİ'ler ve büyük ölçekli şirketler diye ikiye ayırarak tekrar gerçekleştirdik. KOBİler için, kiralama ile borç arasında anlamlı bir ilişki bulunamamıştır. Büyük ölçekli şirketler için kiralama ve borç arasındaki ilişkinin sonuçları borç tanımlarına göre farklılık göstermekte olup güçlü sonuçlara ulaşılmıştır. Ayrıca Brics ülkelerinin gelişmişlik düzeyi GSYİH ve kiralama eğilimleri incelenmiş olup, kiralama ile ülkelerin GSYİH değeri arasında pozitif ve anlamlı bir ilişki bulunmaktadır. Ülkelerin yıllık gayri safi

yurtiçi hasılası arttıkça daha fazla kiralamaya yöneldiklerini görüyoruz. Ayrıca, aynı borç seviyesinde, ülkelerin yıllık gayri safi yurtiçi hasıla değerlerinin artmasıyla şirketlerin kira oranları önemli ölçüde artmaktadır. Yani, gelişmişlik düzeyi yüksek ülkelere aynı düzeyde borç alan firmalar daha fazla kiralama kullanma eğilimindedir.

Yazarın bilgisi dâhilinde, bu çalışma, BIST ve BRICS ülkeleri listesinde yer alan firmalar üzerinde leasing ve borç ilişkisini doğrudan inceleyen ilk ve tek çalışmadır. Ayrıca, daha önce hiçbir çalışma bu ilişkiyi etkileşim terimlerini kullanarak incelememiştir. Bu çalışma, alacaklılara, finansal kiralama şirketlerine potansiyel müşteriyi tespit etmeleri açısından yol gösterici özelliğe sahip bir çalışmadır.

Anahtar Kelimeler: kiralama, tamamlayıcı, ikame, borç, BRICS, BIST, Tobit, sınırlı bağımlı değişken modelleri, rastgele etkili tobit model

JEL Sınıflandırması: G30



This thesis is dedicated to three precious women in my life;

To my daughters İnci and Gülce,

To my beloved mother Melahat...

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LIST OF ABBREVIATIONS

BIST	Borsa Istanbul Stock Exchange
BRICS	Brazil, Russian Federation, India, China And South Africa
IPO	Initial Public Offering
VAT	Value Added Taxes
GDP	Gross Domestic Product
IMF	International Monetary Fund
CVM	Brazilian Securities Commission
BOVESPA	The São Paulo Stock Exchange
BM&F	Brazilian Mercantile and Futures Exchange
NSE	National Stock Exchange
BSE	Bombay Stock Exchange.
OLS	Ordinary Least Square

CHAPTER 1: INTRO

1.1. Research Questions and Significance of the Study

One of the most curious about corporate finance is what determine the firms' corporate management decision and how it can be possible. One important question is how companies compensate and finance their investments and what capital structure is proper of firms' characteristics in literature (Modigliani & Miller, 1958; Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001). Leverage management is in the center of the considerable debate on building corporate structure and investment decisions (Öztekin, 2015). Also, firms should provide a balance between debt level and income (Lim, Mann, & Mihov, 2017; Stewart, 1984). This can be possible with various types of alternative borrowing ways. In this study, we analyze the relation between financial debt and a different type of debt which is named "leasing" (Shillinglaw, 1958).

Leasing is an instrument that provides the use of equipment or land for specific periods of time at fixed payments. Leasing provides that investment goods are hired instead of purchasing. It also provides an increasing profitability and utility by allowing firms to have more available fund for operating capital to other needs or investments.

In which situation, firms use financial debt and financial leasing and how built up the capital structure in terms of debt and leasing jointly. At this paper, we evaluate how leasing should led to balance debt and how relation exist each other in Istanbul Stock Exchange listed firms in Turkey and Brics countries public corporations.

In this context, this research makes three novel contributions to the literature. First; there has been very rare studies on the types of financial leasing and financial debt (Bayless & Diltz, 1990; Adadeji & Stapleton, 1996; Krishnan & Moyer, 1994; Deloof & Verschueren, 1999;

Deloof, Lagaert, & Verschueren, 2007; Degl'Innocenti & Girardone, 2012; Cosci, Guida, & Meliciani, 2015; Zhang, Zhai, & Sun, Does the level of financial leasing matter in the impact of bank lending on economic growth: Evidence from the global market (2006–2016), 2019). Therefore, this study broadens very limited research on the choice between leasing and debt in terms of firms' future and past indicators. It also enriches the relationship between leasing and debt literature, focusing on a developing economy that has not been adequately studied on this issue.

Second, as far as we know; this is the first study investigating the relationship between financial debt and leasing in Turkey via Borsa Istanbul Stock Exchange (BIST) and BRICS countries listed firms. Furthermore, the Borsa Istanbul Stock Exchange (BIST) market is a proper candidate for investigating the volume density of lease using since it has been used in 1986s (Tekinalp, 1992). Unfortunately, leasing market depth is suffered significantly from the impact of the poor legal environment, insufficient government burden tax regulation and inadequate incentives for slowing down the development of financial markets in Turkey (Altıntaş & Sarı, 2012; Şit & Şit , 2013; Turan Kurtaran, 2016).

Third; this study reports arguments on how new rules and regulations affect selection process of borrowing types such as financial debt and financial leasing. I tested and founded that the governmental regulation on value added tax rate for leasing industry between the years 2007 and 2012 effect significantly negative the lease propensity in Turkey. Understanding the nature of these impacts is necessary for listed firms, investors, managers, owners, auditors, and insurance broker in lessening adverse selection, agency cost and moral hazardous.

Fourth; this study analyzes that in which situation firms prefer to use lease even if they are at the same debt level. In this context, I controlled how the relationship change between firms have different level of size, amount of collateral, liquidity, tax rate, profitability, retained

earnings, financial distress, growth opportunity, exchange rate differences, interest rate and firm age at the same debt level.

Fifth and the last contribution of this thesis in literature is information of use of lease in industrials. I controlled the information about leasing propensity sector by sector using industry dummy variables.

This study also assists and sheds light future studies about selecting the types of the debt determinants in the context of Turkish listed companies and BRICS countries listed companies.

This study becomes eight sections. Firstly, introduction, significance, and contribution of the study is expressed. Secondly, main, and sub-research questions are introduced. Thirdly, data, samples, research design, pre and post estimation tests are reported. Fourthly, methodology is explained. From fifth section to eight section, empirical analysis, results, and conclusions are discussed.

1.2. Why financial lease?

Firms can finance 100 % of their project with the opportunities provided by financial leasing, so that they do not depend on their equity. Leasing proposes cash flow plan with flexible rent payments suitable for firms' fund flow. Leasing proposes to evaluate incentives for firms. Firm can benefit from the financial leasing company incentive for their incentive investment, so firms can use their incentive. If firms wish, they can buy the rented property at a representative price at the end of the period. Leasing provides opportunity of risk management. Risk management with fixed rent against fluctuations in money values and interest rates.

1.3. Function of financial lease in Turkey

Function of financial leasing is as follows. A preliminary agreement including the price and delivery conditions is made with the seller firm by selecting the investment property by the tenant company. When it comes to financing the project, the investor company applies to a

financial leasing company. It gives the necessary information and documents to the leasing company for evaluation. The financial leasing company makes the necessary financial analysis and makes an offer to the investor. If it deems necessary, the investor can request a guarantee from the firm. When the agreement is reached, a financial lease agreement is signed between the leasing company and the investor company. If the investments have incentive, after the financial leasing contract is signed, an application is made to the Ministry of Economy and a letter is written which of the goods listed in the incentive certificate will be purchased by the financial leasing company within the scope of the financial lease agreement. The financial leasing firm benefits from the incentives related to the property because it has the title of owner and reflects it to its tenant. The financial leasing company pays the cost of the goods to the seller. The goods subject to financial leasing are delivered to the lessee (Association of Financial Institutions, 2021).

Both financial leasing and debt is a kind of debt instrument. Both are used to finance the investors/firms. Both are presented in financial statement. Moreover, firms prefer to use them according to firms' leverage level or capital structure. Too much leverage level increases firms' financial risks. On the other hand, too much equity means idle money for company's owner. There must be a balance between debt and equity level. In such cases, companies can want to lease or use financial borrowing, considering their debt levels and capital structures. Leasing provides the advantage of paying 1% VAT instead of paying 18% or 8% VAT on firms' investments, the direct foreign currency borrowing option for firms' leasing repayments instead of borrowing in foreign currency. The import and incentive procedures for leasing investment was done by the expert staff of leasing company. Namely, leasing company provides an operational convenience for investors. Leasing enables to manage firms' cash flow easily by repaying the value added tax (VAT) generated during the purchase in installments instead of paying in advance with rental payments. Furthermore, leasing takes the advantages of being

exempt from all kinds of taxes, duties and fees and provides the opportunity to borrow with fixed lease in the medium and long term. On the other hand, prefers to lease, do not reduce the firms' bank credit limits for investments. Without using firm equity, lease provides convenience to take the equipment and to use 100% financing for firms' entire investment by spreading all contractual expenses to the lease payment plan which is arranged in accordance with the cash flow of company's demand, the efficiency and economic life of the investment. Leasing takes the advantage of firms' leasing transactions that firms' leases remain constant throughout the contract and benefit for the opportunity of depreciation and revaluation in all fixed asset investments made with leasing. Leasing gives the comfort of customized solutions for your investments' financing needs whether large-scale or small-scale. At the end of the lease payment period, firms have a chance of the ownership right of the lease instrument paying a symbolic amount.

If the firms want to use bank credit, they should apply and give guarantee to bank. They have to have a credit score about solvency. If companies have no credit score which is start-up or small enterprise, they cannot reach bank loan directly and face to lots of unnecessary transaction procedure. After buying leasing instrument, which is financed by bank credits, investors do not easily dispose of instrument because of inefficient secondary market or lack of know-how about secondary market. Moreover, investors have to endure and arrange all cost of allowances, stamp, tax, and fees as file expense.

In the financial leasing, the lease payments paid for the leased investment property and the depreciation of the economic asset activated as a right are reduced by deducting from the tax base by considering the expenses.

1.4. Leasing in Turkey

According to the 2019 Global Leasing Report (Gleeson, 2020), Turkey was ranked by the leasing ratio 0,68 as 38 out of 50 countries in 2018, the leasing ratio 0,93 as 33 out of 50 countries in 2017, the leasing ratio 0,84 as 34 out of 50 countries in 2016. In 2019, annual leasing volume as a percentage of gross domestic product rank is 38; down from its ranking of 33 of 2017 and 34 of 2016.

Leasing started to be used as a financial instrument on the date 1983 with decree on the Establishment of Special Finance Institutions (Official Gazette of the Republic of Turkey, 1984). First leasing company was founded at the year of 1986 and increasing the rate of leasing companies in financial sector continued (Şişman & Şişman, 2017). In other words, the number of firms operating in the sector has increased rapidly until the 2000s. At 2007; as the government increased the VAT rate from 1% to %18, leasing operational volume reduced considerably and the number of leasing transaction decreased to 61 % according to previous year (The worldwide leasing penetration rate , 2008; Altıntaş & Sarı, 2012; Turan Kurtaran, 2016).

Figure 1 demonstrates lease rate by years for Borsa Istanbul listed firms. In figure 1, we easily see that lease rate increased by years. Also, there is a decreasing trend between 2008 and 2012 years.

This situation, which adversely affected the development of financial markets, was revised in 2011 with the new regulation of the government and the withdrawal of 18% to 1% the VAT rates. Furthermore, in 2012; the government continued to regulate to achieve about a sustaining development of leasing markets and offered new leasing types such as operational leasing, sales and lease back (Official Gazette of the Republic of Turkey, 2012; Shillinglaw, Leasing and Financial Statements, 1958; Schall, 1987; Bayless & Diltz, 1990). As Figure 1, there is a sharp decline in the use of leasing between the years 2007 and 2012 in Turkey. After lowering VAT

value, leasing market begins to rise again (Altıntaş & Sarı, 2012; Turan Kurtaran, 2016; Şit & Şit, 2013).

Figure 1

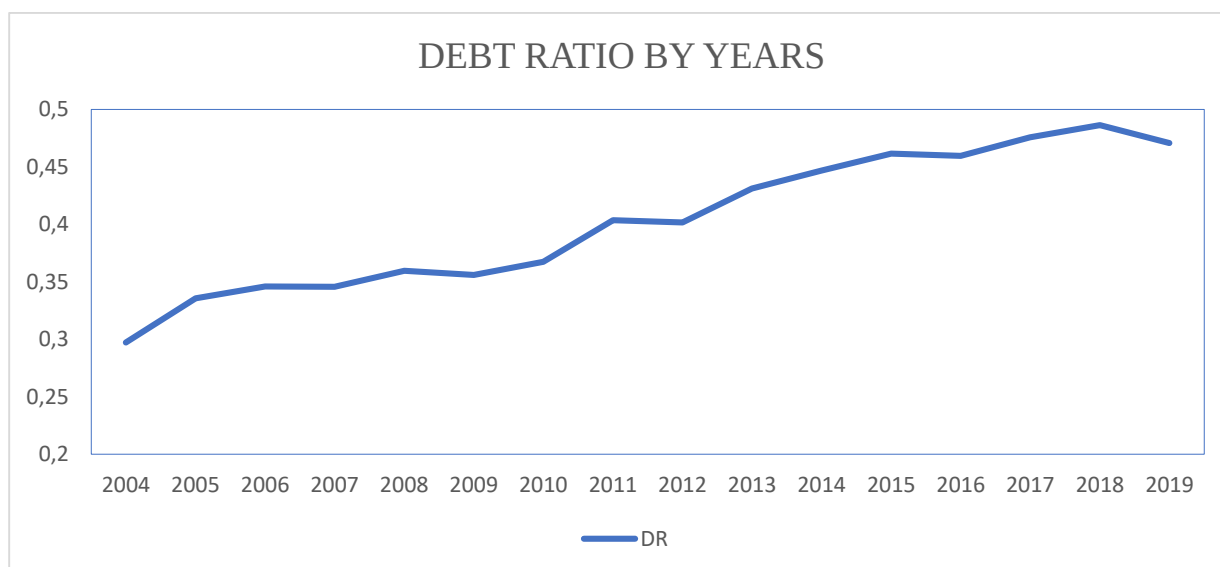
Leasing Ratio by Years



LR is calculated as total financial lease over total assets by years for all firms in the sample.

Figure 2

Debt Ratio By Years



DR is calculated as total debt minus total financial leases over total assets by years for all firms in the sample.

The concept of leasing has recently become significant in Turkey. Results of this study are used by the investors to realize positive results, such as increasing use of leasing in financial markets. Unlike available research, this paper evaluates capital structure builders' attitude toward the use of leasing as a type of debt according to macro-economic situations. Furthermore, it reveals the result of opportunistic behavior by also considering financial literacy in Turkey.

1.5. Why Brics?

BRICS, which was born as a reaction to the unipolar ruling in the economy, is actually a community based on economic interests, created to say that the world is not just the USA. It is a formation that focuses on changing the inequalities in the system fairly against the rich European countries that have a say on the world economic order with their status quo approach and the US hegemony, which is a unipolar global power after the cold war. Especially after the 2008 global financial crisis, while the growth rates of developed countries declined, developing countries had more say in the global economy. This community consisting of Brazil, Russia, India, and China, which was shown among the emerging economies named as BRIC for the first time in 2001, was later called Brics and transformed into an economic structure formed by the countries of Brazil, Russia, India, China and South Africa in 2006. The BRICS abbreviation emerged with the combination of the initials of the countries. With the joining of South Africa in 2006, it transformed from BRIC to BRICS, taking its current form. Since these 5 countries, which are also G20 countries, have superpower positions in their regions, they have an economically significant population over the countries in these regions. Relations between Brics countries are structured according to the understanding of common benefit and states have decided not to interfere in each other's internal affairs.

Countries meeting annually with their presidents since 2009 pursued the goal of establishing a political contact. In 2014, the foundations of the New Development Bank (NDB) were laid under of BRICS. In this way, countries created an institution that rivals the International

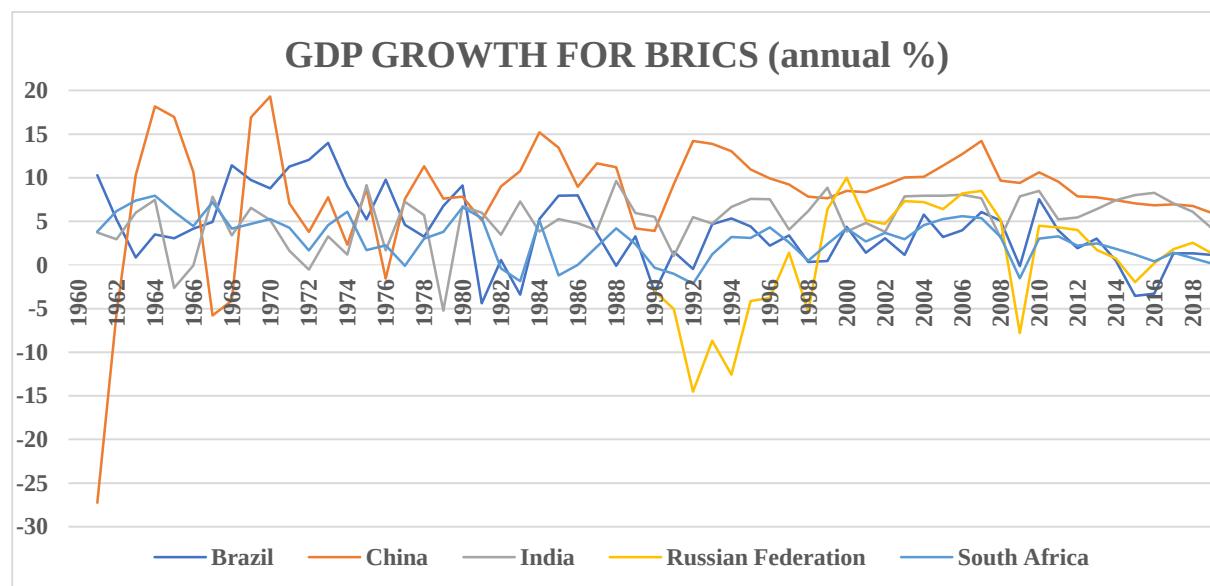
Monetary Fund (IMF), which is dominated by the USA and Europe. Countries meeting annually at the level of heads of state since 2009 pursued the goal of establishing a political dialogue. In 2014, the foundations of the New Development Bank (NDB) were laid under the umbrella of BRICS. In this way, countries created an institution that rivals the International Monetary Fund (IMF), which is dominated by the USA and Europe. With a capital of 50 billion dollars, the bank has become one of the largest multilateral institutions in the world.

1.6. Brics Economics

BRICS countries started to grow economically and financially after the 2008 Global crisis. This is confirmed by the annual increase in GDP on a country basis. The figure 3 below shows the GDP levels for Brazil, Russia, India, China, and South Africa.

1.6.1. Brazil

Brazil ranks 8th in the world in terms of GDP, 31st in the world in terms of growth rate, and 5th in the world in terms of population and surface area. Brazil is the largest country in the Southern Hemisphere and the most populated country in South America. Among the BRICS countries, it is the 3rd largest country in terms of area, population, economic size, and growth rate. Brazil has a comparative advantage in agricultural products (coffee, sugar, oranges, cocoa, tobacco), livestock products (meat, poultry), wood products (paper, pulp), mineral and metal products (iron, steel, and aluminum) due to its abundant natural resources.

Figure 3*GDP Growth for Brics (Annual %)*

Similar to other Latin American countries, Brazil started to implement liberalization policies at the end of the 1980s, and as a result of these policies, there was a jump in the amount of foreign investment entering the country after 1995, and the country's economy started to recover after the global crises. The export volume, which increased with the economic programs supported by the IMF, brought remarkable growth to the country in the 2000s, and significant successes were achieved in the fight against inflation.

From the point of view of financial markets, it can be said that the system is predominantly banking sector and that the only stock exchange of the country, the Sao Paulo Stock Exchange-BOVESPA is the most developed stock exchange in Latin America.

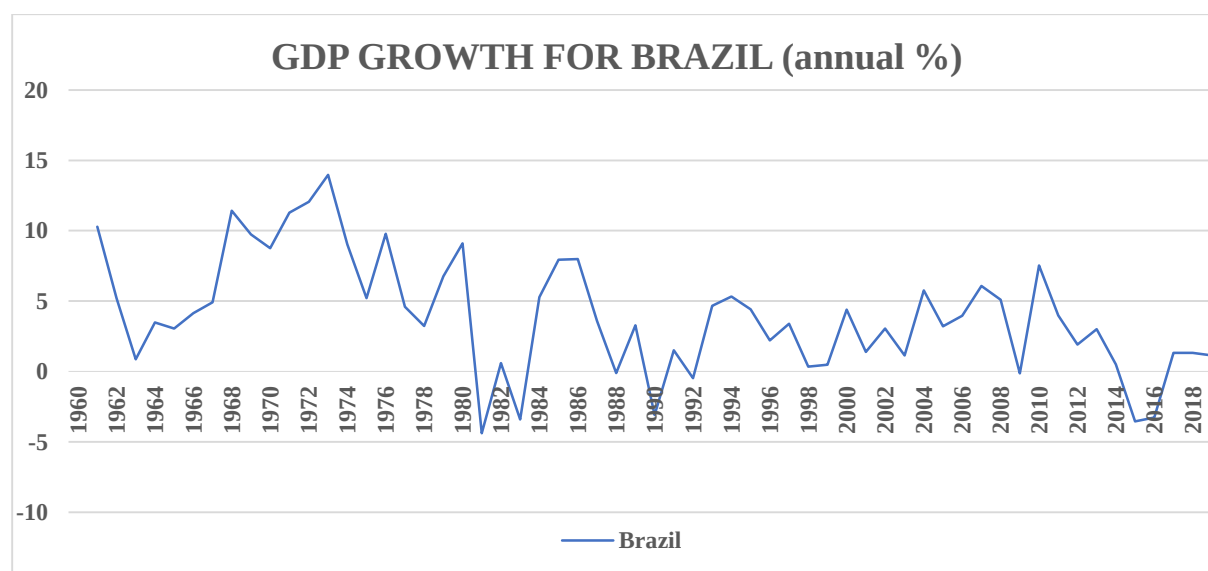
At the top of the National Financial System is the National Monetary Council as the highest regulatory authority, and the capital markets are controlled by the CVM (Brazilian Securities Commission), which is organized as an independent federal institution together with this council and is linked to the Ministry of Finance.

BOVESPA, which was established in 1890, was reorganized in 2000 and became what it is today. From the point of view of financial markets, it can be said that the system is predominantly banking sector and that the only stock exchange of the country, the Sao Paulo Stock Exchange-BOVESPA is the most developed stock exchange in Latin America. At the top of the National Financial System is the National Monetary Council as the highest regulatory authority, and the capital markets are controlled by the CVM (Brazilian Securities Commission), which is organized as an independent federal institution together with this council and is linked to the Ministry of Finance. BOVESPA, which was established in 1890, was reorganized in 2000 and became what it is today. The liquidity provided by the BOVESPA Fixa platform, created for the trading of fixed income public securities, is expected to improve the issue of asset and mortgage-backed securities. For companies that voluntarily adopt corporate governance principles, a separate transaction system called Novo Mercado was established five years ago, and a successful corporate governance practice is being implemented. BM&F (Brazilian Mercantile and Futures Exchange), the country's futures exchange; It is the fifth largest futures exchange in the world, with an average of 200 million contracts per year, mainly on interest, foreign currency, stock index and main export products such as coffee, soybeans, ethanol, sugar and bovine livestock. With the BEST-Brazil: Excellence in Securities Transactions project, which was created with the participation of the Central Bank of the country, the Treasury, the Capital Markets Board, the Stock Exchange, the Futures Exchange, and the Settlement and Custody Bank, it is aimed to attract more foreign investors to the capital markets. awareness and access to capital markets, transaction conditions, regulations, advantages, etc. roadshows, seminars, etc., in important financial centers of the world, in order to provide information on the issues. works are being done. Arrangements have been made for foreign investors, which reduces bureaucracy, eliminates domestic/foreign differences, reduces examination time (for foreign investors who want to trade in the stock

market, the registration period has been reduced to 24 hours), provides tax exemptions, and encourages electronic transactions. As of 2007 BOVESPA Holding S.A.; started to be traded in BOVESPA, which is the stock exchange of the country in which it owns 100% of the capital. With the said public offering, the market value of BOVESPA was realized as 9.179 billion USD and this amount placed the Sao Paulo stock exchange in the fifth place in terms of market value among the 23 publicly traded stock exchanges in the world.

Figure 4

GDP Growth For Brazil (Annual %)



1.6.2. Russia Federation

The largest country in the world with an area of 17 million km², Russia, with a population of 144,406,261 million people, was established after the collapse of the Soviet Union in 1991. Although he abandoned a deep-rooted central planning tradition and became acquainted with the economic and cultural structure of the western world with this date, he tried to adapt to the free market economy with the comprehensive reform programs implemented especially in the field of privatization. As expected, this rapid transition period was quite painful. In 1998, the country declared a moratorium on foreign debt payments, with the effect of the Asian crisis inflicting losses on the exports of the energy sector, which is the backbone

of the country's economy, due to falling prices. With the tight monetary policy implemented after this crisis and the increase in global energy prices, the payment of foreign debts accelerated.

Figure 5

GDP Growth for Russia Federation (Annual %)



When we look at the country's financial system, as a natural consequence of being a transition economy, the banking system, which had the function of intermediation only in the payments made within the system and surveillance/control in the payments of the fully public institutions during the central planning periods of the Soviet Union, primarily developed. In this framework, it switched to the financial intermediation function in terms of resource allocation.

1.6.3. India

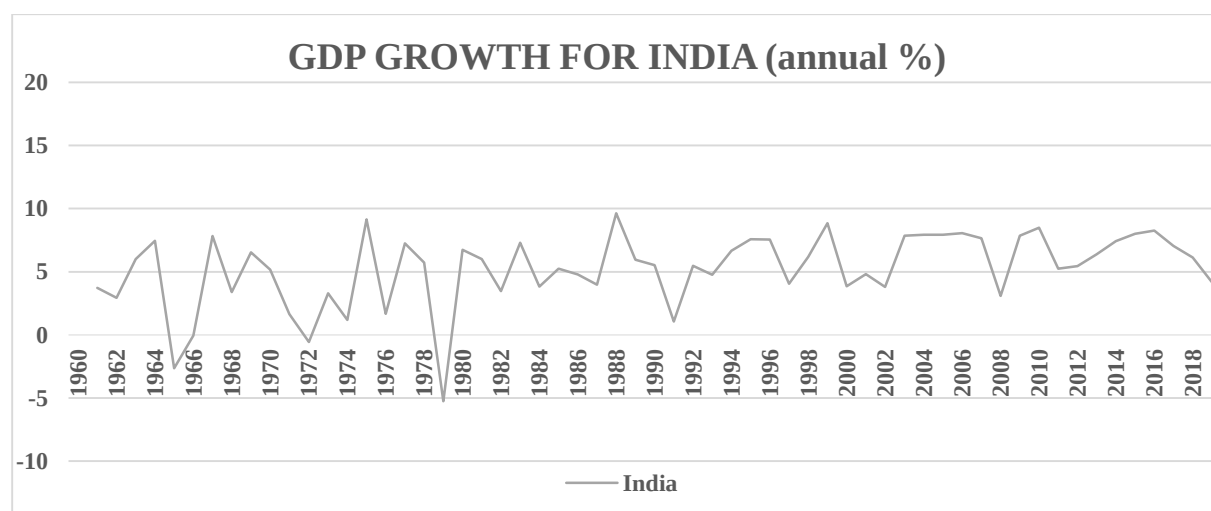
India has 3,287,000 km² surface area and 1.366.000 people are considered, realizes 21,6 % of the world's imports and 18,4 % of its exports (Worldbank, worldbank.org, 2021).

The acceleration of growth in the country coincides with the transition to an open economy, and the liberalized trade policy since 1991 has increased the competitiveness of exports, and in addition, the increase in exports in the service sector, mainly due to information technologies, with the entry of the private sector and foreign capital has supported the process. The

liberalization of trade led to an increase in the wages of the unskilled, reducing the wage imbalance in the country, and as India's weight in the Asian markets increased, the country became a regional growth engine. China's participation in the World Trade Organization and the abolition of quotas in textile and apparel make competition difficult for India. However, support for a developed infrastructure, relatively low customs rates, and a developed business environment (such as bureaucratic conditions) is required for a sustainable competitive edge.

