CAPITAL STRUCTURE OF FIRMS: PECKING ORDER AND TRADE-OFF THEORIES, EVIDENCE FROM TURKISH STOCK EXCHANGE

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Abstract

This study aims to identify the factors that are influential on capital structure decisions of firms on the Borsa Istanbul BIST 50 Index and test which of the theories -pecking order or trade-off- is used to account for the firms' borrowing behaviors. The firms which are on the BIST 50 Index and which operate in the finance sector were removed from the sample due to the difference of their structures. Leverage ratio was used as the dependent variable while return on assets (ROA), size of firms and growth rate were treated as independent variables. The post-financial crisis period 2009-2015 was examined with panel data regression analysis. It was found that the capital structures of 36 companies on the BIST 50 Index were in conformity with the pecking order theory.

Key words: *pecking order theory, trade-off theory, capital structure, agency theory, asymmetric information*

1. INTRODUCTION

If firms choose to finance their funding needs completely with common stock, this cash flow will come completely from stockholders. But, if both debt and equity securities are issued, the source of cash flow will be doubled: debtholders and stockholders. In literature, this structure created by firms as a mixture of diverse securities is called capital structure (Brealey and Myers1991). In other words, capital structure is a financial structure consisting of long-term foreign assets and equities used by firms for financing purposes (Türko 1999).

In making investment decisions, enterprises are required to plan the sources of financing they will use in their investments as well. Even firms' dividend decisions are as important as their investment and financing decisions in their plans. Such decisions tend to affect firms' market values. In particular, if firms are publicly traded enterprises, then they are faced with stakeholders to whom they are accountable. With their financing decisions, they are primarily responsible to stockholders while their debtors that also include other stakeholders are also important. While they are accountable primarily to stockholders with their financing decisions, the group from which they borrow from amount other stakeholders is important as well. This is because while borrowing managers of enterprises need to increase the value of stakeholders, not to face with the risk of bankruptcy, to perform the agency role in the best way possible, not to undermine the prestige in paying the debts, and to ensure that the costs of debt are comparable to other financing sources and that favorable debt costs are comparable to the return on investment.

The finance literature is rife with studies on capital structure. Nevertheless, these studies failed to come up with uniform results on capital structure of firms. Capital structure of firms varies across countries, sectors, firms and periods.

The work on the capital structure of firms tends to focus mainly on two areas. In the first group, the effect of capital structure decisions of firms on the market value was discussed. In other studies, the focus was on the factors affecting the firms' capital structure decisions, trying to identify the type of financing source used and the capital structure theory involved (Burucu and Öndeş 2015).

This study will focus particularly on trade-off and pecking order theories. The concepts of agency costs, signal effect and asymmetric information will also be discussed in connection with these theories.

To this end, the study provides theories related to capital structure in the section following the introduction. In the third section, the literature review about the study is given. The fourth section contains the panel data analysis to find out with which theory capital structures of the firms in the Istanbul Stock Exchange 50 Index comply. The findings from this panel data analysis are discussed in the conclusion section.

2. CAPITAL STRUCTURE THEORIES

As capital structure is a mixture of financing sources used in firms, managers are supposed to decide on the financing sources of their firms, i.e., their targeted capital structure, and make up their minds about the financing sources for enabling this structure (Sayılgan 2008).

In literature, whether financing decisions have any effect on firms' market value was debated and certain theories were offered. In particular, it is noted that debate on capital markets commenced with the 1958 work by Modigliani and Miller (MM). MM argued that the market value of firms would not change depending on the financing sources they would select (Brealey and Myers1991). In other words, MM maintained that the value of a firm borrowing on equities (V_U) is equal to that of a firm whose capital structure consists both of loans and equities (V_L). It is impossible to refute MM's arguments under perfect competition conditions, but markets tend to be tainted with imperfection, which, in turn, leads to certain glitches in capital markets (Gürsoy 2012).

