The Relationship Between Initial Public Offering and Firm Performance: A Research on Borsa Istanbul (BIST)*

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Abstract

The aim of this study is to examine the relationship between initial public offering (IPO) and firm performances of the firms operating in Turkey. The data set involves 38 firms that conducted initial public offerings in Borsa Istanbul (BIST) for the period of 2003 and 2011. Return on asset (ROA), return on equity (ROE), and operating profit margin (OPM) are used as a measure of firm performance. Median change analysis and panel data analysis have been employed as two different methods. According to the results of these analyses, there is a statistically significant relationship between the IPO and firm performance. It was found that firm performance decreased during the same and the following first year that the IPO took place, in comparison to the year preceding the IPO.

Keywords: Initial Public Offering, Financial Performance, Median Change Analysis, Panel Data Analysis, Borsa Istanbul

JEL Classification: G30, L25

İlk Halka Arz ve Şirket Performansı Arasındaki İlişki: Borsa İstanbul Üzerine Bir Araştırma

Öz

Bu çalışmanın amacı, İlk Halka Arz (İHA) ile şirket performansı arasındaki ilişkinin Türkiye'de faaliyet gösteren şirketlerde araştırılmasıdır. Bu kapsamda 2003-2011 yılları arasında Borsa İstanbul'da İHA'sı gerçekleştirilen 38 şirketin verileri kullanılmıştır. Şirket performansının ölçüsü olarak kullanılan değişkenler, toplam varlıkların karlılık oranı (ROA), özkaynakların karlılık oranı (ROE) ve faaliyet kar marjı (OPM)dır. Medyan değişim analizi ve panel veri analizi olmak üzere iki farklı yöntemin

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kullanıldığı çalışmada, her iki analiz yöntemden elde edilen sonuçlara göre, İHA ile şirket performansı arasında istatistiki olarak bir ilişkinin var olduğu ve İHA öncesindeki yıla göre şirket performansının, İHA yılında ve İHA'dan sonraki ilk yılda düştüğü tespit edilmiştir.

Anahtar Kelimeler: İlk Halka Arz, Finansal Performans, Medyan Değişim Analizi, Panel Veri Analizi, Borsa Istanbul

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1. INTRODUCTION

Stocks are traded on the stock exchange significantly increases the corporate reputation and recognition of companies. As the capital markets of the countries develop, many firms that have reached a certain size start towards the Initial Public Offering (IPO) due to the significant advantages it provides. Firms decide to go public to for the following reasons:

a) to provide funds required for new investments,
b) to monitor the perceptions of investors about the value of the company,
c) to encourage the employees,
d) to increase coverage in printed and visual media,
e) to increase the, creditworthiness, and
f) obtain certain privileges provided to publicly-owned firms in the legislation (Deloitte, 2008; BIST, 2013).

Many factors prevent firms from going public. These can be listed as (Çelik, 2016)

a) having to share profits,
b) increased reporting and auditing responsibilities,
c) reduced power of control in management,
d) loss of confidentiality,
e) legal follow-up,
f) obligation to inform the public, and,
g) costs of the IPO process

Consideration of its advantages and the burdens, the decision to go public is a strategic and difficult process for the firm executives. Going public enables the firm to become a part of a larger organization through sales of shares. The market value of the shares can be monitored daily and stock prices can be compared.

IPOs are also important for the development of capital markets. Money and capital markets must operate effectively for a developed and efficient financial system.

Ensuring the fluidity of funds in the country with money and capital market instruments leads units in the economy to save on the one hand, while offering different alternatives for assessing savings on the other. Since the capital market instruments are medium and long-term financial instruments, the level of development of the stock market and the bond market has vital importance in terms of capital accumulation and investments in the economy. In many countries where the capital market is not sufficiently developed, capital accumulation is insufficient, and the funds required for physical investments are provided by a significant degree of foreign capital. Countries highly dependent on foreign capital inflows for real economic growth, are in a riskier position in terms of financial stability and economic stability. The World Bank data also

confirms that there is a close relationship between the development of the capital market and the economic development. According to the 2018 data, in developed countries such as Switzerland, United States, Canada, and Japan, the market capitalization of listed domestic companies constitute the 204%, 148%, 113%, and 107% of GDP respectively, whereas in developing countries such as Brazil, Indonesia, Mexico, and Argentina, they constitute 49%, 46%, 31%, and 9% of GDP respectively (World Bank, 2018).