Figure 6

GDP Growth For India (Annual %)



There are two stock exchanges in the country, NSE-National Stock Exchange of India and BSE-Bombay Stock Exchange.

1.6.4. China

China, which is among the BRICS countries, closed to the outside of the economic structure of the communist system in the 1980s have begun reforms to make outward with 1990, in 2001 became a member of the World Trade Organization. China, which is a world giant even when only 9,597,000 km² surface area and 1.397.715 people are considered, realizes 17,3 % of the world's imports and 18,5 % of its exports (The Worldbank , 2021). The labor cost advantage created by the large working-age population, the availability of land suitable for all kinds of economic activities and the potential market power created by the population provide this

country with a unique competitive advantage. Again, with the foreign trade surplus obtained, China is among the important countries that export capital to foreign countries in the world. On the other hand, it is among the countries that attract the most foreign investment in the world due to the performance of its economy.

The increase in GDP in China is remarkable and confirms the reason for the start of commercial wars with the USA. The next graph shows the percentage change in GDP growth.

Figure 7

GDP Growth For China (Annual %)



As a matter of fact, CIC (China Investment Company), which is China's sovereign fund; China, which was established to manage the said foreign exchange reserves, preferred to use its surplus funds through this fund instead of low-interest treasury bills.

Particularly with its partnerships in Wall-Street brokerage houses such as Morgan Stanley, Black Stone and Bear Stearns, it has become able to compete with the largest investment banks in America. With these developments, China, a country dominated by public ownership,

The concern that it may act for geo-political purposes beyond financial purposes in its investments and interfere with the sovereignty areas of the target countries has begun to be voiced in the world. In the face of this discussion, it is seen that China prefers passive share purchases, which do not have the right to participate in the management and do not aim to seize control, as a strategy to prevent the threat perception in question in order not to encounter obstacles in its investments in the world financial markets. In terms of financial markets, it can be said that China's financial system has historically been a banking-based system based with public ownership, and commercial public banks account for half of the banking sector assets. In terms of capital markets, China is quite behind the world countries. Two stock exchanges operate in the country, namely the Shanghai and Shenzhen stock exchanges, which were established in 1990. Most of the listed companies are State-Owned Enterprise SOEs, which negatively affects the depth and liquidity of the stock markets. There is a restriction for foreign investors to have a maximum of 10% share in domestic companies in the stock exchanges. Different categories of shares are traded on the Chinese stock exchanges, named in alphabetical letters: A- Shares issued in Chinese currency (Yuan/Renminbi) for domestic investors, B- Currency for foreign investors (USD in Shanghai stock exchange, Shenzhen Stocks issued in Hong Kong Dollars, P- 100% shares of private sector companies, H- Shares issued on the Hong Kong stock exchange, Q- Shares issued on the Singapore stock exchange, N- Shares issued on the New York stock exchange, L- Shares issued on the London stock exchange

The bond market, on the other hand, lags behind the stock market, mainly government bonds rather than private sector bonds. Private sector companies, especially those listed on the Hong Kong stock exchange, generally prefer to issue bonds abroad.

There are three main regulatory bodies in the Chinese financial market, all of which were established after 2000: the China Banking Regulatory Board, the China Securities Regulatory

Board, and the China Insurance Regulatory Board. These three institutions observe their fields of activity.

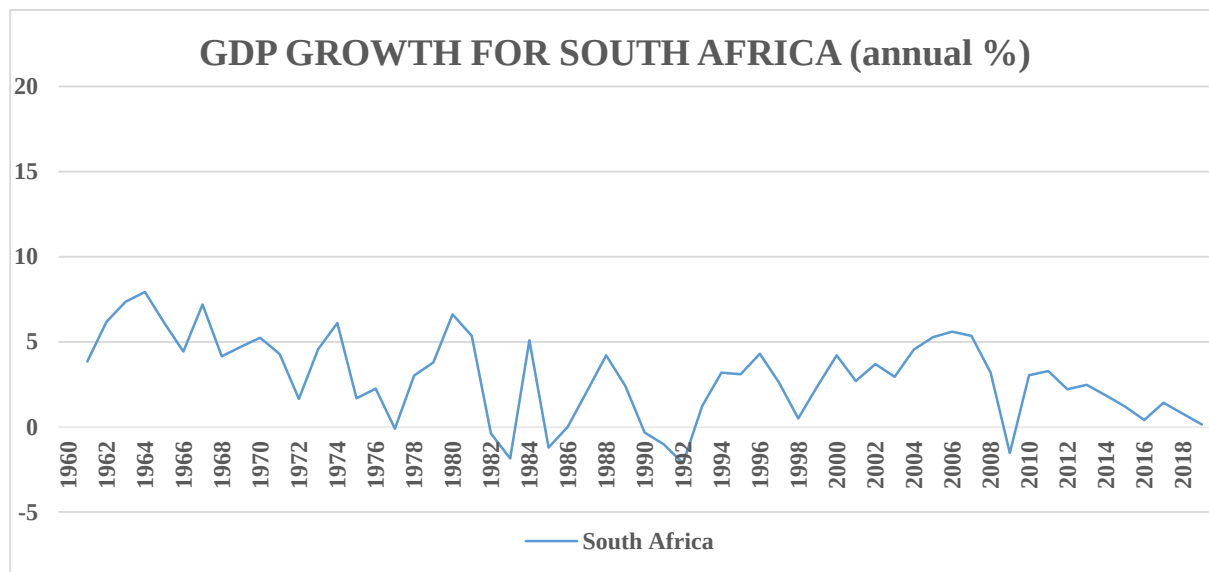
However, the security and orderly functioning of the financial system is the responsibility of the Bank of China. The decisions of each institution are subject to the approval of the State Council, which takes into account the political concerns of the communist party leadership. In terms of the financial system, the process of reducing public sovereignty in the system is one of the most important topics of discussion for China in the future.

1.6.5. South Africa

South Africa has 1.220.000 km² surface area and 58.558.000 people are considered. Imports rate is 29,4 % of the world's imports. Export's rate is 29,85 % of the exports (Worldbank, 2021).

In 1994, regime was changed and ended apartheid in South Africa. Main source of income is mining. Despite South Africa has a 2nd largest economy in Sub-Saharan Africa area (Worldbank, 2021), income inequality and high unemployment still continue. With the world's largest free trade area and a market of 1.2 billion people, the continent is using the potential of its resources and people to create an entirely new path of development (Worldbank, 2021).

There is a stock exchange in South Africa which is named Johannesburg stock exchange. Johannesburg stock exchange is the biggest stock market in Sub-Saharan Area.

Figure 8*GDP Growth For South Africa (Annual %)*

1.7. Leasing in Brics Countries

In recent years, emerging economies attract attention in world economies. Emerging markets financial and economic development have received a huge attention by researchers, academicians, and policy makers (Samargandia, Kutan, Sohag, & Alqahtani, 2020; Guru & Yadav, 2019).

According to White Clarke Global (WCG) Leasing Report 2020 sees that the top 50 countries increased their new business volume by 0.33%, which rose from \$ 1,282.73 billion in 2017 to \$ 1,287.01 billion in 2018. This performance maintains the noteworthy growth of 16.6% in 2017 and 9.4% in 2016. The report demonstrates that the global leasing industry has grown 131% in the past nine years. Three regions, North America, Europe and Asia, account for more than 95% of the total world volume. BRICS countries raise using of lease both annual volume and percentage growth between the years 2017 and 2018. Annual volume of Brazil is 2,69 US \$ bn, percentage growth is 22,90 between 2017 and 2018. Russia has 20,59 annual volume US \$ bn, 20,71 percentage growth between 2017 and 2018. Annual volume of India is lowest score in BRICS countries with 1,58 US \$ bn but percentage growth is the highest in BRICS countries

with 60,21 between 2017 and 2018. China has the top annual volume in BRICS countries with 254,42 US \$ bn but has lowest percentage growth in BRICS countries with 1,27 between 2017 and 2018. South Africa has 3,51 US \$ bn annual volume, 12,86 percentage growth between 2017 and 2018 (White Clarke Group, 2020).

CHAPTER 2: LITERATURE REVIEW

2.1. Theories and Literature Review

Expectation of finance theories suggest that debt and leasing are substitute but empirical studies show that it is an ambiguity. The relation between financial debt and financial leasing is researched by using firm level panel data which is listed Istanbul stock exchange (BIST) in Turkey. Literature mostly emphasize to clarify the relation on two theories: trade-off theory (Ambrose, Emmerling, Huang, & Yildirim, 2019; Cosci, Guida, & Meliciani, 2015; Beattie, Goodacre, & Thomson, 2000; Graham, Lemmon, & Schallheim, 1998; Yan, 2006) and pecking order theory (Mehran, Taggart, & Yermack, 1999; Eisfeldt & Rampini, 2009; Krishnan & Moyer, 1994). Trade-off theory (Myers, 1984) defends leasing and debt is substitute on the contrary pecking order theory (Baskin, 1989) suggest that there is complementary relation between them. Pecking order theory is a semi-strong efficient market theory which firms' investments will be based on priority order such as firstly domestic finance; secondly, debt issuance by bond issuance, lastly share issuance. In contrast to the pecking order theory of capital structure, the trade-off theory advocates that companies should make more external borrowing to take advantage of the debt tax shield (Kraus & Litzenberger, 1973).

If not so much in the literature, is associated with the contracting theory (Harris & Raviv, 1992). Contracting theory propose that contracting cost is determined by firm specifics such as debt level, firm market value, risk of investments etc.

Moreover, asymmetric information theory is mentioned in literature. Asymmetric information theory defends that if one of buyer and seller have more information about relevant product in sale interview, there is an information asymmetry in this situation (Akerlof, 1970).

In literature, studies of (Krishnan & Moyer, 1994; Yan, Leasin and Debt Financing: Substitutes or Complements?, 2006; Deloof & Verschueren, Note: Are Leases and Debt Substitutes? Evidence from Belgian Firms, 1999; Beattie, Goodacre, & Thomson, Operating Leases and the Assesment of Lease-Debt Substitutability, 2000; Deloof, Lagaert, & Verschueren, Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs, 2007; Eisfeldt & Rampini, 2009; Singh, 2013; Lin, Wang, Chou, & Chueh, 2013; Neuberger & Rathke-Doppner, 2013; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015) (Munir, Kok, Teplova, & Li, 2017), (Zhang, Zhai, & Sun, 2019) analyzed the relationship between lease propensity and debt and had reached the result of substitute relation. In the contrast, (Ang & Peterson, 1984; Adams & Hardwick, 1998; Lasfer & Levis, The determinants of the leasing decision of small and large companies, 1998; Mehran, Taggart, & Yermack, 1999; Koh & Jang, 2009; Devos & Rahman, 2014; Lim, Mann, & Mihov, 2017; Giner & Pardo, 2017; Ambrose, Emmerling, Huang, & Yildirim, 2019) found that there is a complementary relation between leasing and debt. In addition to these studies, there are also studies that have mixed conclusions such as (Adadeji & Stapleton, 1996; Upneja & Dalbor, 1999; Schallheim, Wells, & Whitby, 2013).

Studies that work on the effect of substitution will be discussed in the below paragraph. (Krishnan & Moyer, 1994) examined the substitution relationship between leasing propensity and debt in the context of risk of bankruptcy cost in their study. While doing this examination, they controlled the retained earnings, growth rates, coverage ratio and operating risk using the method of logistic regression and ordinary least squares OLS. At the end of their study, they

reached the conclusion that leasing has been shown to involve lower bankruptcy costs than borrowing. (Adadeji & Stapleton, 1996) explores the relationship between lease and debt in terms of taxable capacity. Use of leasing is affected by taxable capacity, negatively. Authors got the substitution result for lease and debt relation. Also, they reached the result of inadequate access to the debt capital markets affect the lease and debt selection for the firms. Studies of (Deloof & Verschueren, 1999) and (Deloof, Lagaert, & Verschueren, 2007) investigated the relationship between lease and debt in the context of substitution or complementary relation. First study of (Deloof & Verschueren, 1999) explored the leasing and different debt categories for Belgium firms. Results indicated that intra-group debt and long-term bank debt are substitutes for lease financing but there is no substitution. On the other side, study of (Deloof, Lagaert, & Verschueren, 2007) probed the relationship between lease and debt for Belgium small and medium enterprises SMEs firms. They found the substitution relationship. Namely, more debt is associated with less leases. (Beattie, Goodacre, & Thomson, 2000) use the comparing operational lease data and financial lease data to measure the level of substitution by using comprehensive measure and partial measure. They found that the relation is based on partial substitution effect.

Table 1 Literature Review About Lease And Debt

Author/Year	Financial Lease or Operating Lease	Country	Substitute or Complement	Method	Sample Period
(Ang & Peterson, 1984)	operating lease	US	Complement	Tobit	1976-1981 Annual data
(Krishnan & Moyer, 1994)	financial lease	US	Substitute	Logit	1984-1986 Annual data
(Adadeji & Stapleton, 1996)	financial lease	UK	Mix	Tobit, OLS	1990-1992 Annual data
(Adams & Hardwick, 1998)	operating and financial Lease	UK	Complement	OLS	1994 One-year Annual data
(Lasfer & Levis, 1998)	operating lease	UK	Complement	Univariate Regression, Logit	1982–1996 Annual data
(Upneja & Dalbor, 1999)	operating and financial Lease	US	Mix	OLS	1981-1992 Annual data
(Deloof & Verschuere, 1999)	financial leasing	Belgium	Substitute	Panel Tobit	1992-1994 Annual data
(Mehran, Taggart, & Yermack, 1999)	operating and financial Lease	US	Complement	Tobit, OLS	1986-1991 Annual data
(Beattie, Goodacre, & Thomson, 2000)	operating and financial Lease	UK	Substitute	Tobit, OLS	1990-1994 Annual data
(Yan, 2006)	operating lease	US	Substitute	GMM	1983-1997 Annual data
(Deloof, Lagaert, & Verschuere, 2007)	financial lease	Belgium	Substitute	Panel Tobit, OLS	1995-1999 Annual data
(Eisfeldt & Rampini, 2009)	operating lease	US	Substitute	Panel OLS	1992 One-year Annual data
(Koh & Jang, 2009)	operating lease	US	Complement	OLS	1995-2004 Annual data
(Singh, 2013)	operating and financial Lease	US	Substitute	Tobit, OLS	2006-2008 Annual data
(Lin, Wang, Chou, & Chueh, 2013)	operating and financial Lease	US	Substitute	Panel Tobit, OLS	1991-2005 Annual data
(Schallheim, Wells, & Whitby, 2013)	sales and lease back	US	Mix	OLS	1980-2011 Annual data
(Neuberger & Rathke-Döppner, 2013)	contracts	Germany	Substitute	Tobit	1998 One-year Annual data
(Devos & Rahman, 2014)	operating and financial Lease	US	Complement	OLS	1980-2011 Annual data

(Cosci, Guida, & Meliciani, 2015)	financial leasing	Italy	Substitute	Probit, OLS	2006 One-year Quarterly data
(Bourjade, Huc, & Muller-Vibes, 2017)	operating lease	Worldwide	Complement	GMM	1996-2011 Annual data
(Munir, Kok, Teplova, & Li, 2017)	operating lease	China	Substitute	Threshold Regression	2009–2012 Annual data
(Lim, Mann, & Mihov, 2017)	operating lease	US	Complement	Ordered Logit	1995-2011 Annual data
(Giner & Pardo, 2017)	operating lease	Spain	Complement	Multivariate Regression	2010-2013 Annual data
(Ambrose, Emmerling, Huang, & Yildirim, 2019)	operating lease	US	Complement	Bisection method	1996-2006 Annual data
(Zhang, Zhai, & Sun, 2019)	financial lease	40 Countries Worldwide	Substitute	Threshold Regression	2006-2016 Annual data

(Yan, 2006) investigates the relation between debt and leasing by using as distinct from previous studies in three aspects: by using joint financing cost function, generalized method of moment (GMM), the impact of asymmetric information, agency costs and taxes. In the consequences, outputs show that leasing and debt are substitute. (Eisfeldt & Rampini, 2009) studied on the financing role of leasing and secured lending. Leasing has agency cost because of separation of ownership and control. Moreover, more financially constraint firms prefer to use lease than less financially constraint firms in the context of increasing debt capacity. Some studies in literature investigated the relationship between lease and debt in the context of specific sector analyses such as (Singh, 2013). (Singh, 2013) determined the relationship between lease and debt for the restaurant and retailed industry. This study reached substitute relation about lease and debt for the firms from the restaurant and retailed industry. Also, growth opportunity and firm size is important for this study. (Lin, Wang, Chou, & Chueh, 2013) interpreted that the question of lease and debt has substitute or complement relation in the context of financially constrained situation for firms. They found that the more financially constrained firms tend to use more lease than less financially constrained firms. (Neuberger & Rathke-Doppner, 2013) studied on leasing by small enterprises with using internal data of leasing firms in Germany. Although young and small firms are more financially constrained, they prone to use more leasing than others because of increasing their debt capacities. Moreover, they investigated contract and firm-specific characteristics, demographic, and socio-economic characteristics of entrepreneurs. Older and higher qualified entrepreneurs prefer to use more leasing than young and non-educated ones. Female and nonmarried entrepreneurs of young companies use leasing more, wherefore they want to increase firms' debt capacities. This study and results are very important at aging populations such as Germany for their growth in the future. (Cosci, Guida, & Meliciani, 2015) aimed at studying on credit constrained and leasing propensity for Italian firms. They concluded that leasing supported to maintain the

capital for the credit constrained firms. (Munir, Kok, Teplova, & Li, 2017) investigated the relationship between lease and debt in terms of the impact of CEO power for Chinese small and medium entrepreneurs (SMEs) using threshold model. They arranged two model both debt and lease decision with threshold models and reached the results that there are threshold effects in the CEO power-debt relationship and CEO power-operating lease relationship. Especially, firms lease less when CEO power index above a certain threshold level. Furthermore, authors found that firm managers can manipulate capital structure to pursue their interests. (Zhang, Zhai, & Sun, 2019) handled the relationship between lease and debt financing in terms of economic growth in global markets. They examine the relationship between GDP and leasing with respect to macroeconomic indicator. Study covers 40 countries between the years 2006 and 2016 to examine the effect of financial leasing levels on the relationship between bank borrowing and economic growth. According to the panel threshold model results, financial leasing level can provide information about the relationship between bank borrowing and growth. They emphasize that in the case of high levels of leasing, the impact of the increase in bank loans on economic growth cannot be mentioned. They provided three contributions in literature. Firstly, they found that there exists a threshold effect for financial leasing on the relationship between bank loans and economic growth. Secondly, bank loans significantly support economic growth at the medium financial leasing level. Thirdly, bank loans support economic growth insignificantly at the level of high financial leasing.

Studies that work on the effect of complementary will be discussed in the below paragraph. Study of (Ang & Peterson, 1984) is one of the first study which investigated the relationship between lease and debt in the literature. Results of this study is a first in literature in terms of being complementary relationship between lease and debt, too. On the contrary, consensus of standard finance theory, they showed that increasing of lease use increases the debt use. (Adams & Hardwick, 1998) try to understand the determinants of leasing decision in

United Kingdom listed firms. They investigated the determinants in terms of four firm-specific characteristics such as leverage, company size, ownership structure and investment opportunities. They found that ownership structure and leverage have a positive relationship with corporate leasing decision. Company size and investment opportunity set have a weak and insignificant relationship with corporate leasing decision, respectively. (Lasfer & Levis, 1998) studied on the determinants of leasing decision of small and large firms in United Kingdom listed and non-listed firms. Leased firms are more tax losses, high fixed capital investment, high debt to equity ratio. They separated the research in two sub-sample such as large and small firms. Leasing is associated with profitability, leverage and taxation positively correlated for large companies. On the other side, small firms are associated with only growth opportunities. In addition, they reached the result that smaller firms with high Tobin q and less profitable are more likely to use leasing. (Mehran, Taggart, & Yermack, 1999) investigated CEO ownership effect on the decision of leasing or debt financing. CEO ownership is related positively with decision of leasing and debt financing. Namely, CEO with large ownership stakes engage in more leasing. (Koh & Jang, 2009) studied on the determinants of the operating lease in the hotel industry. They reached that hotel firms with less internal funds and/or with higher debt ratios are more likely to use operating lease. Moreover, Koh and Jang (2009) got the result that hotel firms with less financially distressed are more likely use operating lease than more financially distressed firms. While firm size increases, operating lease decreases. The growth opportunity of hotel firms is insignificant in the result. (Devos & Rahman, 2014) examine the effect of companies' location on the use of leasing. Rural firms tend to use less lease than urban firms. Furthermore, firms with higher debt capacity lease less, and firms faced with more financial constraints lease more. (Lim, Mann, & Mihov, 2017) examined the relationship between lease and debt in terms of increasing of credit capacity with operating lease use. To do while, they investigated the impact of credit rating and borrowing costs on operating lease or debt uses.

They found that operating lease use is less sensitive than debt uses for firms which is financially constraint and have limited ability to use tax shield. (Giner & Pardo, 2017) investigated the why firms tend to use operating lease and how change of accounting rules impact the use of operating lease. Choosing of operating leasing is affected by firm size, firm's industry. Also, firms which tend to violate leasing covenants use operating lease more. Changes of accounting rules is affected firm's borrowing system. (Ambrose, Emmerling, Huang, & Yildirim, 2019) studied on the relationship between leases and debt in the context of substitutiary and complementary. Literature suggests that lease and debt have no impact on firms' value, but authors claim that firm's value can be affected by counterparty credit risk.

As well as studies which are about substitution and complementarity, there are studies which is concluded both substitution and complementary relationship between lease and debt such as mixed results. For instance, (Upneja & Dalbor, 1999; Schallheim, Wells, & Whitby, 2013) reached mix relationship between lease and debt. (Upneja & Dalbor, 1999) examined the tax and lease relationship. They studied on two different tax measurement to get real relationship between lease and tax such as after financing and before financing tax rates. If after financing tax rates are used, they reached spurious negative results. On the other hand, if they before financing tax rates are used, the results are positive and significant. In this study, authors demonstrated that it could give incorrect results for the different measurement of tax rates. Furthermore, they reached both substitution and complementary relationship between lease and debt. (Schallheim, Wells, & Whitby, 2013) separated the sample into two groups. One of them is given substitution result, other of them is complementary result. They reached a significant negative relation between leasing and the firm's size, marginal tax rate, and z-score, consistent with "complementary" theories. Furthermore, they reached a positive and significant relation between leasing, the marginal tax rate, and changes in cash with "substitution" theories.

As can be seen in the table 2 below, the direction and significance of the variables in some studies are like this.



Table 2 Results About Lease And Debt

Author/Year	Dependent Variable(s)	Independent Variables
(Ang & Peterson, 1984)	LR	DR**(+) , LIQ, OL**(-) , SV, PE, SIZE, RET**(-)
(Krishnan & Moyer, 1994)	LR	ASSETGROW**(+) , RETEARN*(-) , EBITCOVR***(-) , EBIT/TA*(+) , LDA**(-) , EBITVAR, MBRATIO
(Adadeji & Stapleton, 1996)	LR	DR, PE, LQ, SIZE, TR
(Adams & Hardwick, 1998)	LR	LEV*(+) , SIZE*(-) , OWN*(+) , IOS*(-)
(Lasfer & Levis, 1998)	LR	TAX/PBT, TAX rec/TA, ACTR/ME, Pr ACTR/ME, ACTWO/ME, AddOFTA/TA*(+) , R&D/Sales, Sales G, q, LTD/CE, EPS, ln (TA)*(+) , ln(Sales)*(+) , ln(ME)
(Deloof & Verschueren, 1999)	LR	LT nonleasing debt, Ltfinancial debt banks**(-) , LT financial debt other loans***(-) , other LT financial debt, LT trade debt, other LT debt***(-) , profitability, variability, size**(-) , growth, current assets*(-) , fixed financial assets
(Mehran, Taggart, & Yermack, 1999)	LR	fraction of shares held by CEO*(+) , fraction of shares held by CEOSquared**(-) , log(sales)**(-) , log(sales)squared**(+)
(Beattie, Goodacre, & Thomson, 2000)	LR	DR, PE, LQ, ln(SZ)***(-) , TR, PROF, TAGROW, FAPROP
(Yan, 2006)	LR, DR	Long-term debt ratio***(-) , operating lease ratio**(-) , market to book ratio, employment, no-dividend, marginal tax rate, abnormal earnings, operating income, total assets, prop plant equip.
(Deloof, Lagaert, & Verschueren, 2007)	LR	Debt ratio*(-) , profitability*(-) , variability, log of total assets, growth, current assets*(-) , financial assets*(-)
(Eisfeldt & Rampini, 2009)	LR	log(assets)*(-) , dividends/assets***(-) , long-term debt/assets, cashflow/assets***(-) , q, cash/assets, average tax rate, marginal tax rate, small tax loss, large tax loss**(+), R&D/sales, firm age
(Koh & Jang, 2009)	LR	cash**(-) , ebidta*(-) , Retained earning***(-) , debt**(+) , q, Zscore*(+) , size*(-) , size squared*(+)
(Singh, 2013)	LR	DR*(+) , Growth opp*(-) , collateral*(+) , tax rate*(-) , Zscore, size*(+ , -)
(Lin, Wang, Chou, & Chueh, 2013)	LR	Debt*(-) , internal funds*(-) , growth*(-) , risk*(+) , collateral*(-) , size*8- , uniqueness *(-) , tax loss*(+)
(Schallheim, Wells, & Whitby, 2013)	LR	change in total debt*(-) , change in LT debt, change in ST debt, ln(total assets)*(-) , change in cash**(+), capital expenditure, marginal tax rate, interest coverage, z score***(-)

(Cosci, Guida, & Meliciani, 2015)	LR	debt/total assets***(-), taxes/EBIT, revenues(log)*(-), age*(-) exporting firms***(-), operating profit/total assets, current assets/short-term debt**(-), tangible assets/total assets**(-), net trade debt/total assets*(+)
(Munir, Kok, Teplova, & Li, 2017)	LR	power*(+, -), debt***(+,-), tax*(+), size**(-,+), profit, risk, growth, tang**(+), evol*(-,+)
(Giner & Pardo, 2017)	LR	lev*(+), roa (*(-), current ratio**(+) , findis, size**(+), tax, book to market
(Zhang, Zhai, & Sun, 2019)		dgdg*(+), loans*(+,-),labor, openness, invest*(+)

- 1) *, **, *** indicate that 1%, 5%, 10% significant levels, respectively.
- 2) The minus or plus signs in parentheses also indicate whether the result is positive or negative.
- 3) TAX PBT is the ratio of tax charge to profit before tax. TAX rec is tax carry forward. TA is total assets. ACTR is the reported recoverable advanced corporate tax. Pr ACTR is the ACT recoverable provision. ACTWO is the ACT written off. ME is year-end market value of equity. LTD is long-term debt. CE is capital employed. EPS is earnings per share. q is the ratio of market value to book value of equity. ln denotes the logarithm. SA is total sales. Add OFTA are the additions to other than property and building tangible fixed assets. Sales G is for sales growth.
- 4) LRP is the partial lease ratio for finance leases only, DR is the total debt ratio, PE is the price earnings ratio, LQ is the current ratio, ln (SZ) is the natural log of total assets, TR is the reported tax rate, PROF is return on capital employed, TAGROW is the geometric mean growth in total assets over 3 years and FAPROP is the proportion of fixed to total assets.
- 5) dgdg annual growth rate of real GDP per capita in constant 2010 US\$
leasing percentage of leasing volume to GDP
loans percentage of outstanding bank loans to GDP
labor annual growth rate of the labor force, which comprises people aged 15 and older who supply labor for the production of goods and services during a specified period
openness log of openness, where openness is measured as the share of exports plus imports in the GDP
invest annual growth rate of gross capital formation

2.2. Research Questions

In this study, the same research questions will be tested for both samples of Borsa Istanbul and Brics countries listed companies. Results will be discussed at the chapters fifth and seventh, respectively.