Over time, it turned out that this theory of MM had assumptions that would hardly occur in real life conditions, and given, at least, there were bankruptcy and agency costs of the tax factor, MM revised it in 1963. In their 1963 work, MM found that the taxes firms pay in return for their borrowing turn out to be an advantage for them and that financing through debts may have a positive effect on the market value of firms. In this case, V_U and V_L differ. The factors that differentiate V_U and V_L are summed below:

- The tax to be paid by the firms that use debts and the tax shield this would create,
- The agency problem that emerges when managers use the borrowed money in very risky investments,
- The costs of financial distress firms may face due to excessive borrowing,
- The undermining of the firm's financial flexibility or re-borrowing capability due to excessive borrowing and the resulting loss of financial prestige.

The trade-off theory emerged in response to the above-mentioned factors. The trade-off theory takes into consideration the balance between costs and benefits of the debts in the capital structure. The benefits of an enterprise's using debts include the resolution of its free cash flow problems and decrease in the tax it will pay. The costs of debts, on the other hand, consist of potential bankruptcy costs and agency conflicts between stockholders and bondholders (Fama and French 1999).

Financial distress is the difficulty a firm faces in fulfills its obligations towards its creditors. The latest phase of financial distress is bankruptcy (Gürsoy 2012). Thus, even if it does not formally amount to bankruptcy, the costs of financial distress include agency, moral hazard, monitoring and contracting costs, which fray out the firm's value (Myers 1984).

All sorts of financial distress introduce additional costs to firms, resulting in a decline in the price of stocks certificates. The bigger a firm's financial leverage ratio, the higher the risk of its facing financial distress. In this case, the cost of financial distress will increase along with the borrowing ratio. Indirect costs of the financial burden are legal costs and fairly lower than indirect costs. The indirect costs of the financial burden will actually have bigger effect on the firm. An example of indirect costs is the decline in a firm's effectiveness. In such a case, managers tend to place greater emphasis on satisfaction of the firm's creditors rather than on the firm's activities. The relationship among the firm's stakeholders slackens and the firm's prestige is undermined and the expected cash flows start to decline (Gürsoy 2012).

According to the **agency theory**, there are differences in the way the parties share the risk related to the firm and the parties in question have diverge goals (Koç 2015). Jensen and Meckling define agency relations as a contract between the owners of the firm, who may be one or more, and the agent to whom the owners delegate the duty of making decisions about the firm (Jensen and Meckling 1976). The agency problem emerges in connection with this relationship. The agency problem is the potential conflict of interest between the owner and the agent which may arise due to differing goals or purposes (Eisenhardt 1989). The costs of preventing the clash of interest that may emerge among stakeholders are called agency costs. Jensen and Meckling categorize agency costs into three groups: the monitoring expenditures borne by the owner, the bonding expenditures borne by the agent and the residual loss.

Moreover, the decreased opportunity for managers to freely use the firm's cash or the possibility of the firm's using the capital market for financing needs will lead a decline in the agency costs. In other words, agency costs will decrease when the firm's profits are distributed as dividend, urging managers to focus on lending and capital markets (Koç 2016).

Following the article Myers wrote in 1984, interest in the capital structure increased. Before Myers' article, the dominant theory was the optimal capital structure, where the debts would be increased as much as possible with a view to securing the corporate tax shield. After a point, however, the expected cost of bankruptcy would remain above the tax advantage. With the pecking order theory, Myers (1984) indicated that firms don't have well-specified target debt ratio and they would go first with internal financing, then with external debt financing and eventually with external equity. This implied that if a firm has lower debts and strong financial structure compared to other firms in the sector, this firm would probably turn to internal equity in its investments. Likewise, if a firm uses debts for financing purposes due to tax and other benefits, it would ultimately choose common stock (Ghosh and Cai 1999).

In the trade-off theory, managers would make their decisions by comparing the financial distress and the tax shield benefit they would obtain in return for the agency costs. The pecking order theory, however, places emphasis on time as an important concept in the decisions to be taken by the finance managers. In the pecking order theory, the selection of the financial sources to be used according to time and cost matters.

