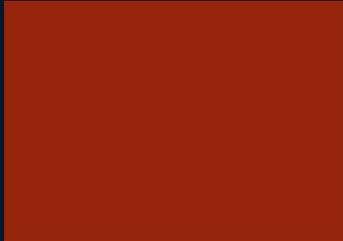




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IS HARBERGER-LAURSEN-METZLER HYPOTHESIS VALID IN TURKEY?¹

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ABSTRACT

Purpose- In so far as financial development that supports the supply-side view as well as the country's competitiveness, a rapid increase in import price index in comparison to the export price index brings forth the deterioration regarding trade. A similar case also exists in Turkey. The aim of the study is to test the relationship between foreign trade balance and terms of trade in Turkey.

Methodology- In this study, the monthly data of terms of trade and foreign trade balance for the period 2005: M1 - 2017: M4 are analyzed for Turkey, and the validity of Harberger-Laursen-Metzler Hypothesis is tested.

Findings- The deviations in the short run converge to the long-term equilibrium in approximately 6 months period. In addition, considering the normalized long-term relationship, the 1-unit increase in the terms of trade would cause an average increase of \$ 321,335 in the estimated dependent variable, namely, the foreign trade balance.

Conclusion- There exists a long-term relationship between the variables, namely, terms of trade and foreign trade balance. Moreover, there is a short-term unilateral causality from foreign trade balance to terms of trade.

Keywords: Terms of trade, balance of trade, cointegration, Harberger-Laursen-Metzler Hypothesis.

JEL Codes: F14, F32, F41

1. INTRODUCTION

The terms of trade are the indicators that cover the long- and the short-term commercial movements of different economies, the change of the scale of goods subject to foreign trade over time and external economic dynamics in this context. In today's economic world which is affected by globalization as a whole, even in a period through which so-called openness is asserted to a large extent, the relationship between international foreign balance and terms of trade has become a matter of debate along with the increased international mobility of goods. The relationship between exchange rate / foreign trade balance / current account balance and terms of trade that can be estimated with various indicators such as exchange of goods and export/import quantity indexes are explicated using different hypotheses. Although approaches of "J and S Curves" and "Harberger Laursen Metzler-HLM Effects" are included in these hypotheses, the relationship between terms of trade and foreign trade balance in Turkey is examined within the context of HLM approach. Turkey is an emerging country so economic growth is mostly determined by export and import i.e foreign trade. If HLM hypothesis is valid in Turkey, solution will be to rearrange the terms of trade.

In the first section of the study, the theoretical background of the relationship between foreign trade balance and terms of trade is given within the framework of the approach and the second section is devoted to the literature review. In the third and the last section of the study, the validity of HLM approach in Turkish economy is tested via econometric modeling.

Terms of trade, also known as terms of international trade, define the relationship between export price and import price indexes of a country (Parasız 2013, 72), while relative prices are used instead of terms of trade to be defined as the rate of exchange of export goods with import (Seyidođlu 2007, 55). While it is known that studies related to terms of trade started

¹ This manuscript was developed and revised version of the study presented in 21.Finance Symposium in Balikesir.

in the second half of the 19th century, consideration of the concept begins with the Classical economists' inquiry of "which goods would be subject to trade and which goods would be exported and which goods would be imported by the countries" (Hepaktan and Karakayali, 2009, 182). Since the calculation methods of terms of trade for the countries differ, the table below contains some variations and explanations regarding these calculations.

Table 1: Variations and Explanations of the Terms of Trade

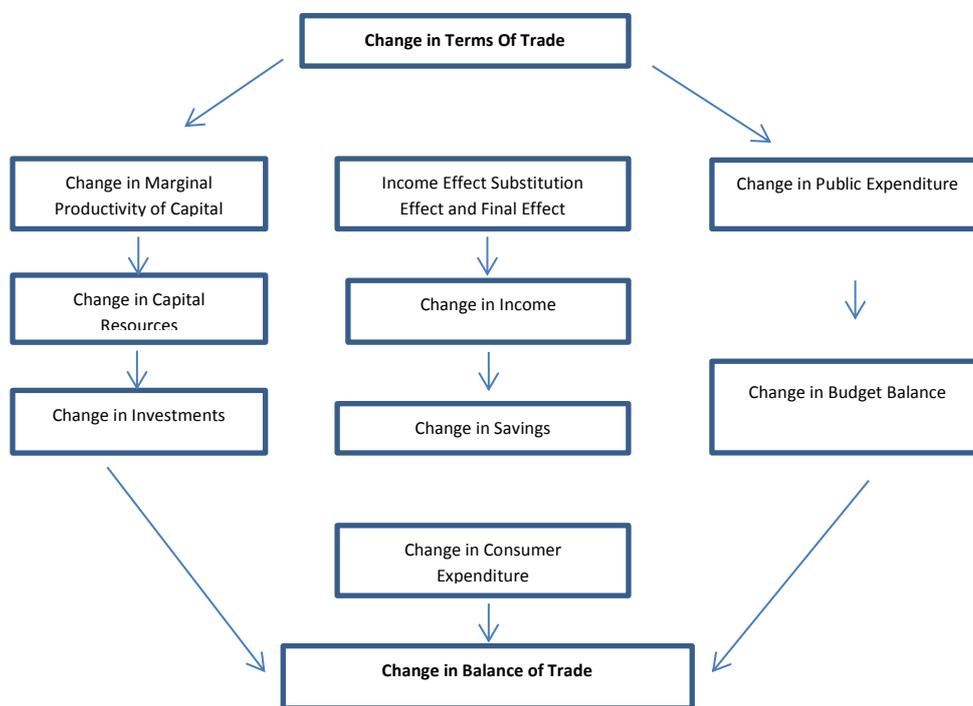
Definition of the Terms of Trade in Consideration of Barter		
Type of the Terms of Trade	Formula	Explanation
Net Barter Terms of Trade (N)	$N = P_x / P_M$ (P_x : export price index, P_M : import price index)	It is obtained by equating export prices. Since it only involves purchase & sale of goods, it may lead to deceptive results in measuring the productivity of the trading parties. Its advantage is based on the indication of the short-term changes.
Gross Barter Terms of Trade (G)	$G = Q_M / Q_x$ (Q_M : import quantity index, Q_x : export quantity index)	It is the ratio of import quantity index to export quantity index. It is used to eliminate the shortcomings of prices indexes. It faces criticism similar to Net Barter Terms of Trade.
Income Terms of Trade (I)	$I = D_x / P_x = (P_x / P_M) \cdot Q_x$ (D_x =export value index)	It indicates the purchasing power of exports since the importing capacity of the country is explained regarding exports. Therefore, it is also known as export-based import capacity index. It is criticized for not considering the change in productivity.
Definition of the Terms of Trade in Consideration of Factorial Change		
Single-Factorial Terms of Trade (S)	$S = (P_x / P_M) \cdot V_x$ V_x = productivity index in export sector	It is defined as a good economic welfare indicator in determining returns from foreign trade, while it is quite difficult to estimate the changes in productivity of resources in practice.
Double-Factorial Terms of Trade (D)	$D = (P_x / P_M) \cdot (V_x / V_M)$ V_x = productivity index in import sector	An increase in Double-Factorial Terms of Trade indicates that one unit of input used in export sector would be replaced by more foreign inputs. However, calculation of the quantity of import goods to be obtained corresponding to the change in exports involves somewhat uncertainty.
Definition of the Terms of Trade in Consideration of Utility		
Real Cost Terms of Trade (R)	$R = S \cdot E$ (R =real cost terms of trade, E = Disutility coefficient index of exports)	Disutility coefficient index of exports indicates that each unit of increasing imports leads to a rise in real costs.
Utility Terms of Trade (F)	$F = R \cdot (U_o^M / U_o^A)$ U_o^M / U_o^A = The index of the relative utility of the foregone domestic goods and the imported goods.	In the formula, the domestic goods foregone and the imported goods are denoted by A and M; respectively, while utility index is denoted by U. Since technical and utility coefficients of exports and imports are not measurable, they are not used.

Source: Prepared by the authors with reference to Aslan and Yörük (2005) and Ergin and Yetiz (2017).

In Table 1, terms of trade that can be calculated via different variations not only affect many indicators in the international economy but also give information about the level of development of the country's economy. Moreover, in the case of trade openness, especially the imbalance of payments in the country's economy is important. In this context, the approaches used in studies conducted on terms of trade and foreign trade balances do take certain criteria into account, and they are separated from each other in various aspects. Among these, the J-curve approach is based on the impacts of short-term exchange rate or terms of trade due to price and quantity delays on the foreign trade balance, while the S-curve approach indicates that the relationship between foreign trade balance and terms of trade is negative in the short-term

again. Another approach, namely, Harberger-Laursen-Metzler, states a straightforward relationship between foreign trade balance and terms of trade (Bekar and Terzi 2016, 36).

Figure 1: Transmission Mechanism for the Terms of Trade



Source: Misztal (2009).

According to Laursen-Metzler (1950), any change in terms of trade affects macroeconomic data as follows (Oktar and Dalyan 2012, 5):

- *Improvement regarding trade*: the recovery of real income growth and the current account balance
- *Deterioration in terms of trade*: increase in expenditure items in exports, decreasing savings and deterioration in the current account balance

In other words, any change in terms of trade would penetrate through the foreign trade balance and even in the same direction. The issue to be noted here is that a change in terms of trade affects the foreign trade balance basically through three channels. These are the Savings channel, the Savings-Investment Channel and the Public Expenditure channel. Figure 1 illustrates the algorithm of changes.

2. LITERATURE REVIEW

The impacts of the terms of trade on both income and growth have been extensively reviewed in the literature, and there are also some other studies in which its impacts on the foreign trade balance are also analyzed. It is foreseen that the change in terms of trade leads to the change in both national income and imports along with the savings and the investment channels, in turn, results in the change in the foreign trade balance. This theory, referred to as the 'Harberger-Laursen-Metzler- HLM (Harberger, 1950: Laursen and Metzler, 1950) in the literature, is generally tested using the time-series and panel data analysis. Turkey is among the countries with the problem of the trade deficit at high levels. In this context, the studies conducted on explaining the deterioration and improvement of the foreign trade balance are considered for testing the validity of the HLM theory for the Turkish economy.

In this regard, in Yaman and Korkmaz (2006)'s study on Turkey, this relationship is examined by the Granger Causality Test between 1991: Q4 - 2003: Q3 and it is detected that a positive shock in terms of trade may have caused deterioration in the foreign trade balance. Similarly, Oktar and Dalyan (2012) performed VAR and Cointegration analyses using monthly data for the period 2004 - 2011 and indicated that a positive shock in terms of trade would have led to an improvement in the current account balance. Küçükaksoy and Çiftçi (2014) also tested the validity of HLM Hypothesis with Johansen Cointegration Test, Granger Causality Test and VAR models using monthly data for the period 2003: M1 - 2014: M4. Their

findings include the existence of a long-term cointegration between the variables, recovery of the foreign trade balance after nine months following the deterioration in the early periods due to a shock in terms of trade and the validity of the HLM Hypothesis for Turkey. Bekar and Terzi (2016) examined the validity of the S-curve related to the relationship between the terms of trade and foreign trade balance via the Hodrick-Prescott Filter Method using monthly data between 2002: M1 - 2014: M12 for selected goods. The analysis results revealed that the S-curve is valid in trade of some goods. Lars et al. (1983) examines the effect of terms of trade changes on a small country with perfect capital mobility. In their study two periods and infinite horizon are examined. Mansoorian (1993) used the habit persistence model of Ryder and Heal to examine the Harberger Laursen Metzler effect. He found that HLM effect holds and terms of trade deterioration reduces savings. Otto (2003) investigated the existence of HLM effect on a small economy by using structural vector autoregression model. He found a strong support for the existence of HLM effect. Bouakez (2008) investigated the HLM effect on Australia, Canada and United Kingdom. His results show that terms-of-trade movements do not affect the current account in a significant way. Choi, Hur and Kang (2017) analyze the effects of terms of trade shocks in the Korean economy. They discuss that although the shock deteriorates the terms of trade (TOT), it is clearly associated with an expansionary effect on output, which is more pronounced at longer horizons. Karol et al. (2017) test the validity of HLM hypothesis for the Slovakia, Croatia and Czech Republic. The conclusions come from the structural vector autoregressive analysis of the cyclical components of **terms-of-trade**, **trade** balance, output, consumption, and investment in three post-communist countries. Brueckner and Carneiro (2017) estimates the effects that **terms of trade** volatility has on real gross domestic product (GDP) per capita growth. They find that the GDP share of domestic credit to the private sector has no significant effect on the relationship between growth and **terms of trade** volatility.

3. DATA AND METHODOLOGY

In this study which analyzed the relationship between the terms of trade and foreign trade balance within the context of Turkey; the terms of trade and foreign trade balance are represented by index and difference between nominal export and import values, respectively. The analysis period consists of 2005: M1 - 2017: M4 period on a basis of monthly data. The data series are obtained from the database of Turkish Statistical Institute (TSI). In the analysis of the data, EViews software is utilized. The series included in the study are tested by the Augmented Dickey-Fuller (ADF) unit root method. Time-series method is used in the study. Unit root tests are applied to determine the level of stationarity of the data. If the variables are determined to be cointegrated at the same level as a result of the stationarity test, Johansen & Juselius cointegration method would be used to investigate whether or not a long-term relationship exists. While the marriage of a couple can be regarded as a cointegration relation for two variables, the engagement period of this couple can be regarded as the short-term effect analysis, also known as error correction model. The error-correction model, as a short-term analysis, helps in determining how long would the engagement period, in other words, the short-term effect last. Following the error correction model, the causality relation between the variables is to be tested with Error Correction Model Granger causality test.

4. FINDINGS AND DISCUSSIONS

This section shows the results of tests and findings.

4.1. Augmented Dickey-Fuller (ADF) Test

The Augmented Dickey-Fuller (ADF) test analyzes whether or not the examined data contains a unit root.

In the first degree auto regressive model, using endogeneous variable, Y_t , and time index, t , $\Delta Y_t = (\rho - 1)Y_{t-1} + U_t = \delta Y_{t-1} + U_t$ function illustrates $I(1)$ operator.

Here, the hypothesis $\delta = 0$ is tested. When $\delta = 0$, since the change between periods is based on a random variable, the null hypothesis is expressed as "unit root exists". Or if;

$Y_t = \rho Y_{t-1} + U_t$, when $|\rho| \geq 0.05$, the unit root exists. However, this test does not compute t-statistics on the standard T distribution since it is applied on residual terms, but not on raw data, and compares it with the critical values in MacKinnon (1996) (Uçan 2013, 161-162).

Table 2: Unit Root Test Results

Augmented Dickey-Fuller (ADF)					
Series	Level		Series	1 st Diff.	
	ADF Value	Prob.		ADF Value	Prob.
FT_Balance	-3.161	0.096	FT_Balance	-11.696	0.0000

T_OT	-2.633	0.266	T_OT	-3.652	0.0003
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In the analysis, the series are tested using the ADF unit root technique. It is seen that the variables included in the study become stationary at the first differences level, namely, I (1). For the existence of a long-term relationship between the variables after the stationarity of the variables has been established, the optimal lag lengths in the framework of the VAR analysis are determined by the lag length criterion.

Table 3: VAR Lag Length Result

Lag	LogL	LR	FPE	AIC	SIC	HQ
0	-2548.646	NA	6.69e+13	37.50950	37.55233	37.52690
1	-2363.036	363.0312	4.63e+12	34.83876	34.96726*	34.89098*
2	-2357.930	9.835301	4.55e+12	34.82251	35.03667	34.90954
3	-2352.959	9.430811	4.49e+12*	34.80822*	35.10805	34.93007
4	-2351.778	2.206269	4.68e+12	34.84967	35.23517	35.00633
5	-2348.858	5.366714	4.76e+12	34.86556	35.33673	35.05703
6	-2345.379	6.292966	4.80e+12	34.87322	35.43006	35.09951
7	-2341.005	7.782772	4.77e+12	34.86773	35.51023	35.12882
8	-2338.504	4.378226	4.88e+12	34.88976	35.61792	35.18567
9	-2334.361	7.127720	4.88e+12	34.88766	35.70149	35.21838
10	-2333.444	1.550396	5.11e+12	34.93300	35.83250	35.29854
11	-2331.456	3.303459	5.27e+12	34.96259	35.94776	35.36294
12	-2324.716	11.00270*	5.07e+12	34.92229	35.99312	35.35745

Note: LR: Likelihood Rate Test Statistics; FPE: Final Prediction-Error Criteria; AIC: Akaike Information Criteria; SIC: Schwarz Information Criteria; HQ: Hannan-Quinn Information Criteria.

The results of AIC and SIC criteria are generally used in the literature. In this study, since 1 lag indicated by SIC result is thought not yield statistically significant results due to monthly data, 3 lags selected by AIC result are used.

4.2. Johansen-Juselius Cointegration Test

The cointegration analysis tests the existence of a long-term relationship among stationary series of the same order. If the series are directly subjected to the least squares method whenever they are cointegrated in the same order (for example I (1)), a case of spurious regression is encountered, so that the existence of a long-term relationship would be neglected. If at least one long-term relationship is found following the cointegration analysis, the relationship between the series becomes a significant regression. In this study, the Johansen-Juselius cointegration technique, which investigated the long-term relations in terms of trade and foreign trade balance variables, is performed. The trace test and the maximum eigenvalue test are considered to determine the number of Johansen-Juselius cointegration vectors and whether or not they are significant (Esen 2012, 94).

Table 4: Johansen-Juselius Cointegration Test Results

Trace Test	5% Critical Value	P-Value**	Null Hypothesis
15.044	15.494	0.0290	None *
2.055	3.841	0.1517	At most 1
Maximum Eigenvalue Statistcs	5% Critical Value	P-Value**	Null Hypothesis
14.989	14.264	0.0383	None *
2.055	3.841	0.1517	At most 1

* the null hypothesis is rejected at 5% significance level.

**based on MacKinnon-Haug-Michelis (1999) values.

In Table 4, the results pertaining trace and maximum eigenvalue statistics of Johansen-Juselius cointegration analysis are shown. The null hypothesis, indicating that there is no cointegration relation, is rejected according to both test results. This means that there is at least one cointegration relationship between terms of trade and foreign trade balance. It means that there is a long-term relationship between terms of trade and foreign trade balance. In the later phase of the analysis, the error-correction model is applied to examine what type of process through which this obtained long-term relationship passes in the short-term.

4.3. The Error-Correction Model (ECM)

The cointegration that shows the existence of a long-term relationship among variables indicates an interaction among the series also in the short-term. An error-correction model should be applied to determine how long the interactions, in other words, the fluctuation in the short-term would converge to the long-term equilibrium. Assuming that the two variables such as X and Y are cointegrated, the error-correction equation would be as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 U_{t-1} + V_t$$

Here, ΔY_t represents the lagged value of Y_t . ΔX_t , on the other hand, represents the lagged value of X_t . α_0 , α_1 , α_2 , and U_{t-1} denote the constant term, the short-term coefficient, the balancing error term and, the lagged value of the error term that expresses the long-term equilibrium adjustments, respectively. V_t is shown as a white noise error term (Dikmen 2012, 312).

Table 5: Error-Correction Model

	FT_Balance
Error Correction coefficient	-0.173*
Standard deviation	(0.062)
Estimated T value	[-2.787]
<i>Normalized Equation</i>	
	$FT_Balance(-1)=38766747+321335 T_OT(-1)$
Estimated T value	[-3.579]

It is expected that the error correction coefficient obtained from the error correction equation is negative and that statistically significant value is obtained between zero and minus one. In Table 5, the error-correction coefficient is found as -0.173. The error-correction coefficient is statistically significant according to the obtained *t*-value. Accordingly, -0.173 of the short-term deviations which occur in relation to foreign trade balance and the terms of trade disappear per annum. That is, these deviations would converge to the long-term equilibrium in approximately 6 ($1 / |-0.173| = 5.78$) months period. In addition, considering the normalized long-term relationship, the 1-unit increase in the terms of trade would cause an average increase of \$ 321,335 in the estimated dependent variable, namely, the foreign trade balance.

4.4. Granger Causality Test

The Granger causality test is a method of investigating whether or not a mutual interaction exists between the series. A possible bilateral causality would be expected between the series with cointegration relationship, while a unilateral or no relationship would also be encountered. Essentially, Granger (1969), while defining causality, stated that "X is said to Granger-cause Y if Y can be better predicted using the histories of both X and Y than it can by using the history of Y alone" (Granger, 1988: 554).

Table 6: HDM Granger Causality Test Results

H₀ (No Granger Causality)	Chi-square	Prob.	Decision
D(T_OT) ≠> D(FT_Balance)	1.075	0.584	Accept H ₀
D(FT_Balance) ≠> D(T_OT)	9.457	0.008	Reject H ₀

The equations of the statement are as follows:

$$Y_t = \sum \alpha_i n_i = 1 Y_t - i + \sum \beta_i n_i = 1 X_t - i + \epsilon 1_t$$

$$X_t = \sum \lambda_i n_i = 1 X_t - i + \sum \delta_i n_i = 1 Y_t - i + \epsilon 2_t$$

Here; for $i = 1, 2, \dots, n$, α_i , β_i and δ_i represent the lag coefficients. Also $\epsilon 1_t$ and $\epsilon 2_t$ refer to error terms with white-noise characteristics. Therefore, the causality relationship between the series can be explained by these equations. Also, if the probability value is less than 0.05 at the 5% level of significance, the null hypothesis is rejected and it is understood that the series Granger cause each other.

According to the results of the ECM Granger causality, the existence of a unilateral causality relation from FT_Balance to T_OT is determined in the short-term under the constraint of the period covered.

Econometric results indicate that HLM Hypothesis is valid in Turkey. That means, positive changes in terms of trade, *ceteris paribus*, would also cause positive changes in the economy's balance of foreign trade. So aggregate demand increases resulting in rise in economic growth.

5. CONCLUSION

The relationship between terms of trade and the current accounts in a broad sense and the relationship between terms of trade in a narrow sense is a matter of considerable research in the economics literature.

The fact that macroeconomic indicators are not so important in both developed and developing countries' economies is seen as the result of globalized world trade and the transfer of competitiveness along with growth rates across the countries.

More precisely, liberalized financial and real markets have led to the differentiation of import and export items which have changed the size of merchandise trade between countries. Thanks to the countries with different macroeconomic structures and trade flows with dynamic frameworks, the relationship between terms of trade and the balance of foreign trade preserves its vitality. Here, on the other hand, the discussion of the extent to which different theories and approaches are appropriate for the country's economic structure is analyzed by various econometric tests and theoretical explanations. While Harberger-Laursen-Metzler (HLM) hypothesis is one of the approaches on terms of trade and balance of foreign trade, it is argued that the positive (negative) changes in terms of trade, *ceteris paribus*, would also cause positive (negative) changes in the economy's balance of foreign trade. The keypoint here is inquiring the validity of such theory in the macroeconomic structure of each country. In this study, the applicability of HLM for Turkey is explicated by utilizing theoretical background as well as econometric methods. With a clearer statement, the impact of terms of trade on balance of foreign trade is analyzed for Turkish economy pertaining HLM. According to the obtained findings, there is a long-term relationship between and whereas a short-term causality relationship from the foreign trade balance toward terms of trade is found.

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OWNERSHIP STRUCTURES AND CHARACTERISTICS INFLUENCE ON AUDIT FEE

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ABSTRACT

Purpose - The purpose of this paper was to investigate the influence of the structures and characteristics of corporate ownership on audit fees paid to external auditors by Indonesian companies listed on Indonesian Stock Exchange (ISE).

Methodology - The population of this research was non-financial companies listed in Indonesia Stock Exchange during the period of 2014-2016 that were sampled using purposive sampling method resulted in 150 companies met the criteria. Data collected were then analyzed using multiple linear regression analysis. The dependent variable was the level of audit fees charged to the client by an external audit represented as AFEE, measured in the Indonesia rupiah. Meanwhile, the independent variables were ownership structure of the company consisted of: (1) managerial ownership, (2) foreign ownership, (3) government ownership; and characteristics structure, which is divided into: (4) complexity, (5) current ratio, (6) leverage, (7) profitability.

Findings- The results showed that firms with larger foreign ownership, on government ownership, and on profitability significantly and positively affected audit fees, but higher managerial ownership significantly and negatively affected firms with audit fees. The results also showed the insignificant relationship between complexity, current ratio and leverage and audit fees.

Conclusion- Managerial Ownership, Foreign ownership, government ownership, and profitability influence on audit fee for external auditor.

Keywords: Ownership structure, audit fees, firm characteristics, agency theory, Indonesia.

JEL Codes: M40, M41, M42

1. INTRODUCTION

The cases of Enron and Arthur Anderson (Griffin, Lont, & Sun, 2009) as well as PT. Kereta Api Indonesia have greatly affected the reputation of the accounting profession and financial reporting companies. These accounting cases illustrates the importance of having strong corporate governance to improve the reporting of financial statements and the quality of the audit. In this regard, internal and external oversight mechanisms have been suggested to solve or at least reduce the possible fraud to happen. As a result, auditor's work is receiving attention from the users of the financial statements, especially shareholders, to ensure the reliability and the credibility of the company's financial statements. This obligation becomes more complex as the structure and the characteristic of the corporate ownership are specific.

Differences of companies' ownership structure causes differences in the mechanisms of controlling conducted by shareholders in overseeing the company's business activities, including financial statement reporting process. Inefficiency and malfunctioning of the corporate governance mechanisms is the major factor of cases (Mazlina Mustapha & Ayoib Che Ahmad, 2011) which might cause by difference monitoring mechanism as well as financial statement reporting process (Yatim, Kent, & Clarkson, 2006). Previous studies have shown that the audit fees paid to the external auditors varies depending on the structure of corporate ownership (Mitra, Hossain, & Deis, 2007; Adelopo, Jallow, & Scott, 2012). However, few research discussing the ownership structure of the company as one of the corporate governance in audit costs available. Most studies examined the cases in the developed countries such as Finland (Niemi, 2005), America (Mitra et al., 2007) and England (Adelopo et al., 2012).

Given this situation, the purpose of this paper was to investigate the influence of the structures and characteristics of corporate ownership on audit fees paid to external auditors by Indonesian companies listed on Indonesian Stock Exchange (ISE). In this study, the corporate ownership structure was divided into ownership manager, foreign ownership, and the ownership of the government associated with audit fee. The corporate characteristics, which was divided into complexity, profitability, and company risk also related to audit fee.

This paper is organized in the following part. Section 2 reviews agency theory underlying the background of the hypotheses and elaborate the relationship between audit fee and management ownership, foreign ownership, government ownership, complexity, current ration, leverage, and profitability. Section 3 describes the methodology developed in this study covering variables, sample selection, and method of analysis. Section 4 elaborates steps of conducting data analysis and explains the empirical results, and finally, section 5, concludes the paper.

2. LITERATURE REVIEW

2.1.Hypotheses Development

In this research, agency theory was applied to predict companies with dispersed ownership or separately as government and foreign ownership. Agency theory is a contractual relationship that occurs between the principal who uses the agent to carry out the services in accordance with the interests of the principal in the event of separation of ownership and control of companies (Jensen & Meckling, 1976). This causes the internal control auditor dubious clients and improve substantive tests to the extent that is necessary (Chan, Ezzamel, & Gwilliam, 1993). As a result, auditor requires more time and labor costs in providing audit services.

Researches focusing on the effect of the ownership on the audit cost have also been conducted in Indonesia. Oktorina and Wedari (2015) concluded that managerial ownership, audit committee activity, firm size, liquidity ratios, profitability ratios affect audit fees. Next, Baldacchino, et al. (2014) identified that Client size, complexity, risk, ownership control, and corporate status affect the amount of audit fee. Meanwhile, research upon factors influencing audit fee conducted by Gammal (2012) showed that the size of KAP is the most important factor affecting audit fee.

Agency theory is a relevant theory to explain the mechanism of how the company's ownership structure can affect the cost of agency that relates to significant positive internal controls. In this sense, the presence of corporate governance mechanisms would improve supervision of the management of the company in order to reduce error reporting process of the financial statements (Hogan & Wilkins, 2008). The cost of agency referred to in this research was the cost of the audit.

On the other side, the corporate ownership structure is as concentrated as managerial ownership is expected to have a strong risk control mechanism. This makes the auditor to exert less effort and time to perform audit services to the company resulting in a decrease in audit fees charged to the client-party auditor

2.2. Management Ownership on Audit Fees

Jensen & Meckling (1976) stated that according to agency theory, the separation between manager and owner of a company reduces agency costs taken by managers. Therefore, previous studies suggested manager to own company's shares as a supporting oversight manager to enhance internal control and reduce audit costs. The greater the proportion of their holdings, the more responsible the managers to increase the value of a company will be.

Meanwhile, Mustapha and Che Ahmad (2011) proved that managerial ownership has inversed relationship with monitoring costs. This is consistent with agency theory that the amount of monitoring costs will be lower if the proportion of the ownership structure mostly owned by director or management that obliged management to access more information and manage the resources of the company adequately. This supported the previous studies conducted by Nelson & Rusdi (2015). Therefore, it is hypothesized that

H1: firms with large managerial ownership are likely to have lower audit fees

2.3.Foreign Ownership on Audit Fees

Jensen & Meckling (1976) stated that according to agency theory there is a difference interest between the principal or the owner of the company and the agent or manager. In fact, managers do not always run the company according to the goals of the owner instead using the authority to fulfill his/her personal interests. The problem will be more complex when it takes place in foreign companies, as audit fee to be paid for the external auditor is the major concern.

In the foreign company, audit fees will increase substantially due to the complexity of the financial statement because of geographic separation and different accounting standard between parents and its subsidiaries. Furthermore, foreign ownership requires more control over its management because of conflict of interest between management of subsidiaries

and the owner of foreign companies (Niemi, 2005). This finding supported the one of Nelson & Rusdi (2015). Therefore, it is hypothesized that:

H2: firms with large foreign ownership are likely to have larger audit fees.

2.4. Government Ownership on Audit Fees

Jensen & Meckling (1976) stated that according to agency theory, companies with good governance mechanisms are expected to reduce agency conflicts, one of which is the cost of supervising companies' management activities. The reduced conflict might happen due the existence of a good internal corporate system, in which manager will be difficult to manipulate the financial report.

Governmental ownership differs from the other forms of ownerships as the state-owned corporations are ultimately financed by money that belongs to the people of the state, and the ultimate ownership is extremely dispersed. This creates a more pronounced free-rider problem compares to big listed companies. With a diffused ownership structure, shareholders have no strong incentive to monitor directly the management themselves because each shareholder has only a small investment in the firm. As a result, in the government owned companies, as internal control system is low, the agency problem is high; thus, external auditors are needed. Chan et al. (1993) suggested that companies' shareholders with widely dispersed ownership depend on a greater reliance on auditing as a mean of monitoring to managerial behavior. This finding supported study of Nelson & Rusdi (2015). It is thus hypothesized that:

H3: firms with large government ownership are likely to have larger audit fees.

2.5. Complexity on Audit Fees

In agency theory, because of asymmetric information between managers and business owners, it is increasingly difficult for shareholders to determine whether managers are manipulating or not. So, to oversee the activities of the manager, the owner employ an external auditor as a representative of the owner to oversee the manager and ensure the credibility of the financial statements (Jensen & Meckling, 1976).