The main research subject of this study is to examine the relationship between leasing and debt. In order to obtain more robust results, other economic and financial factors that we think will affect the relationship between leasing and debt have been examined as a sub-research question and reported in the relevant chapters.

2.2.1. Main Research Question: Lease and Debt Relation

The most important question is about whether leasing and debt are substitute or complement in both BIST and BRICS countries public firms. In literature, traditional finance theory said that debt and finance lease are substitutes. There are some supporting empirical researches about substitution as (Krishnan & Moyer, 1994; Yan, Leasin and Debt Financing: Substitutes or Complements?, 2006; Deloof & Verschueren, Note: Are Leases and Debt Substitutes? Evidence from Belgian Firms, 1999; Beattie, Goodacre, & Thomson, Operating leases and the assessment of lease±debt substitutability, 2000; Yan, Leasin and Debt Financing: Substitutes or Complements?, 2006; Eisfeldt & Rampini, 2009; Singh, 2013; Lin, Wang, Chou, & Chueh, 2013; Neuberger & Rathke-Doppner, 2013; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015); (Munir, Kok, Teplova, & Li, 2017; Zhang, Zhai, & Sun, Does the level of financial leasing matter in the impact of bank lending on economic growth: Evidence from the global market (2006–2016), 2019). On the contrary, some studies reached controversial results against studies which are defended on leasing and debt substitution. Studies which found the complementary relationship between lease and debt is such as (Ang & Peterson, 1984; Adams & Hardwick,

1998; Lasfer & Levis, The determinants of the leasing decision of small and large companies, 1998; Mehran, Taggart, & Yermack, 1999; Koh & Jang, 2009; Devos & Rahman, 2014; Lim, Mann, & Mihov, 2017; Giner & Pardo, 2017; Ambrose, Emmerling, Huang, & Yildirim, 2019) have found substitution relation between leasing and debt. Furthermore; (Adadeji & Stapleton, 1996; Upneja & Dalbor, 1999; Schallheim, Wells, & Whitby, 2013) have found mixed results as both substitution effect and complementary effect. Hence, research question 1 is evolved according to these findings.

- ***Research Question 1: Is there a complementary or substitutory relationship between lease and debt for Borsa Istanbul BIST and BRICS countries listed companies?***

Expectation about the relationship between lease and debt is unknown. I reached the correct results with empirical analysis. If there is a substitution relationship between lease and debt the coefficient of the variable of financial debt $DEBT_{it}$ is the negative sign $\beta_1 < 0$. On the other hand, if there is a complementary relationship between lease and debt the coefficient of the variable of financial debt $DEBT_{it}$ is the positive sign $\beta_1 > 0$.

In this study, I used only financial lease data to understand the relationship between debt and lease such the studies (Adedeji & Stapleton, 1996; Krishnan & Moyer, 1994; Deloof & Verschueren, Note: Are Leases and Debt Substitutes? Evidence from Belgian Firms, 1999; Deloof, Lagaert, & Verschueren, Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs, 2007; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015; Zhang, Zhai, & Sun, Does the level of financial leasing matter in the impact of bank lending on economic growth: Evidence from the global market (2006–2016), 2019).

2.2.2. Sub-Research Questions

As I mentioned before, in the light of the literature in order to obtain more robust results, our sub-research question is as follows.

- ***Research Question 2: How do the following factors affect the complementary and substitutory relationship between lease and debt for Borsa Istanbul BIST and BRICS countries listed companies: taxes, size, collateral, liquidity, profitability, retained earnings, growth opportunity, firm IPO age, bankruptcy risk, exchange rates and interest rates?***

2.2.2.1. Tax effect

One of sub-research question is investigated whether tax rate changes have affected leasing selection or not. Tax rate effect is the one of the most crucial research questions for the firm capital structure decisions which was studied by (Adedeji & Stapleton, 1996). They researched the direct effect of tax charge on leasing or debt selection process, so they found that tax charge affects using lease negatively. They studied on U.S data between the years 1990 and 1992 testing with heteroscedastic tobit model and ordinary least square OLS methods. They use liquidity, price earnings ratio, size tax rate as control variables. In conclusion, they proposed that the shortage of taxable capacity and the inadequate access debts are the most crucial reason to use of leasing. While (Adadeji & Stapleton, 1996; Singh, 2013) propose that tax affected the significantly negative impact on leasing decision ; (Cosci, Guida, & Meliciani, 2015; Landry, Fortin, & Callimaci, 2013) propose significantly positive relationship between tax charge and leasing decision. In addition, (Beattie, Goodacre, & Thomson, 2000; Schallheim, Wells, & Whitby, 2013) found insignificant relationship between tax and lease decision. In general, they propose positively significant relation for some subsample. (Mehran, Taggart, & Yermack, 1999) suggests both positive and negative significant relation for different methods and different dependent variable definitions. (Munir, Kok, Teplova, & Li, 2017; Lasfer & Levis,

The determinants of the leasing decision of small and large companies, 1998; Giner & Pardo, 2017; Sharpe & Nguyen, 1995; Yan, Leasing and Debt Financing: Substitutes or Complements?, 2006) present insignificant relationship between tax charge and leasing decision. In details, while (Adadeji & Stapleton, 1996) is examining the relationship between debt and lease, they control the factors such that tax, expected growth (price earnings ratio), size, liquidity, industrial effects. On the other hand, while (Cosci, Guida, & Meliciani, 2015; Landry, Fortin, & Callimaci, 2013) are studying on the relationship between lease and debt, they control tax effect with some control variables such as firm age, revenues, growth of total assets, exporting firms dummies, industrial dummies, operating profit, liquidity, tangible assets, net trade debt, location and cash flow coverage. (Beattie, Goodacre, & Thomson, 2000; Schallheim, Wells, & Whitby, 2013) found insignificant relationship between tax and lease with using control variables such as growth opportunity, liquidity, size, profitability, growth, fixed effect proportion as collateral, change in cash, capital expenditure, interest coverage, z score and industrial effects on leasing and debt selection process. Therefore, research question is proposed accordingly, as follows.

- ***Sub-Research Question: What is the effect of taxes on the use of leasing for Borsa Istanbul BIST and BRICS countries listed companies?***

In addition, in Turkey, between 2007 and 2012 value-added tax rate (VAT) is changed by the governmental regulation from the %1 to %18 (Official Gazzete of Republic of Turkey, 2007). At this aspect, we analyze that this regulation affects percentage of use of leasing with year-dummy variable. Additionally, change of VAT rates are investigated as additional research question unlike the study of Brics countries.

2.2.2.2. Size effect

Another sub-research question is designed to understand whether firm size determine the preference of borrowing type such as lease or debt or not. (Neuberger & Rathke-Doppner, 2013) have an evidence that small and young companies are mostly use of lease because of

increasing their debt capacity. (Neuberger & Rathke-Doppner, 2013) defenses this research question that small and medium firms are more likely constraint than large-sized firms. Moreover, constraint firms have difficulties to reach bank lending. According to pecking order theory, firms tend to use firstly internal funds and equity than external funds like bank credits as debt (Neuberger & Rathke-Doppner, 2013). But low-sized firms like small-sized firms refrain to get bank debt firstly because of difficulty of reaching bank debt. Instead, small companies tend to lean towards leasing. (Deloof, Lagaert, & Verschueren, 2007) declare that small and medium enterprises (SME) tend to use lease as substitute for debt. In the perspective of (Deloof, Lagaert, & Verschueren, 2007); more use of leases is associated with less non-lease financing such as debt for SMEs. Namely, SMEs have higher lease usage than large firms wherefore asymmetric information and pecking order theory (Sharpe & Nguyen, 1995; Krishnan & Moyer, 1994; Deloof, Lagaert, & Verschueren, Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs, 2007; Myers & Majluf, Corporate financing and investment decisions when firms have information that investors do not have, 1984; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015) finds the results that leasing decreases with firm size. (Sharpe & Nguyen, 1995) explain size as a proxy that propose flexible investment opportunity and support this idea with empirical results that small size firms use leasing than large size firms. In this context, it can be possible that there exists a relationship between company size and debt capacity. Studies show that small and start-up firms are likely to use leasing to increase debt capacity. As a result, low sized firms are more likely to practice leasing in an opportunistic manner, so research question is shaped accordingly.

- ***Sub-Research Question: Does firm size effect the use of lease for Borsa Istanbul BIST and BRICS countries listed companies?***

2.2.2.3. Collateral

The term collateral refers to an asset that a lender accepts as indemnity for a loan. Collateral may be in the form of real estate or other assets due to purpose of the loan. Collateral is a way of hedging the risk of bankruptcy for the lender. That is, if the borrower goes bankrupt and cannot pay, the lender can confiscate the collateral and sell it to compensate for some or all of its losses. In this situation, firm's owner prefers to use their fixed assets as collaterals to get loan from bank or other institutions. Collateral provides to reach loan easier than non-collateral case for investors.

In lease and debt studies, (Lasfer & Levis, 1998; Deloof & Verschueren, 1999; Beattie, Goodacre, & Thomson, 2000; Yan, 2006; Singh, 2013; Lin, Wang, Chou, & Chueh, 2013; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015) added as a control variable in their lease and debt models to understand the investor selection under existing collateral. (Lasfer & Levis, 1998; Singh, 2013; Munir, Kok, Teplova, & Li, 2017) found that there is significant and positive relationship between lease propensity and fixed asset proportion. (Lin, Wang, Chou, & Chueh, 2013; Cosci, Guida, & Meliciani, 2015) found that there is significant and negative relationship between lease propensity and fixed asset proportion. (Deloof & Verschueren, 1999; Beattie, Goodacre, & Thomson, 2000; Yan, 2006) reached insignificant result between lease propensity and collateral. As a result, research question is following.

- ***Sub-Research Question: Does collateral proportion effect the use of lease for Borsa Istanbul BIST and BRICS countries listed companies?***

2.2.2.4. Liquidity

Liquidity is the ability of an asset or security to be liquidated quickly without affecting the market price. In this presence, studies (Ang & Peterson, 1984; Adedeji & Stapleton, 1996; Deloof & Verschueren, 1999; Beattie, Goodacre, & Thomson, 2000; Deloof, Lagaert, &

Verschueren, 2007; Eisfeldt & Rampini, 2009) investigate whether the liquidity situation is effective in the selection of leasing. Namely, studies try to understand that more liquid firms tend to use lease or more liquid firms tend to use debt.

(Ang & Peterson, 1984; Adadeji & Stapleton, 1996; Beattie, Goodacre, & Thomson, 2000) found that there is an insignificant relationship between lease and liquidity. (Deloof & Verschueren, 1999; Deloof, Lagaert, & Verschueren, 2007; Eisfeldt & Rampini, 2009; Koh & Jang, 2009; Cosci, Guida, & Meliciani, 2015) found that there is significant and negative relationship between lease and liquidity. (Giner & Pardo, 2017) found that there is significant and positive relationship between lease and liquidity. As a result, research question is following.

- ***Sub-Research Question: Does liquidity effect the use of lease for Borsa Istanbul BIST and BRICS countries listed companies?***

2.2.2.5. Profitability

Profitability ratios can be compared to efficiency ratios, which assess how well a company uses its assets internally to generate revenue (as opposed to post-cost profits). Profitability ratio is an indicator of firms financially wellness situation. Researchers such as (Ang & Peterson, 1984; Lasfer & Levis, 1998; Deloof & Verschueren, 1999; Deloof, Lagaert, & Verschueren, 2007; Cosci, Guida, & Meliciani, 2015; Munir, Kok, Teplova, & Li, 2017) added the variable of profitability in their research to understand tendency of high / low level profitable firms to lease or lend debt.

(Ang & Peterson, 1984; Lasfer & Levis, The determinants of the leasing decision of small and large companies, 1998; Deloof, Lagaert, & Verschueren, Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs, 2007) found that there is negative and significant relationship between lease propensity and profitability level of firms. Less profitable firms are more likely to use leasing than buying the assets. (Deloof & Verschueren,

1999; Cosci, Guida, & Meliciani, 2015; Munir, Kok, Teplova, & Li, 2017) got insignificant result between lease and profitability level. In a conclusion, research question is following.

- ***Sub-Research Question: Does profitability level of firms effect the use of lease for Borsa Istanbul companies BIST and BRICS countries listed?***

2.2.2.6. Growth opportunity

In literature, researchers use price earnings ratio as a proxy of growth opportunity. (Ang & Peterson, 1984; Krishnan & Moyer, 1994; Adadeji & Stapleton, 1996; Adams & Hardwick, 1998; Deloof & Verschueren, Note: Are Leases and Debt Substitutes? Evidence from Belgian Firms, 1999; Beattie, Goodacre, & Thomson, Operating leases and the assessment of lease±debt substitutability, 2000; Deloof, Lagaert, & Verschueren, Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs, 2007; Beattie, Goodacre, & Thomson, Operating leases and the assessment of lease±debt substitutability, 2000; Deloof, Lagaert, & Verschueren, Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs, 2007); (Koh & Jang, 2009; Singh, 2013; Lin, Wang, Chou, & Chueh, 2013; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015; Munir, Kok, Teplova, & Li, 2017) used the price earnings ratio as a proxy of growth opportunity variable. (Krishnan & Moyer, 1994) got the significant and positive relationship between lease propensity and growth opportunity. (Adams & Hardwick, 1998; Koh & Jang, 2009; Singh, 2013; Lin, Wang, Chou, & Chueh, 2013) got the significant and negative relationship between lease propensity and growth opportunity. (Ang & Peterson, 1984; Adadeji & Stapleton, 1996; Deloof & Verschueren, Note: Are Leases and Debt Substitutes? Evidence from Belgian Firms, 1999; Beattie, Goodacre, & Thomson, Operating leases and the assessment of lease±debt substitutability, 2000; Deloof, Lagaert, & Verschueren, Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs, 2007; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015;

Munir, Kok, Teplova, & Li, 2017) found an insignificant relationship between lease selection and growth opportunity. In a conclusion, research question is following.

- ***Sub-Research Question: Does growth opportunity of firms effect the use of lease for Borsa Istanbul companies BIST and BRICS countries listed?***

2.2.2.7. Firm age

In literature, firm age is used as proxy of financial constraints. Especially, young firms might want flexibility. Furthermore, firm age might denote a score which is measured by banks or creditors. Old firms have high score, and they reach loan easier than startup firms or young one. Because of firm age might be a denominator of getting easier loan, (Eisfeldt & Rampini, 2009; Neuberger & Rathke-Doppner, 2013; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015) used the variable of firm age in their research. (Eisfeldt & Rampini, 2009) found that there is no significant relationship between firm age and lease propensity. (Neuberger & Rathke-Doppner, 2013; Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015) found that there is negative and significant relationship between firm age and lease propensity. This means that old firms tend to use debt rather than lease. In a conclusion, research question is following.

- ***Sub-Research Question: Does age of firm effect the use of lease for Borsa Istanbul BIST and BRICS countries listed companies?***

2.2.2.8. Risk factors: bankruptcy risk, interest rate and exchange rate effect

Last research questions are about risk factors of companies. The financial situation of the companies affects the way they borrow. Firms that are financially distress are more difficult to access loans, while companies that are financially health are more comfortable in finding loans because their credit scores are high (Krishnan & Moyer, 1994). Borrowing interest and

exchange rate risk also affect the debt levels and patterns of firms. The situation of financially distress for firms may change all financial activities such as borrowing ways, investment opportunities or use of internal / external source. In that case, more financially distress firms tend to use more lease than borrowing from bank. In literature (Eisfeldt & Rampini, 2009; Sharpe & Nguyen, 1995) financially distress firms are associated by poor source which is defined reaching bank lending or low credit score. Namely, no bank wants to give credit to financially distress firms because of default risk. In the light of these statements, research question is arranged as follow.

- ***Sub-Research Question: Does bankruptcy risk effect the use of lease for Borsa Istanbul BIST and BRICS countries listed companies?***

In this study, one of the new and the first thing is the exploration the effect of interest rate on the relationship between debt and leasing selection. Due to borrowing interest rate change from creditor (bank) to creditor (bank), active bond interest rate which imitate the general trend of market, was used. There is no consensus in the literature about interest rate effect on lease\debt selection but (Adadeji & Stapleton, 1996) associates interest rate with (Munir, Kok, Teplova, & Li, 2017) mentioned about interest providing the tradeoff tax shield benefits of debt against the cost of financial distress based on static tradeoff theory.

- ***Sub-Research Question: Does change of interest rate effect the use of lease for Borsa Istanbul BIST and BRICS countries listed companies?***

In emerging economies such Turkey and BRICS countries, investors face to currency risk when firm managers want to invest or borrow. Fluctuation of exchange rate in Turkey is a fundamental problem for firms which want to invest or borrow. In recent years, Turkish Liras depreciate against the U.S Dollar. If firms invest or borrow with dollar currency, currency risk is occurred for firms. Leasing proposes a risk management with fixed lease payments against

fluctuations in money values and interest rates (Association of Financial Institutions, Association of Financial Institutions, 2020). Based on this proposition, I added a research question which is controlled the currency risk on lease decision.

- ***Sub-Research Question: Does change of value of currency effect the use of lease for Borsa Istanbul BIST and BRICS countries listed companies?***

CHAPTER 3: DATA AND METHODOLOGY

3.1. Data and Sample for Borsa Istanbul Public Firms

In this part, firm-level quarterly panel data which is publicly available stock firms listed at Borsa Istanbul Stock Exchange BIST are used.

Financials and insurance sectors are eliminated. Furthermore, firms have missing data, are eliminated. Ultimately, there are 62 quarterly time periods between the years 2004Q3 and 2019Q4 and 147 firms. Finally, there are 9114 firm-year level panel data¹. All data refer the year between 2004Q3 and 2019Q4. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network FINNET, EquityRT and Bloomberg database. Table 3 and table 4 shows descriptive statistics for the variables used in all regression analysis.

After looking at the raw data in general, I classified the sectors at Global Industry Classification Standard (GICS) developed by Morgan Stanley Capital International (MSCI) and Standard & Poor's (S&P) in 1999 (Global, 2018).

According to descriptive statistics at table 3 and table 4, there are 147 firms and 62 quarterly data in sample. Totally, 9114 firm-level data are included in this research.

¹ All firms' tickers used in this part are presented in the Appendix A for the years 2004Q3 and 2019Q4.

At table 3, lease ration mean value is 0.1047 and standard deviation is 0.2150. Debt ratio mean is 0,48, standard deviation is 0,25. Results are same as in these researches (Deloof & Verschueren, 1999; Adadeji & Stapleton, 1996; Deloof, Lagaert, & Verschueren, 2007; Giner & Pardo, 2017; Graham, Lemmon, & Schallheim, 1998; Krishnan & Moyer, 1994; Singh, 2013; Upneja & Dalbor, 1999; Schallheim, Wells, & Whitby, 2013); (Munir, Kok, Teplova, & Li, 2017; Lin, Wang, Chou, & Chueh, 2013)..

In table 4, I report to comprehensive descriptive studies about data. In 2004, firms use lease 0,04 in average and seven percent of firms in 2004 have more lease rate with respect to average. On the other hand, in 2019 firms use lease 0,30 in average and forty-three percent of firms in 2019 have more lease rate with respect to average. In 2004, firms use debt 0,41 in average and forty-six percent of firms in 2004 have more debt rate with respect to average. On the other hand, in 2019 firms use debt 0,56 in average and fifty-five percent of firms in 2019 have more lease rate with respect to average.

In table 5, Pearson correlation coefficients are presented for all variables. In Table 6, lease density by years is presented. Lease usage has increased in recent years.

Table 3 Descriptive Statistics for Borsa Istanbul Stock Exchange Listed Firms

Descriptive Statistics

Sample consists of 147 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 9114 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. Ln (MCAP) is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. . IPOAGE which is measured current year minus initial public offer IPO year. INTEREST The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Variable	Obs	Mean	Std. Dev.
# FIRMS	9114	74	42,4365
# PERIODS	9114	31,5	17,8965
LR	9114	0,1047	0,2150
DR	9114	0,4751	0,2460
LDR	9114	0,1294	0,1351
SDR	9114	0,3372	0,2027
Ln (MCAP)	9114	8,0315	0,7137
TANGIBLE	9114	0,291	0,2344
LQ	9114	2,8511	50,889
TAX	9114	-0,0941	28,2354
EBITDA/TA	9114	0,0976	0,1039
RETAINED/TA	9114	0,1371	0,1399
PE	9114	9,3348	32,0052
FINDIS	9114	3,7006	9,7417
IPOAGE	9114	18,3134	6,4649
USDTL	9114	2,4836	1,4518
INTEREST	9114	12,9319	4,8008

Table 5 Pearson Correlation Matrix for Borsa Istanbul Listed Firms

	DR	LDR	SDR	ln (MCAP)	TANGIBLE	LQ	TAX	EBITDA/TA	RETAINED/TA	PE	FINDIS	IPOAGE	INTEREST	USDTL
DR	1,0000													
LDR	0,5368	1,0000												
SDR	0,8163	-0,0041	1,0000											
ln (MCAP)	-0,0645	0,0737	-0,1349	1,0000										
TANGIBLE	-0,1046	0,0499	-0,1540	-0,0479	1,0000									
LQ	-0,0474	-0,0188	-0,0437	-0,0164	-0,0009	1,0000								
TAX	-0,0018	-0,0065	0,0016	0,0176	0,0068	-0,0009	1,0000							
EBITDA/TA	-0,1164	-0,0302	-0,1212	0,3065	0,0037	-0,0076	0,0172	1,0000						
RETAINED/TA	-0,3727	-0,1677	-0,3208	0,3381	-0,0423	-0,0012	0,0076	0,2178	1,0000					
PE	0,0068	0,0034	-0,0042	0,0176	-0,0035	0,0071	0,0011	0,0069	0,0052	1,0000				
FINDIS	-0,2722	-0,1592	-0,2134	0,0346	-0,0306	0,0574	0,0009	0,0783	0,0445	0,0159	1,0000			
IPOAGE	0,1408	0,1032	0,0882	0,1762	0,0020	-0,0223	0,0172	0,0828	0,1649	-0,0066	0,0242	1,0000		
INTEREST	0,0142	0,0058	0,0105	-0,1120	0,0890	0,0155	0,0069	0,1085	-0,0721	-0,0090	-0,0499	-0,1498	1,0000	
USDTL	0,1739	0,1314	0,0991	-0,0355	-0,0266	-0,0137	-0,0008	0,0839	0,0996	0,0012	-0,0381	0,5967	0,1768	1,0000

Table 6 Lease Density by Years

Year	Lease Density by Years
2004	0.075
2005	0.333
2006	0.374
2007	0.395
2008	0.129
2009	0.238
2010	0.170
2011	0.224
2012	0.224
2013	0.286
2014	0.272
2015	0.265
2016	0.259
2017	0.259
2018	0.279
2019	0.816

Lease density = number of firms that lease / 147 firms during the mentioned year.

3.2. Data and Sample for Brics Countries Public Firms

Sample consist of five countries Brazil, Russia, India, China, and South Africa stock market data. Totally, there are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years². The amount of data by country are as follows, countries Brazil (160 firms-level data), Russia (100 firms-level data), India (6370 firms-level data), China (760 firms-level data), and South Africa (210 firms-level data). All items calculated US dollar currency. Data are provided by Bloomberg and Equity RT.

At table 7, lease ration mean value is 0.0002 and standard deviation is 0.002. Debt ratio mean is 0,063, standard deviation is 0,22.

In table 8, I report to comprehensive descriptive studies about data. In 2009, firms use lease 0,0001 in average and three percent of firms in 2009 have more lease rate with respect

² All firms' tickers used in this part are presented in the Appendix B for the years 2009 and 2018.

Table 7 Descriptive Statistics for Brics Countries Listed Firms

Sample consist of five countries: Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years. LR is measured by book value of financial leases over total assets. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. log (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Variable	Obs	Mean	Std. Dev.
TICKERNUB	7600	380,5	219,4073
TIMENUMB	7600	5,5000	2,8725
LR	7600	0,0002	0,002
DR	7600	0,0629	0,2172
LDR	7600	0,1778	0,2422
SDR	7600	0,1566	0,3757
ln (MCAP)	7600	9,4739	1,0912
TANGIBLE	7600	0,3352	0,2113
LQ	7600	3,4951	40,7211
TAX	7600	-0,2152	3,8827
EBITDA/TA	7600	12355	61,2929
RETAINED/TA	7600	-0,0539	1,8327
PE	7600	16,5601	11,0571
FINDIS	7600	12,755	164,3219
IPOAGE	7600	9,5342	4,1264
INTEREST	7600	7,5192	1,4754
EXCRATE	7600	50,151	19,8513

[illegible][illegible]

Table 9 Pearson Correlation Matrix For Brics Countries Listed Firms

	DR	LDR	SDR	ln (MCAP)	TANGIBLE	LQ	TAX	EBITDA/TA	RETAINED/TA	PE	FINDIS	IPOAGE	INTEREST	EXCRATE
DR	1,0000													
LDR	0,0868	1,0000												
SDR	0,0852	0,1217	1,0000											
ln (MCAP)	-0,1524	-0,0176	-0,1253	1,0000										
TANGIBLE	0,0338	0,3128	0,0084	-0,0119	1,0000									
LQ	-0,0055	-0,0245	-0,0245	-0,0425	-0,0253	1,0000								
TAX	-0,0178	-0,0156	0,0050	0,0037	-0,0094	0,0006	1,0000							
EBITDA/TA	0,0056	0,0073	0,0029	0,0106	-0,0075	-0,0014	0,0002	1,0000						
RETAINED/TA	-0,0464	-0,3039	-0,3161	0,0932	-0,0124	0,0050	0,0035	0,0020	1,0000					
PE	-0,0001	0,0138	-0,0029	0,0129	0,0024	-0,0001	-0,0001	-0,0003	-0,0188	1,0000				
FINDIS	-0,0111	-0,0380	-0,0140	0,0750	-0,0206	-0,0040	-0,0031	-0,0012	0,0231	-0,0008	1,0000			
IPOAGE	-0,0343	-0,0630	0,1315	0,0315	0,0270	-0,0175	0,0051	0,0139	-0,0177	-0,0147	0,0461	1,0000		
INTEREST	0,0920	0,1495	-0,0063	-0,1002	0,1202	-0,0066	-0,0044	0,0124	-0,0500	0,0043	0,0107	0,1796	1,0000	
EXCRATE	-0,0550	0,0931	0,1155	-0,1242	0,1569	-0,0053	0,0034	0,0096	0,0294	-0,0048	0,0180	0,6172	0,4167	1,0000

to average. On the other hand, in 2018 firms use lease 0,0001 in average and seven percent of firms in 2018 have more lease rate with respect to average. In 2009, firms use debt 0,05 in average and twenty two percent of firms in 2009 have more debt rate with respect to average. On the other hand, in 2018 firms use debt 0,06 in average and twenty two percent of firms in 2018 have more lease rate with respect to average.

In table 9, Pearson correlation coefficients are presented for all variables. Financials and insurance sectors are eliminated because of different accounting procedures.

3.3. Dependent and Independent Variables

Dependent variable is leasing ratios for all models. In literature, most common measurement for Leasing Ratio (LR) is the book value of total financial leases as a share of total assets (Deloof, Lagaert, & Verschueren, 2007; Krishnan & Moyer, 1994; Adadeji & Stapleton, 1996). Financial leases are consisting of total financial lease as long term and short-term financial leases.

In this analysis, main aim is to evaluate the relationship between lease share and level of leverage. Since main dependent variable in this analysis is debt ratio. In literature, most common definition for Debt ratio (DR) is total debt minus total financial leases over total assets (Koh & Jang, 2009; Munir, Kok, Teplova, & Li, 2017; Cosci, Guida, & Meliciani, 2015). Alternative two measurements for debt ratio are such as long-term debt (LDR) and short-term debt (SDR) ratio. Long term debt ratio (LDR) is measured as long-term debt minus long term lease over total assets (Krishnan & Moyer, 1994; Deloof, Lagaert, & Verschueren, 2007; Eisfeldt & Rampini, 2009). Short-term debt ratio (SDR) is measured as short-term debt minus short-term lease over total assets.

Sometimes, we see that firms use debt to reduce tax payments and firms with high profit can have higher debt ratios (Deloof, Lagaert, & Verschueren, 2007). This inference is consistent with pecking order theory (Myers & Majluf, 1984)) which indicate that firms firstly use internal sources than external sources. Since high profit firms need less external financing as a result have a low debt ratio. Moreover, there is an informational asymmetry between managers and investors. Firms can try to overcome this problem by following a financial pecking order.