In other words, when the price of a firm's share certificates is lower compared to its real value in the market, it would be risky for the firm's managers to issue new certificates as a source of financing. Indeed, if the firm issues new certificates with a price that is less than the real value of the certificates, this would amount to transfer of assets from exiting partners to new shareholders (as the existing shares in the market are sold below their real value), which is hardly desirable. In this case, the best decision is that the firm should borrow (Gürsoy 2012).

Myers and Majluf (1984) argued that managers have **asymmetric information**. Thus, if with this asymmetric information, managers issue security at a time when the firm's securities are overpriced, investors discount the new and existing risky securities of the firm. By predicting these price discounts in advance, managers may abandon their investments even if they consider financing their profitable investments with new risky securities. To avoid this dilemma in investment decisions, managers tend to finance the projects with retained profits which do not contain asymmetric information and low-risk debts (Fama and French 1999). In this case, the possibility of underinvestment is avoided through internal financing or by issuing securities which wouldn't be underpriced by the market. Internal financing and low-risk bonds would not be subject to the market's low pricing effect (Myers and Majluf 1984). As a measure, managers are able to eliminate the problem of low pricing by not distributing the firms' dividends, but retaining them at the firm. If the firm cannot finance a project with the undivided profits, it may resort to the option of financing with external sources. In this case, the firm will turn to the bond issue which does not contain excessive risk.

Myers and Majluf (1984) suggest that financing with debts is more advantageous than financing with equity in making investments. As noted above, when managers decide to issue share certificates in order to finance their investments, the price of share certificates will decline. If they can secure funds

by obtaining risk-free debts, the costs may be lower. By acting in this manner, they can increase the firm's value, but also safeguard the interests of old shareholders.

If the firm has marketable securities and surplus cash, it won't face the problem of undervaluation of its securities. When the problem of underpricing of share certificates, firms will be able to finance the projects whose net present value (NPV) is positive. Firms are able to create cash and marketable securities in two ways. First, when their investment needs are lower, firms may reduce their dividend payments and retain the funds created at the firm in the form of marketable securities or use for the firm's debts. When a firm does not distribute its profits, but use them to pay its debts, this will create an unused capacity for borrowing. Second, the firm may issue new share certificates at periods when the asymmetric information of managers is lower (Myers and Majluf 2007).

Myers summarizes the pecking order theory as follows (1984):

- Firms prefer internal financing.
- Firms adjust their targeted dividend ratios according to the investment opportunities.
- If the firm's cash flow is less than its investment expenditure needs, the firm uses its cash balance or speculative security in its portfolio.
- If external financing needs arise, the firm will use debts in the first place. Then, they will issue hybrid securities like convertible bonds. Finally, they will issue share certificates. This approach gives no room for a well-defined target debt and equity ratio. There are two types of equities, with internal funds located at the top of the hierarchy and share certificates at the bottom.

It is reasonable to ask to what extent firms will stick to the financial hierarchy in making their financing decision, given the above-mentioned "timing" and existence of asymmetric information between managers and investors (Brigham and Houston 2014).

It follows that the "timing factor" is not the only factor that matters in the financial hierarchy theory. The cost of borrowing is equally important. Indeed, if a firm secures financing via external sources at the infinite level, taking solely the timing factor into consideration, it will eventually face with financial distress or bankruptcy cost, as suggested by the trade-off theory as well.

In other words, the capital structure that maximizes the price of a firm's share certificates will minimize the weighted average capital cost (WACC). In this case, as it is difficult to estimate how a change in the capital structure will affect the price of share certificates, managers try to predict how a change in the capital structure influences the WACC. In doing so, many managers use the relationship between the capital structure and the WACC in making capital structure decisions (Brigham and Houston 2014).

The pecking order theory is suitable particularly to large firms. Analysis of the small and fast growing firms revealed that they didn't exhibit the pecking order behavior. Due to the more financing needs of fast growing firms, managers are inclined toward equity issue, which reduces the amount of debt obtained from outside (Frank and Goyal 2003).

In the light of the foregoing, it can be said that according to the financing hierarchy theory, firms don't have optimal capital structures and target borrowing ratios as well. The value of firms is affected by whether they stick to the financing hierarchy with regard to their financing needs, and importance is attached to their compliance with the theoretical hierarchy in obtaining financing (Can 2013).

