Effects of Public Ownership on Corporate Performance: Empirical Evidence from Turkish Manufacturing Industry

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By

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VITA

Mehmet Saraç was born on July 21, 1967 in Istanbul. Following his high school education, he attended the Faculty of Business Administration of Istanbul University between 1986 and 1990 and got a B.A. degree. Subsequently, he obtained a Master's degree in Auditing & Accounting from the same Faculty in 1992 submitting his thesis titled "The Effectiveness of Auditing System in Turkey". During his university education, he worked as intern in several companies. In 1993 he was appointed to Mersin University as a research assistant and went to the U.S. in 1994 for the graduate study. He obtained a Master's degree from The George Washington University in accounting and taxation and took several courses in the PhD program in accounting at the same University. Meanwhile, he worked in a major audit project and also in a financial reform project for D.C. Government. After he returned to Turkey, he attended to PhD program in Department of Management at Boğaziçi University, where he has been working as a research assistant since September 1998. He attended to several international conferences where his papers published in the proceedings. He has also worked as business development and finance consultant for two advertising companies.

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ABSTRACT

"The Effects of Public Ownership on Corporate Performance: Empirical Evidence Form Turkish Manufacturing Industry"

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This dissertation provides an empirical analysis of the changes in operating performance and certain financial characteristics of firms as they make the transition from private to public ownership through initial public offerings (IPOs). The expectations are tested on a sample of 81 Turkish manufacturing firms that went public between 1990 through 1998 inclusive. Eight-year-data of each firm around IPO year are included in the sample.

First, operating return on assets, sales, capital expenditures, leverage and cost of financing of each firm in the sample are examined throughout an eight-year-window. Statistical analyses are performed to see if there are significant differences before and after IPOs. Then, the possible causes are investigated to explain the changes. Change in certain stock market indicators is also considered.

The findings show that firms exhibit a substantial decline in post-IPO operating performance, assets turnover and capital expenditures on assets. There is an increase in leverage and decrease in cost of borrowing. Those firms retaining higher proportion of capital inside seem to exhibit less decrease in performance after IPO. Those firms that underprice their stocks at IPO seem to show higher decrease in post-IPO performance. These two findings, however, lack sufficient statistical significance. High-pre-IPO operating performance and market buoyancy around IPO date seem to lead investors to develop optimistic assessments of earnings growth.

KISA ÖZET

"Halka Açıklığın Şirket Performansı Üzerindeki Etkileri: Türk İmalat Şirketleri Üzerine Görgül Bir Çalışma"

Mehmet Saraç

Bu tez, firmaların, halka açıldıktan sonra faaliyet performansındaki ve belirli finansal göstergelerindeki değişimi ve bu değişimin muhtemel nedenlerini görgül olarak analiz etmektedir. Beklentiler, Türkiye'de 1990 ve 1998 arasında halka açılan 81 imalat firması üzerinde test edilmektedir. Örnek kütledeki her bir firmanın halka arzdan üç yıl öncesi, arz yılı ve arzdan sonraki dört yılı olmak üzere sekiz yılına ait veriler incelenmektedir.

Öncelikle örnek kütledeki firmaların bu sekiz yıllık süreçteki esas faaliyet karı'nın aktiflere oranı, satışları, sabit sermaye yatırımları, borç oranı ve finanslama maliyetleri incelenmekte, ve halka arz öncesi ile sonrası arasında ciddi bir fark olup olmadığını görmek için istatistiksel analizler yapılmakta, sonra bu değişimlerin muhtemel nedenleri araştırılmaktadır. Belirli sermaye piyasası göstergelerindeki değişim de ayrıca incelenmektedir.

Analiz sonucunda, halka arz sonrası faaliyet karlılığında, varlıkların devir hızında, sabit sermaye yatırımlarının varlıklara oranında ve borçlanma maliyetinde önemli ölçüde düşüş olduğu, borç oranında bir artış olduğu kanıtlanmaktadır. Halka arz oranı düşük firmaların karlılığındaki düşüşün nisbeten az olduğu, hisselerini düşük fiyattan arz edenlerin ise karlılığındaki düşüşün daha fazla olduğu görülmektedir. Ancak bu son iki bulgu, istatistiksel anlamda yeterli kanıttan yoksundur. Halka arz öncesindeki yüksek karlılık ve arz döneminde piyasada görülen canlılık, yatırımcıların, firmanın büyüme ve karlılığının devamlı olacağı şeklinde iyimser bir beklentiye girmelerine yol açmaktadır.

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LIST OF ABBREVIATIONS

Terminology	**Abbreviation**
Asset Turnover	ATO
Capital Expenditures	CAPEX
Capital Expenditures on Assets	COA
Cost of Borrowing	COB
Earnings per Share	EPS
Gross Domestic Product	GDP
Gross National Product	GNP
Initial Public Offerings	IPO
Insider Ownership	INSIDER
Istanbul Stock Exchange	ISE
Less Developed Countries	LDC
Leverage	LEV
Market-to-book Ratio	M/B
Natural Logarithm of Capital Expenditures	LNCAPEX
Natural Logarithm of Sales	LNSALES
Net Present Value	NPV
Operating Return on Assets	OROA
Price-Earnings Ratio	P/E
Research and Development	R&D
Return on Assets	ROA
Sales	SALES

Seasoned Equity Offerings	SEO
State Enterprise	KIT
State Planning Organization	DPT
The Central Bank of Turkey	TCMB
Tobin's Q	TQ
Underpricing	UNDPR
United Kingdom	UK
United Nations Conference on Trade and Development	UNCTAD
United States	US

1. INTRODUCTION

1.1. THE PURPOSE AND SCOPE OF THE STUDY

The purpose of this study is to investigate the change in certain financial characteristics of firms as they make the transition from private (closely held) to public ownership through initial public offerings (IPOs). Because this subject is classified as an issue of corporate ownership/governance theory, the relationship between corporate ownership structure in general and corporate performance will be reviewed first.

The issue of corporate governance has become of importance since the birth of the modern corporation and received significant attention in the literature especially since *Berle* and *Means'* study (1932). Since then, exploring the determinants and consequences of corporate ownership structure has always been an interesting discussion topic in the academic circles. One of the crucial problems that especially finance executives face is achieving the best composition of ownership structure that maximizes the firm value. To some extent, the literature has developed certain theories and provided certain answers to the questions around this issue such as property rights theory, agency theory, and asymmetric information theory. These theories have attempted to explain the relationship between the ownership structure and fundamental indicators of firm such as value, performance, leverage and risk.

There are several dimensions of the issue of corporate ownership. Among these, private (closely held) ownership versus public (publicly traded) ownership constitutes an important dimension to discuss. Stock markets play an increasingly important role not only in the financial sectors, but in the whole economy of especially developing countries. The securities market is a key component of their capital markets. They are of crucial importance in encouraging savings and providing

long-term financing necessary for investment and economic growth. The primary security market, especially Initial Public Offerings (IPOs) plays an important role to achieve growth and development. As Pagano et.al.(1998) described, the decision to go public is one of the most important but least studied questions in corporate finance. Therefore, the issue of determinants and effects of IPO require much more attention to study on.

The Turkish capital market has significantly expanded since the early 1980s. Although severe crises, persistent inflation and instability have had an obvious deteriorating effect on the security market, the direction of the main policy of the Turkish State has remained towards more liberal, capitalist economy. Despite the extreme volatility in the securities market due to crises, a considerable progress took place in terms of public offerings of private firms and privatization of state enterprises *(KITs)*. Some major *KIT*s have been privatized; a considerable number of private companies have gone public. Thus, the security market has somehow survived and even expanded. However, both the public's stake in Turkish firms and the market capitalization-to-GNP ratio is still below the sufficient level, as empirically proven this study.

The purpose of this study is to investigate the impact of corporate ownership structure on corporate performance, and, particularly, the change in certain financial characteristics of firms as they make transition from private (unquoted /closely held status) to public ownership (quoted/publicly held status) through IPOs. The study examines this issue by testing the relevant hypotheses derived form the theory. Following an analysis of the corporate ownership concept and impact of ownership type on performance, the study focuses on the dimension of public ownership.

Although going public has usually been an interesting discussion topic in Turkey, there are not a sufficient number of empirical studies exploring the real motives behind the IPOs and the consequences of IPOs of Turkish firms. Therefore, "why Turkish firms go public?" and "what happens after they go public?" are two crucial questions to be scientifically answered.

The agency theory suggests that all firms encounter a potential of agency problem as they separate the ownership and management functions. Due to this separation, the conflict of interest between management and shareholders constitute a source of agency costs. This usually leads to reduction in firm performance. As the ownership structure becomes diffused, in other words, the insiders' (management's) stake is reduced in the firm, then the management's motive towards value maximization decreases. Instead, they act in their own best interest, causing a *moral hazard* problem. Amihud et.al. (1983) explains the issue through the "*managerialism-ownerism*" approach. In an environment of managerialism, professional managers can be expected to operate the firms in their own interests, while ownerism exists when managers act in the interests of the firm's external owners. Bridging this divergence of interests is commonly assumed possible through managerial ownership. That is, high enough levels of managerial stock ownership relative to managers' personal wealth may align the interests of managers with those of external shareholders for value-maximizing behavior, converting an environment of managerialism into one of ownerism.

The conventional wisdom is that going public is simply a stage in the development of a firm. Nevertheless, Pagano et.al. indicate that going public is not a stage that all firms eventually reach, but instead a choice that they make. In any case,

going public usually means a fundamental change in the corporate ownership structure, causing a more diffused characteristic.

This study attempts to bring empirical evidence to the hypotheses related to the public ownership issue from the Turkish manufacturing industry and to find answers to these aforementioned research questions.

1.2. OUTLINE OF THE STUDY

This paper is organized as follows: Chapter 2 explains the relevant theories and discusses the issues around the relationship between corporate ownership structure and performance in general. The third chapter specifically focuses on the public ownership dimension and, following a review of recent empirical studies on this topic, contains the empirical analysis on the impact of going public on the corporate performance and financial structure. Finally, chapter 4 presents the conclusions.

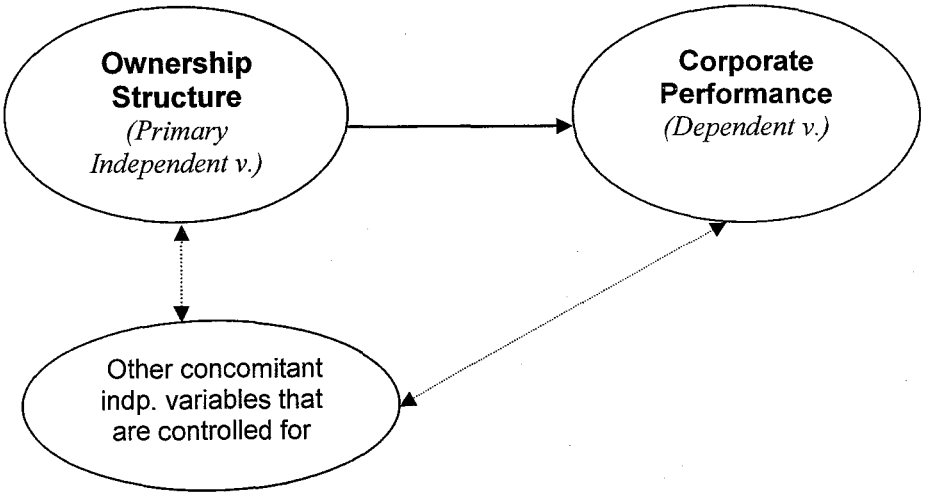
2. CORPORATE OWNERSHIP AND PERFORMANCE

2.1. INTRODUCTION

The concept of corporate ownership can be analyzed under many dimensions in various contexts. Some studies have focused on particular dimensions of corporate ownership such as managerial ownership or employee ownership, while others discuss the issue from a wider perspective. The studies analyzed the issue from firms' perspective have usually focused on the relationship between ownership structure and other financial indicators of the firms. Existing literature on this issue has provided competing hypotheses and conflicting evidence as to whether there is a meaningful relationship between ownership and performance or there is positive or negative relationship between these aspects of the firm. Before getting into the literature overview, it is wiser to understand the primary theories pertaining to this issue.

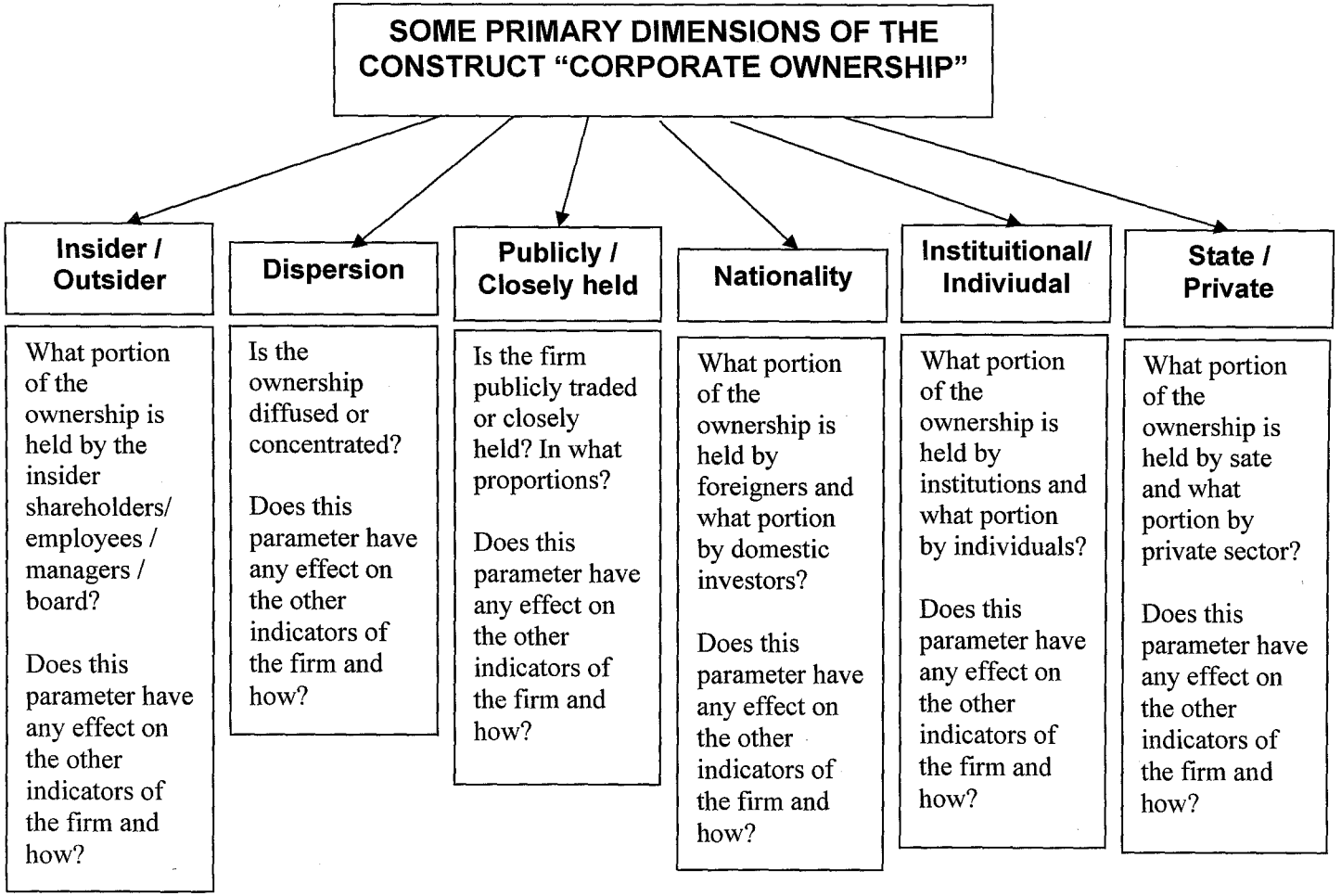
Figure 1

The Basic Conceptual Model



Performance = *f* (Ownership Structure, Other factors such as Size, Capital Expenditures, Advertising Expenditures, R&D Expenditures, Industry)

Figure 2


SOME PRIMARY DIMENSIONS OF THE CONSTRUCT "CORPORATE OWNERSHIP"
Insider / Outsider
What portion of the ownership is held by the insider shareholders/ employees / managers / board?
Does this parameter have any effect on the other indicators of the firm and how?
Dispersion
Is the ownership diffused or concentrated?
Does this parameter have any effect on the other indicators of the firm and how?
Publicly / Closely held
Is the firm publicly traded or closely held? In what proportions?
Does this parameter have any effect on the other indicators of the firm and how?
Nationality
What portion of the ownership is held by foreigners and what portion by domestic investors?
Does this parameter have any effect on the other indicators of the firm and how?
Instituitional/ Indiviudal
What portion of the ownership is held by institutions and what portion by individuals?
Does this parameter have any effect on the other indicators of the firm and how?
State / Private
What portion of the ownership is held by sate and what portion by private sector?
Does this parameter have any effect on the other indicators of the firm and how?

2.2. THEORIES CONCERNING CORPORATE OWNERSHIP AND CAPITAL STRUCTURE

2.2.1. The Agency Theory Perspective

In 1932, Berle and Means published "The Modern Corporation and Private Property", the forerunner of the agency cost theory developed by Jensen and Meckling (1976) and Fama and Jensen (1983). Since then, the studies that have attempted to analyze the consequences of separation of ownership and control developed the agency theory. It has been recognized for a long time that firms' managers may have personal goals that compete with shareholder wealth maximization. The fact that managers are empowered by the owners of the firm –the shareholders– to make decisions creates a potential conflict of interest that falls under the general concept called *agency*. Within the financial management context, the primary agency relationships are 1) between stockholders and managers, and 2) between debtholders and stockholders.

A potential agency conflict arises whenever the manager of the firm owns less than a 100 percent of the firm's common stock. If the manager, as the agent of the shareholders, acts in his own best interest, then there exists a *moral hazard* problem. Since it is virtually impossible for shareholders to monitor all managerial actions, managers may take such unobserved actions conflicting the interests of the shareholders.

To reduce the potential agency conflicts and moral hazard problems, shareholders must incur *agency costs* such as expenditures for monitoring managerial actions; restructure the organization, and opportunity costs which are incurred when shareholder-imposed restrictions limit managers' ability to take actions that contribute to shareholder wealth. In addition to monitoring, there are a number of

ways, such as performance-based incentive plans, to encourage managers to maximize shareholders wealth (Brigham and Gapenski, 1994).

The agency theory approach asserts that there is an optimal capital structure that maximizes the firm value because of the trade off between the advantage of tax savings obtained by increasing debt and agency cost. That is, the tax advantage of using debt is balanced by the increasing agency costs arising from the leverage. Therefore, it is possible to form an optimal composition of stock and debt that minimizes the cost of capital while maximizing the firm value. The bankruptcy costs also balance the advantages of leverage.

The ultimate level of optimal capital structure is the point where the marginal utility of tax savings caused by leverage equals the total marginal cost of bankruptcy and agency problem.

There are several devices used to reduce the agency costs. The primary disciplining of managers comes through external sources such as the capital market, the managerial labor market and the market for takeovers. Other control devices used to align the interests of managers with shareholders are managerial shareholding, institutional shareholding, blockholding, employing outside directors on the board and leverage.

2.2.2. Managerial Ownership

As firms have faced with growing challenges from such factors as increased competition, regulatory reform and technological change, they have focused considerable new attention on the efficiency of their operations in the recent past. In addition to undertaking major restructuring programs involving substantial layoffs, consolidation, and the implementation of new technology, some banks, for instance,

adopted policies explicitly requiring managers to hold significant stock ownership in the firm. (Cebenoyan et. al., 1999). In each case, the expectation is that by directly tying the manager's wealth to the performance of the firms, the managers become more likely to operate the firms in a value-maximizing way that is generally consistent with the desires of the owners.

Among the control devices used to minimize the agency cost, managerial ownership is still an unresolved question. Amihud, Kamin and Ronen (1983) and Amihud and Lev (1981) have developed a useful approach by stressing the distinction between *managerialism* and *ownerism*. In an environment of managerialism, professional managers can be expected to operate the firms in their own interests, while ownerism exists when managers act in the interests of the firm's external owners. Bridging this divergence of interests is commonly assumed possible through managerial ownership. That is, high enough levels of managerial stock ownership relative to managers' personal wealth may align the interests of managers with those of external shareholders for value-maximizing behavior, converting an environment of managerialism into one of ownerism. (Jensen and Meckling, 1976; Gorton and Rosen, 1995).

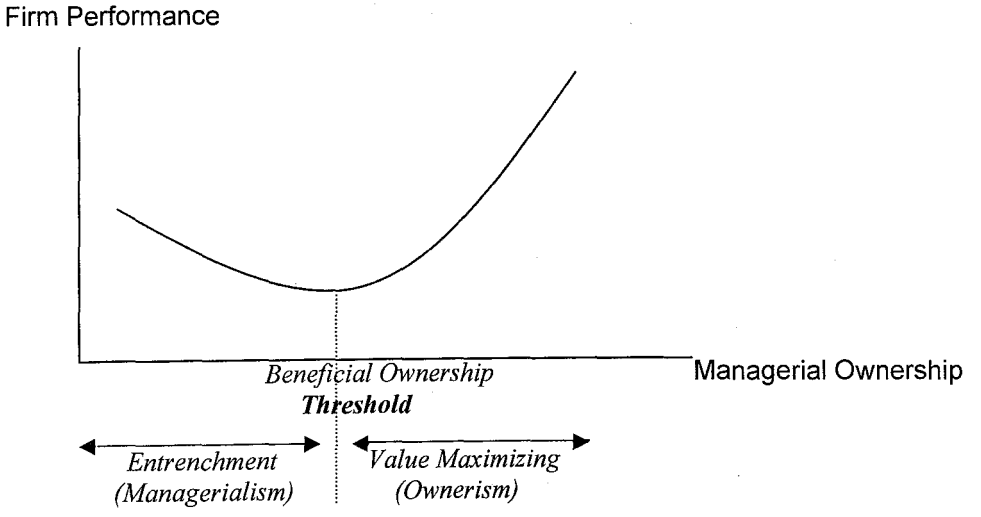
The key word in the previous sentence is the adjective 'high enough'. At low levels of stock holdings, managers may become entrenched and use their power, though limited, to prevent their dismissal even as they pursue their own interest, at the expense of the value of the firm. With confidentiality a necessity especially in banking sector, outside stockholders do not have access to many of the managers' decisions. Thus, with very limited risk of detection and punishment in such an environment, entrenched managers may be more likely to choose to pursue individual goals at the expense of firm value.

From these arguments, it is clear that the divergence between managerialism and ownerism is dependent on the size of the ownership stake that managers have in a firm. Up to a certain point, rising managerial ownership may have a detrimental effect on firm performance as managers become more entrenched and complacent (managerialism dominating). Beyond this point, further increases in managerial ownership may be beneficial to the performance of the firm, with manager-owners striving to improve the efficiency and value of the firm (the emergence of ownerism).

These theoretical considerations provide a background for a test of *a Beneficial Ownership Threshold Hypothesis*. Under this hypothesis, managerial stock ownership and the firm performance should be related in a curvilinear fashion. At modest levels of managerial ownership, the relatively poor performance predicted by managerialism is expected while above some threshold level of managerial ownership, the superior performance of ownerism is anticipated.

Figure 3

Managerial Ownership & Firm Performance Relationship under Beneficial Ownership Threshold Hypothesis

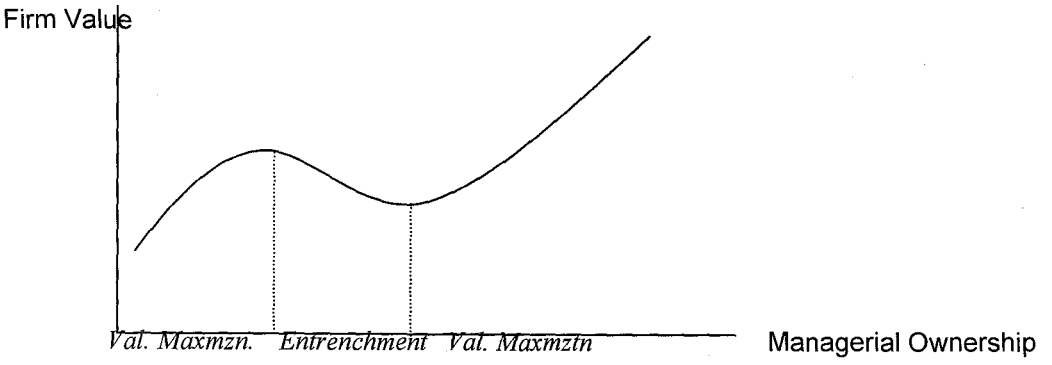


As can be seen in the literature review section ahead, some authors focus on the firm value as the dependent variable. Among those, Morck et.al. (1987) and Chen et.al. (1993) find nonmonotonic relationship between managerial ownership and firm

value, their findings suggest two turning points: Value increases in the first interval, decreases in the second, and finally increases again.

Figure 4

Managerial Ownership & Firm Value Relationship according to Morck et. al. & Chen et. al.



2.2.3. Asymmetric Information and Pecking Order

The foundation of Asymmetric Information approach is that the managers/insiders have more sophisticated and superior information compared to investors/outsiders. This approach, therefore, asserts that the asymmetric information has an important impact on capital structure decisions of the firm. Based on the existence of this asymmetric information, the pecking order approach asserts that there is no such thing as the optimal capital structure for firms that they pursue, yet there is a pecking order, that is, a hierarchy in their financing preferences.

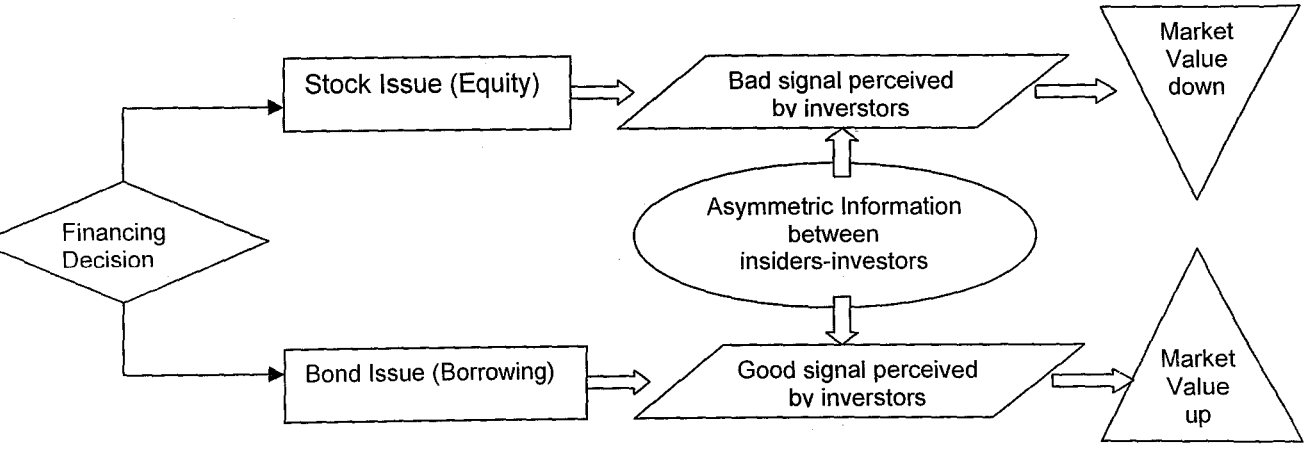
While Modigliani-Miller assume that the both managers (insiders) and investors (outsiders) have symmetric information regarding the future of the firm, Ross asserts that the information in these parties is asymmetric (1977). That is, the managers (insiders) have better information than the investors (outsiders) on the firm. This effects the financing decisions. The financing decisions of the insiders on the firm, on the other hand, are perceived a "signal" by investors and reflected to the firm valuation.