The complexity of the company might be caused by transactions using foreign currency, the number of subsidiaries, the number of branches, or the existence of business operations abroad (Cameran 2005). Client's complexity variables are proxy using inventory and account receivables divided by total assets (Niemi, 2005). In doing the auditing, external auditors need more time and effort to understand the client's business operations that in return affect the audit cost which will be higher. Gonthier-Besaciere & Schatt (2007); Hay et al. (2006); and Nelson & Rusdi (2015) found a positive relationship between client complexity and audit costs. Given this situation, the formulated hypothesis is:

H4: firms with large complexity are likely to have larger audit fees.

2.6. Current Ratio on Audit Fees

In determining the amount of audit fees, auditors consider the behavior of the client. For example, a company has a weakened corporate financial condition or higher risk of failing to pay its obligations. It is the responsibility of the auditor to ensure that the annual report is free from material misstatement. In this regard, the auditor will request compensation related to additional work to reduce audit risk. Previous research has examined when any risk action made by the client could lead to increased audit costs (Ghosh, 2011; Nelson & Rusdi, 2015; Wahab et al., 2011). In this study, the measurement used to measure business risk is the current ratio. Based on the description, it is hypothesized that:

H5: firms with large current ratio are likely to have lower audit fees.

2.7. Leverage on Audit Fees

Leverage is intended to illustrate the client's business risk; the greater the potential risk of a company to be bankrupt, the more the management try to misstate the financial statements. Consequently, the more effort the auditor attempt to do (O'Keefe, Simunic, & Stein, 1994) and the more time the auditor need to reduce the risk, the higher the audit fee imposed will be (Nelson & Rusdi, 2015). In fact, there is a positive relationship between leverage and audit costs (Yatim et al. (2006); Nelson & Rusdi (2015). Therefore the hypothesis is:

H6: firms with large leverage are likely to have larger audit fees.

2.8. Profitability on Audit Fees

In agency theory, following Jensen & Meckling (1976), as agents are employed by principals to fulfill their interests, the managers as agents of a company have responsibility to make profits. However, as a result of asymmetric information,

between the manager and the owner of the company, the owners find difficulties to determine whether managers do manipulation or not (Jensen & Meckling, 1976). To avoid such agency conflict that may reduce the profits, the owners hire services from external auditors to be their representative to ensure the quality of the companies' financial statements.

Profitability is an important indicator of the management performance that should be controlled for the needs of audit work. According to Joshi & Al-bastaki (2000) and Nelson & Rusdi (2015), firms reporting high profits are subject to high public attention to ensure the integrity and reputation of the company. Therefore, as auditors audit the revenue and the expense of the company, the auditors' effort will turn into an increase in audit fees. Based on the description above, hypothesis is formulated:

H7: firms with large profitability are likely to have larger audit fees.

3. DATA AND METHODOLOGY

3.1. Variable Measurement

The dependent variable used in this study was the level of audit fees charged to the client by an external audit represented as AFEE, measured in the Indonesia rupiah obtained directly from the financial statements. Meanwhile, the independent variables were the ownership structure of the company consisted of: (1) managerial ownership, (2) foreign ownership, (3) government ownership; and characteristics structure, which is divided into: (4) complexity, (5) current ratio, (6) leverage, (7) profitability

The independent variables were measured using stock ownership shareholders of management, foreign, and government, generated from the percentage of share ownership issued in the company's annual report. A company is categorized as managerial ownership if the percentage of ownership shares owned by management is larger than the average percentage shares owned by the company's management. The variable of the foreign ownership structure was measured by the percentage of share owned by both individual and non-individual foreigners. The government ownership was measured by the percentage of shares owned by Government of the Republic Indonesia.

Companies' ownership structure was measured using dummy variable. Code 1 was used when the company category met the criteria of the ownership structure; whereas, 0 was used when the company category did not meet the ownership criteria structure. Meanwhile, the independent variables of the company characteristics were measured by inventory and account receivables divided by total assets (Niemi, 2005) to describe the complexity of a company. The variable used to measure the level of corporate risk based on the company's financial strength in dealing with short-term liabilities was current ratio, which is current assets divided by current liabilities (Ghosh, 2011; Wahab et al., 2011).

Meanwhile, the variable used to describe the level of corporate risk based on the use of debt to finance was leverage, which is the total of debt divided by total assets (Ebrahim, 2010; Yatim et al., 2006). Furthermore, the variable used to measure the company's ability to make a profit was profitability, which is the amount of profit before tax divided by total assets (Joshi & Al-bastaki, 2000).

3.2. Sample Selection

The population of this study, all non-financial companies using currency rupiah listed in the stock exchange of Indonesia within the period of 2014-2016, was purposively sampled. Of all sampled, 150 of non-financial companies matched the criteria.

3.3. Method of Analysis

Multiple linear regression was used to test the hypothesis. The equation of multiple regression model is as follows:

The data used was secondary data gathered from Indonesian Stock Exchange Report during 2014-2016. Meanwhile, the tool used to analysis the data was Multiple Linear Regression (Ghozali, 2012). This analysis tool was chosen as it was able to answer the objective of this study; therefore, the findings were expected to describe whether audit cost had a positive or negative influence on foreign ownership, government ownership, profitability, and current ratio.

Based on the theoretical framework and the previous research, the equation of the multiple regression model of this study is formulated as follows:

$$\text{LNAFEE} = \beta_0 + \beta_1(\text{MOWN}) + \beta_2(\text{FOWN}) + \beta_3(\text{GOWN}) + \beta_4(\text{INVREC}) + \beta_5(\text{C.RATIO}) + \beta_6(\text{LEV}) + \beta_7(\text{ROA}) + \epsilon$$

LNAFEE : Natural log of total value of audit fees paid to the external auditors by the firms

MOWN : Managerial ownership

FOWN	: Foreign ownership
GOWN	: Government ownership
INVREC	: Complexity
C.RATIO	: Current ratio
LEV	: Leverage
ROA	: Profitability
ϵ	: error term

4. FINDINGS AND DISCUSSIONS

4.1. Descriptive Analysis

All non-financial companies listed in Indonesia as population of the research was purposively sampled and the result turned out to be 150 non-financial companies were eligible as they met the predetermined criteria. Table 1 describe the descriptive statistic of the samples.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AFEE	150	46750000.00	4550765000.00	907928004.7800	1087946405.79674
LNAFEE	150	17.66	22.24	19.9823	1.15469
INVREC	150	.00	.80	.2517	.19323
CRATIO	150	.00	464.98	6.8014	38.30937
LEV	150	.00	1603.50	21.0345	178.14555
ROA	150	-.32	.87	.0688	.10068
MOWN	150	.00	.51	.0265	.07993
FOWN	150	.00	.97	.2446	.29769
GOWN	150	.00	.76	.0940	.22344
Valid N (listwise)	150				

Source: Secondary data processed, 2018

Table 1 shows the descriptive statistics of the minimum, average, and standard deviation of the variables used in this study.

4.2. Dummy Variable

The independent variables consisted of ownership structure as dummy variable and the characteristics of the company. Table 2 shows the frequency of the dummy variable.

Tabel 2: Dummy Variable Frequency

Variable		Frequency	Percentage
MOWN	MOWN=1 companies with shares owned by managerial is higher than 2.65 %	109	72.67%
	MOWN=0 companies with shares owned by manajerial is lower than 2.65 %	41	27.33%
FOWN	FOWN =1 companies with shares owned by foreign is higher than 24.46%	127	84.67%
	FOWN =0 companies with shares owned by foreign is lower than 24.46%	23	15.33%
GOWN	GOWN =1 companies with shares owned by government is higher than 9.4%	114	76%
	GOWN =0 companies with shares owned by government is lower than 9.4%	36	24%

Source: Secondary data processed, 2018

Table 2 shows the proportion of the samples having score of higher or lower than the average value (descriptive statistic). In the managerial ownerships (MOWN), 72.67% samples are above the average value of 2.65%; while, others are lower than the average value. In the foreign owned companies, the number of samples having higher than the average score of 24.46% is 84.67%; while, the rest, 15.33%, has below average score. Meanwhile, in the government owned companies, the number of samples having higher than the average score of 9.4% is 76%; while, the rest, 24%, has below average score.

Before performing regression analysis, the model was tested using classical assumption to identify whether the model was free from the problems of normality test, multi-colonierity test, autocorrelation test, and heterokedasticity test.

The first hypothesis tested showed that managerial ownership had a negative relationship on audit fees; there was insufficient evidence to support firms with managerial ownership that tended to lead to lower audit fees. This result was supported by the research of Niemi (2005) that managerial ownership variables were negatively related to audit fees.

Table 3: Results of Hypothothesis

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	19.743	.179		110.392	.000
MOWN	-2.243	1.090	-.155	-2.058	.041
FOWN	.674	.300	.174	2.250	.026
GOWN	1.017	.401	.197	2.539	.012
INVREC	-.815	.450	-.136	-1.811	.072
CRATIO	-.002	.002	-.068	-.900	.369
LEV	.001	.000	.110	1.443	.151
ROA	3.530	.878	.308	4.020	.000

a. Dependent Variable: LNAFEE

The result of the second hypothesis showed that the foreign ownership had a positive relationship on audit fees, which was in line with previous research of Niemi (2005). The increase of the audit fees took place as the foreign ownership tended to have high complexity of financial reporting and geographical differences. The reporting of the company's financial statements would be more complex when the parent company was located in a different country from its subsidiaries due to different accounting rules and standards in each country.

The result of the third hypothesis showed that the government ownership had a positive relationship with audit fees, which was in line with the study of Chan *et al.* (1993); and Nelson & Rusdi (2015). In agency theory, companies with good governance mechanisms are expected to reduce agency conflicts, one of which is the cost of supervising company management activities (Jensen & Meckling, 1976).

The audit fees of the government ownership companies tended to increase because public financed government-controlled companies were fragmented or dispersed. Such ownership tended to have low interest in overseeing the performance of the managers making it difficult for external auditors and increased the audit fees.

The result of the fourth hypothesis showed that the client complexity did not have a significant relationship on audit cost, as there was not enough evidence to support that companies with complex client complexity tended to lead to higher audit fees. This was in accordance with previous research by Nelson & Rusdi (2015); and Niemi (2005) that client complexity had no effect on audit fees.

The result of this hypothesis tested contradicted with Gonthier-Besacier & Schatt (2007); and Hay *et al.* (2006) that client complexity positively affected audit costs because clients with complex business required more effort and time on external auditors to fully understand business operations of the clients. In other words, the more the time spent on doing the audit procedures, the higher the audit cost will be.

This can be proven from the company's research data ASSA code in 2014 has an INVREC amount of 0.063 with an audit fee of Rp 744,000,000 while a company with CTTH code has an INVREC amount of 0.698 but only pays an audit fee of Rp 300,000,000. This shows that not all companies with high complexity will be charged a high audit cost as well.

This result allegedly caused by companies that have high inventory and accounts receivable have good accounting information systems and good internal controls so that companies can handle the number of transactions efficiently and effectively. This certainly facilitates external auditors so that client complexity does not affect towards audit fees.

The result of the fifth hypothesis showed that current ratio did not affect audit fee. This finding was in line with the one of Baldacchino, et al. (2014) as public accountant firm considered audit risk and business of the clients very low.

The result of the sixth hypothesis showed that the leverage did not affect the audit fees. This indicated that there was not enough evidence to support the firms with high leverage ratios. This indication led to the increase of the audit fees that external auditors charged on their clients. The result of this test was not in accordance with previous research by Nelson & Rusdi, (2015); and Yatim *et al.* (2006) that the greater the potential risk of companies to go bankrupt, the more the management try to misstate the financial statements; so that, the auditors need more performance to reduce such risks. However, this was in line with the previous research conducted by Oktorina & Wedari (2015) that leverage had no effect on audit costs.

This can be seen from the research data by the company with INTP code where the company has LEV of 0.149 and the audit fees of Rp 3.612.000.000 while the company with the code CTTH have LEV of 0.771 with audit fees of Rp 300,000,000

The results of the seventh hypothesis showed that profitability had a positive relationship on audit fees. This was in line with the research of Joshi & Al-bastaki (2000) that companies reporting high profits were subject to high public attention; therefore, to save the integrity and the reputation of the company, the auditor audited the income and also the expense of the company, that in turn increased the audit fees.

5. CONCLUSION

The results of this study indicate several factors affecting the amount of audit fees paid by the company. The results show a significant positive relationship between auditing fees and firms with greater foreign ownership, government ownership, and profitability but there is a significant negative relationship with firms with higher managerial ownership. The results also indicate a non-significant relationship between audit fees and firm complexity as well as leverage and current ratio.

This study has several limitations. Firstly, there is little disclosure of audit fees in the company's annual report, making the number of research samples small. Secondly, the regression model has 21.1% of the factors that affect audit fees. Third, this study uses the total cost paid to the external auditor as an audit fees; whereas, in the audit cost there may be assurance services and non assurance services

Based in these limitations, further research is expected to add other variables besides the regression model such as firm size, auditor size, and audit committee characteristics in order to explain factors outside the regression model.

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ABSTRACT

Purpose - This study investigates announcement effect anomaly on Seasoned Equity Offerings (seos) conducted in Borsa Istanbul for the 2010 – 2015 period and analyze its determinants.

Methodology - Event study and regression analysis were used to determine in order to observe abnormal returns in case of announcement performed. For the purpose of comparing results based on announcement was published or not, Paired Sample Statistics test was used. To find out announcement effect anomaly's determinants regression analysis was used through Panel Dynamic OLS (PDOLS) method.

Findings- Abnormal average returns and abnormal cumulative returns were observed as negative both in case of announcement or not. But negative returns is significantly higher when announcement is made.

Conclusion- Announcement effect anomaly has been confirmed and it has been determined that Leverage Change Ratio, Nominal Capital Increase, CAR (-10,1) variables have positive effect on seos while M/B ratio has negative effect.

Keywords: Announcement effect, seasoned equity offering, capital increase, abnormal stock returns, price anomalies.

JEL Codes: C23, G10, G32

1. INTRODUCTION

Some of the studies on seasoned equity offerings in the literature are related to announcement effect anomaly. It is possible to describe the effect of the announcement as the change in the stock prices following the public announcement of the company's stock issuances which conducted after initial public offering. Myers and Majluf (1984), Eckbo and Masulis (2005); describe the announcement effect as negative reaction to the stocks which overvalued.

Asquith and Mullins (1986), have separated seasoned equity issuances as primary and secondary issuances. They define the primary issuance as a new share issuance that increases the shares in the free float of the company while they describe the secondary seasoned equity issuance as the issuance of the shares held by the existing shareholders. In other words that has not increased the number of company shares.

In most of the studies performed in the previous literature, negative announcement effect was observed in seasoned equity offerings. The negative effect of the announcement shows that when the investors realise announcement, they apply downward revision in valuing of the stocks. Although the majority of the studies carried out indicate a negative effect, but in some studies the positive effect of the announcement has also been confirmed.

The study of Asquith & Mullins (1986) and Masulis & Korwar (1986), which can be regarded as the first of the studies related to the announcement effect show that on average 3% of the negative announcement effect was calculated on the announcement day compared to two days before last day.

However, Eckbo and Masulis (1995) pointed out that in the capital increases in which the subscription rights used (public placements) and Wruck (1989) argued in capital increases which allocated to only a specific investors (private placements),

negative announcement effects have not been identified. In fact, according to the results of studies conducted in some other countries outside the US, the announcement effect is also calculated positively.

Eckbo, Masulis and Norli (2005), defined announcement effect which is generally considered negative in the initial and seasoned equity offerings, as the indirect issuance costs of the company.

However, in seasoned offerings, the market reaction is generally negative, but the market response may be different in cases where the seasoned equity offering is completed and canceled. Mikkelson and Partch (1986), determined that in the case of the completion of seasoned offering, stock returns are positive in period between the announcement and the completion of the issuance but then it turns to negative. If the announcement is canceled, it is determined that the returns are negative in the period between announcement and issuance then turns to positive.

In this study; based on analyses made through the sample consisting of companies that performed seasoned equity offering for the 2010-2015 period in Borsa Istanbul, we tested announcement effect hypothesis is valid. For the purpose of confirming hypothesis we tried to find out whether announcement of seasoned offering creates a meaningful effect on the average abnormal return of the stocks.

2. LITERATURE REVIEW

Modigliani and Miller (1958), found that issuance of new stocks, which lead to a decrease in the leverage level of the company and hence in the per share earnings, convey a negative signal to the market and thus investors respond negatively to the announcement of new share issuance.

Scholes (1972), introduced two hypotheses regarding the announcement effect during seasoned equity offerings: price pressure hypothesis and transaction cost hypothesis. The price pressure hypothesis emphasizes that the issue of new stocks leads to a steady decline in stock prices, depending on the increase in the amount of stock circulating in the market. The transaction costs hypothesis suggests that investors have a negative response to the seasoned equity offerings as investors have to re-adjust their investment portfolios so that they can buy them from issuance, which in turn increases the transaction costs of investors.

Myers and Majluf (1984), stated that when there is information asymmetry between firm management and investors in favor of firm management, firms first apply to internal financing sources and then they prefer external financing sources. They also underlined that in terms of using external sources they first prefer debt financing and then they tend to issue stocks. In the literature, this is called the pecking order theory.

Before the seasoned equity offering, if there is information that may effect value of stocks of companies but the investors haven't aware of yet, it is called asymmetric information and according to Myers and Majluf (1984) it is inevitable because of two reasons:

- Information are shared with the investors through the announcements that include important decisions may affect the price of the stocks, carries the confidential information of the company to its competitors. Therefore company management may delay the disclosure of such kind of information.
- If the company is publicly held, the company will have many partners at different levels of knowledge and education and the company may not be able to explain each decision of management to the all investors particularly not having technical background at all times. Therefore, it is accepted that the shareholder and senior management may not prefer to publish material disclosures prior to decisions to be taken.

Based on the reasons above, the asymmetric knowledge also gives the opportunity of market timing to the firm management. When the firm's stock becomes overvalued, the firm management tries to maximize the issuance revenue by choosing the seasoned equity offering as financing preference. As a result, the seasoned equity issuance decision of the company gives a negative signal to the investors and leads them to give negative response to the company's issuance. In the literature, this is called Existing Asset Value Signalling Hypothesis regarding the value of assets.

Miller and Rock (1985), argued that firms' issuance of new stocks give a negative signal to the market. In this hypothesis called the cash flow signalling, it is accepted that the stock issuance decision is perceived by market as firms can not generate enough cash to finance its operations and investments because their liquidity ability are too low.

Mikkelson and Partch (1986), conducted study in seasoned offerings on stocks and debt instruments performed by 360 industrial firms in the US during the 1972-1982 period and found negative announcement effect in issuance. They asserted that change in stock prices are not related to the amount of new financing, the size of the IPO and the quality of the rating of the borrowing instrument etc. According to their analysis the financial instrument is the only significant determinant of the price reaction. In addition to this, they found that abnormal price movements after the announcements of completed

issuance followed a reversal price movements when compared to the announcements after canceled and / or incomplete issuances.

Asquith and Mullins (1986), examined 531 public offerings of common shares performed by public and industrial firms in the US were made in the form of capital increases through underwriting during 1963 – 1981 period. They calculated announcement effect for whole sample as - %2,7 during the announcement period that they considered to be 2 days. Based on issuance method they found negative effect as - %3 in primary issues, - %2 in secondary issues and - %3,2 in combined issues which include both primary and secondary issues. The results obtained confirm the negative announcement effect and consistent with the previous literature. They emphasized that primary offerings caused dilution in stocks due to increasing number of shares.

Jensen (1986), in his study called wasteful investment hypothesis, argued that financing through borrowing will have a controlling effect on the activities of the firm's managers and thus it increase the operational efficiency of the firm. He emphasized that thanks to use of debt, firms may have fewer initiatives on their cash flows and they must be more rational in all their decisions. Thus some typical agency problems such as moral hazard by Holmstrom in 1979 and adverse selection by Rock in 1986 may not be seen or may be reduced.

Barclay and Litzenberger (1988), observed an average - 1.3% negative market response in the first 15 minutes following the announcement of public offering. However, in the hour following announcement of public offering, a negative response was observed slightly lower than returns of the first 15 minutes, at a statistically significant level. It has been determined that, issue size, the use of the fund obtained from the offering and the expected profitability of new investments don't correlate with announcement effect seen in the new share issue. Unlike many studies in the previous literature, it has been reported that after the completion of the new share issue, an average improvement as 1.5% in firm stock prices has been observed.

Eckbo and Masulis (1995), have examined the effect of the investment banking activities and the use of subscription right on the public offering. If investment bank believes that price determined during the pricing phase is overvalued, may ask the issuer to reduce the price of the issue and / or to withdraw it. This behaviour of investment banking may reduce the cost of asymmetric information. Participation of existing shareholders who are regarded much closer to company and have superior and confidential information, will be perceived as positive signal thanks to reducing adverse selection problem.

Bayless and Chaplinsky (1996), found that price reactions of the market for announcements of seasoned equity offerings in hot public offering markets was an average of 200 base points lower than the response to the seasoned equity offerings made during cold public offerings markets. Findings obtained based analysis confirm that firms are going to apply the opportunity window in stock issuance.

Eckbo, Masulis and Norli (2005), during 1980-2004 period, observed that only half of the publicly traded companies in the US issued any financial instruments after the initial public offering, and a quarter of them made seasoned equity offerings. They emphasized that this is related to the cost of adverse selection should be taken into consideration when companies want to provide their financing needs from external resources.

They found the announcement effect of stocks offered in the US through full underwriting is negative. In their study, it was reported that the negative announcement effect seen in the private sector includes industrial firms is more severe than public firms. They calculated two-day abnormal return as - % 3 in industrial companies while they found as - % 1 in public firms. They stated that the lower market response seen in public firms was consistent with adverse selection model. Because when public firms are compared to private sector companies, they have less initiative to make timing for overvaluation of stocks in short term.

Wu, Wang and Yao (2005), studied on a sample included 405 seasoned equity offerings based on private and public placement made by industrial firms under the full underwriting during the period of 1989 – 1997 in the Hong Kong stock Exchange. According to the results of the analysis, positive announcement effect was determined in seasoned equity offerings which made both in the form of public offerings and private offerings. They calculated abnormal returns as %2 in private offerings while they realised %1,9 return in public placement during the announcement period included 2 days. Via the regression analysis they applied, it has been determined that there is a significant statistical relationship between the returns on the announcement day and the concentration level of the company's capital both in private and public placements. It is also emphasized that in the analysis, relationship between the announcement day returns and the huge amount of new share issuance will be positive if the concentration in the capital is over 40%. It is argued that firms with relatively low market value / book value ratios, but whose growth rate is uncertain, are more likely to be seen the positive announcement effect in their stocks. They also found that the firm size had a significant effect in the announcement effect anomaly that seen in the seasoned equity offering. They observed higher announcement effect in new stock issuances made by relatively small issuers. They attribute this to asymmetric information in small-scale issuer firms is more related investment opportunities than the existing assets available.

Shen (2006), analyzed the capital increases were performed in the Shenzhen and Shanghai stock exchanges during the 1993-2003 period, including 72 public offerings and 567 capital increases that subscription rights were used. According to the results of the analysis, similar to the developed countries' stock markets, the decrease in stock prices observed on the announcement day, that is, the negative announcement effect was confirmed. It has been found that the impact of the announcement is positively correlated with the proportion of Chinese publicly companies whose shares owned by the government. Also the poor performance in the public offerings is greater in the capital increases in which the subscription right is used. According to market and risk adjusted returns, the two-day average abnormal returns are calculated as %1,1 for public offerings and calculated as 0.43% for capital increases that subscription right is used. It has been noted that these negative abnormalities detected in China differ from previous studies conducted in Japan, Singapore and Korea, but are compatible with studies performed in the United States, England and France.

Shahid et al. (2010), examined price reactions for the announcement of different types of share issuances of 717 seasoned equity offerings conducted during period of 1998- 2008, in which 565 capital increases that subscription rights were used and 152 were performed in the form of direct public sale. In the analysis, unlike the previous literature, three different announcement dates were taken into account include the date of the board meeting, the date of the general assembly meeting and the date when the public announcement was made. Findings according to the analysis results show that the market has a positive response to the capital increases in which the subscription right is used, but seasoned equity offerings have a negative signal to investors. While the negative announcement effect was observed in the seasoned equity offerings on the all dates of announcements, the dates on which the market responded most were the date of the board of directors, the announcement date of the public announcement and the date of the general meeting respectively.

Ruutu (2010), found that the returns of announcement period in seasoned equity offerings fluctuates somewhat depending on the type of issue. In the study, as issue type accelerated offerings and book building at a fixed price were used. Accelerated offerings method was examined under two subheadings covers bought deal and accelerated book building. According to the underwriting methods examined in the sample, the most positive return was seen in the type of full underwriting.

Ahsan and Alam (2014), analysed the impact of the announcement effect in the sample consist of 83 seasoned equity offerings include subscription right usage and capital increase during the period of 2006 – 2012 in Bangladesh. The results of the analysis were consistent with the literature and found the existence of abnormal returns on the day of the announcement and nearest days. Regarding the daily sectoral distribution of abnormal returns, it is found that the most abnormal returns are seen in the textile sector and the lowest abnormal returns are seen in the banking sector.

3. DATA AND METHODOLOGY

3.1. Sample Construction

In this study, the data of firms that performed seasoned equity offerings between 2010 and 2015 were analyzed. 79 seos performed by 58 publicly held companies during analyze period are included for the first form of sample construction. Like Asquith and Mullins (1986), Dubois and Jeanneret (2000) and Allen and Soucik (2008); in order to prevent overlap problems only first seos issues are included to sample during analyze period by ignoring subsequent seo issues were conducted by the same companies in the same period. Therefore 67 seos performed by 52 firms were included to the final sample. The data analyzed in the sample consist of the company's stock announcements dates and issuance dates, closing values (prices) of the stocks and BIST 100 index for the related period, returns calculated based on closing prices and the financials of the companies. Data of stocks and BIST 100 were obtained daily basis from Borsa Istanbul for the analysis period. Announcements of seasoned equity issuance of the companies were analyzed through the official site of Public Disclosure Platform (www.kap.gov.tr) by examining the material disclosures of each company for the related period. Since the company's seasoned equity offering was announced for the first time by the decision of the board of directors, the decision date of the company's board of directors was taken into consideration as the date of the announcement.

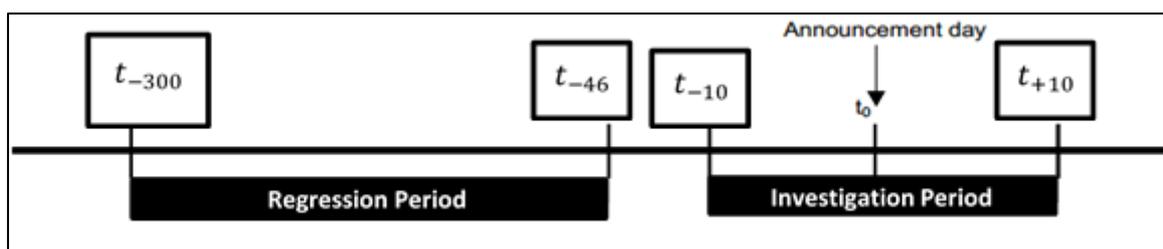
3.2. Model

During the analysis of this study, event study and regression method was used. In event studies main actions should be taken as follow (Kaya, 2012: 67, Mazgit, 2013: 236-237) :

- A regression estimate is made by assuming the existence of a linear relationship between firm return (r_i) and market return (r_m) in the estimation window. In such studies, a specific period before the announcement is called the regression period or the estimation window (Brown and Warner, 1985). Regression period is used to determine the normal behavior of the asset returns compared market returns when there is no any event (in this study seasoned equity announcement). Pre-event observation should include 252 days or at least 126 days in the forecast window so that actual price movements can be defined (Beninga, 2012: 373). In this study, because the period of obtaining permission from Capital Markets Boards (CMB), which is the regulator of capital markets in Turkey, lasts about 1-1.5

months before the announcement of the decision to increase capital, the regression period which designed prediction window by starting 46 days before the announcement date as Dutordoir and Hodrick's study in 2012 was used. Based on regression analysis performed in this study, we want to clarify that if the companies do not make seasoned equity offerings, what the expected returns of the stocks would be. Then, using the parameters of the calculated regression, in parallel with the study of Asquith and Mullins in 1986, the announcement observation period was considered to be the 10-day period covers before and after the seasoned equity offering (-10, +10), and the expected returns, abnormal returns and cumulative abnormal returns are calculated for this period. These results obtained; represent the expected abnormal returns of the stock under the assumption that there is no seasoned equity offering has occurred. Figure 1 below shows below the regression and observation period used in the model.

Figure 1: Regression and Observation Period Used in Model



- In the next stage, the abnormal returns are calculated by using the stocks returns and market returns in the seasoned equity offering for the investigation period (ie. using the actual observation values), then the average and cumulative average abnormal returns are reached by using these values. Finally, the findings obtained by these two analyzes are compared and tried to find out whether the announcement effect exists or not. It is decided that the hypothesis of announcement effect is valid when there is a meaningful difference between the two analysis findings while it can be rejected if there is no meaningful difference.

First of all, in order to initiate calculations for each firm, daily returns of stocks (r_i) and market (r_m) values for the related period are calculated. Equations used in this process as follows;

$$R_{it} = \left(\frac{P_{it} - P_{it-1}}{P_{it-1}} \right) * 100 \quad (1)$$

$$R_{mt} = \left(\frac{P_{mt} - P_{mt-1}}{P_{mt-1}} \right) * 100 \quad (2)$$

Here P_{it} is the stock price of firm i at time t and P_{mt} is the closing price at day t of BIST100 index. In the next step, by using the values of these two series for (-300, -46) period and equation (3), for each firm (for the 67 seasoned equity offerings in which the data set is appropriate in this study), α and β coefficients were estimated by making separate equation estimations using ordinary least squares method.

$$R_{it} = \alpha_i + \beta_i R_{mt} \quad (3)$$

The parameters obtained are shown in Table 1. This was performed with Eviews 9.0 program

Table 1: Coefficients Calculated in the Prediction Window

<i>Id</i>	<i>Alfa (α)</i>	<i>Beta (β)</i>
1	0.003	0.351
2	0.044	0.795
3	0.126	0.727
4	-0.241	0.836
5	-0.130	0.783
6	0.196	0.709

7	0.071	0.385
8	0.130	0.635
9	0.964	0.388
10	-0.085	0.405
11	0.054	0.946
12	-0.199	0.732
13	-0.246	0.119
14	-0.204	0.374
15	0.077	0.589
16	0.011	0.692
17	0.411	0.491
18	-0.032	0.921
19	-0.064	0.315
20	-0.079	0.541
21	1.072	1.020
22	-0.033	0.431
23	-0.046	0.782
24	0.347	0.243
25	-0.004	0.777
26	-0.038	0.840
27	0.228	1.150
28	0.429	0.402
29	-0.048	0.567
30	-0.085	0.942
31	0.067	0.610
32	-0.078	0.734
33	-0.253	0.851
34	0.081	-0.015
35	0.008	0.090
36	-0.027	0.823
37	0.205	0.468
38	-0.137	0.430
39	0.197	0.964
40	0.324	0.696
41	0.117	0.972
42	-0.053	0.528
43	0.056	0.676
44	0.153	0.642
45	0.906	0.249
46	0.124	0.423
47	-0.264	0.768

48	0.129	0.908
49	-0.122	0.495
50	0.033	0.652
51	-0.688	0.729
52	-0.048	0.375
53	0.109	0.410
54	-0.114	0.861
55	0.892	0.766
56	-0.058	0.802
57	-0.091	0.397
58	-0.076	0.726
59	-0.017	0.531
60	-0.185	0.413
61	0.191	0.635
62	0.341	0.164
63	0.021	0.700
64	0.005	0.829
65	0.031	0.551
66	-0.161	0.828
67	0.254	0.994

By using α and β coefficients obtained, for each company expected returns were calculated separately for investigation period (-10, +10). The equation used in this process is;

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} \quad (4)$$

$E(R_{it})$ refers to expected returns of company i and R_{mt} refers to the return of the BIST100 index for the day t . Using the equation (5), the abnormal return (AR_{it}) of each firm is calculated.