3. LITERATURE ON THE ANALYSIS

Numerous studies were conducted on the capital structure of firms. Some of them sought to identify the factors acting on the capital structure. Others tried to determine the theory which accounts for capital structures of firms. Some of these studies were given below:

Frank and Goyal (2003) tested the pecking order theory with publicly traded US firms for the period between 1971 and 1998. Unlike what the pecking order theory suggested, they found that equity issues were prioritized over debt issue in financing financial deficits.

Frank and Goyal (2009) examined the importance of certain factors in capital structure decisions of publicly traded US firms between 1950 and 2003. The factors they studied were: profitability, size, growth, industry, nature of assets, taxation, risk, supply-side constraints, stock market conditions, debt market conditions, and macroeconomic conditions. They concluded that the capital structure was in harmony with the trade-off theory.

Shyam-Sunder and Myers (1999) appraised 157 US firms using the data from the period 1971-1989 to test the pecking order and trade-off theories. In their analysis Shyam-Sunder and Myers obtained results that shore up the pecking order theory at the expense of the alternative trade-off theory.

In their analysis about the Shyam-Sunder and Myers' work (1999) **Chirinko and Singha (2000)** concluded that Shyam-Sunder and Myers' work (1999) contained no empirical evidence supporting either the pecking order theory or the trade-off theory. They indicated that alternative tests were needed to identify the determinants of the capital structure and to make a distinction among other hypotheses.

Watson and Wilson (2002) analyzed the data of 629 small and medium-sized enterprises in the UK for the period between 1990 and 1995 and obtained findings in support of the pecking order theory. They established that the pecking order theory was more strongly implemented especially in closely-held firms.

Rajan and Zingales (1995) studied the financing decision of public firms in developed countries and focused on the factors affecting the capital structure. Their conclusion was in harmony with previous studied and similar to the case in other countries.

In their article, **Ivashkovskaya and Solntseva (2007)** created a model defining the major Russian public companies and tested the pecking order theory and trade-off theory. In the end, they obtained no finding that supported either the pecking order theory or the trade-off theory.

Atiyet (2012) sought to review the capital structure issue and compare the pecking order theory with the trade-off theory. The study was performed using the data of 250 French firms for the period between 1999 and 2005 and the findings that supported the pecking order theory were obtained. This result also revealed the existence of the asymmetric information. The trade-off theory failed to account for the new debt issue in French firms while the pecking order theory provided an explanation for it.

Sánchez-Vidal and Martín-Ugedo (2005) conducted a study on 1566 Spanish firms between 1994 and 2000. They found that the pecking order theory applied particularly small and medium-sized enterprises and high-growth and highly-leveraged companies in the sample. The firms in question used long-term sources for their financing deficits.

Ata and Ağ (2010) analyzed the sample of firms operating in the metal industries at Istanbul Stock Exchange for the period between 2003 and 2007. They found that the variables debt ratio, liquidity ratio, interest coverage ratio, and growth rate (except the firm's size) had a negative effect on the capital structure and obtained findings in support of the financial hierarchy theory.

Terim and Kayalı (2009) sought to identify the factors affecting the capital structures of the manufacturing firms in Istanbul Stock Exchange as well as the behaviors of these firms in making capital structure decisions for the period between 2000 and 2007. Of the factors affecting the capital structures of firms, there were strong and significant relationships between net fixed assets, profitability and growth opportunities and the capital structure while the relationships between factors size and non-debt tax shield and the capital structure were found to be strong, but not economically significant.

Okuyan and Taşçı (2010) examined Turkey's top 1000 industrial firms for the period between 1993 and 2007 in terms of the determinants of the capital structure and borrowing behaviors of firms. They tried to find if the pecking order or the trade-off theory applied in firms' borrowing. The results

demonstrated that the firms used internal funds, but they obtained debts when these funds were insufficient. This implies the pecking order theory is valid in accounting for the borrowing behaviors of industrial enterprises in Turkey.

Durukan (1997) conducted an analysis of 68 firms in Istanbul Stock Exchange between 1990 and 1995 and found negative correlation between profitability and borrowing level, with findings in support of the pecking order theory.