In this section, control variables are measured to get economically and financially robust results. First is Size ($\ln(\text{MCAP})$) variable which is indicated that logarithm of market capitalization. In literature, researchers are in a controversial about the issue of size. (Lasfer & Levis, 1998) specifies the purpose of use of firm size variable as another proxy variable for asset type. They claim that large, diversified firms are less prone to rely on leasing than smaller firms. On the contrary, (Jensen, 1986) suggests that agency problems are more likely to occur in large mature firms. With the inference made from research of (Jensen, 1986), it can be that large firms to lease more than smaller firms. The intend of this paper is to expand this literature by evaluating the leasing decision of small versus large companies. Although, I consider firm size as a measure of the extent to which firms have the ability to assign assets internally. Literature indicate that the determinants of the leasing decision are likely to be size dependent because of the differences in the financing opportunities available to small and large companies and in their potential agency costs. In article of (Yan, 2006) indicate that firm size is another proxy that can show the quality of outsiders' information, as a large firm faces less asymmetric information than a small firm.

Literature associates leasing propensity with firm's collateral magnitude. Firms which have more collateral reach loan easier than firms which have less collateral. In literature, common measurement of fixed asset proportion or collateral (TANGIBLE) is total net tangible fixed assets over total assets (Beattie, Goodacre, & Thomson, 2000; Cosci, Guida, & Meliciani, 2015; Munir, Kok, Teplova, & Li, 2017). Specifically, (Beattie, Goodacre, & Thomson, 2000) explains the collateral and lease propensity in their research. They claim that firms with assets that can be used as security may be likely to lend. (Munir, Kok, Teplova, & Li, 2017) clearly state in their study that firms more fixed assets are willing to use debt rather than lease.

Another control variable is liquidity (LQ) which is measured as current asset over current liability (Adadeji & Stapleton, 1996; Beattie, Goodacre, & Thomson, Operating Leases

and the Assessment of Lease-Debt Substitutability, 2000; Giner & Pardo, 2017; Adadeji & Stapleton, 1996) notices the relation between leasing propensity and liquidity of company because of shortage of liquidity may be a strong reason for desiring finance leases. Also, (Beattie, Goodacre, & Thomson, 2000) shows that liquid companies are more likely to deal with bank debt than lease.

In literature, the most mentioned relation is tax and lease propensity. Common measurement in literature for tax (TAX) is as effective tax rate. TAX is measured as tax charge over profit before tax (Adadeji & Stapleton, 1996; Lasfer & Levis, 1998; Beattie, Goodacre, & Thomson, 2000). (Adadeji & Stapleton, 1996; Lasfer & Levis, The determinants of the leasing decision of small and large companies, 1998; Beattie, Goodacre, & Thomson, Operating leases and the assessment of lease±debt substitutability, 2000) use tax variable to analyze the tax effect on the decision to lease rather than buy assets.

Other important control variable is profitability (EBITDA/TA)) which is defined as EBITDA over total assets (Krishnan & Moyer, 1994; Mehran, Taggart, & Yermack, 1999; Giner & Pardo, 2017).

Moreover, past profitability (RETAINED/TA) as a risk indicator and past performance which is defined as retained earnings over total assets (Krishnan & Moyer, 1994).

Growth Opportunity (PER) is measured as the price earnings ratio (Ang & Peterson, 1984; Adadeji & Stapleton, 1996; Adams & Hardwick, 1998; Beattie, Goodacre, & Thomson, Operating leases and the assessment of lease±debt substitutability, 2000). Price earnings ratio is measured market cap yearly average over net income yearly. Investors look at companies for annualized profits rather than quarter profits. Therefore, our net profit is priced on the basis of share prices that we saw annualized market value of the company. So, we made market value divided by annual net profit to find price earnings ratio.

Financial distress (FINDIS) is evaluated as multivariate Altman Z-score values (Zscore) (Krishnan & Moyer, 1994; Upneja & Dalbor, 1999; Koh & Jang, 2009; Giner & Pardo, 2017; Munir, Kok, Teplova, & Li, 2017). (Krishnan & Moyer, 1994) state that firms benefit from lease financing are expected to have lower Z-scores³, which indicates a higher probability of firm failure. (Upneja & Dalbor, 1999) propose that Z-scores (Altman E. , 1968), (Altman, Zhang, & Yen, 2007) which have higher score is indicative of the strength of the firm, are applied to measure the financial health of the firm. (Koh & Jang, 2009) claims that financially healthy firms have access to leasing companies in addition to debt and equity markets when funds are necessary. Thus, financially healthy firms may be less likely to use lease as compared to financially distressed firms. (Munir, Kok, Teplova, & Li, 2017) propose that financial distress in general is used to measure the level of firm operation or bankruptcy risk. The chance of financial distress increases when a firm has revenues that are sensitive to economic downturns, high fixed costs, or illiquid assets.

Interest rate (INTEREST) shows active bond interest. Active bond is the most traded bond, so its interest is the most accepted in the market because its interest is also very liquid.

USDTL and EXCRATE is the change of exchange rate US dollar - Turkish Liras and US dollar – relative countries currency for BRICS, respectively. Firms want to use protecting the currency risk and increase of interest rate.

I added the variable of firm age (IPOAGE) which is measured current year minus year of initial public offer. Recognition is important for firms because of their credit scores. Recognized companies that have been on the stock market for years are easier to access loans than unrecognized companies (Eisfeldt & Rampini, 2009; Neuberger & Rathke-Doppner, 2013;

³ A score below 1.8 means it's likely the firms are in the situation of bankruptcy, while firms with scores above 3 are not likely to go bankrupt.

Cosci, Guida, & Meliciani, Leasing Decisions and Credit Constraints: Empirical Analysis on a Sample of Italian Firms, 2015).

The effect of the VAT rate change, which is a study only for Turkey, on the use of leasing was measured with VAT year-dummy variable. It indicates the years of increasing VAT rates assign to 1, others zero.



Table 10 Literature Review for Lease

Variables	(Ang &	(Krishnan &	(Adadeji &	(Adams & Hardwick.	(Lasfer &	(Deloof &	(Mehran, Taggart, & Yermack, 1999)	(Upneja &	(Beattie,	(Yan, 2006)	(Deloof,	(Eisfeldt &	(Koh & Jang,	(Singh, 2013)	(Lin, Wang, Chou. &	(Neuberger & Rathke-	(Cosci, Guida,	(Giner &	(Munir, Kok,
Leasing 1.(Capitalized value of finance leases & hire purchase (HP) divided by total assets) 2.[Capitalized value of finance leases & hire purchase + operating lease liability) (operating lease liability/(1 +interest rate assumed implicit in op lease)]/ [Total assets + operating lease asset) 3.(rental payments/rental payments + r%×assets + depreciation) 4.(rental payments/rental payments + capital expenditures) 5.[(book value of capital leases + present value of operating leases)/market value of the firm 6.book value of Capital leases/market value 7.financial leases as a share of total assets 8.the present value of the operating leases as the current year rental expense and the rental commitments over the next five years discounted at 10%.. 9.operating lease share as total rental commitments divided by total capital costs 10.Operating lease expense/total assets 11.the total leasing exposure to fixed assets 12. Total leasing exposure to property, plant and equipment 13.Operating leases to book value of equity 14.net leased assets/net total fixed assets 15.Leasing Share of Total Capital Cost 16.Operating Lease Share of Total Capital Cost 17. Operating lease: (the current rental expense of the operating lease commitments for the next five years)/market value of the firm. Market value of the firm: total assets–book value of equity + market value of equity + PV of the operating lease.	13	7	1	9;14	1	7	7;15;16	6;8	1;2	8	7	3;4	10	5;6	6;17	11;12	7	10	9

Table 11 Literature Review for Debt

Variables	(Ang & Peterson, 1984)	(Krishnan & Moyer, 1994)	(Adadeji & Stapleton, 1996)	(Adams & Hardwick, 1998)	(Lasfer & Levis, 1998)	(Deloof & Verschuere, 1999)	(Mehran, Taggart, & Yermack, 1999)	(Upneja & Dalbor, 1999)	(Beattie, Goodacre, & Thomson, 2000)	(Yan, 2006)	(Deloof, Lagaert, & Verschuere, 2000)	(Eisfeldt & Rampini, 2009)	(Koh & Jang, 2009)	(Singh, 2013)	(Lin, Wang, Chou, & Chueh, 2013)	(Neuberger & Rathke-Döppner, 2013)	(Cosci, Guida, & Meliciani, 2015)	(Giner & Pardo, 2017)	(Munir, Kok, Teplova, & Li, 2017)
Debt Ratio 1. debt divided by book value of equity, market value of equity, or total assets 2. long-term debt/total assets 3. [(long-term, short-term loans and overdrafts less (finance leases, hire purchase and short-term investments))/total assets 4. the ratio of total long-term (non-leasing) debt at book value plus prior charge capital (e.g. preference shares) over the total assets (£m). 5. long-term debt/capital employed 6. long term financial debt 7. long term trade debt 8. Short-Term + Long-Term Debt/ (S.T + L.T. Debt + Market Value of Equity) 9. the ratio of book value of total long-term debt net of capital leases to the market value of the firm 10. the book value of total debt net of the amount of capitalized leases divided by adjusted book value 11. Total debt/total assets 12. Financial liabilities to total assets 13. Financial liabilities to fixed assets 14. Debt/total assets 15. Net trade debt/total assets 16. total liabilities/total assets	1	2	3	4	5	6;7	8	9	3	10	2	2	11		9	12;13	14;15	16	11

Table 12 Literature Review for Growth Opportunity And Liquidity

Variables	(Ang & Peterson, 1984)	(Krishnan & Moyer, 1994)	(Adadeji & Stapleton, 1996)	(Adams & Hardwick, 1998)	(Lasfer & Levis, 1998)	(Deloof & Verschuere, 1999)	(Mehran, Taggart, & Vermack, 1999)	(Upneja & Dalbor, 1999)	(Beattie, Goodacre, & Thomson, 2000)	(Yan, 2006)	(Deloof, Lagaert, & Verschuere, 2000)	(Eisfeldt & Rampini, 2009)	(Koh & Jang, 2009)	(Singh, 2013)	(Lin, Wang, Chou, & Chueh, 2013)	(Neuberger & Rathke-Döppner, 2013)	(Cosci, Guida, & Meliciani, 2015)	(Giner & Pardo, 2017)	(Munir, Kok, Teplova, & Li, 2017)
Growth Opportunity 1. the price earnings ratio 2. geometric mean 5-year growth rate in fixed assets 3. average percentage rate of total assets growth during the specific period 4. Tobin's q (total assets growth as a proxy for investment opportunities) 5. Growth opportunities is the market-to-book ratio and defined as the market value of assets divided by the book value of total assets. 6. Growth: market value of the firm/ (total assets + PV of the operating lease) 7. growth of total assets for 4 years	1	2	1	1		3			1;2		4		4	5	6		7		4
Liquidity 1. the current ratio 2. Current asset/current liability 3. current asset/total assets 4. financial assets/total assets 5. cashflow/total assets 6. cash/total assets 7. Current assets/short-term debt	1		2			1			2		3;4	5;6	6				7	2	

Table 13 Literature Review for Size And Tax Rate

Variables	(Ang & Peterson, 1984)	(Krishnan & Moyer, 1994)	(Adadeji & Stapleton, 1996)	(Adams & Hardwick, 1998)	(Lasfer & Levis, 1998)	(Deloof & Verschuere, 1999)	(Mehran, Taggart, & Yermack, 1999)	(Upneja & Dalbor, 1999)	(Beattie, Goodacre, & Thomson, 2000)	(Yan, 2006)	(Deloof, Lagaert, & Verschuere, 2000)	(Eisfeldt & Rampini, 2009)	(Koh & Jang, 2009)	(Singh, 2013)	(Lin, Wang, Chou, & Chueh, 2012)	(Neuberger & Rathke-Döppner, 2013)	(Cosci, Guida, & Meliciani, 2015)	(Giner & Pardo, 2017)	(Munir, Kok, Teplova, & Li, 2017)
Size 1. total year-end assets (in billions of dollars) 2. annual market value of total assets 3. $\ln(\text{size} = \text{total assets})$ 4. $\ln(\text{total sales})$ 5. Sales (\$ Millions) 6. Total assets is the log of the book value of assets 7. firm size squared 8. the natural log of the market value of the firm. 9. size = Number of employees	1		1	2	3;4	3	1;5;4	1		6	4	4	1;7	8	8	9		4	4
Tax Rate 1. average tax rate = tax paid/income before extraordinary items 2. tax charge/profit before tax 3. tax carry forward/total assets 4. the reported recoverable advanced corporate tax/year end market value of equity 5. advanced corporate tax recoverable provision/year end market value of equity 6. advanced corporate tax written off/year end market value of equity 7. Before-Financing Marginal Tax Rate 8. average tax rate = Income Taxes/Income Before Extraordinary Items 9. Taxes/EBIT 10. tax expense/net income before taxes 11. Official tax rate, reported in firm's yearbook compulsorily		1	2		2;3;4;5;6		7		2	7		7;8		7			9	10	11

Table 14 Literature Review for Fixed Asset Proportion

Variables		(Ang & Peterson, 1984)	(Krishnan & Moyer, 1994)	(Adadeji & Stapleton, 1996)	(Adams & Hardwick, 1998)	(Lasfer & Levis, 1998)	(Deloof & Verschuere, 1999)	(Mehran, Taggart, & Yermack, 1999)	(Upneja & Dalbor, 1999)	(Beattie, Goodacre, & Thomson, 2000)	(Yan, 2006)	(Deloof, Lagaert, & Verschuere, 2007)	(Eisfeldt & Rampini, 2009)	(Koh & Jang, 2009)	(Singh, 2013)	(Lin, Wang, Chou, & Chueh, 2013)	(Neuberger & Rathke-Döppner, 2013)	(Cosci, Guida, & Meliciani, 2015)	(Giner & Pardo, 2017)	(Munir, Kok, Teplova, & Li, 2017)
Fixed Asset Proportion 1.the additions to other than property and building tangible fixed assets/total assets 2.total fixed assets/total assets 3.Property, plant, and equipment is scaled by the book value of assets. 4. Collateral value of assets is defined as net property, plant, and equipment divided by the book value of total assets.						1	2			2	3				4	4		2		2

Table 15 Literature Review for Retained Earnings

Retained Earnings 1.retained earnings/total assets	Variables	
		(Ang & Peterson, 1984)
	1	(Krishnan & Moyer, 1994)
		(Adadeji & Stapleton, 1996)
		(Adams & Hardwick, 1998)
		(Lasfer & Levis, 1998)
		(Deloof & Verschuere, 1999)
		(Mehran, Taggart, & Yermack, 1999)
		(Upneja & Dalbor, 1999)
		(Beattie, Goodacre, & Thomson, 2000)
		(Yan, 2006)
		(Deloof, Lagaert, & Verschuere, 2007)
		(Eisfeldt & Rampini, 2009)
	1	(Koh & Jang, 2009)
		(Singh, 2013)
		(Lin, Wang, Chou, & Chueh, 2013)
		(Neuberger & Rathke-Döppner, 2013)
		(Cosci, Guida, & Meliciani, 2015)
		(Giner & Pardo, 2017)
		(Munir, Kok, Teplova, & Li, 2017)

Table 16 Literature Review for Profitability And Bankruptcy Risk

Variables	(Ang & Peterson, 1984)	(Krishnan & Moyer, 1994)	(Adadeji & Stapleton, 1996)	(Adams & Hardwick, 1998)	(Lasfer & Levis, 1998)	(Deloof & Verschueren, 2006)	(Mehran, Taggart, & Yermack, 1999)	(Upneja & Dalbor, 1999)	(Beattie, Goodacre, & Yan, 2006)	(Deloof, Lagaert, & Eisfeldt & Rampini, 2009)	(Koh & Jang, 2009)	(Singh, 2013)	(Lin, Wang, Chou, & Chueh, 2013)	(Neuberger & Rathke-Döppner, 2013)	(Cosci, Guida, & Meliciani, 2015)	(Giner & Pardo, 2017)	(Munir, Kok, Teplova, & Li, 2017)
PROFITABILITY 1. EBIT/total assets 2. EBIT/total interest charges 3. coefficient of variation of EBIT over the previous 10 years 4. Standard Deviation of EBIT to Assets Between specific years 5. Earnings before interest and tax (EBIT) divided by capital employed 6. Abnormal earnings = current earnings per share minus next year's earnings per share divided by current share price 7. EBITDA/total assets 8. Internal funds: (EBITDA–taxes)/ total assets 9. Revenues (log)		1;2;3					1;4	5	6		7		8		9	1	
BANKRUPTCY RISK 1. Z-SCORE = multivariate Altman Z-score values 2. Ohlson score 3. the variability of the firm's income over the 1994–1999 period as a proxy for the probability of distress. 4. Modified Z-Score 5. Risk: volatility of the yearly change in EBIT/the mean value of total assets. 6. rating = Rating index, divided by 100, low¼good, high¼bad 7. Number of bank relationships: dummy¼1, if the lessee has more than one bank relationships, 0 otherwise		1					1;2			3	1	4	5	6;7		1	1

3.4. Research Design

The model we use to research the relation between leases and debt is originated on the model provided by (Ang & Peterson, 1984) and accepted by others (Beattie, Goodacre, & Thomson, 2000; Deloof, Lagaert, & Verschueren, 2007; Adadeji & Stapleton, 1996; Yan, 2006). (Ang & Peterson, 1984) use the following model to explain the debt-to-lease displacement ratio α by the equation:

$$DR_{NL} = DR_L + \alpha LR_L \quad (1)$$

where DR_{NL} is the debt ratio of a firm which does not use lease DR_L is the debt ratio of a firm which use lease and LR_L is the lease ratio. Lease–debt substitution coefficient is demonstrated α . There are two cases for the lease-substitution coefficient such as $0 < \alpha < 1$ and $\alpha > 1$ or $\alpha < 0$ which correspond substitution effect and complementarily effect. respectively.

$$DR_{NL} = DR_L + \alpha LR_L = C(X_1 . X_2 . \dots) \quad (2)$$

$$LR_L = -\frac{1}{\alpha} DR_L + \frac{1}{\alpha} C(X_1 . X_2 . \dots) \quad (3)$$

$C(X_1 . X_2 . \dots)$ indicates that control variables which effect the dependent variable of lease ratio

$$LR_L = \beta_0 + \beta_1 DR_L + \sum_i \beta_{1+i} \text{ control variable}_i \quad (4)$$

If leases and debt have a substitutionary relation, then α is positive and β_1 is negative. If leases and debt are complemented, then α is negative β_1 is positive.

As in previous studies, (Beattie, Goodacre, & Thomson, 2000; Cosci, Guida, & Meliciani, 2015) the model assumes that a leasing propensity of firm is a function of its debt.

In this study, we used as control variables such as size ($\ln(\text{MCAP})$), collateral (TANGIBLE), liquidity (LQ), effective tax rate (TAX), profitability (EBITDA/TA), past profitability or

retained earnings (RETAINED/TA), growth opportunity (PER), bankruptcy risk (FINDIS), IPO date (IPOAGE), change of exchange rate (USDTL for BIST listed firms, EXCRATE for Brics countries listed firms), change of interest rate (INTEREST).

Furthermore, we controlled whether there is a significant relationship between leasing propensity and sectors for BIST and BRICS countries listed firms.

Moreover, we also investigated whether there is a significant change between firms of the same debt level when their size ($\ln(\text{MCAP})$), collateral (TANGIBLE), liquidity (LQ), effective tax rate (TAX), profitability (EBITDA/TA), retained earnings (RETAINED/TA), growth opportunity (PER), bankruptcy risk (FINDIS), IPO date (IPOAGE), change of exchange, change of interest rate (INTEREST) changes using interaction variables.

3.5. Pre-Analysis of Nature of Panel Data

Since I use panel data in my thesis, there are some processes that I need to control due to the nature of panel data. Panel data are data sets that have both time and cross-sectional dimensions. Panel data is defined as the combination of time series and cross-sectional data. That is, panel data have repeated measurements for the same individual. Panel datasets express the change of cross-section data over time. One of the most important points to consider when using a panel data set is the heterogeneity between cross-sections (Greene, 2003), (Wooldridge, 2012). In this context, panel data has several advantages to increase the effectiveness of predictions, such as control of individual heterogeneity (Baltagi, 2005), (Güven, 2018)⁴, more information, more degrees of freedom, more variability between variables, and less dependency. In addition to these advantages, since the panel data is generally based on micro economic data, it does not contain aggregation error and is more reliable (Baltagi, 2005). In the analysis made with panel data, both the time dimension and the unit dimension should be taken

⁴“Units may not be homogeneous due to individual differences in ability, management differences, cultural and geographical differences, and so on. Failing to incorporate these unobserved differences into the model can lead to biased estimates. Such problems in the cross-section data can be overcome by panel data models”

into consideration. The stationarity of the series should be tested for the time dimension. If our series is not stationary, regression analysis causes spurious regression. It is also important that the units are homogeneous or heterogeneous. Due to these two important reasons, firstly, it will be checked that there is a correlation between units (individuals) and then the stability of the data. While cross-sectional dependency is tested then unit root tests are applied.

When unit root tests are performed, the panel data random tobit model will be applied.

3.6. Pre-Estimation and Post-Estimation Tests for Sample of Borsa Istanbul Public Firms

Before conducting econometric model, it is necessary to test the dependency between individuals and to implement unit root tests. The presence or absence of cross-sectional dependencies will play a key role in the selection of the panel unit root tests. In this study, Pesaran (2004) CD_{LM} (if $N > T$)⁵ test will be applied to test the dependency between units (Pesaran, 2004). The reason we prefer Pesaran (2004) CD_{LM} test is that it can be applied when if $N > T$. In my dataset, individuals, i.e., firms, are larger than time dimensions, so Pesaran (2004) CD_{LM} test has a suitable to test the correlation between individuals.

At table 17, Pesaran (2004) CD_{LM} test results are presented.

⁵ If $N < T$, then Breusch-Pagan test (1980) * should be applied.

If $N \geq T$, then Pesaran CD_{LM2} (2004) ** test should be used.

*Breusch, T. S., Pagan, A.R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies*, 47(1), 239-253.

** Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels. *Discussion Papers*. Published Version: Pesaran, M. H. (2021). General diagnostic tests for cross section dependence in panels. *Empirical Economics*, 60, 13-50.

Table 17 Results Of Cross-Sectional Dependency Due To Pesaran CDlm (2004) Test For BIST Listed Firms

Sample consists of 147 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 9114 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. Ln (MCAP) is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PER is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. INTEREST shows active bond interest. USDTL is the change of exchange rate US dollar - Turkish Liras. IPOAGE which is measured current year minus initial public offer IPO year. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Variables	CD	P-Value
LR	127,982	0,0000
DR	131,267	0,0000
LDR	52,089	0,0000
SDR	29,891	0,0000
Ln (MCAP)	60,691	0,0000
TANGIBLE	108,963	0,0000
LQ	49,55	0,0000
TAX	23,313	0,0000
EBITDA/TA	57,261	0,0000
RETAINED/TA	73,906	0,0000
PE	5,344	0,0000
FINDIS	58,271	0,0000
IPOAGE	82,284	0,0000
USDTL	815,541	0,0000
INTEREST	815,518	0,0000

For the cross-sectional dependency tests in the table, the null hypothesis was determined as “H0: There is no cross-sectional dependency”.

When table 17 is analyzed, the null hypothesis is rejected by all tests at the 1% significance level for all variables. The null hypothesis was rejected; this stated there is no contemporaneous correlation. Impact of shocks in one firm could affect another firm when both firms belong in

the panel data set. After detecting cross-sectional dependency, second generation panel unit root tests will be performed (Ghura, 2019 March; Solarin & Al-Mulal, 2018; Şengül, Omay, Yıldırım, & Köse, 2020).

Table 18 Results of Panel Unit Root Tests For BIST Listed Firms

Sample consists of 147 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 9114 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. Ln (MCAP) is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. INTEREST shows active bond interest. USDTL is the change of exchange rate US dollar - Turkish Liras. IPOAGE which is measured current year minus initial public offer IPO year. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Variables	Levin, Lin, and Chu	Harris and Tzavalis	Bretiung
	adjusted t-statistics	rho z-statistics	lambda statistics
LR	-19,3693*	-98,7501*	-18,6437*
DR	-6,6618*	-18,9728*	-4,1696*
LDR	-7,6980*	-28,8693*	-5,7946*
SDR	-11,6787*	-33,6185*	-12,1123*
Ln (MCAP)	-2,9941**	-2,4184**	-3,7490*
TANGIBLE	-19,9505*	-90,2924*	-1,6603**
LQ	-84,4667*	-16,9948*	-58,9589*
TAX	-93,7920*	-16,9948*	-64,9700*
EBITDA/TA	-12,9460*	-91,0461*	-7,5707*
RETAINED/TA	-10,1191*	-26,7305*	-10,1155*
PE	-63,5459*	-16,9948*	-18,8767*
FINDIS	-10,9089*	-49,0938*	-13,9377*
IPOAGE	-5,9522*	-16,9948*	-57,0214*
USDTL	-65,3240*	-16,9948*	-58,0720*
INTEREST	-83,7370*	-16,9948*	-66,4078*

*, **, *** denoted 1%, %5, %10 significance level, respectively.

For the stationarity tests in the table, for Levin, Lin and Chu unit root test the null hypothesis was determined as “H0: Panels contain unit root.”; for Harris and Tzavalis unit root test the null

hypothesis was determined as "H0: Panels contain unit root." ; for Breitung unit root test the null hypothesis was determined as "H0: Panels contain unit root.".

In this study, the second-generation panel unit root tests, also known as heterogeneous panel unit root tests, which also consider the cross-sectional dependence, were applied to control the stationarity of variables ^{6,7}. To our data, the second-generation unit root tests (Levin, Lin, & Chu, 2002) unit root, (Harris & Tzavalis, 1999) unit root and (Breitung & Das, 2005) unit root tests have been applied. According to tests results, the hypothesis that panels contain unit root is rejected. Multicollinearity between independent variables, heteroscedasticity and normality for error terms are controlled.

To analyze the multicollinearity between independent variables, variance inflation factor VIF (1/Tolerance) is performed (Salmerón, García, & García, 2018). There is no consensus about variance inflation factor threshold score. In literature, 5 and 10 is mostly used for threshold value of variance inflation factor. Suspect severe multicollinearity if $VIF > 5$ (Studenmund, 2014; Chatterjee & Simonoff, 2013). (Studenmund, 2014) proposes to detect the multicollinearity two ways. One of them is variance inflation factor is greater than 5. Second of them is analyzing the simple correlation coefficients between the explanatory variables. Correlation matrix is presented at table 9.

⁶ (Collart Dinarte, 2013, December) defenses in her thesis about heterogeneity between units like these words "A Random Parameters Tobit model can be specified to account for unobserved heterogeneity and the censoring of zero bids within and across individuals".

⁷ (Lunik, 2015 Spring) defenses in her thesis about correlation between units like these words "Random effects panel data models assume that the unobserved individual effect is random across farms (units), and that there is no correlation between the individual's specific effects and independent variables"

Furthermore, (Ott & Longnecker, 2010) propose different threshold score for variance inflation factors the variance inflation factor (VIF) is a useful indicator of the overall impact of collinearity in estimating the coefficient of an independent variable. If it is large, such as 10 or more, collinearity is a serious problem.