The equation used in this process (Asquith and Mullins, 1986: 68);

$$AR_{it} = R_{it} - E(R_{it}) \quad (5)$$

Then, using these AR values, a cumulative abnormal return (CAR) for each firm is calculated. The equation used in this process (Asquith and Mullins, 1986: 68);

$$CAR_{t_1}^{t_2} = \sum_{t=t_1}^{t_2} AR_t \quad (6)$$

Using the previously calculated AR values, the Average Abnormal Returns (AAR) for each date were calculated. The equation used in this process (Asquith and Mullins, 1986: 68);

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (7)$$

Using CAR_t values in a similar manner, Cumulative Average Abnormal Returns (CAAR) for each date were calculated. The equation used in this process (Asquith and Mullins, 1986: 69);

$$CAAR_{t_1}^{t_2} = \frac{1}{N} \sum_{i=1}^N CAR_{t_1}^{t_2} \quad (8)$$

Calculated AAR and CAAR values are divided by their standard deviation to reach t statistics. The formula used to calculate standard deviation is:

$$\sigma = \sqrt{\frac{1}{(n-2)} \left[\sum (y - \bar{y})^2 - \frac{[\sum (x - \bar{x})(y - \bar{y})]^2}{\sum (x - \bar{x})^2} \right]} \quad (9)$$

The formulas used to calculate the t statistic are:

$$t = \frac{AR_t}{\sigma} \quad (10)$$

$$t = \frac{CAR_t}{\sigma} \quad (11)$$

4. FINDINGS AND DISCUSSIONS

4.1. Test Results about Hypotheses on Seos Existence Seos

The AAR and CAAR values obtained as a result of these operations are shown in Table 2. This was done using the SPSS 22 program and MS Office Excel 2013.

Table 2: AAR and CAAR Values Without Announcement

DAY	AAR	t ist	CAAR	t ist
-10	0.146	0.501	-0.127	-0.315
-9	0.009	0.021	0.158	0.303
-8	0.122	0.352	0.280	0.448
-7	-0.075	-0.200	0.205	0.286
-6	0.176	0.512	0.382	0.439
-5	0.460	1.138	0.842	0.906
-4	0.205	0.606	1.047	1.063
-3	0.353	0.788	1.401	1.255
-2	0.691	1.439	2.092*	1.726
-1	-0.232	-0.686	1.860	1.561
0	-0.618	-0.982	1.241	0.874
1	-2.104**	-2.471	-0.940	-0.537
2	-0.02	-0.037	-0.882	-0.445
3	-1.459***	-3.226	-2.342	-1.243
4	-0.487	-1.316	-2.829	-1.430
5	0.705	1.399	-2.124	-0.980
6	0.273	0.770	-1.850	-0.812
7	-0.498*	-1.843	-2.349	-1.022
8	-0.213	-0.834	-2.562	-1.089
9	-0.765**	-2.368	-3.327	-1.444
10	-0.185	-0.415	-3.411	-1.527

Note: ***, **, and *; refer to the relevant value is statistically significant at 1%, 5% and 10% significance levels, respectively.

According to the results in table 2; negative average abnormal return on stocks occurred on days 1, 3, 7 and 9 following announcement of seasoned equity offering. In CAAR values, average abnormal return of the stocks was negative for the period of two days prior to the announcement of the seasoned equity offerings.

In the analyzes made so far, it has been worked under the assumption that no seasoned equity offerings announcement has been made. In order to calculate AAR^a ve $CAAR^a$ values for the case which seasoned equity offerings were performed actual P_{it} ve P_{mt} values for the investigation period and R_{it} and R_{mt} values calculated based on equation (1) and equation (2) were used. The formula used to calculate the abnormal return in the case of the seasoned equity offering (Asquith and Mullins, 1986: 68):

$$AR_{it}^a = R_{it} - R_{mt} \quad (12)$$

AR_{it}^a : indicates abnormal returns in the case of an announcement.

Using AR^a values and equation (13) the cumulative abnormal returns (CAR^a) were calculated as follows:

$$CAR_{t_1 t}^{t_2 a} = \sum_{t=t_1}^{t_2} AR_t^a \quad (13)$$

In the next stage, based on AR^a and CAR^a values and equation (14) and equation (15) average abnormal returns (AAR^a) and average cumulative abnormal returns ($CAAR^a$) were calculated.

$$AAR_t^a = \frac{1}{N} \sum_{i=1}^N AR_{it}^a \quad (14)$$

$$CAAR_{t_1 t}^{t_2 a} = \frac{1}{N} \sum_{i=1}^N CAR_{t_1 i}^{t_2 a} \quad (15)$$

Finally, standard deviation were calculated using Equation (9) and t statistics are obtained using Equation (10). The findings are listed in Table 3:

Table 3 : AAR^a and CAAR^a Values After Announcement

DAY	AAR ^a	t ist.	CAAR ^a	t ist.
-10	0.005	0.012	-0.042	-0.103
-9	-0.201	-0.379	-0.244	-0.309
-8	-0.217	-0.487	-0.461	-0.426
-7	-0.472	-1.011	-0.934	-0.686
-6	-0.029	-0.067	-0.963	-0.578
-5	0.228	0.461	-0.734	-0.372
-4	-0.168	-0.386	-0.903	-0.402
-3	0.060	0.114	-0.842	-0.330
-2	0.457	0.809	-0.385	-0.135
-1	-0.386	-0.893	-0.771	-0.249
0	-0.647	-0.930	-1.419	-0.411
1	-2.133**	-2.439	-3.552	-0.934
2	-0.117	-0.196	-3.670	-0.877
3	-1.142**	-1.982	-4.812	-1.258
4	-0.110	-0.236	-4.922	-1.347
5	0.516	0.997	-4.406	-1.140
6	0.320	0.913	-4.085	-1.036
7	-0.648**	-2.068	-4.733	-1.162
8	-0.433	-1.525	-5.167	-1.231
9	-0.936***	-2.616	-6.103	-1.418
10	0.152	0.342	-5.809	-1.392

Note: *** and **, refers that related values are statistically significant at 1% and 5% significance level respectively.

According to the results shown in Table 3; negative average abnormal returns of stocks on the 1st, 3rd, 7th and 9th days following announcement related seasoned equity offerings was observed. In other words, negative effect seen in related days when the companies announce their capital increase decision. However, it was found that cumulative average abnormal returns before and after the public announcement of the seasoned equity offering were not statistically significant.

Based on average abnormal returns, hypotheses used to find out whether announcement effect exist:

$H_{1,0}$: $AAR_t = AAR_t^a$ Average abnormal returns are not significantly different from each other. That is, the announcement effect hypothesis can be rejected.

$H_{1,1}$: $AAR_t \neq AAR_t^a$ Average abnormal returns are significantly different from each other. That is, the announcement effect hypothesis can not be rejected.

Based on on cumulative average abnormal returns, hypotheses used to find out whether announcement effect exist:

$H_{2,0}$: $CAAR_t = CAAR_t^a$ Cumulative average abnormal returns are not significantly different from each other. That is, the announcement effect hypothesis can be rejected.

$H_{2,1}$: $CAAR_t \neq CAAR_t^a$ Cumulative average abnormal returns are significantly different from each other. That is, the announcement effect hypothesis can not be rejected.

If the H_0 hypotheses can not be rejected, the announcement effect hypothesis will be accepted as valid for the related days.

In order to test these hypotheses, table 4. was prepared by evaluating results based on Table 2. and Table 3. together.

Table 4: AAR and CAAR Values Without Announcement and AAR^a and CAAR^a Values After Announcement

DAYS	AAR	CAAR	AAR ^a	CAAR ^a
-10	0.146	-0.127	0.005	-0.042
-9	0.009	0.158	-0.201	-0.244
-8	0.122	0.280	-0.217	-0.461
-7	-0.075	0.205	-0.472	-0.934
-6	0.176	0.382	-0.029	-0.963
-5	0.460	0.842	0.228	-0.734
-4	0.205	1.047	-0.165	-0.903
-3	0.353	1.401	0.060	-0.842
-2	0.691	2.092*	0.457	-0.385
-1	-0.232	1.860	-0.386	-0.771
0	-0.618	1.241	-0.647	-1.419
1	-2.104**	-0.940	-2.133**	-3.552
2	-0.02	-0.882	-0.117	-3.670
3	-1.459***	-2.342	-1.142**	-4.812
4	-0.487	-2.829	-0.110	-4.922
5	0.705	-2.124	0.516	-4.406
6	0.273	-1.850	0.320	-4.085
7	-0.498*	-2.349	-0.648**	-4.733
8	-0.213	-2.562	-0.433	-5.167
9	-0.765**	-3.327	-0.936***	-6.103
10	-0.185	-3.411	0.152	-5.809

When the results in Table 1.4 are considered; the $H_{2,0}$ hypothesis was rejected at the level of significance of 10% and it was decided that the announcement effect hypothesis was valid for only on the second day before the announcement of the seasoned equity offering because the CAAR value was statistically significant only this day. On the 1st, 3rd, 7th and 9th days after announcement of the seasoned equity offering, there is a negative and statistically significant average abnormal returns regardless seasoned equity offering announcement published. During the investigation period, the returns calculated on the assumption that the seasoned equity offering announcement was not made were negative. After the announcement of the seasoned equity offering published the negative return both on the announcement date and after continued. If there is a meaningful difference between the two returns, the announcement effect hypothesis will be accepted for the stocks of

companies that make seasoned equity offerings during the analysis period. In other words, the existence of more negative and / or less negative returns will be questioned if the company publish announcement offering.

Paired sample statistics t test was used to determine whether there is a significant difference between AAR - AARa values and CAAR – CAARa values. This test is effective in testing whether the average of measurements of a group's separate criteria differ (Akdağ, 2011). In this context, table 5. shows test results rest on AAR and AARa values.

Table 5: Paired Samples Test – AAR& AARa

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
AAR - AAR ^a	0.113	0.220	0.048	0.013	0.214	2.361	20	0.029

Since the probability value (0.029) in Table 1.5 is smaller than 0.05, $H_{1,0}$ hypothesis was rejected and it was decided that there was a significant difference between AAR and AARa values. Based on the AAR values, it can be assumed that the announcement effect hypothesis is valid. Table 6. shows test results rest on CAAR and CAARa values.

Table 6: Paired Samples Test - CAAR& CAARa

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
CAAR - CAAR ^a	1.987	0.824	0.179	1.612	2.362	11.049	20	0.000

Since the probability value (0.029) in Table 6. is smaller than 0.05, $H_{2,0}$ hypothesis was rejected and it was decided that there was a significant difference between CAAR and CAARa values. Similarly, by looking at the CAAR values, it can be assumed that the announcement hypothesis is valid.

When the results obtained from this analysis are generally evaluated; it can be claimed that the seasoned equity offerings announcement has a statistically significant effect on the average abnormal returns and the cumulative average abnormal returns of the stocks. From this point, it can be claimed that the announcement effect hypothesis is valid for the companies that offered to the public between 2010 and 2015. Announcement effect was observed as negative. Based on the findings shown in table 1.2, if the announcement was made during the investigation period, it is seen that the stock returns are lower than when the announcement done. If the announcement is not made, the cumulative abnormal return of stocks on the 10th day after the announcement date calculated as approximately - 3.4%, while in case of existence of announcement the cumulative abnormal return on the 10th day following the announcement calculated as 5.8%. Based on these calculated values, the existence of a negative announcement effect is confirmed for the sample consisting of companies that have made seasoned equity offerings in Borsa Istanbul during the analysis period.

4.2 Determinants of Announcement Effect

At the end of the analysis, the determinants of the announcement effect will be found by panel data analysis methods. For this purpose, AARa and CAARa used as dependent variables while leverage ratio change (LC), issue size (nominal value of shares sold: IS), CAR(-10,-1) (CAR) and Market Value / Book Value ratio (M/B) were used as in dependent and following models were created :

$$\text{Model 1: } AAR_t^a = \beta_0 + \beta_1 LC_{it} + e_{it} \quad (16)$$

$$\text{Model 2: } AAR_t^a = \alpha_0 + \alpha_1 IS_{it} + u_{it} \quad (17)$$

$$\text{Model 3: } AAR_t^a = \delta_0 + \delta_1 CAR_{it} + v_{it} \quad (18)$$

$$\text{Model 4: } AAR_t^a = \theta_0 + \theta_1 M/B_{it} + \varepsilon_{it} \quad (19)$$

$$\text{Model 5: } CAAR_t^a = \beta_0 + \beta_1 LC_{it} + e_{it} \quad (20)$$

$$\text{Model 6: } CAAR_t^a = \alpha_0 + \alpha_1 IS_{it} + u_{it} \quad (21)$$

$$\text{Model 7: } CAAR_t^a = \delta_0 + \delta_1 CAR_{it} + v_{it} \quad (22)$$

$$\text{Model 8: } CAAR_t^a = \theta_0 + \theta_1 M/B_{it} + \varepsilon_{it} \quad (23)$$

Among these models, Model (1) and Model (5) for Leverage Effect Hypothesis, Model (2) and Model (6) for Price Pressure Hypothesis, Model (3) and Model (7) for Signalling Hypothesis and Model (4) and Model (8) for Growth Opportunities Effect Hypothesis used to test above mentioned hypotheses. Due to the size of the CAR (-10, -1), the time dimension of all these analyzes was taken as (-10, -1) period. In this case, the time dimension of the analysis T was regarded as 10 and the horizontal section size N was taken as 67.

Descriptive statistics of the variables included in these models are presented in Table 7:

Table 7: Descriptive Statistics for Variables

	AAR^a		CAAR^a		LC
Mean	-0.072	Mean	-0.628	Mean	-5.298
Median	-0.098	Median	-0.753	Median	-1
Maximum	0.457	Maximum	-0.042	Maximum	35
Minimum	-0.472	Minimum	-0.963	Minimum	-58
Std. Dev.	0.265	Std. Dev.	0.306	Std. Dev.	14.561
Skewness	0.417	Skewness	0.612	Skewness	-1.198
Kurtosis	2.502	Kurtosis	1.977	Kurtosis	5.645
Jarque-Bera	26.406	Jarque-Bera	71.140	Jarque-Bera	355.764
Probability	0.000	Probability	0.000	Probability	0.000
Sum	-48.494	Sum	-421.020	Sum	-3550
Sum Sq. Dev.	47.042	Sum Sq. Dev.	62.723	Sum Sq. Dev.	141860.3
Observations	670	Observations	670	Observations	670
	IS		CAR		M/B
Mean	178.985	Mean	1.400	Mean	6.390
Median	78	Median	-0.278	Median	2.550
Maximum	3233	Maximum	53.082	Maximum	110.697
Minimum	5	Minimum	-28.539	Minimum	-86.847
Std. Dev.	413.815	Std. Dev.	8.189	Std. Dev.	24.424
Skewness	6.1663	Skewness	1.785	Skewness	1.720
Kurtosis	44.734	Kurtosis	10.914	Kurtosis	13.881
Jarque-Bera	52870.35	Jarque-Bera	2104.66	Jarque-Bera	3635.891
Probability	0.000	Probability	0.000	Probability	0.000
Sum	119920	Sum	938.454	Sum	4281.815
Sum Sq. Dev.	1.15E+08	Sum Sq. Dev.	44872.94	Sum Sq. Dev.	399105.4
Observations	670	Observations	670	Observations	670

Regression analysis was performed through Panel Dynamic OLS (PDOLS) and results are shown in Table 8.

Table 8: Regression Analysis Results

Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
	Dependent Variable AAR ^a				Dependent Variable CAAR ^a			
<i>LC</i>	0.001** * [2.57]	-	-	-	0.01*** [5.13]	-	-	-
<i>IS</i>	-	-0.001*** [-4.59]	-	-	-	0.0005*** [-6.08]	-	-
<i>CAR</i>	-	-	0.0001 [-0.08]	-	-	-	0.01** * [-2.77]	-
<i>M/B</i>	-	-	-	0.0007** [-1.89]	-	-	-	0.006** * [-3.70]
<i>R</i> ²	0.06	0.09	0.07	0.06	0.72	0.55	0.06	0.94
\bar{R}^2	0.06	0.09	0.07	0.06	0.72	0.55	0.06	0.94

Note: *** and **; refers that related values are statistically significant at 1% and 5% significance level respectively. The square brackets indicate the t statistics, and the normal parentheses indicate the probability value.

According to the findings in table 1.8 the explanatory levels (R^2) of models 1, 2, 3, 4 and 7 are slightly lower. However, according to Gujarati (2004: 258-260), this will not a matter. Autocorrelation and variance problems in PDOLS method are solved by Newey - West method. Therefore, the results obtained are generally trustworthy.

In Model 1 and Model 5, the 1% decrease in LC reduced the abnormal returns and the cumulative abnormal returns of stocks adjusted to market returns by 0.1% and 1%, respectively. These values are statistically significant at 1% significance level.

Therefore, the Leverage Effect Hypothesis is valid for this sample.

In Model 2 and Model 6, a 1% increase in IS appears to reduce abnormal returns and cumulative abnormal returns of stocks by 0.1% and 0.05%, respectively. These values are statistically significant at 1% significance level. Therefore, the Price Pressure Hypothesis is valid for this sample.

It is seen that the 1% increase in CAR (-10, -1) in Model 3 and Model 5 reduced the abnormal returns and cumulative abnormal returns of the stocks adjusted to market returns by 0.01% and 1%, respectively. While the first of these values was not statistically significant, the second was significant at 1% significance level. Therefore, the Cash Flow Signal Hypothesis is valid in this sample.

A 1% increase in M / B in Model 4 and Model 6 seems to reduce the abnormal returns and cumulative abnormal returns of stocks by 0.07% and 0.6%, respectively. These values were statistically significant at 5% and 1% significance level, respectively. The hypothesis of the impact of growth opportunities assumes that firms with high M / B rates are able to evaluate investment projects that have a higher added value and allow company to grow. Therefore high M / B ratio can be regarded as a positive signal to the market. According to this hypothesis, the increase in this area will also increase the return of stocks. Therefore, it can be assumed that the Hypothesis of the Impact of Growth Opportunities is not valid since stock returns are negative and statistically significant when M / B rate increase for the analyzed sample.

5. CONCLUSION

In this study, the existence of negative announcement effect anomaly was determined and confirmed statistically during the seasoned equity offerings held in Borsa Istanbul during 2010 - 2015 period. The announcement effect was calculated to be approximately 2.6% over the closing date of the 1st trading day following the announcement, covering the entire sample, and it is significant at the 5% significance level. The main reason for the negative announcement effect observed in related period that majority firms of sample performed seasoned equity offerings are made in the form of a capital increase. On the other hand, positive announcement effects were observed in the seasoned equity offerings in the form of allocated capital increase, as opposed to the general outcomes.

Four independent variables were used in the study as determinants of the announcement effect. These are respectively; Leverage Change Ratio (LC), Cumulative Abnormal Returns (CAR) (-10,-1), Issue Size (Nominal value of shares sold: IS) and Market Value / Book Value (M/B MB). Each variable was used to test whether the hypotheses related to the announcement effect are valid in Borsa Istanbul for the analysis period. LC, IS, CAR (-10,-1) and MB variables were used to test Leverage Effect Hypothesis, Price Pressure Hypothesis, Signal Hypothesis and Growth Opportunity Effect Hypothesis respectively.

The leverage effect hypothesis assumes that the increase in firm leverage will increase earnings per share due to the debt tax benefit and therefore the negative investor response will be observed when firms announce seasoned equity offering which decrease firm's leverage level. In the study, the firm leverage ratio was calculated as Total Liabilities / Total Assets. The leverage ratio change was also calculated by comparing the leverage ratio obtained from the year-end balance sheet published before the announcement of the seasoned equity offering and the ratio obtained from the year-end balance sheet published after the announcement. The findings obtained in the study confirm the hypothesis. It has been determined that the 1% decrease in the leverage ratio for the sample reduces the cumulative stock returns by 1%. From here it can be assumed that the Leverage Effect Hypothesis is valid for the period of analysis in Borsa Istanbul.

The Price Pressure Hypothesis assumes that the seasoned equity offering of the firm, in other words capital increase, will lead to a steady decline in the share price. Moreover, according to the same hypothesis, the higher the issue size is assumed to cause the greater the decrease in stock value. The nominal amount of capital increase was taken into consideration as the size of the issue in the study. The company's capital increase is realized by issuing new stocks representing increasing capital, which means that the number of stocks in circulation increases. Therefore, it is accepted that according to the typical supply-demand law in the economy the amount of stock increased will decrease the value of the company. In the analysis, it was determined that the 1% increase in the issue size reduced the cumulative stock returns by 0.05% and this result is statistically significant at the 1% significance level. It has been confirmed that the Price Pressure Hypothesis is also valid for seasoned equity offerings made during the period of analysis in Borsa Istanbul.

The Signal Hypothesis assumes that the seasoned equity offering of the firm is a signal sent to the market. In the literature there are vast major studies which underline negative signal effect of seasoned equity offerings. The firm's offering decision may be interpreted by current and potential investors in the market as having failed to provide and generate required fund to finance growth and / or investment activities. As a result, according to the hypothesis, due to this negative perception of investors related to the financials of the firm, there is a negative reaction from the market for the announcement of the company's seasoned equity offering and the firm's stocks may show sharply decline. This is called Signal Hypothesis or Cash Flow Signal Hypothesis. In this study, the CAR (-10, -1) variable was used to measure the signal effect. According to the analysis results, it was determined that the 1% increase in this variable decreased the cumulative returns by 1%. Similar to previous hypotheses, this hypothesis also has been confirmed by findings from the study.

Growth opportunity effect hypothesis assumes that firms with higher market value, thanks to their solid market perception, will be able to have more chance to evaluate investments opportunities which is more profitable and can accelerate company's growth than small companies. The M / B variable was used to measure the effect of this hypothesis in the study. In the analysis, the effect of the change in M / B ratio on stock return was examined. The M / B ratio change is calculated by comparing the ratios based on financials published after announcement and before announcement. According to hypothesis, high M / B multiplier can be regarded as positive signal sent to market thanks to being overvalued of firm's stock by the optimistic investors who believe firm's future financial stability. Therefore, it is expected that having high ratio will have positive effects on firm's stock returns. According to the findings of the analysis in the study, 1% increase in the ratio will decrease the cumulative returns of stocks by 0,6%. This finding is also significant at the 1% significance level. As a result, Growth opportunity effect hypothesis can not be accepted for the sample during the analysis period.

In this study, the effect of the announcement of the seasoned equity offering on the stock price performance and the determinants that caused it were examined by analyzing the market reaction that occurred when the seasoned equity offering was announced to the public. In order to prevent the overlapping problem for the returns calculated during the regression period which formed by the past price movements of the stocks, firms that have made more than one seasoned equity offerings during the analysis period, were excluded from the sample. Thus final sample included 67 firms.

Based on calculation made in the analysis, average abnormal returns and cumulative abnormal returns has been observed regardless announcement made. On the other hand, it has determined that more negative returns were calculated when announcement was made and this evidence is statistically significant.

Therefore according to results of analysis, in Borsa Istanbul, announcement effect has been confirmed on seasoned equity offerings made during 2010 – 2015 period. According to the calculations made in the analyzes, the effect of the announcement was determined as negative. It is possible to think that the negative effect of announcement is due to fact that the majority of offerings made during the review period in the form of capital increases. As evidence observed in this study in line with majority of previous studies, offerings were made in the form of capital increases (public placement) lead to both current and potential investors to think that firms applied offerings are not capable of creating required cash flows to finance its investments operations while offerings made in private placement forms convey to market a positive signal that some investors are interested in the firms. Thus, investors react positively to private placements while give a negative response to the public placements. The findings are consistent with previous studies both in national and international literature.

The factors that caused the announcement effect were also analyzed in the analysis. Independent variables considered as determinants of the announcement effect in the study; Leverage Change Ratio (LC), Issue Size (IS), Market Value / Book Value (M / B Multiplies - MB) and Cumulative Abnormal Returns (-10, -1) (CAR).

In the analysis, each of these variables was used to test previously generated hypotheses to explain the effect of the announcement seen in seasoned equity offerings. LC, IS, CAR (-10,-1) and MB variables were used to test Leverage Effect Hypothesis, Price Pressure Hypothesis, Signalling Hypothesis and Growth Opportunity Effect Hypothesis respectively.

According to the findings obtained from the analysis;

- The decline in the leverage ratio with the seasoned equity offering has been found to have a negative effect on the stock return of the firm, in other words, the Leverage Effect Hypothesis has been confirmed.
- The higher the amount of nominal capital raised as a result of the seasoned equity offering, the lower the firm's stock return was observed, indicating that the Price Pressure Hypothesis is also valid for the sample studied.
- Another finding in the analysis is that decrease of stock returns was observed as the increase in the CAR variable. Based on this finding, it is confirmed that the Signalling Hypothesis is valid.
- Finally; the increase in the M / B ratio variable has been found to have a negative effect on stock returns that is Growth Opportunities Effect Hypothesis is not valid for the sample.

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THE EFFECTS OF OWNERSHIP STRUCTURE ON FINANCIAL PERFORMANCE OF ENTERPRISES IN THE LIGHT OF ACCOUNTING BASED PERFORMANCE INDICATORS: A RESEARCH ON THE FIRMS TRADED ON THE BIST INDUSTRIAL INDEX

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ABSTRACT

Purpose-The purpose of this study is to determine the effects of the ownership structure in the enterprises traded on BIST on their financial performance in the light of accounting based performance indicators.

Methodology-It has been benefited from the data of 112 enterprises. Models created to examine the effects of the ownership structure on the financial performance of the enterprise were subjected to panel data analysis by Eviews 8 programme.

Findings-It was determined that the free float rate and the corporate investor ratio have a statistically negative significant effect on the return on assets, the foreign share has a positive significant effect, the corporate investor share has a negatively significant effect and the firm size has a statistically positive effect on the return on equity.

Conclusion- It is found that the ownership structure of firms has statistically significant effect on ROA and ROE which are dimensions of financial performance.

Keywords: Ownership structure, financial performance, firm size, panel data analysis, Istanbul Stock Exchange (BIST)

JEL Codes: C33, G32, M41

1. INTRODUCTION

The conflicts of interest between the enterprise owners, managers and other shareholders and the conflicts of interest between the individuals having the authority to control the enterprise and the shareholders following the enterprise from the outside constitute the center of the corporate governance literature. Although some similarities can be found in the ownership of the enterprises, serious differences can also be observed. These differences can affect the financial performance of the enterprise and these impacts arising from the differences affect the decision on formation of the ownership structure.

The notion of ownership means to have the right to be able to make savings and to transact for the existing asset due to having the right to use the asset. The notion of the ownership concentration refers to the control of a high percentage of the existing shares belonging to the enterprise by a certain individual or individuals. In parallel with the gradually growing enterprise structures, the increase of the shareholders has led to some changes which are also continued today in the existing ownership structures. The ownership structure, which is one of the variables affecting financial performance of the enterprises, is discussed in two different ways in the literature.

The first one focuses on the partnership concentration and is determined in accordance with the percentage of the shares owned by the shareholders, and the second one is formed in accordance with the partnership composition. The partnership composition is taken into consideration in regard to the individual and/or corporate partners established the partnership in the enterprise and a classification is made in accordance with that criterion. The partnership composition is analyzed in different forms such as managerial ownership, family ownership, corporate investor ownership, state ownership and

foreign ownership which is defined by the foreign ownership structure. From this point of view, the controlling shareholder will pressure on the management at the degree of concentration in order to avoid the risks in accordance with the degree of ownership concentration in the enterprise (Fettahoğlu and Okuyan, 2009). Up to the present, reflections of the diversities regarding the ownership structure on the financial performance in an enterprise have been subjected to analyses in different periods of time and within the scope of many different studies in the literature through different variables in terms of the countries with different levels of development and economy.

The notion of performance generally means that realization of the aims previously determined in different ways is subjected to analysis. If it is necessary to explain the notion of performance from the point of the enterprises, we can define it as the sum of efforts which indicate the state of realization of the aims and targets. In our day, importance of the reference to the notion of performance shown by the enterprises has increased by maximizing the value to be obtained from the shares and providing the profitability which are the main aims of the enterprises. The main aim of the enterprises on the financial performance is to bring their profitability and current assets to the maximum level for their partners and shareholders.

The aim of this study is to examine the relationship between the ownership structure and the financial performance of the enterprises, which are traded on the BIST industrial index and continue their activities uninterruptedly between the years of 2006 and 2014, through the accounting based financial performance indicators. Thus, it is aimed to reveal the effects of the characteristics regarding the ownership structure of the enterprises on their performance. Analysis of this effect based on the relevant performance criteria will reveal whether there is an effect of the ownership structure on determination of the financial performance of the enterprises. If the aims of this study are to be expressed in detail, the ownership structure defines the individuals who represent the business capital and determination of the size of the shares (Izciler, 2014). The share of the largest partner which defines the number of individuals having the share majority, in other words, the condition in which the shares are collected by certain individuals and therefore the individuals or institutions having the control and management of the enterprise, the number of partners holding the majority (number of the partners holding more than 10% of share), the foreign share, the free float rate and the corporate investor ratio are used as the variables of the ownership structure. Though these variables used are the factors which form the ownership structure in the enterprises, it is necessary to determine the extent and intensity of the efficiency of these factors on the performance.

The study consists of four chapters. Following the introduction, the second chapter includes the studies which examine the effect of the ownership structure in the enterprises on the performance. The main purpose of the study, the structure of the sample, the conceptual model, the constraints of the study, the data set, the independent and dependent variables used, the hypotheses, statistical results on the study and interpretations of the results are discussed in the third chapter. In the conclusion which is the fourth chapter, information regarding the general discussion of the study is provided.

2. LITERATURE REVIEW

2.1. Ownership Structure and Financial Performance of the Enterprises

The view in which the capital owners have expanded to a wide basis in the enterprises (in other words, having a low intensity partnership structure) and the enterprise is being controlled by the managers has been possessed in the corporate finance for a long time. This expression mentioned as “Concentrated Ownership” in the literature means that the ownership has concentrated on a specific group of shareholders. As the level of this concentration increases, in other words, as the level of ownership of a shareholder increases, such ownership structures are mentioned as the concentrated ownership or partnership structure. Otherwise, the structure is defined as the widely held ownership as it spreads more to the base. The starting point for this view is Berle and Means’ work “Modern Corporation and Private Property” published in 1933 and benefited by many authors. In this work, Berle and Means noted that the enterprises in the USA which have a capital structure spread on a wide basis are prevalent and remarked that the ownership of the capital is distributed among the small shareholders and the control is concentrated in the hands of the senior managers. Therefore, it is thought that this work caused the formation of a literature within a supervisory framework (Demsetz and Lehn, 1985; La Porta, Lopez-de-Silanes and Shleifer, 1999). After this work, the conflicts of interest between the managers and the shareholders are being intensively studied by the researchers who try to understand the nature of the firms (Demsetz and Lehn, 1985; Jensen and Meckling, 1976). Jensen and Meckling (1976) argued that the managers who are the shareholders at a low level cannot maximize the shareholder wealth, and the reason is that the managers tend to use additional appropriations.