Gülşen and Ülkütaş (2012) examined the industrial enterprises in Istanbul Stock Exchange for the period between 1990 and 2005 and found a significantly negative correlation between leverage and profitability and firm size. Their findings were in support of the pecking order theory.

4. ANALYSIS

4.1 Data and Methodology

The purpose of this study is to find out which of the capital structure theories, i.e., trade-off theory and the pecking order theory, applies in the determination of the leverage in creating the capital structures of the firm in the Borsa Istanbul BIST 50 Index. As the 50 firms in the BIST 50 Index were from diverse sectors, the firms from the financial and sports sectors were removed from the sample as they were believed to cause discrepancy in the results. In the end, 36 firms were analyzed for the period between 2009 and 2015. As this was a post-crisis period, it is believed to be important for the examination of the capital structures of firms.

The study handled both time series and cross-sectional data and therefore, the panel data analysis method was adopted as it was recommended for the study combining such data. A model was created based on Tong and Green (2004).

4.2 Variables and Hypotheses

The dependent variable is the leverage ratio (LEV). **LEV** = (Long term debts + short term debts) / Total assets)

Independent variables:

1. Size: Equity capital was used as the measure of the size. An examination of the studies conducted revealed that the sum of equity capital was more significant (Gülşen and Ülkütaş, 2012, p.54). Therefore, equity capital was used in the study as the variable representing a firm's size.

Logarithm of the equity capital was taken and included in the model. (**SIZE** = Ln equity capital).

2. Profitability: Return on assets was taken. (**ROA** = Operating profit / Total assets)

3. Growth rate: Growth was calculated with regard to the previous year. (**GR** = Total $assets_t$ / Total $assets_{t-1}$)

In literature, differing results were obtained for the trade-off and the pecking order theory when the effect of the independent variables of size, profitability and growth on the dependent variable of leverage was investigated. Accordingly, hypotheses were formulated.

The possibility of big firms facing with the default risk is lower. Consequently, we may argue that big and mature firms tend to indulge in more external borrowing. In the trade-off theory, as the firm size increases, the risk of the firm's facing with the default risk declines and therefore, it gets more debt. The pecking order theory, on the other hand, expects a negative correlation between leverage and size. It is assumed that bigger firms have more internal funds and they would tend to use these internal funds in the first place for financing purposes. Therefore, bigger firms will use less debt.

Hypothesis 1: There is a **significant positive** correlation between the firm's size and debt (LEV) (trade-off theory). There is a **significant negative** correlation between the firm's size and debt (pecking order theory).

In the trade-off theory, profitable firms are faced less with the expected costs of financial distress and enjoy tax shield protection. The pecking order theory, on the other hand, suggests that profitable firms prefer internal financing to external financing. In particular, if the profitable firms have fixed investments and dividend payments, they tend to obtain less debt (Frank, Goyal, 2009, p. 7).

Hypothesis 2: There is a **significant positive** correlation between the firm's profitability (ROA) and debt (LEV) (trade-off theory). There is a **significant negative** correlation between the firm's profitability and debt (pecking order theory).

Growth increases the cost and risk of financial distress and decreases free cash flow problems. Thus, the trade-off theory assumes that growing firms will have less debt. In the pecking order theory, however, the firms which make more investments and grow as a result will increase their debt in order to make further investments to maintain their profitability and cover their costs.

Hypothesis 3: There is a **significant negative** correlation between the firm's growth rate (GR) and debt (LEV) (trade-off theory). There is a **significant positive** correlation between the firm's growth rate and debt (pecking order theory).

The following table provides descriptive statistics about the variables.