Turkey is a developing country, whose financial system consists largely of the banking sector. As of the end of 2018, the share of the banking sector within the total financial sector is 83%, and the ratio of the banking sector assets to GDP is 104% (TBB, 2018).

In contrast, the ratio of the total market capitalization of firms traded in Borsa Istanbul (BIST) to GDP is 19% (World Bank, 2018). This figure is quite below that of many developed economies. Istanbul Stock Exchange (IMKB) was founded in 1985 as an organized market in which share certificates were traded While there was a significant increase in the number of IPOs that took place until 2000, the figures remained very limited during the economic crisis of 2000 and 2001. A total of 50 firms went public between 2003 and 2009, while a total of 75 firms conducted IPOs between 2010 and 2012 (PWC, 2013). In this period, the public offering activities carried out by the economy management contributed greatly to the increase in the number of the IPOs. Within the scope of these activities, a cooperation protocol was signed between IMKB, Capital Markets Board of Turkey (SPK), Turkish Association of Capital Market Intermediary Institutions (TSPAKB), and the Union of Chambers and Commodity Exchanges of Turkey (TOBB) on August 2008 and efforts were initiated to increase the number of the IPOs (Kaderli, 2016). In 2013, IMKB acquired the name Borsa Istanbul (BIST), and as of the end of 2018, 515 firms are traded in BIST (KAP, 2018).

The performance of the firms in the IPO process is closely related to firm managers and investors. Investors who make a bid to purchase stock during this process make a judgment according to a value determined based on the past performance and future performance expectations of the firm. At this point, the financial performance levels of firms in the pre-IPO period, the IPO period, and post-IPO period have different importance for investors.

The present paper preliminary attempt is to analyze the relationship between initial public offering (IPO) and firm performance of the firms operating in Turkey, divided into four sections. The first section gives a brief overview about the study. The second chapter outlines the previous studies regarding the present study. In the third section, the data set of the study, the explanation of variables and the research methodology is presented. Lastly, the results of the study are summarized in the final chapter.

2. LITERATURE REVIEW

The studies carried out by Jain and Kini (1994), Cai and Wei (1997), Kim et al (2004), Ahmad-Zaluki (2008), Bulut (2008), Pereira and Sousa (2012) investigated the relationship between the IPO and firm performance, financial performance of the firms decreased both in the IPO period and the years after IPO compared to the pre-IPO year. Another study by Boubakari and Cosset (1998) found that firm performance increased during the post-IPO period.

Jain and Kini (1994) used the data of 682 firms with IPOs between 1976 and 1998 in his study on firms operating in the USA. As a result of the study in which the median change analysis method was used, they found that the performance of the firms

declined at the time of IPO (0) and the first (+1), second (+2) and third (+3) years of IPO compared to the year before the IPO. In the study, the median change in the ratio of business profit to total assets in the year before the IPO compared to IPO year (0) and the following three years was -3.58%, -7.60%, - 10.53% and - 9.09%, respectively, while the median change in the ratio of net cash flow from operations to total assets was -3.92%, -7.92%, - 7.40% and % - 6.44%, respectively.

Cai and Wei (1997) studied 180 firms with IPOs on the Tokyo Stock Exchange between 1971-1992 and found that the financial performance of the firms decreased in the five years after the IPO compared to the pre-IPO. According to the results of the study using the median change analysis method, the median changes of the profitability ratio (net profit/total assets) in the first (+1), third (+3) and fifth (+5) years of IPO were -2.4%, -3.3%, and -4.0%, while the median change of business profit (business profit/total assets) of the assets was -3.8%, -5.0%, and -5.7%, respectively. In the study, it was figured out that the median changes in the ratio of net cash flow generated from operating activities as a third measure of financial performance to assets were -2.5%, -2.7% and -2.5%, respectively.

Boubakari and Cosset (1998) found in their study which used data from 79 firms that conducted IPOs between 1987 and 1993 in 21 developing countries that there were increases in the financial performance of firms in the post-IPO period. According to the results of the study, the median values of operating margin before and after the IPO is 4.60% and 7.99%, respectively, the median values of return on asset ratio are 5.13% and 6.66% respectively, and the median values of the return on equity ratio are 16.35% and 18.05% respectively.