Nevertheless, Demsetz and Lehn (1985) argued that the shareholders have both advantages and disadvantages from their intensity in the ownership structure. For the authors, the benefits to be obtained by the owners from reducing the share of ownership create a disadvantage for a greater intensity. According to this, the owners can direct their energy and time to the works in which the benefits remain completely for themselves. The cost of avoiding from ownership will most likely be a lower enterprise performance, and its results will be shared by all the shareholders at the rate of their shares.

La Porta et al. (1999) summarized the studies provided the evidences of increased managerial ownership by the end of the 1990s. The authors found in their samples that the 36% of the large enterprises are in the low intensity, 30% of them are controlled by a family or individuals, 18% of them are controlled by the state, 5% of them are controlled by a low intensity financial institution and 5% of them are controlled by a low intensity enterprise. For smaller enterprises, the percentage of the companies controlled by the family has increased in 53%. For the authors, these studies indicate that the large enterprises in many countries have large shareholders and that these shareholders also take an active role in corporate governance.

The impact of the ownership structure on the firm performance has also been examined theoretically and empirically. Berle and Means (1933) argued that the ownership concentration should affect the firm value positively as it reduces the conflict of interest between the shareholders and the managers. The relationship between the concentrated ownership and the firm performance and the relationship between the strengthening mechanisms for control and the firm performance are prominent among the studies which examine the relationships between the ownership and the performance. A positive (McConnell and Servaes, 1990; Morck, Shleifer and Vishny, 1988) or negative (Villalonga and Amit, 2006) relationship is predicted based on the effects of alignment and entrenchment of the relationship theories between the concentrated ownership (partnership) and the firm performance. Therefore, the managerial ownership with a low shareholding level increases the firm value as the interests find a common ground. However, the managerial ownership with a high shareholding level causes a decrease in the firm value and more conflicts of interest due to the reinforcement effect.

However, statistically insignificant relationships were determined between the ownership and the performance. Demsetz and Lehn (1985), Demsetz and Villalonga (2001), Himmelberg, Hubbard and Palia (1999) have obtained empirical results which state the ownership concentration is an endogenous result of the shareholders' decisions made in order to maximize their own profit. Thus, they argued that the ownership concentration has no effect on the firm value. For Demsetz and Villalonga (2001), coefficient of the Tobin Q variable is negative in the ownership equations, and the relevant negative effect is more than the ownership concentration in the internal ownership.

For Demsetz and Lehn (1985), three of the factors which affect the ownership structure should be examined. These factors are the value-maximizing size of the firm, the profit potential from exercising more effective control, and systematic regulation made in accordance with the scope and effect of the decisions made by the shareholders. McConnell and Servaes (1995) assumed that the ownership is more important in the high growth firms than the low growth firms, and they stated that the relationship between the ownership structure and the firm performance varies by the low or high growth of the enterprises.

Furthermore, external block ownership such as managerial share ownership is one of the structures in the literature. The managerial ownership is defined as the ratio of shares owned by managers and other members of the board of directors (Brailsford, Oliver and Pua, 2002). Morck et al. (1988) determined the average level of the managerial share ownership as 10.60%; McConnell and Servaes (1990) determined the average level of the managerial share ownership as 11.84%, and Brailsford et al. (2002) determined the average level of the managerial share ownership as 10.65%.

However, Brailsford et al. (2002) defined the external block ownership as the percentage of shares owned by the large shareholders. This percentage indicates the ownership ratio of the five largest shareholders, and the ownership ratio of the largest 2 and 20 shareholders has been used as sensitivity analyses and control variables. The authors used the data of the largest 2, 5 and 20 external shareholders for the external block shareholder representative.

The family ownership is also examined in the literature on ownership. This type of ownership structure can be seen in the enterprises in which the ownership percentage of the family members or the family is high. For Morck, Stangeland and Yeung (1998) and Villalonga and Amit (2006), the family ownership reduces the usual conflict between the owner and the manager. Therefore, it is expected that the agency theory will have a positive effect on the firm performance of the family ownership. However, Morck et al. (1998) found a negative effect between these two variables. On the other hand, Villalonga and Amit (2006) found an evidence that the positive effect can only be seen when control and management come together through a certain form. For the authors, the effects of ownership are not clear as the previous studies could not separate the family ownership from the family control and the family management.

King and Santor (2008) argued that these non-common results obtained from the empirical studies on the family ownership and the firm performance are based on two reasons regarding determination and prediction of the model. The first one is based on the view that the relationship between the family ownership and the performance is not identified without separation of control and ownership from each other. While the family owners can follow the management, and become an active investor, they can also use the mechanisms such as the dual-class share structure or the pyramidal structures to strengthen the voting right. The presence of the dual-class shares is observed in case that there are two or more share classes with different rights to vote. On the other hand, the pyramidal ownership structures are observed in case that the blockholder (usually the family) controls the main company or holding. These mechanisms empowering the control cause a decrease in the level of alignment of the incentives of the controlling shareholders (the corporate shareholders) and the

minority shareholders, increase the managerial consolidation and the risks of expropriation or asset and income transfer. For the authors, the second problem is the unobservable firm heterogeneity. The presence of unobservable effects of the ownership on the performance poses a problem for determination of the direction of causality. Therefore, the single equation models such as cross-sectional studies which disregard the firm heterogeneity will lead to prejudicial results.

3. DATA AND METHODOLOGY

3.1. Aim of the Study

The aim of this study is to examine how the diversified ownership structures of the firms affect the financial performance under the guidance of the accounting based performance criteria and to determine whether the ownership structures have an effect on the financial performance of the firms. The changes created by the percentaged differences in the share of the largest partner, the corporate investor ratio, the foreign share, the number of the majority shareholders and the free float rate on the return on assets and the return on equity will be analyzed in this study. The reason for selection of the industrial index and the service index is to be able to obtain clearer and real-like results in practice.

3.2. Data Set and Sampling Used in the Study

The firms in this study were selected from the enterprises traded on the Industrial Index (XUSIN) and listed on Borsa Istanbul (BIST). It has been paid attention to prefer the enterprises listed on the industrial index without making any sectoral distinction and to properly collect the nine-year (2006-2014) data of 112 enterprises. The main reason for collection of the data in 2006 and the following years is that the effects of the economic crisis observed around the world in 2008 on financial performance of the enterprises can be examined closely. Furthermore, it should be especially considered that data of the firms to be used in the relevant study do not include all firms located in Turkey and traded on Borsa Istanbul (BIST).

In the beginning of the study, all data of 147 enterprises traded on the industrial index between the years of 2006 and 2014 were included in the scope of the analysis. However, 35 enterprises in total were excluded from the analysis because they did not meet the data of the years in the study period. As a result, 1008 (112*9) data in total were analyzed based on the 9-year data of 112 enterprises. During the analysis, it was determined that the series were not stationary due to the unit root problem. The first and second-degree difference, square root and logarithmic transformations were made in order to ensure the stability of the series. As a result of these transformations, the number of observations has decreased. Due to this reason, 890 observations were analyzed in the industrial index.

The financial data of the enterprises analyzed were obtained in two different ways. The financial data of the enterprises in 2008 and the early periods included in the relevant index were acquired from the official website of the BIST (www.borsaistanbul.com). The data regarding to 2009 and later were acquired with the public information published in the official website of the BIST (www.borsaistanbul.com), the official website of the Public Disclosure Platform (KAP) (www.kap.gov.tr), the official website of the Central Registry Agency (MKK) (www.mkk.com.tr), the official website of Finnet 2000 Plus (www.finnet.com.tr) and the official website of the enterprises through the use of the programs called Finnet Excel Add-in and Finnet Stock Expert.

3.3. Variables Used in the Study

Dependent, independent and control variables were primarily preferred in the study. In determination of the variables, it has been started from the variables reached the most consensus on the literature. As the effects of the relevant variables on the financial performance in the enterprises were analyzed, performance determinants of the enterprises consist of the accounting based performance measurement techniques. The variables used in the study are classified under three titles as the ownership structure, the financial performance and the control variable. The independent variables used in the study are composed of the variables which represent the ownership structure. To increase the descriptive capacity of the model created considering the relevant variables, the control variable which is thought to be effective on financial performance of the enterprises has been included in the relevant models.

Dependent variables of the relevant study are the return on assets (ROA) and the return on equity (ROE) shown in the table 3. The independent variables are respectively the share of the largest partner (EBOP), the free float rate (HAO), the number of the partners (ORTAK), the foreign share (YABP), the corporate investor ratio (KURY) and these variables are shown in the Table 1. The control variable firm size (VALOG) which is thought to be effective on the financial performance and it is shown Table 2.

Table 1: Independent Variables of the Model (Ownership Structure)

Variables	Description	Symbol	Variable Calculations	Author
Ownership Structure	Share of the Largest Partner	EBOP	Capital Amount of the Largest Partner / Total Equity	Bayrakdaroğlu (2010) Oruç (2012) Toraman and Okuyan (2009)
	Free Float Rate	HAO	Public Capital Amount / Total Equity	Bayrakdaroğlu (2010) Zhang (1998)
	Number of the Partners	ORTAK	Number of the partners with more than 10% of the capital shares	Doğan and Topal (2015)
	Foreign Share	YABP	Capital Share of the Foreign Partner / Total Equity	Bayrakdaroğlu (2010) Büyükmert (2015) Li et al. (2009)
	Corporate Investor Ratio	KURY	Capital Share of the Corporate Investor / Total Equity	Kumar (2006) Mirzaei (2012) Pushner (1995) Sayman (2012)

Table 2: Control Variable of the Model

Variables	Description	Symbol	Variable Calculations	Author
Ownership Structure	Firm Size	VALOG	Natural Logarithm of the Total Assets	Deesomsak et al. (2004) Friend and Lang (1988) Huang and Song (2006) Mehran, Taggart and Yermack (1999)

Table 3: Dependent Variables of the Model (Financial Performance)

Variables	Description	Symbol	Variable Calculations	Author
Dependent	Return on Assets	ROA	ROA=Net Income / Total Assets	Nazir and Afza (2009) Singh and Pandey (2008) ALShubiri (2011)
	Return on Equity	ROE	ROE=Net Income / Equity	Nazir and Afza (2009) Singh and Pandey (2008) ALShubiri (2011)

3.3.1. Return on Assets (ROA)

The return on assets is a ratio which determines how much profit an enterprise earned from its total assets and which is one of the most frequently used measures in determination of the enterprise performance (Kaufman and Watstein, 2008). The return on assets ratio indicates how efficient the enterprises use their total assets. This performance indicator is considered as a financial performance criterion in terms of the dependent variable in the relevant studies (Albayrak and Akbulut, 2008; Hall and Weiss 1967; Kandir, Karadeniz, Özmen and Önal, 2008; Kültür and Demirgüneş 2007; Whittington, 1980).

The return on total assets is an indicator which measures the percentage of income earned by the enterprise from the investments made for its assets within a certain period. The enterprises make an effort to gain the maximum benefit from each investment made for their assets. The point to be emphasized is that what percentage of the investments is made by the equity and what percentage of the investments is made by the foreign resources (Akdogan and Boyacioglu, 2014).

When the return on total assets is calculated, the net income after tax is used on the basis of the total assets. This indicator consists of a combination of two different variables as the profit margin and the total assets turnover ratio. If the return on total assets is to be rearranged on this basis (Young and O'Byrne, 2001), the following equation is obtained:

$$\text{The return on assets} = \text{Net Income/Net Sales} \times \text{Net Sales/Net Assets}$$

Therefore, the return on assets can be defined as a combination of the profit margin and the total assets turnover ratio. For Rakshit (2006), the indicator of the return on assets is a financial performance indicator which gives the best results, and all activities performed in the enterprise will eventually contribute to the return on assets.

When the return on assets is calculated, the units in numerator and denominator of the relevant ratio may show an alteration. While income is considered as an activity term in some enterprises, the item of net income can be used in many enterprises. This variability can be also valid for the total assets in the denominator of the ratio. The assets owned by an enterprise can be defined as the total assets as well as the result obtained when we deduct the short-term debts from the total assets (Hornsgren, Foster and Datar, 1999). Different results may occur because different items can be used in the parts of numerator and denominator, and many changes can be seen on the financial structure of the enterprise in time (Saldanlı, 2006). As the relevant ratio indicates the remaining amount after deduction of the net income, interests and taxes, the ratio may be low or high in accordance with the changes observed on the financial structure of the enterprises. Therefore, the use of the profit unit before tax and interest instead of the net profit unit in the numerator part of the formula in the profitability analyses to be made based on the enterprises with different financial structures may lead to a truer and more significant indicator for the result to be obtained (Akgüç, 1998).

3.3.2. Return on Equity (ROE)

Return on equity is also known as the return on shareholder's equity in the literature (Escalona, 2002; Rappaport, 1998). The return on equity is considered as an important ratio which indicates the relationship between the capital invested in the enterprise by the shareholders and the income earned. This ratio also shows how efficiently the enterprise is managing the capital invested by the shareholders. In addition that it indicates the return on equity invested in the enterprise by the shareholders, it is calculated by dividing the income after tax by the equity.

When the return on equity ratio is considered from the point of the return, in other words, the maximization of the capital invested by the shareholders, the return ratio provided by the equity capital for an entity within the body of the enterprise in the period is an important criterion for the shareholders as the main aim is to increase the enterprise value (Ercan and Ban, 2005).

The return on equity determines the extent to which the return earned from the equity invested in the enterprise by the shareholders changes in the relevant year. This indicator is considered as an accounting based performance criterion by reason of the fact that it is aimed the shareholders can earn profit (Cenger, 2006). The ratio of return on equity includes three main components as the profit margin, the asset turnover and the equity multiplier (Livingstone and Grossman, 2002). These three components are formulated as follows:

$$\text{Return on Equity} = \text{Net Income/Net Sales} \times \text{Net Sales/Assets} \times \text{Assets/Equity}$$

Managers in the enterprises may lead to a manipulation in the return on equity making a change in the components of the above formula. From this point of view, it is also possible to establish a relationship between the return on equity and the return on assets through the leverage ratio as follows (Müslümov, 2005; Grant, 2003). The leverage ratio is calculated by dividing the total liabilities by the total assets.

$$\text{Equity} = \text{Return on Assets}/(1-\text{Leverage Ratio})$$

Based on the relationship stated in the above formula, it can be said that a possible change in the equity results from the return on assets or the leverage ratio. An increase should be provided in the return on assets and the leverage ratio in order to obtain an increase in the return on equity.

Palepu, Healy and Bernard (2000) suggested that the net operating income after tax can be also added as an alternative in the formula used in calculation of the return on equity. On the other hand, Pavelkova and Knapkova (2003) argued that it is necessary to include the variables such as the interests paid, the sum of loans and bonds, external resources, other debts and the equity multiplier in the relevant formula. The return on equity indicator does not present any business profile which leads to an increase or a decrease in value for the shareholders of the enterprises. The main reason is that it is not possible to determine whether the relevant ratio generates a return more or less than the cost of equity invested in the enterprise by the shareholders. Therefore, it is not a criterion to be subjected to the relevant comparison. Though it gives the managers an idea on the present condition of the enterprise, it does not play a directing role especially in operational activities (Makelainen, 1999).

3.3.3. Share of the Largest Partner (EBOP)

This variable is a ratio used to determine what percentage of the total shares in the enterprise is owned by the person who is the principal shareholder of the enterprise. It is possible to have a decrease in number of the variables used to measure the return of the enterprise as the percentage of the shares owned by the largest shareholder has increased. The main reason of the relevant problem is that the shareholder with a high number of shares has tried to consider his individual interests instead of the interests for the benefit of the enterprise as he has become dominant in making decision on activities of the enterprise (Kakilli-Acaravcı, Kandir and Zelka, 2015). It is said that the fewer individuals with the majority of the shares the more concentrated ownership structure in the enterprise as inversely proportional. Therefore, it is stated that the higher the percentage of shares owned by a small number of shareholders or a single shareholder in the enterprise

the greater the chance for the enterprise to have an ownership structure with concentration at the same ratio (Fettahoğlu and Okuyan, 2009). The largest shareholder's share ratio is calculated as the Largest Partner's Capital Amount/Total Equity (Bayrakdaroğlu, 2010). In the study conducted by La Porta et al. (1999), it has been found that the shareholders who own the majority of the current shares in the enterprise have increased their controlling power through a conglomeration and the shares providing a concession in voting as they have the majority of the shares. If a shareholder's percentage in the total shares is between 20% and 50%, this shareholder has been called as a large shareholder due to the shares owned by him. In order that a shareholder can be defined as a controlling partner, the percentage of the shares owned by the shareholder must be in the above mentioned range (Pedersen and Thomsen, 1997).

The fact that a shareholder is defined as the controlling partner due to his majority in the total shares makes the relevant shareholder more advantageous than other shareholders in decision process and management of the enterprise. The controlling partner who is in the position of the largest shareholder may not be a partner of the enterprises for only investment purposes. The partnership can be established also for the purpose of participating in the managerial activities due to the high percentage of shares owned by the partner. Participating in an enterprise as a partner may be actualized by dominating the administration of the relevant enterprise or by having a representative in the board of directors to represent himself in the enterprise to be participated by the partner. Such participation is defined as a holding relationship with the simplest definition. The largest shareholder, namely, the largest partner of an enterprise can be a family owned enterprise as well as a foreign corporate investor (Sayman, 2012). As stated above, the components of ownership and control are collected in one-hand within the body of enterprise where the largest shareholder takes place in. Due to the relevant characteristic, such enterprises are known as the enterprises with a concentrated ownership structure (Kıyılar and Belen, 2005). Family owned enterprises, non-public offering enterprises and unlimited enterprises are some of the relevant types of enterprise (Gençtürk, 2003). In the enterprises with the largest shareholder, the controlling partner's tendency to follow the decisions taken by the management and the activities of the enterprise will increase in proportion to the increase in the number of shares owned by him. Such case will also decrease the conflicts of interest between the partners and the senior managers, namely, the cost of agency in the enterprise. The most important advantage of the largest shareholder, in other words, the controlling partner is appointment of the managers determined by him to the relevant enterprise. In the enterprises where the largest shareholder takes place in, any problem has not been encountered in making long-termed decisions. Therefore, it is possible to make long-termed investments in such enterprises (Berezneak, 2007).

3.3.4. Free Float Rate (HAO)

Before making a definition for the free float rate in the enterprises, the terms of the public offering and the publicly traded enterprise need to be explained. The term of the public offering can be defined as making the necessary regulations which provide the public with an opportunity to participate in the relevant enterprise because a shareholder within the capital structure of an enterprise which does not allow the public to become a shareholder. If an enterprise previously offered its shares to the public decides on the public offering again, such case is defined as the offering of a new share. However, if the shares of an enterprise with a closed capital structure are offered to the public for the first time, such case is defined as the initial public offering (Akbulak and Akbulak, 2004).

The ratio of an enterprise's publicly offered shares to the total shares owned by the enterprise is called as the free float rate. Though the distinction between control and ownership is significant in the enterprises where the ratio of publicly offered shares is high in the total, the ownership and the control are one within the other in the enterprises closed to the public. The enterprises with a high free float ratio provide the finance of investments to be made through borrowing. However, the rate of the debt to the equity is high in the enterprises where the free float ratio is not low (Turaboğlu, 2002). On the other hand, the rate of interest of the loan to be taken will also be high because the fact that the level of tangible assets is low, the concentration of the current assets on the certain items is high and the information regarding the enterprise cannot be accessed transparently by the firms which will meet the loan need in the non-publicly offered enterprises (Jensen and Meckling, 1976). Therefore, the non-public enterprises do not prefer to obtain finance by borrowing. Furthermore, the rate of loan to equity in the non-public enterprises is less than the rate in the publicly traded enterprises. The free float rate is a ratio determine what percentage of the total equity owned by the enterprise is offered to the public. Therefore, the rate to be used in the study is calculated as Total of the Publicly Traded Equity/Total Equity (Bayrakdaroğlu, 2010).

As the enterprises with a high free float rate have more resources in comparison to the enterprises in a closed structure, the relevant enterprises can make more investments in the tangible fixed assets. The tangible fixed assets owned by the enterprise determine the level of input used at the production stage in order that the manufacturing activities of the enterprise can be carried out. As the level of tangible fixed assets is high in the large scaled enterprises with a high free float rate, it can be said that the relevant enterprises have a higher capacity for production (Turaboğlu, 2002).

The fact that the ownership structure of the enterprises with a high free float rate has a complex and broad-based nature provides many advantages. Economy of scope, which is defined as an opportunity to decrease the cost by producing many products through the use of the power of the enterprise in a certain area and to increase the product range through the experiences gained, can be given as an example for the advantages of the relevant ownership structure (Yayla, Kaya and Ekmen, 2005). Another example is that the enterprises with a high free float rate have more equity by means of their ownership structure and therefore have longer activity periods (Ağdelen and Erkut, 2008). There are some disadvantages of the public offering as well as the above advantages. One of these disadvantages is that the structure occurred due to the public offering makes the need of enterprises for professional managers compulsory (Büyükdereci, 2007). The partners who are afraid of losing the management of the enterprise want to keep the free float rate at a certain level. In case of the public offering, they enable the previous partners to have the right of priority during the sale of the shares (Sayman, 2012).

3.3.5. Number of the Partners (ORTAK)

The ownership structure of the enterprises is determined by the structure of the shareholders and the number of them in the enterprise. The size of the ownership structure, in other words, the number of the partners in the enterprise varies from enterprise to enterprise. The fact that this number is high indicates that the ownership of the enterprise has a broad-based structure which constitutes one of the main aims of the capital markets. As a result of ever increasing information exchange and communication opportunities between the parties, the ownership structures of the enterprises become diversified by the emerging markets (Sayman, 2012).

It is seen that it is highly probable the managers use the assets of the enterprise for their own interests in case that the managers in the enterprise have a small number of shares, the number of the shareholders is high and the shares belonging to the enterprise show an irregularity as a result of inclusion. It is stated that the reduction of the conflict of interest between the managers and the shareholders may be possible with an increase to be provided at the rate of the managers' shares (Jensen and Meckling, 1976).

The shareholders, who have the majority of shares in terms of the number, in other words, who have the authority to control the enterprise, may be able to obtain a benefit by directing the income of the enterprise to be obtained in accordance with their personal interests or to generate an income by using the assets belonging to the enterprise for the benefit of other entities they own (Yurtoglu, 2000).

In case that the shares of the enterprise belong to a large majority, the other groups, namely, the minority shareholders have very few rights and values. If voting on control of the enterprise becomes a current issue, importance of the minority group in terms of the right to vote is quite low. However, the voting right of this group is only important in the struggle to provide the individuals in different administrative positions within body of the enterprise with the votes. Moreover, another importance of the minority group comes to existence when there are many shareholders but there is not any ownership concentration, in other words, any group which controls the enterprise (Chung and Kim, 1999).

3.3.6. Foreign Share (YABP)

Foreign capital is classified in two categories as foreign direct investment and foreign indirect (portfolio) investment. Foreign direct investment is defined as the investments which provide a foreign enterprise with an opportunity to have the right to a full or partial ownership on an enterprise and its assets in another country. Foreign indirect investment refers to the financial transactions made with the result that a foreign enterprise abroad purchases the stocks and bonds in the ownership of an enterprise which is traded at the exchange of another country (Sağlam, 2003). It is necessary to invest directly in the enterprises in other countries by the foreign individuals or institutions in order that the foreign ownership can be realized within the body of an enterprise. When we consider the realization of foreign capital investments from the viewpoint of the ownership, it is seen that the joint venture, company mergers and acquisitions are performed in the form of subsidiary company and considered as the investments made in order to ensure the ownership completely (Batmaz and Tekeli, 2009).

The joint venture, one of the types of realization of foreign direct investments, is defined as the way in which the foreign investors establish a new enterprise with shareholders of an enterprise carrying out its activities in a foreign country or participate in an existing enterprise as a partner. The joint venture is a type of foreign capital investment in which there is not any controlling shareholder for the ownership structure. One of the most important reasons for the foreign investors' decision on going into a partnership is that there are many legal restrictions in the country where the relevant enterprise to be invested by the investor takes place in (Yavan, 2006). As for the foreign investments in the full ownership, all transactions are carried out directly by the foreign enterprise which makes the investment. All investments made are completely under the control and ownership of the foreign enterprise (Altınışık, 2006). On the other hand, subsidiary enterprise is a type of enterprise actualized through the establishment of a new enterprise by the foreign investor in a foreign country or the purchase of 50% of the shares of the enterprise to be invested by a foreign investor. Due to the nature of the merger type, the foreign shareholders become the controlling shareholders of the subsidiary enterprise. Even

if there are domestic shareholders within the ownership structure of such enterprises, all decisions of this new enterprise are taken by the foreign shareholders (Yavan, 2006).

3.3.7. Corporate Investor Ratio

Corporate investor ratio is a share indicator which states what percentage of the circulating shares of a publicly traded enterprise is purchased by the corporate investors. Increase of the relevant ownership in the enterprise means that the risk indicator of the enterprise is reduced and a less risky policy is pursued by comparison with other enterprises. Though this policy pursued may increase the performance of the enterprise, it may cause the enterprise, which tries to keep the risk level minimum, to encounter a problem in using the existing investment opportunities. Calculation of the corporate investor ownership is made as the Number of Shares of the Corporate Investors/the Number of Circulating Shares of the Enterprise (Kakilli-Acaravci et al., 2015).

In the study conducted by Alfaraih, Alanezi and Almujaed (2012) and empirically examined the effects of the corporate ownership and the government ownership on the performance of the enterprises in the Kuwait Stock Exchange, both Tobin's Q which is a market based measure and the Return on Assets (ROA) which is an accounting based performance indicator were used to measure the performance in the enterprise. In the results of regression analysis of the study examined 134 enterprises listed on the Kuwait Stock Exchange in 2010, a positive relationship has been observed between the corporate investor ratio and the performance of the enterprises. Furthermore, it has been emphasized that the corporate investors have a dominant and effective role as a corporate governance mechanism. On the other hand, a negative relationship has been observed between the government ownership and the performance of the listed enterprises. In addition, it has been stated that the performance observed in the enterprises is worse when the government ownership exists. Results from the study indicate that different types of ownership have different effects on performance of the enterprise. Though the performance of the enterprises is increased by some of the ownership structures, it has been observed that some ownership structures worsen the performance.

3.3.8. Firm Size

In the studies on the ownership structure, measurements are performed using total assets, total equity and total sales as the firm size indicators. The firm size is included in the relevant models formed as the control variables in the studies which measure the relationship between the ownership structure and the performance of the enterprise. The main reason of the relevant case is that it is thought both the procedures regarding the ownership structure and the size of enterprise may be effective on the financial performance. Using the total assets as the firm size in the study, the logarithm of the total assets of the firm in the relevant years is calculated and included in the model in order to provide a compatibility with other variables.

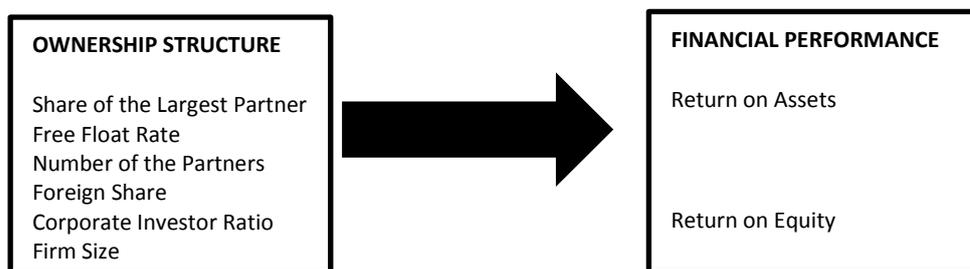
Large firms are more effective than small firms as they can effectively benefit from the economy of scale. However, the enterprises may be faced with risks such as financial unprofitability and performance decrease as they develop in terms of the size. Therefore, the effect of the firm size on financial performance has become a controversial topic (Majumdar, 1997).

As the enterprise value decreases in the small scaled enterprises, the share of direct bankruptcy cost in the enterprise value will increase. Such case means the increase of the borrowing rates because the enterprise value increases (Fıratoğlu, 2005). As the enterprise size increases, the share of the managerial ownership in the enterprise will also show an increase. Therefore, the costs of agency and the moral risk terms are highly associated with each other. Furthermore, the growth in the enterprise size may also affect the need to work with more professional managers (Ünlü, Bayrakdaroğlu and Şamiloğlu, 2011).

3.4. Research Models and Hypotheses

The following conceptual models and hypotheses have been developed in accordance with the aim and scope of this study, and the effect of the ownership structure on financial performance of the enterprises has been investigated. The main hypotheses to be tested in this study are stated in the Table 4. In accordance with the literature, two main hypotheses were developed. In the following parts of the study, the effect of the variables related to the ownership structure on the return on the performance indicators called as the return on assets and the return on equity will be tested through the models developed and in accordance with the main hypotheses. Conceptual framework is shown in the Figure 1.

Figure 1: Conceptual Framework



H₁: The ownership structure affects the return on assets of the enterprises.

- a) The share of the largest partner affects the return on assets of the enterprise.
- b) The free float rate affects the return on assets of the enterprise.
- c) The corporate investor ratio affects the return on assets of the enterprise.
- d) The number of the partners affects the return on assets of the enterprise.
- e) The foreign share affects the return on assets of the enterprise.
- f) The size of assets affects the return on assets of the enterprise.

H₂: The ownership structure affects the return on equity of the enterprises.

- a) The share of the largest partner affects the return on equity of the enterprise.
- b) The free float rate affects the return on equity of the enterprise.
- c) The corporate investor ratio affects the return on equity of the enterprise.
- d) The number of the partners affects the return on equity of the enterprise.
- e) The foreign share affects the return on equity of the enterprise.
- f) The size of assets affects the return on equity of the enterprise.

As $2 \times (1+1) = 4$, four models formed in the study are as follows: Two models which include five independent variables of the ownership structure (EBOP, HAO, KURY, ORTAK, YABP) and two dependent financial variables (ROA, ROE), and separately two additional models in which one of them includes the control variable (VALOG) and the other one does not include any control variable.