Because the investors do not have the future information on the firm that the insiders have, these information cannot be reflected in the market price of the firm. Therefore, if the insiders expect the future performance of the firm to be good, the firm is undervalued in the opinion of insiders. If the insiders expect future performance to be bad, on the other hand, then the firm is overvalued in the eyes of insiders. Thus, the financing preferences of insiders who have true information on the future performance give a signal to the investors. In case of undervaluation, managers do not prefer equity financing because the stock market will not provide as much amount cash as the firm deserves, thus they go for borrowing. If the firm is overvalued, then the equity financing is preferred because in this case firm obtains more cash then otherwise would obtain from debt financing.

Thus, the equity financing decision of the managers is perceived by the investors as a bad signal for the future of the firm. This subsequently causes a decline in the market price.

Figure 5

Asymmetric Information (Signaling) Approach



Myers asserts that in a world where asymmetric information exists the firms have a pecking order (financing hierarchy) in financing their investments (1984).

According to Myer's approach, managers first prefer the internal sources for the firm's investments because internal sourcing will not be perceived as a bad signal by investors. Thus, investments will be realized without the stock prices decline. On the other hand, external sourcing from capital markets may well put the management under the close watch and audit of the capital markets. Managers usually tend to avoid such cases. In addition to these two disadvantages, issuing stocks or bonds also burdens certain costs of issue on the firm. Due to all these reasons, managers prefer internal financing.

In case that the internal sources are insufficient to meet the needs of the firm, then, according to pecking order approach, debt financing is preferred first. While the equity financing is perceived as a negative signal that causes the decline in stock prices, debt financing is considered relatively less negative signal. In addition, the cost of borrowing is usually lower than that of stock issue. The new stock issue, therefore, happens to be the last resort in financing hierarchy.

Those approaches that consider the asymmetric information suggest that firms should maintain a debt reserve in case of a profitable investment opportunity that firm encounters. If there is no such reserve, then the firm will go for stock issue not to miss the opportunity and will bear the high costs and probably will sell the stocks at an undervalued price. Therefore, firms are advised to maintain a debt level for such cases. Another implication of asymmetric information approach is that the level of borrowing is limited. This limitation requires less borrowing than required by bankruptcy and agency cost approaches.

2.3. AN OVERVIEW OF THE PREVIOUS STUDIES ON THE RELATIONSHIP BETWEEN CORPORATE OWNERSHIP AND PERFORMANCE IN GENERAL

The studies on the corporate ownership date back to 1930s, and this issue has always been in the field of hot discussions in management and finance. The past researches have dealt with the question how the level of agency conflict varies as the level of insiders' share increase or decrease in the firm. Do insiders tend to maximize the shareholders' wealth, therefore, the firm's value, or, to act in their own best interests by deploying the assets for their own benefit?

The literature has provided evidence that a significant relationship between these two concepts does exist. Despite the consensus on the existence of this relationship, there are conflicting findings about the sign of the relationship. Some studies have found positive relationship, while others have found nonmonotonic or curvilinear relationship. I.e, corporate value decreases in some intervals of the amount of the stake owned by managers while it increases in some other intervals. Some studies, on the other hand, have developed efficiency frontiers and used inefficiency scores to measure the performance while others employ some ratios such as ROA and Tobin's Q.

Berle & Means' study (1932) **"Diffusion of the shareholdings in large corporations"**. As the firm size increases, stockholding becomes diffused. The dispersion of ownership reduces shareholders' desire and ability to control large corporations. The separation of ownership and control and decreasing managers' stake in the firm create conflict of interest between owners and managers. When managers hold little equity in such a corporate, the assets may be deployed to benefit managers rather than shareholders.

Jensen & Meckling's study (1976) **"Convergence-of-Interest Hypothesis".** According to this hypothesis, there is a "uniform positive relationship" between management ownership and corporate value. This implies that as managers' stake increases, corporate value increases at all levels of management ownership. As their stake increase, managers pay a larger share of the cost of deviation from value-maximization and are therefore less likely to squander corporate wealth. Therefore, agency costs and management ownership are negatively related.

Demsetz (1983), Fama (1980), Hart (1983) and Jensen & Ruback (1983) **"Entrenchment Hypothesis".** This approach contests Berle and Means (1932), asserting that shareholdings are not diffusely owned among large corporations, because owners will not systematically relinquish control to managers with dissimilar interests. Even if the ownership is diffused, it does not imply reduction in firm value. The writers who assert this thought pointed out offsetting costs of significant management ownership. When a manager owns a small stake, market discipline (e.g. the managerial labor market, product market and market for corporate control) may still force him towards value-maximization. In contrast, a manager who controls a substantial fraction of the firm's equity may have enough voting power or influence to guarantee his employment with the firm at attractive salary. This hypothesis claims that corporate assets can be less valuable when managed by an individual free from checks on his control.

Morck et.al. (1987), Chen et.al. (1993) **"Nonmonotonic relationship".** These studies have proved that corporate value is a function of management ownership and there is a nonmonotonic relationship between these two parameters. That is, the slope of the corporate value varies depending on the intervals of management ownership. They used a piecewise regression that allows slopes to

change at 5% managerial ownership, and 25% managerial ownership. That is, they split the independent variable "managerial ownership" into three intervals and checked to see how the firm value is affected within these intervals. They measured firm value by Tobin's Q (TQ), which equals market value of assets divided by the replacement cost of physical assets. The findings reveal that TQ increases as managerial ownership increases up to 5%. Between 5% and 25% entrenchment occurs and TQ tends to decline; over 25%, managers' interests converge with the firm's interests, and TQ increases again. In these investigations, the other concomitant variables such as firm size, debt ratio, expenditure on advertisement and R&D are also controlled for.

Amihud, Kamin and Ronen (1983), Amihud and Lev (1981), Jensen and Meckling, 1976, Gorton and Rosen, 1995 **"Stressing the distinction between 'Managerialism' and 'Ownerism".** In an environment of managerialism, professional managers can be expected to operate the firms in their own interests, while ownerism exists when mangers act in the interests of the firm's external owners. Bridging this divergence of interests is commonly assumed to be possible through managerial ownership. That is, high enough levels of managerial stock ownership relative to managers' personal wealth may align the interests of managers with those of external shareholders for value-maximizing behavior, converting an environment of managerialism into one of ownerism.

Saunders, Strock and Travlos (SST)(1990), Mullins (1991), Demsetz, Saidenberg and Strahan (1997), Chen, Steiner and Whyte (1998) and Anderson and Fraser (2000) **"Relation between managerial ownership and market risk measures."** SST and Mullins find a significant positive linear relationship between ownership and risk for a sample of bank holding companies. While Demsetz, et al.

find similar results, the others reach contesting conclusions suggesting negative or nonlinear relation.

Berger and Mester (1997), Cebenoyan, Cooperman, and Register (1995, 1999, 2000) **"Studies on Banks and Thrifts."** Berger and Mester examine determinants of cost and profit efficiency in bank holding companies. They do not find managerial ownership as a significant determinant. The latter group of authors examines the relationship between accounting risk measures and managerial ownership for the banking sector in the 1980's and early 1990's and find nonlinear relation. In their last research, they analyze the relationship between managerial ownership and performance as well as riskiness. The results provide supporting evidence to the beneficial ownership threshold hypothesis. That is, up to a certain level of managerial ownership, managers tend to become entrenched and deploy the firm's assets to their own interests. Beyond that level, they change this attitude and dedicate their efforts to value maximization of the firm.

Uğurlu (1999) and Önder (2000): **"Evidence from Turkish manufacturing industry."** These recent papers make useful contribution by providing answers to the key questions around agency theory from the recent data of Turkish manufacturing industry. Ugurlu's work examines the interrelations between the devices used to control agency costs. The results suggest that proportion of insiders on the board is positively related to the percentage of family shareholdings and negatively related to the percentage of foreign institutional shareholdings and ownership concentration. The finding that managerially controlled firms have lower debt ratio than the institutionally controlled and the family controlled firms supports the entrenchment hypothesis. Onder, on the other hand, focus on the 'concentration' dimension of ownership structure. The findings suggest that the concentration of ownership is

positively related to the market value of equity and negatively related to the operating efficiency. That is, as the concentration of ownership increases, the market value of the equity increases as well. As concentration decreases, assets are more efficiently used. The research also found that public ownership rate is positively related to growth rate of assets and growth rate of sales.

3. PUBLIC OWNERSHIP AND PERFORMANCE

3.1. INTRODUCTION

Most businesses begin life as proprietorship or partnerships, and then, as the more successful ones grow, at some point, they usually find is desirable to convert into corporations. Initially, these new corporations' stocks are generally owned by the firm's founders, officers, key employees, and/or a very few investors who are not actively involved in management. However, if growth continues, at some point the company may decide to go public.

This study specifically investigates the change in operating performance of firms as they make the transition from private (closely held) to public ownership through initial public offerings (IPOs). Although some recent studies investigate the performance of IPO firms, they typically focus on the post-issue stock price performance rather than accounting performance. A few papers based on the U.S. or European firms put aside, this is the first comparative study that attempts to empirically investigate the operating performance of Turkish manufacturing firms before and after IPOs.

3.2. LITERATURE REVIEW

3.2.1. An Overview of Recent Empirical Studies

Singh and Hamid (1992) investigated the links that might exist between corporate capital structure and the types of financial markets and institutions that are supportive of long-term growth. To that end, the authors examined the accounting and stock market information for the top fifty listed manufacturing corporations in nine less developed countries (LDCs) including Turkey. The results of their study showed that LDC corporations in general rely heavily on external funds and on new issues of shares to finance the growth of their net assets. Comparing their results with Mayer's (1990) stylized facts concerning the financing patterns of advanced country corporations; they concluded that there were important differences between the two groups of corporations. They suggested that LDC firms rely on external finance, to a greater extent than their counterparts in advanced economies. According to the findings of Singh and Hamid, Korean stock market development in the 1980s contributed to raising capital for the investment of large companies and played a large role in the expansion of Korea's private sector.

Singh (1995) tried to test the robustness of his first study's results by increasing the size of the firm samples and by including an additional country, Brazil. He explored the initial hypotheses to explain the observed results and to identify the reasons why LDC firms apparently resort to new equity funds to such a large degree to finance their growth. Relying on aggregate statistics compiled by United Nations Conference on Trade and Development (UNCTAD) (1993), Singh concluded that the reason developing country firms rely heavily on equity funds is for investment.

Pagano et. al. (1998) found that Italian companies appeared to go public not to finance future investments and growth, but to deleverage, or to adjust their balance

sheet after a period of abnormally high investment and growth. Using the financial data of private firms in Italy from 1982 to 1992, the authors analyzed the determinants of IPOs by comparing the ex ante and ex post characteristics of IPOs with those of private (closely held) firms. The likelihood of an IPO increased with a company's size and the industry's market-to-book ratio. Companies appeared to go public not to finance future investments and growth, but also to adjust their debt ratios after a period of high investment and growth. Pagano et.al. observed that the leverage, capital expenditures, and profitability declined after the IPO. Although profits may decline after a firm chooses to go public, given a firm's characteristics, the overall benefits of going public outweigh the costs, including, for instance, lower costs of credit and an increased turnover in control.

In the long-run, Ritter (1991) reported that stock issuing firms during 1975-1984 substantially underperformed a sample of matching firms (by which Ritter means that same-capitalized companies which have not issued stock within the last five years are matched) from the period of the closing price on the first day of public trading to their three-year anniversaries. There is substantial variation in the underperformance year-to-year and across industries, with companies that went public in high-volume years faring the worst. The patterns are consistent with an IPO market in which 1) investors are periodically overoptimistic about the earnings potential of young growth companies, and 2) firms take advantage of these "windows of opportunity". There are, however, large variations in the volume of IPOs over time. If the high volume periods were associated with poor long-run performance, this would indicate that issuers are successfully timing new issue to take advantage of a "windows of opportunity".

Mayer and Alexander (1991) made a comparative study of public and private companies, or, "quoted" and "unquoted" firms, as called in the U.K., where they obtained the data. They set out to answer whether stock markets are a source of *short-termism*, referring to a practice of discouraging long-term projects and investment over short-term profits. Data is gathered for 56 quoted and 56 unquoted UK firms. Analysis done on matched pairs consists of statistical summaries that result in the authors' comparing characteristics, real performance, and financial performance of quoted and unquoted firms. The study found that the concentration of ownership for the unquoted sample is higher, especially shares owned by directors. Quoted firms are larger than unquoted when ranked by sales, and the industry concentration for each varies. Growth rates of sales, investment, and employment of quoted firms are greater than unquoted. Do quoted firms perform better than others? The study finds out that profits for both types of firm have risen over the sample period, but profit margins are higher for quoted than unquoted firms. This is also true for dividend expenditures. Unquoted firms have higher investment to profit ratios but this can be attributed to the lower dividend to profit ratios. The authors' result indicate that short-termism is not a problem if one looks at the financial performance of quoted firms; however, the existence of higher dividend payments and greater expenditure on takeovers could indicate that short-term profits are sought after rather than long-term projects. The question of inefficiency as a result of separation of ownership and control is shown to be unresolved as quoted firm outperform unquoted firms.

Evans, Hay and Morris (1995) set out to determine which form of governance structure provides economic efficiency. They attempted to find out an explanation for the superior performance of Japan and Germany during late 1980s and early

1990s, which led many to think that those countries had superior forms of corporate governance. Since Japan and Germany are characterized by concentrated and highly monitored firms versus Anglo-American characterization of firms with dispersed shareholdings and frequent takeovers, the issue of separation of ownership and control in public corporations resurfaced. They provided a classification system for shareholdings by country separating dispersed versus concentrated, managerial versus non-managerial, and individual versus institutional. The U.S. listed firms are dominated by individual shareholders while UK listed firms are dominated by institutions. Concentrated shareholding is found in Japanese firms by mostly institutional shareholders, by individual owners in German companies, and by managerial owners in UK unquoted firms. As for the profitability comparison, analysis of variance reveals that unquoted firms are definitely more profitable then quoted firms. Return on equity is higher for unquoted firms. Overall, smaller unquoted firms outperform quoted and larger unquoted, respectively, but most firms fall into the smaller unquoted category. Alternatively, growth is higher in quoted firms compared to smaller unquoted firms. Larger unquoted firms better and grow. The authors conclude that quoted firms pursue growth rather than profits as a defense mechanism against takeover while smaller unquoted firms do not have the pressure to grow. Also, as larger unquoted firms become more profitable, they are taxed more which leads to growth strategy to avoid taxation that might force a sale of the company or financing. In sum, their results confirm the Berle and Means hypothesis that diffuse ownership may lead to inefficient performance. It should be noted, however, that divergence in performance between quoted and unquoted firms was much smaller in the later years of 1980s which could indicate that differences in performance is eroding over time.

3.2.2. Economic Development and the Stock Market

Atje and Jovanovic (1993) provide a model in which financial markets have a greater stimulating effect on economic growth than just financial intermediation. Their study of 40 countries found a significant correlation between economic growth over the 1980-88 period and the value of stock market trading divided by Gross Domestic Product (GDP). They concluded that stock markets are more helpful to the development of venture capital and, hence, technical progress than banks.

Using similar econometric approach to that of King and Levine (1993), Levine and Zervos (1995) studied the links between stock market and development and growth, and then analyzed measures of both the stock market and banking development predict growth. They found that, after allowing for a host of other factors associated with growth, the level of stock market development, especially market liquidity, is robustly correlated with current and future economic growth, capital accumulation, and productivity growth. Moreover, measures of both stock market development and banking development independently predict long-run economic growth even when entered together in cross-country growth regressions.

UNCTAD (1933) reported that, for several industrializing countries, new issues on the stock market have been important in financing a considerable proportion of their total gross domestic investment.

In Turkey, the development and performance of stock market and the economy reveals meaningful relationship. The Turkish capital market has significantly expanded since the 1980s, the period during which the country experienced a series of fast and fundamental changes towards a market economy similar to those in developed countries. Although severe crises, persistent inflation and instability have had an obvious deteriorating effect on the security market, the

direction of the main policy of the Turkish State has remained towards more liberal, capitalist economy. Despite the extreme volatility in the securities market due to crises, a considerable progress took place in terms of public offerings of private firms and privatization of state enterprises *(KITs)*. Some major *KITs* have been privatized; a considerable number of private companies have gone public. Thus, the security market has somehow survived and even expanded. However, both the public's stake in Turkish firms and the market capitalization-to-GNP ratio is still below the sufficient level, as empirically proven this study.

The empirical findings related to the economic environment in Turkey throughout the sampling period and the relationship between economic indicators and stock market data are described in detail in the findings section ahead.

3.2.3. Advantages of Going Public

1. Permits founder diversification. As a company grows and becomes more valuable, its founders often have most of their wealth tied up with the company. By selling some of their stock in a public offering, they can diversify their holdings, thereby reducing somewhat riskiness of their personal portfolios.

2. Increases liquidity. The stock of a closely held firm is illiquid: it has no ready market. If one of the owners wants to sell some shares to raise cash, it is hard to find a ready buyer, and even if a buyer is located, there is no established price on which to base the transaction. These problems do not exist with publicly owned firms.

3. Facilities raising new corporate cash. If a privately held company wants to raise cash by a sale of new stock, it must either go to its existing owners, who may not have any money or not want to put any more eggs in this particular basket, or else shop around for wealthy investors. However, it is usually quite difficult to get

outsiders to put money into a closely held company, because if the outsiders do not have voting control (over 50 percent of the stock), the inside stockholders/managers can run roughshod over them. The insiders can pay or not pay dividends, pay themselves extraordinary salaries, have private deals with the company, and so on. For example, the president might buy a warehouse and lease it to the company at a high rental, get the use of Rolls Royce, and enjoy frequent "all-the-frills" travel to conventions. The insiders can even keep outsiders from knowing the company's actual earnings, or its real worth. There are not many positions more vulnerable than that of an outsider stockholder in a closely held company, and for this reason, it is hard for closely held companies to raise new equity capital. Going public, which brings with it both public disclosure of information and regulation by certain state agencies, greatly reduces these problems, making people more willing to invest in the company, and thus making it easier for the firm to raise capital.

4. Establishes a value for the firm. For a number of reasons, it is often useful to establish a firm's value in the marketplace. For one thing, when the owner of a privately owned business dies, state tax appraisers must set a value on the company for estate tax purposes. Often, these appraisers set too high value, which creates an obvious problem. However, a publicly owned company has its value established with a little room for argument. Similarly, if a company wants to give incentive stocks to key employees, it is useful to know the exact value of those options. Finally, for a number of reasons, employees much prefer to own stock, or options on stock, that is publicly traded. (Brigham and Gapenski (1994)).

5. Contribution to the Economic Development. Financial markets are essential components and determinants of the economic structure of a country. Public offerings, as they develop the financial markets, make considerable contribution to

the economic development especially in developing countries. The stock markets play important role in financing a considerable proportion of the total gross domestic investment. A well-functioning stock market helps to create a more equitably distributed welfare, as well as to increase capital accumulation.

3.2.4. Disadvantages of Going Public

1. Cost of Reporting. A publicly owned company must file quarterly and annual reports with various state agencies such as Capital Markets Board. These reports can be costly, especially for the small firms.

2. Disclosure. Management may not like the idea of reporting operating data, because such data will then be available to competitors. Similarly, the owners of the company may not want people to know their net worth, and since a publicly owned company must disclose the number of shares owned by its officers, directors, and major stockholders, it is easy enough for anyone to multiply shares held by price per share to estimate the net worth of the insiders.

3. Self-dealings. The owners/managers of closely held companies have many opportunities for various types of questionable but legal self-dealings, including the payment of high salaries, nepotism, personal transactions with the business (such as a leasing arrangement), not-truly-necessary fringe benefits. Such self-dealings, which are often designed to minimize taxes, are much harder to arrange if a company is publicly owned.

4. Inactive market/low price. If the firm is very small, and if its shares are not traded with much frequency, its stock will not really be liquid and the market price may not be representative of the stock's true value. Security analysts and stockbrokers simply will not follow the stock, because there will just not be

sufficient trading activity to generate sufficient sales to commissions to cover the costs of following the stock.

5. Control. Because of the increase in tender offers and proxy fights, the managers of publicly owned firms who do not have voting control must be concerned about maintaining control. Further, there is pressure on such managers to produce annual earnings gains, even when it might be in the shareholders' best long-term interests to adopt a strategy that might penalize short-term earnings but benefit earnings in future years. These factors have led a number of public companies to "go private" in leveraged buyouts deals where the managers borrow the money to buy out the nonmanagement stockholders.

3.2.5. Determinants and Consequences of Going Public

Pagano et. al. (1998) summarized theories related to the costs and benefits of going public as described in Table 3. In these theories, each cost or benefit is associated with the most representative model and with empirical predictions of these models of these models on the variables affecting the probability and likely consequences of an IPO. According to these theories, the variables affecting probability of an IPO are a firm's financial characteristic such as size of the firm, leverage, R&D, cost of financing, growth rate, risk and organizational characteristics such as concentration of ownership and control, and external factors like the stock market index. Following are a brief review of the hypotheses related to the determinants and consequences of going public.

1. Adverse Selection. The informational asymmetry, (which also means that smaller and newer companies are less well-known to investors), between investors and issuers about the true value of firms adversely affects the average quality of

firms seeking a new listing and thus the price at which their shares can be sold, and also determines the magnitude of the underpricing needed to sell them. This adverse selection cost is a more serious obstacle to the listing of young and small firms that have little track record and low visibility than for old and large firms. In the presence of adverse selection, the probability of going public should be positively related with the age and/or the size of the company.

2. Administrative Expenses and Fees. Going public implies considerable direct costs of underwriting fees, registration fees, legal fees, and professional fees. In addition to the initial underwriting expenses, there are other fees related to the legal requirements for the listing company such as yearly expenses on auditing and being listed on a stock exchange. Since these expenses increase proportionally with the size of the IPO, they are, in relative terms, more significant for small firms. Thus, the existence of direct costs of stock exchange listing suggests the likelihood of an IPO being positively correlated with firm size.

3. Overcoming Borrowing Constraints. Gaining access to another source of finance in addition to banks is the most cited benefit of going public, which is explicitly present in most models. The opportunity to tap public markets for funds should be particularly appealing to companies with large current and future investment plans, with high leverage, and with rapid growth. All these factors should be positively related to the likelihood of an IPO.

Other implications of the financial constraint hypothesis, which can be tested using ex post data, are that newly listed firms should increase their investment or reduce their debt exposure after an IPO and are not likely to increase their payout ratio after an IPO.

4. Greater Bargaining Power with Banks. By gaining access to the stock market and disseminating information to investors, a company encourages outside competition to its bank and ensures a lower cost of credit and/or a larger amount of external financing (Rajan, 1992). Thus, to reduce credit costs or to have alternate sources of funds, the firms facing higher interest rates are and more concentrated credit sources are more likely to go public. After an IPO, credit will become cheaper and more readily available. That is, the cost of borrowing is expected to decrease in the post IPO period, and, therefore, the leverage is expected to increase.

5. Liquidity and Portfolio Diversification. The decision to go public affects the liquidity of a firm's stock as well as allowing for diversification by the firm's shareholders. Shares of private firms can be traded only by informal searching for a counterpart, at considerable cost for the initiating party. Share trading on an organized exchange is cheaper, especially for small shareholders who want to trade on short notice. If the initial owners raise money from many investors, there is a benefit of liquidity provided by being listed on an exchange. Since liquidity of a firm's shares increases with the trading volume, only sufficiently large firms may effectively reap this benefit. This implies a positive relationship between size and o a company and the likelihood of an IPO. Similarly, taking a company public provides its owners with opportunities for diversification. This can be achieved directly, by divesting from the firm and reinvesting in other assets, or indirectly, by having the company acquire stakes in other companies. If diversification is an important motive in the decision to go public, riskier companies should be more likely to go public. In addition, controlling shareholders should sell a large proportion of their shares at the time of IPO or soon afterward to reduce risk.

5. Monitoring. The stock market also provides a managerial disciplinary device, both by creating the danger of hostile takeovers and by exposing the firm to the market's assessment of its managerial decisions. Moreover, shareholders of a public company can use stock price information to design more efficient compensation schemes for their managers, such as by indexing their salaries to the stock price or by offering stock options.

6. Windows of Opportunity. If there are periods in which stocks are mispriced, as suggested by Ritter (1991), firms recognizing that other firms in their industry are overvalued have incentive to go public. One would also expect a company to be more likely to go public when the market for comparable firms is particularly buoyant to the extent that entrepreneurs manage to exploit the overvaluation of their companies by investors (Ritter, 1984). Pagano et al. measures the buoyancy of the relevant market by the median market-to-book (M/B) ratio of public companies in the same industry. A high M/B ratio may also indicate that rational investors place a high valuation on future growth opportunities in an industry. If these growth opportunities require large investments, companies will be induced to go public in order to raise the necessary funding (Singh, 1995).

Pagano et al. tried to discriminate between these two hypotheses mainly by relying on ex post evidence. If newly listed firms invest an abnormal rate and earn large profits, then the relationship between M/B and IPOs is likely to be driven by expectations of future growth opportunities. Otherwise, it is likely to reflect the desire to exploit a "window of opportunity." But an indirect test can also be based on ex ante evidence. If raising funds for future investments is the main reason to go public, the likelihood of carve-outs should not be affected by the M/B because the parent firm already has access to the stock market.

Table 1

Empirical Predictions of the Main Theories Concerning the Decisions to Go Public

The following table illustrates the main costs (Panel A) and benefits (Panel B) of the decision to go public. Each cost or benefit (first column) is associated with the most representative models capturing it (second column) and with the empirical predictions of these models on the variables affecting the probability of an IPO (third column) and the likely consequences of the IPO (fourth column).

		Empirical Predictions	
	Model	**Effects on the Probability of IPO**	**Consequences after IPO**
Panel A: Cost of Going Public			
Adverse selection and moral hazard	Leland and Pyle (1977), Chemmanur and Fulghieri (1995)	Smaller and younger firms less likely to go public	Negative relation between operating performance and ownership
Fixed costs	Ritter (1987)	Smaller firms less likely to go public	
Loss of confidentiality	Campbell (1979), Yosha (1995)	High-tech firms less likely to go public	
Panel B: Benefits of Going Public			
Overcome borrowing constraints		IPO more likely for high-debt and/or high-investment firms	Deleveraging / high-investment
Diversification	Pagano (1993)	Riskier firms more likely to go public	Controlling shareholder decreases his stake
Liquidity	Market microstructure models	Smaller firms less likely to go public	Diffuse stock ownership
Stock market monitoring	Holmstrom and Tirole (1993), Pagano and Rolell (1998)	High investment firms more likely to go public	Large use of stock-based incentive contracts
Enlarge set of potential investors	Merton (1987)		Diffuse stock ownership
Increase bargaining power with banks	Rajan (1992)	IPO more likely for firms paying higher interest rates	Decrease in borrowing interest rates
Optimal way to transfer control	Zingales (1995)		Higher turnover of control
Exploit mispricing	Ritter (1991)	High M/B ratio in the relevant industry	Underperformance of IPOs; no increase in investments

Cho (1994) reported that the growth rate of assets and the amount of fixed assets after IPO increased the probability of an IPO. On the other hand, the ration of bank loans to total liabilities, the ratio of land value to sales, and the degree of leverage reduced the probabilities for IPO. Cho used paired group data from 284 firms, including 142 listed firms that went public from 1988 to 1991 and registered firms.