Table 19 Variance Inflation Factor Results for BIST Listed Firms

Sample consists of 147 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 9114 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. $\ln(\text{MCAP})$ is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PER is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. INTEREST shows active bond interest. USDTL is the change of exchange rate US dollar - Turkish Liras. IPOAGE which is measured current year minus initial public offer IPO year. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Model 1				
Variable	VIF	VIF Sqrt	Tolerance	Tolerance Squared
DR	1,39	1,18	0,7199	0,2801
$\ln(\text{MCAP})$	1,29	1,14	0,7729	0,2271
TANGIBLE	1,04	1,02	0,9632	0,0368
LQ	1,01	1,00	0,9945	0,0055
TAX	1,00	1,00	0,999	0,001
EBITDA/TA	1,17	1,08	0,8582	0,1418
RETAINED/TA	1,41	1,19	0,7086	0,2914
PER	1,00	1,00	0,9988	0,0012
FINDIS	1,11	1,05	0,9034	0,0966
INTEREST	1,19	1,09	0,8382	0,1618
IPOAGE	1,86	1,36	0,5367	0,4633
USDTL	1,85	1,36	0,5399	0,4601

Model 2				
Variable	VIF	VIF Sqrt	Tolerance	Tolerance Squared
LDR	1,11	1,05	0,9006	0,0994
$\ln(\text{MCAP})$	1,32	1,15	0,7596	0,2404

TANGIBLE	1,02	1,01	0,9801	0,0199
LQ	1,00	1,00	0,9955	0,0045
TAX	1,00	1,00	0,9989	0,0011
EBITDA/TA	1,16	1,08	0,8599	0,1401
RETAINED/TA	1,23	1,11	0,8138	0,1862
PER	1,00	1,00	0,999	0,001
FINDIS	1,04	1,02	0,9598	0,0402
INTEREST	1,19	1,09	0,8379	0,1621
IPOAGE	1,84	1,36	0,5426	0,4574
USDTL	1,85	1,36	0,5407	0,4593

Model 3

Variable	VIF	VIF Sqrt	Tolerance	Tolerance Squared
SDR	1,25	1,12	0,7598	0,2002
ln(MCAP)	1,29	1,13	0,7767	0,2233
TANGIBLE	1,06	1,03	0,9470	0,0530
LQ	1,01	1,00	0,9944	0,0056
TAX	1,00	1,00	0,9989	0,0011
EBITDA/TA	1,16	1,08	0,8593	0,1407
RETAINED/TA	1,30	1,14	0,7681	0,2319
PER	1,00	1,00	0,9990	0,0010
FINDIS	1,07	1,03	0,9364	0,0636
INTEREST	1,19	1,09	0,8383	0,1617
IPOAGE	1,86	1,37	0,5364	0,4636
USDTL	1,83	1,35	0,5471	0,4529

Model 4

Variable	VIF	VIF Sqrt	Tolerance	Tolerance Squared
LDR	1,13	1,06	0,8882	0,1118
SDR	1,27	1,13	0,7888	0,2112
ln(MCAP)	1,32	1,15	0,7593	0,2407
TANGIBLE	1,06	1,03	0,9462	0,0538
LQ	1,01	1,00	0,9944	0,0056
TAX	1,00	1,00	0,9989	0,0011
EBITDA/TA	1,17	1,08	0,8582	0,1418
RETAINED/TA	1,38	1,18	0,7228	0,2772
PER	1,00	1,00	0,999	0,001
FINDIS	1,10	1,05	0,9082	0,0918
INTEREST	1,19	1,09	0,8379	0,1621
IPOAGE	1,87	1,37	0,5358	0,4642
USDTL	1,85	1,36	0,5395	0,4605

Heteroskedasticity and non-normality is an issue for tobit models. Heteroscedasticity and non-normal tobit model maximum likelihood estimator is inconsistent (Arabmazer & Schmidt, 1984; McDonald J., 2009). Conditional moment test (CM-test) (Pagan & Vella, 1989) for normality and (Andrews, 1988) chi square test⁸ for heteroskedasticity are performed and presented at bottom of each table. Conditional moment test and Andrew's chi squared test results indicate that there is no heteroscedasticity and non- normality for all models.

3.7. Pre-Estimation and Post-Estimation Tests for Brics Countries Public Firms

Firstly, the cross-sectional dependency means heterogeneity between cross-sections is controlled (Greene, 2003; Wooldridge, 2012) then stationarity to avoid spurious regression is checked. Firstly, to determine the cross- sectional dependency, Pesaran (2004) CD test is applied. After the cross- sectional dependency test is applied, I deployed the unit root tests. After completing all preliminary test of nature of panel data, I implemented the random effect panel tobit model.

In this section, I implemented the cross-sectional dependency test to determine the heterogeneity between individuals. Due to determine dependency, Pesaran (2004) CD test is applied (Pesaran , 2004). Pesaran (2004) CD test is implemented only under the case of where the number of the individual is greater than the time dimension $N > T$ ⁹ . In BRICS dataset, individuals, i.e., the number of firms, are larger than time dimension. For these reasons, Pesaran (2004) CD test is fitting for cross-sectional dependency testing.

⁸ An extension of Pearson chi-square testing to parametric models with covariates.

⁹ ⁹ If $N < T$ then Breusch-Pagan test (1980) “Breusch, T. S., Pagan, A.R. (1980). *The Lagrange multiplier test and its applications to model specification in econometrics. The Review of Economic Studies*, 47(1), 239-253”

If $N \geq T$ then Pesaran CD_{LM2} (2004) “Pesaran, M. H. (2004). *General diagnostic tests for cross section dependence in panels. Discussion Papers. Published Version: Pesaran, M. H. (2021). General diagnostic tests for cross section dependence in panels. Empirical Economics*, 60, 13-50.”

Table 20 Results of Cross-Sectional Dependency due To Pesaran CD (2004) Test For BRICS Countries Listed Firms

Sample consist of five countries: Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years . LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. log (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax . EBITDA/TA is defined as EBITDA over total assets . RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Variables	CD	P-Value
LR	1140,533	0,0000
DR	587,862	0,0000
LDR	237,222	0,0000
SDR	436,049	0,0000
Ln (MCAP)	77,859	0,0000
TANGIBLE	19,186	0,0000
LQ	908,798	0,0000
TAX	12,939	0,0000
EBITDA/TA	1430,86	0,0000
RETAINED/TA	552,309	0,0000
PE	1437,603	0,0000
FINDIS	719,633	0,0000
IPOAGE	37,379	0,0000
EXCRATE	960,080	0,0000
INTEREST	1121,466	0,0000

For the cross-sectional dependency tests in the table, the null hypothesis was determined as “H0: there is no cross-sectional dependency”.

After cross-sectional dependency tests, second generation panel unit root tests will be performed (Ghura, 2019 March; Solarin & Al-Mulal, 2018; Şengül, Omay, Yıldırım, & Köse, 2020). In this study, the second-generation panel unit root tests, were applied to control the stationarity of variables. To our data, the second-generation unit root tests (Levin, Lin, & Chu, 2002) unit root, (Harris & Tzavalis, 1999) unit root and (Breitung & Das, 2005) unit root tests have been applied.

Table 21 Results of Panel Unit Root Tests for BRICS Countries Listed Firms

Sample consist of five countries; Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years . LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. log (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax . EBITDA/TA is defined as EBITDA over total assets . RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Variables	Levin, Lin and Chu	Harris and Travis	Breitung
	adjusted t-statistics	rho z-statistics	lambda statistics
LR	-31,8600*	-38,7224*	-33,0639*
DR	-44,0382*	-77,9971*	-5,8954*
LDR	-21,4283*	-11,0465*	-1,4848***
SDR	-21,9599*	6,9506	7,0963
Ln (MCAP)	-34,2130*	-17,2417*	-0,4675
TANGIBLE	-38,2404*	-13,7608*	-0,2430
LQ	-8,8669*	17,3878	-11,9440*
TAX	-95,0760*	-85,0348*	-32,9224*
EBITDA/TA	-73,4619*	-85,2351*	-54,5938*
RETAINED/TA	-8,8669*	-34,0871*	-0,0342
PE	-54,5982*	-73,1478*	-1,8723**
FINDIS	-27,6591*	-76,2855*	-8,9167*
IPOAGE	-40,4609*	-72,7354*	-0,0002*

EXCRATE	-6,2714*	-18,7117	-26,4194
INTEREST	-23,4980*	-32,1814*	-35,7955*

*, **, *** denoted 1%, %5, %10 significance level, respectively.

For the stationarity tests in the table, for Levin, Lin, and Chu unit root test the null hypothesis was determined as "H0: Panels contain unit root."; for Harris and Travis unit root test the null hypothesis was determined as "H0: Panels contain unit root."; for Breitung unit root test the null hypothesis was determined as "H0: Panels contain unit root.".

Except for the SDR, ln(MCAP), TANGIBLE, LQ, RETAINED/TA, EXCRATE variables, we rejected the "H0: Data is not stationary" hypothesis at 1% significance level and decided that the rest of variables are stationary. Variables except SDR, ln(MCAP), TANGIBLE, LQ, RETAINED/TA, EXCRATE are not stationary at level of I (0), but the first difference of SDR, ln (MCAP, TANGIBLE, RETAINED/TA variables are seen to be stationary at level of I (1). Variables LQ is not stationary at level of I (1), but the second difference of LQ variable is seen to be stationary at level of I (2). In the next part of our analysis, we will prevent the spurious regression problem by using the first difference of the SDR, ln(MCAP), TANGIBLE, RETAINED/TA, EXCRATE variables and the second difference of LQ variable are used.

Table 22 Results of Panel Unit Root Tests With First And Second Differences for Brics Countries Listed Firms

Sample consist of five countries; Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years . LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. log (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax . EBITDA/TA is defined as EBITDA over total assets . RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

	Levin, Lin and Chu	Harris and Travis	Breitung
Variables	adjusted t* statistics	rho z- statistics	lambda statistics

SDR	-21,9599*	6,9506	7,0963
diffSDR	-78,1944*	-72,5398*	-42,6210*
Ln(MCAP)	-34,2130*	-17,2417*	-0,4675
diffLn(MCAP)	-92,8754*	-76,2204*	-22,3207*
TANGIBLE	-38,2404*	-13,7608*	-0,2430
diffTANGIBLE	-9,6058*	-79,9202*	-28,1107*
LQ	-8,8669*	17,3878	-11,9440*
diffLQ	-8,8669*	11,8284	1,4291
diffdiffLQ	-7,3891*	-59,2297*	-13,6478*
RETAINED/TA	-8,8669*	-34,0871*	-0,0342
diffRETAINED/TA	-90,5129*	-38,5734*	-6,1445*
EXCRATE	-6,2714*	-18,7117	-26,4194
diffEXCRATE	-58,7314*	-51,1945*	-16,2569*

* denoted 1% significance level.

Variables SDR, SIZE3, COL, PASTPROF are not stationary at level of I (0), but the first difference of SDR, SIZE3, COL, PASTPROF variables are seen to be stationary at level of I (1). Variables LQ is not stationary at level of I (1), but the second difference of LQ variable is seen to be stationary at level of I (2).

Table 23 Variance Inflation Factor for BRICS Countries Listed Firms

Sample consist of five countries: Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years. LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. log (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Variable	VIF	SQRT VIF	Tolerance	R-Squared
DR	1,06	1,03	0.9443	0.0557
LDR	1,29	1,14	0,7762	0,2238
SDR	1,15	1,07	0.8709	0.1291
Ln (MCAP)	1,08	1,04	0.9274	0.0726
TANGIBLE	1,01	1,00	0.9916	0.0084

LQ	1,00	1,00	0.9994	0.0006
TAX	1,00	1,00	0.9970	0.0030
EBITDA/TA	1.00	1,00	0.9993	0.0007
RETIANE/TA	1,42	1,19	0.7037	0.2963
PE	1,01	1,01	0.9858	0.0142
FINDIS	1,01	1,01	0.9887	0.0113
IPOAGE	1,74	1,32	0,5744	0,4256
EXCRATE	2,09	1,45	0,4781	0,5219
INTEREST	1,27	1,13	0,7864	0,2136

Multicollinearity between independent variables, heteroscedasticity and normality for error terms are controlled. To analyze the multicollinearity between independent variables, variance inflation factor VIF (1/Tolerance) is performed (Salmerón, García, & García, 2018). There is no consensus about variance inflation factor threshold score. In literature, 5 and 10 is mostly used for threshold value of variance inflation factor. Suspect severe multicollinearity if $VIF > 5$ (Studenmund, 2014; Chatterjee & Simonoff, 2013). (Studenmund, 2014) proposes to detect the multicollinearity two ways. One of them is variance inflation factor is greater than 5. Second of them is analyzing the simple correlation coefficients between the explanatory variables. Correlation matrix is presented at table 9.

Furthermore, (Ott & Longnecker, 2010) propose different threshold score for variance inflation factors the variance inflation factor (VIF) is a useful indicator of the overall impact of collinearity in estimating the coefficient of an independent variable. If it is very large, such as 10 or more, collinearity is a serious problem.

Heteroskedasticity and non-normality is an issue for tobit models. Heteroscedasticity and non-normal tobit model maximum likelihood estimator is inconsistent (Arabmazer & Schmidt,

1984; McDonald J. , 2009). Conditional moment test (Pagan & Vella, 1989) for normality and (Andrews, 1988) chi square test¹⁰ for heteroscedasticity are performed and presented at bottom of each table.

3.8. Random Effect Tobit Regression

Tobit model was developed by Tobin in 1958. Purpose of development is that the least squares method gives biased results for censored data because most of the data set is equal to 0 and the rest is positive. He developed the tobit model that considers the censorship of the data set used in Tobin. In such cases, limited dependent variables models are used (McDonald & Moffitt, 1980). Tobit model is a nonparametric alternative to least squares regression (Liao, 1994).

There are two types of tobit models, truncated tobit models and censored tobit models. Truncated tobit models are used when observations of both dependent and independent variables cannot be observed. In this case, there is no exact information about the number of missing observations in truncated tobit models (Long, 1997; Davidson & MacKinnon, 2003). On the other hand, in the censored tobit model, at least the observations of the independent variables can be observed (McDonald & Moffitt, 1980; Davidson & MacKinnon, 2003; Kennedy, 2008). Censored tobit models are also known as the censored sampling model in which the information of the dependent variable is observed only for some observations. Censoring can only be right, left only, or both right and left, i.e., range definition (Agung, 2011). One of the features that differentiates the censored regression model from the truncated regression model is that the cutting process in the truncated regression models changes the sample, while the censoring process does not change the sample (Long, 1997). In the Tobit model, when the dependent variable is censored, all values in a certain range turn into a single

¹⁰ An extension of Pearson chi-square testing to parametric models with covariates.

value and are encoded that way, this process is called censoring. Tobin censors the negative values of the dependent variable in his study in which he found the Tobit model (household expenditure assigns the number 0 instead of negative values) and gives the value 0 to all of them. In most of the analyzes where economic research is conducted and the censored dependent variable is used, censoring from the left is more common than censoring from the right. The reason is that in most of the analyzes conducted, the economic observations of dependent variables do not take negative values. An example is the case where the demand for a good, service or household spending, is the dependent variable in any analysis. While there are all observations of independent variables in our sample, we see that some of our dependent variables do not. When we conducted a literature review (Ang & Peterson, *The Leasing Puzzle*, 1984; Adadeji & Stapleton, 1996; Deloof & Verschueren, *Note: Are Leases and Debt Substitutes? Evidence from Belgian Firms*, 1999; Deloof, Lagaert, & Verschueren, *Leases and Debt: Complements or Substitutes? Evidence from Belgian SMEs*, 2007; Mehran, Taggart, & Yermack, 1999; Beattie, Goodacre, & Thomson, *Operating Leases and the Assessment of Lease-Debt Substitutability*, 2000; Singh, 2013; Neuberger & Rathke-Doppner, 2013) we found that the researchers used the Tobit regression model when all observations cannot be observed for dependent variables and can be observed all independent variables, completely. While observing the independent variables completely in my sample, we see that my dependent variables do not exist for some companies. In this case, when I looked at the literature, I reached the information that we should use the panel censored tobit model. Although the Tobit model is an alternative to the ordinary least squares model, the estimators can be biased and inconsistent when we work with the ordinary least squares model with censored samples (Greene, 2003), while the estimators in the tobit model are unbiased and consistent. Tobin (1958) did not deem suitable ordinary least squares for models with limited dependent variables, and suggested using the tobit model, which is a multiple statistical model that considers the

probability distribution of the censored sample in the analysis (Greene, 2005). The Tobit model is a powerful model in this sense compared to the ordinary least squares OLS model.

Panel data set was used in this study¹¹. Panel data set is defined as the combination of time series and cross section data. That is, panel datasets have repeated measurements for the same unit. Panel datasets express the change of cross-section data over time. One of the most important points to consider when using a panel data set is the heterogeneity between cross-sections (Greene, 2003; Wooldridge, 2012). In this context, panel data has several advantages to increase the effectiveness of estimations, such as control of individual heterogeneity, more information, more degrees of freedom, more variability between variables, and less dependency. In addition to these advantages, since the panel data is generally based on micro data, it does not contain aggregation error and is more reliable (Baltagi, 2005). Panel tobit model has been used rather than tobit model in empirical studies for more accurate estimation of model parameters, accurate modeling of differences between units, and better estimation of the relationship between factors (Hsiao, 2007).

In this study, random effect panel tobit model was used to understand the relationship between leasing and debt to predict its determinants ¹². In the analysis of panel data with the help of tobit model, both fixed effect and random effect panel tobit model can be used. The literature has encountered many practical difficulties in calculating the parameters of the tobit model, which includes a large number of fixed effect dummy variables, and it is not possible to produce a complete solution to this problem, and also because it gives biased and inconsistent results, especially in small samples, which is a much more important problem than the difficulties encountered in the calculation of practical parameters. Since fixed effect tobit model

¹¹ (DeLoof & Verschuere, 1999), (DeLoof, Lagaert, & Verschuere, 2007), (Lin, Wang, Chou, & Chueh, 2013), (Graham, Lemmon, & Schallheim, 1998), (Albarrak, 2015) are used micro finance panel data with Tobit Analysis.

¹² Stata xttoit command was used to run random effect tobit model.

is not appropriated and not recommended (Greene, 2005). In this study, random effect panel tobit model application will be applied due to these problems encountered in the fixed effects tobit model.

The random effects tobit model can be written as below for the firm i which is used leasing.

$$y_{it}^* = x_{it}'\beta + \varepsilon_{it} \quad (5)$$

$$i = 1, 2, \dots, N; \quad T = 1, 2, \dots, T$$

$$\varepsilon_{it} = w_i + u_{it} \quad (6)$$

$$w_i \sim NID(0, \sigma_w^2) \quad u_{it} \sim NID(0, \sigma_u^2)$$

$$y_{it} = \max(0, y_{it}^*) \text{ or } y_{it} = \begin{cases} y_{it}^* & \text{if } y_{it}^* > 0 \\ 0 & \text{others} \end{cases}$$

Random effect tobit model in equation (5), y_{it} determines the lease ratio of the i th firm in the period t , x_{it} is the matrix of independent variables, w_i is the unobservable individual effects, u_{it} , the error terms which has unobservable individual and random effect. If assuming that w_i 's is constant for each individual, then it is referred to as the "Fixed Effect" estimator; or if it is considered to be taken randomly from a probabilistic distribution then it should be referred to as a "Random Effect" estimator (Wooldridge, 2012).

Model which is used for this study has been estimated using the maximum likelihood method. When we look at the literature (Greene, 2003; Davidson & MacKinnon, 2003), maximum likelihood estimation (MLE) method is used in Tobit model for parameter estimates. Since the parameters obtained through MLE are not linear, the predictions are performed in iterations. In addition, as an iteration method, the Newton - Raphson method was used here because it requires less time and less iteration (Jamil, 2013).

$$f(y) = y \quad (7)$$

$$f(y) = [f(y^*)]di [F(c)] 1 - di \quad (8)$$

P(censored); if $y^* \leq c$,

$$P(y_i = c) = P(y^* \leq c) = P(B'x_i + u_i \leq c) \quad (9)$$

$$P(U_i \leq C - \beta'x_i) = P\left(\frac{u_i}{\sigma} \leq \frac{C - B'x_i}{\sigma}\right)$$

$$= \phi\left(\frac{C - \mu}{\sigma}\right) = 1 - \phi\left(\frac{\mu - C}{\sigma}\right)$$

P(uncensored); if $y^* > c$,

$$P(y^* > c) = 1 - \phi\left(\frac{C - \mu}{\sigma}\right) = \phi\left(\frac{\mu - C}{\sigma}\right)$$

$$L = \prod_{i=1}^n \left[-\phi\left(\frac{B'x_i - C}{\sigma}\right) \right]^{1-d_i} \left[\frac{1}{\sigma} \phi\left(\frac{y_i - B'x_i}{\sigma}\right) \right]^{d_i} \quad (10)$$

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

$$\ln L = \sum_{y_i=0} \ln \left[1 - \phi\left(\frac{B'x_i}{\sigma}\right) \right] + \sum_{y_i>0} \ln \frac{1}{\sigma} \phi\left(\frac{y_i - B'x_i}{\sigma}\right) \quad (11)$$

CHAPTER 4: THE RELATIONSHIP BETWEEN LEASING AND DEBT IN BORSA ISTANBUL PUBLIC FIRMS: EMPRICAL ANALYSIS AND RESULTS

4.1. Main Models, Sector Specific Analysis, and Interaction Variables

In this study, one of main aims is to evaluate the relationship between the leasing propensity and debt for Borsa Istanbul stock exchange listed firms. Namely, we try to understand whether leasing helps firms to increase their debt capacity. Moreover, I examined the possibility of the use of lease of companies with which type of capital structure information more relevant and likely to increase the use of lease. I analyzed models to understand this relation in following variables: tax, balance sheet items (size, ipoage, growth opportunity) and

global economic indicators (change of exchange rate (usdtl, euro1), interest rate), balance sheet proxies of credit constraints (profitability, past profitability, liquidity, collateral, Zscore), sectoral dummies, dummy for change of vat rate, interaction among main dependent variable and control variables and leasing propensity of small and medium-large size firms.

Regression results show that a positive and significant relationship between leasing propensity (LR) and debt (DR) for Borsa Istanbul stock exchange listed firms according to Model 1. My study align in literature supporting the complementarity hypothesis (Ang & Peterson, 1984; Lewis & Schallheim, 1992; Singh, 2013; Schallheim, Wells, & Whitby, 2013; Giner & Pardo, 2017); in contrast to support the substitutability hypothesis (Adadeji & Stapleton, 1996).

Unlike study of (Singh, 2013), the relationship between tax rate (TAX) and leasing propensity insignificant such as (Sharpe & Nguyen, 1995; Schallheim, Wells, & Whitby, 2013; Munir, Kok, Teplova, & Li, 2017; Beattie, Goodacre, & Thomson, 2000; Yan, 2006; Giner & Pardo, 2017; Adadeji & Stapleton, 1996) according to Model 1, 2, 3, 4. Tax rate in BIST listed firms is not effective on leasing or debt selection.

There is consistently significant and positive relationship between firm size (ln (MCAP)) and leasing propensity for models 1, 2, 3, 4. Larger companies are most likely to use leasing than smaller ones.

Firms may be asked to collateral by the credit institution when companies take up a loan to the institutions during borrowing. If all other conditions completed for companies which have collaterals reach debt easier than other firms. Surplus of collateral may canalize companies to use debt. Namely, firms want to invest, prefer to use bank loan rather than lease when they have enough collateral. In Models 1, 2, 3, 4 coefficients of collateral variable support this hypothesis. Surplus of collaterals makes to borrow rather than lease. There is a consistent negative significant relation between amount of collateral (TANGIBLE) and leasing

propensity. This result is in contradiction with (Beattie, Goodacre, & Thomson, 2000; Deloof & Verschueren, 1999; Graham, Lemmon, & Schallheim, 1998; Lin, Wang, Chou, & Chueh, 2013; Singh, 2013; Munir, Kok, Teplova, & Li, 2017), and is supported the results with the study of (Yan, 2006; Cosci, Guida, & Meliciani, 2015).

Liquidity (LQ) is an indicator of the ability of businesses most practical and quickly converted of assets into cash. As the level of liquidity of companies increases, investing tendency increases. Firms are less liquid and have cash flow problems engage in more leasing (Beattie, Goodacre, & Thomson, 2000). At all models, there is an insignificant relationship between liquidity and leasing ratio. Namely, liquidity is not an indicator to lease for firms in BIST.

Current profitability (EBITDA/TA) and past profitability or retained earnings (RETAINED/TA) variables are proxy of performance measure. Firm's current profitability level or past profitability information can give us an information about firm's leasing or debt propensity. Static theory suggest that debt level is positively correlated with profitability. More profitable firms have more income, more likely to have high tax rates and less susceptible to bankruptcy. In all debates, more profitable firms can access to low-cost debt easier than less profitable firms (Kare & Herbst, 1990; Krishnan & Moyer, 1994). As you see at all of models, there is negatively and significant relationship between profitability levels and leasing propensity (Ang & Peterson, 1984; Giner & Pardo, 2017; Deloof, Lagaert, & Verschueren, 2007). On the other words, as soon as firms increase their profitability level, they reach debt easier and prefer to use debt. In literature, past profitability information is used by age of firm and its riskiness (Krishnan & Moyer, 1994). Moreover, past profitability information gives us bankruptcy potential of firm. In this study, there is consistent and exact result about the past profitability and lease propensity. There is a negative and significant relation between lease and past profitability. It means that firms have higher past profitability level prefer to use debt

The tables include the estimated coefficients, significance level of the variables, Wald chi-square, likelihood ratio tests statistics, and number of observations censored and uncensored¹³. rather than lease. This result is contradicting with (Krishnan & Moyer, 1994) results, supporting with study of (Koh & Jang, 2009) .

Price earnings ratio (PER) (Ang & Peterson, 1984; Adadeji & Stapleton, 1996; Adams & Hardwick, 1998; Beattie, Goodacre, & Thomson, 2000) is used as proxy for growth opportunity. Price earnings ratio is the ratio of the stock price to the profit per share. The most advantageous side of this measure is that it indicates the stock market's forward-looking assessment of growth prospects. In this study, growth opportunity which is measured as price earnings ratio is not significant for all models like the study of (Beattie, Goodacre, & Thomson, 2000; Adadeji & Stapleton, 1996).

Z score (FINDIS) is a traditional measure of financial health. Higher scores indicate firm's strength of financial health. The Altman Z score close to 1.8 refer a firm might be increased probability of bankruptcy risk, while a score closer to 3.00 refer a firm is in solid financial positioning. Namely, firms which is high Altman Z score is not associated likely to go bankrupt.

¹³ Same outputs are reported by (Lunik, 2015 Spring) in her thesis.

Table 24 Random Effect Tobit Model Regression and Interaction Research for BIST Listed Firms

Sample consists of 147 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 9114 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. ln (MCAP) is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PER is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. INTEREST shows active bond interest. USDTL is the change of exchange rate US dollar - Turkish Liras. IPOAGE which is measured current year minus initial public offer IPO year. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Dependent Variable	LR							
Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
DR	0,1645***				-0,0435			
LDR		-0,1108		-0,1476**		-0,6923		-0,5966
SDR			0,0851	-0,1175*			-1,5462**	-0,1802***
ln(MCAP)	0,1893***	0,1824***	0,1769***	0,1766***	0,2135***	0,1785***	0,1280***	0,1757***
TANGIBLE	-0,3831***	-0,3873***	-0,4003***	-0,3981***	-0,9617***	-0,5657***	-0,69900***	-0,5878***
LQ	0,00004	0,00002	-0,0118	-0,0011	-0,00031	0,0027**	0,0194	0,003425**
TAX	0,00056	0,000052	0,00006	0,00005	0,00079	0,00094	-0,0005	0,00093
EBITDA/TA	-0,2742***	-0,3216***	0,3221***	-0,3409***	-0,6461***	-0,3275***	-0,3487*	-0,3531***
RETAINED/TA	-0,3686***	-0,4558***	-0,4554***	-0,4886***	-0,3224*	-0,3925***	-0,4467***	-0,4465***
PER	0,00002	0,00001	0,00002	0,00001	-0,00002	0,00004	0,00004	0,00004
FINDIS	-0,0103***	-0,0141***	-0,0134**	-0,0151***	-0,0165**	-0,0134***	-0,0140***	-0,0160***
IPOAGE	-0,0538***	-0,0516***	0,0515***	-0,0507***	-0,0739***	-0,0576***	-0,0641***	-0,0562***
USDTL	0,2391***	0,2391***	0,2387***	0,2387***	0,2324***	0,2554***	0,2239***	0,2555***
INTEREST	-0,0141***	-0,0137***	-0,0138***	-0,0136***	-0,0062	-0,0078***	-0,0164***	-0,0078***
DR*ln(MCAP)					-0,0791	0,0921	0,0763	0,0843
DR*TANGIBLE					0,9388***	0,8601***	0,4962	0,8779***
DR*LQ					-0,0336	-0,1295**	-0,4780***	-0,1687***
DR*TAX					-0,0014	-0,0049	0,0018	-0,0048
DR*(EBITDA/TA)					0,5331	0,5311	0,2738	0,679
DR*(RETAINED/TA)					0,3737	-0,0452	0,604	0,0137
DR*PER					0,00005	-0,0004	-0,00008	-0,0004

DR*FINDIS					0,0321	-0,0608	0,0077	-0,0793
DR*IPOAGE					0,0390***	0,0369***	0,0363***	0,0349**
DR*USDTL					0,0015	-0,1151**	0,0191	-0,1193**
DR*INTEREST					-0,0159**	-0,0382***	0,0067	-0,0,69***
cons	-1,2225***	-1,0893***	-1,0254***	-0,9997***	-0,9487**	-1,0340***	-0,0702	-0,9442***
Wald Statistics	678,28***	674,61***	674,30***	677,76***	729,60***	714,25***	743,08***	719,52***
LR test	1859,64***	1910,02***	1935,85***	1913,64***	1743,97***	1847,75***	1749,86***	1852,69***
Rho	0,47	0,48	0,48	0,48	0,48	0,48	0,47	0,48
Left Censored	6684	6684	6684	6684	6684	6684	6684	6684
Uncensored	2430	2430	2430	2430	2430	2430	2430	2430
CM-Test	64,656***	43,627***	24,790***	46,902***	17,929***	37,668***	79,775***	38,475***
Chi2 Test	637,39***	553,03***	467,13***	567,67***	622,24***	543,32***	615,34***	556,95***

In literature, other crucial reason for use Z score in analysis is that Z score variable does not cause the collinear relation within other explanatory variables. In general, outputs tell us consistent results about the relationship between leasing propensity and Altman Z score. In accordance Model 1, 2, 3, 4, there is a significant and negative relation between bankruptcy risk of firm and leasing propensity. As the firm's financial well-being improves, we see that it uses less leasing. In literature, (Krishnan & Moyer, 1994) studied on the relationship between bankruptcy costs and the financial leasing decision. They found that as bankruptcy risk is increasing, firms tend to lease financing. This result is consistent with our result.