Table 4: Models in which the Ownership Structure is an Independent Variable

		Model 1	Model 2	Model 3	Model 4
		A	B	A	B
Dependent	ROA	+	+		
	ROE			+	+
Independent	EBOP	+	+	+	+
	HAO	+	+	+	+
	KURY	+	+	+	+
	ORTAK	+	+	+	+
	YABP	+	+	+	+
Control	VALOG		+		+

3.5. Research Methods and Findings

Different types of data sets can be used when econometric studies are conducted. The data sets on various types can be explained through the models which are appropriate for the structures. When the literature is considered, it is seen that three types of data sets are used as cross-sectional data, time series data and panel data in the studies. In the relevant

study, the effect of the ownership structure and the capital structure on financial performance of the enterprise has been examined by the panel data analysis. The data have been analyzed by using the program called Eviews 8.0. Descriptive statistics calculated for the independent variables to be used in the regressions will be included in the study. The variables will be examined in terms of their mean, median, maximum, minimum, standard deviation, kurtosis, skewness and Jarque-Bera values. Any significant relationship should not be found between the independent variables used in the regression in order to prevent the problem of multicollinearity in the regression to be analyzed in the study. In order to determine the relevant situation, a correlation analysis will be made between the variables before predicting the models. The econometric methods used in empirical analyses vary by the types of data. The method which analyzes the data of the different units at the same point of time is called as the 'cross-sectional' data analysis, and the method which analyzes the change of the same units in time is called as the 'time series' analysis. The type of analysis made by using the cross-sectional data with time dimension is expressed as 'panel data' analysis. The problem of multicollinearity is less observable between the variables with the panel data, increases the descriptive capacity of the analysis or gives an opportunity to conduct the econometric analyses even when there are insufficient cross-sectional observation and short time series (Baltagi, 1995).

Due to the abovementioned advantages, there are some disadvantages of the panel data analysis which brings the cross-sectional analysis and the time series analysis together. If the data are not stationary in the dimension of the time series of the panel data, in other words, if there is a unit root problem in the data, the results to be obtained from the regression analysis will be misleading. The unit root tests will be made in order to determine whether the data are stationary.

There are many unit root tests used in order to determine whether the data are stationary in the panel data analysis. These tests are used both for the balanced panel data and the unbalanced panel data. LLC (Levin, Lin and Chu, 2002; Levin and Lin, 1992; 1993), IPS (Im, Pesaran and Shin, 1997; 2003), Hadri LM (Hadri, 2000), Maddala and Wu (1999), Harris and Tzavalis (1999), Breitung (2000) and Harris-Sollis (2003) are some of the relevant tests. The distinctive characteristic of these tests is that they are used in the analysis of balanced panel data. If the data are sorted imbalancedly, Fisher-type unit root tests preferred based on the LLC test and the Augmented Dickey-Fuller (1979) test are selected. Within the scope of this study, the above unit root tests will be used based on the data characteristics and the results will be reported. The panel data analysis provides an opportunity to work with a wider data, allows the unobservable variables to be associated with the independent variables, gives a higher degree of freedom, and offers an opportunity to analyze the data with its heterogeneity. The linear panel data model is ordinarily as follows:

$$y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \dots + \alpha_i + u_{it}, \quad i = 1, 2, \dots, N; t = 1, 2, \dots, t \quad (1)$$

In the model; y_{it} defines the dependent variable, x_{it} defines the independent variables, β defines the coefficient parameters, α_i defines the unobservable individual effects which are stationary in the time dimension, i defines the cross-sectional unit, t defines the time period and u_{it} defines the error term.

In the study, the linear panel data methods will be used as an estimator method for the panel data. These methods are the Fixed Effects Method and the Random Effects Method. Furthermore, the results of the Hausman test which determines if the method of Fixed or Random Effects should be used in the analysis will be discussed.

In the Fixed Effects method, the fixed effect estimator allows the unobservable individual effects in time (α_i) to be associated with the independent variables. The model, which is obtained through the time average of the unidirectional non-observable components model in the equality numbered (2) and the unidirectional non-observable components model in the equality numbered (3), has been stated.

$$y_{it} = \beta_0 + \beta_1 x_{it} + \alpha_i + u_{it}, \quad i = 1, 2, \dots, N; t = 1, 2, \dots, t \quad (2)$$

$$\bar{y}_i = \beta_1 \bar{x}_i + \alpha_i + \bar{u}_i, \quad t = 1, 2, \dots, t \quad (3)$$

$$y_{it} - \bar{y}_i = \beta_1 (x_{it} - \bar{x}_i) + (u_{it} - \bar{u}_i), \quad i = 1, 2, \dots, N; t = 1, 2, \dots, t \quad (4)$$

$$\dot{y}_{it} = \beta_1 \dot{x}_{it} + \dot{u}_{it}, \quad i = 1, 2, \dots, N; t = 1, 2, \dots, t \quad (5)$$

By subtracting these two equations from each other, the equation numbered (4) which is also called within transformation has been obtained. The equation numbered (5) is a representation with differential operator of the equation numbered (4). If the Pooled Least Squares estimation method is applied to the model, the fixed effects estimator is found (Wooldridge, 2010).

In the random effects method, it is assumed that the unobservable individual fixed effects in the time dimension are not associated with all the descriptive variables in all time dimensions. In the relevant method, the Generalized Least Squares (GLS) estimation method is used as the error term includes autocorrelation. By the Generalized Least Squares method, the standard errors and the statistics of t and F become valid again. In the equation numbered (6), the model with transformation of the Generalized Least Squares is stated.

$$y_{it} - \theta \bar{y}_i = \beta_1 (x_{it} - \theta \bar{x}_i)^T + (v_{it} - \theta \bar{v}_i) \quad (6)$$

In the equation; y_{it} defines the dependent variable, θ defines the coefficient used in transformation of the GLS, x_{it} defines the independent (descriptive) variable, v_{it} defines the error margin transformed and $(v_{it} = \alpha_i + u_{it})$ ve $\bar{y}_i, \bar{x}_i, \bar{v}_i$ define the time average of the variables. As it is seen in the equation numbered (6), the Random Effects estimator subtracts only the rate of θ of the time averages (Baltagi, 2005).

The main difference between the Fixed Effects and the Random Effects is resulted from the relationship of the fixed individual effects in the time dimension with the independent variables. Though the Fixed Effects model allows the fixed individual effects in the time dimension for the relationship with the independent variables, the Random Effects model does not allow for the fixed individual effects in the time dimension for the relationship with the independent variables. The Hausman Test, which identifies which method gives more consistent results and whether the difference between the estimators of the two methods is statistically significant in the model, determines the results. Accordingly, the test statistic is stated below:

$$H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})^T [Avar(\hat{\beta}_{FE}) - Avar(\hat{\beta}_{RE})]^{-1} (\hat{\beta}_{FE} - \hat{\beta}_{RE}) \quad (7)$$

$\hat{\beta}_{FE}$ indicates the fixed effects estimator, $\hat{\beta}_{RE}$ indicates the random effects estimator and $Avar$ identifies the asymptotic variance of them. The null hypothesis (H_0) of the Hausman Test which shows the χ^2 distribution with the degree of freedom determined by k is as "The method of Random Effects is consistent" (Greene, 2003). In the test result, the rejection of H_0 indicates that the method of Fixed Effects should be preferred.

Time series are the sequence of the observations made at periodical time intervals. One of the most important issues in the times series is stability. Almost all the statistical inferences are made through the assumption of the stability in the series. If there is not any stability, the series must be stabilized in any way before proceeding to the conclusion (Akdi, 2010). As in all the analyses of time series, the variables should be stable in order to prevent the false relationships between the variables in the panel data analysis which performs both time series and the cross-sectional analyses together. It is suggested that the stability should be examined in two ways. The common unit root process was examined with Levin, Lin & Chu (2002) test and each unit was examined with Im, Pesaran & Shin (2003) test and ADF-Fisher Chi-Square test. Results of the panel unit root test are shown in the Table 5. The unit roots were first examined in the level; when the unit root is detected in the relevant level, it is stabilized by taking the first or second differences respectively.

Table 5: Descriptive Statistics and Stability (Unit Root) Test Results of the Industrial Index Series

Series	X	SS	Md	Mn	Mx	S	K	JB	LLC	IPS	ADF ¹
ROA	0,05	0,09	0,05	-0,51	0,70	0,27	7,54	879,3**	-28,721**	-6,100**	384,019**
LROE	-1,18	0,10	-1,18	-2,41	0,00	-0,91	43,3	6837**	-22,495**	-4,873**	358,877**
EBOP	0,50	0,21	0,50	0,00	0,99	0,10	2,44	14,79**	-1189,73**	-7580,91**	247,365**
L(D2HAO)	-0,50	0,06	-0,50	-0,85	0,00	-0,83	20,82	11693**	-45,390**	-4,503**	275,045**
LKURY	0,44	0,22	0,44	0,00	0,99	0,16	2,54	13,41**	-27,248**	-4,956**	355,621**
ORTAK	1,35	0,81	1,00	0,00	4,00	0,60	3,56	75,71**	-26,047**	-6,498**	109,204**
LYABP	-4,60	2,74	-3,81	-13,81	0,02	-0,96	3,63	171,8**	-42,158**	-10,642**	491,237**
VALOG	19,69	1,39	19,54	16,29	23,8	0,38	2,93	25,22**	-18,231**	-4,057**	345,839**

*p<0,05 **p<0,01 ¹: Asymptotic χ^2

The statistical method, which is used to test the heteroscedasticity of the error term frequently seen in the panel data econometry, is the Lagrange Multiplier (LM) test (Greene, 2003). For this purpose, the test of Breusch-Pagan LM and Pesaran Scaled LM were utilized.

H0: Heteroscedasticity does not exist

H1: Heteroscedasticity exists.

When the problem of heteroscedasticity is encountered, correction of the standard errors in the fixed effects models was made by White's Diagonal Coefficient Covariance method, and the Cross-Section Weighted GLS was applied. However, correction of the standard errors in the random effects models was made by White's cross sectional coefficient covariance method, and Swamy-Arora weighted GLS was applied (Kyriazis and Anastassis, 2007).

In the panel data regression estimation, the Hausman test was used in order to determine which method of estimation (with fixed or random effects) should be used. The Hausman test is a method used to decide on the model to be preferred when it is necessary to make a choice between the fixed effects models and the random effects models (Greene, 2003). Based on the X^2 statistic obtained from the Hausman test, the model to be used has been determined.

H0: The random effects model is suitable.

H1: The fixed effects model is suitable.

Variance inflation factor (VIF) and correlation between the variables were examined in order to consider the problem of multicollinearity before the panel data regression. If the simple (bivariate) correlation between the independent variables is 0.71 and above, there is a high relationship between the variables. On the other hand, the fact that the correlation is above 0.90 is the indicator of multicollinearity. In case that the correlation coefficient is above 0.70, it is necessary to examine the variance inflation factors (VIF) separately for each model. As a rule, the multicollinearity will be discussed in case that the VIF is equal to 10 or higher. Therefore, one of the binary variables should be subtracted from the model (Çokluk, Şekercioğlu, Büyükköztürk, 2010).

Table 6: Results of the Correlation Analysis between the Industrial Index Variables

Variables	1	2	3	4	5	6	7	8
1. ROA	1,00	-0,71	0,02	0,05	-0,04	0,04	0,00	0,02
2. SROE		1,00	0,00	-0,01	0,01	0,00	-0,08	-0,06
3. EBOP			1,00	0,06	0,33	-0,34	0,02	-0,04
4. LDHAO				1,00	0,08	-0,01	0,02	0,01
5. SKURY					1,00	-0,18	0,35	0,04
6. ORTAK						1,00	0,05	0,17
7. LYABP							1,00	0,40
8. VALOG								1,00

T is used to indicate the terms. While N indicates the total number of the enterprises, T defines the total number of the terms.

Table 7: Model 1A Panel Regression Analysis Results

Dependent Variable: ROA					
Method: Panel LS&AR					
Independent Variables*	Coefficient	SH	T	p	VIF
EBOP	0,046	0,025	1,880	0,060	1,12
LDHAO	-0,093	0,042	-2,218	0,027	1,01
SKURY	-0,101	0,022	-4,538	0,000	1,26
ORTAK	0,001	0,006	0,142	0,887	1,06
LYABP	0,002	0,002	1,502	0,134	1,17
C	0,036	0,029	1,263	0,207	
Number of the panel variables observed	890		Model F	5,134	
Number of the cross sections included	112		Prob(F)	0,000	
Hausman (X^2)	5,072		Durbin Watson	1,651	
Prob Hausman (X^2)	0,407		ΔR^2	0,023	
Model	Random Effects				
Heteroscedasticity		LM1 $X^2=8411,06$ $p=0,000$	LM2 $X^2=18,682$ $p=0,000$		
Correction	White cross-section Swamy-Arora				

As the H0 hypothesis which indicates the random effects model is more effective than the fixed effects model in the model1a formed for ROA dependent variable was accepted as a result of the Hausman test ($X^2=5,07$; $p>0,05$), the random effects method was used in the panel data estimation for the model1a. It has been found that the model is significant ($F=5,13$; $p<0,01$) in the random effects panel regression equation made for the model1a. Furthermore, it has been determined that the variables of HAO ($t=-2,22$; $p<0,05$) and KURY ($t=-4,54$; $p<0,01$) have a significant effect on the ROA. It has been seen that all the variables included in the model indicate averagely 2% of the variance in the ROA variable. As a result, it has been considered that the variance is real as the Durbin Watson score ($DW=1,65$) is higher than the R^2 . The results are shown in Table 7.

$$ROA = 0,04 + 0,05*EBOP - 0,09*HAO - 0,10*KURY + 0,00*ORTAK + 0,00*YABP + \epsilon_{it}$$

Table 8: Model 1B Panel Regression Analysis Results

Dependent Variable: ROA				
Method: Panel LS&AR				
Independent Variables	Coefficient	SH	t	p
VALOG	0,009	0,005	1,745	0,081
EBOP	0,041	0,034	1,187	0,236
LDHAO	-0,089	0,017	-5,108	0,000
SKURY	-0,097	0,022	-4,344	0,000
ORTAK	-0,001	0,005	-0,202	0,840
LYABP	0,001	0,002	0,702	0,483
C	-0,146	0,127	-1,154	0,249
Number of the panel variables observed	890		Model F	5,222
Number of the cross sections included	112		Prob(F)	0,000
Hausman (X^2)	4,544		Durbin Watson	1,651
Prob Hausman (X^2)	0,603		ΔR^2	0,027
Model	Random Effects			
Heteroscedasticity		LM1 $X^2=8499,7$ $p=0,000$	LM2 $X^2=19,47$ $p=0,000$	
Correction	White cross-section Swamy-Arora			

As the H0 hypothesis which indicates the random effects model is more effective than the fixed effects model in the model1b formed for ROA dependent variable and included VALOG as a control variable was accepted as a result of the Hausman test ($X^2=4,54$; $p>0,05$), the random effects method was used in the panel data estimation for the model1b. It has been found that the model is significant ($F=5,22$; $p<0,01$) in the random effects panel regression equation made for the model1b. Furthermore, it has been determined that the variables of HAO ($t=-5,11$; $p<0,01$) and KURY ($t=-4,34$; $p<0,01$) have a significant effect on the ROA. It has been seen that all the variables included in the model indicate averagely 3% of the variance in the ROA variable. As a result, it has been considered that the variance is real as the Durbin Watson score ($DW=1,65$) is higher than the R^2 . Based on the Model1b results, it has been seen that there is not any increase in the total variance obtained after involving the variable of VALOG in the model (Model2A $R^2=0,02$; Model2b $R^2=0,03$). The results are shown in Table 8.

$$ROA = -0,15 + 0,01*VALOG + 0,04*EBOP - 0,09*HAO - 0,10*KURY + 0,00*ORTAK + 0,00*YABP + \epsilon_{it}$$

- H1a Rejection : EBOP variable has not any significant effect on the ROA.
H1b **Acceptance** : HAO variable has a negatively significant effect on the ROA.
H1c **Acceptance** : KURY variable has a negatively significant effect on the ROA.
H1d Rejection : ORTAK variable has not any significant effect on the ROA.
H1e Rejection : YABP variable has not any significant effect on the ROA.
H1f Rejection : VALOG variable has not any significant effect on the ROA.

Table 9: Model 2A Panel Regression Analysis Results

Dependent Variable: SROE					
Method: Panel LS&AR					
Independent Variables*	Coefficient	SH	t	p	VIF
EBOP	0,031	0,040	0,785	0,433	3,49
LDHAO	-0,070	0,045	-1,547	0,122	4,25
SKURY	-0,119	0,036	-3,336	0,001	6,03
ORTAK	0,002	0,003	0,531	0,595	1,95
LYABP	0,003	0,001	2,674	0,008	2,45
C	-1,172	0,025	-47,021	0,000	
Number of the panel variables observed	890		Model F	5,690	
Number of the cross sections included	112		Prob(F)	0,000	
Hausman (X^2)	7,943		Durbin Watson	1,667	
Prob Hausman (X^2)	0,159		ΔR^2	0,026	
Model	Random Effects				
Heteroscedasticity		LM1 $X^2=8177,6$ $p=0,000$	LM2 $X^2=16,59$ $p=0,000$		
Correction	White cross-section Swamy-Arora				

As the H0 hypothesis which indicates the random effects model is more effective than the fixed effects model in the model2a formed for ROA dependent variable was accepted as a result of the Hausman test ($X^2=7,94$; $p>0,05$), the random effects method was used in the panel data estimation for the model2a. It has been found that the model is significant ($F=5,69$; $p<0,01$) in the random effects panel regression equation made for the model2a. Furthermore, it has been determined that the variables of KURY ($t=-0,12$; $p<0,01$) and YABP ($t=2,67$; $p<0,01$) have a significant effect on the ROA. It has been seen that all the variables included in the model indicate averagely 3% of the variance in the ROA variable. As a result, it has been considered that the variance is real as the Durbin Watson score ($DW=1,67$) is higher than the R^2 . The results are shown in Table 9.

$$ROE = -1,17 + 0,03*EBOP - 0,07*HAO - 0,12*KURY + 0,00*ORTAK + 0,00*YABP + \epsilon_{it}$$

Table 10: Model 2B Panel Regression Analysis Results

Dependent Variable: SROE				
Method: Panel LS&AR				
Independent Variables	Coefficient	SH	t	p
VALOG	0,012	0,005	2,526	0,012
EBOP	0,023	0,040	0,589	0,556
LDHAO	-0,064	0,040	-1,623	0,105
SKURY	-0,111	0,033	-3,360	0,001
ORTAK	-0,001	0,004	-0,296	0,768
LYABP	0,001	0,002	0,676	0,499
C	-1,409	0,105	-13,385	0,000
Number of the panel variables observed	890		Model F	6,657
Number of the cross sections included	112		Prob(F)	0,000
Hausman (X^2)	6,721		Durbin Watson	1,675
Prob Hausman (X^2)	0,347		ΔR^2	0,037
Model	Random Effects			
Heteroscedasticity		LM1 $X^2=8230,6$ $p=0,000$	LM2 $X^2=17,06$ $p=0,000$	
Correction	White cross-section Swamy-Arora			

As the H0 hypothesis which indicates the random effects model is more effective than the fixed effects model in the model2b formed for ROA dependent variable and included VALOG as a control variable was accepted as a result of the Hausman test ($X^2=6,72$; $p>0,05$), the random effects method was used in the panel data estimation for the model2b. It has been found that the model is significant ($F=6,66$; $p<0,05$) in the random effects panel regression equation made for the model2b. Furthermore, it has been determined that the variables of VALOG ($t=2,53$, $p<0,05$) and KURY ($t=-3,36$; $p<0,01$) have a significant effect on the ROA. It has been seen that all the variables included in the model indicate averagely 4% of the variance in the ROA variable. As a result, it has been considered that the variance is real as the Durbin Watson score ($DW=1,68$) is higher than the R^2 . Based on the Model3b results, it has been seen that there is not any increase in the total variance obtained after involving the variable of VALOG in the model (Model3a $R^2=0,03$; Model3b $R^2=0,04$). The results are shown in Table 10.

$$ROE = -1,41 + 0,01*VALOG + 0,02*EBOP - 0,06*HAO - 0,11*KURY + 0,00*ORTAK + 0,00*YABP + \varepsilon_{it}$$

- H2a Rejection : EBOP variable has not any significant effect on the ROE.
 H2b Rejection : HAO variable has not any significant effect on the ROE.
 H2c **Acceptance** : KURY variable has a negatively significant effect on the ROE.
 H2d Rejection : ORTAK variable has not any significant effect on the ROE.
 H2e **Acceptance** : YABP variable has a positively significant effect on the ROE.
 H2f **Acceptance** : VALOG variable has a positively significant effect on the ROE.

4. CONCLUSION

In this study, the effects of the ownership structure in the enterprises traded on Borsa Istanbul (BIST) and included in the industrial index on their financial performance are examined in the light of accounting based performance indicators. It has been benefited from the data of 112 enterprises which are traded on the relevant index and carry out their activities uninterruptedly during the period between the years of 2006 and 2014. The relationship between the share of the largest partner, the corporate investor ratio, the free float rate, the number of partners and the foreign share used as the variables of ownership structure and the "Return on Assets" and the "Return on Equity" used as the indicators of financial performance has been analyzed.

In accordance with the results of the panel data regression analysis made for the ROA, it has been found that the free float rate and the corporate investor ratio have a negatively and statistically significant effect on the return on assets in the enterprises. Therefore, it can be interpreted that the increase in the free float rate and the corporate investor ratio has increased the share risk and the share price of the enterprises. Furthermore, the increase seen in the free float rate indicates that these firms are defined as the widely held firms. As the number of professional managers is high in management of such firms, it can be stated that these managers relatively manage the assets more effectively.

Based on the results of the panel data regression analysis made for the ROE which is the second model of the study, it has been found that the corporate investor ratio has a negatively and statistically significant effect on the return on assets and the return on equity. Furthermore, it has been determined that the foreign share and the size of total assets, it other words, the size of enterprise used as a control variable in the study have a positively and statistically significant effect on the return on equity. Therefore, the increase in the foreign share, namely, the change of the foreign partnership into the controlling shareholder may have a positive effect on financial performance of the enterprises and provide the shareholders with an opportunity to make more profitable investments. Furthermore, the foreign shareholders' power to control and audit the enterprises which show an increase in the level of foreign ownership will lead to a positive effect on financial performance of the enterprises.

It has been seen that the increase of the activity diversity on the cash flow has an effect to minimize the possible fluctuations, in other words, the risk of bankruptcy. As the large scaled enterprises benefit from the economy of scale effectively, they can be more effective than the small scaled enterprises. In the results of analyses made in the four models created for determination of the financial performance, any statistically significant relationship has not been found for the variables of the share of the largest partner and the number of partners.

Based on the research results, it has been seen that financial performance of the enterprises is not independent of the ownership structure. It can be said that the variables of ownership structure are effective on the accounting based financial performance indicators and that it is important to consider these variables in the characteristics and differences regarding the ownership structure of the enterprises while commenting the financial performance.

The results obtained from the research are important especially for the investors. Thus, the investors who aim to earn profit and increase their welfare will want to know the factors which affect the financial performance, in other words, the profitability of the enterprises with shares. It is expected that the results of this study will be beneficial for giving an idea for the enterprises which are traded on the BIST Industrial Index and different from each other in terms of the ownership

structure. Though some results are compatible with the studies made on the relevant research in the literature up to the present, any compatibility has not been observed in some of them. The differences in the sector, year and variables used are effective factors for the incompatibility in the relevant studies made in the literature. Therefore, the results should be interpreted only for the enterprises, which carry out their activities in the relevant index, due to some restrictions. The enterprises in the index mentioned in the study consist of the enterprises which carry out their activities uninterruptedly in the relevant range of years. All enterprises listed on the relevant index have not been included in the scope of the analysis due to the restrictions.

In the following studies which will examine the relationship between the financial performance and the structures of capital and ownership, examinations can be made through a comparison of countries and sectors in the relevant indices in addition to the different indices and a wider data set.

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ABSTRACT

Purpose- In the literature the effect of exchange rate volatility on various macroeconomic variables has been extensively studied but there are not enough studies about the reasons of exchange rate volatility. The aim of the research is to present the theoretical framework about the determinants of exchange rate volatility and to determine the factors affecting exchange rate volatility in Turkey for a period from 1974 to 2016.

Methodology- In this research the stationary analysis of the series is determined by the Augmented Dickey Fuller Test (ADF) and the PP (Phillips-Perron test) unit root tests. In addition the GARCH model is used to calculate the real effective exchange rate volatility. The Johansen cointegration test is used to determine whether there is a long-term relationship between variables. The coefficients of the long-run relationship between the variables are estimated by the FMOLS method.

Findings- The ADF and PP unit root test results show that the series are stationary at first difference. According to Johansen cointegration test results, it has been found that there is a long-run relationship between the variables involved in the analysis. Results from the FMOLS method for determining the direction and severity of the long-term relationship between the variables reveal that LGFCF, LMONEY and LTRADE positively affects significantly, while LFDI, LGDPC, LGGEXP negatively affects real effective exchange rate volatility.

Conclusion- The rise in domestic investment (LGFCF), money supply (LMONEY) and trade openness (LTRADE) increases the real effective exchange rate volatility, while the rise in foreign direct investment (LFDI), output (LGDPC) and government expenditures (LGGEXP) also reduces the real effective exchange rate volatility.

Keywords: Exchange rate, exchange rate volatility, GARCH, Johansen Cointegration analysis, FMOLS analysis.

JEL Codes: C32, F30, F31

1.INTRODUCTION

Following the collapse of the Bretton Woods system in 1973, the fixed exchange rate system was abandoned and the countries were left to fluctuate their money. For countries adopting a floating exchange rate system, exchange rate volatility has become an inevitable fact of life. Exchange rate volatility corresponds to large fluctuations around the balance value of the exchange rate or short-term fluctuations around the long-term trends of the exchange rate (Oaikhenan and Aigheyisi, 2015: 47; Giannellis and Papadopoulos, 2011: 41). In other words, the exchange rate volatility is a variation of the price of one currency in another currency. Volatility refers to all movements and changes that are effective in depreciation or appreciation of a currency. The profitability of foreign exchange transactions is affected by the appreciation or loss of foreign currency (Martins, 2015: 14). Exchange rate volatility is associated with unpredictable movements in relative prices in the economy. For this reason, exchange rate stability is one of the main factors affecting foreign (direct and portfolio) investments, price stability and stable economic growth (Ajao, 2015: 44).

The changes in the main economic factors make the exchange rates more volatile by causing unexpected changes in the exchange rate level. In addition changes in these factors can lead to further growth of the volatility, by exceeding the target for the long-term equilibrium exchange rate in the short term (Ayhan, 2016: 10).

Excessive exchange rate volatility leads to delays in investment decisions, causing uncertainty in the economy. The uncertainty that is caused by volatility also negatively affects economic growth by affecting investment and investor confidence, productivity, consumption and international trade and capital flows (Oaikhenan and Aigheyisi, 2015: 49). Exchange rate volatility leads to high degree of uncertainty in ensuring price stability and economic growth and in setting

macroeconomic and monetary policy targets (Ajao, 2015, 44). Finding reasons for real exchange rate volatility due to possible negative effects is important in terms of developing appropriate economic policies to minimize fluctuations.

Although there is no consensus on the causal factors of exchange rate volatility, many factors have been identified in the literature. Some factors are mostly country-specific. Trade openness, capital flows, economic growth rate, level of financial development, foreign reserve level, external debt and the current exchange rate regime are among the commonly mentioned factors. The extent to which each factor affects exchange rate movements depends on the method used, the period of analysis and the economic conditions prevailing in each country (Stancik, 2007: 2; Oaikhenan ve Aigheyisi, 2015: 50).

There is a wide literature analyzing the effect of exchange rate volatility on various macroeconomic aggregates such as economic growth, trade flows, domestic and foreign investments and capital flows. However, there are not many studies on the causes or determinants of exchange rate volatility.

The objective of this study is to determine the sources of exchange rate volatility in Turkey for the period 1974-2016. To achieve our objective, this paper consists of the following sections: the next section provides theoretical framework on the determinants of exchange rate volatility. Section three presents applied literature. While the fourth section presents data and econometric methodology, the fifth section concludes the paper.

2. THEORETICAL FRAMEWORK

In both developed and emerging economies, exchange rate stability is important in achieving macroeconomic policy objectives. Governments have adopted different exchange rate management policies, especially for developing economies, to create a realistic and stable exchange rate.

For this reason, many countries have been exposed to exchange rate fluctuations, which have become highly uncertain or volatile. Exchange rate volatility is an important factor that increases the risk in the financial world (Hassan et.al.,2017: 2). So exchange rate volatility and its determinants for countries have become a new focus of interest.

All factors that determine foreign exchange supply and demand cause indirect exchange rate volatility to change. There are many factors that affect the real exchange rate volatility, even if the effect of each depends on the economic conditions of the countries of the world. These factors include output level, inflation, trade openness, interest rates, domestic and foreign money supply, exchange rate regime, central bank independence, changes in the balance of payments, international capital movements, developments in information and communication technologies and monetary and fiscal policies to be implemented. In addition, speculations, news, expectations that contribute to the exchange of these variables will indirectly affect the volatility of the exchange rate (Ayhan, 2016:10; Stancik, 2007:2; Ajao, 2015: 47; Hassan et.al., 2017: 2).

In terms of the fundamental determinants of exchange rate volatility, the focal point is almost exclusively focused on macroeconomic fundamentals and structural features of the foreign exchange market. However, some studies have also analyzed the effect of "soft power" measures on exchange rate volatility (Cevik, 2015: 4). In this respect, it can be said that the "soft power" factors have an important influence on the exchange rate volatility, directly and indirectly, by reinforcing complementarities among different institutions, promoting better policy choices and shaping the pattern and evolution of macroeconomic bases and risk premiums (Cevik, 2017: 272).

Theoretical support for the determination of the exchange rate is based on monetary and macroeconomic theories. The theory of money, which assumes the integration of goods and capital markets, suggests that the rate of change between two countries' currencies should be equal to the total price level between the two countries. Macroeconomic (real) theory draws attention to macroeconomic variables in determining the exchange rate. This approach is divided into the Balassa-Samuelson approach and the approach of payment balance, as proposed by Nurkse. The Balassa-Samuelson approach focuses on the trade balance between traded and non-trade sectors, while Nurkse's approach draws attention to the balance of payments (Hassan et.al.,2017:3). An appropriate payment balance leads to an excessive appreciation of the exchange rate, and an imbalance in payments leads to the depreciation of the exchange rate of the country. Therefore, foreign exchange demand and supply have an important role in determining the exchange rate in the foreign exchange market (Hassan et.al.,2017: 3). In addition, the floating exchange rate regime is more volatile than the fixed exchange rate regime (Oaikhenan and Aigheyisi, 2015: 48).

3. APPLIED LITERATURE

With the emergence of floating exchange rate regimes, the volatility of exchange rates attracted much attention in economic researches. In the literature on the determinants of exchange rate volatility, there are various empirical studies using time series or panel data analysis methodologies on different countries or groups of countries. Table 1 presents some empirical studies investigating the determinants of exchange rate volatility. When table 1 is examined, it appears that the

factors affecting exchange rate volatility are financial openness, net foreign asset and interest rate, fiscal balance, economic (trade) openness, inflation, inflation volatility, commodity prices, oil prices, output, domestic output movements, growth rate, volatility of output, government expenditures, money supply growth, money supply volatility, terms of trade shocks, FDI flows, foreign reserves, current account balance, domestic and external debts.