3.2.6. Stock Market Performance of IPOs

There well-documented "anomalies" with IPOs are underpricing, "hot issue" markets and long-run underperformance.

Numerous studies have documented the underpricing phenomenon and the hot issue market phenomenon in the pricing of IPOs. Rock (1986) reported that if new shares are priced at their expected value, privileged investors (investors whose information is superior to that of the firm as well as that of all other investors) crowd out other investors when good issues are offered and they withdraw from the market when bad issues are offered. The offering firm must price the shares at a discount in order to guarantee that the uninformed investors purchase the issue. Ritter (1984) also reported on the most hot issue market that was followed by large and prolonged increases in the volume of IPOs.

Ritter and Loughran (1995) also revealed that the "new issue puzzle" which demonstrates that IPOs and Seasoned Equity Offerings (SEOs) have been poor long-run investments for investors. The average annual return during the five years after issuing is only 5% for firms conducting IPOs, and only 7% for firms conducting SEOs.

In their sample of IPOs from 1973-1988, Loughran reported that, on average, IPOs underperform during the six calendar years after going public.

This phenomenon of IPO underperformance is no restricted to the U.S. Levis (1993) showed that IPOs in the U.K. underperformed relevant benchmarks for 36 months of their public listing after their first day of trading.

Lee (1993) opened a window to emerging markets in the Korean context (which was then an emerging market but may well be considered "developed" today). He reported that there is evidence of a "hot issue market" in Korea in the short term, but IPOs outperformed in the long run, a contrary result to Ritter and Loughran (1995).

Özer (1999), achieved one of the most recent and comprehensive study on IPO performance in Turkey, identifies the patterns and determinants of market performance of IPOs in the stock exchange in Turkey. The study documents the return structures using raw return, market adjusted return and aftermarket adjusted return series of IPOs for the 500 event days following the offer. Market related, issue related, issuing firm related and underwriter related characteristics are investigated as sources of differences in IPO returns. The results indicate that IPOs provide significant excess returns over the market in the first three days. The returns of IPOs are independent of the market movement during the first three days and then they approximate to the market. Although daily returns are not significantly different form the market, cumulative returns in IPO market increase for about two weeks and reach the maximum level around this date. The cumulative returns exhibit a decreasing and increasing trend over the remaining 500 days but the level of cumulative returns obtained at the end of 500 days remains much below the level of return obtained at the end of second week of trading. The pattern of IPO returns also indicates the presence of segmentation in the IPO market. Environmental and market related factors are found to act as important sources of differences in both initial and long

term returns. The seasoning of the IPO market itself, the relationship between the underwriter and the issuer and the short term trend of the market as the time of the IPO are the most important variables accounting for differences in initial returns.

3.3. RESEARCH QUESTIONS AND EXPECTATIONS

This study attempts to empirically test the hypotheses reflecting the post-IPO expectations on the certain financial indicators of firms. The theory and previous research done on the basis of U.S. and European firms have showed that IPO firms exhibit a decline in post-issue operating performance relative to their pre-IPO levels. The decline in operating performance of IPO firms, however, comes with a caveat. These firms exhibit high growth in sales and capital expenditures relative to those firms in the same industry in the post-IPO period. Thus, declining operating performance of IPO firms cannot be attributed to lack of sales growth opportunities or cutbacks in post-IPO capital expenditures. The expectations and interpretations on the case of Turkey, however, may be somewhat different than the previous studies done in the West due to the macroeconomic conditions and firm behaviors both peculiar to Turkey. While the expectation of this study on the operating performance is the same, that is, a decline is expected, other indicators may well behave differently than those found in the western literature. First of all, the instable and high-inflationary economy makes it difficult to take rational financial decisions and to do long-term planning. Capital expenditures, for instance, is unlikely to increase in the post-IPO period, because firms tend to perceive IPO as a short-term financing opportunity and they go public not to finance future investments and growth, but to deleverage, or to adjust their balance sheet after a period of abnormally high investment and growth.

Derived from the relevant theories and expectations in the Turkish context, the testable hypotheses of this research concerning the Turkish manufacturing firms that go public are listed in the following paragraphs.

1. The operating performance is expected to decrease after IPO.

2. There is not an increase expected in investment after IPO.

3. The leverage is expected to increase after IPO. (It is expected to decrease towards and at the IPO).

4. The cost of borrowing is expected to decrease after IPO.

5. There is a positive relationship between the proportion of ownership retained by insiders (managerial ownership) after IPO and operating performance.

6. There is a positive relationship between the proportion of ownership retained by insiders (managerial ownership) after IPO and capital expenditures.

7. There is a positive relationship between underpricing and post-IPO operating performance. That is, IPO firms that underprice should exhibit superior operating performance in comparison to those that do not.

8. The stock market has an overoptimistic expectation concerning IPO firms based on their pre-IPO performance. In other words, the ratios comparing market expectations to the actual firm performance is expected to be high subsequent to the IPO, declining significantly over time.

3.4. DATA

3.4.1. Source of Data

The main data sources are the firm's balance sheets, income statements, cash flow statements, yearbooks, stock market and other macroeconomic statistics.

As many empirical research done in Turkish context encounter, this study as well had to cope with the difficulties to find the accurate firm data especially belonging to pre-IPO period. The main problem is that the firms in Turkey do not provide sufficient information to public unless they apply for the Stock Exchange to trade their shares. Therefore, there are not accurate and detailed data available of those firms that do not go public. Although certain institutions such as Chambers and banks hold this information, they do not provide them pronouncing the confidentiality issue as an excuse. It is difficult to find even the last one-year data prior to IPO in some cases. Another difficult task is finding the accurate and detailed ownership structure data. Overall, consistency and compatibility of financial data across the firms before can be questioned in some cases.

These problems arise from the lack of institutionalization, lack of discipline and late development of Turkish capital market and accounting standards. Thus, achieving such an empirical research in Turkey happens to be much more difficult task compared to, say, the U.S. where everything is well-documented and ready to use in certain sources such as COMPUSTAT.

All difficulties put aside, the best data provider institutions appear to be the Istanbul Stock Exchange (ISE) in firm-specific data, The Central Bank (TCMB), The State Planning Organization (DPT) and the Treasury in macro economic data. In addition, some private financial portals such as www.analiz.com on the Internet provide useful database to the researchers.

The pre-IPO data is obtained mostly from the ISE bulletins from the ISE Library. While in some cases data are available on the CD or Internet, most data belonging to pre-IPO period and ownership structure are not available in digital format, and most of them are obtained from the monthly bulletins and entered manually.

As for the industry-specific data, the Industry Sector Financial Statements published the TCMB provide the necessary information. The old data are available in the books and last five years are on the CD. Other macroeconomic data are obtained from the Internet sites of TCMB, DPT and Treasury.

3.4.2. Sample Selection Process and Time Span

The first criterion to select the firms is their industry. Because the manufacturing industry is considered the most important component of the economy, only manufacturing firms in Turkey constitute the first-step prospective sample. Second step in the selection process is a result of the fact that necessary data are available for ISE-quoted firms only. That is, only those manufacturing firms traded in ISE are selected. Among these, only those firms of which IPOs occurred between 1990 and1998 inclusive are considered because the earliest and latest periods where pre-IPO and post-IPO data are available require this interval. The last requirement for a firm to be included in the sample is to have at least one year OROA data prior to IPO and four subsequent years after the IPO year (year –1 through +4). Although most observations have the other financial data for year –3 through year +4 (Eight-year-data), there are some firms lacking the other financial data for year –3 and –2. The final sample is consisted of 81 firms.

The distribution of 81 IPOs throughout the research period prevents the study from prospective bias of timing and industry. That is, there are sufficient

number of IPOs occurred each year. This makes the sample consisting of different time windows each have at least six-year-data (from the year prior to IPO through fourth year after IPO). Thus, the effects of peculiar macro economic conditions are balanced with other periods. The distribution of industry, however, looks more uneven compared to that of IPO year. This prospective bias is eliminated by also taking industry-adjusted values of all variables throughout the analysis. The industry means represent both public and non-public companies selected by TCMB.

Table 2 shows the summary statistics for the sample. The number of IPOs in manufacturing industry per year shows a various trend depending mostly on the macroeconomic conditions. The distribution of IPOs in all sectors also shows the same trend.

In panel A the distribution of IPOs are classified by industry sector and year. The distribution of sectors is highly skewed, as expected. Constituting a sample where all sectors are represented in equal numbers would be seen an attempt to avoid sampling bias. However, it is considered unnecessary in this study on the ground that this sample should also represent the actual sector distribution of all firms in the entire economy. Indeed, this sample exhibits a representative distribution of the weights of each sector in the Turkish manufacturing industry.

In panel B of table 2, the characteristics of the sample are outlined. The mean (median) initial stock return for the sample is 9,67 (7,14) percent. The mean (median) gross proceeds raised by these firms are 386 (181) billion TL in current prices and 37 (22) billion TL in inflation-adjusted prices. The mean (median) proportion of equity sold to public is 19 (15) percent, meaning 81 (85) percent of the firm is retained by insiders. These figures suggest that the original entrepreneurs continue to hold a substantial stake in the firm after IPO.

Table 2

Sample Summary Statistics

Frequency distribtuions and characteristics of a sample of 81 public offerings through Istanbul Stock Exchange (ISE). The sample consist of those manufacturing firms that have sufficient data for at least one year prior to IPO and three years after IPO. The data is collected and compiled from print and digital sources of ISE, Central Bank, Treasury and State Planning Organization of Turkey. ISE classification is used to classify the sample with respect to industry sectors. The initial return is defined as the difference between the first ISE-listed after-market-price and the offering price as a proportion of the offering price. The Management's share is proportion of the equity of the firm retained by original owners after the IPO.

Panel A: Number of IPOs per year

(Manufacturing Industry)

Year	Number of IPOs
1990	14
1991	8
1992	5
1993	8
1994	13
1995	10
1996	9
1997	8
1998	6
Total	**81**

Panel A1: Number of IPOs by Industry Sector

Industry Sector *	1990	1991	1992	1993	1994	1995	1996	1997	1998	**Total**
DGD	1	3		2	1	4	5	3	3	**22**
GIT	1		1	1	5		2	1	2	**13**
TTS	3	1	1	2		4		1		**12**
MMG	3		2	2	2		1	1		**11**
PKM	3	2			1	1	1	1		**9**
KBY	1	1	1	1	2				1	**7**
MET	1				2					**3**
OTO		1				1		1		**3**
ORM	1									**1**
Total	**14**	**8**	**5**	**8**	**13**	**10**	**9**	**8**	**6**	**81**

Industry Sector Codes

DGD	Textile, wearing apparel and leather sector
GIT	Food, bevarage and tobacco sector
TTS	Non-metalic mineral products
MMG	Fabricated metal products and machinery equipment
PKM	Chemicals, petroleum, rubber and plastic products
KBY	Paper and paper products, printing and publishing sector
MET	Basic metal industries
OTO	Automotive sector

Panel B: Characteristics of IPO Sample

Descriptive Measure	Mean	Median
Initial Return (%)	9,67	7,14
Offer Price (TL)	12.243	8.000
Public Share (Proportion Traded in ISE) (%)	18,55	15,13
Management's (Insiders') Share(%)	81,45	84,87
Size of Issue - Current prices (Million TL)	385.695	181.140
Size of Issue - 1990 prices (Million TL)	37.070	21.782

3.4.3. Economic Environment and the Stock Market in Turkey throughout the Sampling Period

Table 2 and Table 3 explore the overall picture of Turkish economy and Turkish stock market during the sampling period of the study. This period captures almost all characteristic episodes of the Turkish economy. These two tables, when analyzed simultaneously, also give an idea on the correlation between the development of the stock market and the general performance of the economy. For example, a correlation analysis for the relationship of GNP with the basic stock market indicators reveals significant positive relationships, as expected. The *Pearson* correlation coefficients for the relationship of GNP with ISE market capitalization, number of firms traded in ISE, trading volume of ISE and ISE-100 Index are 0,7392, 0,9711, 0,8217, and 0,3169, respectively.

The market capitalization, however, is still not at a significant level in Turkey compared to other developing economies. Total market capitalization of ISE companies in 2002 equals 20 percent of the GDP. It was 17 percent in 1995, a very low ratio, compared to 40 percent of Korea in the same year. In 1995, the number of companies traded in ISE was 193, a significantly low number compared to that of Korea, which were 721 then. Considering the number of companies traded in ISE as of the end of 2002 is 262, still below the Korea's 1995 level, one can conclude that there is still a huge gap between these two economies, considered equivalent in many terms some fifty years ago.

Table 3

Some Key Macroeconomic Indicators Throughout The Sampling Period

Table represents the macroeconomic environment in Turkey during the sampling period of the research. All IPOs in the sample fall into the period between 1990 and 1998. However, due to the requriements of the research that pre-IPO and post-IPO data are used, the overall data frame stretch from 1987 to 2002. The macroeconomic data are obtained from digital sources of The Treasury, State Planning Organization and The Central Bank. The year-to-year percentage changes in the items are in italic fonts shown below the respective level-data .

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
GNP Levels-87 pr (000.000.000TL)	75.019	76.108	77.347	84.592	84.887	90.323	97.676	91.733	99.028	106.080	114.874	119.303	112.044	119.144	107.783	116.165
GNP Levels-Curr Pr (000.000.000TL)	75.020	129.175	230.371	397.178	634.393	1.103.843	1.997.323	3.887.903	7.854.887	14.978.067	29.393.262	53.518.332	78.282.967	125.596.129	176.483.953	273.463.168
GDP Levels-Curr Pr (000.000.000TL)	74.722	129.223	227.325	393.060	630.117	1.093.368	1.981.868	3.868.430	7.762.456	14.772.110	28.835.883	52.224.945	77.415.272	124.583.458	178.412.438	276.002.988
GNP (87 prc) % change	*9,8*	*1,5*	*1,6*	*9,4*	*0,3*	*6,4*	*8,1*	*-6,1*	*8,0*	*7,1*	*8,3*	*3,9*	*-6,1*	*6,3*	*-9,4*	*7,8*
Empolyment Rate %	91,50	91,30	91,10	91,80	91,90	91,70	91,20	91,60	92,53	93,52	93,27	93,23	92,40	85,74	83,64	89,40
Empl Rate % chng	*-0,44*	*-0,22*	*-0,22*	*0,77*	*0,11*	*-0,22*	*-0,55*	*0,44*	*1,01*	*1,07*	*-0,27*	*-0,04*	*-0,89*	*-7,21*	*-2,45*	*6,89*
Wholesales Price Index (TEFE)	100	171	280	426	662	1.073	1.702	3.757	7.065	12.335	22.366	38.067	58.599	89.240	144.862	216.712
Whls Fr Indx % chng	*32,98*	*70,38*	*63,87*	*52,23*	*55,45*	*62,10*	*58,66*	*120,81*	*88,04*	*74,59*	*81,32*	*70,20*	*53,94*	*52,29*	*62,33*	*49,60*
Interest Rate % (St Domstc Borrw)	*N/A*	*N/A*	59,82	54,02	80,46	87,68	87,56	164,40	121,86	135,18	127,20	122,50	109,50	38,00	96,20	63,79
Interest Rate % chng	*N/A*	*N/A*	*N/A*	*-9,70*	*48,95*	*8,97*	*-0,14*	*87,75*	*-25,88*	*10,93*	*-5,90*	*-3,69*	*-10,61*	*-65,30*	*153,16*	*-33,69*
Exchange rate TL/USD (Monthly Avrg)	856	1.421	2.121	2.608	4.170	6.888	10.986	29.704	45.673	81.084	151.429	260.040	417.581	623.685	1.222.921	1.504.598
Exchange rate % chng	*27,83*	*66,04*	*49,27*	*22,96*	*59,91*	*65,17*	*59,51*	*170,38*	*53,76*	*77,53*	*86,76*	*71,72*	*60,58*	*49,36*	*96,08*	*23,03*

Table 4

The Turkish Stock Market: Summary Data

The key indicators of Istanbul Stock Exchange (ISE) during the sampling period. All IPOs in the sample fall into the period between 1990 and 1998. However, due to the requriements of the research that pre-IPO and post-IPO data are used, the overall data frame stretch from 1987 to 2002. The data are obtained from print and digital sources of ISE, The Treasury, State Planning Organization and The Central Bank.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
ISE Market Cap (000.000.000TL)	3.182	2.048	15.553	55.238	78.907	84.809	546.316	836.118	1.264.998	3.275.038	12.654.308	10.611.820	61.137.073	46.692.373	68.603.041	56.370.247
ISE Market Cap (000.000.USD)	3.125	1.128	6.756	18.737	15.564	9.922	37.824	21.785	20.565	30.329	61.348	33.473	112.276	68.635	47.189	33.773
ISE Markt Cap / GDP %	4,26	1,58	6,84	14,05	12,52	7,76	27,57	21,61	16,74	22,17	43,88	20,56	78,97	37,48	38,45	20,42
Trading Vol. (000.000.000TL)	105	149	1.736	15.313	35.487	56.339	255.222	650.864	2.374.055	3.031.185	9.048.721	18.029.966	36.877.335	111.165.396	93.118.834	106.302.343
Trading Vol. (000.000 USD)	118	115	773	5.854	8.502	8.567	21.770	23.203	52.357	37.737	58.104	70.396	84.034	181.934	80.400	70.756
No.of IPOs per year	N/A	N/A	N/A	34	21	13	16	25	28	27	29	20	9	35	1	3
No.of Firms traded in ISE	82	79	76	110	134	145	160	176	193	213	244	262	256	287	279	262
ISE-100 USD Index (1986=100)	385	169	199	184	197	281	305	671	749	643	481	536	385	120	449	357

Chart 1 and 1a also provide useful information to help understand the economic environment from the firm standpoint throughout the sampling period. It exhibits the operating return on asset (OROA – *"Esas Faaliyet Karı / Toplam Varlıklar"*) and the return on assets (ROA – *"Net Kar / Toplam Varlıklar"*) ratios of those Turkish manufacturing firms that went public within the period of 1990-1998. There is an obvious and persistent decline in both measures after 1994, which reflects the negative impacts of 1994 financial crisis on the manufacturing industry. The consistency between the trends of the two ratios spoiled after 1999: While OROA declines from 0.09 to 0.06 between 1999 and 2000, ROA increases from -0.05 to -0.03 during this period. In the following period, in turn, OROA increases up to 0.11, while ROA shows a sharp decline down to -0.25. Then, OROA slightly declines again while ROA goes up to -0.04, close to its level of in 2000. All these inconsistency between these ratios can be explained by the extreme increase in interest rates, which can be observed in Table 1.

Figure 6

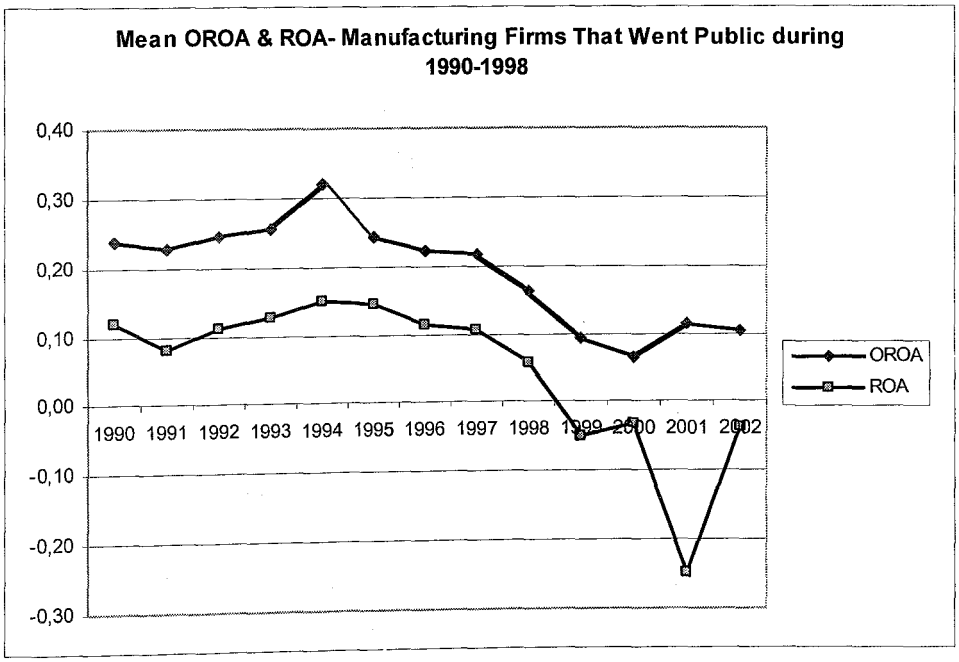
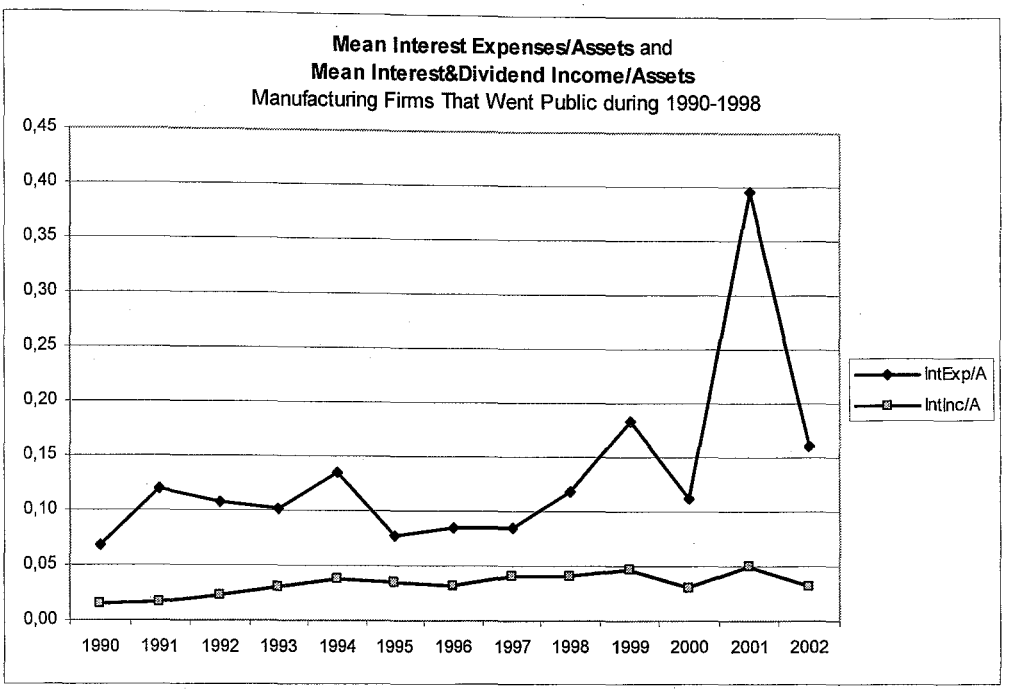


Figure 6a



This abnormal increase in the interest rates affected the corporate profits in two ways: First, high interest rates on T-Bills and Bonds motivated manufacturing firms to stop or reduce their original productions and prefer to lend money to government in exchange of high-interest bearing T-bills and bonds. A considerable proportion of firm earnings consisted of interest income for a certain period. The increasing ROA and decreasing OROA in 1999 through 2000 can be explained by this fact. It lasted until the new regulations in especially banking sector took place following the 2000 crisis. On the other hand, the cost of borrowing, namely, interest expenditures soared due to the extremely high interest rates which caused the sharp declines in net profits. The profit-reducing effect of the interest rates became dominant after 2000 for the manufacturing firms.

The analysis on the sample of this research generally verifies the common law that the negative effect, namely, the profit-reducing effect of the high interest

rate has been much more significant for the manufacturing firms than its income-generating effect.

3.4.4. The Variables and the Model

Although measurement of the firm performance and evaluation is a very commonly studied and well-formulated area of accounting and finance, there are various approaches as to which measure to use when analyzing certain aspects.

There are mainly three approaches in the studies concerning the ownership structure: the first one takes the firm value, second one takes profitability and third one takes efficiency (input-output comparison) as the dependent variable. Although all approaches aim to explore the consequences of ownership structure in terms of the fundamental financial indicators of firm, the first one takes a photograph of a certain moment so to say, while the other two reveal the results of operation within a certain period. Tobin's Q, (TQ) for instance, is a commonly used measure of the firm value by the previous studies when analyzing the impacts of ownership structure on firm's financial indicators. The performance of a firm is mostly measured by return on assets (ROA) and return on equity (ROE). In addition, other indicators such as asset turnover and earnings per share (EPS) are also used. The most difficult aspect to measure is the efficiency because it involves the production functions, manufacturing processes and industrial details. It appears to be a very complicated task in a sample where various sectors are involved.

This study prefers the operating return on asses (OROA) as the primary dependent variable to measure the firm performance because it is better than ROA to measure the real performance in such countries as Turkey. The financial indicators of Turkish firms exhibit abnormal results compared to their counterparts in other

economies especially until the last two financial crises occurred in 1999 and 2000. These peculiar results include extremely high financial expenses and non-operating income as documented in the previous section. The abnormal magnitude of these two non-operating items of the income statement limits the efficiency of ROA to measure the real efficiency. In order to avoid this bias peculiar to Turkey, OROA is preferred as the performance measure.

OROA is the operating income deflated by total assets as of the end of the year. Operating income *(Esas Faaliyet Karı)* equals net sales less cost of goods sold and all operating expenses. It provides a robust measure of the efficiency of asset utilization. By doing so, OROA also involves the efficiency aspect to a considerable extent.

Change in OROA is measured as the mean change in levels, i.e., the mean value of $\{OROA_{it} - OROA_{i(-1)}\}$ where i represents the firm, t represents a post-IPO fiscal year end and –1 represents the fiscal year prior to IPO.

In order to eliminate the industry bias, the industry-adjusted change in OROA is also calculated by matching each IPO firm with its industry based on the Central Bank's classification. Hence, the industry-adjusted performance of a firm is the difference between its change in OROA and the mean change in the OROA of its industry. In other words, industry-adjusted figures show the relative performance only.

Also attempted to measure are the growths in other key accounting measures such as sales, (SALES) asset turnover (ATO), capital expenditures (CAPEX), capital expenditures on assets (COA), leverage (LEV) and cost of borrowing (COB). Because of either data limitations or skewed distribution, the industry adjustments for sales and capital expenditures could not be done. SALES and ATO attempt to

primarily test whether the decrease in OROA arises from the low-profile operation, while CAPEX and COA proxy to explore whether the decrease arises from the insufficient investment level. These variables also embed the size dimension into the model. The cost of borrowing is computed as the financial expenses (*finansman giderleri*) divided by short and long term financial debts.

The insider (managerial) ownership (INSIDER) is defined as the proportion of ownership retained by insiders after the IPO. This variable is used to predict the post-IPO operating performance. In some studies, managerial ownership is used to mean the proportion of stock held by directors and managers, while in some others it means proportion of stocks held by all individual and institutional shareholders who control and govern the firm. The latter can also be defined as (1– *the proportion of publicly traded shares*). This study defines the term same as the latter.