Kim et al. (2004) analyzed the data of 133 firms that had IPOs on the Thai Stock Exchange between 1987 and 1993. According to the results of the study in which the median change analysis was used, the median changes in return on assets ratio at the time of IPO (0), first (+1), second (+2) and third (+3) years following the IPO were -19.57%, -44.12%, -63.23%, and -70.77% respectively. The median changes in net cash flow from operating activities in the same period were -51.59%, -89.01%, -97.87% and -96.83% respectively.

Ahmad-Zaluki (2008) studied ROA and net profit margin (NPM) as a measure of financial performance in his study of 254 firms that conducted IPOs on the Malaysian Stock Exchange between 1990 and 2000. He found out that the financial performance of the firms declined in the following years compared to the year before the IPO. In the study, the median values of ROA before the IPO year (-1), at the time of IPO (0), first (+1), second (+2), and third (+3) years of IPO were 14.28%, 12.91%, 8.22%, 6.89%, and 4.89%, respectively, while the median value of the NPM was 13.93%, 14.25%, 9.75%, 8.97%, and 5.94%, respectively.

Bulut (2008) conducted a study on 175 firms that conducted IPOs in Istanbul Stock Exchange (IMKB) between 1992 and 2000 and examined the changes in the financial performance of the firms in 3 years after the IPO. The study employed the median change analysis method, and it was found out that the firm performances declined in the first (+1), second (+2) and third (+3) years following the IPO period. According to the results of the research analysis, the median changes of the return on assets at the time of IPO (0) and in the three years after the IPO in the firms that had IPOs by top investment banks compared to the period before IPO were -11.6%, -16.1%, -31.3%, and -43.2%, respectively, while the IPOs of the firms with low reputable investment banks realized as -4.1%, -17.1%, -15.9%, and -21.1%, respectively. The median changes in the operating income to total assets and the operating income to net sales, which are other performance measures used in the study, were negative in the three years after and during the IPO period compared to the year before the IPO.

Pereira and Sousa (2012) carried out a study on 555 firms with IPOs in European countries from 1995 to 2006 and concluded that the financial performance of the firms decreased after the IPO. In the study using median change analysis method, the median changes in the return on assets ratio in the first (+1), second (+2) and third (+3) years after the IPO were -1.92%, -2.83%, and - 4.67%, respectively. The median changes in the ratio of net cash flow from operating activities to assets were -2.23%, -2.98%, and -3.10%, respectively, during the same period.

3. DATA SET and METHODOLOGY

As was mentioned, two different methods are employed as a median change analysis and panel data analysis to examine the relationship between initial public offerings (IPO) and firm performances of the Turkish firms operating in Turkey. In this part of the study begins by examining of the data set and variables used in the analyses, and then present the relationship between both analysis methods and initial public offerings (IPO) and firm performances.

3.1 The Data Set

The data set of the research includes the figures calculated based on the financial statements of 38 joint-stock firms with IPOs in the period of 2003-2011 in Borsa Istanbul (BIST). Industry and trade firms were involved in this study and the distribution of these firms by sub-sectors is given in Table 1.

Tablo 1. Distribution of Firms by Sectors

Sectors	**Number of Firms**
Wholesale and Retail Trade	10
Fabricated Metal Products, Machinery And Equipment	6
Technology	6
Food, Beverage & Tobacco	5
Textile, Wearing Apparel And Leather	4
Paper and Paper Products, Printing And Publishing	4
Electricity Gas and Water	2
Agriculture, Forestry and Fishing	1
	38

Two of 38 firms started to trade in BIST in 2003, six in 2004, three in 2005, six in 2006, eight in 2010, and 13 in 2011.

3.1.1. Variables Used in Analysis

In the median change analysis employed in the study, the return on asset (ROA), return on equity (ROE), and operating profit margin (OPM) are used as the financial performance measure of the firms. Information on the calculation of performance measures is given in Table 2.

Tablo 2. Variables Used in Median Change Analysis

Variables	**Calculation**
ROA	Net Income / Total Assets
ROE	Net Income / Equity
OPM	Operating Income / Net Sales

In panel data analysis, ROA, ROE, and OPM are the dependent variables of the models. The variables used in panel data analysis are given in Table 3.