Table 1: Applied Studies on the Determinants of Exchange Rate Volatility

Author	Period / Country	Method / Variables	Conclusion
Calderon and Kubota (2018)	1974-2013 82 countries (of which 22 are industrial countries)	Panel regression analysis	The results show that trade in manufacturing helps reduce RER volatility while non-manufacturing trade may contribute to higher RER volatility and that financial openness mitigates (amplifies) RER volatility in a country with higher (lower) share of foreign equity vis-à-vis foreign debt liabilities.
Khin et.al.(2017)	2010-2016 Malaysia	VECM, Johansen Cointegration test and Granger Causality test	The VECM model results indicated a significant and positive short-run relationship between exchange rate, consumer price index (CPI), and the lagged of the exchange rate. Besides, there is also a significant and negative short-run relationship between exchange rate and money supply.
Adusei and Gyapong (2017)	1975-2014 Ghana	Partial Least Squares Structural Equation Modelling approach	These results underpin the conclusion that inflation, monetary policy rate, current account balance, money and quasi money supply per GDP, annual GDP growth rate and the total external debt are significant predictors of the cedi-dollar exchange rate in Ghana.
Hassan et.al. (2017)	1989Q1- 2015Q4 Nigeria	Autoregressive Distributed Lag (ARDL) model and Granger Causality test	The findings revealed that net foreign asset and interest rate have positive and statistically significant impact on exchange rate volatility while fiscal balance, economic openness and oil price have positive and statistically insignificant impact on exchange rate volatility. Furthermore, nominal gross domestic product has negative and statistically insignificant impact on exchange rate volatility.
Alagidede and Ibrahim (2017)	1980 - 2013 Ghana	Johansen cointegration test and VECM	Results showed that in the short-run, output was the most important driver of exchange rate fluctuations. In the long run, exchange rate volatility was significantly influenced by government expenditure and money supply growth and terms of trade shocks, FDI flows and domestic output movements.
Mpofu (2016)	1986-2013 South Africa	GARCH model	The study found that switching to a floating exchange rate regime has a significant positive effect on ZAR volatility. The results also indicate that trade openness significantly reduces ZAR volatility only when bilateral exchange rates are used, but finds the opposite when multilateral exchange rates are used. The study also finds that volatility of output, commodity prices, money supply and foreign reserves significantly influence ZAR volatility.
Cevik et.al. (2016)	1996-2011 115 countries	GMM	The empirical results showed a high degree of persistence in exchange rate volatility, especially in emerging market economies. It was also found that "soft power" variables have a statistically significant effect on exchange rate volatility between countries.
Oaikhenan, and Aigheyisi (2015)	1970-2013 Nigeria	EGARCH model	The results showed that of the economy, government expenditures, interest rate movements as well as the lagged exchange rate are among the major significant variables that influence REXRVOL during this period.
Insah and Chiaraah (2013)	1980- 2012 Ghana	ARDL model	The results revealed that there exist positive relationship between government expenditure and exchange rate volatility, while money supply, domestic and external debts were negatively related to exchange rate volatility.
Mirchandani	1991 - 2010	Pearson's	Exchange rates is correlation with many variables such as

(2013)	India	correlation analysis	interest rate, inflation rate, growth rate and current account balance in either direct or indirect manner.
Ajao and Igbokoyi (2013)	1981 - 2008 Nigeria	GARCH and ECM model	The results indicated that real exchange rate, trade openness, government expenditure, real interest rate have positive impact on exchange rate volatility.
Grydaki and Fontas (2011)	1979-2009 Certain Latin American countries	Multivariate GARCH Model	The study revealed that financial openness, money supply volatility and inflation volatility explained exchange rate volatility. Flexible exchange rate regime was also found to increase exchange rate volatility.
Englama <i>et al.</i> (2010)	1999:1 -2009: 12 Nigeria	VAR model and VECM model	The results showed that exchange rate volatility was strongly influenced by changes in oil price at the foreign market both in the long-run and short-run.
Asiama and Kumah (2010)	1980 - 2008 African countries	Panel cointegration approach	The study revealed that real exchange rate was strongly influenced by openness, terms of trade and oil prices.
Morana (2009)	1980:1–2006:6 US, Japan, Euro-12 area, UK, and Canada	FI-F-VAR model	The results of the study show that with causality being stronger from macroeconomic volatility to exchange rate volatility.
Chipili (2009)	1964-2006 Zambia	GARCH model	The results indicated that the switch from the fixed to the flexible exchange rate regimes had significant positive effect on the conditional volatility of real exchange rate. In addition, monetary factors had a relatively larger effect than real factors.
Calderon and Kubota (2009)	1975-2005 82 countries	Panel data regression analysis	The results showed that high productivity shocks and sharp oscillations in monetary and fiscal policy shocks was reason high real exchange rate volatility. It was also found that financial openness led to fluctuations in the real exchange rate.
Al-Samara (2009)	1980 -2008 Syria	VECM and ARCH	The results showed that relative productivity, total investment and oil price have positive impact on exchange rate volatility. Government expenditure was found to have negative impact.
Stancik (2007)	1999-2014 European Union members' countries	TARCH model	The findings revealed that economic openness, information and flexible exchange rate regimes have positive and statistically significant impact on exchange rate volatility.

4. DATA AND ECONOMETRIC METHODOLOGY

4.1. Data

This study used data from the 1974-2016 period for Turkey. All variables used in the analysis are used after the logarithms are taken. The functional form of the econometric model will be as:

$$VOL_t = \beta_0 + \beta_1 LFDI_t + \beta_2 LGFCF_t + \beta_3 LTRADE_t + \beta_4 LGGFCE_t + \beta_5 LMONEY_t + \varepsilon_t \quad (1)$$

The abbreviations, descriptions of variables and source of the data are presented in the Table 2.

Table 2: The Dataset-Variable Description

Abbreviations of variables	Definition	Source
REER	Real effective exchange rate (CPI based) considering 67 trading partners, (1974-2016)	Bruegel Database 2017
FDI	Foreign direct investment, net inflows (% of GDP) (1974-2016)	The World Bank (WB) (World Development Indicators 2018)
GFCF	Gross fixed capital formation (% of GDP) (1974-2016)	The World Bank (WB) (World Development Indicators 2018)
TRADE	Trade openness (% of GDP) (1974-2016)	The World Bank (WB) (World Development Indicators 2018)
GGFCE	General government final consumption expenditure (% of GDP) (1974-2016)	The World Bank (WB) (World Development Indicators 2018)

GDPC	GDP (constant 2010 US\$) (1974-2016)	The World Bank (WB) (World Development Indicators 2018)
MONEY	Broad money growth (annual %) (1974-2016)	The World Bank (WB) (World Development Indicators 2018)

In the application part of the study, first, the real exchange rate volatility series (VOL) is estimated using the real effective exchange rate with the GARCH (1,1) model. Then, stationary analysis is performed with the Augmented Dickey-Fuller (ADF) (1981) and Phillips-Perron (PP) (1988) unit root tests. The Johansen cointegration test is used to test whether there is a cointegration relationship between the variables. The coefficients are also estimated with the help of the Fully Modified Ordinary Least Squares (FMOLS) model.

4.2. Econometric Results

4.2.1. Estimated Exchange Rate Volatility

Using the GARCH (p, q) method (Bollerslev, 1986), the real effective exchange rate volatility series (VOL) is established. The GARCH model tries to demonstrate the volatility by allowing delayed conditional variances to enter the model. The estimated model can be expressed in equation 2 below.

$$\sigma_t^2 = \omega + \sum_{i=1}^p \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^q \beta_j \sigma_{t-j}^2 \quad (2)$$

The hypothesis set in Equation 3 is tested

$$H_0 = \alpha_1 = \alpha_2 = \dots = \alpha_p = 0 \quad (3)$$

$$H_0 \neq \alpha_1 \neq \alpha_2 \neq \dots \neq \alpha_p \neq 0$$

The Lagrange multiplier (LM) test developed by Engle (1982) is used when testing whether a variable contains ARCH effects in the literature. In the case of $LM > \chi_p^2$ (p degrees of freedom) table, the null hypothesis can be rejected and the existence of ARCH effect and model specification can be decided. After accepting the ARCH effect, the GARCH (1,1) model is developed to estimate the volatility.

Table 3: Lagrange Multiplier Test Results

Heteroskedasticity Test: ARCH			
F-statistic	13.37661	Prob. F(1,40)	0.0007
Obs*R-squared	10.52554	Prob. Chi-Square(1)	0.0012

As seen in Table 3, the probability value of χ^2 according to ARCH LM test result is found to be significant at 5% level. This result indicates that the hypothesis H_0 is to be rejected, in other words, it is the ARCH effect and therefore has a volatility of the series. Thus, the GARCH variance series shows that it can be used as a measure of real effective exchange rate volatility.

4.2.2. Unit Root Test Results

The stationary of the variables is tested with the ADF (Augmented Dickey-Fuller, 1981) and PP (Phillips-Perron, 1988) unit root tests. The null hypothesis for Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) implies that the unit root is contained, ie the series are not stationary. In both tests, the null hypothesis is rejected if the test statistics are less than the critical values.

Accordingly, the level of the null hypothesis for all variables can not be rejected at the level of 5% significance. However, it is found that the first differences of variables are stationary. The Johansen cointegration test can be performed because the variables used in the analysis are stationary ratings I(1).

Table 4: ADF ve Phillips-Perron Unit Root Test Results

Variable	ADF (%5)		Phillips-Perron (%5)		Order of integration
	Level (Intercept)	1st. Different (Intercept)	Level (Intercept)	1st. Different (Intercept)	
VOL	-1.740335 (-2.933158)	-6.242312 (-2.935001)	-1.792967 (-2.933158)	-6.263567 (-2.935001)	I(1)
LGDPC	0.269935 (-2.933158)	-6.197479 (-2.935001)	0.299192 (-2.933158)	-6.195244 (-2.935001)	I(1)
LGFCF	-1.638726 (-2.933158)	-5.720557 (-2.935001)	-1.736936 (-2.933158)	-5.719206 (-2.935001)	I(1)
LGGEYP	-1.138135 (-2.933158)	-5.578213 (-2.935001)	-1.460649 (-2.933158)	-5.641496 (-2.935001)	I(1)
LFDI	-1.745577 (-2.933158)	-9.137707 (-2.935001)	-1.456177 (-2.933158)	-9.932143 (-2.935001)	I(1)
LTRADE	-1.523261 (-2.933158)	-4.655854 (-2.936942)	-1.538926 (-2.933158)	-5.466694 (-2.935001)	I(1)
LMONEY	-1.195527 (-2.935001)	-9.537864 (-2.935001)	-1.841850 (-2.933158)	-9.695659 (-2.935001)	I(1)

Note: The numbers in the table are t statistic values and critical values are reported in the parentheses.

4.2.3. Determination of Lag Length and Appropriate Model

It is necessary to find the optimum lag length before proceeding to the Johansen cointegration test. VAR analysis is used to determine the optimum lag length. When the VAR model is established, the model selection criteria values for various lag lengths are as shown in Table 5.

Table 5: Determination of Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	21.59371	NA	1.14e-09	-0.729686	-0.434132	-0.622823
1	258.2276	378.6142	9.95e-14	-10.11138	-7.746947*	-9.256475
2	311.7785	66.93871	9.99e-14	-10.33893	-5.905618	-8.735982
3	410.2753	88.64710*	1.67e-14*	-12.81377*	-6.311580	-10.46278*

*Indicates lag order selected by the criterion. LR: Sequential modified LR test statistic (each test at 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion

As shown in Table 5, the appropriate number of lag length for the unrestricted VAR model is 3 according to the LR, FPE, AIC and HQ information criteria. The existence of a long-run relationship between variables is determined by the Johansen cointegration test after the appropriate number of lag length are determined.

When the cointegration test is applied, it is important to determine whether the model includes constant, parameter and trend and what kind of trend is affected by the variables. In order to determine the appropriate model, usually the model with the minimum Akaike and Schwarz value is selected. In the study, the model with the smallest Akaike and Schwarz values became a quadratic deterministic trend model.

4.2.4. Johansen Cointegration Analysis

Johansen (1988) and Johansen and Juselius (1990) have developed a cointegration test that can be used even if there is more than one cointegration relationship between variables, using the VAR model that takes all the variables endogenous. The cointegration tests allow the estimation and modeling of the long-run relationship between variables that are stationary at the same level but are not stationary in their levels.

Table 6: Results of Johansen Cointegration Test**Unrestricted Cointegration Rank Test (Trace)**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.998924	541.0258	139.2753	0.0001
At most 1 *	0.923219	274.4790	107.3466	0.0000
At most 2 *	0.846908	174.3736	79.34145	0.0000
At most 3 *	0.805297	101.1818	55.24578	0.0000
At most 4 *	0.568376	37.36691	35.01090	0.0275
At most 5	0.104673	4.599078	18.39771	0.9550
At most 6	0.007332	0.286999	3.841466	0.5921

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.998924	266.5468	49.58633	0.0001
At most 1 *	0.923219	100.1053	43.41977	0.0000
At most 2 *	0.846908	73.19185	37.16359	0.0000
At most 3 *	0.805297	63.81485	30.81507	0.0000
At most 4 *	0.568376	32.76784	24.25202	0.0030
At most 5	0.104673	4.312078	17.14769	0.9465
At most 6	0.007332	0.286999	3.841466	0.5921

Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The results of the Johansen cointegration test for the determination of the existence of a long-term relationship between variables are presented in Table 6. Johansen's maximum likelihood approach uses two types of probabilistic test statistics. One of them is the trace statistic and the other is the maximum eigenvalue statistic. According to the trace statistic and maximum eigenvalue statistic, the null hypothesis ($r = 0$) that there is no cointegration relation between variables is rejected against the alternative hypothesis that there is a cointegration relation between variables. Because trace statistic and maximum eigenvalue statistic values are greater than the critical value of 5%. Both the trace statistic test and the maximum eigenvalue statistic test at the 5% level show that the equation of cointegration is 5. This result shows that there is a long-run relationship between the variables.

4.2.5. Fully Modified Ordinary Least Squares

As described in Juselius (1999), parameter quantities obtained from the Johansen cointegration test are not interpreted (Saatçi and Dumrul, 2013: 18). For this reason, after the long-run relationship between variables has been established according to the results of the cointegration test, the severity and direction of this relationship has been estimated using the FMOLS method developed by Phillips and Hansen (1990). The FMOLS test is valid under the assumption that all variables are stationary in the first difference and that there is a cointegration relationship between the variables. Table 7 shows the estimation results obtained from the FMOLS analysis.

Table 7: Dynamic Analysis of Variables Affecting Real Effective Exchange Rate FMOLS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI	-0.016000	0.014694	-1.088940	0.2836
LGDPC	-0.138941	0.067748	-2.050860	0.0478
LGFCF	0.360964	0.072455	4.981939	0.0000
LGGEXP	-0.173188	0.075062	-2.307281	0.0271
LMONEY	0.072992	0.016973	4.300455	0.0001
LTRADE	0.126775	0.047180	2.687030	0.0110
C	2.402814	1.548743	1.551461	0.1298
R-squared	0.678041	Mean dependent var		0.098298
Adjusted R-squared	0.622848	S.D. dependent var		0.109765
S.E. of regression	0.067410	Sum squared resid		0.159043
Long-run variance	0.003134			

The value of the R^2 indicates that about 67 % of the variation in exchange rate volatility is due to variations in the independent variables. This result shows that the variables involved in the analysis are among the major variables affecting exchange rate volatility. Results from the FMOLS reveal that LGFCF, LMONEY and LTRADE positively affects significantly real effective exchange rate volatility. An increase in LGFCF which is used as a demonstration of domestic investment and LMONEY which is used as an indicator of money supply increases the exchange rate volatility. In the literature, it is stated that as the openness of the economy increases, exchange rate volatility will decrease (Al-Samara, 2009: 8). However, FMOLS results show a statistically significant positive relationship between real effective exchange rate volatility and trade openness. The reason for the increase in exchange rate volatility of the trade openness can be explained by the fact that the non-manufacturing trade is higher. The correlation between trade openness and RER volatility varies, especially when there is a distinction between trade in manufacturing and non-manufacturing goods. Non-manufacturing trade may contribute to higher RER volatility, while manufacturing trade helps balance RER volatility (Calderón and Kubota, 2018: 183).

FDI negatively affect insignificantly exchange rate volatility. The LGDPC coefficient is negative and significant. The increase in LGDPC shows that the exchange rate volatility are reduced. The increase in LGDPC suggests that the increase in output increases the volatility. The effect of LGGEXP on exchange rate volatility is negative and statistically significant. This effect indicates that an increase in government spending has reduced exchange rate volatility.

5. CONCLUSION

The exchange rate volatility and uncertainty caused by volatility, investments, capital movements, production, imports and exports negatively affect. It is important to know the factors that cause exchange rate volatility in order to create economic policies that will minimize exchange rate volatility. In this study, the factors that led to the real effective exchange rate volatility for the 1974-2016 period in Turkey, Johansen cointegration test and FMOLS test is attempted to be determined. In addition, the GARCH model is used to calculate the real effective exchange rate volatility in the study.

According to Johansen cointegration test results, it has been found that there is a long-run relationship between the variables involved in the analysis. Results from the FMOLS method for determining the direction and severity of the long-run relationship between the variables reveal that domestic investment (LGFCF), money supply (LMONEY) and trade openness (LTRADE) positively affects significantly, while foreign direct investment (LFDI), output (LGDPC), government expenditure (LGGEXP) negatively affects real effective exchange rate volatility. This result implies that the exchange rate volatility will increase as domestic investment (LGFCF), money supply (LMONEY) and trade openness (LTRADE) increase, exchange rate volatility will decrease as the foreign direct investment (LFDI), output (LGDPC) and government expenditure. In some of the studies in the literature, the increase in government expenditures has positively affected the exchange rate volatility, whereas in this study it is reached that the spending negatively affects the volatility, consistent with the Al-Samara (2009). In addition, while the trade openness is expected to negatively affect the exchange rate volatility, in this study it is reached that it affects the volatility positively. This result is consistent with the workings of Ajao and Igbokoyi (2013) Stancik (2007) and Hassan et.al. (2017). Policy makers can develop appropriate macroeconomic and monetary policies, taking into account these factors that affect exchange rate volatility. In future studies, the effect of soft power indicators on exchange rate volatility can be analyzed for Turkey.

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A STUDY ON THE EFFECT OF INDEPENDENT AUDIT SUPPORT OF KOSGEB TO LEAD SMEs AUDITING

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ABSTRACT

Purpose- The aim of this study is to investigate the benefit from the independent audit activity with the numerical superiority among the total enterprises in developed and developing countries; the extent to which SMEs that are in the backbone of the country's economy, by considering their share in production, employment, investment, foreign trade, total lending and taxation.

Methodology- It is aimed to determine the extent to which independent audit support program in KOSGEB, which was established in Turkey in order to increase the competitiveness of the Small and Medium-sized Enterprises, which has not reached consensus on all over the world and which is referred to as SMEs in the international level and to increase the contribution of SMEs to our country's economic growth, is benefited by them. The information of Companies, which benefited from the support, had been obtained from KOSGEB.

Findings- It is thought that independent audit to be crucial for Companies to maintain their existence with sustainable growth. The number of SMEs benefiting from the relevant support of independent audit has been found to be low at a remarkable level.

Conclusion- Therefore, the contribution of the independent audit support of KOSGEB on particularly optional audit their financial statements has been explored on SMEs operating in Istanbul, the centre of the economy in Turkey.

Keywords: Independent audit, SMEs, KOSGEB, support programs, independent audit support.

JEL Codes: M40, M42, M49

KOSGEB BAĞIMSIZ DENETİM DESTEĞİNİN KOBİ'LERİ DENETİME YÖNLENDİRME ETKİSİ ÜZERİNE BİR ARAŞTIRMA

ÖZET

Amaç- Bu çalışmanın amacı, gelişmiş ve gelişmekte olan ülkelerdeki toplam işletmeler arasındaki sayısal üstünlüğü başta olmak üzere, üretim, istihdam, yatırım, dış ticaret, toplam krediler ve vergiler içindeki payları göz önünde bulundurulduğunda ülke ekonomilerinin bel kemiği durumda olan KOBİ'lerin, bağımsız denetim faaliyetinden ne derece yararlandığı üzerinedir.

Yöntem- Tüm dünyada üzerinde fikir birliğine varılmamış olan ve KOBİ olarak anılan "Küçük ve Orta büyüklükteki işletmeler" in, rekabet güçlerinin uluslararası düzeyde artırılması ve ülkemizin ekonomik büyümesinde KOBİ'lerin katkısının yükseltilmesi için ülkemizde kurulan KOSGEB'in KOBİ'lere sunmuş olduğu 15 farklı destek programı kapsamında yer alan genel destekler içerisindeki bağımsız denetim desteğinin, KOBİ'ler tarafından ne derece faydalandığını tespit edilmesi amaçlanmıştır. KOSGEB'den söz konusu destekten yararlanan işletme bilgileri elde edilmiştir.

Bulgular- Bağımsız denetimin, işletmelerin sürdürülebilir bir büyüme ile varlıklarını idame ettirmesi açısından önemli olduğu düşünülmektedir. Söz konusu bağımsız denetim desteğinden yararlanan KOBİ'lerin sayısı dikkat çekici derecede düşük olduğu tespit edilmiştir.

Sonuç- Bu sebeple, ülkemizde ekonominin merkezi durumunda olan İstanbul ilinde faaliyet gösteren KOBİ'lerin, KOSGEB'in Bağımsız Denetim desteğinden faydalanma derecesi üzerinden söz konusu desteğin özellikle isteğe bağlı olarak KOBİ'lerin bağımsız denetim yaptırmasına katkısı irdelenmiştir.

Anahtar Kelimeler: Bağımsız denetim, KOBİ, KOSGEB, destek programları, bağımsız denetim desteği.

JEL Kodları: M40, M42, M49

1. GİRİŞ

Dünyada teknoloji gelişimine bağlı olarak, ülke ekonomilerinin gün geçtikçe artan küreselleşme, farklı bir ifadeyle; ülke ekonomileri arasında sınırların her geçen gün ortadan kalkmaya başladığı, ülkelerin birbirleriyle bütünleşme düzeylerinin sürekli artma eğiliminde olduğu bir süreçten geçilmektedir (Kırloğlu, 2011).

Teknolojinin geliştiği, gümrüklerin kaldırılıp azaltıldığı, piyasalarının ve firmaların küreselleştiği günümüz koşullarında başarıyı yakalayabilmek için finansal tablolardan elde edilen bilgilerin sayısal analizlere tabi tutularak etkin yatırımlara dönüştürülmesi gerekmektedir. Sermaye piyasalarında globalleşmeye paralel olarak gerçekleşen gelişmeler ve yabancı sermayelerdeki hareketlilik işletmelerin finansal durumlarını ortaya koyan tablolarda yer alan bilgilerin; kolay, kıyaslanabilir, şeffaf ve anlaşılabilir olmalarını zorunlu kılmaktadır (Çankaya, 2012).

Dünyada olduğu gibi ülkemizde de KOBİ'ler ekonomin temel unsurları olarak önemli bir yer teşkil etmektedir. KOBİ'lerin özellikle finansal açıdan sağlıklı bir yapı ile sürdürülebilirliklerinin sağlanması gerekir. Finansal olarak sağlıklı bir yapı elbette finansal tabloların bağımsız bir uzman tarafından denetlenmesi ile mümkün olacaktır. KOBİ'ler kaynak yetersizlikleri sebebiyle denetim maliyetine katlanmayı tercih etmeyip, her türlü hata ve hile riskine karşı korunmasız olarak faaliyetlerini yürütmektedirler. Bu noktada KOBİ'lerin gelişmesinde öncü rol oynayan KOSGEB, destek programları arasına bağımsız denetim desteğini de dahil etmiştir. Şüphesiz bağımsız denetimin işletmeler açısından önemi KOSGEB'i böyle bir desteği vermeye yöneltmiştir. Bu kapsamda özellikle maliyet açısından denetim yaptırmaya istekli olamayan işletmelerin, söz konusu destek sayesinde, işletmelerinin sağlıklı bir büyüme ve sürekliliklerini sağlamak açısından önemli bir güvence hizmetinden faydalanması beklenmektedir. Çalışmamız bu varsayımın geçerli olup olmadığını araştırılması üzerine inşa edilmiştir.

Çalışmamızda denetim kavramı, bir güvence hizmeti olarak finansal bilgi kullanıcıları açısından bağımsız denetimin temel amacı ve duyulan ihtiyaç anlatılmaya çalışılmıştır. Ülkemizdeki KOBİ'lerin kısaca tanımlanması ile birlikte denetime duyulan ihtiyaç doğrultusunda denetimin söz konusu ihtiyacı gidermedeki hedefi ve öneminden söz edilmiştir. KOBİ'lerin denetim ve güvence hizmetlerine erişiminde maddi destek sağlamak üzere KOSGEB'in bağımsız denetim desteğinden bahsedilerek, bugüne kadar KOBİ'lerin bu destek ile birlikte isteğe bağlı olarak bağımsız denetim yaptırmadaki etkisi ölçülmeye çalışılmıştır. KOSGEB tarafından elde edilen bilgiler neticesinde bulgular değerlendirilmiş, ilgili kuruluşlardaki uzmanlar ile mülakat yapılarak konu hakkındaki görüşlerine başvurulmuştur.

2. DENETİM KAVRAMI, AMACI VE KAPSAMI

Son yüzyılda yaşanan ekonomik hayattaki hızlı değişim, işletmelerin gitgide büyüyerek aralarındaki ticari ilişkilerin her geçen gün artmasını sağlamış ve dolayısıyla finansal bilgilerin artması, finansal tabloların karmaşıklığının artmasına neden olmuştur.

Denetim, bilgiler ile belirlenen kriterler arasındaki uygunlukların derecesini belirlemek ve raporlamak için ilgili kanıtların elde edilmesi ve değerlendirilmesidir. Denetim, yetkili, bağımsız bir kişi tarafından yapılmalıdır (Arens, 2013). Denetim, yaşamın her anında yoğun olarak karşılaşılan bir kavramdır. Denetim, genel anlamıyla yapılan işlerin kontrol edilmesi olarak ifade edilebilmektedir (Çetinkaya, 2014). Denetçiler esas olarak, bir şirketin finansal tablolarının genel kabul görmüş muhasebe ilkelerine uygun olarak hazırlandığının makul bir şekilde güvence altına alınmasından sorumlu olan bağımsız üçüncü taraf gözlemcileri olarak kamu yararına hizmet etmektedir. (Bettner, 2015) İşletmelerde denetim denince akla ilk olarak 'finansal tablo denetimi' gelse de aslında denetim kavramı bir işletmenin bütün fonksiyonlarını içine alır. Denetimin çeşitli tanımları yapılabilir. Denetim Kavramları Komitesi denetimi; "İktisadi olayları veya faaliyetleri ile alakalı olarak öne sürülen iddiaların önceden belirlenmiş kurallara ne kadar uygun olduğunun tespitinin yapılması amacıyla, objektif olarak verilerin toplanması ve elde edilen sonuçların değerlendirilmesini sağlayan sistemli bir süreçtir." olarak tanımlamıştır (Güredin, 2014).

Bağımsız denetim, firmaların finansal faaliyetleri neticesinde düzenledikleri tabloların ilgili yönetmelik ya da diğer mevzuatlara uygunluğunun çeşitli denetim teknikleri kullanılarak finansal dokümanlar üzerinden denetlenmesi ve bunların rapor haline getirilerek açıklanmasıdır.

Kamu Gözetim Kurumu'nun yayınladığı Bağımsız Denetim Yönetmeliği'nde bağımsız denetim kavramı; "Mali tablolar ve bilgilerin, uluslararası finansal raporlama ölçütlerine uygun olması ve bilgilerin doğruluğu konusunda, yeterli bir güvence sağlayacak ölçüde veri elde edilmesi amacıyla, teftiş kurallarında öngörülen hususların resmî belgeler incelenerek raporlanması" olarak tanımlanmıştır.

Yukarıdaki açıklamalardan hareketle şu tanım yapılabilir. Denetim, herhangi bir etki altında kalmadan inceleme ve gözlemlerimizi kurallara ve yasalara bağlı kalarak üçüncü kişilerin doğru karar almasına yardımcı olmak amacıyla bir rapor halinde sunulmasıdır. Farklı tanımların olduğu düşünülürse, denetimin tanımında özünde, kendilerine kaynak tahsisi yapılan gerçek ya da tüzel kişilerin, söz konusu kaynakları kullanım şekillerinin hesabının sorulmasına yönelik bir kavramdır (Şentürk, 2017).

Denetim faaliyetinin temel amacı; kuruluşların oluşturduğu finansal tabloların ve mali kayıtların tamamıyla gerçeğe uygun ve güvenilir olduğunu, işletme sahipleri başta olma üzere diğer tüm finansal aktörlere gösterebilmektir. Kısaca denetim, bilinçli ve güvenilir bir görüşü bir rapor halinde almak amacıyla yapılmaktadır (Ayrancı, 2010).

2.1. Denetime Duyulan İhtiyaç

Denetim, bilginin kalitesini geliştiren bir güvence hizmetidir. Finansal raporlardaki denetlenmiş bilgiler daha güvenilirdir; çünkü bir denetim şirketi finansal tablolardaki iddiaları kanıtlar elde ederek incelemiş ve finansal tabloların doğruluğunu ve bilgi vericiliğini geliştiren değişiklikler yapmak için yönetimi ikna etmiştir. Bu durum, sonuçların denetim raporunda belirtilmesiyle birlikte, finansal tablo kullanıcılarının bilgiye güvenmesini sağlamaktadır (Hay, 2014). İşletmelerin faaliyet raporlarında halka açıkladıkları muhasebe bilgileri, etkin bir sermaye piyasasının gelişiminde önemli bir rol oynamaktadır. Denetim, bir mali yıl içerisinde kaydedilmiş bilgilerin, yine aynı mali yıl içerisinde gerçekleşmiş iktisadi olayların doğru olup olmadığı ile ilgilenmektedir. Bu amaçla finansal bilgilerin gerçeğe uygun bir şekilde hazırlanıp hazırlanmadığı denetler. Bağımsız denetimler firmaların ekonomik göstergelerinin, önceden belirlenmiş mali standartlara uygunluğunun ve doğruluğunun tespit edilebilmesi amacıyla yapılan tüm denetim faaliyetlerinin gerçekleştirilerek bunların sonuçlarının resmi bir rapor haline getirilmesi sürecidir. Bu amaçla, bağımsız denetim işletmenin hazırladığı finansal tabloların, raporlama standartlarına uygun hazırlanıp hazırlanmadığını ve bu raporlar doğrultusunda işletmenin mali durumunu doğru bir şekilde yansıtır yansıtmadığını denetlemektedir. Gerek işletme yönetimi gerekse işletmeye kredi sağlayan kuruluşlar işletmenin mali durumunun net olarak tespit edilmesi için şirketin denetlenmesi ihtiyacı duymaktadırlar (www.denetimnet.net, 2017).

Denetim faaliyetine duyulan ihtiyaç, temsilci-temsil edilen arasındaki ilişki sonucu ortaya çıkmıştır. Söz konusu taraflar arasında anlaşmazlık olması halinde; temsilci, temsil edilen tarafın çıkarları bakımından lehine yönde tutum sergileyemebilmektedir. Dolayısıyla tarafların çıkarları ve beklentileri ile ilgili uyumsuzlıklardan kaçınmak veya bu uyumsuzlukları minimum seviyeye çekebilmek maksadı ile temsil edilen kişiler, uzman bir gözetim sistemine gereksinim duymuşlardır (Eilifsen, 2000). Muhasebe denetiminin ise, mali tablolar ilgililerinin kararını etkilemede veya kararların bilgiye dayandırılarak alınmasını sağlamada kaliteli bilgi temini önemli derecede etkileyecektir (Kara, 2016). Dolayısıyla denetçilerin temel sorumluluğu, finansal tablo ilgililerine arz edilen bilgilerin doğruluğunu tespit etmek ve yatırımcıların işini kolaylaştırmaktır.