Underpricing (UNDPR) is another variable that attempts to predict the post-IPO operating performance of a firm. It is defined as the difference in the first after-market price and the offering price as a proportion of the offering price.

Market to book ratio, (M/B), price-earnings ration, (P/E) and earnings per share (EPS) are the variables that explore the relationship between the market expectations/valuation and real operating performance.

The tables in the following sections document the changes in variables relative to pre-IPO year. These changes are defined as differences between the pre-post ratios for proportional variables such as OROA, COA, LEV and COB. The changes in other group of variables are defined as percentage changes, such as SALES, ATO and CAPEX since they represent either amounts or turnover. In other words, they are calculated as dividing the differences between pre-post IPO levels by

the pre-IPO levels. In order to eliminate the inflation bias, SALES and CAPEX variables are deflated by the manufacturing industry price index (1987=100).

The following is the list of all variables explained above:

OROA = Operating income / Total assets as of the year-end

SALES = Sales in real prices (1987=100)

ATO = Sales / Total assets

CAPEX = Capital expenditures

COA = Capital expenditures / Total assets

LEV = Total (long and short term) debts / Total assets

COB = Financial expenditures / Total (long and short term) financial debts

INSIDER = Equity retained by insiders after the IPO / Total shareholder's equity

(or, = 1 – the proportion of shareholder's equity sold to public)

UNDPR = (First after-market price – Offering price) / Offering price

M/B = Price of share at the year-end / Shareholder's equity per share

P/E = Price of each share at the year-end / EPS during the period

EPS = Profit after taxes / (Shareholder's equity /1000)

In order to see the performance relative to the industry, the industry-adjusted values of the ratio variables are also used, while the industry adjustments for the currency level variables are not included in the analysis. The reason for that is the nature of the industry data. That is, TCMB industry reports published annually captures the three-previous-year-data. Thus, the sampling window moves every year

and the calculation is repeated for a given year for two or three times (except for the first year of sampling horizon, which is 1987 here). The difference between these repeated calculations for a given year sometimes differ significantly with regard to currency level variables, causing misleading results. The ratio variables do not show such a significant variation between the sampling windows.

The question as to whether the decline in OROA is a result of the failure in sales increase, poor sales turnover ratio or insufficient capital investment is further analyzed in the econometric model explained below:

Operating Performance = f (Sales performance, Capital Expenditures)

The model above is expressed in these alternative cross-sectional regression models:

$$OROA_{it} = \beta_0 + \beta_1 LNSALES_{it} + \beta_2 LNCAPEX_{it} + e_i \quad (1)$$

$$OROA_{it} = \gamma_0 + \gamma_1 ATO_{it} + \gamma_2 COA_{it} + e_i \quad (2)$$

where

i represents the firm, t represents the fiscal year, LNSALES and LNCAPEX are the natural logarithms of the sales and capital expenditures and e_i zero-mean error term. Alternatively, the lagged values are also used for CAPEX and COA because it may not be appropriate to expect the impact of the investments levels on the profitability in the same year:

$$OROA_{it} = \beta_0 + \beta_1 LNSALES_{it} + \beta_2 LNCAPEX_{it-1} + e_i \quad (1a)$$

$$OROA_{it} = \gamma_0 + \gamma_1 ATO_{it} + \gamma_2 COA_{it-1} + e_i \quad (2a)$$

All the models are operationalized through two methods: first, an overall model is defined based on a panel data. Second, the variables are split with respect to the year relative to IPO and a correlation matrix and regression model is defined for each year relative to IPO.

The relationship between leverage and cost of borrowing, in other words, whether the level of leverage is a function of borrowing costs is further analyzed through the following model:

$$LEV_{it} = \beta_0 + \beta_1 COB_{it} + e_i \quad (3)$$

The signaling impact of underpricing (UNDPR) on the operating performance of IPO firms is tested through another regression model. The proportion of ownership retained by entrepreneurs (INSIDER) is also included in the model to see the explanatory power of insider/managerial ownership, and also to control for this variable while analyzing the performance-underpricing relationship. If not controlled, it may mask their relationship.

Operating Performance = f(Underpricing, Insider Ownership)

$$OROA_{it} = \delta_0 + \delta_1 UNDPR_i + \delta_2 INSIDER_i + e_i \quad (4)$$

where OROA it is the performance change of firm i for year t (0, +1, +2, +3 or +4), and the $UNDPR_i$ and $INSIDER_i$ belong to firm i matched with $OROA_{it}$. This model too, is run through both panel data and yearwise method. In the latter, four separate OROAs are defined for each year relative IPO and these OROAs are regressed on $UNDPR_i$ and $INSIDER_i$.

3.5. THE FINDINGS

3.5.1. Operating Performance Measures

This study first attempts to find out whether there is a significant difference in certain indicators of firms before and after going public and how these variables changes throughout the post-IPO period. First, an aggregate analysis is done by comparing the average of three consecutive years prior to IPO and the average of four consecutive years after IPO. The comparison is followed by the charts illustrating the trends in the variables. Finally, each of the four consecutive years in the post-IPO period is compared with pre-IPO period. The base period for comparison is the year –1, that is, all variables are expressed as the difference relative to the year prior to IPO. T-tests are applied for all comparative analyses.

The findings show that IPO firms exhibit a decline in post-issue operating performance relative to their pre-IPO levels, as expected. This result is consistent with most of the previous studies. Table 5 and Figure 7 illustrate the facts that are consistent with the expectations. The OROA makes an upward move just before IPO and it declines significantly throughout the post-IPO period. The four-year-average OROA in the post-IPO period is 20 percent, significantly lower than three year-average OROA of 24 percent in pre-IPO period (p= 0,001).

The upward move in OROA just before the IPO and the consistent decline following the IPO seem to verify the "window dressing" and/or "windows of opportunity" hypotheses. The OROA levels show an obvious decline, from 0,27 in year –1, to 0,25 in IPO year, 0,24 in year +1, 0,20 in year +2, 0,21 in year +3 and 0,15 in year +4. The changes are significant at 0,05 level for year +1 and 0,01 level for the following years.

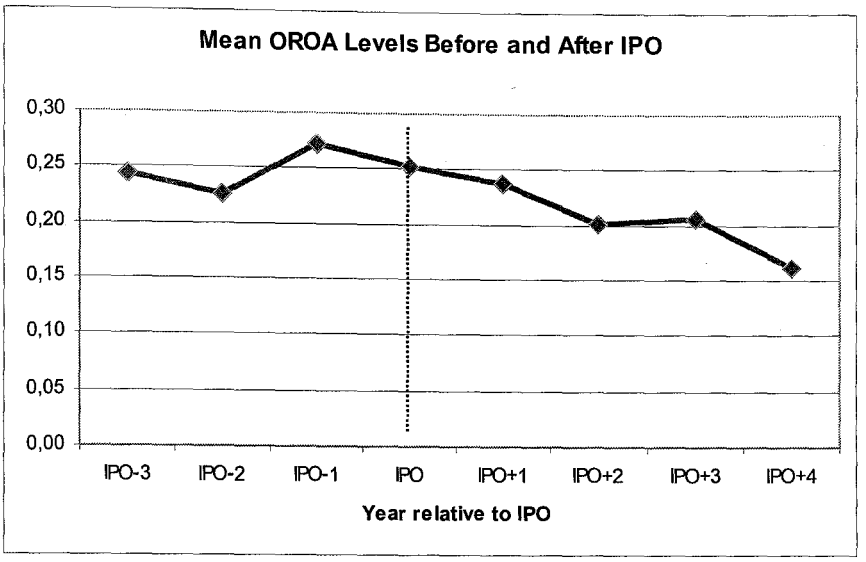
Table 5

Operating Performance, Leverage and Cost of Borrowing Levels of IPO Firms

Table values are for the mean or median levels for 81 IPO firms during 1987 through 2002. The sample consists of those publicly traded firms of which financial data are available. Operating return on assets equals operating income *(esas faaliyet karı)* divided by total assets at year-end. Sales and capital expenditures are deflated by the manufacturing industry price index with the base year 1987. Due to the scale problem, the industry means for these two variables are not considered meaningful to report. Instead, their firm-level median values are presented. Asset turnover equals net sales over total assets. Capital expenditures data are obtained from the cash flow statements for the period 1989-1997 and from the balance sheet footnotes for the following years. Leverage equals the total debt divided by the total assets. Cost of borrowing equals the financial expenditures divided by the total of short and long term financial debts. The year columns indicate the years relative to the year in which the firm goes public.

	Year Relative to Completion of IPO							
	-3	-2	-1	0	+1	+2	+3	+4
Panel A: Operating Return on Assets								
IPO issuing firms -Mean (%)	24,33	22,54	27,22	25,16	23,77	20,07	20,56	16,11
Matched industry -Mean (%)	15,88	16,48	17,25	15,85	15,99	14,09	14,07	14,22
Number of observations	74	79	81	81	81	81	81	81
Panel B: Sales (1987=100 Real Prices, Million TL)								
IPO issuing firms -Mean	74.063	76.499	119.459	122.219	127.644	131.812	128.871	123.901
IPO issuing firms - Median	33.032	35.350	39.200	44.100	48.534	51.863	49.437	49.009
Number of observations	71	77	79	79	79	79	79	79
Panel C: Asset Turnover								
IPO issuing firms -Mean	1,58	1,52	1,66	1,51	1,44	1,41	1,36	1,32
Matched industry -Mean	1,24	1,25	1,29	1,28	1,26	1,19	1,16	1,18
Number of observations	73	78	79	79	79	79	79	79
Panel D: Capital Expenditures (1987=100 Real Prices, Million TL)								
IPO issuing firms -Mean	4.431	5.085	5.013	6.444	6.345	7.701	5.505	6.103
IPO issuing firms - Median	2.133	2.149	3.060	4.325	4.420	4.759	2.995	3.449
Number of observations	14	33	56	56	56	56	56	56
Panel D1: Capital Expenditures over Total Assets								
IPO issuing firms -Mean (%)	12,82	13,18	13,60	15,02	12,61	12,83	9,86	10,26
Matched industry -Mean (%)	25,58	25,88	26,67	26,50	25,96	26,19	24,42	24,68
Number of observations	16	36	59	60	60	60	60	60
Panel E: Leverage								
IPO issuing firms -Mean (%)	55,07	58,01	55,30	50,48	52,95	55,55	59,33	64,90
Matched industry -Mean (%)	60,56	61,62	54,06	61,26	60,94	63,22	64,09	64,13
Number of observations	74	78	81	81	81	81	81	81
Panel F: Cost of Borrowing								
IPO issuing firms -Mean (%)	89,91	69,82	87,34	70,55	68,03	57,20	57,65	52,89
Matched industry -Mean (%)	48,02	50,69	45,38	47,18	47,03	43,54	43,09	46,52
Number of observations	52	62	65	66	66	66	66	64

Figure 7



Industry adjusted numbers show a similar pattern of significant underperformance especially for year +2, +3 and +4. Figure 8 illustrates the comparison of IPO firms' level of operating performances with their industry counterparts. The mean level of OROA for IPO firms decline over time, while the corresponding levels for their industry counterparts show a slight decline. Further, in each of the seven years examined the IPO firms outperform the industry, although this difference declines with time. These findings suggest that the industry effect in explaining the decline in performance is limited.

Figure 8

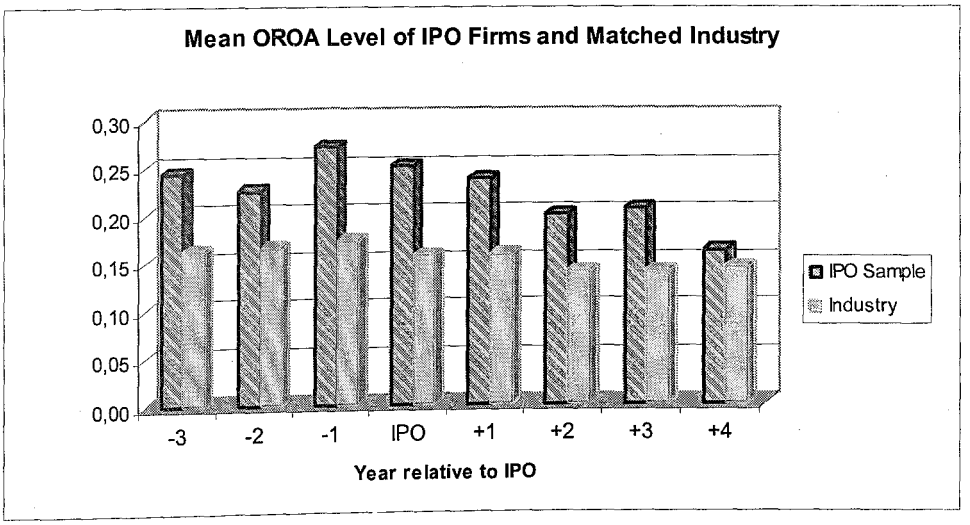


Table 6 compares each of the five years, including the IPO year, subsequent to IPO with the pre-IPO levels. Panel A presents the mean change in OROA both before and after industry adjustment for different time windows. The changes in operating performance are –2,06 percent, –3,46 percent, –7,15 percent, –6,67 percent and –11,10 percent for year 0, +1, +2, +3 and +4, relative to year –1. The declines are significant at 0,05 level for year +1 and 0,01 level for the following years. Industry adjusted changes, that is, the changes relative to the respective industry show a similar pattern of significant underperformance especially for year +2, +3 and +4. However, the significances somewhat weaken when industry effect is considered. The industry-adjusted changes are −0,66, −2,20, −3,99, −3,48, and −7,37 percent respectively in the post-IPO period. Hence, the inferior operating performance of IPO firms cannot be solely attributed to industry effects, yet cannot be ignored at all.

The most obvious decline in OROA is in the fourth year of IPO, revealing such a level at which there is almost no difference with the industry level. This trend implies that the OROA levels of IPO firms are likely to decrease even below their industry counterparts after the fourth year of going public. A future study with a longer time horizon would confirm this expectation.

There are a number of potential explanations for the decline in the post-IPO operating performance of IPO firms. One explanation is related to the potential for increased agency costs when a firm makes the transition from private to public ownership. A second reason could be that managers attempt to window-dressing their accounting numbers prior to going public. This will lead to pre-IPO performance being overstated and post-IPO performance being understated.

Table 6

Operating Performance, Leverage and Cost of Borrowing of Turkish Manufacturing Firms that Went Public Between 1990-1998

Table values are for the mean change/growth expressed as a percentage for 81 IPO firms during 1987 through 2002. The sample consists of those firms of which financial data are available. OROA equals operating income (*esas faaliyet karı*) divided by total assets at year-end. Sales growth equals the net growth in sales with respect to year -1. ATO equals net sales over total assets. Capital expenditures data are obtained from the cash flow statements for the period 1989-1997 and from the balance sheet footnotes for the following years. Cost of borrowing equals the financial expenditures divided by the total of short and long term financial debts. The industry-adjusted change/gowth for a given firm is the deviation from the contemporaneus industry mean. Year -1 is the fiscal year preceding the year during which the firm goes public. The significance tests are based on the paired sample T-Tests.

	Year Relative to IPO Year				
Measure of Operating Performance	From **-1 to 0**	From **-1 to +1**	From **-1 to +2**	From **-1 to +3**	From **-1 to +4**
Panel A: Operating Return on Assets					
Mean Level in Year -1 (%):					
IPO issuing firms = 28,58					
Matched industry = 17,25					
Mean Change (%)	- 2,06	- 3,46**	- 7,15***	- 6,67***	- 11,10***
Mean Industry-Adjusted Chng (%)	- 0,66	- 2,20	- 3,99**	- 3,48*	- 7,37***
Number of observations	81	81	81	81	81
Panel B: Sales					
Level in Year -1 (1987=100 Real Prices, Million TL):					
Mean = 116.597					
Median = 38.827					
Mean percentage change (%)	14,81	25,83	30,73	37,88*	31,18
Median percentage change (%)	13,84	18,19	27,41	21,37	14,53
Ln-Sales Mean percntg chng (%)	0,92***	1,75***	1,99***	2,24***	1,34
Number of observations	79	79	79	79	79
Panel C: Asset Turnover					
Mean Level in Year -1 (%):					
IPO issuing firms = 1,66					
Matched industry = 1,29					
Mean percentage change (%)	- 6,30***	- 9,73***	- 10,59***	- 14,16***	- 17,85***
Mean Industry-Adj'd percntg chng (%)	- 4,01**	- 7,48**	- 4,46**	- 6,01**	- 10,56*
Number of observations	79	79	79	79	72
Panel D: Capital Expenditures					
Level in Year -1 (1987=100 Real Prices, Million TL):					
Mean = 5,013					
Median = 2.974					
Mean percentage change (%)	75,64**	80,00*	129,09*	75,52	92,44
Median percentage change (%)	7,72	30,39	4,33	- 16,83	- 19,15
Ln Cap.Exp. Mean percnt chng (%)	2,32	1,26	2,41	- 2,01	- 4,35*
Number of observations	59	59	59	59	59
Panel D1: Capital Expenditures over Total Assets					
Mean Level in Year -1 (%)					
IPO issuing firms = 14,41					
Matched industry = 26,67					
Mean change (%)	1,45	- 0,86	- 0,70	- 3,62**	- 3,20*
Mean Industry-Adjusted chng (%)	1,95	- 0,53	0,53	- 0,04	- 1,01
Number of observations	59	59	59	59	59

Table 6 (continued)

	Year Relative to IPO Year				
	From - 1 to 0	From - 1 to +1	From - 1 to +2	From - 1 to +3	From - 1 to +4
Panel E: Leverage (Debt over Total Assets)					
Mean Level in Year -1 (%):					
IPO issuing firms = 55,28					
Matched industry = 60,55					
Mean Change (%)	- 3,93***	- 2,39	0,36	4,02*	9,64*
Mean Industry-Adjusted Chng (%)	- 10,78***	- 8,93***	- 8,35**	- 5,51	0,39
Number of observations	81	81	81	81	81
Panel F: Cost of Borrowing					
Mean Level in Year -1 (%):					
IPO issuing firms = 87,34					
Matched industry = 45,37					
Mean Change (%)	- 16,00	- 18,89	- 30,24	- 29,86	- 38,06*
Mean Industry-Adjusted Chng (%)	- 25,68	- 21,44	- 41,83	- 37,53	- 46,79*
Number of observations	65	65	65	65	64

* The difference is significant at 0,01 level
** The difference is significant at 0,05 level
*** The difference is significant at 0,10 level

A third explanation for the decline in OROA is related to the management's failure to generate pre-IPO levels of positive NPV projects or failure to maintain the required levels of capital expenditures. In other words, declines in post-issue performance is expected if managers cannot generate pre-IPO levels of positive NPV projects or fail to maintain the required levels of capital expenditures. Alternatively, positive NPV projects may have negative earnings early, so that operating performance declines while investment is occurring. To examine this issue, growth in sales, asset turnover and capital expenditures are also studied to determine if they can explain the underperformance of OROA. A fourth reason could be that entrepreneurs may time their issues to coincide with unusually high profitability, which may be a result of either their firms' efficiency or the good industrial or market conditions. The common threads running through these three explanations for the post-issue

decline in operating performance are the presence of information asymmetry and/or a conflict of interest between the original entrepreneurs (insiders) and the new shareholders.

Lee (1993) reported that because IPO market was driven by the government to stimulate the capital market and owners were usually reluctant to go public for fear of losing control, the government provided that an owner could retain a majority control by limiting the number of shares to be sold. This meant that an IPO would not have a serious impact on voting control and that the agency cost was not likely to be related to the firm's profitability in Korea, as in Mikkelson, Partch and Shah (1997). In Turkey, a similar pattern is observed in IPOs as well. That is, the original owners of firms that go public are eager to retain the control and they in fact ensure their control no matter what proportion of shares are sold. Moreover, the average proportion of shares sold to public is 19 percent in Turkey, still well below the other capitalist economies. In sum, most IPOs do not result in losing control of insiders. Therefore, it seems difficult, in the case of Turkey, to explain the decline in operating performance with the agency hypothesis.

The trends in sales, asset turnover, and capital expenditures also help understand the underlying reason for the decline in the profitability. Table 6 indicates a jump in mean sales in year −1 and a slow growth thereafter. However, the median sales show a steady and insignificant growth throughout the entire time window. The mean of three-year-average sales in the pre-IPO period is 110.679 million TL and the mean of four-year-average sales in the post-IPO period is 128.057.000.000 million TL, while the median values are 35.516 million TL and 49.330 million TL, respectively. T-Test reveals a significant difference between before and after IPO periods at 0.01 level (p = 0,005). Because SALES shows an abnormal distribution

and contains extreme values causing significant skewness, it is also useful to consider the distribution of natural logarithms. Although *Ln* values exhibits also the similar pattern with that of the real amounts trend, the changes relative to year −1 are significant until year +3, inclusively.

The obvious increase of sales in year −1 also coincides with the increase in OROA. Prior to IPO year the mean sales goes up to 119.459 from 76.499, meaning some 150 percent increase. However, the growth in sales slows down with the IPO and shows usually insignificant increase in the following years. The increase in sales is 15, 26, 31, 38 and 31 percent for year 0, +1, +2, +3, and +4 relative to year −1. It reaches a significant level in year three and shows a decline afterwards. The change relative to year −1 in Ln values of sales are 0,92, 1,75, 1,99, 2,44 (all three with significant *t* values) and 1,34 for the year 0, +1, +2, +3, and +4, respectively.

Panel C in Table 5 and Table 6 reports the mean levels and percentage changes in asset turnover. The only increase is observed in year −1, where the most significant increase in OROA and Sales take place. It shows a declining trend in all other periods. The mean changes relative to year −1 are −6, −10, −11, −14 and −18 percent in the four years subsequent to IPO, each being significant at 0,01 level. When compared to the industry, IPO firms show better performance over all the periods, although their decrease is faster than their industry counterparts. Despite the growth in sales, the decline in asset turnover is indicative of the fact that IPO firms increase their assets faster than their sales. Confirming the research hypotheses, the significant decline in ATO is also consistent with the OROA trend.

Figure 9

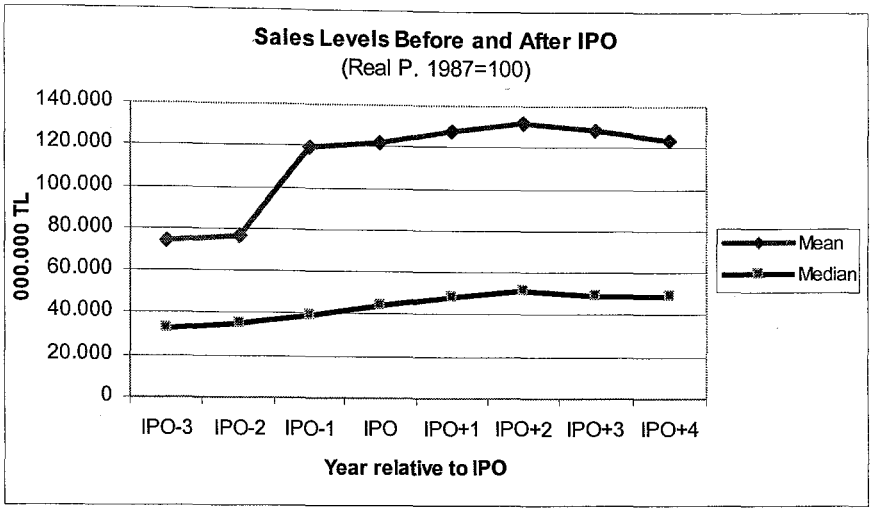


Figure 10

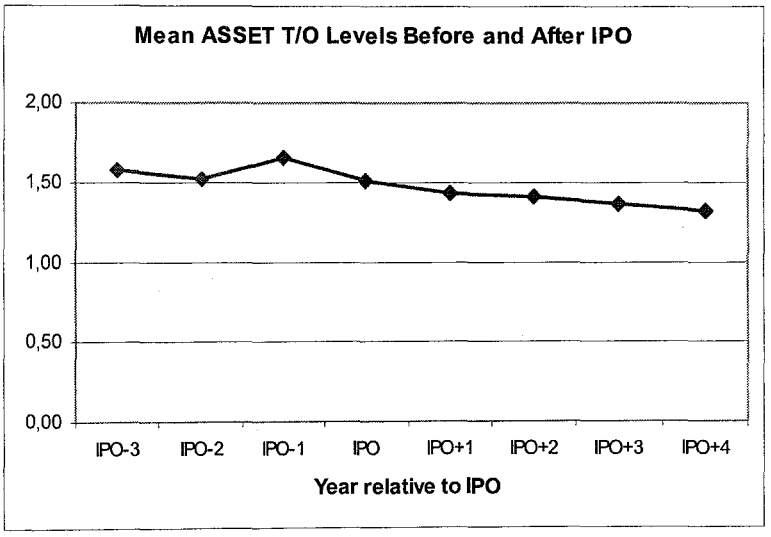
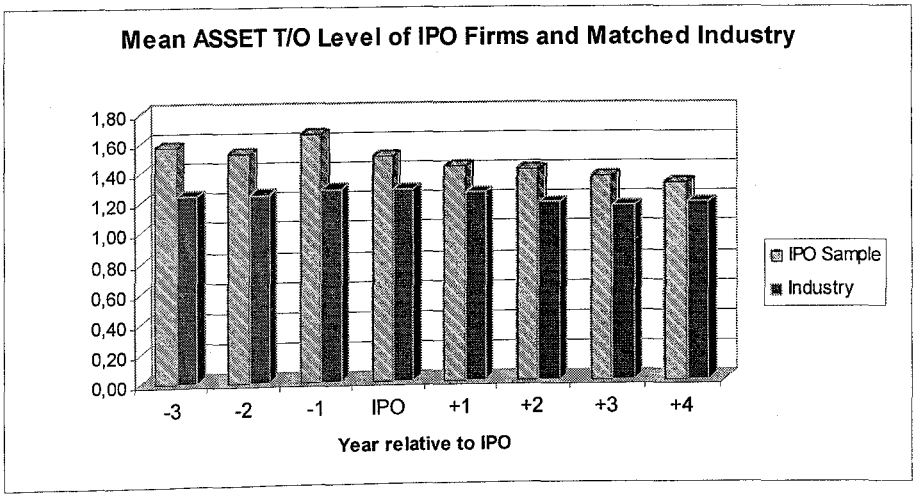


Figure 11



In panel D and D1 the trend in capital expenditures and capital expenditures relative to total assets are exhibited respectively. There is a significant increase relative in the first three years following IPO to year −1, when capital expenditures are solely considered. It shows, however, a contrary pattern when deflated by the total assets. Except for year +1 where an insignificant increase occurs, the capital expenditures over total assets ratio declines in each of the other following years, being significant in year +3 and +4. Industry adjusted figures also show similar trend, though not significant. The weakening significance in the decline of COA when compared to the industry indicates that the industrial conditions also seem to explain in part the decrease of COA. Despite the matched industry firms also have a declining trend parallel to IPO firms; IPO firms have lower COA ratios in each period. When the significant increases in sales, asset turnover and capital expenditures in year −1 are taken into account simultaneously, the decline in operating performance of IPO firms is consistent with (1) managers attempting to "window-dress" by overstating pre-IPO performance, and (2) managers timing their issues to coincide with periods of unusually good performance and/or with buoyant market conditions, in other words, "windows of opportunity approach". Although capital expenditures show a significant increase in the IPO year and the two subsequent years, they exhibit a decline when deflated by the total assets beginning from the year +1 in the post IPO period, being significant in the last three years. If CAPEX is considered solely, one can say that management maintains a high-enough level of investment in order to achieve positive NPV project, thus the value-maximization. The growth in CAPEX may imply that proceedings from the IPO are used for the investment. Yet CAPEX shows an abnormal distribution and contains extreme values. Thus, it may be necessary to consider the natural logarithms.