Table 1. Descriptive Statistics of Variables

	Size	**Growth**	**Leverage**	**Profitability**
Mean	9,099102	1,180618	0,518184	0,092613
Median	9,145551	1,135321	0,557718	0,077917
Maximum	10,22242	5,262267	0,91043	0,547376
Minimum	7,556321	0,710708	0,074706	-0,184528
Std. Dev.	0,589699	0,327312	0,197523	0,086855
Skewness	-0,36569	8,021022	-0,431437	2,0074
Kurtosis	2,743785	97,68371	2,380033	10,76438

4.3 Application Results

Basic level (Intercept and Trend) panel unit root test was performed for the variables used in the model, namely size, leverage, profitability and growth. All variables were found to be stationary as the probability value of the test statistics was below 0.05 according to the Levin, Lin and Chu (LLC) test. However, as the probability value of the test statistics was found to be above 0.05, the variables were not stationary under the Im, Pesaran and Shin W test. After obtaining their first-order differences, the stationarity tests of the panel data (Intercept) were performed again and all variables were found to have probability values less than 0.05 according to LLC, Im-Pesaran and Shin W and ADF tests. Thus, all variables were treated as "first-order stationary." All variables were included in the model after their first order differences were obtained.

Basic level (Intercept) unit root tests were performed on the residual terms obtained from the results of the panel data regression model with the variables whose first-order differences were obtained. As a result, probability values were found to be below 0.05 in all tests. In this case, the residual term of the model is stationary as well. The established panel data regression model is valid.

Table 2. Panel Unit Root Test

Test	**Variables**	**Levin,Lin and Chin Stat.**	**Prob.**	**Im,Pesaran and Shin W Stat.**	**Prob.**	**ADF.**	**Prob.**
Unit Root Test Level -Intercept and Trend	**GR**	-19,220	0,000	-1,251	0,1050*	120,168	0,000
	LEV	-13,687	0,000	-0,333	0,3695*	90,810	0,0664*
	ROA	-15,548	0,000	0,776	0,2187*	100,411	0,0151
	SIZE	-18,120	0,000	0,072	0,4700*	83,520	0,0000
Unit Root Test First difference-Intercept	**GR**	-26,523	0,000	-7,899	0,000	201,321	0,000
	LEV	-19,217	0,000	-6,113	0,000	174,705	0,000
	ROA	-16,463	0,000	-5,677	0,000	167,248	0,000
	SIZE	-17,120	0,000	-5,370	0,000	158,126	0,000
Unit Root Test Level -Intercept	**Model's Residual Term**	-15,596	0,000	-4,100	0,000	141,059	0,000

* Not statistically significant at the 0.05 level.

As seen in Table 3, when the correlation of all variables to be used in the model was examined, no correlation was found among the variables other than LEV and ROA. As the LEV variable is a dependent variable in the model, the relationship model found will not make a negative effect on the model. Lack of relationship among the independent variables is a positive factor for the established regression model as it won't increase the model's strength in a meaningless manner.

Table 3. Correlation Analysis

Correlation	**SIZE**	**GR**	**ROA**	**LEV**
SIZE	100,0%			

GR	-6,7%	100,0%		
	0,290	-----		
ROA	-3,9%	9,5%	100,0%	
	0,533	0,132	-----	
LEV	4,0%	9,9%	-13,3%	100%
	0,532	0,116	0,034*	-----

* Statistically significant at the 0.05 significance level.

The results obtained from the established panel data regression model are given in Table 4. The panel data regression model was estimated using the Cross-section SUR method. Thus, erroneous model estimation due to a potential high relationship between independent variable was avoided. 7 years and 36 decision units were used in the model. Estimation was made using 216 data in total.

Table 4. Model

Periods: 6				
Cross-sections included: 36				
Total panel (balanced) observations: 216				
Model: Panel Least Squares, Cross-section SUR (PCSE)				
Dependent Variable: ΔLEV				
Independent Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0,032	0,005	6,219	0,000*
ΔROA	-0,165	0,079	-2,101	0,037*
ΔSIZE	-0,493	0,044	-11,177	0,000*
ΔGROWTH	0,122	0,012	9,958	0,000*
R^2	0,571			
F-statistic	93,898			
Prob.(F-statistic)	0,000*			

* Statistically significant at the 0.05 significance level.

As the t test probability values of the independent variables are below 0.05 according to the model's results, the independent variables are statistically significant. The F test result of the model was found to be 93.89 and as the probability value is below 0.05, the model is statistically significant. The model's R^2 value was found to be 0.57. Thus, the independent variables of the model account for the dependent variable leverage at the level of 57%.