IPO date is the period from the date of IPO to present. We use this variable as a proxy of recognition in finance world. Furthermore, a factor that negatively affects the likelihood of a loan application being rejected by the bank. In study, results show us that there is a negative and significant relationship between leasing propensity and IPO date. This result is supported with the results of study of (Cosci, Guida, & Meliciani, 2015). Namely, the possibility of using debt increases as the recognition, transparency and awareness of a company will increase with the years of being open to the public. Because the company can reach bank debt more easily than an unknown company.

Unlike the literature, we add two different variables such as interest rates and exchange rates. Especially recent years the current economic and financial situation of Turkey bring us about using of exchange rate differences and interest rates variables. Most of firms listed in BIST provide raw materials and energy with US dollars. Turmoil behavior of dollar- Turkish Liras exchange rates cause bankruptcy for some firms.

Table 25 Random Effect Tobit Model Regression by Main Industries for BIST Listed Firms

	Model I	Model II	Model III	Model IV
Dependent Variables	DR	LDR	SDR	LDR&SDR
Materials	0,2333***	0,1016	0,0877	0,1301 0,1100
Consumer Staples	0,2780	-0,6557***	-0,9151***	-0,9853*** -1,2390***
Consumer Discretionary	-0,2712*	0,0575	-0,8351***	-0,1924 -0,9009

One of the most important reasons for companies to make financial leasing is management of exchange rate risk and interest rate risk. To evaluate the effect of change of interest rate and exchange rate on leasing propensity, we add them into the model. As change of dollar rates increase, we see that firms tend to lease more significantly. Firms prefer to lease rather than debt loan because of dollar exchange rates steepen. On the other hand, increasing of change of interest rate causes a significant decrease of use of lease. Unlike the relationship between dollar exchange rate and leasing propensity, there is reverse significant relationship between interest rate and leasing propensity. These results are consistent with my research expectation which there is positively significant relationship between leasing and currency rates and negatively significant relationship between leasing and interest rate. Firms prefer to use lease management of currency risk wherefore if they buy the equipment with loan, they face the risk of increase of dollar.

Change of Vat rates is checked by constructing a time dummy between the years 2007 and 2012 in model. Negative and significant leasing propensity is found between the year 2007 and 2012. In the years when VAT values increased 2007 - 2012, using leasing decreased significantly¹⁴. Results are consistent that increase of VAT rate causes the decrease of use of lease propensity.

To evaluate the leasing propensity in different sectors industrials, we used sub-samples for main industries at Table 25. There is a significant and positive relationship between leasing propensity and materials industries with respect to model 1 for Borsa Istanbul Stock Exchange listed firms. On the other hand, there is a significant and negative relationship between leasing propensity and consumer discretionary with respect to model 1. Moreover, findings lead us about negative and significant relationship between leasing and consumer staples industries.

¹⁴ Results are presented in Appendix D.

For more comprehensive results, I re-run model 1, 2, 3, 4 with interaction variables. My main purpose of this comprehensive study is to find the relationship between any variable and leasing propensity at the same debt level. To explain more clearly, I investigated and checked the question of whether there is a significant alteration in use of leasing of companies with the same debt level when their level of size $\ln(\text{MCAP})$, collateral TANGIBLE , liquidity LQ , effective tax rate TAX , profitability EBITDA/TA , past profitability RETAINED/TA , growth opportunity PER , financial distress FINDIS , IPO age IPOAGAE , exchange rate $\text{USD\TL}$, interest rate INTEREST shifted.

According to model 5, 6, 7, 8 results on table 24, there is an insignificant and positive relationship between leasing propensity and firm size at same debt level. Moreover, there is a significant and positive relationship between leasing propensity and amount of collateral at same debt level. This means that companies have more collateral with the same debt level are significantly use more leasing. When we look at the relationship between leasing propensity and past profitability rate, there is an insignificant relationship at same debt level. There is positive and significant relationship between ipoage and lease propensity at same debt level. Namely, firms that have been traded on the stock market for a longer time make more leases. Last, there is a negative and significant relationship between leasing propensity and change of interest rate. As the interest rates increase, the use of leasing among companies with the same debt level begins to decline.

Since the estimation is built on the maximum likelihood method in the random effect tobit model, instead of the F test, Likelihood Ratio Test (LR test) statistics are calculated to test the goodness of fit of the model, and z statistics are calculated instead of the t statistic to test the significance of the parameters (Tabachnick & Fidell, 2013; Yerdelen Tatoğlu, 2018). At all models, Likelihood ratio test statistics are significant. According to the result of the LR test, the H_0 hypothesis is rejected, in other words, it is seen that the standard error of the individual

effect is different from zero, the pooled model is not suitable. Moreover, Wald statistics are reported for all models of random effect tobit model. If prob value of Wald statistics is smaller than 0,005 ($p < 0,005$), model is significant for this regression (Yerdelen Tatoğlu, 2018). In this study, random effect tobit model is significant for all models because of prob value of Wald statistics are smaller than 0,005. Number of uncensored data are 2430 and number of censored data are 6684¹⁵.

4.2. Main Models, Sector Specific Analysis, And Interaction Variables for Small & Medium Enterprises and Large Enterprises

In this part, we try to evaluate the relationship between lease and debt for small & medium enterprises SME and large enterprises LE. While making SME and LE distinction for sample of Borsa Istanbul stock exchange listed firms, we used the definitions of (KOSGEB, 2021). Number of employees of firm is used to define SME and LE. SME firms consist of less than 250 employees and LE consist of more than 250 employees according to definition of (KOSGEB, 2021).

After determining SME and LE samples according to definition of (KOSGEB, 2021), there are 42 firms and 62 quarterly time periods between the years 2004Q3 and 2019Q4 for SMEs. Totally, 2604 firm-level data are occurred for SMEs. There are 105 firms and 62 quarterly time periods between the years 2004Q3 and 2019Q4 for LEs. Totally, 6510 firm-level data are occurred for LEs.

For small and medium enterprises, the lease-to-debt relationship is significant and negative according to the definition of debt as short-term debt. It means that when SMEs must choose between short-term debt or lease, they only choose one. That is, there is a substitutional

¹⁵ Study of (Beattie, Goodacre, & Thomson, 2000) consists of similar uncensored and censored data rate for tobit regression.

relationship between lease and short-term debt. For small and medium-sized firms, there is a significant and negative relationship between retained earnings and lease. We concluded that as the retained earnings increases, it uses less leasing. Again, there is a significant and negative relationship between firms' financial distress and lease. As the financial situation of the companies improved, the use of lease decreased. There is a significant but inconsistent relationship between firm age and the lease. There is a significant and positive relationship between the American Dollar & Turkish Liras exchange rate difference and lease use. As the exchange rate difference increases, we see that companies give more importance to the use of leasing.

For large enterprises, in the analysis made using the definition of debt ratio as total debt divided by total assets at Model 1 on table 26, a significant and positive relationship was found between debt and leasing. Likewise, in the analysis in which we examined the large enterprises sample group, there is a significant and negative relationship between leasing and the amount of collateral, profitability, retained earnings, firm age, and interest.

In other words, the use of leasing decreases as the amount of collateral, profitability, retained earnings of the company, firm age and the interest rate increases. There is a significant and positive relationship between the change of dollar exchange rate and the use of leasing.

Table 26 Random Effect Tobit Model Regression for Small & Medium Enterprises with Interactions of BIST Listed Firms

Sample consists of 42 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 2604 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. ln(MCAP) is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PER is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. INTEREST shows active bond interest. USDTL is the change of exchange rate US dollar - Turkish Liras. IPOAGE which is measured current year minus initial public offer IPO year. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Dependent Variable	LR							
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8
DR	0,0634				-1,9144			
LDR		-0,1715		-0,3248**		-14,5411***		-14,6319***
SDR			-0,3638***	-0,4338***			0,692	-0,4536***
ln(MCAP)	0,4416***	0,4322***	0,4089***	0,4034***	0,4907***	0,1710*	0,6084***	0,1478
TANGIBLE	-0,1412	-0,1565	-0,1909*	-0,2112*	-0,7365***	-0,1525	-0,4667**	-0,236
LQ	0,0001	0,00013	0,00012	0,0001	-0,004	0,00083	-0,0101	0,0013
TAX	0,0002	0,0002	0,0002	0,0002	0,0014	-0,0023	0,0011	-0,0021
EBITDA/TA	-0,0729	-0,1284	-0,1076	-0,1847	-0,4654	-0,1886	-0,149	-0,1798
RETAINED/TA	-0,7319***	-0,7291***	-0,8533***	-0,8459***	-1,3480***	-0,6815**	-1,2151***	-0,7765***
PER	0,00003	0,00002	0,00003	0,00002	0,00002	0,00005	0,00009	0,00005
FINDIS	-0,0124**	-0,0137***	-0,0167***	-0,0183***	-0,0105	-0,0089*	-0,0098	-0,0131**
IPOAGE	0,0461***	-0,0451***	-0,0446***	-0,0432***	-0,0744***	-0,0424***	-0,0698***	-0,0399***
USDTL	0,2679***	0,2648***	0,2640***	0,2601***	0,2600***	0,2377***	0,2867***	0,2295***
INTEREST	0,2679***	-0,0056	-0,0053	0,0057	0,0019	-0,0027	0,0095	-0,0029
DR*ln(MCAP)					0,1155	1,9375***	-0,256	1,9648***
DR*TANGIBLE					0,7461*	0,0448	0,3812	0,1604

DR*LQ					0,0254	-0,0365	-0,0514	-0,059
DR*TAX					-0,0023	0,0143	-0,0025	0,0133
DR*(EBITDA/TA)					1,3896**	1,4451	1,7248**	1,2057
DR*(RETAINED/TA)					1,8190**	0,8346	1,4434	0,6754
DR*PER					0,0157	-0,0012*	-0,0002	-0,0012*
DR*FINDIS					-0,1596***	-0,1861	-0,2938***	-0,2803*
DR*IPOAGE					0,0537***	0,0079	0,0761***	0,008
DR*USDTL					0,0192	0,0888	-0,0699	0,1466
DR*INTEREST					-0,0123	-0,0161	-0,0338**	-0,0191
cons	-3,7515***	-3,6250***	-3,3240***	-3,2115***	-3,3604***	-1,6675**	-4,3159***	-1,2777*
Wald Statistics	183,76***	185,26***	191,37***	195,81***	208,19***	208,18***	227,04***	220,25***
LR test	509,31***	529,81***	559,20***	547,61***	462,3***	480,76***	472,05***	499,39***
Rho	0,59	0,47	0,61	0,63	0,62	0,59	0,63	0,61
Left Censored	2183	2183	2183	2183	2183	2183	2183	2183
Uncensored	421	421	421	421	421	421	421	421

***, **, * are denoted 1%, %5, 10%, respectively.

We see that the use of leasing has also increased with the increase in the change of dollar exchange rate. Moreover, there is significant and negative relationship between lease and liquidity for large enterprises which are at same debt level. It means that they prefer to use debt rather than lease.



Table 27 Random Effect Tobit Model Regression with Interactions for Large Enterprises of BIST Listed Firms

Sample consists of 105 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 6510 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. ln (MCAP) is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PER is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. INTEREST shows active bond interest. USDTL is the change of exchange rate US dollar - Turkish Liras. IPOAGE which is measured current year minus initial public offer IPO year. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Dependent Variable	LR							
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8
DR	0,3169***				1,0905			
LDR		0,0389		0,0521		1,4678		1,4706
SDR			0,0215	0,0393			-0,1179	-0,0485
ln (MCAP)	0,1185***	0,1067***	0,1081***	0,1084***	0,1891***	0,1332***	0,0843	0,1316***
TANGIBLE	-0,6360***	-0,6517***	-0,6430***	-0,6468***	-1,0911***	-0,7804***	-1,0103***	-0,7889***
LQ	-0,0115	-0,0288***	-0,0270**	-0,0264**	-0,0004	-0,0123	-0,0005	-0,0147
TAX	-0,001	-0,0011	-0,0011	-0,0011	-0,0019	-0,00003	-0,0048	-0,00004
EBITDA/TA	-0,4540***	-0,5075***	-0,5060***	-0,5017***	-0,7003**	-0,4286**	-0,3818	-0,4380***
RETAINED/TA	-0,2453**	-0,3738***	-0,3789***	-0,3637***	-0,2333	-0,3626***	-0,4530***	-0,3768***
PER	-0,0009	-0,005	-0,005	-0,0044	0,00001	0,0104	-0,0029	0,0082
FINDIS	0,0067	0,0045	0,0039	0,0045	-0,0157	0,0039	-0,0152	0,0038
IPOAGE	-0,0576***	-0,0544***	-0,0543***	-0,0546***	-0,0749***	-0,0591***	-0,0536***	-0,0587***
USDTL	0,2343***	0,2343***	0,2343***	0,2344***	0,2322***	0,2491***	0,1821***	0,24491***
INTEREST	-0,0154***	-0,0148***	-0,0147***	-0,0148***	-0,0066	-0,0091***	-0,0173***	-0,0090***
DR*ln(MCAP)					-0,1887**	-0,1124	-0,0687	-0,1133
DR*TANGIBLE					0,7643***	0,5994*	0,6863	0,6090*

DR*LQ					-0,1307***	-0,2453***	-0,6316***	-0,2532***
DR*TAX					0,0018	-0,0034	0,0118	-0,0034
DR*(EBITDA/TA)					0,0809	-0,2527	-0,6126	-0,0034
DR*(RETAINED/TA)					0,3326	0,1682	0,7807	-0,2175
DR*PER					0,00003	-0,00004	0,00003	0,1859
DR*FINDIS					0,1016**	-0,0517	0,1216**	-0,00003
DR*IPOAGE					0,0366***	0,0317*	0,0054	-0,0531
DR*USDTL					-0,0063	-0,1032*	0,1193**	0,0317*
DR*INTEREST					-0,0174**	-0,0370**	0,0064	-0,1045*
cons	-0,4615	-0,2145	-0,234	-0,2461	-0,6238	-0,4605	0,4413	-0,4256
Wald Statistics	522,86***	512,82***	512,99***	512,81***	565,10***	546,23***	567,63***	546,63***
LR test	1279,53***	1278,81***	1273,12***	1268,11***	1189,16***	1229,33**	1141,43***	1220,96***
Rho	0,44	0,43	0,43	0,43	0,44	0,43	0,41	0,43
Left Censored	4501	4501	4501	4501	4501	4501	4501	4501
Uncensored	2009	2009	2009	2009	2009	2009	2009	2009

***, **, * are denoted 1%, %5, 10%, respectively.

4.3. Conclusion

This study is about the relationship between lease and debt in Borsa Istanbul Stock Exchange listed firms. We investigated whether there is substitutionary or complementary relationship between lease and debt. Sample consist of 147 firms and 62 quarterly firm-level data between the years 2004Q3-2019Q4. As a result, there are 9114 firm-level data. Random effects tobit regression model which is proper for limited dependent variable model ran to investigate the relationship between lease and debt.

Results indicate that there is a positive and significant relationship between the financial leasing and the debts i.e., complementary relationship between lease and debt. I used control variables as firm size $\ln(\text{MCAP})$, collateral amount TANGIBLE/TA , firm's liquidity LQ , firm's tax liabilities TAX , past and current profitability RETAINED/TA and EBITDA/TA , investment and growth opportunities PER , firm's financial bankruptcy situation FINDIS , the date when the firm is listed on the stock market, i.e., firm age IPOAGE , changes in interest rate INTEREST and exchange rates $\text{USD\TL}$.

According to the definition of total debt, the relationship between leasing and debt is significant and positive. That is, the relationship between leasing and debt is complement.

There is negative and significant relationship between leasing and collateral amount, past and current profitability, financial distress, firm age, changes of interest rates. While increasing of collateral amount, past and current profitability, firm age, changes of interest rates, firms use more debt than lease. Moreover, we see that the use of leasing decreases as the firm improves financially. On the contrast, there is positive and significant relationship between leasing and firm size, change of USD-Exchange rate. Increasing of

change of USD-TL exchange rate, firm size increases the leasing propensity more than debt.

Moreover, I also looked at the impact of the VAT rate change implemented by the government between 2007 and 2012 on leasing and debt selection. I found that there is negative and significant leasing propensity in the years 2007 and 2012.

We also checked whether the selection of debt and leasing differs significantly by sector. There is a significant and positive relationship between leasing propensity and materials industries. On the other hand, there is a significant and negative relationship between leasing propensity and consumer discretionary. Moreover, findings lead us about negative and significant relationship between leasing and consumer staples industries.

In our model, where we examined the effect of the change in the VAT rate between 2007 and 2012 on the use of leasing, we concluded that the VAT dummy variable has a significant and negative relationship with leasing. In other words, the increase in the VAT rate decreased the use of leasing.

For companies with the same debt level, there is a significant and positive relationship between leasing and firm age, the amount of collateral. Moreover, there is a significant and negative relationship between leasing and interest rate, effective tax rate.

For SMEs, there is significant and negative relationship between leasing and past profitability, financial distress level. There is significant and positive relationship between firm age, change of exchange rate, interest rate.

For SMEs with the same debt level, there is a significant and positive relationship between leasing and firm age, amount of collateral, profitability, past profitability. There is a significant and negative relationship between leasing and financial distress level.

For LEs, there is significant and positive relationship between leasing and total debt. This means that leasing and total debt is complement for LEs. Furthermore, there is significant and negative relationship between leasing and amount of collateral, profitability, past profitability, firm age, interest rate. Also, there is significant and positive relationship between leasing and change of exchange rate.

For LEs with the same debt level, there is significant and positive relationship between leasing and firm age, collateral, financial distress level. As well as there is significant and negative relationship between leasing and interest rate, liquidity. Additionally, for LEs with the same debt level, there is significant and negative relationship between leasing and the industrials of consumer discretionary.

This study is the first research about leasing in Turkish listed companies. From this point of view, this study is the first and gives comprehensive information about leasing propensity for Borsa Istanbul Stock Exchange listed firms. And this gives comprehensive results for leasing market in Turkey.

This study sheds light on capital structure makers, investors, and firms' managers to reach about right borrowing. Most of all, this information will be useful for leasing companies to identify their potential customers. As an emerging economy, Turkey needs deep and high volume in the leasing market and leasing diversity.

CHAPTER 5: THE RELATIONSHIP BETWEEN LEASING AND DEBT IN BRICS PUBLIC FIRMS: EMPIRICAL ANALYSIS AND RESULTS

5.1. Main Models, Sector Specific Analysis, And Interaction Variables

The main purpose of this study is to examine the relationship between lease and debt for Brics countries listed firms. While doing this, we carried out the study by adding the factors that take into account the size of the firms $\ln(\text{MCAP})$, the collateral amount of firms TANGIBLE , the liquidity ratio of the firm LQ , the tax rate paid by the firm TAX , the profitability structure of the firm EBITDA/TA , retained earnings RETAINED/TA , the growth opportunities PER , and the financial distress of the firms FINDIS , firm age IPOAGE , exchange rate difference for relevant countries EXCRATE and interest rate INTEREST .

Model 1, Model 2, Model 3, Model 4 are main models¹⁶. Model 5, Model 6, Model 7, Model 8 are derived from main models with interaction variables. Furthermore, I study on the lease and sector relationship with sub-samples at table 29.

The relationship between lease and debt is consistently significant in all models when we measure the debt variable as long-term debt minus long-term financial lease over total assets LDR . When we look at the main models results (Model 1, Model 2, Model 3, Model 4), there is a significant and negative relationship between lease and debt which is measured by book value of long-term debt minus long-term financial lease over total assets LDR . Negative significant relationship between lease and debt means that there is substitutionary relationship between lease propensity and debt ratio in the long run (Krishnan & Moyer, 1994; Yan, 2006; Deloof & Verschueren, 1999; Beattie, Goodacre, & Thomson, 2000; Yan, 2006; Deloof,

¹⁶ The main models, model 1, model 2, model 3, model 4 studied with raw data, i.e., without taking first or second differences, are reported in appendix C.

Lagaert, & Verschueren, 2007); (Cosci, Guida, & Meliciani, 2015; Munir, Kok, Teplova, & Li, 2017; Zhang, Zhai, & Sun, 2019). And we do not reach significant relation between lease and debt which is measured as DR and SDR in any models.

Profitability is a proxy of performance measure. Static theory suggest that debt level is positively correlated with profitability. More profitable firms have more income, more likely to have high tax rates and less susceptible to bankruptcy. In all debates, more profitable firms can access to low-cost debt easier than less profitable firms (Kare & Herbst, 1990; Krishnan & Moyer, 1994). There is consistently significant and negative relationship between lease and firm profitability EBITDA/TA (Ang & Peterson, 1984; Giner & Pardo, 2017; Deloof, Lagaert, & Verschueren, 2007). It can be said that as the profitability of the companies increases, they give up using leases and turn to debt. On the other words, as soon as firms increase their profitability level, they reach debt easier and prefer to use debt.

IPOAGE variable indicates firm age. It is observed that the tendency to use leasing increases as firm age increases. In other words, as the years in which companies are traded on the stock exchange increase, the rate of leasing use increases. There is a significant and positive relationship between lease and EXCRATE which is measured by the change of exchange rate US dollar - relative currency. As the exchange rate increased, companies preferred leasing, which is an alternative borrowing method instead of using debt. Currency risk encouraged companies to avoid borrowing and use leasing, which is a less risky way of borrowing.

Table 28 Random Effect Tobit Model Regression with Interactions for BRICS Countries Listed Firms

Sample consist of five countries: Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years. LR is measured by book value of financial leases over total assets. DR is measured by the ratio of book value of total long-term debt net of capital leases to total assets. LDR is measured by book value of long-term debt minus long-term financial lease over total assets. SDR is measured by book value of short-term debt minus short-term financial lease over total assets. $\ln(\text{MCAP})$ is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Dependent Variable	LR							
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8
DR	0,0012				0,0165***			
LDR		-0,0018***		-0,0017***		0,0209***		0,0211***
SDR			0,0003	0,0002			-0,0079	0,0003
$\ln(\text{MCAP})$	-0,0001	-0,0001	-0,0002	-0,0002	-0,0003	0,0003	-0,0001	0,0003
TANGIBLE	-0,0014	-0,0012	-0,0014	-0,0012	-0,0014	-0,001	-0,0006	-0,001
LQ	-0,0076	-0,0071	-0,0066	-0,0069	-0,0154	-0,0029	-0,0037	-0,0027
TAX	0,0088	0,0065	0,0078	0,0067	-0,00003	-0,0001	0,00004	0,0001
EBITDA/TA	-0,0018***	-0,0019***	-0,0018***	-0,0020***	-0,0016***	-0,0018***	-0,0016***	-0,0018***
RETAINED/TA	-0,0001	-0,0001	-0,00004	-0,0001	-0,00003	-0,0001	-0,0001	-0,0001
PE	-0,0002	-0,0002	-0,00024	-0,0003	-0,0002	-0,0003	-0,0003	-0,0003
FINDIS	-0,0027	-0,0029	-0,0027	-0,0029	-0,0008	-0,0027	-0,0017	-0,0027
IPOAGE	0,0002***	0,0003***	0,0003***	0,0003***	0,0003***	0,0003***	0,0003***	0,0003***
EXCRATE	0,0001**	0,0001**	0,0001**	0,0001**	0,00002	0,00004	0,0001**	0,00004

INTEREST	0,0001	0,0002	0,0001	0,0002	0,00023**	0,00042***	0,00003	0,0004***
DR*ln(MCAP)					0,0031*	-0,0025**	0,0001	-0,0025**
DR*TANGIBLE					0,0016	-0,0009	-0,0034	-0,0008
DR*LQ					0,0001	0,00003	0,0001	-0,00003
DR*TAX					0,001	0,0001	-0,0002	0,0002
DR*(EBITDA/TA)					-0,0015	-0,0007	-0,0006*	-0,0007
DR*(RETAINED/TA)					-0,0004	0,00014	0,0002	0,0002
DR*PE					-0,0003	0,0005	0,1292	0,0005
DR*FINDIS					-0,00001	0,0176	0,0045	0,0175
DR*IPOAGE					-0,0008***	-0,0005***	-0,0004***	-0,0005***
DR*EXCRATE					0,0008***	0,0002	-0,0001	0,0002
DR*INTEREST					-0,0012**	-0,0023***	0,0007***	-0,0023***
cons	-0,0077***	-0,0075***	-0,0077***	-0,0075***	-0,0088***	-0,0101***	-0,0077***	-0,0101***
Wald Statistics	128,18***	135,57***	126,31***	136,19***	181,91***	156,88***	148,25***	158,25***
LR test	1182,72***	1222,84***	1227,38***	1222,14***	1149,61***	1201,66***	1127,61***	1201,68***
Rho	0,55	0,57	0,55	0,57	0,55	0,57	0,56	0,57
Left Censored	4486	4486	4486	4486	4486	4486	4486	4486
Uncensored	1594	1594	1594	1594	1594	1594	1594	1594
CM-Test	860,28*	880,19*	912,33*	880,75*	771,32*	906,22*	910,45*	902,67*
Chi2 Test	5585,12*	1149,23*	1148,78*	1079,17*	8894,34*	1338,63*	1111,15*	1142,23*

***, **, * are denoted 1%, %5, 10%, respectively.

Note1: All interaction variables are generated with total debt DR for model 5.

Note2: All interaction variables are generated with long-term debt LDR for Model 6.

Note3: All interaction variables are generated with short-term debt SDR for Model 7.

Note4: All interaction variables are generated with long-term debt LDR for Model 8

Table 29 Random Effect Tobit Regression of Main Industries for BRICS Countries Listed Firms

	Model I	Model II	Model III	Model IV
Variables	DR	LDR	SDR	LDR&SDR
Wholesale Trade	-0,0162**	-0,001	-0,0004	-0,0009 -0,0004
Public Administration	0,0011	0,004	-0,0045	0,0028 -0,0030
Mining	0,0011	-0,0001	-0,0005	-0,0001 -0,0002
Transportation, Communications, Electric, Gas and Sanitary service	0,0001	0,0007	-0,0009	0,0004 -0,0010
Agriculture, Forestry and Fishing	0,0411***	-0,0001	0,0003	-0,0001 0,0003
Manufacturing	0,0020*	-0,0030***	-0,0003	-0,0030 -0,0003
Services	-0,0098***	0,0003	0,0007**	0,0009 -0,0007**

There is no significant relationship between lease and other factors such as the size of the firm's $\ln(\text{MCAP})$, the collateral amount of firms TANGIBLE , the liquidity ratio of the firm LQ , the tax rate paid by the firm TAX , retained earnings RETAINED/TA , the growth opportunities PER , and the financial distress of the firms FINDIS and interest rate INTEREST for main models Model 1, Model 2, Model 3 and Model 4. In other words, the size of the firm's $\ln(\text{MCAP})$, the collateral amount of firms TANGIBLE , the liquidity ratio of the firm LQ , the tax rate paid by the firm TAX , retained earnings RETAINED/TA , the growth opportunities PER , and the financial distress of the firms FINDIS and interest rate INTEREST are not an indicator of leasing propensity for BRICS countries listed companies.