Figure 12

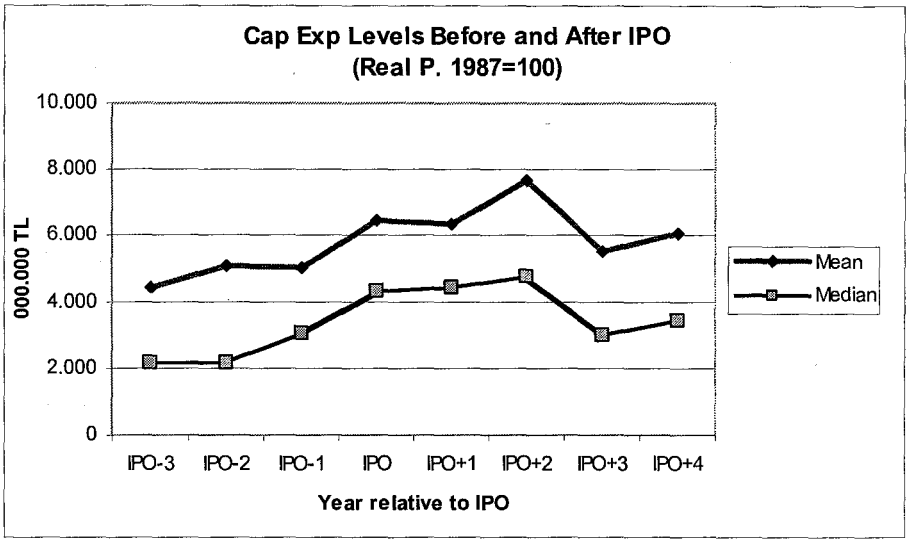


Figure 13

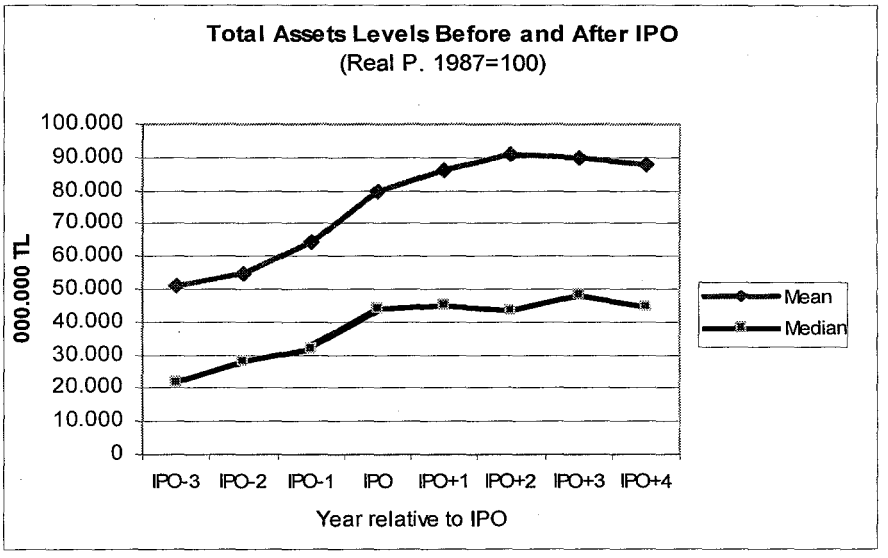


Figure 14

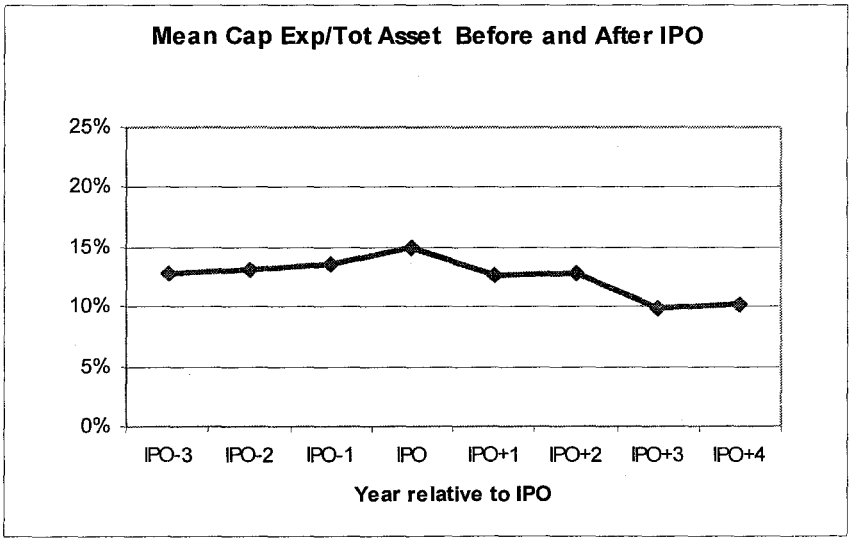
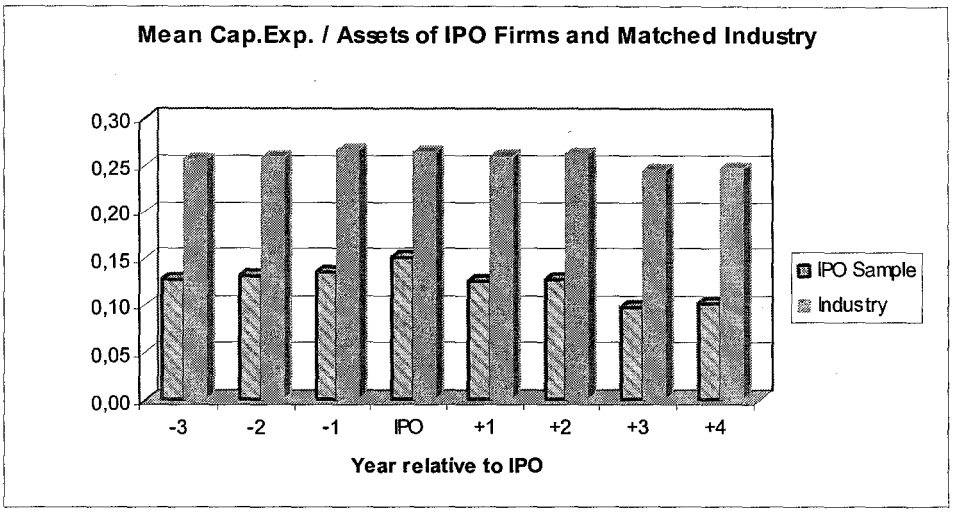


Figure 15



The trend in *Ln* values of CAPEX displays an observable increase from year −2 to −1 and then insignificant increases until year +1. From this point on, it declines reaching a significant *t* in year +4. It is also useful to compare the growth in CAPEX with the growth of the totals assets as well. This is an important point to consider because in most balance sheets in Turkey, as mentioned in the preceding sections, short-term items including T-bills and government bonds have constituted a significant proportion of the assets for years, especially until year 2000. Firms invested more in such high interest-bearing securities rather than fixed assets. Considering the fact that such securities bear usually maximum one-year or shorter maturities in Turkey, the fixed assets are not likely to contain securities.

The mean total assets shows a significant rise in the IPO year, as expected. In real prices, it jumps from 55 billion TL in year –2 to 65 billion TL in year –1 and to 80 billion in the IPO year, meaning 20% annual growth in the pre-IPO period on average. Although the growth continues until year +2 where it reaches the peak level of 91 billion TL, the growth rate declines to 5% following the IPO. The growth stops in year +3 and then begins to fall.

The mean total assets grows faster than that of the capital expenditures, in other words, capital expenditures do not increase relative to the total assets. The declining COA means that managers do not maintain sufficient level of investment so that positive returns cannot be generated. The industry-adjusted COA change in year +2, however, seems to be the result of the industry effect. There is a positive change of 5,3 percent in the adjusted figures, while the raw change is negative 7 percent. This means that if the whole industry COA did not decline in year +2, IPO firms would not have shown this much decline in COA. However, the t-test does not provide a robust evidence for this judgment. Figure 15 also indicates that the COA ratios of IPO firms are far below relative to the industry counterparts.

Whether the decline in the operating performance in the post-IPO period can be explained by the poor sales performance and insufficient investment level is analyzed through the correlation and regression analyses modeled in the previous chapter. Table 7 reveals the correlations analysis and Table 8 the findings of regression models.

Table 7

Correlation Matrix for All Variables in the Analysis

Table values displays the bivariate pearson correlation coefficients, significances of correlations and number of observations for 81 IPO firms during 1987 through 2002. The sample consists of those firms of which financial data are available. OROA equals operating income (*esas faaliyet karı*) divided by total assets at year-end. Sales growth equals the net growth in sales with respect to year -1. ATO equals net sales over total assets. Capital expenditures data are obtained from the cash flow statements for the period 1989-1997 and from the balance sheet footnotes for the following years. Cost of borrowing equals the financial expenditures divided by the total of short and long term financial debts.

Panel A: Panel Data

		OROA	SALES	LNSALES	ATO	CAPEX	LNCAPEX	COA	LEVERG
SALES	Pearson Corr.	**-0,03**							
	Significance	0,348							
	N	976							
LNSALES	Pearson Corr.	**0,102*****	0,702***						
	Significance	0,001	0,00						
	N	976	976						
ATO	Pearson Corr.	**0,248*****	0,472***	0,3***					
	Significance	0,00	0,00	0,00					
	N	981	976	976					
CAPEX	Pearson Corr.	**-0,017**	0,369***	0,418***	-0,239***				
	Significance	0,735	0,00	0,00	0,00				
	N	411	410	410	411				
LNCAPEX	Pearson Corr.	**0,063**	0,439***	0,553***	-0,206***	0,719***			
	Significance	0,205	0,00	0,00	0,00	0,00			
	N	410	409	409	410	410			
COA	Pearson Corr.	**-0,041**	-0,073	-0,056	-0,101	0,534***	0,546***		
	Significance	0,404	0,136	0,253	0,041	0,00	0,00		
	N	414	413	413	414	410	410		
LEVERG	Pearson Corr.	**-0,282*****	-0,023	-0,272***	-0,085***	-0,111**	-0,155***	-0,093*	
	Significance	0,00	0,474	0,00	0,007	0,024	0,002	0,058	
	N	981	976	976	981	411	410	414	
COB	Pearson Corr.	**0,203*****	-0,046	0,056	0,143***	-0,02	-0,048	-0,119**	-0,08**
	Significance	0,00	0,166	0,092	0,00	0,698	0,346	0,018	0,015
	N	913	910	910	913	390	389	393	913

*** Correlation is significant at the 0.01 level (2-tailed).
** Correlation is significant at the 0.05 level (2-tailed).
* Correlation is significant at the 0.10 level (2-tailed).

Table 7 (Continued)

Panel B: Correlation Between the Levels Split With Respect to IPO year

Table values are for the bivariate pearson correlation coefficients, signficances of correlations and number of observations between the levels split with respect to the year -1. Each variable is matched with OROA in the respective year and calculated the bivariate correlations.

		Year –1	Year 0	Year +1	Year +2	Year +3	Year +4
		OROA	OROA	OROA	OROA	OROA	OROA
LNSALES	Pearson Corr.	**0,058**	**0,063**	**0,003**	**0,12**	**0,054**	**0,211***
	Significance	0,609	0,58	0,976	0,293	0,639	0,062
	N	79	79	79	79	79	79
ATO	Pearson Corr.	**0,067**	**0,2***	**0,212***	**0,203***	**0,229****	**0,192***
	Significance	0,56	0,08	0,06	0,071	0,041	0,089
	N	79	80	80	80	80	80
LNCAPEX	Pearson Corr.	**-0,116**	**-0,149**	**0,034**	**0,223***	**0,119**	**0,07**
	Significance	0,395	0,27	0,81	0,10	0,38	0,61
	N	56	56	55	56	56	56
COA	Pearson Corr.	**-0,231***	**-0,378*****	**-0,06**	**0,069**	**0,087**	**-0,165**
	Significance	0,081	0,003	0,648	0,599	0,506	0,21
	N	58	59	60	60	60	60
LEVERG	Pearson Corr.	**-0,056**	**-0,055**	**-0,157**	**-0,202***	**-0,32****	**-0,624*****
	Significance	0,62	0,627	0,16	0,071	0,004	0,00
	N	81	81	81	81	81	81
COB	Pearson Corr.	**0,205***	**0,268****	**0,188**	**0,203***	**0,275****	**0,199**
	Significance	0,10	0,03	0,131	0,10	0,03	0,116
	N	65	66	66	66	66	64

*** Correlation is significant at the 0.01 level (2-tailed).
** Correlation is significant at the 0.05 level (2-tailed).
* Correlation is significant at the 0.10 level (2-tailed).

Panel A shows that operating return on assets is positively correlated to sales, asset turnover and cost of borrowing and negatively correlated to leverage, all being statistically significant. Capital expenditures are not significantly correlated to operating return but, interestingly, significantly correlated to the sales and asset turnover with positive sign. After the yearwise separation of the data, as revealed in panel B, the reverse correlation of COA with OROA shows a significant level in year –1 and especially in year 0, unlike in the case of panel data where it shows no significant correlation.

Table 7 (Continued)

Panel C: Correlation of The Changes for Each Year With Respect to IPO Year

Table values are for the bivariate pearson correlations between the changes in the levels with respect to the year -1. Each variable is matched with OROA in the respective year and calculated the bivariate correlations.

		−1 to 0	−1 to +1	−1 to +2	−1 to +3	−1 to +4
		OROA Chng	OROA Chng	OROA Chng	OROA Chng	OROA Chng
LNSALES Change	Pearsn Corr.	**0,478*** **	**0,337*** **	**0,419*** **	**0,386*** **	**0,488*** **
	Significnc.	0,00	0,00	0,00	0,00	0,00
	N	79	79	79	79	79
ATO Change	Pearsn Corr.	**0,427*** **	**0,45*** **	**0,475*** **	**0,525*** **	**0,488*** **
	Significnc.	0,00	0,00	0,00	0,00	0,00
	N	79	79	79	79	79
LNCAPEX Change	Pearsn Corr.	**-0,183**	**0,026**	**-0,188**	**-0,028**	**-0,026**
	Significnc.	0,178	0,85	0,16	0,84	0,85
	N	56	55	56	56	56
COA Change	Pearsn Corr.	**-0,048**	**0,003**	**-0,272** **	**-0,016**	**0,01**
	Significnc.	0,715	0,98	0,037	0,906	0,937
	N	59	59	59	59	59
LEVERG Change	Pearsn Corr.	**0,076**	**0,187***	**-0,02**	**-0,276** **	**-0,661*** **
	Significnc.	0,50	0,095	0,861	0,013	0,00
	N	81	81	81	81	81
COB Change	Pearsn Corr.	**0,326*** **	**0,063**	**-0,026**	**0,162**	**0,132**
	Significnc.	0,01	0,62	0,839	0,199	0,299
	N	64	65	65	65	64

*** Correlation is significant at the 0.01 level (2-tailed).
** Correlation is significant at the 0.05 level (2-tailed).
* Correlation is significant at the 0.10 level (2-tailed).

The relationship between OROA and other variables are further analyzed in the regressions of which the findings are displayed in Table 8 and 8a. Despite their low levels, all R-squares in Table 8 and most R-squares in Table 8a are significant, as revealed by F ratios. The low values should not be a surprising result because the goal set forth is not to explain the entire variation in OROA, but to see whether the selected variables can constitute a meaningful model to explain it. As a matter of fact, all coefficients are significant in Model (1) and (2a). Sales and asset turnover has

always significant explanatory power in explaining the decline in operating return on assets ratio while capital expenditures can explain the variation in OROA in Model (1) and (4) only.

Table 8

The table values represent the unstandardized Beta coefficients, t values and significances of the listed independent variables in the regressions for each year relative to IPO. In the alternative models t-1 values are considered for LNCAPEX and COA. Also reported are the R-squared, F and p values for the each model.

Panel A: Results of Model (1) - Panel Data

Model $OROA_{it} = \beta_0 + \beta_1 LNSALES_{it} + \beta_2 LNCAPEX_{it} + e_i$

R Square	F	Signf.
0,085	18,794***	0,000

Coefficients	Beta	t	Signifcnc
Constant	-0,572***	-4,203	0,000
LNSALES	0,091***	6,121	0,000
LNCAPEX	-0,023***	-3,097	0,002

Panel B: Results of Lagged Model (1a) - Panel Data

Model $OROA_{it} = \beta_0 + \beta_1 LNSALES_{it} + \beta_2 LNCAPEX_{it-1} + e_i$

R Square	F	Signf.
0,043	8,713***	0,000

Coefficients	Beta	t	Signifcnc
Constant	-0,272**	-2,046	0,041
LNSALES	0,043***	3,078	0,002
LNCAPEX	0,006	0,989	0,323

Panel C: Results of Model (2) - Panel Data

Model $OROA_{it} = \gamma_0 + \gamma_1 ATO_{it} + \gamma_2 COA_{it} + e_i$

R Square	F	Signf.
0,069	15,198***	0,000

Coefficients	Beta	t	Signifcnc
Constant	0,133	6,141	0,000
ATO	0,075***	5,445	0,000
COA	-0,026	-0,311	0,756

Table 8 (continued)

Panel D: Results of Lagged Model (2a) - Panel Data

Model $OROA_{it} = \gamma_0 + \gamma_1 ATO_{it} + \gamma_2 COA_{it-1} + e_i$

R Square	F	Signf.
0,066	13,89***	0,000

Coefficients	Beta	t	Signifcnc
Constant	0,142***	6,987	0,000
ATO	0,061***	4,682	0,000
COA	0,186**	2,327	0,020

Using lagged data for capital expenditures apparently leads reverse results. LNCAPEX has negative and significant impact on OROA when using the contemporaneous data, while the effect happens to be positive yet insignificant when using the lagged values. The coefficient of COA in contemporaneous panel data analysis is negative-insignificant, while it turns to be positive and significant when lagged data are used.

As the variables are split on the basis of year relative to IPO and separate regressions are run for each year, capital expenditures seem to show more consistent results. First, it is always negatively related to OROA except for year +2. The significance of the relationship increases when the lagged data are used.

If the lagged analysis on the panel data is considered, the decline in OROA is explained by the decrease in COA, implying that managers do not maintain sufficient level of investment so that positive returns cannot be generated. The problem of inconsistency between the results of lagged and contemporaneous analysis may be eliminated with a larger sample size and wider sampling window.

Table 8a

The table reveals the unstandardized Beta coefficients, t values and significances of the listed independent variables in the regressions for each year relative to IPO. In the alternative models t-1 values are considered for LNCAPEX and COA. Also reported are the R-squared, F and p values for the each model.

Panel A. **Regression Results for Model (1) -Yearwise Data**

		Year 0	Year +1	Year +2	Year +3	Year +4
	Dependent v.	OROA	OROA	OROA	OROA	OROA
Independent v.						
LNSALES	Beta	0,083***	0,038	0,041	0,085*	0,149***
	t- value	3,250	1,100	1,180	2,660	3,165
	Significnc.	0,000	0,270	0,240	0,010	0,003
LNCAPEX	Beta	-0,042***	-0,008	0,006	-0,011	-0,033
	t- value	-2,790	-0,450	0,393	-0,653	-1,515
	Significnc.	0,000	0,650	0,696	0,510	0,136
The model	R-Squared	0,180	0,020	0,070	0,130	0,163
	F Value	6,01***	0,630	2,120	3,97**	5,161***
	Significance	0,000	0,530	0,130	0,020	0,009

Panel B. **Regression Results for Lagged Model (1a) -Yearwise Data**

		Year 0	Year +1	Year +2	Year +3	Year +4
	Dependent v.	OROA	OROA	OROA	OROA	OROA
Independent v.						
LNSALES	Beta	0,086***	0,067*	0,047	0,113***	0,175***
	t- value	3,342	1,981	1,550	3,409	4,263
	Significnc.	0,002	0,053	0,127	0,001	0,000
LNCAPEX (t-1)	Beta	-0,051***	-0,032*	0,001	-0,032*	-0,080***
	t- value	-2,908	-1,808	0,080	-1,919	-3,178
	Significnc.	0,005	0,076	0,937	0,060	0,002
The model	R-Squared	0,194	0,078	0,069	0,180	0,267***
	F Value	6,369***	2,255	1,939	5,834***	9,630
	Significance	0,003	0,115	0,154	0,005	0,000

Panel C. **Regression Results for Model (2) -Yearwise Data**

		Year 0	Year +1	Year +2	Year +3	Year +4
	Dependent v.	OROA	OROA	OROA	OROA	OROA
Independent v.						
ATO	Beta	0,057*	0,094***	0,043	0,145***	0,129**
	t- value	1,787	3,178	1,389	4,172	2,198
	Significnc.	0,079	0,002	0,170	0,000	0,032
COA	Beta	-0,400**	-0,072	0,090	0,170	-0,460
	t- value	-2,595	-0,410	0,623	0,958	-1,399
	Significnc.	0,012	0,683	0,536	0,342	0,167
The model	R-Squared	0,189***	0,154***	0,037	0,240***	0,103**
	F Value	6,517	5,171	1,107	8,987	3,282
	Significance	0,003	0,009	0,337	0,000	0,045

Table 8a (Continued)

Panel B. **Regression Results for Lagged Model (2a) -Yearwise Data**

Independent v.	Dependent v.	Year 0 OROA	Year +1 OROA	Year +2 OROA	Year +3 OROA	Year +4 OROA
ATO	Beta	0,073**	0,090***	0,041	0,143***	0,126**
	t- value	2,311	3,025	1,312	4,073	2,142
	Significnc.	0,025	0,004	0,195	0,000	0,036
COA (t-1)	Beta	-0,284**	-0,133	-0,051	-0,021	-0,365
	t- value	-2,035	-0,829	-0,297	-0,135	-1,116
	Significnc.	0,047	0,410	0,768	0,893	0,269
The model	R-Squared	0,153***	0,162***	0,032	0,227***	0,092*
	F Value	4,985	5,398	0,953	8,405	2,897
	Significance	0,010	0,007	0,392	0,001	0,063

3.5.2. Leverage

Leverage (total debts over total assets ratio) shows usually a declining trend in the pre-IPO period and increasing trend after IPO, as illustrated on Figure 16. The mean leverage decreases by 3,93 percent from the year −1 to 0, significantly at 0,01 level. It reaches the minimum level of 50 percent in the IPO year. Then it begins to increase gradually in the post-IPO period, up to such a level above the pre-IPO period. The change in the debt ratio represents a statistically significant difference in year +3 and +4, relative to year −1, the base year. Namely, it is 0,04 in year +3 and 0,10 in year +4, relative to year −1. However, the four-year-average leverage in the post-IPO period is 58 percent, a very close ratio to the three year-average leverage of 56 percent in pre-IPO period. The sharp decline just before the IPO and in IPO year supports the hypothesis that firms substitute their source of funds from debt to equity in order to deleverage. However, IPO firms do not maintain their new financial structure featuring low leverage after the IPO. Therefore, the IPO also seems to serve as a deleveraging tool for a certain period.

Figure 17 illustrates the comparison between leverage trends of IPO firms with that of the matched industry averages. In general IPO firms seem to use less debt compared to the industry except for year −1 and +4. The most significant difference occurs in the IPO year, as expected.

Figure 16

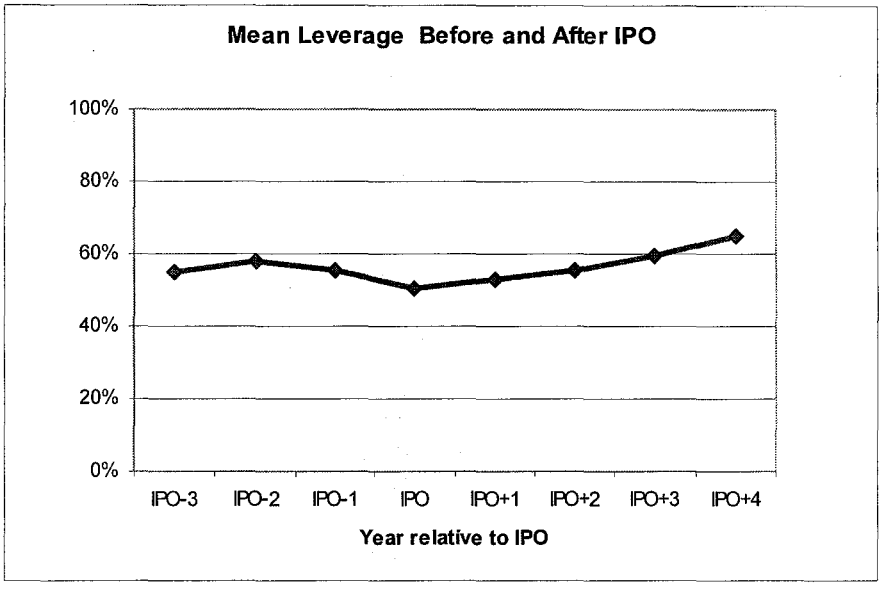
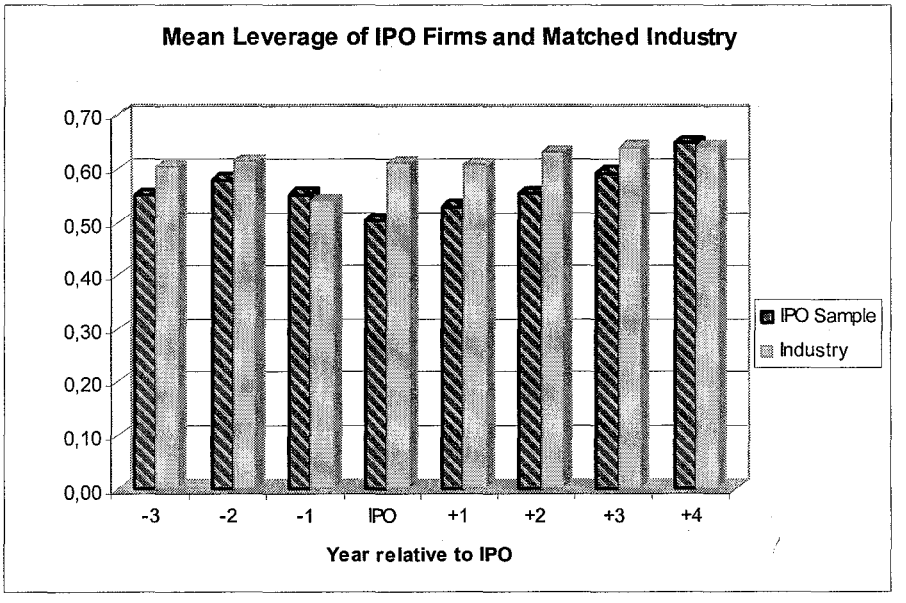


Figure 17



The industry-adjusted change from year −1 to 0 is −11 percent, significant at 0,01 level. Unlike the non-industry-adjusted numbers, the low leverage level relative to pre-IPO period maintains its significance until year +2. However, the leverage of IPO firms increase faster than that of the industry and exceeds the mean industry leverage in year +4.