Tablo 3. Variables Used in Panel Data Analysis

Dependent Variables	**Calculation**
ROA, ROE, OPM	See Table 2
Independent Variables	**Calculation**
TFA	Tangible Fixed Assets / Totat Alssets
LEV	Total Debt / Total Assets
CR	Current Assets / Current Liabilities
D1	Dummy Variable for the IPO Year
D2	Dummy Variable for the year after IPO

The financial statements required for the collection of the research data were accessed from the official internet address of Borsa Istanbul (BIST) (http://www.borsaistanbul.com/veriler/verileralt/mali-tablolar-arsiv) and the official internet address of the Public Disclosure Platform (KAP) (www.kap.org.tr). The initial public offering (IPO) data used in the study was obtained from the Capital Markets Board's (CMB) website (www.spk.gov.tr).

3.3. Methodology and Empirical Results

As pointed out earlier, two different methods were used: median change analysis and panel data analysis.

3.3.1. Median Change Analysis

In the median change analysis, the median values of the performance measures selected within the scope of the study were calculated as of the pre-IPO year (t-1), at the time of IPO (t=0), and in the next year after IPO (t+1), and then the statistical significance of the change in median values in (t=0) and (t+1) years compared to (t-1) year was determined by Wilcoxon test.

The median values of the firm performances of the (t-1), (t=0), and (t+1) years of 38 firms are given in Table 4.

Tablo 4. Median Values of Firm Performance Measures

Performance Measures	**Median Values**		
	Year before IPO (t = -1)	IPO year (t = 0)	Year after IPO (t = +1)
ROA	0,0653	0,0300	0,0097
ROE	0,1355	0,0648	0,0256
OPM	0,0340	0,0176	0,0126

When Table 4 is examined, it is seen that the median values of all three performance measures decreased in (t=0) and (t=+1) years compared to (t-1) year. Table 5 shows the results of the Wilcoxon test, which was conducted to analyze whether the change in median values of ROA, ROE, and OPM from (t-1) to (t=0) and from (t-1) to (t+1) was statistically significant. The hypotheses of the Wilcoxon test are formed as follows.

H0: It did not change the median value of the IPO's relevant financial ratio.
H1: It changed the median value of the IPO's relevant financial ratio

Tablo 5. Median Change Analysis of Performance Measures in the IPO Process

		Change in Median Value from (t-1) to (t=0)		Change in Median Value from (t-1) to (t+1)	
Performance Measure	Number of Firms	Increase/ Decrease	(P-value)	Increase/ Decrease	(P-value)
ROA	38	- 0,0353	0,342	- 0,0556	0,007
ROE	38	- 0,0707	0,091	- 0,0109	0,002
OPM	38	- 0,0164	0,421	- 0,0214	0,010

Table 5 includes changes in the median values of financial performance measures from (t-1) to (t=0) and from (t-1) to (t+1) and the probability value (P-value) that reflects the statistical significance of this change. According to the Wilcoxon test statistics, the change in the median values of ROA, ROE, and OPM in (t-0) year in comparison with the (t-1) year was not statistically significant at 95% confidence level. Besides, the change (decrease) in the median values of all three financial performance measures in (t+1) compared to (t-1) year is statistically significant at a 99% confidence level.

3.3.2. Panel Data Analysis

Table 3 shows the list of dependent and independent variables used in panel data analysis methodology to investigate the impact of the IPO on the financial performance of the firms. Three models with the dependent variables of ROA, ROE, and OPM were suggested. Various tests have been applied to find the most appropriate panel data model for the data set used. At this stage, the presence of individual and/or time effects for each model was first tested by the LR test. Also, F test was used to investigate the presence of individual effect, and the LR test was used to investigate the presence of time effect. The results of these tests are given in Table 6.