ΔLEV = 0,032 - 0,165 * ΔROA - 0,493 * ΔSIZE + 0,122 * ΔGR

According to the model's results, there is a 0.165-unit inverse relationship between the variable ROA and the dependent variable LEV. When ROA increases by 100 units, LEV decreases by 16.5 units. There is a 0.493-unit relationship between size and LEV. When size increases by 100 units, LEV decreases by 49.3 units. There is a 0.122-unit direct relationship between growth and LEV. When growth increases by 100 units, LEV increases by 12.2 units.

Table 5. Correlogram Analysis

Lag	**AC**	**PAC**	**Q-Stat**	**Prob**
1	0,139	0,139	4,2375	0,052
2	0,073	0,055	5,4218	0,066
3	-0,084	-0,104	6,9792	0,073
4	0,021	0,043	7,0758	0,132
5	0,022	0,028	7,1859	0,207

The correlogram test was performed on the terms obtained from the panel data regression. It was found that the probability values for 5 lags were above 0.05 and it was concluded that there was no autocorrelation in the established model.

5. CONCLUSION

In identifying the capital structures of 36 firms traded on Stock Exchange Istanbul's BIST 50 Index, the relationship between leverage and the firms' profitability, size and growth was examined to find out if the pecking order theory or the trade-off theory can explain their behaviors.

The conclusions given the table below were drawn. The assumptions of the pecking order theory were found to be similar to the model's results. Using the model established, analysis was performed by taking three variables into consideration and the pecking order theory was found to be valid.

	ROA	**SIZE**	**GROWTH**
In the trade-off theory; LEV	+	+	-
In the pecking order theory; LEV	-	-	+
In the established model; LEV	-	-	+

REFERENCES

Ata, Ali and Yusuf Ağ, (2010), Firma Karakteristiğinin Sermaye Yapısı Üzerindeki Etkisinin Analizi. *Istanbul Üniversitesi Iktisat Fakültesi Ekonometri ve Istatistik Dergisi,* vol.11, pp.45-60

Atiyet, Ben Amor, (2012), The Pecking Order Theory and the Static Trade Off Theory: Comparison of the Alternative Explanatory Power in French Firms. *Journal of Business Studies Quarterly*, vol.4, no.1, pp. 1-14

Aypek, Nevzat (ed) 2014, *Finansal Yönetimin Temelleri*, Brigham, Eugene F. and Joel F. Housten, Istanbul.

Brealey, Richard A. and Stewart C.Myers, (1991), *Principles of Corporate Finance,* 4th ed. International ed:McGraw-Hill Company.

Burucu, Hümeyra and Turan Öndeş, (2015), Finansal Hiyerarşi Ve Dengeleme Teorisinin Geçerliliğinin Türk Imalat Sanayi Firmalarında Test Edilmesi, *Sakarya Iktisat Dergisi/The Sakarya Journal of Economics,* vol.3, pp.61-76

Can, Reyhan, 2013, "Finansman Hiyerarşisi 9Pecking Order) Kuramı ve Borsa Istanbul (BIST) 100 Endeksi Üzerine Bir Uygulama",YL tezi, Niğde Üniversitesi, Niğde.

Chirinko, Robert S., Anuja R. Singha, (2000), Testing Static Trade Off Against Pecking Order Models of Capital Structure: A Critical Comment, *Journal of Financial Economics*, vol. 58, pp. 417-425

Durukan, Banu. (1997), Hisse Senetleri IMKB'de Işlem Gören Firmaların Sermaye Yapısı Üzerine Bir Araştırma 1990 – 1995, *IMKB Dergisi*, vol.1, no.3, pp.75-91.

Eisenhardt, Kathleen M., (1989), Agency Theory: An Assessmnet and Review. *The Academy of Management Review*, vol.14, no.1, pp.57-74

Fama, Eugene F. and Kenneth R. French, (2002), Testing Trade-Off and Pecking Order Predictions About Dividends and Debt, *The Review of Financial Studies,* vol.15, no.1, pp.1-33.