Debt is also considered among the devices used to control agency costs (Uğurlu, 1999). Going public causes diffusion in ownership and thus increase the potential for agency costs. Maintaining a certain level of debt forces the managers towards value-maximization. Asymmetric information approach, on the other hand, suggests that debt financing is preferred for publicly traded firms because it is perceived as a good signal by the market, leading increase in stock prices, thus the firm value.

The rise in the leverage can also be explained by the declining cost of borrowing (credit) as the firm becomes publicly traded. This subject is analyzed in the following section.

Overall, the findings confirm the expectations that the leverage tends to increase because of the increase in the perceived value of the firm and credibility, overcoming borrowing constrains, greater bargaining power with banks, decreasing cost of borrowing and using the leverage as a device to control agency costs. Although the average debt ratio of the four subsequent years after IPO is greater than that of the last three years before IPO, the difference is insignificant.

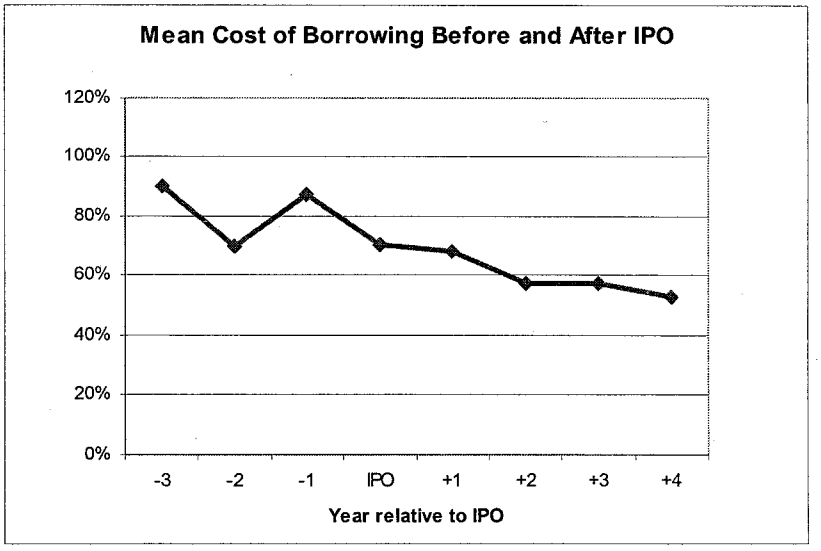
3.5.3. Cost of Borrowing

As reported earlier in the section 3.2.5., gaining access to capital markets and disseminating information to investors may reduce the cost of credit, possibly

because of the firm's improved bargaining position with banks (Rajan, 1992). Pagano *et al.* (1998) describes three possible reasons why the cost of borrowing may fall after IPO. First, upon listing, companies may become safer borrowers because they reduce their leverage. Second, more information becomes publicly available, so lenders have more information about their creditworthiness. The well-known ground to determine the interest charged on the credit is the risk of the borrower. The primary cause of the risk is the lack of perfect information on the borrower. The lender also bears a cost to obtain sufficient information on the firm that want to borrow. As the firm provides more information on itself, the cost of information for the lender declines. Lower information costs, therefore, are rebated to borrowers in the form of lower interest rate. Third, being listed on the stock market offers a company an outside financing option that limits the bargaining power of a bank. Also, a successful IPO might help to build the firm's credibility.

As shown in the Table 6 and Figure 18, cost of borrowing (COB) indeed declines throughout the time as the firm goes public. It makes an upward move just before the IPO and maintains a declining trend after IPO. The four-year-average OROA in the post-IPO period is 60 percent, significantly lower than three year-average OROA of 89 percent in pre-IPO period (p= 0,09). The changes in COB levels in each of the four years in the post IPO period relative to year −1 are as follows: −16 percent, −19 percent, −30 percent, −30 percent and −38 percent, the one in year +4 being statistically significant. COB ratios relative to the matched industry also exhibit similar patterns, which consist of −26, −21, −42, −38 and −47 percent changes relative to year −1. The change in the fourth year is statistically significant like in the unadjusted figures.

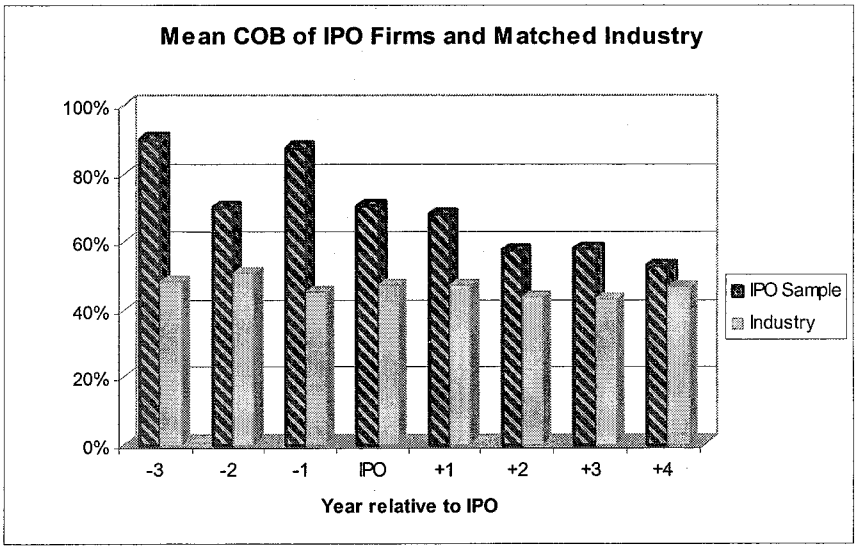
Figure 18



IPO firms obviously bear higher interest rates compared to the industry mean in general. However, the difference begins to decline after the IPO and approaches to zero in year +4. A future study with longer time horizon may well find even lower COB for the IPO firms in the subsequent years.

The findings confirm the expectation that cost of borrowing declines as firms begin to publicly trade.

Figure 19



The correlation table reveals that the relationship between leverage and cost of borrowing is negative, as expected. That is, as COB declines, LEVERAGE

increases. Although the correlation coefficient is 8%, it is significant at 0,05 level. Whether the level of leverage is a function of cost of borrowing is further analyzed in the regression model of which the results are displayed on Table 9.

Table 9

Results of Model (3) - Panel Data

The table exhibits the unstandardized Beta coefficients, t values and significances of the regression model (3). Also reported are the R-squared, F and p values for model.

Model	$LEV_{it} = \beta_0 + \beta_1 COB_{it} + e_i$		
	R Square	F	Signf.
	0,006	5,912**	0,015
Coefficients	Beta	t	Signifcnc
Constant	0,607***	29,61	0,000
COB	-0,043**	-2,432	0,015

The regression analysis indeed provides evidence on the effect of cost of borrowing on the leverage. The model overall is significant although the low level of R-square. The significant beta coefficient of COB suggests that the cost of borrowing is an important factor to explain the variation in leverage.

3.5.4. Management (Insider) Ownership and Operating Performance

Both the agency theory hypothesis and the signaling hypothesis lead to the expectation that firms with higher ownership retained by entrepreneurs (high insider-low public ownership) show superior performance compared to firms with lower ownership retained (low insider-high public ownership). In order to test this hypothesis, the relationship between the post-IPO operating performance measures

and the fraction of the firm retained by pre-issue shareholders (INSIDER) is examined. The sample is split into two groups based on the median INSIDER. Henceforth, the above median subsample will be referred to as the high-ownership group and the below median INSIDER subsample as the low-ownership group.

In Table 10, the high and low insider ownership groups are compared using several variables observable prior to IPO. Due to the high deviation in those variables expressed in TL values, the difference between mean and median values are significant. Thus, both mean and median levels are reported for them. In other variables representing ratios, the mean and median values are very close; therefore, only the mean values are exhibited. The high (low) insider ownership group's mean offer price 10.344 TL (14.288 TL) while the median values are 7.900 TL and (10.500 TL). The mean gross proceeds from their IPOs are 374.564 million TL (397.426 mio.TL), while the median values reveal 90.000 mio.TL and (207.900 mio.TL).

Table 10
Summary Statistics of Turkish Manufacturing Firms that Went Public between 1990-1998
Split By Median Proportion of The Firm Retained After IPO
(Insider / Managerial Ownership)

Table values represent the pre-IPO summary statistics of Turkish manufacturing firms that went public between 1990-1998 split by median fraction of the shareholder's equity retained by original entrepreneurs after IPO. The initial return is defined as the difference in the first after-market price and the offering price as a proportion of the offering price. Following variables represent the last three-year-average figures prior to IPO. Becasue some firms do not have all the three-year-data avaliable, their two-year average or one year values prior to IPO are used. The values in parantheses are the number of observations. The difference in the numbers between the two subsample is a result of inclusion of the median observations in one of the groups and/or data reduction due to absence of data. In the last column the first values represent the t value and those in the pharanteses their *p* values. The number of asteriskes indicate the confidence levels, i.e., one astrerisk for 90%, two for 95% and three for 99%.

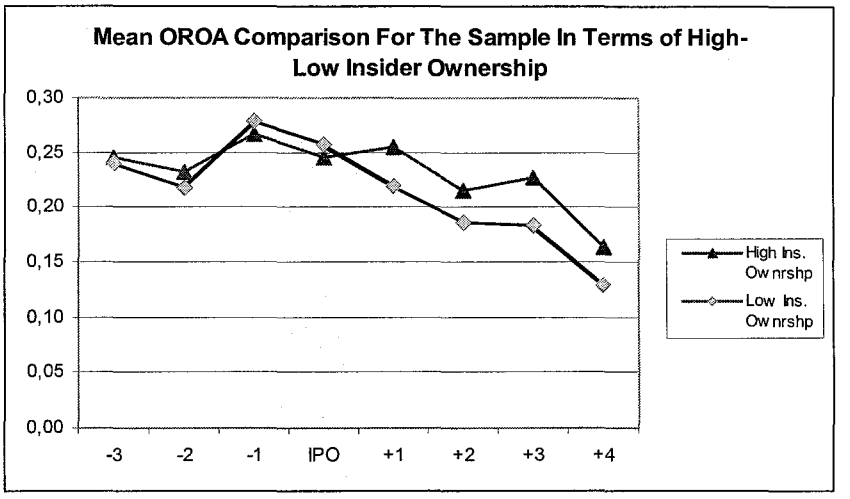
Variable	High Insider Ownership (Insider >= 84,87%)		Low Insider Ownership (Insider < 84,87%)		Significance of difference t (*p* value)
Mean size of issue (Curr. prices- Million TL)	374.564	(39)	397.426	(37)	-0,14 (0,889)
Median size of issue (Curr. prices- Million TL)	90.000	(39)	207.900	(37)	
Mean offer price (TL)	10.344	(42)	14.288	(39)	-1,76* (0,082)
Median offer price (TL)	7.900	(42)	10.500	(39)	
Mean initial return (%)	11,49	(41)	7,65	(37)	1,09 (0,278)
Mean ownership retained by insiders (%)	87,14	(41)	75,69	(39)	7,29***(0,000)
Mean OROA of pre-IPO-3-yrs.-avrg (%)	23,93	(42)	25,06	(39)	-0,43 (0,666)
Mean COA of pre-IPO-3-yrs.-avrg (%)	13,20	(29)	13,27	(30)	-0,032 (0,975)
Mean Levrg. of pre-IPO-3-yrs.-avrg (%)	55,50	(42)	55,71	(39)	-0.059 (0,953)
Mean Asset Size of pre-IPO-3-yrs.-avrg (87 Prc. Mio TL)	87.161	(42)	27.632	(39)	1,950** (0,055)
Median Asst S. of pre-IPO-3-yrs.-avrg (87 Prc. Mio TL)	35.062	(42)	23.478	(39)	

The mean offering price of high insider ownership group is significantly higher than that of the other group. This result is likely to indicate that those firms that retain higher fraction of the stock within the firm and sell lower proportion to public underprice their stocks at the IPO. Underpricing issue is further analyzed in the following section.

OROA prior to IPO in the low insider ownership group is slightly higher than that of the other, though the difference is not significant. There is not a difference in COA and LEV between the two groups. The mean asset size, however, differ significantly between the groups; lower insider ownership group having

significantly higher asset size than the other. This implies that larger firms retain higher fraction of the stock within the firm and sell lower proportion to public, while smaller firms prefer selling higher fraction of shares to public.

Figure 20



The changes in operating performance and leverage for the post-IPO period for the two groups, both before and after industry adjustments, are reported in Table 11. As also illustrated in Figure 20, OROA for both high-ownership and low-ownership groups shows almost the same pattern. That is, they both increase in year −1 and decline for the years following the IPO. However, the high ownership group shows superior performance relative to the low-ownership group in the post-IPO period, while there is not even a visible difference before IPO. As for the changes relative to year −1, both groups usually show significant the decline after IPO. The industry-adjusted changes as well demonstrate the similar pattern, though significances weaken. Except for year 0 where the raw change in the high-ownership group is lower than that of low-ownership group, both raw and adjusted declines in the low- ownership group continues to be more substantial than the high-ownership group throughout all the post-IPO period.

In sum, those firms that retain higher fraction of the stock within the firm and sell lower proportion to public are likely to perform better than those firms that retain lower fraction of the shares and sold higher fraction to public. The t-tests between the groups however, do not provide a sufficient confidence level in order to reach a robust conclusion. A future study with a larger sample size and wider time horizon is believed to provide the more significant results.

Also compared are the changes in sales, asset turnover, capital expenditures, capital expenditures on assets and leverage between the high and low-ownership groups in panel B, C, D, E and F of Table 11. Apart from the year −1, high-ownership group displays more significant increase in sales growth for both raw and *Ln* figures. The trend in asset turnover shows a consistent pattern with the sales, though all the changes are negative. That is, the decline in ATO is less significant in high-ownership group than that of the low-ownership group throughout all the periods. The findings for these two variables are also consistent with the OROA pattern: those firms that retain higher fraction of the stock within the firm and sell lower proportion to public are likely to perform better than those firms that retain lower fraction of the shares and sold higher fraction to public. However, the difference between the groups does not reveal a significant t-statistics. Although insider ownership has a potential to be a factor to explain the decline in sales and asset turnover, this study cannot provide sufficient evidence for that conjecture.

As for the capital expenditures, low-ownership group displays higher increase for all the periods. If considered solely, the findings of this variable imply that those firms that with higher public ownership spend more for the capital investments. When capital expenditures are deflated by total assets, the two groups display an inconsistent pattern. That is, none of them maintains a continuous rise or

Table 11

Operating Performance of Turkish Manufacturing Firms that Went Public between 1990-1998 Split By Median Proportion of The Firm Retained After IPO (Insider Ownership)

Table values are the mean change/growth expressed as percentage for 81 IPO firms during the period 1987-2002. The data is split into two groups based on the insider ownership. Those observations that have higher INSIDER ratios than the median INSIDER are included in the HIGH insider ownership group and the remaining in the LOW insider ownership group. The two groups are compared in terms of the variables listed below. Because the distribution of SALES and CAPEX are highly skewed, their natural logharitms are also used. The significance of the differences are analyzed through T-Tests. The asterisks next to the change values indicate the significance of the changes relative to year -1 within each group. The the third column in each time interval shows the significance of the difference between the two groups, the first row indicating the t-value and the second probability.

	Years Relative to IPO Year														
	- 1 to 0			- 1 to +1			- 1 to +2			- 1 to +3			- 1 to +4		
	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)
Panel A: Operating Return on Assets															
Mean change (%)	-6,74**	-2,67	1,08 (0,283)	-3,73*	-5,72**	0,65 (0,517)	-7,76***	-9,05***	0,38 (0,704)	-6,56**	-9,33***	0,70 (0,484)	-11,64***	-14,69***	0,54 (0,538)
Mean Indstr.-adj. chng (%)	-0,08	-1,29	0,47 (0,643)	-0,66	-5,27**	1,79* (0,076)	-2,24	-5,87**	0,95 (0,344)	-1,67	-5,44*	0,95 (0,347)	-6,17**	-9,53**	0,74 (0,459)
Number of observations	42	39		42	39		42	39		42	39		42	39	
Panel B: Sales (87 Prices)															
Mean percentage change (%)	13,02	16,74***	-0,54 (0,594)	27,27	24,29***	0,35 (0,730)	32,33	29,01	0,30 (0,768)	42,49	32,91***	0,61 (0,544)	41,98	19,53**	1,32 (0,190)
Mean Ln-Sales perc. chng (%)	0,60	1,35***	-1,15 (0,253)	1,81***	1,77***	0,07 (0,943)	2,03***	2,01***	0,02 (0,768)	2,54***	1,92***	0,68 (0,50)	2,14**	0,00	1,65 (0,103)
Number of observations	41	38		41	38		41	38		41	38		41	38	
Panel C: Asset Turnover															
Mean percentage change (%)	-4,86	-7,85**	0,57 (0,571)	-8,73**	-10,81***	0,33 (0,741)	-8,65***	-12,67***	0,61 (0,542)	-11,2***	-17,35***	0,96 (0,342)	-12,26***	-23,87***	1,57 (0,120)
Mean Indstr.-adj. prcnt chng (%)	-0,33	-7,98*	1,20 (0,2330)	-5,11*	-10,03*	0,66 (0,509)	-1,36	-7,79	0,85 (0,40)	-1,91	-10,43*	1,02 (0,310)	-6,38	-15,23	1,07 (0,290)
Number of observations	41	38		41	38		41	38		41	38		38		34

Table 11 (Continued)

	Years Relative to IPO Year														
	- 1 to 0			- 1 to +1			- 1 to +2			- 1 to +3			- 1 to +4		
	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)	Insider >= 84,87%	Insider < 84,87%	t for H-L (*p*-Value)
Panel D: Capital Expenditures (87 prices)															
Mean percentage change (%)	68,82	81,54	-0,26 (0,797)	52,88	103,51	-1,12 (0,267)	95,18	158,48	-0,86 (0,392)	11,98**	130,58	-1,93* (0,058)	52,38	127,16	-0,97 (0,339)
Mean Ln-Cap Exp percentage chi	2,32	2,39	-0,02 (0,981)	2,09	4,12	-0,57 (0,574)	1,65	2,79	-0,25 (0,801)	-2,99	-1,10	-0,42 (0,676)	0,43	-8,47*	1,47 (0,148)
Number of observations	26	30		26	30		26	30		26	30		26	30	
Panel E: Capital Expenditures on Assets															
Mean change (%)	1,56	1,35	0,06 (0,952)	-0,94	-0,78	-5,58 (0,954)	-0,46	-0,93	1,28 (0,899)	-5,63**	-1,68	-1,04 (0,302)	-2,95	-3,45	0,13 (0,90)
Mean Indstr.-adj. chng (%)	2,11	1,84	0,06 (0,955)	-0,62	-0,47	-0,37 (0,970)	0,58	0,50	0,02 (0,986)	-3,67	2,56	-1,45 (0,155)	-2,95	0,36	-0,57 (0,573)
Number of observations	29	30		29	30		29	30		29	30		29	30	
Panel F: Leverage															
Mean change (%)	-3,47*	-6,28***	1,02 (0,311)	-1,21	-3,57*	0,76 (0,452)	0,60	-0,20	0,23 (0,817)	0,71	7,62**	-1,52 (0,134)	3,87	15,79	-1,15 (0,255)
Mean Indstr.-adj. chng (%)	-13,77***	-9,08***	-0,90 (0,369)	-11,85**	-6,16*	-0,94 (0,349)	-12,18**	-4,88	-1,09 (0,281)	-13,66**	2,53	-2,1** (0,039)	-9,62	12,26	-1,57 (0,121)
Number of observations	42	39		42	39		42	39		42	39		42	39	

decline. The high ownership group may be superior in one year, while the other group in the following period, resembling a random distribution.

When adjusted with the industry means, the decline in the COA ratio of IPO firms can obviously be explained by the industry effect. The raw changes in both groups in year +2 for instance, indicate a decline relative to year −1 but the industry-adjusted figures show an increase, though insignificant. Insider ownership seems to explain the COA change in year +3 and +4, as the direction of industry-adjusted changes for the groups are contradictory to each other. That is, COA of high-ownership group shows a decline in year +3 and +4 relative to −1, while the COA of low-ownership group displays an increase in those years. However, the results of t-test do not provide robust evidence to the difference between the groups.

The insider ownership factor plays a noticeable role to explain the changes in the leverage in certain periods, though not statistically significant. The difference between the groups in terms of leverage change relative to year −1 approaches to significant level in year +3 and +4. Overall, they usually move in the same direction but the low-ownership group displays a higher deviation throughout the post-IPO period. That is, the decline and rise of mean leverage in low-ownership group is steeper relative to the high-ownership group. This implies that those firms that retain higher fraction of the stock within the firm and sell lower proportion to public is more stable in terms of borrowing, compared to those firms that sell higher proportion of shares to public.

Although the t-tests could not provide the significant *p* values, the insider/managerial ownership tend to have an explanatory power for the operating performance and leverage in the post-IPO period. The consistent results of relatively superior post-IPO performance of firms with high-ownership retention by

entrepreneurs give the impression of conformity with the research hypothesis derived from the agency and signaling model. The results can be improved with probably more significant *p* values by enlarging the sample size and time horizon, as well as applying other econometric models. With such an improvement, on the contrary, the findings may well confirm the opposing hypothesis which rejects the effect of agency issue. This would also be a more likely result for the IPO firms in Turkey, as going public has a different nature, function, scale and consequences than other capitalist Western economies. As a matter of fact, some previous studies in Turkey such as Köse (1997) could not find evidence to the agency hypothesis for Turkish firms.

3.5.5. Operating Performance and Underpricing

According to the information asymmetry and signaling approaches, IPO firms signal their quality to the market by underpricing their stock. These models suggest that high-quality issuers sell a small fraction of the firm at the IPO and underprice their stocks. Subsequently, a second equity issue and/or insider sale is undertaken through a seasoned offering when market prices are established and the information asymmetry is resolved or minimized. Low-value firms that try to take advantage of the information asymmetry and dress themselves to look like high-value firms incur the cost of underpricing. Further, there is a positive probability that the true quality of the low-value firm will be revealed in between the two offerings. When the probability of type revelation is high enough (but not too high), the low-value firms find it optimal not to underprice and to voluntarily reveal their type by selling at their true value. In the resulting separating equilibrium, only high-value firms underprice at the IPO. Thus, if subsequent operating performance proxies for

unobservable firm quality at the time of IPO, the signaling models of underpricing predict that IPO firms that underprice should exhibit superior operating performance compared to those that do not. This study tests this speculation by examining the relation between IPO underpricing and post-IPO performance.

Table 12

Summary Statistics of Turkish Manufacturing Firms that Went Public between 1990-1998 Split by Median Underpricing

Table values are pre-IPO summary statistics of Turkish manufacturing firms that went public between 1990 1998 split by median underpricing. Underpricing is defined as the difference in the first after-market price and the offering price as a proportion of offering price. Number of observations are given in the pharanteses next to the values. The third column displays the t-statistics and the *p* values for the difference between the two groups. Number of asteriskes indicate the level of significance/confidence.

Variable	Low Underpricing (Ini.return =< 7,14%)		High Underpricing (Ini.retrn > 7,14%)		Significance of difference **t / (*p* value)**
Mean size of issue (Curr. prices- Million TL)	361.522	(38)	390.196	(39)	-0,177 (0,860)
Median size of issue (Curr. prices- Million TL)	72.000		218.400		
Mean offer price (TL)	11.114	(38)	13.818	(40)	-1,160 (0,250)
Median offer price (TL)	8.375		8.375		
Mean Underpricing (%)	-1,18	(37)	19,95	(40)	-8,08***(0,000)
Mean ownership retained by insiders (%)	82,14	(38)	81,84	(40)	0,146 (0,884)
Mean OROA in Year -1 (%)	24,86	(38)	29,86	(40)	-1,714* (0,091)
Mean OROA of pre-IPO-3-yrs.-avrg (%)	25,33	(39)	23,66	(41)	0,63 (0,529)
Mean COA in Year -1 (%)	12,92	(23)	13,39	(32)	-0,168 (0,867)
Mean COA of pre-IPO-3-yrs.-avrg (%)	13,06	(30)	13,18	(28)	-0,052 (0,959)
Mean Leverage in Year -1 (%)	54,24	(38)	56,53	(40)	-0,632 (0,531)
Mean Asset Size in Year -1 (87 prices Mio TL)	100.283	(38)	33.237	(40)	2,058** (0,043)
Median Asset Size in Yr -1 (87 prices Mio TL)	40.540		31.665		

Initial return is used as the proxy to measure underpricing. It is defined as the difference in the first after-market price and the offering price as a proportion of offering price. In Table 12, the IPO sample is split into two subsamples based on the median initial return. A comparison of the two subsamples on several variables measured at or prior to IPO is displayed in the table above. The results suggest that

there is a significant difference between the two groups with regard to operating return on assets and asset size, both measured in the year prior to IPO. The two groups do not differ from each other in terms of mean offer price, mean insider ownership retention at the IPO, mean capital expenditures over assets and mean leverage, both measured in the year prior to IPO. The significance of differences in issue size and offer price does not display a considerable change when the inflation-adjusted numbers are used for these two variables as well. However, the use inflation-adjusted figures reveal a contrary relative magnitude between the two groups with regard to these variables. Namely, the mean issue size for the low-underpricing (high-underpricing) group is 38 billion TL (34 billion TL) and the mean offer price for low-underpricing (high-underpricing) is 3.951 TL (3.340 TL).

It can be inferred, based on the information observable prior to IPO, that large and efficient firms tend to underprice their stocks. These initial findings support the expectations derived from the theory discussed above, suggesting that only high-value firms underprice their stocks. It is yet necessary to look at the post-IPO performance as well to reach a sound conclusion.

In Table 13, a comparison of post-IPO operating performance and leverage for the two groups is provided for different time windows. The moving horizon used to calculate the industry data causes the repeated calculations of the industry means. This lead huge variation in the currency level variables (SALES and CAPEX) for the same year and makes it difficult to decide which one should be matched with the firm analyzed. Hence, the industry-adjusted values are not calculated for SALES and CAPEX. Instead, the *Ln* values are also reported in order to eliminate the potential bias caused by abnormal distribution.