Tablo 6. Individual and/or Time Effects for Models and Their Results

Panel A: LR Test: Individual and / or Time Effects $(H_0: \sigma_{\mu_i} = \sigma_{\lambda_t} = 0)$			
Dependent Variables	**Models**	**Test Statistics**	**P-value**
ROA	Model 1	33.66	0.0000
ROE	Model 2	24.14	0.0000
OPM	Model 3	7.46	0.0240
Panel B: F Test: Individual Effects $(H_0: \mu_i = 0)$			
Dependent Variables	**Models**	**Test Statistics**	**P-Value**
ROA	Model 1	5.04	0.0000
ROE	Model 2	3.74	0.0000
OPM	Model 3	2.28	0.0015
Panel C: LR Test: Time Effects $(H_0: \sigma_{\lambda_t} = 0)$			
Dependent Variables	**Models**	**Test Statistics**	**P-value**
ROA	Model 1	0.00	1.0000
ROE	Model 2	0.00	1.0000
OPM	Model 3	0.00	1.0000

According to the results of the tests, it was concluded that there is an individual effect at 95% confidence level and that there is no time effect. Hausman test was applied to check whether the individual effect is fixed or random. The results of this test are given in Table 7.

Tablo 7. Hausman Test Results

Dependent Variables	**Models**	**Test Statistics**	**P-value**
ROA	Model 1	6.07	0.4156
ROE	Model 2	2.34	0.8854
OPM	Model 3	7.21	0.3022

In the Hausman test, the basic hypothesis is suggested as 'the random-effects model is active', while the alternative hypothesis is 'fixed -effects model is consistent'. As a result of the test, it was figured out that the models to be suggested should be one-way random effects models because the basic hypothesis could not be rejected in all three models.

In the random-effects model, error terms are assumed to be with equal variance (homoscedastic) and without autocorrelation within and relative to units. If estimations are made without considering problems related to assumptions, t statistics and confidence intervals are no longer valid due to deviations of standard errors (Tatoglu, 2012, 199). The test of deviations from assumptions was performed with the tests given in Table 8.

Tablo 8. Specification Tests (Heteroscedasticity and Autocorrelation)

Tests	**ROA**	**P-value**	**ROE**	**P-value**	**OPM**	**P-value**
Levene, Brown ve Forsythe Testi	2.85	0.000	2.19	0.000	4.56	0.000
Bhargava, Franzini and Narendranithan's DW Test	1.89		1.81		1.65	
LM Testi	5.97	0.000	17.57	0.000	18.79	0.000

Levene, Brown and Forsythe test was used to investigate the presence of heteroscedasticity, and the hypothesis at 99% confidence level was rejected in all three models to determine the presence of heteroscedasticity. The Durbin-Watson (DW) Test and LM test of Bhargava, Franzini and Narendranithan were used to test the presence of the autocorrelation problem. Since the DW test result is less than 2, test statistics reject the null hypothesis of no first-order serial correlation in all three models. In the LM test, it was found that the problem of autocorrelation exists in the models to be established due to the rejection of the basic hypothesis.

As a result of the tests performed in Table 6, Table 7 and Table 8, it was found out that the models employed in the study were one-way individual effects (random effects) model and that all the models had heteroscedasticity and autocorrelation problems. Therefore; Arellano, Froot, and Rogers standard errors model is appropriate for models which take into account the problem of heteroscedasticity and autocorrelation in all three models. Dummy variables (D1 and D2) related to the year of the IPO and the year after IPO were included as independent variables to see the effect of the IPO on the firm performance while final models were created. Table 9 presents the results of the final models in which the assumptions are corrected.

Tablo 9. Estimation Results of Final Models

Dependent Variables:	**Model 1**		**Model 2**		**Model 3**	
	ROA		ROE		OPM	
Independent Variables	Coefficient	P- value	Coefficient	P- value	Coefficient	P- value
TFA	-0.1188	0.008	-0.2677	0.002	-0.1419	0.003
LEV	-0.0886	0.034	-0.0023	0.980	-0.2355	0.000
CR	-0.0056	0.000	-0.0039	0.096	-0.0083	0.000
Constant	0.1589	0.000	0.2600	0.000	0.2388	0.000
D1	-0.0290	0.001	-0.0854	0.000	-0.0384	0.012
D2	-0.0475	0.000	-0.1303	0.000	-0.0688	0.000
Wald Statistics	208.06	0.000	50.08	0.002	63.29	0.000
R^2	% 32.53		% 34.15		% 33.03	

D1: Dummy variable for the IPO year. D2: Dummy variable for the first year after the IPO.