2.2. Denetimin Hedefleri ve Önemi

Temelde finansal tabloların mevzuat açısından uygunluğunun tespit edilebilmesi için kullanılabilir kanıtlar toplanarak görüş oluşturabilmek adına denetim yapılmaktadır (Erdoğan, 2002). Kanun koyucu tarafından düzenlenmiş denetime tabi kuruluşlarca bir yükümlülük olarak yerine getirilen denetim türüne yasal (zorunlu) denetim denmektedir. Denetim faaliyetlerini yerine getirecek olan denetçilerin sahip olması gereken nitelikler ile denetimin konu, amaç ve usulleri resmi yönetmelik ve yönergelerle belirlenmektedir. Bu tür denetimlere örnek olarak genellikle özel kuruluşların denetimlerini (bankalar, sigorta şirketleri vb.) vermek mümkündür (Haftacı, 2014).

Her ne kadar denetim çoğunlukla mevzuat gereğince zorunlu yapılıyor olsa da işletme yönetiminin karar alma süreçlerinde güvenilir bilgiye ihtiyaç duyulması sebebiyle isteğe bağlı (ihtiyari) olarak da yapılması istenmektedir.

İhtiyari denetimde; herhangi bir yasal zorunluluk yoktur. Bu denetimle ilgili, işletme bilgi kullanıcıları tarafından işletmenin gerçek durumunu ortaya çıkarılması için yapılan denetimlerdir. Örneğin, Bir işletmenin hisse senedini satın almadan önce ya da kredi kuruluşları tarafından bir şirkete kredi verilemeden önce yapılan denetimler genellikle isteğe bağlı denetime girmektedir. İşletmenin yaptırdığı iç denetim veya faaliyet denetimi ihtiyari denetime örnek gösterilebilir. Uygulama açısından bakıldığında zorunlu denetimle isteğe bağlı denetim arasında önemli bir fark olmadığı söylenebilir (Toroslu, 2012).

Dış denetim olarak da adlandırılan bağımsız denetim, işletmelerin finansal tablolarının bağımsız denetimden geçirilerek işletmelerle ilgili finansal bilgileri kullanacak taraflara karşı güven oluşturma da en önemli etkenlerden biridir.

Bağımsız denetimin önemli kılan başlıca hususlar güvenilir bilgi sağlama, finansal tablolara ilgili analiz, tahmin, denetim ve rapor hazırlama gibi konular üzerinde yönetime gelecek için kararlar vermesi şeklindedir. Ayrıca son yıllarda işletmelerin büyümesi, işletmelere yönelik kamu denetiminin artması, küreselleşen piyasalarla beraber rekabet ortamının artması, beşerî faktörlerinin önem kazanması gibi hususlar da bağımsız denetimin önemi ile paralellik göstermektedir. Bağımsız denetim toplumdaki çeşitli sosyal gruplara, iş hayatına ve kurumlara farklı faydalar sunarak ekonomik faaliyetleri düzenleme görevi görmektedir.

Bağımsız denetimin uygulamada sunduğu faydalar (Güredin, 2014):

- Denetlenen işletmeye sağlanan yararlar,
- Diğer finansal aktörlere sağlanan faydalar,
- Kamu kuruluşlarına sağlanan faydalar olmak üzere bir sınıflandırma yapılarak incelenebilir.

İç denetim ise işletmelerin faaliyetlerini kontrol edilerek, değerlendirilmesi ve sonuçların raporlar halinde sunulmasını, buna ek olarak firma çalışanlarının görevlerini daha verimli bir şekilde yapabilmelerini sağlayabilmek için kurum içerisinde teşkil edilen birim olarak tanımlanabilmektedir.

İç denetimin amacı işletmelerdeki öz kontrolün artırılmasının sağlanmasıdır. Yürütülen çalışmalar sonucunda iç denetçiler, elde ettikleri sonuçları ve geleceğe yönelik tekliflerini üst yönetime iletirler (Haftacı, 2014).

Denetçilerin işletmelere nasıl değer kattığını tanımlanırken, iç denetimin aşağıdaki işlevleri yerine getirerek risk yönetim ortamına değer kattığı savunulmaktadır (Pickett, 2013):

- Risk yönetim süreçlerini ve kurum içindeki genel kontrol sistemlerini gözden geçirmek,
- İş risklerini belirleme ve bu riskleri güvenilirlik, bütünlük, uygunluk, koruma, verimlilik ve etkililik açısından hafifletmek için tasarlanmış iç kontrolleri değerlendirmek,
- Maliyet etkin risk yönetim süreçlerinin geliştirilmesi ve kullanılması ve iç denetimin bir değişim katalizörü rolü vasıtasıyla en iyi uygulamaların tesisi ile ilgili olarak organizasyonu eğitmek.

3. TÜRKİYE'DE KOBİ'LER VE TARİHSEL GELİŞİMİ

Ülkemizde köklü bir geçmişe sahip olunan KOBİ'lerin tarihimize Ahilik ve daha sonraki adı ile lonca teşkilatının adını almış olmaları da sanayi devriminden sonra siyasi, sosyal ve en önemlisi ekonomik yapıda başlayan dönüşüme ayak uydurmada zorluk çektiklerinden önemini yitirmişlerdir. Cumhuriyetimizin ilk döneminde ekonomiyi temel kaynağı tarım ve hayvancılığa dayalı olduğundan bu dönemde pek fazla gelişmiş olduğu söylenememektedir. Ancak 1923 yılından itibaren ülkemizde gerçekleşen İzmir iktisat kongresi ile yeni Türkiye'nin ekonomik sorunlarının tartışıldığı ve ülkenin kalkınmasında tarım, hayvancılığın yanında ticaretinde önemli olduğu vurgulanmıştır. Bu kongreden sonra KOBİ'lerin gelişmekte ve ekonominin içinde yerini almaya başladığı söylenebilir. İlk planlı kalkınma dönemine 1961 yılında geçilmiştir.

İlk beş yıllık kalkınma planında (1962-67); KOBİ'lerin Sanayi Bakanlığının sorumluluğu altında olduğu ve karma bir ekonomik model oluşturmaya başlanmıştır. Altıncı beş yıllık kalkınma döneminde (1990-94) ise; KOBİ'lere yönelik faaliyetler daha da genişletilerek ve KOBİ'leri her açıdan destekleyecek olan (eğitim, finansman, teknoloji, altyapı, organizasyon vb.) ve sorunlarını çözecek birtakım tedbirlerin alınması amacıyla, ayrıca Küçük Ve Orta Ölçekli Sanayi Geliştirme ve Destekleme İdaresi Başkanlığı (KOSGEB)'nin oluşturulmasına karar verilmiştir.

Yedinci beş yıllık kalkınma planında (1996-2000); KOBİ'lere verilen önemli belirtmek için, 1996 yılı "KOBİ YILI" olarak ilan edilmiş, KOBİ'lerin proje, finansman, organizasyon ve teknoloji alanlarında desteklenmesi, girişimcilik eğitimi verilmesi bu planda yer almıştır. Sekizinci beş yıllık kalkınma planında (2001-2005); KOBİ'lere yönelik destek, teşvikler ve bu amaçla gerçekleştirilen düzenlemeler daha da genişletilerek, KOBİ'ler kredi garanti fonu, risk sermayesi, finansman yatırım ortalığı, gayrimenkul yatırım ortaklığı gibi modern finansman araçları ve kuruluşlarla desteklenmek istenmiştir. Dokuzuncu kalkınma planında (2007-2013) ise, özellikle KOBİ'lerin rekabet güçlerini artırıcı ve ihracat olanaklarını genişletici şekilde düzenlemelere yer verilmiştir. Ancak planda KOBİ'lere müstakil bir bölüm ayrılmamıştır (Aykaç, 2008).

Onuncu kalkınma planında (2015-2018) Küçük işletme ihtiyaçlarına duyarlı iş ortamında, KOBİ'lerin rekabet güçlerinin uluslararası düzeyde artırılması ve ülkemizin ekonomik büyümesinde KOBİ'lerin katkısının yükseltilmesi öngörülmüştür.

Ülkemizde KOBİ tanımı, destek sağlayıcı kuruluşların KOBİ tanımını farklı şekilde uygulamalarının yarattığı farklılıkları ortadan kaldırmak amacıyla, 8 Ocak 1995 tarihli, 3143 sayılı Sanayi ve Ticaret Bakanlığı'nın Teşkilat ve Görevleri Hakkında Kanun'un ek 1. maddesi gereğince, Avrupa Birliği'ndeki KOBİ tanımıyla uyumlu bir mevzuat düzenlemesi yapılarak, "KOBİ'lerin Tanımı, Nitelikleri ve Sınıflandırılması Hakkında Yönetmelik" kapsamında 2005 yılında yayımlanmış ve 2006 yılından bu yana KOBİ'lere destek veren kurum ve kuruluşlar tarafından kullanılmaktadır. Ülkemizde KOBİ tanımına Tablo 1 de yer verilmiştir (www.kosgeb.gov.tr, 2017).

Tablo 1: Ulusal KOBİ Tanımı

Ölçek	Çalışan Sayısı	Yıllık Ciro (TL)	Yıllık Aktif Toplamı (TL)
Mikro İşletme	< 10	≤ 1 Milyon	≤ 1 Milyon
Küçük İşletme	10-49	≤ 8 Milyon	≤ 8 Milyon
Orta Büyüklükteki İşletme	50-249	≤ 40 Milyon	≤ 40 Milyon

Kaynak: (28457 sayılı Resmî Gazete, 2012).

3.1. KOBİ'lerin Ülkemizde Önemi, Ekonomideki Yeri ve Yapısı

KOBİ'ler dünyada olduğu gibi ülkemizde de ekonominin en önemli unsurları olmuştur. Ülkemizde KOBİ'ler; Toplam işletmelerin %99'unu, toplam yatırımların %50'sini, toplam istihdamın %78'ini, toplam satışların %65'ini, toplam ihracatın %59'unu, toplam katma değerinin %55'ini oluşturarak reel sektörün en önemli aktörü rolünü üstlenmiştir (Akdoğanlı, 2014).

3.2. KOBİ'lerde Bağımsız Denetimin Önemi

KOBİ'ler açısından bakıldığında bağımsız denetim bir zorunluluk mudur, yoksa ihtiyaç mıdır sorusunu sorabiliriz. İşletme ilişkisi içerisinde olan taraf için finansal bilgi önemlidir. Son yıllarda KOBİ'lerin ekonomik faaliyetlerin artması sonucu olarak finansal tablolarındaki işlemlerin daha karmaşık hale gelmesi, verilerin çokluğu ve bilgi sağlayanların yanlı tutumları nedeniyle mali tablolarındaki bilgilerin güvenilirliği daha fazla sorgulanmakta ve bilgi kullanıcılarının güvenilir bilgiye olan ihtiyaçları artmaktadır (Şentürk, 2017).

Şirket ile paydaşlar arasındaki etkileşimin büyüklüğü kamunun yatırımcıyı yani taraf olanı korumasına sebep olmuştur ve bu nedenle bağımsız denetim KOBİ'lerde ihtiyaçtan öte bir zorunluluk haline gelmiştir. Bu nedenle işletmelerin finansal tablolarındaki bilgilerin karar alıcılar tarafından dikkate alınmadan önce; bağımsız denetçi veya denetim kuruluşu tarafından onaylanması yerinde olacaktır.

Bağımsız Denetim, KOBİ'lerin uzman bilgisinden yararlanmalarını, yönetimindeki bilgi eksikliklerinin gidermesini sağlayacağı düşünülmektedir. UFRS ile uyum sağlamanın yanında, bağımsız denetçilerin KOBİ'lerin iç prosedürlerine ve süreçlerine yapacağı yenilikler, tavsiyeler ve bu prosedürlerdeki eksikliklerin ve zayıflıklarının geri bildirimleri KOBİ'lerin rekabetçi iş ortamında yanında kurumsal bir alt yapıya yardımcı olacaktır ve ileride karşılaşılabilecekleri büyük problemler için şimdiden önlem almalarını sağlayacaktır.

KOBİ'nin büyümesini desteklemesi açısından güvenilir ve doğru finansal bilginin önemi oldukça fazladır. Bir denetim, Yönetim kurulu veya karar vericiler için güven sağlamakla beraber şirket ortakların menfaatlerinin korunmasına da yardımcı olur. Yönetim kurulu veya karar vericilere kullandıkları finansal bilgilerin güvenilir ve ilgili muhasebe çerçevesine her açıdan doğru olması işletme dışı paydaşlara güven vermektedir. Bir şirketin muhasebe ve iç kontrol sistemi hakkında uzman profesyoneller tarafından yapılacak objektif bir denetim, gelecekte öngörülemeyen sorunları önlemekte çok ciddi faydalar sağlayacaktır.

Bağımsız denetim finansal tablolarındaki bilgilerin güvenilir olup olmadığını ortaya çıkarmak için yapılan çalışmaların yanı sıra, hata veya hilenin yapılmasını engellemeye caydırıcı olarak rol üslenebilmektedir. Denetçiler tarafından verilen öneriler yönetici durumunda olanlar tarafından düzgün uygulanırsa işletme içi iç kontrol yapısını geliştirebilmektedir. Hile yapma fırsatlarını azaltan güçlü ve kontrollü bir finansal yapıya kavuşturabilir. Bağımsız Denetim iş büyüdükçe başarılı bir planlamaya olan ihtiyacı tamamlamaktadır.

Sonuç olarak baktığımızda bağımsız denetim, KOBİ'lere gelecekte karşılaşmaları muhtemel zorlukları aşmaları için hem finansal hem de finansal olmayan sürdürülebilir bir düzeni hazırlamaktadır.

4. KOSGEB BAĞIMSIZ DENETİM DESTEĞİ

Küçük ve Orta Ölçekli İşletmeleri Geliştirme ve Destekleme İdaresi Başkanlığı (KOSGEB), 12.04.1990 tarihli ve 3624 Sayılı Kanun ile; "Ülkenin ekonomik ve sosyal ihtiyaçlarının karşılanmasında Küçük ve Orta Ölçekli Sanayi İşletmelerinin payını ve etkinliğini artırmak, rekabet güçlerini ve düzeylerini yükseltmek, sanayide entegrasyonu ekonomik gelişmelere uygun biçimde gerçekleştirmek" amacıyla kurulmuştur (www.kosgeb.gov.tr, 2017).

KOSGEB Destek Programları Yönetmeliği kapsamında oluşturulan 15 destek programı ve Teminat Giderleri Desteği ile KOBİ'ler ve girişimciler desteklenmektedir. KOSGEB'in veri tabanına kayıt olmak şartıyla desteklenen KOBİ'ler söz konusu desteklerden faydalanabilmektedir.

KOSGEB'in destek programları, ülkemizin ekonomik ve sosyal ihtiyaçlarının karşılanmasında, küçük ve orta ölçekli işletmelerin payını ve etkinliğini artırmak, rekabet güçlerini ve düzeylerini yükseltmek, sanayide entegrasyonu ekonomik gelişmelere uygun biçimde gerçekleştirmek amacı ile hazırlanmıştır. Destek programlarının sınıflandırılmasında genel destekler içerisinde; Eğitim, danışmanlık, yurt içi fuarlara katılım, yurt dışı iş gezisi, tanıtım, eşleştirme, nitelikli eleman istihdam, enerji verimliliği, tasarım, sınai mülkiyet hakları, belgelendirme, test, analiz ve kalibrasyon, lojistik, gönüllü uzmanlık ve bağımsız denetim olmak üzere 15 farklı destek unsuru yer almaktadır (www.kosgeb.gov.tr, 2017).

Genel destek programı aracılığıyla, KOBİ'lere yönelik genel işletme geliştirme ve rekabet gücünü artırmaya yönelik sağlanan desteklerin tamamı geri ödemesiz olup, desteklere ilişkin bilgiler aşağıdaki tabloda gösterilmiştir.

Tablo 2: Genel Destek Program Dahilindeki Destekleri

GENEL DESTEK PROGRAMI DESTEKLERİ		
Sıra	Destek Türü	Üst limit (TL)
1	Yurt İçi Fuar Desteği	45.000
2	Yurt Dışı İş Gezisi Desteği	20.000

3	Tanıtım Desteği	25.000
4	Eşleştirme Desteği	30.000
5	Nitelikli Eleman İstihdam Desteği	50.000
6	Danışmanlık Desteği	22.500
7	Eğitim Desteği	20.000
8	Enerji Verimliliği Desteği	75.000
9	Tasarım Desteği	22.500
10	Sınai Mülkiyet Hakları Desteği	30.000
11	Belgelendirme Desteği	30.000
12	Test, Analiz ve Kalibrasyon Desteği	30.000
13	Bağımsız Denetim Desteği	15.000
14	Gönüllü Uzmanlık Desteği	15.000
15	Lojistik Desteği	40.000
TOPLAM		470.000

Kaynak: (KOSGEB 2017 Faaliyet Raporu, 2018).

KOSGEB'in genel destekler içerisinde yer alan bağımsız denetim desteği ile, işletmelerin; Kamu Gözetimi, Muhasebe ve Denetim Standartları Kurumu tarafından yetkilendirilmiş bağımsız denetim kuruluşları ve/veya bağımsız denetçilerden aldıkları bağımsız denetim hizmetlerine destek verilmektedir. Söz konusu destek ile KOBİ'lerin özellikle isteğe bağlı olarak yaptırabilecekleri bağımsız denetimlerin önemini ortaya koymakta ve destekten de faydalanılarak bağımsız denetim hizmet talebinin yüksek olması beklenmektedir.

4.1. Bağımsız Denetim Desteğinin ve İstanbul İlinde Faaliyet Gösteren KOBİ'ler

Ülkemizin özellikle ekonomik açıdan en gelişmiş şehri olan İstanbul; istihdam, ticaret ve sanayinin gelişiminin sadece ülkemiz için değil dünyanın sayılı şehirlerinden birisidir. Bu sebeple KOSGEB Bağımsız Denetim Desteğinin denetime yeterli önemi göstermesi açısından etkinliğinin araştırılması adına, İstanbul ilinde yer alan KOBİ'ler üzerinde bir çalışma yapılması ülkemizdeki durumu daha net göstereceği öngörüsü ile tercih edilmiştir.

Ülkemizin ve hatta dünyanın en büyük iki ticaret ve sanayi kuruluşları olan İstanbul Sanayi Odası (İSO) ve İstanbul Ticaret Odası (İTO), İstanbul'da KOBİ'lerin temsilcisi durumunda faaliyet göstermektedir. Aşağıdaki tabloda gösterildiği üzere söz konusu odalara kayıtlı, İSO'da 18.620, İTO'da ise 410.709 KOBİ yer almaktadır. Bu kadar büyük sayıda şirketin var olması nedeni ile İstanbul ilinde faaliyet gösteren işletmelerin ülkemiz ekonomisi açısından oldukça önemlidir.

Tablo 2: İTO ve İSO Kayıtlı KOBİ'lerin Hukuki Statüsüne Göre Dağılımı

Firma Türleri	İTO'ya Kayıtlı Firma Sayısı	İSO'ya Kayıtlı Firma Sayısı
Adi Ortaklık Ticari İşletmesi	-	1
Anonim Şirket	60.603	5.387
Banka Merkezleri	51	-
Banka Şubeleri	3.193	-
Birlikler	5	-
Dernek İktisadi İşletmesi	-	2
Diğer Kooperatifler	354	-
Gerçek Kişi Ticari İşletmesi	129.563	988
Girişim Ortaklığı	-	1
Holding	544	-

Kamu İktisadi Kuruluşu	1.413	1
Kolektif Şirket	489	76
Komandit	44	13
Kredi Kooperatifi	45	-
Limited Şirket	213.623	12.149
Tüketim Kooperatifi	20	-
Vakıf İktisadi İşletmesi	-	1
Yabancı Şirketin Türkiye Merkez Şubesi	-	1
Yapı Kooperatifi	762	-
Toplam	410.709	18.620

Kaynak: (www.iso.org.tr, 2017), (www.ito.org.tr, 2017).

Bağımsız denetim desteğinden faydalanılabilmesi için KOSGEB veri tabanına kayıtlı olunması gereklidir. Araştırmanın yapılmış olduğu tarih itibarıyla İstanbul ilinde KOSGEB veri tabanına kayıtlı KOBİ sayısının 271.999 olduğu yetkililer tarafından bildirilmiştir.

Özellikle 6102 sayılı Türk Ticaret Kanunu'nun 14 Şubat 2011 tarihinde yasalaşması ile birlikte bağımsız denetim işletmeler açısından önemli hale gelmiş ve farkındalığa sebep olmuştur. KOSGEB de Türk Ticaret Kanunu'nun bağımsız denetim vurgusu ile birlikte genel destekleri içerisinde bağımsız denetim desteğini de dahil etmiştir.

Araştırmamız kapsamında KOSGEB yetkilileri tarafından, İstanbul ilinde kayıtlı işletmeler içerisinde bağımsız denetim desteğinden bugüne kadar yararlanan KOBİ sayısının toplam 49 olduğu belirtilmiştir. Denetim desteğinden yararlanan KOBİ'lere ait bilgiler aşağıda sınıflandırılarak sunulmaya çalışılmıştır.

Tablo 3: KOBİ'lerin Yıllık Net Satış Hasılatları ve Aktif Toplamlarına Göre Dağılımı

KOBİ'lerin Büyüklüklerine Göre Sınıflandırılması		Net Satış Hasılatı	Aktif Toplamı
Mikro KOBİ	1.000.000 TL	6	6
Küçük Ölçekli KOBİ	1.000.000 TL (Dahil değil)-8.000.000 TL arasında	10	11
Orta Ölçekli KOBİ	8.000.000 TL (Dahil değil)-40.000.000 TL arasında	23	25
KOBİ	40.000.000 TL 'nin Üstü	10	7
Toplam İşletme Sayısı		49	49

Yukarıdaki tabloda görüldüğü üzere, orta ölçekli KOBİ'ler bağımsız denetim desteğinden faydalanan işletmeler içerisinde en yüksek talebi gösteren sınıf olmuştur. İstanbul ilinde KOSGEB'e kayıtlı 271.999 KOBİ arasından sadece 49 işletmenin söz konusu destekten faydalandığı düşünüldüğünde, yıllık net satış hasılatı ve aktif toplam büyüklüğü 40 Milyon Türk Lirası üzerinde olan işletmelerin destekten faydalananlar içerisinde oranının düşük olması da ayrıca dikkat çekicidir.

Tablo 4: KOBİ'lerin Faaliyet Gösterdiği Sektörlere Göre Dağılımı

Faaliyet Gösterilen Sektör	İşletme Sayısı
İmalat	17
Elektrik, Gaz, Buhar Ve İklimlendirme Üretimi ve Dağıtımı	4
İnşaat	2
Toptan ve Perakende Ticaret	10
Ulaştırma ve Depolama	3
Bilgi ve İletişim	2

Mesleki, Bilimsel ve Teknik Faaliyetler	6
İdari ve Destek Hizmetleri Faaliyeti	5
TOPLAM	49

Bağımsız denetim desteğinden yararlanan KOBİ'lere faaliyet gösterdikleri sektörler bazında dağılımına baktığımızda, %35 ile imalat sektörünü %20 ile toptan ve perakende ticaret sektörünün takip ettiği görülmektedir.

Destekten faydalanan 49 işletmenin hukuki statülerine göre dağılımında ise 36 Anonim Şirket, 12 Limited Şirket ve sadece 1 şahıs işletmesi olduğu bilgisi elde edilmiştir. Ayrıca bağımsız denetim hizmetini verenler açısından sınıflandırıldığında; 41 bağımsız denetimin Kamu Gözetim Kurumu tarafından yetkilendirilmiş bağımsız denetim kuruluşlarıncı, diğer 8 bağımsız denetimin ise şahıs bağımsız denetçi tarafından gerçekleştirilmiştir.

KOSGEB yetkililerinden elde edilen veriler ışığında, KOSGEB'in genel destek programları içerisinde yer alan bağımsız denetim desteğinin KOBİ'ler tarafından faydalanılma eğilimi, toplam KOBİ'lerin sayısı göz önünde bulundurulduğunda çok düşük bir oranda olduğu ortaya çıkmaktadır. İsteğe bağlı olarak KOBİ'lerin bağımsız denetim hizmetinden yararlanmasının, sürdürülebilirlikleri ve gelişimleri açısından önemi gereğince sunulmakta olan söz konusu desteğin, KOBİ'lerin bağımsız denetim yaptırmasında etkisinin yok denecek kadar az olduğu anlaşılmaktadır.

4.2. Bağımsız Denetim Desteği Talebinin Düşük Olmasının Sebepleri

KOBİ'ler tarafından bağımsız denetime ihtiyaç duyulmamasının ve KOSGEB desteğinden faydalanma eğilimin çok düşük olmasının sebepleri; KOBİ'lerin kayıtlı olduğu İstanbul Ticaret Odası (İTO), desteği sunan taraf olarak KOSGEB ve bağımsız denetim faaliyetini gerçekleştiren meslektaşların bağlı olduğu kuruluşların başında gelen İstanbul Serbest Muhasebeci ve Mali Müşavirler Odası (İSMMMO) uzmanlarına mülakat tekniği ile sorulmuştur.

İlgili kuruluşların uzman görüşleri neticesinde aşağıda sıralan unsurlar tespit edilmiştir.

- Kurumsallaşma ve profesyonel yönetim yaklaşımın yeteri kadar gelişmemiş olması
- KOBİ'lerin çoğunluğunun aile şirketi olması
- KOBİ'lerin sahip, hissedar ve yöneticilerinin herhangi bir kuruluş ile iş yapma kültürünün zayıflığı
- KOSGEB desteklerinden, özellikle bağımsız denetim desteğinden haber olunmaması
- Bağımsız denetimin yasal zorunluluk olarak sadece belirli limitleri aşan işletmeleri kapsaması ve limitlerin yüksek olması sebebiyle yaygınlaşmamış olması
- KOBİ'ler nezdinde bağımsız denetim sürecinin uzun zaman aldığı algısı ve fayda-maliyet dengesi yaklaşımı çerçevesinde bakıldığında maliyetinin yüksek bulunması
- KOSGEB bağımsız denetim destek üst limitinin bağımsız denetim hizmet maliyeti açısından düşük olması
- KOBİ'lerin sahip, hissedar ve yöneticilerinin, işletme mali verilerinin bilgi kullanıcıları ve ekonomik karar alıcılar ile paylaşılmasının istememesi ve gizlilik
- KOBİ'lere danışmanlık hizmeti veren serbest muhasebeci mali müşavirlerin bağımsız denetimin önemini ilgililere yeteri kadar ifade edememesi
- KOBİ'ler içerisinde muhasebe bilgi sistemlerine yeterli yatırımın yapılmamış olması ve teknoloji ile entegrasyon eksikliği

5. SONUÇ

Küreselleşen dünya ekonomisiyle birlikte işletmelerde finansal bilgilerinin doğruluğu ve tutarlılığı hem devlet hem yatırımcı hem de ekonomi açısından önem arz etmektedir. Dünyada yaşanan skandallar ve Avrupa Birliğine uyum süreciyle birlikte ülkemizde bağımsız denetim alanında reform yapılması gereken bir konu haline gelişmiştir. Bağımsız denetim kısaca; finansal ve finansal olmayan tüm unsurları inceleyerek işletme hakkında finansal bilgilerin güvenilir ve gerçeğe uygun olup olmadığı hususunda hizmet vermektedir. Finansal tabloları bağımsız denetimden geçen işletmelerin, hata veya hileye bağlı önemli yanlışlıkların önemli derecede azaldığını söyleyebiliriz. Ayrıca bağımsız denetimin caydırıcı bir özelliği bulunmaktadır. Bununla beraber işletmeyi gelecekte karşılaştığı birtakım olumsuzluklara karşı korumaktan söz edilebilir.

Günümüzde Gelir idaresi başkanlığının başlattığı yeni sayılabilecek bir uygulama olan "izaha davet" işletmelerin finansal olayları incelemeye alındığı göz önünde bulundurulduğunda, bağımsız denetim artık isteğe bağlı olmaktan öte, KOBİ'ler için zorunlu olarak yaptırılması gereken bir durum olarak karşımıza çıkmaktadır. Bu sebeple işletmelerin bağımsız denetim yaptırması oldukça önemli bir hal almaya başlamıştır.

KOBİ'ler gelişmekte olan ülkeler ve aynı zamanda ülkemiz için ekonominin vazgeçilmez unsurlarındandır. KOBİ'ler bölgemizdeki siyasi ve ekonomik sorunları nedeniyle, kurumsal ve ekonomik şoklara karşı dirençsiz olduğu görülmektedir.

KOBİ'lerin bu siyasi ve ekonomik şoklara karşı daha dirençli ve istikrarlı olması için özellikle finansal tablolarını bağımsız denetime tabi tutmaları, süreklilikleri adına çok önemli bir ihtiyaç olarak karşımıza çıkmaktadır.

KOSGEB, KOBİ'ler için sunduğu teşvik ve destekler arasında bağımsız denetim desteği de yer almaktadır. Elbette KOBİ'lerin de bu destekten haberdar olmaları ve bu teşvik ve desteklerden yararlanmaları önem arz etmektedir. KOBİ'ler gelecekte zorunlu hale geleceği beklenen bağımsız denetim, KOBİ'lere kendi durumları hakkında bilgi vermekle beraber, ileride oluşabilecek olumsuz durumlara karşı önlem almalarında daha etkili ve işlevli olacaktır.

Buradan yola çıkarak, söz konusu desteğin KOBİ'lerin bağımsız denetim yaptırmasında etkisini, ülkemizin ekonomik açıdan en önemli şehri olan İstanbul baz alınarak araştırılmıştır. İstanbul'da KOBİ olarak tanımlanan ve İstanbul'un Ticaret ve Sanayi Odasına kayıtlı toplam 429.329 KOBİ bulunmaktadır. Ayrıca İstanbul'da faaliyet gösteren odalardan (İTO, İSO) alınan bilgilere göre son üç yılda kapanan veya iflas eden KOBİ sayısı azımsanmayacak kadar fazla olduğunu söylenebilmektedir. KOBİ'lerde özellikle 6102 sayılı Türk Ticaret Kanunu ile birlikte denetim eksikliği doğdu düşünüldüğünde, eksikliğin bu sonuca etkisi olduğu görüşü ağırlık kazanmaktadır. KOBİ'ler tarafından bağımsız denetimin öneminin bilinmemesi ve kurum kültürlerinin zayıflığı neticesinde denetime ilginin düşük olduğu anlaşılmaktadır. Araştırmamızda, denetimin işletmelerin finansal açıdan sağlıklı büyümeleri ve sürekliliklerinin sağlanması açısından önemi göz önünde bulundurularak KOSGEB tarafından desteklenmesi, özellikle isteğe bağlı denetime ilgi uyandırmadığı ve bağımsız denetim talebine etki etmediği anlaşılmıştır. Söz konusu duruma dair tarafların görüşleri alındığında; kurum kültürü eksikliği, aile şirketlerinin çokluğu, zorunlu olmadıkça denetime ihtiyaç duyulmaması, maliyetinin elde edilecek faydadan yüksek görülmesi temel sebepler olarak sıralanmıştır.