To evaluate the leasing propensity in different sectors, I used sub-samples for main industries such as wholesale trade, public administration, mining, transportation communications electric gas and sanitary service, agriculture forestry and fishing, manufacturing, services. There is a negative and significant relationship between wholesale, services manufacturing and lease using. On the other hand, there is a positive and significant relationship between agriculture forestry fishing and lease using.

For more comprehensive results, I re-run main models with interaction variables Model 5, Model 6, Model 7, Model 8. My main purpose of this comprehensive study is to find the relationship between any variable and leasing propensity at the same debt level. To explain more clearly, I investigated and checked the question of whether there is a significant alteration in use of leasing of companies with the same debt level when their level of size $\ln(\text{MCAP})$, collateral TANGIBLE , liquidity LQ , effective tax rate TAX , profitability EBITDA/TA , past profitability RETAINED/TA , growth opportunity PER , financial distress FINDIS , IPO date IPOAGE , exchange rate differences EXCRATE and interest rate INTEREST is shifted.

There is a significant and negative relationship between leasing propensity and IPOAGE at the same debt level. When IPOAGE of firms are increasing, use of leasing is decreasing for the firm which is at same debt level for Model 5, Model 6, Model 7, Model 8.

There is a significant and negative relationship between leasing use and interest rate INTEREST at the same debt level for Model 5, Model 6, Model 8. At the same debt level, firms prefer to use less leasing when interest rate is increasing.

There is no significant relationship between leasing propensity and collateral amount TANGIBLE, liquidity LQ, effective tax rate TAX, profitability EBITDA/TA, past profitability RETAINED/TA, growth opportunity PER, financial distress PER, exchange rate differences EXCRATE at same debt level of firms.

Since the estimation is built on the maximum likelihood method in the random effect tobit model, instead of the F test, Likelihood Ratio Test (LR test) statistics are calculated to test the goodness of fit of the model, and z statistics are calculated instead of the t statistic to test the significance of the parameters (Tabachnick & Fidell, 2013), (Yerdelen Tatoğlu, 2018). At all models, Likelihood ratio test statistics are significant. According to the result of the LR test, the H0 hypothesis is rejected, in other words, it is seen that the standard error of the individual effect is different from zero, the pooled model is not suitable. Moreover, Wald statistics are reported for all models of random effect tobit model. If prob value of Wald statistics is smaller than 0,005 ($p < 0,005$), model is significant for this regression (Yerdelen Tatoğlu, 2018). In this study, random effect tobit model is significant for all models because of prob value of Wald statistics are smaller than 0,005. Number of uncensored data are 1594 and number of censored data are 4486¹⁷.

¹⁷ Study of (Beattie, Goodacre, & Thomson, 2000) consists of similar uncensored and censored data rate for tobit regression.

5.2. Main Models, Sector Specific Analysis, And Interaction Variables For Small & Medium Enterprises And Large Enterprises

In this part, we attempt to examine the relationship between lease and debt for small & medium enterprises SMEs and large enterprises LEs. While making SMEs and LEs distinction for BRICS sample, we used the definitions given by the stock exchanges or official website of the relevant countries. Number of employees of firm is used to define SMEs and LEs.

Table 30 Definitions of Small & Medium and Large Enterprises

Countries	Number of Employees		
	SME	LE	
BRASIL	Less than 500	More than 500	(SEBRAE, 2021)
RUSSIA	Less than 250	More than 250	(OECD ilibrary, 2021)
INDIA	Less than 300	More than 300	(dcmsme.gov, 2021)
CHINA	Less than 300	More than 300	(china.org, 2021)
SOUTH AFRICA	Less than 250	More than 250	(SME South Africa, 2021)

After determining SMEs and LEs samples according to table 32, 203 firms and 10 years, totally 2030 firm-level data are occurred for SMEs; 557 firms and 10 years, totally 5570 firm-level data are occurred for LEs.

When we look at the results that we studied according to the SME sample, the relationship between lease and debt was not found to be significant according to any debt ratio definitions in Model 1, Model 2, Model 3, Model 4 on a consistent basis.

For small and medium-sized companies, a significant and negative relationship was found between the amount of collateral TANGIBLE held by the companies and the use of lease; a significant and negative relationship was found between the profitability EBITDA/TA of the company and the use of lease; a significant and positive relationship was found between the financial distress situation FINDIS of companies and the use of lease; a significant and positive relationship was found between change of exchange rate EXCRATE and lease use in Model 1, Model 2, Model 3, Model 4.

According to Model 5, among companies with the same debt level, the use of lease decreased as the amount of collateral, firm age, and the interest rates increased. Likewise, among companies with the same debt level, the rate of lease utilization increased as the amount of effective tax rate and the exchange rate difference increased.

Contrary to our study for small and medium enterprises SME, the relationship between lease and debt was significant among large enterprises LE. According to the Model 1 results, we see that as the use of lease increases, so does the use of debt. For large enterprises LE, it can be said that there is a complementary relationship between lease and debt according to Model 1. For large enterprises, use of lease decrease as the profitability of the companies increases. As the period from firm age and the exchange rate difference increase the use of lease also increases.

Among large enterprises with the same debt level, the use of lease increased as the amount of collateral and exchange rate increased. Likewise, among companies with the same debt level, the use of lease decreased as the profitability of firm, firm age, interest rate increased.

Table 31 Random Effect Tobit Model Regression and Interactions for Small & Medium Enterprises of BRICS Listed Firms

Sample consist of five countries: Brazil, Russia, India, China, and South Africa stock market data. There are 203 firms from 2009 to 2018 yearly data in sample. Totally, there are 2030 firm-level data for 10 years. LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. ln (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Dependent Variable	LR							
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8
DR	0,0003				0,0956***			
LDR		0,0008		0,0015		0,0146		0,0143
SDR			-0,0012	-0,0014			-0,014	-0,0011
ln(MCAP)	0,0012	0,0012	0,0012	0,0012	-0,0002	0,0013	0,001	0,0013
TANGIBLE	-0,0054*	-0,0055**	-0,0054*	-0,0055**	-0,0012	-0,0066*	-0,0038	-0,0066*
LQ	-0,01	-0,0099	-0,0101	-0,1	-0,0197	-0,0157	-0,0105	-0,0156
TAX	0,00001	0,00002	0,00001	0,00001	-0,0003**	-0,0001	0,0003	-0,0001
EBITDA/TA	-0,0024***	-0,0024***	-0,0025***	-0,0024***	-0,0030***	-0,0035***	-0,0025***	-0,0036***
RETAINED/TA	-0,0002	-0,0002	-0,0003	-0,0004	0,0002	-0,0002	-0,0004	-0,0003
PER	-0,0003	-0,0003	-0,0003	-0,0003	-0,0001	-0,0002	-0,0001	-0,0002
FINDIS	0,00001*	0,00001*	0,00001*	0,00001*	0,00001	0,00001	0,0071	0,00001
IPOAGE	-0,0001	-0,0001	-0,0001	-0,0001	0,00003	-0,0001	-0,0001	-0,0001
EXCRATE	0,0002*	0,0002*	0,0002*	0,0002*	0,00001	0,0002	0,0002	0,0002
INTEREST	-0,0005	-0,0005	-0,0006	-0,0005	-0,00002	-0,0004	-0,0009*	-0,0004
DR*ln(MCAP)					0,0244***	-0,0012	0,0008	-0,0014
DR*TANGIBLE					-0,0830***	0,003	-0,0057	0,003
DR*LQ					0,0001	0,0002	-0,0001	0,00002
DR*TAX					0,0108***	0,0011	-0,0017	0,001

DR*(EBITDA/TA)					0,0015	0,0002	0,0007	0,0056
DR*(RETAINED/TA)					-0,0069	-0,0002	0,0003	0,0001
DR*PER					0,0015	-0,0002	-0,0003	-0,0002
DR*FINDIS					0,0001	0,00001	0,0001	0,00002
DR*IPOAGE					-0,0027***	-0,0005	-0,0002	0,0004
DR*EXCRATE					0,0023***	0,0001	0,00002	0,0001
DR*INTEREST					-0,0091**	-0,001	0,0019	-0,0011
cons	-0,002	-0,0021	-0,0018	-0,0021	-0,0069	-0,0038	0,0005	-0,0037
Wald Statistics	21,31**	21,69**	22,68**	23,78**	59,82***	26,1	28,08	27,56
LR test	194,52***	215,17***	218,28***	212,97***	195,79***	206,02***	219,18***	205,47***
Rho	0,52	0,52	0,52	0,52	0,53	0,51	0,53	0,51
Left Censored	1290	1290	1290	1290	1290	1290	1290	1290
Uncensored	334	334	334	334	334	334	334	334

***, **, * are denoted 1%, %5, 10%, respectively.

Table 32 Random Effect Tobit Model Regression and Interactions for Large Enterprises of BRICS Listed Firms

Sample consist of five countries: Brazil, Russia, India, China, and South Africa stock market data. There are 557 firms from 2009 to 2018 yearly data in sample. Totally, there are 5570 firm-level data for 10 years. LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. ln (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Dependent Variable	LR							
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8
DR	0,0020***				0,0129***			
LDR		-0,0030***		-0,0029***		0,0220***		0,0226***
SDR			0,0008***	0,0007***			0,0055	0,0007***
ln(MCAP)	-0,0004*	-0,0005**	-0,0004*	-0,0005**	-0,0004	-0,0001	-0,0008**	-0,0001
TANGIBLE	-0,0008	-0,0003	-0,0008	0,0004	-0,0015*	0,0005	0,0027**	0,0003
LQ	0,0143	0,0169	0,0157	0,0174	0,0047	0,0121	0,0078	0,0133
TAX	-0,0085	-0,0052	-0,0079	-0,0078	0,0041	0,00006	0,00001	0,0001
EBITDA/TA	-0,0019***	-0,0021***	-0,0020***	-0,0021***	-0,0011***	-0,0017***	-0,0011***	-0,0018***
RETAINED/TA	-0,00004	-0,0001	0,00001	-0,00002	-0,00003	-0,0001	-0,0001	-0,0001
PER	-0,0005	-0,0005	-0,0005	-0,0005	-0,0008	-0,0011	-0,0011	-0,001
FINDIS	-0,0047	-0,0054	-0,0044	-0,0051	-0,0028	-0,0030*	-0,0024	-0,0029*
IPOAGE	0,0003***	0,0003***	0,0003***	0,0003***	0,0003***	0,0003***	0,0003***	0,0003***
EXCRATE	0,0001**	0,0001**	0,0001**	0,0001**	0,00002	0,00001	0,0001**	0,0001
INTEREST	0,0001	0,0002*	0,0002**	0,0002**	0,0002**	0,0005***	0,0002	0,0005***
DR*ln(MCAP)					-0,0006	-0,0022**	0,002	-0,0023**

DR*TANGIBLE					0,0128**	-0,004	-0,0199***	-0,0034
DR*LQ					0,0001	0,0078	0,0001	0,0088
DR*TAX					-0,00004	-0,0003	-0,0001	-0,0003
DR*(EBITDA/TA)					-0,0048***	-0,0022**	-0,0031**	-0,0020*
DR*(RETAINED/TA)					0,0007	0,00003	0,0005**	0,0003
DR*PER					0,0031	0,0014	0,0009	0,0014
DR*FINDIS					-0,0239	0,0154	-0,0153	0,0149
DR*IPOAGE					-0,0004***	-0,0005***	-0,0004***	-0,0005***
DR*EXCRATE					0,0007***	0,0003*	-0,0001	0,0003*
DR*INTEREST					-0,0009**	-0,0025***	0,0002	-0,0026***
cons	-0,0067***	-0,0063***	-0,0069***	-0,0064***	-0,0076***	-0,0093***	-0,0078***	-0,0095***
Wald Statistics	153,72***	183,80***	157,57***	195,04***	194,42***	211,16***	201,29***	221,67***
LR test	1125,43***	1178,25***	1145,07***	1170,88***	1087,73***	1175,53***	1146,83***	1168,59***
Rho	0,59	0,65	0,59	0,64	0,59	0,65	0,59	0,59
Left Censored	3196	3196	3196	3196	3196	3196	3196	3196
Uncensored	1260	1260	1260	1260	1260	1260	1260	1260

***, **, * are denoted 1%, %5, 10%, respectively.

5.3. The Relationship Between Lease and Debt for Brics Countries with Respect to Macroeconomic Variable of GDP

In this section, I try to explain the relationship between lease propensity and debt for BRICS countries with respect to macroeconomic variable of GDP. Namely, the main purpose of creating this title is to unveil the relationship between lease and debt under information of countries level of financial and economic development.

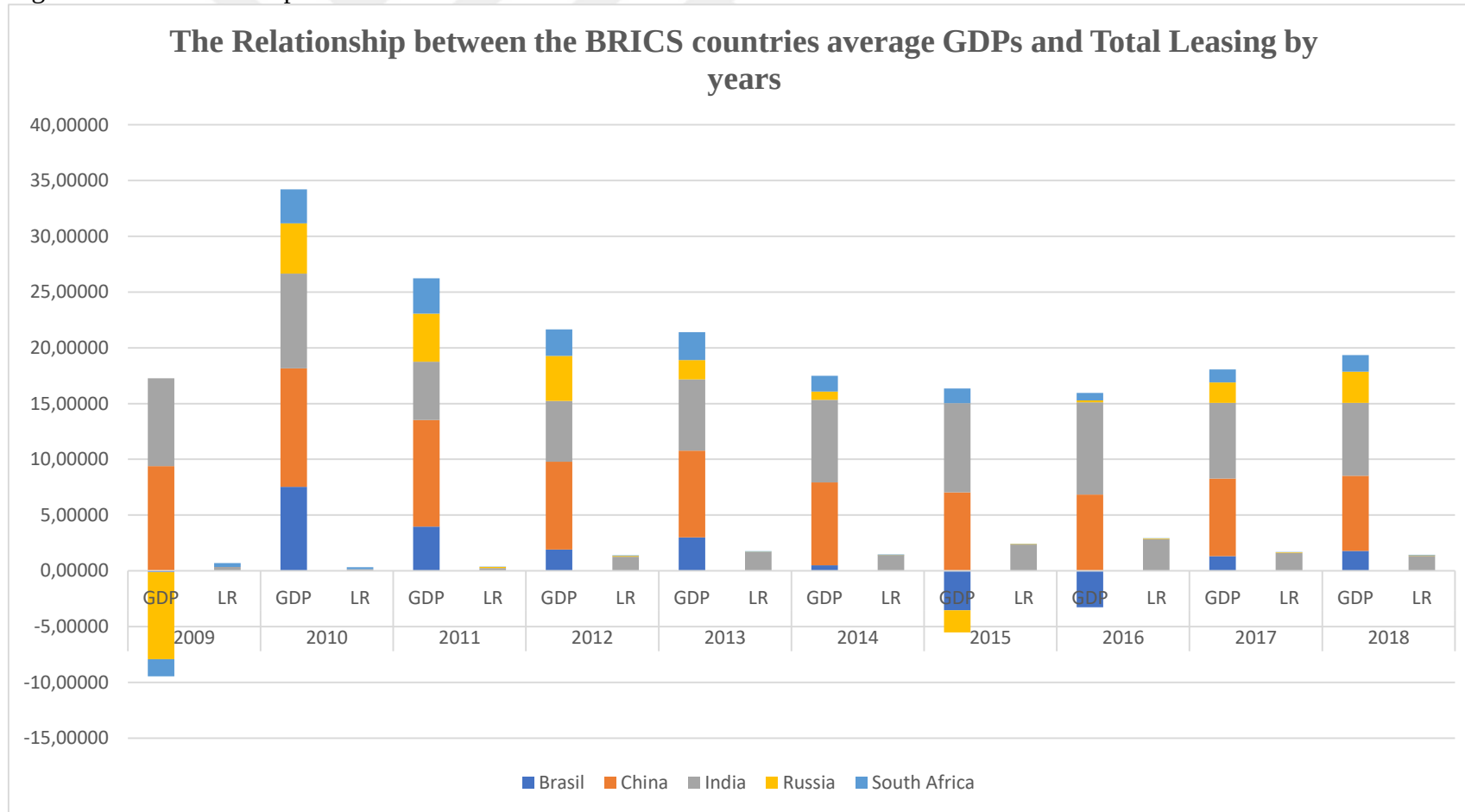
While doing this, we also used financial and economic control variables, taking into account the knowledge of the literature, in order to obtain more robust and accurate results. Leasing is the dependent variable. Debt is the main independent variable and three different versions are used as debt variable such as total debt, short-term debt and long-term debt. Control variables are orderly size of ($\ln(\text{MCAP})$), the collateral amount of firms TANGIBLE, the liquidity ratio of the firm LQ, the tax rate paid by the firm TAX, the profitability structure of the firm EBITDA/TA, retained earnings RETAINED/TA, the growth opportunities PER, and the financial distress of the firms FINDIS, firm age IPOAGE, exchange rate difference for relevant countries EXCRATE, interest rate INTEREST and most of the last one is gross domestic product rate of countries GDP.

There are 5 countries; Brazil, Russian Federation, India, China, South Africa. Totally, there are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years¹⁸. The amount of data by country are as follows, countries Brazil (160 firms-level data), Russia (100 firms-level data), India (6370 firms-level data), China (760 firms-level data), and South Africa (210 firms-level data). All items calculated US dollar currency except GDP¹⁹. Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S.

¹⁸ All firms' tickers used in this part are presented in the Appendix B for the years 2009 and 2018.

¹⁹ Definitions of all variables are mentioned and explained chapter 3.

Figure 9 The Relationship between GDPs and LR



dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are provided by Bloomberg and Equity RT. Annual rate of GDPs of countries are collected from world bank web address (Worldbank, 2022). At figure 9, the relationship between the Brics countries average GDPs and total leasing by years is reported. At first glance, it seems that there is no relationship between countries GDPs and leasing propensity according to figure 9. On the other hand, according to table 33, there is a positive and significant relationship between lease and countries' GDP value for all models (Haiss & Kichler, 2009), (Zhang, Yao, & Zhang, 2020). We see that as the annual gross domestic product of the countries increases, they tend to lease more. As the financial development of the countries such as GDP increases, the variety of financial literacy increases and as a result financial product variety increases (Clichici & Moagăr-Poladian, 2022). Leasing is a financial mechanism that needs an environment and structure that requires financial stability, robustness and development, as well as a social order that can understand and use it. In particular, we see that the lease rates of companies with the same debt level in models 6 and model 8 increase significantly with the increase in the annual gross domestic product GDP values of the countries.

Table 33 Random Effect Tobit Model Regression for BRICS Countries with Respect to Variable of GDP's

Sample consist of five countries: Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years. LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. log (MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. GDP is collected for all countries individually and used annual percentage growth rate of GDP. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Dependent Variable	LR							
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8
DR	0,0013*				0,0145**			
LDR		-0,0019***		-0,0019***		0,0125*		0,0126*
SDR			0,0002	0,0002			0,0037	0,0003
ln (MCAP)	-0,0001	-0,0002	-0,0002	-0,0002	-0,0003	0,0003	-0,0001	0,0003
TANGIBLE	-0,0016	-0,0014	-0,0017*	-0,0014	-0,0017*	-0,0011	-0,0008	-0,0012
LQ	-0,0058	-0,0052	-0,0051	-0,0051	-0,0154	-0,0026	-0,0029	-0,0025
TAX	0,00700	0,0039	0,0053	0,0039	-0,0001	-0,0001	0,0001	-0,0001
EBITDA/TA	-0,0018***	-0,0019***	-0,0018***	-0,0019***	-0,0015***	-0,0018***	-0,0016***	-0,0019***
RETAINED/TA	-0,0001	-0,0001	-0,0001	-0,0001	-0,0001	-0,0001	0,0002	-0,0001
PE	-0,0002	-0,0002	-0,0002	-0,0002	-0,0002	-0,0003	-0,0002	-0,0002
FINDIS	-0,0020	-0,0023	-0,0020	-0,0022	0,0227	-0,009	0,0005	-0,0088
IPOAGE	0,0002***	0,0002***	0,0002***	0,0002***	0,0003***	0,0003***	0,0003***	0,0003***
EXCRATE	0,0001**	0,0001**	0,0001**	0,0001*	0,0001	0,0001	0,0001*	0,0001
INTEREST	0,0004***	0,0004***	0,0004***	0,0004***	0,0004***	0,0005***	0,0003**	0,0006***
GDP	0,0004***	0,0004***	0,0004***	0,0004***	0,0004***	0,0003***	0,0004***	0,0003***

DR*ln (MCAP)					0,0036*	-0,0025**	0,0001	-0,0025**
DR*TANGIBLE					0,0017	-0,0009	-0,0035	-0,0007
DR*LQ					0,0001	0,0001	0,0001	0,0001
DR*TAX					0,001	0,0002	-0,0003	0,0002
DR*(EBITDA/TA)					-0,0137	-0,0004	-0,0006	-0,0003
DR*(RETAINED/TA)					-0,003	0,0002	0,0002*	0,0002
DR*PE					-0,0006	0,0005	-0,0001	0,0005
DR*FINDIS					-0,0001	0,0179	-0,0103	0,0177
DR*IPOAGE					-0,0008***	-0,0005***	-0,0004***	-0,0005***
DR*EXCRATE					0,0007***	0,0001	-0,0001	-0,0001
DR*INTEREST					-0,0009	-0,0017**	0,0001	-0,0017**
DR*GDP					0,0001	0,0007**	0,0001	0,0007**
cons	-0,0114***	-0,0113***	-0,0114***	-0,0113***	-0,00121***	-0,0125***	-0,0119	-0,0125
Wald Statistics	163,17***	171,04***	160,47***	172,40***	211,62***	193,64***	180,50***	196,01***
LR test	1145,23***	1199,81***	1198,61***	1200,19***	1119,63***	1178,94***	1194,60***	1180,42***
Rho	0,54	0,57	0,54	0,57	0,55	0,57	0,55	0,57
Left Censored	4486	4486	4486	4486	4486	4486	4486	4486
Uncensored	1594	1594	1594	1594	1594	1594	1594	1594
CM-Test								
Chi2 Test								

***, **, * are denoted 1%, %5, 10%, respectively.

5.4. Conclusion

In this study, we analyze the relationship between lease and debt for Brics countries listed firms. Sample consist of five countries Brazil, Russia, India, China, and South Africa stock market data. Totally, there are 760 firms from 2009 to 2018 yearly data in sample. Random effects tobit model which is limited dependent variable model is applied to analyze the models.

While examining the relationship between leasing and debt in the study, the relationship between leasing propensity and sectors and the relationship between leasing and size of the firms $\ln(\text{MCAP})$, the collateral amount of firms TANGIBLE , the liquidity ratio of the firm LQ , the tax rate paid by the firm TAX , the profitability structure of the firm EBITDA/TA , retained earnings RETAINED/TA , the growth opportunities PER , the financial distress of the firms FINDIS , firm age IPOAGE , exchange rate difference for relevant countries EXCRATE and interest rate INTEREST of companies at the same debt level were also examined. Moreover, all these studies I mentioned above were analyzed again within SMEs and LEs and more detailed results were tried to be reached.

According to definition of long-term debt, a significant and negative relationship was found between leasing and debt. This means that there is substitute relationship between lease and debt. No significant results were obtained in models with other debt definitions.

There is a significant and negative relationship between leasing and profitability for Brics countries listed firms. Moreover, there is a significant and positive relationship between leasing and IPO date, exchange rate.

I analyzed using the interaction variables for a more detailed study, the use of leasing has decreased significantly as the time passed from firm age with the same debt level. The same

is true for an increase in interest rates. We see that companies with the same debt level, increase the use of leasing as the exchange rate difference increases.

There is a negative and significant relationship between wholesale, services manufacturing and lease using. Furthermore, there is a positive and significant relationship between agriculture, forestry, fishing industrial and lease using.

We conducted the study among SMEs and LEs in order to check which financial factors change the leasing propensity of small-medium sized and large size companies.

For small-medium sized companies SMEs, there is no significant relationship between leasing and debt. However, there is a significant and negative relationship between the amount of collateral and leasing. Likewise, there is a significant and negative relationship between profitability and leasing. There is a significant and positive relationship between financial distress and leasing. Moreover, there is a positive relationship between the exchange rate difference and leasing. For SMEs with the same debt level, there is a negative relationship between age of companies and leasing. There is a significant positive relationship between exchange rate difference and leasing in SMEs with the same debt level. There is a significant and negative relationship between interest rate change and leasing in SMEs with the same debt level. In SMEs with the same debt level, there is a significant and negative relationship between the amount of collateral and leasing. There is a significant and positive relationship between the effective tax rate and leasing in SMEs with the same debt level.

For large sized companies LEs, the results of the relationship between leasing and debt differ according to debt definitions. In the study conducted according to total debt or short-term debt, the relationship between leasing and debt was found to be significant and positive. That is, the relationship between leasing and debt, according to the study by total debt and short-term debt, is complement. In the study conducted according to the definition of long-term debt, the

relationship between debt and leasing was found to be significant and negative. That is, according to the definition of long-term debt, the relationship between leasing and debt is substitute. Again, there is a significant and negative relationship between profitability and leasing. Moreover, there is a significant and positive relationship between the age of the firm, the exchange rate difference and leasing.

At the same debt level, there is a significant and negative relationship between the age of the firm, interest rate change, profitability, and leasing. At the same debt level, there is a significant and positive relationship between the exchange rate difference and leasing. There is significant but not consistent result between collateral amount and leasing.

Furthermore, Brics countries development level and lease propensity is examined in the last section. For countries development level as a proxy of countries GDP value is used. There is a positive and significant relationship between lease and countries' GDP value for all models. We see that as the annual gross domestic product of the countries increases, they tend to lease more. We also investigate how the balance between leasing and debt is between companies with the same debt level, especially with the increase in the annual gross domestic product values of the countries. We see that the lease rates of companies with the same debt level increase significantly with the increase in the annual gross domestic product GDP values of the countries.

This study is the first and only study that directly examines the relationship between leasing and debt on Brics countries. This study sheds light on creditors, leasing companies to reach about right debiting.

CHAPTER 6: CONCLUSION AND DISCUSSION

In this study, the relationship between financial leasing, which is an alternative type of borrowing, and debt was examined. Although the main question is the relationship between leasing and debt, to obtain more robust results, we had to include other financial and economic parameters in our research. As a result of extensive literature research, by adding firm size ($\ln(\text{MCAP})$), collateral (TANGIBLE), liquidity (LQ), tax (TAX), profitability (EBITDA/TA), past profitability (RETAINED EARNING/TA), growth rate (PER), financial distress (FINDIS), interest rate (INTEREST), exchange rate (EXC or USDTL) and firm age IPOAGE to my model, while examining the relationship between lease and debt, I also had the opportunity to observe the relationship between these variables and lease.

The research was carried out on two samples. The first is the study, which includes the data of public companies Borsa Istanbul stock market, and the second is the study of public companies belonging to brics countries. Borsa İstanbul public companies' data set consists of 62 quarterly data and covers the period between 2004Q3 and 2019 Q4. There are 147 companies and 9114 data in total. Brics countries listed firms' data set consists of annual data and covers 10 years between 2009 and 2018. There are 760 companies and 7600 data in total. The lease variable is the dependent variable. The principal independent variable is debt, measured in three different ways and modeled in four different ways. I arrived at four main models by using total debt, short-term debt, long-term debt, and finally, short-term debt and long-term debt as separate variables in a single model. While constructing the model, I used firm size ($\ln(\text{MCAP})$), collateral (TANGIBLE), liquidity (LQ), tax (TAX), profitability (EBITDA/TA), past profitability (RETAINED EARNING/TA), growth rate (PER), financial distress (FINDIS), interest rate (INTEREST), exchange rate (EXC or USDTL) and firm age IPOAGE as control variables in the light of the literature to obtain significant and more robust results.