In the random-effects model, independent variables are significant at 99% confidence level in explaining the variability in performance measures in all models employed according to the results of the Wald test, which explains the general significance of the model. In the first model, independent variables account for about 33% of the variability in ROA, in the second model, about 34% of the variability in ROE, and in the third model, about 33% of the variability in OPM. The dummy variable (D1) used to represent the year of IPO in the employed models and the dummy variable (D2) representing the first year after the IPO is statistically significant and negative at 95% confidence level in all models. This result indicates that the year of IPO and the first year after IPO have a negative effect on the firm performance. In other words, the firm performance decreases in the IPO year and the first year after IPO.

TFA is statistically significant and negative at 95% confidence level in all three models employed. In other words, firms' investment in tangible fixed assets reduces the performance of the relevant period. The effect of leverage ratio on ROA and OPM is significant and negative at 95% confidence level. The fact that firms focus on borrowing in financing their assets reduces their profitability. Current ratio is significant and negative in all three models. The increase in the ratio of firms' ability to pay short-term debts through current assets decreases the profitability of the firms. This case may be due to the over-investment of the firms in working capital.

CONCLUSION

This research was conducted to investigate the relationship between the IPO and firm performance of the firms in Turkey. The data of 38 firms that had IPO in BIST for the period of 2003 and 2011 were used. Two different methods are employed :1) a median change analysis and 2)panel data analysis.

The dependent variables selected as the measure of firm performance are ROA (net income /total assets), ROE (net income/equity), and OPM (operating income/net sales). According to the results of the median change analysis, the median values of the firm performance decrease in the IPO year and the first year after IPO in comparison with the year preceding the IPO. According to the Wilcoxon test, which indicates the statistical significance of the change in the median values, the decrease in ROA, ROE, and OPM was statistically significant at the 99% confidence level in the first year after IPO compared to the year preceding the IPO. In the panel data analysis, dummy variables were defined to represent the effects of the IPO year and the first year after IPO on financial performance in the models where ROA, ROE, and OPM are dependent variables. As a result of the panel data analysis, the effect of the IPO year and the first year after IPO on firm performance was found to be statistically significant and negative at 95% confidence level in all three models.

According to the results of median change analysis and panel data analysis methods, firm performance is affected by the IPO. Firm performance declines in the IPO year and the first year after IPO was compared to the year before IPO. This result ties well with previous studies by Jain and Kini (1994), Cai and Wei (1997), Kim et al (2004), Ahmad-Zaluki (2008), Bulut (2008), and Pereira and Sousa (2012), and differs from the results of study by Boubakari and Cosset (1998).

Based on the research results, it is recommended that investors considering investing in the IPO process should reach a decision considering that the firm performance will be low in the IPO year and the first year after IPO compared to the pre-IPO year. Otherwise, the cost of the investment in the IPO process will be higher than the actual (theoretical) value of the stock.

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Özet

İlk Halka Arz (İHA) ile şirket performansı arasındaki ilişkiyi Türkiye'de faaliyet gösteren şirketlerde araştırmak amacıyla yapılan bu çalışmada Borsa İstanbul'da 2003-2011 yılları arasında İHA'sı gerçekleştirilen 38 şirketin verileri kullanılmıştır. Veri seti oluşturulurken şirketlerin finansal verilerinin karşılaştırılabilir olması için finans

sektöründe yer alan şirketler kapsam dışında bırakılmıştır. Çalışmada medyan değişim analizi ve panel veri analizi olmak üzere iki farklı yöntem kullanılmıştır.

Medyan değişim analizinde, şirketlerin finansal performans ölçüsü olarak aktiflerin karlılığı (ROA), özkaynakların karlılığı (ROE) ve faaliyet kar marjı (OPM) oranları kullanılmıştır. Medyan değişim analizinde, İHA öncesi yılda (t-1), İHA yılında (t=0) ve İHA sonrasındaki ilk yılda (t+1) seçilen performans ölçülerinin medyan değerleri hesaplanmış ve (t-1) yılına göre (t=0) ve (t+1) yılında medyan değerlerindeki değişimin istatistiksel olarak anlamlılığına Wilcoxon testi ile karar verilmiştir. Hesaplanan medyan değerleri karşılaştırıldığında (t-1) yılına göre (t=0) ve (t+1) yıllarında her üç performans ölçüsünün de medyan değerlerinin azaldığı tespit edilmiştir. Wilcoxon testinin sonuçlarına göre (t-1) yılına göre (t=0) yılında performans ölçülerinin medyan değerlerindeki değişim istatistiki olarak anlamlı bulunmamış; (t-1) yılına göre (t+1) yılında ise ROA, ROE ve OPM'nin medyan değerlerindeki değişimin (azalış) % 99 güven düzeyinde istatistiki olarak anlamlı olduğu tespit edilmiştir.