KOBİ'lerin finansal tablolarını hata, hileden ve yönetsel denetimlerden (bağımsız denetimden) geçmiş olmaları neticesinde, finansal durumlarının analiz ve kontrolleri yapıp aynı zamanda bir danışmanlık olarak güvence hizmeti sayılan bağımsız denetim sayesinde daha sağlıklı ve sürdürülebilir bir yapıda olmaları beklenecektir.

Ülkemizin en şeffaf kurumlarından biri olan KOSGEB bugüne kadar KOBİ'lerin gelişmesi için birçok konuda KOBİ'lere desteğini sunmaktadır. KOBİ'lerin bu desteklerden yararlanabilmesi için KOSGEB'in desteklediği sektörlerden olmaları yeterlidir. Ancak KOSGEB'in sunmuş olduğu desteklerden, KOBİ'lerin büyük çoğunluğunun bilgisi olmadığı da görülmektedir. KOSGEB'in bunun için KOBİ'lere yönelik daha fazla bilgilendirme yapması yerinde olacaktır. Ayrıca ticaret ve sanayi odaları tarafından iş birliği yaparak seminerler ve toplantılar ile KOBİ'lerin haberdar etmek ve bilinçlendirmek faydalı olacağını düşünmekteyiz.

KOBİ'ler ile KOSGEB arasında bulunan Mali Müşavirlere yönelik de seminerler verilerek daha aktif olmaları sağlanabilir. Mali Müşavirler bu destek ve teşviklerin uygulanmasında en önemli aktörler olabilirler. KOSGEB'in desteklediği sektörler arasına hizmet sektörünün de dahil edilmesi faydalı olacaktır. Ayrıca KOSGEB'in faaliyet raporlarını incelediğimizde Genel Destekler başvurusunda bulunan KOBİ'lerin hemen hemen hepsine destek sağladığı görülmektedir.

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SELECTION OF OPTIMAL RENEWABLE ENERGY INVESTMENT PROJECT VIA FUZZY ANP

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ABSTRACT

Purpose - This study aims to determine the optimal renewable energy investment project providing a guideline to the investors in decision making process.

Methodology - This study presents a comprehensive and solid mathematical approach considering the assessment of the ambiguities in the preferences of the decision maker for selection of the optimal renewable energy investment project via fuzzy analytic network process (FANP). FANP captures vagueness along with uncertainties in the evaluation.

Findings - After FANP method had been implemented for the considered problem, Hydropower with 31% of importance is selected as optimum renewable energy investment project for the firm.

Conclusion- This study provides a realistic assessment of energy resources and the consideration of the ambiguities presented in the preferences of the decision maker.

Keywords: Multi Criteria Decision Analysis (MCDA), Fuzzy Logic, Fuzzy Analytic Network Process (FANP), Triangular Fuzzy Number, Renewable Energy (RE).

JEL Codes: Q42, G11, D81

1.INTRODUCTION

Energy is the driving force behind economic development and industrialization Nowadays, energy demand is one of the biggest problems for the environment, economy, and development. Fossil fuel reserves are limited and their usage has significant environmental effects so renewable energy sources have been a focus of study because they are renewable, sustainable, and environmentally friendly. Renewable energy sources have to overcome environmental, socio-economic, technical, and institutional barriers. Renewable energy decision making can be considered as a multi criteria decision making problem with correlating criteria and alternatives. Real life decision making situations should be considered when selecting and evaluating an optimal renewable energy investment project, the decision makers or stakeholders can be uncertain about their own level of preference, due to incomplete information or knowledge, complexity and uncertainty within the decision environment. Therefore, it's better to make project selection and assessment under fuzzy conditions.

Energy is the driving force behind economic development and industrialization around the world. Today, energy demand is one of the biggest problems world- wide, with enormous implications for the environment, economy, and development. Due to the fact that fossil fuel reserves are limited and their usage has significant environmental effects, renewable energy sources have been a focus of study because they are renewable, sustainable, and environmentally friendly. The exploitation of renewable energy sources aims not only towards less dependence on fossil fuels, but also protection of the environment. Renewable energy sources have to overcome environmental, socio-economic, technical, and institutional barriers. (Mourmouris and Potolias,2013). Generating electricity from renewable energy sources has become a high priority in the energy policy strategies at a national level as well as on a global scale (Benli, 2013). Renewable energy sources for electricity production continued to improve and are gradually replacing fossil fuel-based power plants (Noorollahi et al.,2016).

Renewable energy sources are the fastest growing energy source in the world and various projections indicate that these resources will have huge contribution in the future (Jefferson, 2006).

There are both quantitative and qualitative factors involved in decision making process of selection of optimal renewable energy investment project. As the complexity of decisions increases, it becomes more difficult for decision makers to determine an optimal alternative. Selecting the appropriate source of energy in which to be invested is a task that involves different factors and policies. Renewable energy decision making can be considered as a multi criteria decision making (MCDM) problem with correlating criteria and alternatives. There are conflicting aspects which should be taken into account due to increasing complexity of the social, technological, environmental and economic factors that affect various interest groups or stakeholders needs.

This study is handled for the energy strategy decision making problem to help energy investors to determine the optimal renewable energy investment project. For this aim, this study presents an evaluation method for selection of the optimal renewable energy investment project using fuzzy ANP (FANP) approach. The rest of the paper is organized as follows: In section 2, literature review is presented. Section 3 summarizes FANP methodology. In section 4, application study and results are provided. Conclusion along with recommendations are given in the final section.

2. LITERATURE REVIEW

The use of multi criteria decision analysis (MCDA) techniques provides a reliable methodology to rank alternative renewable energy resources, technologies and projects in the presence of different objectives and limitations. Multi-criteria analyses are often applied to assess and compare the sustainability of different renewable energy technologies or energy plans with the aim to provide decision-support for choosing the most sustainable and suitable options either for a given location or more generically (Troldborg et al., 2014).

Zhou (2012) highlighted that analytic hierarchy process (AHP) or analytic network process (ANP) has been utilized as a suitable multi criteria decision analysis tool for project selection and evaluation due to the fact that both of them can deal with qualitative and quantitative information at the same time. ANP can take into account the interaction and feedback relationships between criteria and/or indices.

Real life decision making situations should be considered when selecting and evaluating an optimal renewable energy investment project, the decision makers or stakeholders can be uncertain about their own level of preference, due to incomplete information or knowledge, complexity and uncertainty within the decision environment. Due to the vagueness and uncertainty on the judgments of decision makers, the crisp pairwise comparison in the conventional AHP/ANP seems insufficient and imprecise to capture the right judgments of decision makers. It's better to make project selection and assessment under fuzzy conditions. Fuzzy ANP is very useful in circumstances where there is a high degree of interdependence between various attributes of the project, for instance when the result of one criterion also affects the others (Mohanty et al, 2005).

Taha and Daim (2013) mentioned that uncertainties and vagueness are inevitable in a decision making process. Fuzzy logic is integrated to overcome the ambiguities in the preferences. Kahraman et al (2009) executed fuzzy axiomatic design and fuzzy AHP for multi attribute selection among renewable energy alternatives. Kahraman and Kaya (2010) proposed a fuzzy multi criteria decision making methodology which can evaluate linguistic terms, fuzzy numbers, and precise numerical values. Their proposed methodology was applied to the case of Turkey to determine the energy policy by sorting the best available alternatives.

In Table 1, researches regarding MCDM based methods used for renewable energy related problems are given. Beccali et al. (2003) have done an application of the multicriteria decision-making methodology used to assess an action plan for the diffusion of renewable energy technologies at regional scale. They compared the Electre Multicriteria Analysis Approach to a Fuzzy-Sets Methodology. They showed differences among these two different approaches.. Advantages and drawbacks of both methods were explored and some suggestions were proposed. Stein(2013) used AHP to rank electricity producing technologies based on a comprehensive set of 11 factor representing financial, technical, environmental and socio-economic-political considerations. Zhang et al. (2015) developed an improved MCDM method based on fuzzy measure and integral and applied to evaluate four primary clean energy options for Jiangsu Province, China Haddad B. et al.(2017) used AHP method to rank renewables energy sources for the Algerian electricity system. Solar power was shown to be particularly well suited for Algeria, outperforming most of the other renewable options in a large set of highly weighted criteria. Wind power ranked second, followed by biomass, geothermal and lastly by hydropower.

Table 1: Studies Regarding MCDM Based Methods Used For Renewable Energy Selecion Problem

Research Articles	Utilized Technique	Studied Problem
Beccali et al. (2003)	Electre	Decision-Making In Energy Planning. Application Of The Electre Method At Regional Level For The Diffusion Of Renewable Energy Technology.
Stein(2013)	Analytic Hierarchy Process (AHP)	A Comprehensive Multi-Criteria Model To Rank Electric Energy Production Technologies.
Zhang et al. (2015)	The Hybrids Method of EWM (entropy weight method), Shapley Values and Marichal Entropy	Evaluating Clean Energy Alternatives For Jiangsu, China: An Improved Multi-Criteria Decision Making Method.
Haddad B. et al.(2017)	AHP	A Multi-Criteria Approach To Rank Renewables For The Algerian Electricity System.

Examples of the researches regarding fuzzy MCDM based methods used for renewable energy related problems are as follows: Kahraman et al. (2009) used Fuzzy Axiomatic Design and Fuzzy Analytic Hierarchy Process methods for the selection among renewable energy alternatives. They made a comparison between Fuzzy Axiomatic Design and Fuzzy Analytic Hierarchy Process methods to the selection of the best renewable energy alternative. They determined the most appropriate renewable energy alternative for Turkey. Kaya and Kahraman(2011) proposed a modified fuzzy TOPSIS methodology for the selection of the best energy technology alternative by modifying Chen's (2000) weighting procedure using fuzzy comparison matrices of extent analysis. They used the weights of the extent analysis and implemented the steps of TOPSIS algorithm. Finally they found wind energy is the best alternative among other energy technologies. Tasri and Susilawati (2014) developed a selection methodology and to determine the most appropriate renewable energy sources for electricity generation for Indonesia. They used fuzzy AHP method and Hydro power was found to be the best renewable energy source, followed by geothermal, solar, wind energy and biomass.

Dong and Li (2016) examined project investment decision making with fuzzy information (PIDMFI) and revealed features, state of the art, interrelations, and research directions of existing methodologies for PIDMFI.

3. DATA AND METHODOLOGY

The analytical network process (ANP) is a method based on but different from AHP. ANP takes into account the self feedback among criteria or indices with a network structure, while AHP uses a hierarchical structure and does not include self feedback loops (Saaty and Vargas, 2006). ANP takes into account of all kinds of interactions systematically. Many decision problems cannot be structured hierarchically because they involve the interaction and dependence of higher level elements in a hierarchy on lower level elements. Therefore, ANP is represented by a network, rather than a hierarchy (Saaty, 2005).

Fuzzy ANP method adapts the subjectivity of human judgment as being expressed in natural language. Reaching a conclusion is sometimes impractical and unclear to acquire exact judgments in pairwise comparisons. For example, the decision maker may say with confidence that alternative A is very strongly more preferred than alternative B with respect to a criterion, but when asked to give an exact ratio of how strongly A dominates B, difficulties would be arisen in giving a precise numerical value. For another example, in a comparison between an X and Y elements, it can be said that X is strongly preferred than Y. But if the question "how strongly X dominates Y" is asked, then the answer will not be exact. There is always an uncertainty in a decision making process. Fuzzy based method, Fuzzy ANP, can meet required formation for uncertain and vague pairwise comparisons (Boran and Goztepe, 2010).

Due to the complexity and uncertainty involved, and the inherent subjective nature of human judgments, it is sometimes unrealistic and infeasible to acquire exact judgments in pairwise comparisons (Promentilla, et al., 2008). It is more natural or easier to provide verbal judgments when giving subjective assessment. It is difficult for conventional quantification to express reasonably situations, which are apparently complex or hard to define. Linguistic variable can essentially be used in such situations (Lin, et al., 2009).

In Table 2, linguistic scales include "equally important," "weakly important," "essentially important," "very strongly important," and "absolutely important" with respect to fuzzy level scale. Notably, each membership function of linguistic scale is defined by three parameters of the symmetric triangular fuzzy number.

Chang (1996) introduced fuzzy AHP (FAHP) with the use of triangular fuzzy numbers for pairwise comparison scale of FAHP. In this study, Chang’s extent analysis is handled for FANP in selection of the optimal renewable energy investment project, by allowing triangular fuzzy numbers for pairwise comparisons and determining fuzzy weights. Zhu et al. (1999) improved formulation of comparing the triangular fuzzy number’s size.

Table 2: Membership Function of Linguistic Scale Associated with Pairwise Comparisons

Linguistic scale	intensity of importance	Triangular fuzzy scale	Triangular fuzzy reciprocal scale	Explanation
Equally important	1	(1, 1, 1)	(1, 1, 1)	two activities contribute equally to the objective
Intermediate	2	(1, 2, 3)	(1/3, 1/2, 1)	
Weakly important	3	(2, 3, 4)	(1/4, 1/3, 1/2)	experience and judgment slightly favor one activity over another
Intermediate	4	(3, 4, 5)	(1/5, 1/4, 1/3)	
Essentially important	5	(4, 5, 6)	(1/6, 1/5, 1/4)	experience and judgment strongly favor one activity over another
Intermediate	6	(5, 6, 7)	(1/7, 1/6, 1/5)	
Very strongly important	7	(6, 7, 8)	(1/8, 1/7, 1/6)	an activity is favored very strongly over another
Intermediate	8	(7, 8, 9)	(1/9, 1/8, 1/7)	
Absolutely important	9	(9, 9, 9)	(1/9, 1/9, 1/9)	the evidence favoring one activity over another is of the highest possible order of affirmation a reasonable assumption

Note: Reciprocals scale indicates if activity i has one of the above nonzero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i

In this study, the formulations and steps of Chang’s extent analysis approach are used as follows:

Let $X = \{x_1, x_2, \dots, x_n\}$ be an object set, and $U = \{u_1, u_2, \dots, u_m\}$ be a goal set. According to Chang’s extent analysis, each object is taken and performed extent analysis for each goal (g_i) respectively. Therefore, m extent analysis values for each object are obtained and Lin, et al. (2009) defined each object as follows:

$$M_{g_i}^1, M_{g_i}^2, \dots, M_{g_i}^m \quad \text{for } i=1, \dots, n \tag{1}$$

where all the $M_{g_i}^j$ for $j=1, 2, \dots, m$ are triangular fuzzy numbers whose parameters are l (the least possible value), m (the most possible value), and u (the largest possible value), respectively. A triangular fuzzy number is represented as (l, m, u) .

The steps of the Chang’s extent analysis can be given as follows:

Step 1. The value of fuzzy synthetic extent with respect to the i^{th} object is defined as follows:

$$S_i = \sum_{j=1}^m M_{g_i}^j(x) [\sum_{i=1}^n \sum_{j=1}^m M_{g_i}^j]^{-1} \tag{2}$$

where (x) denotes the extended multiplication of two fuzzy numbers. For obtaining $\sum_{j=1}^m M_{g_i}^j$, the fuzzy addition operation of m extent analysis values for a particular matrix is performed as follows:

$$\sum_{j=1}^m M_{g_i}^j = (\sum_{j=1}^m l_j, \sum_{j=1}^m m_j, \sum_{j=1}^m u_j), \quad \text{for } i=1, 2, \dots, n \tag{3}$$

and for obtaining $[\sum_{i=1}^n \sum_{j=1}^m M_{g_i}^j]^{-1}$, the fuzzy addition operation is performed as follows:

M_{gi}^j for $j=1,2,\dots,m$ values such that

$$\sum_{i=1}^n \sum_{j=1}^m M_{gi}^j = (\sum_{j=1}^n li, \sum_{j=1}^n mi, \sum_{j=1}^n ui) \tag{4}$$

And, the inverse of the vector is computed as follows:

$$[\sum_{i=1}^n \sum_{j=1}^m M_{gi}^j]^{-1} = ((\sum_{i=1}^n ui)^{-1}, (\sum_{i=1}^n mi)^{-1}, (\sum_{i=1}^n li)^{-1}) \tag{5}$$

Step 2. The degree of possibility of $M_2=(l_2,m_2,u_2) \geq M_1=(l_1,m_1,u_1)$ is defined as follows:

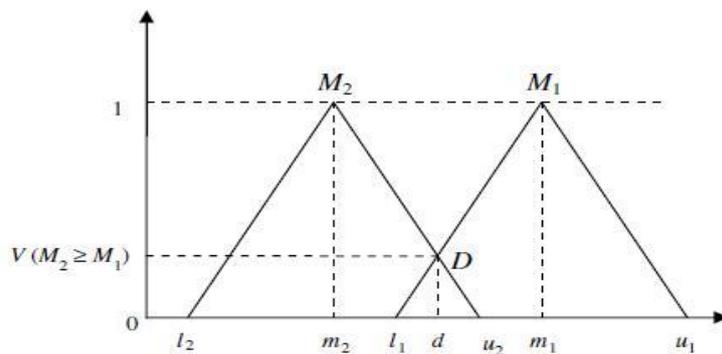
$$V(M_2 \geq M_1) = \sup_{y \geq x} [\min(M_1(x), M_2(y))] \tag{6}$$

which can be equivalently expressed as follows:

$$V(M_2 \geq M_1) = hgt(M_1 \cap M_2) = M_2(d) \tag{7}$$

where d is the ordinate of the highest intersection point D between uM_1 and uM_2 , as shown in Figure 1.

Figure 1: The Intersection between M1 and M2. (source: Lin, et al.,2009)



The ordinate of D is defined as follows:

$$V(M_2 \geq M_1) = hgt(M_1 \cap M_2) = M_2(d) = (l_1 - u_2) / (m_2 - u_2) - (m_1 - l_1) \tag{8}$$

To compare U_{M_1} and U_{M_2} ; we should need both the values of $V(M_1 \geq M_2)$ and $V(M_2 \geq M_1)$.

Step 3. The degree of possibility for a convex fuzzy number to be greater than k convex fuzzy numbers M_i for $i=1,2, \dots, k$ can be defined as follows:

$$V(M \geq M_1, M_2, \dots, M_k) = V[(M \geq M_1) \text{ and } (M \geq M_2) \text{ and } \dots \text{ and } (M \geq M_k)] = \min V(M \geq M_i), \text{ for } i=1,2,\dots,k \tag{9}$$

Assume that

$$d'(A_i) = \min V(S_i \geq S_k) \tag{10}$$

for $k=1,2,\dots,n; k \neq i$. Then the weight vector is defined as in the following way:

$$W' = (d'(A_1), d'(A_2), \dots, d'(A_n))^T \tag{11}$$

where A_i for $i=1, 2, \dots, n$ corresponding to n elements.

Step 4. Via normalization, the normalized weight vectors are evaluated as follows:

$$W = (d(A_1), d(A_2), \dots, d(A_n))^T \tag{12}$$

where W is a non fuzzy number.

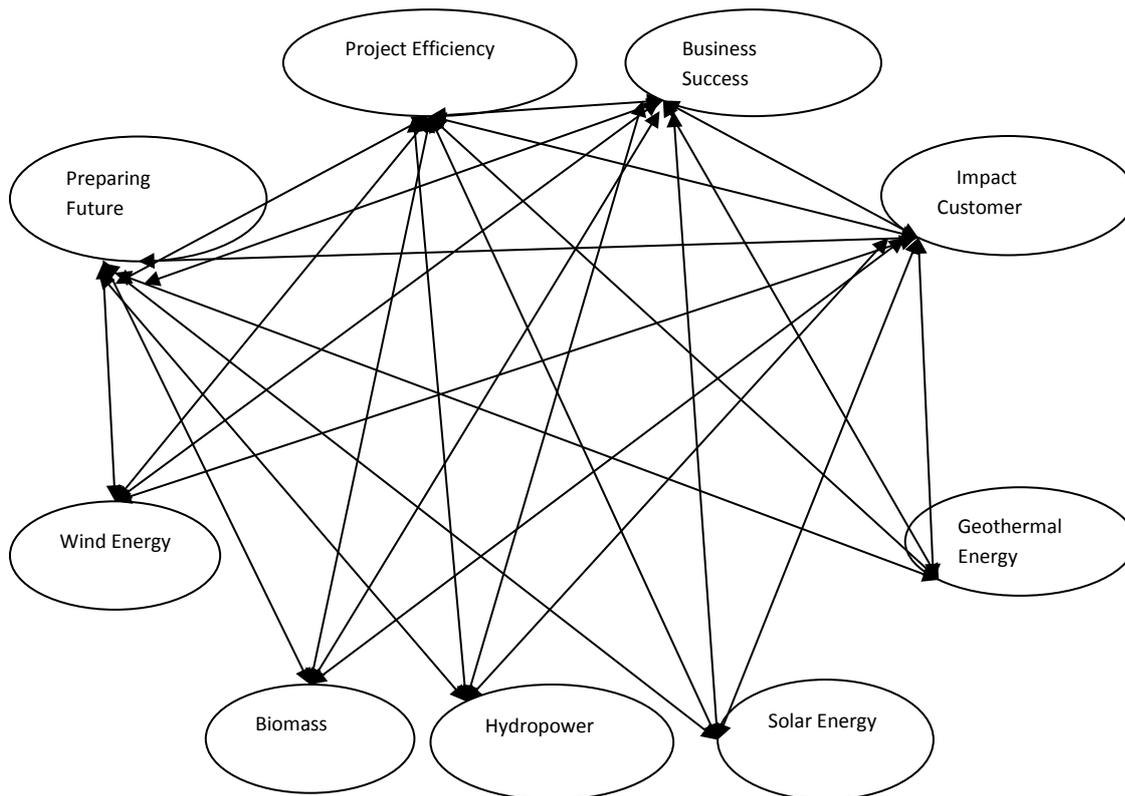
4. FINDINGS AND DISCUSSIONS

This study is handled for the energy strategy decision making problem to help energy investors to determine the optimal renewable energy investment project. Among many critical success factors included in the literature, the ones most suitable

for the companies operating in the energy sector were selected. 4 critical success factors and 5 renewable energy sources have been determined from the literature. From this standpoint, survey is conducted to obtain data to gather preferences of energy experts working in company operated energy sector via questionnaire. The FANP based approach, which is implemented to select the optimal renewable energy investment project, is composed of following steps.

Step 1. 4 Critical Success Factors and 5 Renewable Energy Sources are identified from the literature review as shown in Table 4. The network structure is also shown in Figure 2. There exists interactions between all criteria and the alternatives. However, there is no interaction among alternatives.

Figure 2: Constructed Analytic Network Structure



Step2. Pairwise comparisons were carried out according to survey conducted considering preferences of energy experts. Pairwise comparisons were carried out for each evaluation framework node. Each rated score in the questionnaire corresponds to each matrix of criteria. Each pairwise comparison rating is based on Saaty’s nine-point priority scale. The linguistic scales include “equally important,” “weakly important,” “essentially important,” “very strongly important,” and “absolutely important” with respect to fuzzy level scale. Afterwards, the steps of Chang’s extent analysis approach were carried out. The values of fuzzy synthetic degree were used for calculating the importance weights of alternatives. Then, the probabilities of preference an object was found. The combination of probabilities introduces the weight vector. The weight vectors are normalized. The normalized version of weight vectors are the values which are utilized when choosing alternatives. The normalized version of weight vectors are used to establish Initial Matrix for Fuzzy ANP method.

Table 3: Pairwise Comparisons According to Control Hierarchy

		CRITERIA				ALTERNATIVES				
		Critical Success Factors				Renewable Energy Sources				
		Project Efficiency	Impact Customer	Business Success	Preparing Future	Hydro power	Biomass	Geo Thermal Energy	Solar Energy	Wind Energy
CRITERIA	Project Efficiency	0	X	X	X	X	X	X	X	X
	Impact Customer	X	0	X	X	X	X	X	X	X
	Business Success	X	X	0	X	X	X	X	X	X
	Preparing Future	X	X	X	0	X	X	X	X	X
ALTERNATIVES	Hydropower	X	X	X	X	0	0	0	0	0
	Biomass	X	X	X	X	0	0	0	0	0
	Geothermal Energy	X	X	X	X	0	0	0	0	0
	Solar Energy	X	X	X	X	0	0	0	0	0
	Wind Energy	X	X	X	X	0	0	0	0	0

Step 3 After all comparisons and weighting processes were performed, super matrix is obtained. All the components of the network are located horizontally and vertically in super matrix. 0 indicates that there isn't an impact of criteria or alternatives on other criteria and alternatives.

Table 4 shows initial super matrix, which was obtained from pairwise comparisons, indicating how much influence of elements to each other. However, these data are not available for providing a useful information.

Table 4: Initial Super Matrix

		CRITERIA				ALTERNATIVES				
		Critical Success Factors				Renewable Energy Sources				
		Project Efficiency	Impact Customer	Business Success	Preparing Future	Hydropower	Biomass	Geothermal Energy	Solar Energy	Wind Energy
CRITERIA	Project Efficiency	0	0	0	1	0	0	0	0	0
	Impact Customer	0,244	0	0,146	0	0,232	0,077	0,232	0	0,256
	Business Success	0	0,146	0	0	0	0	0	0,242	0
	Preparing Future	0,756	0,854	0,854	0	0,768	0,923	0,768	0,758	0,744
ALTERNATIVES	Hydropower	0	0	0	0,551	0	0	0	0	0
	Biomass	0	0	0,544	0,231	0	0	0	0	0
	Geothermal Energy	0	0	0,228	0,219	0	0	0	0	0
	Solar Energy	0,592	0,592	0,228	0	0	0	0	0	0
	Wind Energy	0,408	0,408	0	0	0	0	0	0	0
		2	2	2	2	1	1	1	1	1

Initial super matrix should be reduced to a matrix before taking the limit, where each of its column sums correspond to unity, which will result in a matrix that is called a column stochastic matrix. The outcome is a stochastic super matrix. There exists convergence property of stochastic matrices.

Table 5 indicates normalized super matrix. Stochastic matrices are multiplied numerous times in turn, until the columns stabilize and become identical in each block of stochastic matrices.

Table 5: Normalized Super Matrix

	CRITERIA				ALTERNATIVES				
	Critical Success Factors				Renewable Energy Sources				
	Project Efficiency	Impact Customer	Business Success	Preparing Future	Hydropower	Biomass	Geothermal Energy	Solar Energy	Wind Energy
Project Efficiency	0	0	0	0,5	0	0	0	0	0
Impact Customer	0,122	0	0,073	0	0,232	0,077	0,232	0	0,256
Business Success	0	0,073	0	0	0	0	0	0,242	0
Preparing Future	0,378	0,427	0,427	0	0,768	0,923	0,768	0,758	0,744
Hydropower	0	0	0	0,275	0	0	0	0	0
Biomass	0	0	0,272	0,115	0	0	0	0	0
Geothermal Energy	0	0	0,114	0,109	0	0	0	0	0
Solar Energy	0,296	0,296	0,114	0	0	0	0	0	0
Wind Energy	0,204	0,204	0	0	0	0	0	0	0

Limited super matrix is obtained by multiplying numerous times in turn, until the columns stabilize and become identical in each block of weighted super matrix. Normalized super matrix is used instead of weighted Super Matrix. Since our network model requires normalizing the initial super matrix to keep it to be column stochastic. Then, the normalized super matrix can be raised to limiting powers to calculate the overall priorities.

Limiting value in the row indicates the overall priorities of element in that row. The best alternative which has the highest overall priority was obtained and the best selection criterion with the highest overall priority which affects the selection problem was obtained. To obtain the limited super matrix, 19th power of normalized super matrix was taken. This last matrix was the limited super matrix. Limited super matrix is shown in Table 6. If all columns have the same value, indicating an incorrect result. When we analyze any column, we can see the real weights in the network.

Table 6: Limited Super Matrix

	CRITERIA				ALTERNATIVES				
	Critical Success Factors				Renewable Energy Sources				
	Project Efficiency	Impact Customer	Business Success	Preparing Future	Hydropower	Biomass	Geothermal Energy	Solar Energy	Wind Energy
Project Efficiency	0,188	0,188	0,188	0,188	0,188	0,188	0,188	0,188	0,188
Impact Customer	0,077	0,077	0,077	0,077	0,077	0,077	0,077	0,077	0,077
Business Success	0,025	0,025	0,025	0,025	0,025	0,025	0,025	0,025	0,025
Preparing Future	0,376	0,376	0,376	0,376	0,376	0,376	0,376	0,376	0,376
Hydropower	0,104	0,104	0,104	0,104	0,104	0,104	0,104	0,104	0,104
Biomass	0,050	0,050	0,050	0,050	0,050	0,050	0,050	0,050	0,050

Geothermal Energy	0,044	0,044	0,044	0,044	0,044	0,044	0,044	0,044	0,044
Solar Energy	0,081	0,081	0,081	0,081	0,081	0,081	0,081	0,081	0,081
Wind Energy	0,054	0,054	0,054	0,054	0,054	0,054	0,054	0,054	0,054

Step 4. Finally, after the supermatrix is assured of column stochastic, it is raised to a sufficient large power until convergence occurs. That is, the super matrix is then raised to limiting powers to be W^{2n+1} , where n is an arbitrarily large number capturing all interactions and obtains a steady-state outcome. Then, the alternative with the highest overall priority should then be selected.

To normalize every column in the limited super matrix, last priorities in terms of alternatives are introduced and the alternative which has the highest value is chosen as the best alternative. Normalized values of alternatives are shown in Table 7, indicating the optimal renewable energy investment project is hydropower with 31% of importance. In other words, After FANP method had been implemented for the considered problem, Hydropower with 31% of importance is selected as optimum renewable energy investment project for the firm.

Table 7: Results

Alternatives	Limited Values	Real Values
Hydropower	0,10368	0,31
Biomass	0,05026	0,15
Geothermal Energy	0,04402	0,13
Solar Energy	0,08137	0,24
Wind Energy	0,05401	0,16

5. CONCLUSION

When there is interdependence among criteria and alternatives, ANP is an effective tool incorporating interactions among the elements of a decision problem. However, FANP has some further advantages according to the conventional ANP method. It provides more realistic results in pairwise comparison process.

In this study, Fuzzy ANP model for optimum renewable energy investment project has been proposed with an application of the proposed framework constructed for a real renewable energy investment project selection problem. In conclusion, this study provides a realistic assessment of energy resources and the consideration of the ambiguities presented in the preferences of the decision maker. The results of the implementation were informed to energy experts and positive opinions were declared by the decision maker. It has to be taken into account that establishment of pairwise comparisons and network structure are important issues. Data collection from energy experts reflecting their preferences is also significant issue.

It has to be emphasized that the model presented here does not consider all the possible criteria and strategies associated with renewable energy investment project selection. The criteria, strategies and interactions between the criteria and strategies presented in the framework are specific to a particular organization. The methodology utilized in this study can easily be adapted to different situations by adjusting the selection criteria and strategies.

At the end of this study, it must be highlighted that for this kind of studies; decision maker should examine and analyze the situation of his/her firm, and decide to the most appropriate decision making method to make an appropriate and correct implementation.

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