Figure 21

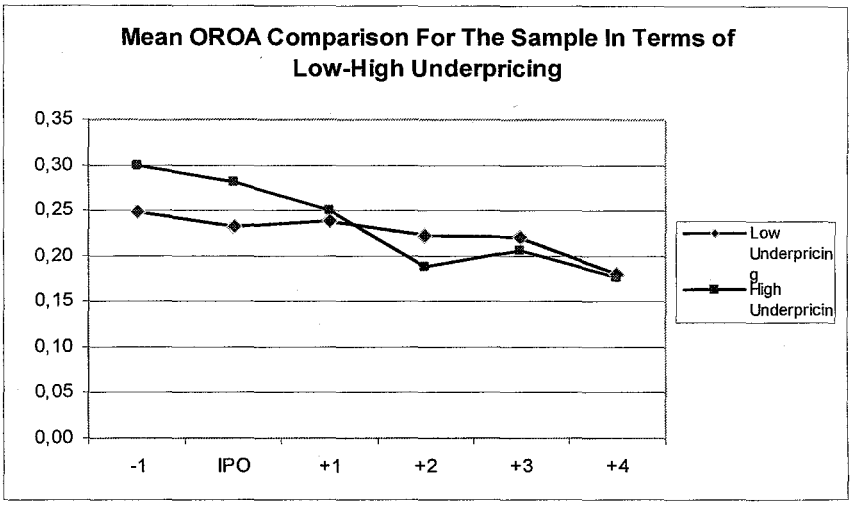


Figure 21 illustrates that the low underpricing group reveals more stable operating performance compared the high underpricing group throughout the post-IPO period. Panel A of Table 10 reports that the decline in OROA of the high underpricing group relative to Year −1 is both apparently and statistically significant while that of low underpricing group is not. In other words, low underpricing firms perform better than the other group. In year +1, +2, +3 and +4 the OROA of low underpricing group declines insignificantly by 1, 2,56, 2,85, and 6.92 percent relative to year −1, while the OROA of high underpricing group shows significant declines of 4,88, 10,98, 16,82, and 12.25 percent for the same periods. The between-group difference is also significant in year +2. The industry-adjusted figures also show a similar pattern.

While the table above suggests that there seems to be difference between the high and low underpricing firms in terms of post-IPO operating performance to some extent, the relative performances of the two groups contradict both the pre-IPO status and the research hypothesis that IPO firms that underprice should exhibit superior operating performance in comparison to those that do not.

Table 13

Operating Performance of Turkish Manufacturing Firms that Went Public between 1990-1998 Split By Median Underpricing (Initial Return)

Table values are the mean change/growth expressed as percentage for 81 IPO firms during the period 1987-2002. The data is split into two groups based on the median underpricing. Those observations that have higher UNDPR ratios than the median UNDPR are included in the HIGH underpricing group and the remaining in the LOW underpricing ownership group. The two groups are compared in terms of the variables listed below. Because the distribution of SALES and CAPEX are highly skewed, their natural logharitms are also used. The significance of the differences are analyzed through T-Tests. The asterisks next to the change values indicate the significance of the changes relative to year -1 within each group. The the third column in each time interval shows the significance of the difference between the two groups, the first row indicating the t-value and the second probability.

	Years Relative to IPO Year														
	- 1 to 0			- 1 to +1			- 1 to +2			- 1 to +3			- 1 to +4		
	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)
	Panel A: Operating Return on Assets														
Mean change (%)	-1,68	-1,75	0,02 (0,981)	-1,00	-4,88**	1,17 (0,248)	-2,56	-10,98***	2,31** (0,024)	-2,85	-16,82***	1,48 (0,143)	-6,92	-12,25***	1,02 (0,312)
Mean Indstr.-adj. chng (%)	0,83	-1,42	0,85 (0,400)	1,05	-4,59**	1,66* (0,102)	2,01	-9,42***	3,05*** (0,003)	1,53	-7,65***	2,29** (0,025)	-2,84	-8,94***	1,21 (0,232)
Number of observations	38	40		38	40		38	40		38	40		38	40	
	Panel B: Sales (87 Prices)														
Mean percentage change (%)	11,39	18,08**	-0,96 (0,343)	21,08	31,09***	-1,16 (0,249)	30,22	32,09***	-0,16 (0,873)	38,71	39,6***	-0,05 (0,957)	37,35	31,16**	0,35 (0,724)
Mean Ln-Sales perc. chng (%)	0,89***	1,05*	-0,25 (0,801)	1,45***	2,2***	-1,21 (0,232)	1,91***	2,16***	-0,33 (0,7394)	2,41***	2,23***	0,19 (0,848)	1,59	1,32**	0,22 (0,830)
Number of observations	36	40		36	40		36	40		36	40		36	40	
	Panel C: Asset Turnover														
Mean percentage change (%)	-3,71*	-6,87**	0,61 (0,542)	-8,36**	-9,05**	0,11 (0,912)	-8,21***	-10,84***	0,40 (0,688)	-11,11***	-15,34***	0,67 (0,508)	-14,72***	-16,55***	0,25 (0,805)
Mean Indstr.-adj. prcnt chng (%)	2,63	-8,19**	1,722* (0,089)	-5,88	-7,42**	0,21 (0,836)	4,55	-11,12**	2,105** (0,039)	3,90	-13,47***	2,112** (0,038)	-4,56	-11,70	0,87 (0,388)
Number of observations	36	40		36	40		36	40		36	40		36	40	

Table 13 (continued)

	Years Relative to IPO Year														
	- 1 to 0			- 1 to +1			- 1 to +2			- 1 to +3			- 1 to +4		
	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)	Undpr =<7,14%	Undpr > 7,14%	t for L-H (*p*-Value)
Panel D: Capital Expenditures (87 prices)															
Mean percentage change (%)	84,43	56,35**	0,58 (0,562)	76,68	69,74*	0,16 (0,870)	129,93	137,55	-0,10 (0,923)	58,90	99,89	-0,61 (0,544)	79,88	117,66	-0,46 (0,650)
Mean Ln-CapExp prcnt chng (%)	1,32	2,43	-0,33 (0,741)	2,90	3,95**	-0,33 (0,747)	1,43	3,47	-0,44 (0,659)	-3,43	0,14	-0,76 (0,449)	-4,18	-1,54	-0,25 (0,802)
Number of observations	22	31		22	31		22	31		22	31		22	31	
Panel C: Capital Expenditures on Assets															
Mean percentage change (%)	1,19	2,70	-0,46 (0,647)	0,59	-0,52	0,05 (0,648)	0,52	0,21	0,09 (0,929)	-2,00	-2,64	0,18 (0,860)	0,10	-3,44	0,97 (0,339)
Mean Indstr.-adj. prcnt chng (%)	2,55	2,66	-0,02 (0,981)	1,58	-1,10	0,69 (0,492)	1,73	1,14	0,15 (0,879)	2,16	0,34	0,44 (0,662)	6,32	-3,96	1,844* (0,073)
Number of observations	24	32		24	32		24	32		24	32		24	32	
Panel E: Leverage															
Mean change (%)	-4,85**	-5,58***	0,26 (0,796)	-3,16	-3,09*	0,02 (0,981)	-0,69	-0,43	-0,07 (0,942)	2,97	2,62	0,08 (0,939)	11,27	3,72	0,72 (0,474)
Mean Indstr.-adj. chng (%)	-11,51***	-12,53***	0,19 (0,850)	-10,47**	-9,56**	0,15 (0,883)	-9,22*	-9,91**	0,10 (0,921)	-6,00	-8,26	0,28 (0,780)	3,79	-6,85	0,74 (0,461)
Number of observations	38	40		38	40		38	40		38	40		38	40	

The regression analysis further examines the relationship between underpricing and firm quality represented by post-IPO operating performance. First, the regression is run on the basis of panel data. The positive coefficient of UNDPR seems to confirm the theoretical expectation, in contrast with the Table 10. That is, those firms that do more underprice are expected to show better operating performance. Yet, both the model and beta coefficients are insignificant. Along with the insider ownership factor, the regression model based on the panel data provides no evidence on the explanatory power of underpricing or insiders' retention of ownership after IPO in predicting the post-IPO performance.

Table 14

Results of Model (4) - Panel Data

The table exhibits the unstandardized Beta coefficients, t values and significances of the regression model (4). Also reported are the R-squared, F and p values for model.

Model $OROA_{it} = \delta_0 + \delta_1 UNDPR_i + \delta_2 INSIDER_i + e_i$

R Square	F	Signf.
0,010	0,376	0,688

Coefficients	Beta	t	Signifcnc
Constant	0,198**	1,997	0,050
UNDPR	0,052	0,506	0,614
INSIDER	0,001	0,650	0,518

Table 14a

Regression Results for Model (4a) -Yearwise Data

The table reveals the unstandardized Beta coefficients, t values and significances of the listed independent variables in the regression for each year relative to IPO. Also reported are the R-squared, F and p values for the each model.

	Dependent v.	Change in OROA				
		−1 to 0	−1 to +1	−1 to +2	−1 to +3	−1 to +4
Independent v.						
UNDPR	Beta	-0,137	-0,238**	-0,274**	-0,273*	-0,164
	t- value	-1,467	-2,262	-2,325	-1,953	-0,911
	Significnc.	0,146	0,027	0,023	0,055	0,365
INSIDER	Beta	-0,089	0,289	0,236	0,241	0,459
	t- value	-0,555	1,604	1,164	1,003	1,485
	Significnc.	0,580	0,113	0,248	0,319	0,142
The model	R-Squared	0,030	0,090	0,081	0,059	0,038
	F Value	1,262	3,717**	3,285**	2,341*	1,470
	Significance	0,289	0,029	0,043	0,103	0,237

On the other hand, when the changes in OROA for each year relative to pre-IPO year are taken as the dependent variables and separate regressions are run, the results contradicts with the panel data regression, yet confirms the findings on Table 10. That is, underpricing is negatively related to change in operating performance for each of the five years relative to IPO. This negative relation of underpricing with the operating return is significant in year +1, +2 and +3. The relationship between the insiders' retention of ownership with the operating performance is generally positive in the separate regression, confirming the panel-data regression. The findings of separate regressions for each year overall imply that those firms that highly underprice their stocks are likely to perform worse than those firms that do less or no underpricing. Although the coefficients for INSIDER are insignificant, they show a consistent positive relationship with OROA except for year +1. That is, those firms that maintain higher fraction of ownership within the firm and sell less to public are likely to show better operating performance after the IPO than those firms that

maintain less ownership within the firm and sell more to public. These findings are consistent with some of the recent studies as well.

The possible reasons for unexpected results revealed in Table 14(a) are as follows: first, since the initial return is used as a proxy for underpricing, the price mechanism in the current stock market happens to be an important factor to consider. The Turkish stock market is still not strong and is too sensitive to the short-term foreign capital movements. It is under heavy effect of non-sense speculation, politics, insider trading and foreign capital movements. Thus, the prices and especially initial returns mostly happen to be the result of many complicated non-financial factors. The crucial concern here is that the high initial returns, that is, high underpricing, may be the results of such speculative factors that boost up the after-market prices, rather than the low pricing of high-quality firms at the IPO.

Second, the assumption that post-IPO operating performance proxies for unobservable firm quality may fail to reflect the truth. That is, the post-IPO OROA may not quite reflect the unobservable firm quality.

The reason for the contradictory results between before and after standings with regard to OROA may be a result of the window-dressing. That is, as discussed in the previous sections, firms tend to window-dress their balance sheets just before the IPO, by overstating their performance indicators. To avoid being trapped by such a bias, it is vise to expand the sampling window through earlier years prior to IPO. The last three-year average OROA of low-underpricing IPO firms is 25,33 percent, while that of high-underpricing group is 23,66 percent with an insignificant difference. Their relative standings contradict the result obtained when only year −1 is considered. This result confirms the existence of window-dressing tendency of IPO firms.

The pattern of sales change seems to confirm the research hypothesis, revealing usually better performance for the high-underpricing group, except for year +4, with significant results. This implies that those firms that perform better are more likely to underprice at IPO to some extent. However, the between-group differences are not significant.

Asset turnover shows a consistent pattern with the operating performance, while contradicting the sales pattern. That is, it usually displays a higher decline for the high-underpricing group, implying that those firms that perform worse are more likely to underprice. The between-group differences are not significant, except for the industry-adjusted change in year +2 and +3.

Capital expenditures and capital expenditures over assets exhibit inconsistent patterns. Although in year 0 and +1 the growths in capital expenditures are higher for the low-underpricing group than the other group, the growth rates are not significant. Surprisingly, the lower growths rates for the high-underpricing group in these years are significant. The insignificant t values for the growth rate of low-underpricing group may be explained by the smaller size of the low underpricing group with a high standard deviation (only 22 observations). The growth rate is apparently higher in the high-underpricing group in the following years with insignificant t values. As a matter of fact, the logarithms of this variable reveal a more consistent pattern: except for year +4, high-underpricing group has a higher growth in capital expenditures. Capital expenditures over total assets ratio reveal a reverse pattern with the capital expenditures: except for year 0, the low-underpricing group is always superior to the other group, both in raw and industry-adjusted figures. However, the between-group difference is significant in year +4 only. Overall, the

findings do not seem to provide a clear evidence to indicate significant and consistent difference between the two groups in terms of capital expenditures.

3.5.6. Market Expectations and Earnings Performance

As documented in the previous sections, a partial explanation for the decline in post-IPO operating performance is that it is (1) a manifestation of the change in the ownership structure resulting from reduced insider/managerial ownership in the post-IPO period. Other explanations, consistent with the change in the incentive structure, for the decline in operating performance are (2) managers attempting to window-dress by overstating pre-IPO performance levels and/or (3) entrepreneurs timing the offerings to coincide with periods of unusually good performance that they know cannot be sustained in the future. One should also keep in mind that that such certain periods of good performance of the IPO firms may be a result of the industry trend and/or macroeconomic conditions which lead all the firms show abnormal operating returns. Window-dressing or successful timing actions taken by issuers may result in potential investors having high, and systematically biased, expectations of earnings and growth in the post-issue period.

This study examines several measures of investor expectations of post-IPO earnings growth and the actual post-issue earnings performance to determine if investors expect continued earnings growth in the post-issue period and if these expectations are fulfilled. Specifically, in order to study investor expectations of earnings potential, post-issue market-to-book (M/B) and price-earnings (P/E) ratios for both IPO firms and their industry counterparts traded in the stock market are examined. Also examined are the earnings per share (EPS) to measure the post-issue earning performance of IPO firms and their industry counterparts. Since there is no

data related to these three ratios available before the firms go public, IPO year is considered as the base year.

Table 15

Market Expectations and Earnings Performance of Turkish Manufacturing Firms That Went Public Between 1990-1998

Table values are for the mean change/growth expressed as a percentage for 81 IPO firms during 1987 through 2002. The sample consists of those firms of which financial data are available. M/B equals price of share at the year-end divided by shareholder's equity per share. P/E equals price of each share at the year-end divided by EPS during the period. EPS equals profit after taxes divided by (shareholder's equity /1000). The industry-adjusted change/gowth for a given firm is the deviation from the contemporaneus industry mean. The significances are measured by the paired-sample T-Tests.

	Year Relative to IPO Year			
Description	From 0 to +1	From 0 to +2	From 0 to +3	From 0 to +4
Panel A: Market to Book Ratio (M/B)				
Mean Level in Year 0 :				
IPO issuing firms = 4,49				
Matched industry = 4,42				
Mean change	- 0,59	- 0,61	- 0,44	- 0,70
Mean industry-adjusted chng	- 0,17	- 0,43	- 0,51	- 0,92*
Number of observations	75	75	72	71
Panel B: Price / Earnings Ratio (P/E)				
Mean Level in Year 0 :				
IPO issuing firms = 15,84				
Matched industry = 15,95				
Mean change	- 2,33	- 6,01	4,83*	6,06*
Mean industry-adjusted chng	- 4,13*	- 5,61	2,40	4,79
Number of observations	77	73	69	57
Panel C: Earnings per Share (EPS)				
Mean Level in Year 0 :				
IPO issuing firms = 1.361				
Matched industry = 1.283				
Mean percentage change (%)	- 4,88*	- 29,17**	- 65,84***	- 99,38***
Mean industry-adjusted prcnt chng (%)	- 33,32**	- 34,16*	- 94,50***	- 28,87***
Number of observations	78	78	78	78

Mean raw and industry-adjusted changes in levels of these ratios in years +1 to +4 relative to year 0 are reported in Table 15. The levels of these ratios throughout the post-IPO period are also illustrated on the Figure 22 through 27.

The results suggest that both M/B and P/E decline for the two years subsequent to the IPO and then P/E shows a significant increase in year +3 climbing up to 22, even higher than the IPO year level, while M/B shows a little growth in year +3 relative to year +2, reaching 4, still below the IPO year level. These levels means almost 38% percent increase for P/E ratio relative to IPO year and 10% decline for M/B relative to IPO year. After year +3 these ratios display very little declines, indicating a stabilized trend. Although the changes in M/B ratio for each of the four years are negative relative to IPO year, the *t*-tests do not reveal significant *t* values for the differences. However, the industry-adjusted changes show more significant decline compared to the raw data, producing a significant t value in year +4. While decline in P/E in year +1 and +2 are also insignificant, the positive change in P/E in year +3 and +4 result in significant *t* values. After the industry adjustments, the significance of the changes in P/E ratio increase in year 0 yet weakens in the following years. Although the significance levels change with the industry adjustments, both ratios show similar patterns. The decline in M/B and P/E ratios implies that the mean price is falling in the post-IPO period for at least two years, fulfilling the expectation of the study. The increase in both M/B and P/E in year +3 may be attributed partially to the economic conditions because the industry ratios also exhibit a rise after year +2. That is, the market was probably buoyant during that period.

The sharper increase in P/E compared to M/B ratio beginning from year +3, however, seems not to be explained solely by the industry effect. This finding also is

inconsistent with Ritter (1991) and Jain (1994). Since the numerators are the same in these two ratios, the difference between the rises of these two ratios after year +3 can be attributed to the different trends in the denominators. The M/B ratio compares the price with the book value of the equity per share, while P/E compares the price with the net profit of the year. The analyses in the previous sections prove that profits significantly declines in the post-IPO period. The finding pertaining to P/E implies that the mean decline in the profits is more significant than the decline in the mean price. The significant decline in the profits after IPO supports this explanation. Alternatively, mean price may even increase despite the decline in the profits. This actually can be an expected result for the Turkish case where the stock market is under heavy effect of non-sense speculation, politics, insider trading and foreign capital movements. Thus, the prices mostly happen to be the result of many complicated non-financial factors. Such speculative factors may boost up the prices even though the firm is not actually valuable. The M/B ratio, on the other hand, does not increase as much as P/E because the book value of equity is also periodically increased in Turkey even though there is no profit or capital increase. That is, due to the high inflation, Turkish firms use a special account called revaluation surplus (*yeniden değerleme fonu*), to adjust their assets according to the inflation. This account is included within the shareholders' equity section of the balance sheet and, as the amount accumulates in this account, shareholders' equity per share inflates. Thus, the denominator maintains an increasing trend, leading a consistent decline in M/B ratio even though the numerator, namely stock prices go up.

EPS shows significant decline in each of the four years relative to IPO year, confirming the research hypothesis and findings for operating return discussed in the previous sections. The decline becomes even sharper when adjusted with the industry

levels. In year 0 the IPO firms have higher EPS than that of the matched-industry mean. After year 0, however, EPS of IPO firms begins to decline over time and maintains always a lower level compared to the industry mean. In other words, IPO firms experience decline over time, while the industry-matched firms demonstrate a rising trend.

One should remember that the mean OROA of industry shows a very stable pattern compared to mean EPS of industry. The difference is explained by the significance of the non-operating income of Turkish firms. That is, as explained in the previous sections, the profits of the Turkish manufacturing firms have contained a significant amount of interest income obtained from the state borrowings especially until 2002. Thus, although the operating income of the manufacturing firms did not experience an increase, the net profits continued to rise due to the increasing interest income.

In sum, IPO firms start out with high M/B ratio and EPS, which decline over time, well below the industry mean. P/E ratio also shows a decline during year +1 and +2, however, contrary to the other two indicators, experiences a sharp increase in year +3. The results overall imply that investors at the beginning appear to value firms going public based on expectation that earnings growth will continue, while in actuality the pre-IPO earnings levels on which the expectations are formed are not even sustained. Although investors later realize the declining trend in the earnings and adjust their valuations over time, the market buoyancy probably influence their expectations and increase the stock prices again while the real earnings continue to decline.

Figure 22

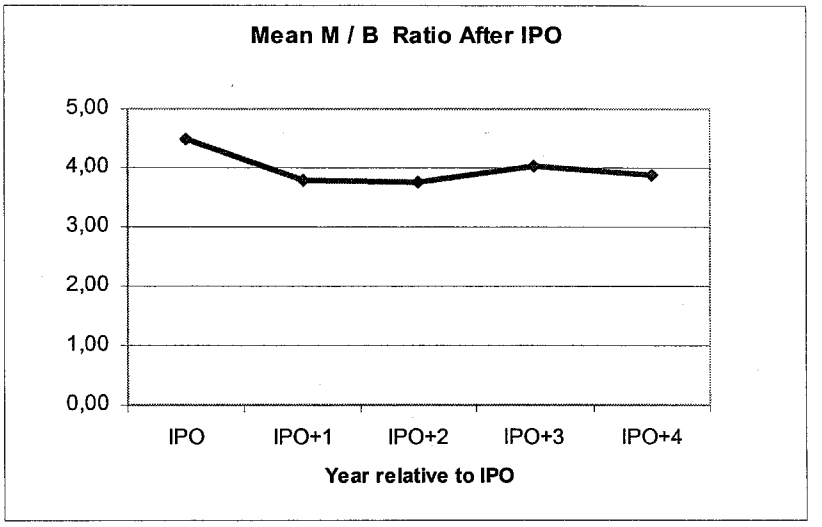


Figure 23

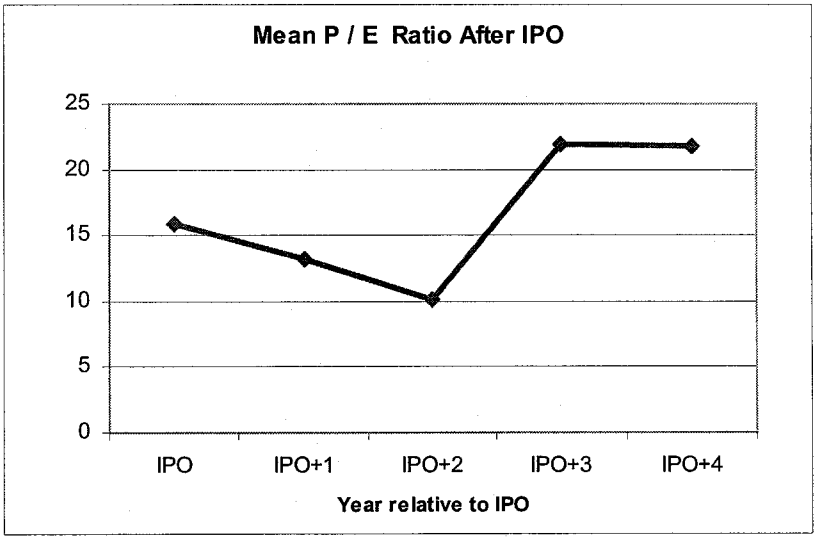


Figure 24

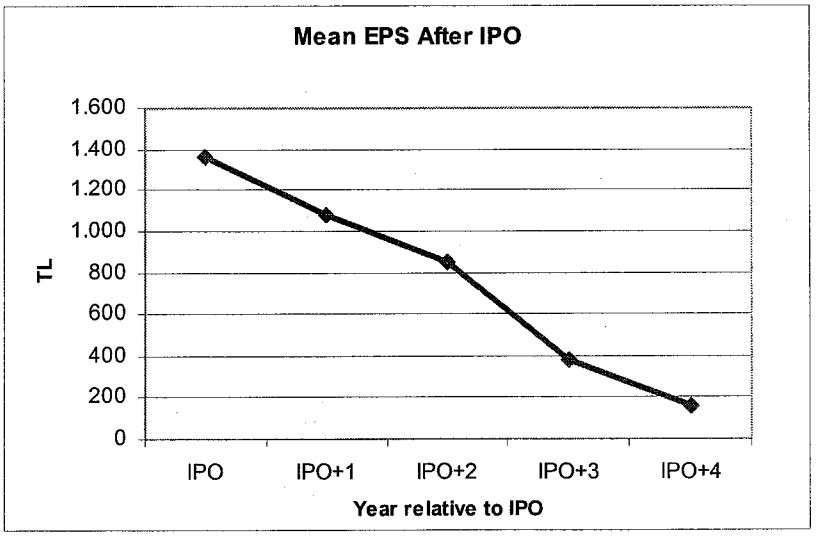


Figure 25

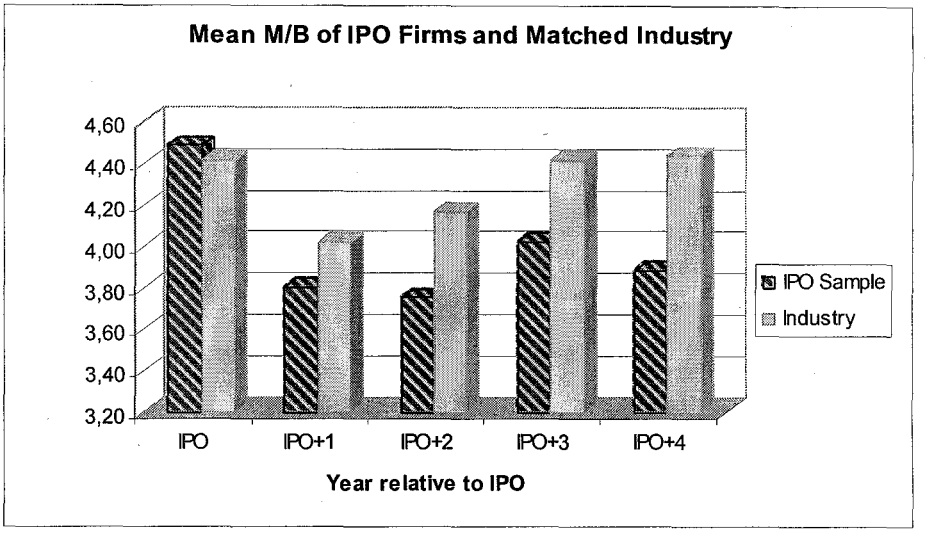


Figure 26

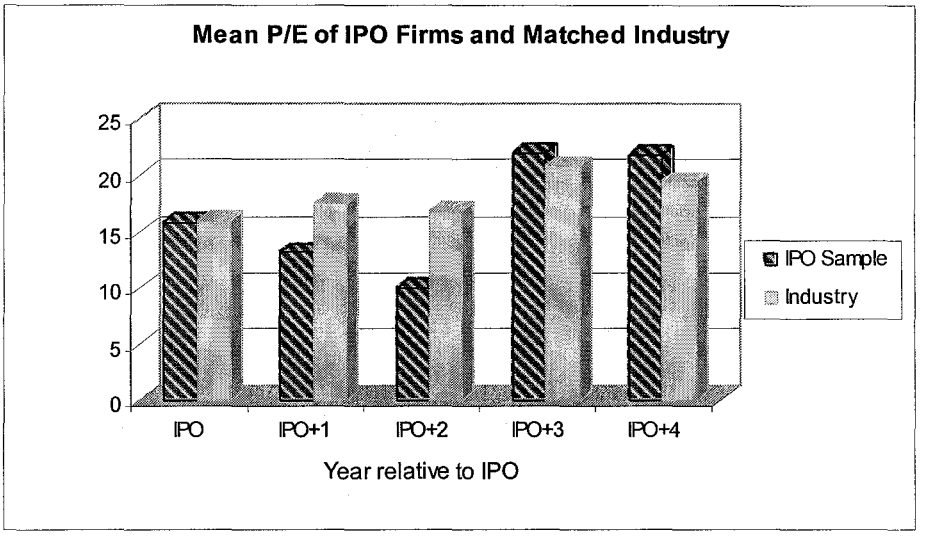
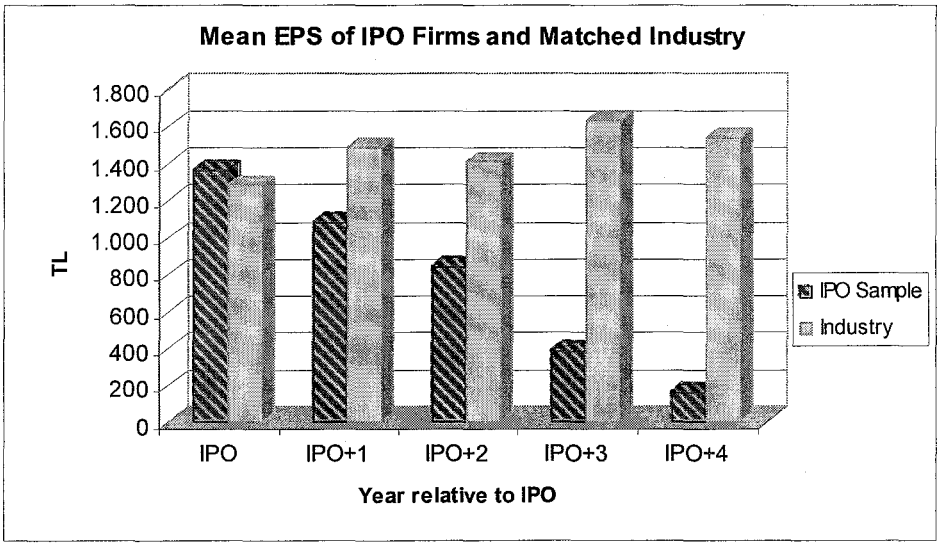


Figure 27



4. CONCLUSIONS

In this study, the changes in certain performance measures and financial characteristics of firms as a result of their transition from private to public ownership (quoted/listed) status are investigated. Following an analysis of the corporate ownership concept and impact of ownership type on performance, the study focused on the dimension of public ownership and tested the relevant hypotheses on a sample constructed of 81 Turkish manufacturing firms that went public between 1990 and 1998, capturing the relevant data from 1987 through 2002.