Panel veri analizinde, İHA'nın şirketlerin finansal performansı üzerindeki etkisi araştırılmıştır. Bu kapsamda ROA, ROE ve OPM'nin bağımlı değişken olduğu üç model kurulmuştur. Modellerin bağımsız değişkenleri maddi duran varlıkların toplam varlıklara oranı (TFA), toplam borçların toplam varlıklara oranı (LEV) ve dönen varlıkların kısa vadeli yabancı kaynaklara oranı (CR)'dır. Modellerde İHA yılını ve İHA sonrasındaki ilk yılı temsil etmek için kullanılan kukla değişkenler de (D1 ve D2) bağımsız değişken olarak yer almıştır. 38 şirketin 2003-2011 dönemine ilişkin oluşturulan dengeli panel veri setine en uygun panel veri modeline karar verebilmek için çeşitli testler uygulanmıştır. Bu aşamada öncelikle her bir model için birim ve/veya zaman etkilerinin varlığı LR testi ile araştırılmıştır. Ayrıca birim etkinin varlığını araştırmak için F testi, zaman etkisinin varlığını araştırmak içinse LR testi uygulanmıştır. Yapılan testlerin sonucunda kurulan modellerde tek yönlü birim etkilerin var olduğuna ulaşılmıştır. Bu aşamada yapılan Hausman testi sonucuna göre tek yönlü tesadüfi etkiler modelinin geçerli olduğu tespit edilmiştir. Çalışmada varsayımlardan sapmalar test edilirken heteroskedasitenin varlığı Levene, Brown ve Forsythe Testi ile otokorelasyon probleminin varlığı ise Bhargava, Franzini ve Narendranithan'ın Durbin-Watson (DW) Testi ve LM testi ile araştırılmıştır. Uygulanan testlerin sonucunda kurulan üç modelde de heteroskedasite ve otokorelasyon probleminin bulunduğuna karar verilmiştir. Bu nedenle kurulan modellerde heteroskedasite ve otokorelasyon problemini dikkate alan Arellano, Froot ve Rogers standart hataları kullanılarak tahminler yapılmıştır. Analizlerin sonuçlarına göre İHA yılını temsil etmek üzere kullanılan kukla değişken (D1) ve İHA sonrasındaki ilk yılı temsil eden kukla değişken (D2), tüm modellerde istatistiki olarak % 95 güven düzeyinde anlamlı ve negatif işaretlidir. Bu sonuç, İHA yılı ve İHA sonrasındaki ilk yılın şirket performansı üzerinde negatif yönlü bir etkisinin olduğunu göstermektedir. Bir başka ifade ile İHA yılında ve İHA sonrasındaki ilk yılda şirket performansı düşmektedir.

Çalışmada kullanılan medyan değişim analizi ve panel veri analiz yöntemlerinin sonuçlarına göre şirket performansı ile İHA arasında istatistiki olarak anlamlı bir ilişkinin var olduğu tespit edilmiştir. İHA yılında ve İHA'dan sonraki ilk yılda şirket performansı İHA öncesi yıla göre düşmektedir. Bu sonuç Jain ve Kini (1994), Cai ve Wei (1997), Kim et al (2004), Ahmad-Zaluki (2008), Bulut (2008), Pereira ve Sousa (2012) tarafından yapılan çalışmaların sonuçları ile benzerlik göstermekte, Boubakari ve Cosset (1998) tarafından yapılan çalışmanın sonuçları ile ise farklılık göstermektedir.

Çalışmada ulaşılan sonuçlar doğrultusunda İHA sürecinde şirkete yatırım yapmayı düşünen yatırımcıların şirket performansının İHA öncesi yıla göre İHA yılında ve İHA'dan sonraki ilk yılda düşük gerçekleşeceğini düşünerek yatırım kararını vermesi önerilir. Aksi takdirde İHA sürecinde yapacağı yatırımın maliyeti, söz konusu pay senedinin gerçek (teorik) değerinden yüksek olacaktır.