Although collecting and cleaning the data, calculating the variables and finally getting them ready for analysis was the longest and most difficult stage of my thesis, it was the same part where I trained myself most technically. About 12 million data were collected and a lot of overtime was spent until the samples and models were finalized. Data were collected from data providers such as Bloomberg, Rasyonet (EquityRT), FINNET and Worldbank.org which is a website that offer open source data. Data are collected in dollar currency. Final data set is panel data. Panel data are data sets that have both time and cross-sectional dimensions. Panel data is defined as the combination of time series and cross-sectional data. That is, panel data have repeated measurements for the same individual. Since, panel data has several advantages to increase the effectiveness of predictions, such as control of individual heterogeneity (Baltagi, 2005), (Güven, 2018), more information, more degrees of freedom, more variability between variables, and less dependency, panel data set was used in this thesis. In addition to these advantages, since the panel data is generally based on micro economic data, it does not contain aggregation error and is more reliable (Baltagi, 2005).

Leasing data, which is my dependent variable, is not observed in every company. When we exclude companies for which leasing data is not observed from the sample, it causes serious information loss. I was based on methods that consider missing data due to information loss. When I reviewed the literature, I decided that it was the tobit regression analysis that could give me the one-to-one relationship between leasing and debt. Since the data set I have is panel data, I used panel tobit regression analysis.

For Borsa Istanbul public firms, results indicate that there is a positive and significant relationship between the financial leasing and the debts i.e., complementary relationship between lease and debt. According to the definition of total debt, the relationship between leasing and debt is significant and positive. That is, the relationship between leasing and debt is complement (Ang & Peterson, 1984; Adams & Hardwick,

1998; Lasfer & Levis, 1998; Mehran, Taggart, & Yermack, 1999; Koh & Jang, 2009; Devos & Rahman, 2014; Lim, Mann, & Mihov, 2017; Giner & Pardo, 2017; Ambrose, Emmerling, Huang, & Yildirim, 2019). The fact that the VAT advantage was abolished between 2007 and 2012 in Turkey- there is no significant tax benefit for leasing-, 71 percent of the companies are large-size (more robust capital structure and easier to obtain loan due to being scored by credit institutions) instead of using lease, it may have pushed companies to use debt and leasing together. There is a negative and significant relationship between leasing and collateral amount, past and current profitability, financial distress, firm age, changes of interest rates. While increasing of collateral amount, past and current profitability, firm age, changes of interest rates, firms use more debt than lease. Moreover, we see that the use of leasing decreases as the firm improves financially. On the contrast, there is a positive and significant relationship between leasing and firm size, change of USD-Exchange rate. Increasing of change of USD-TL exchange rate, firm size increases the leasing propensity more than debt. There is a negative and significant relationship between lease and collateral amount, past and current profitability, financial distress, firm age, changes in interest rates; it supports the complementary relationship between the lease and the debt and is compatible with the results. Because companies with sufficient collateral and with high current profitability can find debt more easily. Again, the high change in interest rates may have caused the leasing to lose its attractiveness. The age of the firm, or in other words its recognition in the market, is also a factor in its easy access to debt. Likewise, companies with a high reputation can reach the debt more easily than a company that has been scored by many credit institutions and therefore is not recognized for debt. As the scale of the firm increases, its access to both debt and leasing becomes more homogeneous, while the shrinkage of the firm channels the firm to certain borrowing ways. Companies in Turkey are generally highly affected by exchange rate changes when

purchasing a product. Companies that want to hedge themselves against currency fluctuations actively use the leasing as a debt instrument, which offers advantages of fixed interest and the opportunity to defer payment over the years. Moreover, I also looked at the impact of the VAT rate change implemented by the government between 2007 and 2012 on leasing and debt selection. I found that there is a negative and significant leasing propensity in the years 2007 and 2012. Companies used leasing less in the period when they lost their VAT advantage. I also checked whether the selection of debt and leasing differs significantly by sector. There is a significant and positive relationship between leasing propensity and materials industries. On the other hand, there is a significant and negative relationship between leasing propensity and consumer discretionary. Moreover, findings lead us about negative and significant relationship between leasing and consumer staples industries. While firms in the sector of consumer discretionary and consumer staples prefer to use only leasing, firms in the industrial of material prefer to use leasing and debt together. It is necessary to continue the research by trying to understand which borrowing channel the companies with the same debt level prefer, there is a significant and positive relationship between leasing and firm age, the amount of collateral. Moreover, there is a significant and negative relationship between leasing and interest rate, effective tax rate at the same debt level. For SMEs, there is a significant and negative relationship between leasing and past profitability, financial distress level. There is significant and positive relationship between firm age, change of exchange rate, interest rate. For SMEs with the same debt level, there is a significant and positive relationship between leasing and firm age, amount of collateral, profitability, past profitability. There is a significant and negative relationship between leasing and financial distress level. For LEs, there is a significant and positive relationship between leasing and total debt. This means that leasing and total debt is complement for LEs. Furthermore, there is a significant

and negative relationship between leasing and amount of collateral, profitability, past profitability, firm age, interest rate. Also, there is significant and positive relationship between leasing and change of exchange rate. For LEs with the same debt level, there is a significant and positive relationship between leasing and firm age, collateral, financial distress level. As well as there is a significant and negative relationship between leasing and interest rate, liquidity. Additionally, for LEs with the same debt level, there is a significant and negative relationship between leasing and the industrials of consumer discretionary.

For Brics countries public firms, according to definition of long-term debt, a significant and negative relationship was found between leasing and debt. This means that there is a substitute relationship between lease and debt (Krishnan & Moyer, 1994; Yan, 2006; Deloof & Verschueren, 1999; Beattie, Goodacre, & Thomson, 2000; Yan, 2006; Eisfeldt & Rampini, 2009; Singh, 2013); (Munir, Kok, Teplova, & Li, 2017; Zhang, Zhai, & Sun, 2019). In other words, companies either use debt or lease while borrowing, this means that they do not prefer to use both together. On reasons for not using leasing can be lack of awareness about leases, lack of awareness of financial institutions offering leasing, tax disadvantage, low capex requirements -cash rich entity, ownership issues (there was no transparency as regards transfer of assets at the end of the lease period), loan are easy to avail. There is a significant and negative relationship between leasing and profitability for Brics countries listed firms. We see that as the profitability of companies increases, the use of leasing decreases. Moreover, there is a significant and positive relationship between leasing and IPO age, exchange rate. I analyzed using the interaction variables for a more detailed study, the use of leasing has decreased significantly as the time passed from firm age with the same debt level. The same is true for an increase in interest rates. We see that companies with the same debt level, increase the use of leasing as the exchange rate difference increases. There is a negative and significant relationship

between wholesale, services manufacturing and lease using. Furthermore, there is a positive and significant relationship between agriculture, forestry, fishing industrial and lease using. We conducted the study among SMEs and LEs in order to check which financial factors change the leasing propensity of small-medium sized and large size companies. For small-medium sized companies SMEs, there is no significant relationship between leasing and debt. However, there is a significant and negative relationship between the amount of collateral and leasing. Likewise, there is a significant and negative relationship between profitability and leasing. There is a significant and positive relationship between financial distress and leasing. Moreover, there is a positive relationship between the exchange rate difference and leasing. For SMEs with the same debt level, there is a negative relationship between age of companies and leasing. There is a significant positive relationship between exchange rate difference and leasing in SMEs with the same debt level. There is a significant and negative relationship between interest rate change and leasing in SMEs with the same debt level. In SMEs with the same debt level, there is a significant and negative relationship between the amount of collateral and leasing. There is a significant and positive relationship between the effective tax rate and leasing in SMEs with the same debt level. For large sized companies LEs, the results of the relationship between leasing and debt differ according to debt definitions. In the study conducted according to total debt or short-term debt, the relationship between leasing and debt was found to be significant and positive. That is, the relationship between leasing and debt, according to the study by total debt and short-term debt, is complement. In the study conducted according to the definition of long-term debt, the relationship between debt and leasing was found to be significant and negative. That is, according to the definition of long-term debt, the relationship between leasing and debt is substitute. Again, there is a significant and negative relationship between profitability and leasing. Moreover, there is a significant and positive relationship between the age of the firm, the exchange rate difference and leasing. At the same debt level,

there is a significant and negative relationship between the age of the firm, interest rate change, profitability, and leasing. At the same debt level, there is a significant and positive relationship between the exchange rate difference and leasing. There is significant but not consistent result between collateral amount and leasing. Furthermore, Brics countries development level and lease propensity is examined in the last section. For countries development level as a proxy of countries GDP value is used. There is a positive and significant relationship between lease and countries' GDP value for all models. We see that as the annual gross domestic product of the countries increases, they tend to lease more. We also investigate how the balance between leasing and debt is between companies with the same debt level, especially with the increase in the annual gross domestic product values of the countries. We see that the lease rates of companies with the same debt level increase significantly with the increase in the annual gross domestic product GDP values of the countries.

This study is the first and only study that directly examines the relationship between leasing and debt on Borsa Istanbul listed firms and Brics countries listed firms with respect to under the information of macro and micro indicators such as firm size, collateral, liquidity, tax, profitability, past profitability, growth rate, financial distress, interest rate, exchange rate, firm age, value-added taxes and gross domestic product GDP rates. And also this study is the first and only study that comprehensively examines the relationship between leasing and debt on Borsa Istanbul listed firms and Brics countries listed firms with respect to basis of firm scales such as SMEs and LEs, basis of industrials, and levels of counties development.

This study sheds light on creditors, leasing companies to reach about right debiting, capital structure makers, investors, and firms' managers to reach about right borrowing. Most of all, this information will be useful for leasing companies to identify their potential

customers. As an emerging economy, Turkey needs deep and high volume in the leasing market and leasing diversity.



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Appendix A

ADANA	ADBGR	ADEL	ADNAC	AEFES	AFYON
AKCNS	AKSA	ALCAR	ALCTL	ALKA	ALKIM
ARCLK	ARENA	ARSAN	ASELS	ASLAN	ASUZU
ATEKS	AYCES	AYGAZ	BAGFS	BAKAB	BANVT
BFREN	BOLUC	BOSSA	BRISABRMEN	BRSAN	
BSOKE	BTCIM	BUCIM	BURCE	BURVA	CELHA
CEMTS	CIMSA	CLEBI	CMBTN	CMENT	DENCM
DERIM	DESA	DEVA	DGKLB	DITASDMSAS	DOAS DOBUR
DOGUB	DOKTA	DURDO	DYOBY	EDIP	EGEEN
EGGUB	EGPRO	EGSER	EMKEL	ENKAI	ERBOS
EREGL	ERSU	ESCOM	FMIZP	FROTO	GENTS
GEREL	GOLTS	GOODY	GSDDE	GUBRF	HEKTS
HURGZ	IHEVA	IHLGM	INDESINTEM	IZMDC	
KAPLM	KARSN	KARTN	KENT	KERTV	KLMSN
KNFRT	KONYA	KORDS	KRDMA	KRDMB	KRDMD
KRSTL	KRTEK	KUTPO	LINK	LUKSK	MAALT
MAKTK	MERKO	METUR	MGROS	MIPAZ	MNDRS
MRDIN	MRSHL	NETAS	NUHCM	OLMIP	OTKAR
PARSN	PENGD	PETKM	PETUN	PINSUPKART	
PKENT	PNSUT	PRKAB	SANKO	SARKY	SASA
SKTAS	SNPAM	SODA	SONME	TATGD	TBORG
TCELL	TEKTU	THYAO	TIRE	TOASO	TRKCM
TTRAK	TUKAS	TUPRS	ULKER	UNYEC	USAK
VAKKO	VESTL	VKING	YATAS	YUNSA	YYAPI

Appendix B

000033:CNE	000529:CNE	000536:CNE	000633:CNE	002277:CNE	002278:CNE
002279:CNE	002280:CNE	002282:CNE	002283:CNE	002284:CNE	002286:CNE
002287:CNE	002288:CNE	002289:CNE	002290:CNE	002291:CNE	002292:CNE
002293:CNE	002295:CNE	002296:CNE	002297:CNE	002299:CNE	002300:CNE
002302:CNE	002304:CNE	002307:CNE	002308:CNE	002309:CNE	002311:CNE
002313:CNE	002314:CNE	002316:CNE	002318:CNE	002319:CNE	002320:CNE
002321:CNE	002322:CNE	002323:CNE	002324:CNE	002325:CNE	002326:CNE
300001:CNE	300004:CNE	300006:CNE	300007:CNE	300008:CNE	300009:CNE
300010:CNE	300012:CNE	300013:CNE	300014:CNE	300015:CNE	300016:CNE
300019:CNE	300020:CNE	300022:CNE	300024:CNE	300025:CNE	300026:CNE
300027:CNE	300028:CNE	300031:CNE	300032:CNE	300033:CNE	300034:CNE
300035:CNE	300036:CNE	500002:INM	500049:INM	500059:INM	500083:INM
500085:INM	500087:INM	500093:INM	500101:INM	500102:INM	500103:INM
500108:INM	500113:INM	500128:INM	500144:INM	500170:INM	500173:INM
500207:INM	500220:INM	500227:INM	500228:INM	500233:INM	500239:INM
500241:INM	500249:INM	500257:INM	500268:INM	500285:INM	500298:INM
500300:INM	500304:INM	500312:INM	500322:INM	500325:INM	500343:INM
500354:INM	500356:INM	500366:INM	500368:INM	500387:INM	500388:INM
500390:INM	500399:INM	500404:INM	500411:INM	500440:INM	500456:INM
500460:INM	500464:INM	500480:INM	500495:INM	500510:INM	500650:INM
500674:INM	500676:INM	500780:INM	500870:INM	501425:INM	502090:INM
502742:INM	502865:INM	502937:INM	503169:INM	503776:INM	503837:INM
504076:INM	504132:INM	504220:INM	504258:INM	504614:INM	504697:INM
504879:INM	504903:INM	504988:INM	505010:INM	505163:INM	505192:INM
505242:INM	505285:INM	505320:INM	505690:INM	505710:INM	505714:INM
505800:INM	506003:INM	506022:INM	506027:INM	506074:INM	506079:INM
506109:INM	506480:INM	506525:INM	506605:INM	506685:INM	506690:INM
506820:INM	506854:INM	506894:INM	506919:INM	507205:INM	507410:INM
507526:INM	507779:INM	507998:INM	508136:INM	508306:INM	508875:INM
508906:INM	509079:INM	509148:INM	509162:INM	509449:INM	509480:INM
509525:INM	509631:INM	511034:INM	511108:INM	511411:INM	511431:INM
511523:INM	511672:INM	512024:INM	512047:INM	512093:INM	512175:INM
512455:INM	512529:INM	512553:INM	512559:INM	512587:INM	512604:INM
512608:INM	513097:INM	513117:INM	513303:INM	513369:INM	513436:INM
513446:INM	513456:INM	513513:INM	513515:INM	513517:INM	513558:INM
514034:INM	514140:INM	514211:INM	514234:INM	514286:INM	514312:INM
514326:INM	514412:INM	514442:INM	514450:INM	514484:INM	515018:INM
515093:INM	516003:INM	516022:INM	516108:INM	517059:INM	517146:INM
517201:INM	517271:INM	517334:INM	517354:INM	517372:INM	517417:INM
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519136:INM	519260:INM	519295:INM	519570:INM	520051:INM	520056:INM
520059:INM	520073:INM	520077:INM	520086:INM	520151:INM	521016:INM
521022:INM	521034:INM	521127:INM	521149:INM	521151:INM	521167:INM
521178:INM	521246:INM	522005:INM	522074:INM	522101:INM	522165:INM

522205:INM 522215:INM 522249:INM 522650:INM 523021:INM 523100:INM
 523116:INM 523204:INM 523537:INM 523586:INM 523606:INM 523638:INM
 523660:INM 523724:INM 523768:INM 523850:INM 523874:INM 524019:INM
 524051:INM 524109:INM 524129:INM 524202:INM 524342:INM 524408:INM
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 526365:INM 526371:INM 526397:INM 526477:INM 526479:INM 526508:INM
 526544:INM 526662:INM 526703:INM 526705:INM 526717:INM 526797:INM
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 532617:INM 532627:INM 532628:INM 532629:INM 532630:INM 532633:INM
 532637:INM 532641:INM 532646:INM 532647:INM 532661:INM 532674:INM
 532678:INM 532687:INM 532693:INM 532711:INM 532712:INM 532721:INM
 532722:INM 532740:INM 532744:INM 532748:INM 532749:INM 532751:INM
 532754:INM 532774:INM 532795:INM 532801:INM 532806:INM 532813:INM
 532815:INM 532817:INM 532822:INM 532830:INM 532831:INM 532841:INM
 532850:INM 532856:INM 532869:INM 532871:INM 532878:INM 532883:INM
 532890:INM 532891:INM 532896:INM 532898:INM 532899:INM 532916:INM
 532918:INM 532937:INM 532942:INM 532944:INM 532945:INM 532946:INM
 532947:INM 532948:INM 532967:INM 532972:INM 532976:INM 532987:INM
 532994:INM 532997:INM 533017:INM 533166:INM 540701:INM 590025:INM
 590051:INM 590056:INM 590057:INM 590070:INM 590072:INM 590075:INM
 600242:CNA 600259:CNA 600854:CNA 600900:CNA 601107:CNA
 601618:CNA 601668:CNA 601989:CNA 63MOONS:INN 700107:INM
 ABAN:INN ABB:INN ADANIPTS:INN AFEP:ZA AGCNET:INN
 AICHAMP:INN AIONJSW:INN ALEMBICLTD:INN ALLSEC:INN
 ALPHAGEO:INN ALT:ZA AMTEKAUTO:INN AON:ZA
 ARCHIDPLY:INN ASAHIINDIA:INN ASHAPURMIN:INN ASTRAL:INN
 ASTRAZEN:INN AUROPHARMA:INN AUTOAXLES:INN
 BALKRISIND:INN BALLARPUR:INN BALPHARMA:INN BANSWRAS:INN

BASML:INN BAU:ZA BBTC:INN BEL:INN BERGEPAINT:INN
 BHARATFORG:INNBHEL:INN BIL:INN BINANIIND:INN BPCL:INN
 BRFL:INN BSOFT:INN BURNPUR:INN BVCL:INN CADILAH:INN
 CELEBRITY:INN CELESTIAL:INN CELP5:BR CELP6:BR
 CENTEXT:INN CESC:INN CGPOWER:INN CHAMBLFERT:INN
 CHEP:RUM CIEL3:BR CNTL:RUM CRD:ZA CTE:INN
 CUMMINSIND:INN DCAL:INN DELTAMAGNT:INN DICIND:INN
 DIVISLAB:INN DREDGECORP:INN DTEX3:BR DYNAMATECH:INN
 EASUNREYRL:INNECLERX:INN EHS:ZA EIDPARRY:INN
 EKC:INN ELECTCAST:INN ELECTHERM:INN ELGIEQUIP:INN
 EMCO:INN ENGI11:BR ENGI3:BR ESCORTS:INN ESSELPACK:INN
 ETO:ZA EUROTTEXIND:INN EXCELINDUS:INN FBMC3:BR FIBR3:BR
 FINCABLES:INN FLY3:BR GARFIBRES:INN GATI:INN
 GENESYS:INN GLOBOFFS:INN GMDCLTD:INN GMRINFRA:INN
 GNDP:ZA GODREJIND:INN GOKEX:INN GRANULES:INN
 GREENPLY:INN GSKCONS:INN GTL:INN GTNIND:INN
 GTNTEX:INN GUJALKALI:INN HAVELLS:INN HBLPOWER:INN
 HCC:INN HCLTECH:INN HIKAL:INN HILTON:INN HINDALCO:INN
 HINDPETRO:INN HUG:ZA IGARASHI:INN IMBI3:BR IMBI4:BR
 IMPEXFERRO:INN INDSWFTLAB:INN INDSWFTLTD:INN INSPIRISYS:INN
 IOC:INN IPLP:ZA ISB:ZA ISKJ:RUM IZMO:INN
 JAGSNPHARM:INN JAIBALAJI:INN JAYNECOIND:INN JAYSREETEA:INN
 JBMA:INN JETAIRWAYS:INN JKPAPER:INN JMCPROJECT:INN
 JMTAUTOLD:INN JNOS:RUM JPASSOCIAT:INN JSL:INN
 JSWSTEEL:INN JUBILANT:INN KAJARIACER:INN KGM:ZA
 KIRIINDUS:INN KIRLOSBROS:INN KMEZ:RUM KOGK:RUM
 KOHINOOR:INN KSK:INN KSL:INN LEEL:INN LIPR3:BR
 LNZL:RUM LNZLP:RUM LT:INN LUMAXIND:INN
 LUMAXTECH:INN M*M:INN MAANALU:INN MAGNUM:INN
 MAHSCOOPER:INN MASTEK:INN MBECL:INN MEGASOFT:INN
 MEND3:BR MIC:INN MML:ZA MOTHERSUMI:INN MOTZ:RUM
 MSPL:INN MTNL:INN MUKANDENG:INN NBVENTURES:INN
 NIITLTD:INN NIITTECH:INN NILKAMAL:INN NITCO:INN
 NMDC:INN NOIDATOLL:INN NORBTEAEXP:INN NPKP:ZA NTCP:ZA
 NTPC:INN NUT:ZA ONMOBILE:INN ONWARDTEC:INN
 PATSPINLTD:INN PEARLPOLY:INN PLASTIBLEN:INN PNC:INN
 POLARIS:INN POLYPLEX:INN PRVI3:BR PTC:INN
 PUNJLLOYD:INN PVR:INN RADAAN:INN RADICO:INN RAIN:INN
 RAJRAYON:INN RAJVIR:INN RANASUG:INN RANEHOLDIN:INN
 RBL:INN RCOM:INN REGENCERAM:INN RELIANCE:INN
 RELINFRA:INN REPRO:INN ROLTA:INN SAGCEM:INN SAIL:INN
 SAKSOFT:INN SAKUMA:INN SANGHVIMOV:INN
 SANOFI:INN SAREGAMA:INN SEP:ZA SHAHALLOYS:INN
 SHREECEM:INN SHREYAS:INN SHRIRAMEPC:INN SICAL:INN
 SINTEX:INN SITINET:INNSMSPHARMA:INN SOMANYCERA:INN
 SONATSOFTW:INN STAR:INN STARPAPER:INN SUDARSCHEM:INN

SUNCLAYLTD:INN SUNPHARMA:INN SUPRAJIT:INN SUPREMEINF:INN
SURYAJYOTI:INN SWELECTES:INN SZPR:RUM TANTIACONS:INN
TARMAT:INN TATAMOTORS:INN TATAMTRDVR:INN
TATASTEEL:INN TCS:INN TENE5:BR THEMISMED:INN
TIRUMALCHM:INN TOR:ZA TRIGYN:INNTRIL:INN TULSI:INN
TXRX3:BR UAT:ZA UFLEX:INN UNIPLY:INN USHAMART:INN
VAKRANGEE:INN VIJSHAN:INN VISASTEEL:INN VOD:ZA
VOLTAS:INN WALCHANNAG:INN WEBELSOLAR:INN
WELCORP:INN WOCKPHARMA:INN WSI:INN ZCI:ZA
ZYLOG:INN



Appendix C

Table 34 Random Effect Tobit Model Regression for BRICS Countries with Raw Data

Sample consist of five countries; Brazil, Russia, India, China, and South Africa stock market data. There are 760 firms from 2009 to 2018 yearly data in sample. Totally, there are 7600 firm-level data for 10 years . LR is measured by book value of financial leases over market value of firm. DR is measured by the ratio of book value of total long-term debt net of capital leases to the market value of the firm. LDR is measured by book value of long-term debt minus long-term financial lease over the market value of the firm. SDR is measured by book value of short-term debt minus short-term financial lease over the market value of the firm. ln(MCAP) is measured by taking algorithms of market capitalization. TANGIBLE is total fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax . EBITDA/TA is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PE is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. IPOAGE is measured current year minus initial public offer IPO year. INTEREST shows active bond interest. EXCRATE is the change of exchange rate US dollar - relative currency. All items calculated US dollar currency. Data are provided by Bloomberg and Rasyonet (Equity RT).

Dependent Variable	LR			
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4
DR	0,0005			
LDR		-0,0021***		-0,0021***
SDR			0,0003	0,0001
ln(MCAP)	0,0005***	0,0005***	0,0005***	0,0005***
TANGIBLE	0,0218	0,0006	-0,0033	0,0005
LQ	-0,0046	-0,0002	-0,0044	-0,0044
TAX	-0,0045	-0,0082	-0,0054	-0,0082
EBITDA/TA	-0,0014***	-0,0015***	-0,0014***	-0,0015***
RETAINED/TA	0,0001	-0,00002	0,0001	-0,0122
PE	-0,0001	-0,0001	-0,0001	-0,0001
FINDIS	-0,0014	-0,0014	-0,0012	-0,0014
IPOAGE	0,00001	-0,00002	0,00001	-0,00002
EXCRATE	0,0001***	0,0001***	0,0001***	0,0001***
INTEREST	0,0003**	0,0002**	0,0003**	0,0002**
cons	-0,0181***	-0,0173***	-0,0180***	-0,0173***
Wald Statistics	312,66***	330,15***	312,26***	330,59***
LR test	1052,66***	1122,68***	1098,89***	1120,04***
Rho	0,46	0,49	0,47	0,49
Left Censored	5879	5879	5879	5879
Uncensored	1721	1721	1721	1721

***, **, * are denoted 1%, %5, 10%, respectively.

Appendix D

Table 35 Random Effect Tobit Model Regression for BIST Listed Firms With Vat Rate

Sample consists of 147 firms and 62 time periods between the years 2004Q3 and 2019Q4. Totally, there are 9114 firm-years observations. LR is the book value of total financial leases as a share of total assets. DR is total debt minus total financial leases over total assets. LDR is measured as long-term debt minus long term lease over total assets. SDR is measured as short-term debt minus short-term lease over total assets. ln(MCAP) is indicated that logarithm of market capitalization. TANGIBLE is total net tangible fixed assets over total assets. LQ is measured as current asset over current liability. TAX is tax charge over profit before tax. EBITDA/TA which is defined as EBITDA over total assets. RETAINED/TA is defined as retained earnings over total assets. PER is measured as the price earnings ratio. FINDIS is evaluated as multivariate Altman Z-score values. INTEREST shows active bond interest. USDTL is the change of exchange rate US dollar - Turkish Liras. IPOAGE which is measured current year minus initial public offer IPO year. Value-Added Taxes VAT dummy variable which is measured as a year dummy. It indicates the years of increasing VAT rates assign to 1, others zero. The currency unit of measurement is USD Dollars. Data are provided from Financial Information News Network and Bloomberg database.

Dependent Variable	LR			
Independent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4
DR	0,1654***			
LDR		-0,1276*		-0,1627**
SDR			-0,0701	-0,1063*
ln(MCAP)	0,1904***	0,1836***	0,1792***	0,1789***
TANGIBLE	-0,3925***	0,3974***	-0,4086***	-0,4064***
LQ	0,00010	0,0001	-0,0009	-0,0001
TAX	0,00003	0,00002	0,00003	0,00002
EBITDA/TA	-0,2656***	-0,3147***	-0,3098***	-0,3301***
RETAINED/TA	-0,3212***	-0,4100***	-0,4041***	-0,4396***
PER	0,00002	0,00002	0,00002	0,00001
FINDIS	-0,0180***	-0,0160***	-0,0154***	-0,0175***
IPOAGE	-0,0555***	-0,0532***	-0,0533***	-0,0524***
USDTL	0,2292***	0,2290***	0,2290***	0,2287***
INTEREST	-0,0154***	-0,0150***	-0,0151***	-0,0149***
VAT	-0,1173***	-0,1183***	-0,1165***	-0,1176***
cons	-1,1231***	-0,9883***	-0,9412***	-0,9119***
Wald Statistics	706,82***	704,20***	702,37***	706,63***
LR test	1864,29***	1916,63***	1938,76***	1919,64***
Rho	0,48	0,48	0,48	0,48
Left Censored	6684	6684	6684	6684
Uncensored	2430	2430	2430	2430

***, **, * are denoted 1%, %5, 10%, respectively.

Changes