Frank, Murray Z. and Vidhan K. Goyal, (2003), Testing the Pecking Order Theory of Capital Structure. *Journal of Financial Economics,* vol.67, pp. 217–248

Frank, Murray Z. and Vidhan K. Goyal. (2009). Capital Structure Decisions: Which Factors Are Reliably Important?. *Financial Management*. Vol.38, pp. 1–37.

Ghosh, Arvin and Francis Cai, (1999), Capital Structure: New Evidence of Optimality and Pecking Order. *American Business Review*, Vol.17, no.1, pp. 32-38

Gülşen, Ahmet Zafer and Özge Ülkütaş, (2012), Sermaye Yapısının Belirlenmesinde Finansman Hiyerarşisi Teorisi ve Ödünleşme Teorisi: IMKB Sanayi endeksinde Yer Alan Firmalar Üzerine Bir Uygulama, *ZKU Journal of Social Sciences*, vol.8, no.15, pp.49-60.

Gürsoy, Cudi Tuncer, 2014, *Finansal Yönetim Ilkeleri,* 2.B., Istanbul, Beta.

Ivashkovskaya, Irina V. Maria S. Solntseva, (2007), The Capital Structure of Russian Companies: Testing Tradeoff Theory Versus Pecking Order Theory, *ЖУРНАЛ "КОРПОРАТИВНЫЕ ФИНАНСЫ,* vol. 2, pp.17-31

Jensen, Michael C. and William H.Meckling, (1976), Theory of the Firm Managerial Behavior, Agency Costs and Ownership Structure, Journal of Financial Economics, vol.3, no.4, pp.305-360.

Koc, Idil Özlem, 2015, *Kurumsal Yönetim ve Sigortacılık Sektörü.* Istanbul, Nobel Yayın Dağıtım.

Koc, Idil Özlem, 2016, *Şirketlerde Kar Payı Dağıtımı,* Istanbul, Nobel Yayın Dağıtım.

Myers, Stewart C., (1984), The Capital Structure Puzzle, *The Journal of Finance*, vol.39, no.3, pp. 575-592.

Okuyan, H. Aydın and H.Mehmet Taşcı, (2010), Sermaye Yapısının Belirleyicileri:Türkiye'deki En Büyük 1000 Sanayi Işletmesinde Bir Uygulama, *BDDK Bankacılık ve Finansal Piyasalar,* vol.4, no.1, pp.105-120.

Rajan, Raghuram and Luigi Zingales, (1995), What Do We Know About Capital Structure? Some Evidence from International Data, *The Journal of Finance,* vol.50, no.5, 1421-1460.

Sa´Nchez-Vıdal, Javıer, Juan Francısco Mart´In-Ugedo, (2005), Financing Preferences of Spanish Firms:Evidence on the Pecking Order Theory, *Review of Quantitative Finance and Accounting*, vol.25, pp.341–355.

Sayılgan, Güven, 2008, *Soru ve Yanıtlarıyla Işletme Finansmanı,* 3.B., Ankara, Turhan Kitabevi.

Shyam-Sunder, Lakshmi and Stewart C. Myers, (1999), Testing Static Trade-Off Against Pecking Order Models of Capital Structure, *Journal of Financial Economics,* vol.51, pp.219-244.

Terim, Burak and Cevdet Alptekin Kayalı, (2009), Sermaye Yapısını Belirleyici Etmenler: Türkiye'de Imalat Sanayi Örneği, *Sosyal Bilimler,* vol.7, no.1, pp.125-154.

Tong, Guanqum and Christopher J. Green, 2004, "Pecking Order or Trade-off Hypothesis? Evidence on the Capital Structue of Chinese Companies", Loughborough University, United Kingdom.

Türko, R.Metin, 1999, *Finansal Yönetim*, Istanbul, Alfa Basın-Yayım.

Watson, Robert and Nick Wilson, (2002), Small and Medium Size Enterprise Financing: A Note on Some of the Empirical Implications of a Pecking Order, *Journal of Business Finance & Accounting*, vol.29, no.3 & 4, pp.557-578