The findings show that the firms going public exhibit a substantial decline in post-issue operating performance. Over a six-year-period extending from the year prior to the IPO until the four years after the offering, the performance of IPO firms declines significantly, based on several performance measures. Despite an increase in sales and capital expenditures, however, the pre-IPO performance levels are not sustained, leading to a decline in expectations. In fact, asset turnover and capital expenditures on assets decrease significantly. In other words, the growth in sales and capital expenditures relative to the growth in total assets actually represent declining trend. The decrease in asset turnover partially explains the decline in operating return on assets. The regression provides negative relationship between capital expenditures on assets and operating return on assets, except for the lagged panel data. That is, the decrease in operating return on assets is partially explained by the decrease in capital expenditures on assets when the effect of capital expenditures in year t-1 on operating return on assets in year t is considered on panel data.

The sharp decline in leverage just before the IPO and in IPO year proves that firms substitute their source of funds from debt to equity in order to deleverage. However, IPO firms cannot maintain their new financial structure featuring low

leverage after the IPO. Leverage displays a consistent increase after IPO, reaching significant differences in third and fourth year of IPO relative to the year just before IPO. Overall, the findings confirm the expectations that the leverage tends to grow because of the increase in the perceived value of the firm and credibility, overcoming borrowing constrains, greater bargaining power with banks, decreasing cost of borrowing and using the leverage as a device to control agency costs.

The cost of borrowing shows a consistent decline after the IPO, reaching a significant level in the fourth year subsequent to IPO. This finding also confirms the expectations. The increase in leverage beginning from the second year subsequent to IPO is partially explained by the declining cost of borrowing.

The findings regarding the insider (managerial) ownership appear to support the research hypothesis with insufficient confidence level. That is, those firms that retain higher fraction of the stock within the firm and sell lower proportion to public are likely to perform better than those firms that retain lower fraction of the shares and sold higher fraction to public. The t-tests between the groups however, do not provide a sufficient confidence level for a more robust conclusion.

The analysis related to the underpricing reveal more inconsistent and complicated results. While the pre-IPO findings support the hypothesis that better-performing firms underprice their stocks, the findings of post-IPO analysis and also that of the regression are not consistent with this result. The possible reasons for the inconsistent results are already explained in the relevant section.

The findings also seem to support the argument that high-pre-IPO operating performance level of the firms and market buoyancy around IPO date may lead investors to develop optimistic assessments of earnings growth for the IPO firms.

Overall, the results of this study indicate that IPO firms are unable sustain their pre-issue performance levels. Although most hypotheses derived from the theory and literature are fulfilled, some of them are contradicted or at least not confirmed. These may indicate the peculiarity of the Turkish case. It should be also noted that a future study with a larger sample size and wider time horizon is believed to provide more robust outcomes.

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APPENDICES

I. THE NAMES, INDUSTRY CATEGORIES AND IPO YEARS OF THE FIRMS INCLUDED IN THE SAMPLE (Sorted by the IPO Year)

Firm	Industry	IPO Year
BOSCH PROFİLO	Fabricated metal products and machinery equipment	1990
YÜNSA	Textile, wearing apparel and leather	1990
SABAH YAYINCILIK	Paper and paper products, printing and publishing	1990
ECZACIBAŞI İLAÇ	Chemicals, petroleum, rubber and plastic products	1990
VESTEL	Fabricated metal products and machinery equipment	1990
PETKİM	Chemicals, petroleum, rubber and plastic products	1990
ASELSAN	Fabricated metal products and machinery equipment	1990
KELEBEK MOBİLYA	Wood products and furniture	1990
FENİŞ	Basic metal industries	1990
MARSHALL	Chemicals, petroleum, rubber and plastic products	1990
KONYA ÇİMENTO	Non-metalic mineral products	1990
KENT GIDA	Food, bevarage and tobacco	1990
TRAKYA CAM	Non-metalic mineral products	1990
ÜNYE ÇİMENTO	Non-metalic mineral products	1990
EDİP İPLİK	Textile, wearing apparel and leather	1991
ADANA ÇİMENTO	Non-metalic mineral products	1991
PETROL OFİSİ	Chemicals, petroleum, rubber and plastic products	1991
TÜPRAŞ	Chemicals, petroleum, rubber and plastic products	1991
TİRE KUTSAN	Paper and paper products, printing and publishing	1991
TOFAŞ OTO	Automotive	1991
SÖNMEZ FİLAMENT	Textile, wearing apparel and leather	1991
ALTINYILDIZ	Textile, wearing apparel and leather	1991
ALARKO CARRIER	Fabricated metal products and machinery equipment	1992
HÜRRİYET GAZETECİLİK	Paper and paper products, printing and publishing	1992
ÇİMENTAŞ	Non-metalic mineral products	1992
BEKO	Fabricated metal products and machinery equipment	1992
BANVİT	Food, bevarage and tobacco	1992
KONİTEKS	Textile, wearing apparel and leather	1993
EGE SERAMİK	Non-metalic mineral products	1993
NETAŞ	Fabricated metal products and machinery equipment	1993
RAKS ELEKTRONİK	Fabricated metal products and machinery equipment	1993

TAT KONSERVE	Food, bevarage and tobacco	1993
MİLLİYET GAZETECİLİK	Paper and paper products, printing and publishing	1993
BURSA ÇİMENTO	Non-metalic mineral products	1993
AKSU İPLİK DOKUMA	Textile, wearing apparel and leather	1993
EGE PLASTİK	Chemicals, petroleum, rubber and plastic products	1994
TUKAŞ KONSERVE	Food, bevarage and tobacco	1994
IŞIKLAR AMBALAJ	Paper and paper products, printing and publishing	1994
KEREVİTAŞ	Food, bevarage and tobacco	1994
DARDANEL	Food, bevarage and tobacco	1994
MUTLU AKÜ	Fabricated metal products and machinery equipment	1994
MERKO GIDA	Food, bevarage and tobacco	1994
VİKİNG KAĞITÇILIK	Paper and paper products, printing and publishing	1994
ANADOLU EFES	Food, bevarage and tobacco	1994
BORUSAN	Basic metal industries	1994
RAKS EV ALETLERİ	Fabricated metal products and machinery equipment	1994
SÖNMEZ PAMUKLU	Textile, wearing apparel and leather	1994
ÇEMTAŞ ÇELİK MAKİNE	Basic metal industries	1994
GÖLTAŞ ÇİMENTO	Non-metalic mineral products	1995
BATI ÇİMENTO	Non-metalic mineral products	1995
SÖKTAŞ	Textile, wearing apparel and leather	1995
OTOKAR	Automotive	1995
ÇBS BOYA	Chemicals, petroleum, rubber and plastic products	1995
ESEM SPOR	Textile, wearing apparel and leather	1995
ECZACIBAŞI YAPI	Non-metalic mineral products	1995
TÜM TEKSTİL	Textile, wearing apparel and leather	1995
BOSSA	Textile, wearing apparel and leather	1995
UKI KONFEKSİYON	Textile, wearing apparel and leather	1996
AKIN TEKSTİL	Textile, wearing apparel and leather	1996
MUDURNU TAVUKÇULUK	Food, bevarage and tobacco	1996
İHLAS EV ALETLERİ	Fabricated metal products and machinery equipment	1996
BİRLİK MENSUCAT	Textile, wearing apparel and leather	1996
YATAŞ	Textile, wearing apparel and leather	1996
AKÇANSA	Non-metalic mineral products	1996
ANADOLU GIDA	Food, bevarage and tobacco	1996
BİSAŞ TEKSTİL	Textile, wearing apparel and leather	1996
SASA	Chemicals, petroleum, rubber and plastic products	1996

BERDAN TEKSTİL	Textile, wearing apparel and leather	1997
GÜMÜŞSUYU HALI	Textile, wearing apparel and leather	1997
ANADOLU ISUZU	Automotive	1997
BAYRAKLI BOYA	Chemicals, petroleum, rubber and plastic products	1997
UZEL MAKİNE	Fabricated metal products and machinery equipment	1997
KRİSTAL MEŞRUBAT	Food, bevarage and tobacco	1997
MENSA MENSUCAT	Textile, wearing apparel and leather	1997
ÇİMBETON HAZIR BETON	Non-metalic mineral products	1997
VANET	Food, bevarage and tobacco	1998
VAKKO	Textile, wearing apparel and leather	1998
PASTAVİLLA	Food, bevarage and tobacco	1998
BAK AMBALAJ	Paper and paper products, printing and publishing	1998
IDAŞ	Textile, wearing apparel and leather	1998
ARSAN	Textile, wearing apparel and leather	1998

II. OPERATING RETURN ON ASSET RATIOS OF THE SAMPLE FIRMS FOR EACH YEAR RELATIVE TO THEIR IPOs (Sorted by the IPO Year)

N=	74	79	81	81	81	81	81	81
Mean	**0,24**	**0,23**	**0,27**	**0,25**	**0,24**	**0,20**	**0,21**	**0,16**
	IPO-3	**IPO-2**	**IPO-1**	**IPO**	**IPO+1**	**IPO+2**	**IPO+3**	**IPO+4**
BSPRO		0,21	0,28	**0,23**	0,30	0,28	0,32	0,34
YUNSA	0,29	0,30	0,22	**0,29**	0,27	0,42	0,35	0,43
SABAH	0,35	0,22	0,23	**0,30**	0,27	0,27	0,17	0,25
ECILC		0,38	0,38	**0,15**	0,12	0,15	0,22	0,30
VESTL	0,00	0,16	0,25	**0,26**	0,23	0,17	0,11	0,25
PETKM	-0,01	0,00	-0,01	**0,02**	0,00	0,00	0,00	0,29
ASELS	0,17	0,16	0,10	**0,11**	0,06	0,12	0,12	0,18
KLBMO	0,29	0,29	0,36	**0,28**	0,19	0,11	0,22	0,28
FENIS		0,12	0,14	**0,17**	0,20	0,21	0,18	0,08
MRSHL	0,06	0,36	0,37	**0,27**	0,20	0,33	0,26	0,39
KONYA	0,49	0,45	0,32	**0,53**	0,35	0,37	0,36	0,29
KENT	0,32	0,10	0,29	**0,23**	0,34	0,34	0,28	0,38
TRKCM	0,26	0,27	0,13	**0,10**	0,16	0,21	0,20	0,27
UNYEC	0,38	0,32	0,20	**0,27**	0,20	0,30	0,38	0,27
EDIP	0,13	0,05	0,19	**0,18**	0,17	0,09	0,62	0,25
ADANA	0,46	0,41	0,37	**0,27**	0,20	0,18	0,24	0,10
PTOFS			0,23	**0,37**	0,30	0,33	0,41	0,36
TUPRS	0,07	0,04	0,05	**0,03**	0,01	-0,04	-0,11	-0,08
TIRE	0,48	0,10	0,10	**0,19**	0,26	0,37	0,59	0,47
TOASO	0,49	0,33	0,35	**0,08**	0,25	0,38	0,17	0,11
SONME	0,60	0,36	0,31	**0,36**	0,44	0,21	0,37	0,28
ALTIN	0,29	0,26	0,26	**0,31**	0,28	0,28	0,31	0,25
ALCAR	0,19	0,12	0,11	**0,12**	0,30	0,40	0,32	0,27
HURGZ	0,09	0,21	0,14	**0,10**	0,16	0,10	0,15	0,12
CMENT		0,37	0,29	**0,33**	0,34	0,33	0,25	0,18
BEKO	0,39	0,36	0,37	**0,35**	0,27	0,26	0,31	0,29
BANVT	0,29	0,37	0,30	**0,17**	0,35	0,28	0,54	0,07
KOTKS	0,26	0,29	0,30	**0,30**	0,38	0,16	0,30	0,29
EGSER	0,24	0,35	0,35	**0,30**	0,57	0,42	0,27	0,20
NETAS	0,20	0,44	0,39	**0,35**	0,19	0,16	0,29	0,39
RAKSE	0,22	0,17	0,22	**0,28**	0,37	0,22	0,35	0,28
TATKS	0,10	0,18	0,31	**0,36**	0,44	0,21	0,37	0,28
MILYT	0,03	0,21	0,16	**0,39**	0,04	0,06	0,07	0,26
BUCIM	0,48	0,46	0,47	**0,47**	0,34	0,28	0,31	0,39
AKIPD	0,30	0,11	0,32	**0,19**	0,18	0,20	0,29	0,18
EPLAS	0,26	0,30	0,42	**0,43**	0,40	0,14	0,20	0,11
TUKAS	0,26	0,27	0,27	**0,62**	0,33	0,11	0,24	0,23
ISAMB	0,26	0,04	0,18	**0,07**	0,11	0,21	0,12	0,08
KERVT	0,41	0,23	0,24	**0,24**	0,21	0,08	0,08	0,12
DARDL	0,24	0,16	0,30	**0,35**	0,13	0,04	0,16	0,05
MUTLU	0,26	0,27	0,37	**0,32**	0,34	0,35	0,18	0,17

MERKO	0,19	0,01	0,03	**0,26**	0,14	0,14	0,08	0,04
VKING	0,11	0,15	0,35	**0,42**	0,41	0,23	0,11	0,00
AEFES	0,47	0,41	0,47	**0,45**	0,25	0,18	0,14	0,08
BRSAN	0,28	0,10	0,13	**0,43**	0,32	0,23	0,35	0,27
RKSEV	0,07	0,18	0,30	**0,23**	0,27	0,32	0,26	0,19
SNPAM	0,14	0,13	0,09	**0,35**	0,15	0,08	0,13	0,07
CEMTS	-0,04	0,13	0,16	**0,38**	0,40	0,22	0,18	-0,06
GOLT	0,51	0,51	0,45	**0,39**	0,36	0,32	0,23	0,17
BTCIM	0,42	0,45	0,49	**0,33**	0,29	0,27	0,20	0,13
SKTAS	0,21	0,22	0,48	**0,24**	0,24	0,17	0,08	0,02
OTKAR	0,28	0,27	0,31	**0,23**	0,23	0,09	0,20	0,23
CBSBO	0,42	0,34	0,26	**0,20**	0,32	0,40	0,24	0,27
ESEMS	0,19	0,23	0,35	**0,41**	0,42	0,40	0,35	0,28
ECYAP	0,12	0,16	0,43	**0,32**	0,23	0,22	0,19	0,16
TUMTK	0,02	0,06	0,35	**0,17**	0,20	0,18	0,03	-0,95
BOSSA	0,28	0,22	0,47	**0,30**	0,23	0,24	0,11	0,02
UKIM	0,33	0,57	0,56	**0,45**	0,46	0,25	0,16	1,18
ATEKS	0,16	0,25	0,32	**0,23**	0,18	0,21	0,14	0,03
MDRNU	0,21	0,08	0,29	**0,08**	0,10	0,18	0,05	-0,56
IHEVA		0,03	0,15	**0,06**	0,01	0,03	0,14	0,11
BRMEN	0,39	0,08	0,05	**0,21**	0,65	0,64	0,72	0,08
YATAS	0,32	0,38	0,40	**0,39**	0,33	0,30	0,20	0,19
AKCNS	0,34	0,36	0,26	**0,11**	0,18	0,22	0,19	0,10
AGIDA	0,17	0,21	0,23	**0,24**	0,19	0,23	0,23	0,19
BISAS	0,03	0,19	0,19	**0,06**	0,06	0,02	-0,18	-0,04
SASA	0,28	0,39	0,35	**0,25**	0,30	0,19	0,16	0,18
BERDN	0,13	0,22	0,23	**0,18**	0,15	0,12	-0,03	0,13
GUMUS	0,42	-0,53	0,22	**0,13**	0,09	0,09	0,05	-0,19
ASUZU	0,22	0,33	0,36	**0,27**	0,14	0,06	0,18	0,03
BYRBY	0,07	0,33	0,15	**0,12**	0,00	-0,05	-0,06	-0,05
UZEL	0,28	0,46	0,46	**0,49**	0,46	0,13	0,13	0,01
KRSTL			0,01	**0,11**	0,19	0,22	0,04	0,03
MEMSA	0,27	0,24	-0,01	**0,10**	0,13	0,09	0,08	0,16
CMBTN	0,01	0,06	0,24	**0,15**	0,10	0,02	0,04	0,03
VANET	0,01	0,04	0,17	**0,13**	0,20	0,04	-0,01	-0,07
VAKKO	0,34	0,33	0,34	**0,20**	0,14	0,16	0,19	0,30
PASTA	0,09	0,24	0,31	**0,04**	0,03	0,09	0,18	0,08
BAKAB	0,09	-0,08	0,32	**0,08**	0,14	0,10	0,26	0,17
IDAS	0,45	0,23	0,50	**0,39**	0,21	0,08	0,15	0,28
ARSAN	0,10	0,04	0,15	**0,07**	0,09	0,04	0,19	0,07

III. CHANGES IN OPERATING RETURN ON ASSET RATIOS OF THE SAMPLE FIRMS RELATIVE TO THE YEAR PRIOR TO IPO

N=	81	81	81	81	81
Mean	**-0,02**	**-0,03**	**-0,07**	**-0,07**	**-0,11**
	-1 to 0	**-1 to +1**	**-1 to +2**	**-1 to +3**	**-1 to +4**
BSPRO	-0,05	0,02	0,00	0,04	0,06
YUNSA	0,07	0,05	0,20	0,13	0,21
SABAH	0,07	0,04	0,04	-0,06	0,02
ECILC	-0,23	-0,27	-0,23	-0,16	-0,09
VESTL	0,00	-0,03	-0,08	-0,14	0,00
PETKM	0,02	0,01	0,01	0,01	0,29
ASELS	0,01	-0,05	0,02	0,02	0,08
KLBMO	-0,08	-0,16	-0,25	-0,14	-0,08
FENIS	0,02	0,05	0,06	0,04	-0,07
MRSHL	-0,11	-0,18	-0,05	-0,11	0,01
KONYA	0,21	0,03	0,05	0,04	-0,03
KENT	-0,06	0,05	0,05	-0,01	0,09
TRKCM	-0,03	0,03	0,08	0,07	0,14
UNYEC	0,07	0,00	0,10	0,18	0,07
EDIP	0,00	-0,02	-0,10	0,43	0,06
ADANA	-0,10	-0,17	-0,19	-0,13	-0,27
PTOFS	0,14	0,07	0,10	0,18	0,13
TUPRS	-0,01	-0,04	-0,09	-0,15	-0,13
TIRE	0,09	0,16	0,27	0,49	0,37
TOASO	-0,26	-0,10	0,04	-0,17	-0,23
SONME	0,04	0,12	-0,10	0,05	-0,03
ALTIN	0,04	0,02	0,02	0,05	-0,01
ALCAR	0,01	0,20	0,29	0,21	0,17
HURGZ	-0,04	0,02	-0,05	0,01	-0,02
CMENT	0,04	0,05	0,04	-0,05	-0,11
BEKO	-0,02	-0,10	-0,11	-0,06	-0,09
BANVT	-0,13	0,05	-0,02	0,24	-0,23
KOTKS	0,00	0,08	-0,14	0,01	-0,01
EGSER	-0,05	0,22	0,07	-0,08	-0,15
NETAS	-0,04	-0,20	-0,23	-0,11	0,00
RAKSE	0,05	0,15	0,00	0,13	0,06
TATKS	0,04	0,12	-0,10	0,05	-0,03
MILYT	0,23	-0,12	-0,10	-0,09	0,10
BUCIM	0,00	-0,13	-0,19	-0,16	-0,08
AKIPD	-0,13	-0,14	-0,12	-0,03	-0,14
EPLAS	0,01	-0,02	-0,28	-0,22	-0,31
TUKAS	0,35	0,06	-0,16	-0,03	-0,04
ISAMB	-0,12	-0,07	0,03	-0,07	-0,10
KERVT	0,00	-0,04	-0,16	-0,16	-0,13
DARDL	0,05	-0,17	-0,26	-0,14	-0,25
MUTLU	-0,05	-0,03	-0,02	-0,19	-0,20

MERKO	0,23	0,11	0,12	0,06	0,02
VKING	0,07	0,06	-0,11	-0,24	-0,35
AEFES	-0,02	-0,22	-0,29	-0,33	-0,39
BRSAN	0,29	0,18	0,09	0,21	0,14
RKSEV	-0,07	-0,03	0,02	-0,04	-0,11
SNPAM	0,26	0,07	0,00	0,05	-0,02
CEMTS	0,22	0,24	0,06	0,02	-0,22
GOLT	-0,07	-0,09	-0,14	-0,22	-0,29
BTCIM	-0,16	-0,20	-0,23	-0,29	-0,36
SKTAS	-0,24	-0,24	-0,31	-0,40	-0,46
OTKAR	-0,08	-0,07	-0,21	-0,11	-0,08
CBSBO	-0,06	0,06	0,14	-0,02	0,00
ESEMS	0,06	0,07	0,05	-0,01	-0,07
ECYAP	-0,12	-0,21	-0,21	-0,25	-0,27
TUMTK	-0,17	-0,15	-0,17	-0,32	-1,30
BOSSA	-0,18	-0,24	-0,24	-0,36	-0,45
UKIM	-0,11	-0,10	-0,31	-0,40	0,62
ATEKS	-0,09	-0,14	-0,11	-0,18	-0,29
MDRNU	-0,21	-0,19	-0,11	-0,24	-0,85
IHEVA	-0,09	-0,14	-0,12	-0,01	-0,04
BRMEN	0,16	0,61	0,60	0,68	0,03
YATAS	-0,01	-0,06	-0,10	-0,20	-0,21
AKCNS	-0,15	-0,08	-0,04	-0,07	-0,16
AGIDA	0,01	-0,03	0,00	0,00	-0,04
BISAS	-0,13	-0,13	-0,17	-0,37	-0,23
SASA	-0,10	-0,05	-0,16	-0,19	-0,17
BERDN	-0,05	-0,08	-0,11	-0,26	-0,10
GUMUS	-0,09	-0,13	-0,13	-0,17	-0,41
ASUZU	-0,09	-0,22	-0,30	-0,18	-0,33
BYRBY	-0,03	-0,15	-0,19	-0,21	-0,20
UZEL	0,03	0,00	-0,33	-0,33	-0,45
KRSTL	0,10	0,19	0,21	0,03	0,02
MEMSA	0,11	0,14	0,09	0,08	0,17
CMBTN	-0,09	-0,14	-0,22	-0,21	-0,21
VANET	-0,03	0,03	-0,13	-0,18	-0,24
VAKKO	-0,14	-0,21	-0,19	-0,16	-0,05
PASTA	-0,27	-0,28	-0,22	-0,14	-0,23
BAKAB	-0,24	-0,18	-0,22	-0,06	-0,15
IDAS	-0,11	-0,29	-0,42	-0,34	-0,21
ARSAN	-0,08	-0,06	-0,12	0,04	-0,08

IV. OPERATING RETURN ON ASSET RATIOS OF THE MATCHED INDUSTRY OF THE SAMPLE FIRMS FOR EACH YEAR RELATIVE TO THEIR IPOs

N=		57	65	81	81	81	81	81	75
Mean		**0,16**	**0,16**	**0,17**	**0,16**	**0,16**	**0,14**	**0,14**	**0,14**
	Indstr.	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**
BSPRO	MMG			0,19	0,16	0,17	0,20	0,18	0,21
YUNSA	DGD			0,13	0,12	0,09	0,13	0,11	0,25
SABAH	KBY			0,14	0,11	0,06	0,09	0,14	0,21
ECILC	PKM			0,20	0,17	0,18	0,18	0,20	0,30
VESTL	MMG			0,19	0,16	0,17	0,20	0,18	0,21
PETKM	PKM			0,26	0,10	0,13	0,02	0,00	0,08
ASELS	MMG			0,19	0,16	0,17	0,20	0,18	0,21
KLBMO	ORM			0,15	0,18	0,14	0,21	0,19	0,19
FENIS	MET			0,19	0,06	0,05	0,04	0,07	0,14
MRSHL	PKM			0,20	0,17	0,18	0,18	0,20	0,30
KONYA	TTS			0,26	0,18	0,32	0,18	0,21	0,26
KENT	GIT			0,09	0,05	0,10	0,10	0,09	0,17
TRKCM	TTS			0,26	0,18	0,32	0,18	0,21	0,26
UNYEC	TTS			0,26	0,18	0,32	0,18	0,21	0,26
EDIP	DGD		0,13	0,12	0,09	0,13	0,11	0,25	0,16
ADANA	TTS			0,18	0,32	0,18	0,21	0,26	0,18
PTOFS	PKM		0,02	0,10	0,13	0,02	0,00	0,08	0,14
TUPRS	PKM		0,02	0,10	0,13	0,02	0,00	0,08	0,14
TIRE	KBY			0,11	0,06	0,09	0,14	0,21	0,24
TOASO	OTO		0,19	0,17	0,08	0,14	0,23	0,14	0,18
SONME	DGD		0,13	0,12	0,09	0,13	0,11	0,25	0,16
ALTIN	DGD		0,13	0,16	0,16	0,18	0,14	0,28	0,21
ALCAR	MMG	0,19	0,16	0,17	0,20	0,18	0,21	0,23	0,23
HURGZ	KBY		0,11	0,06	0,09	0,14	0,21	0,24	0,12
CMENT	TTS		0,18	0,32	0,18	0,21	0,26	0,18	0,14
BEKO	MMG	0,19	0,16	0,17	0,20	0,18	0,21	0,23	0,23
BANVT	GIT	0,09	0,05	0,10	0,10	0,09	0,17	0,18	0,13
KOTKS	DGD	0,16	0,16	0,18	0,14	0,28	0,21	0,15	0,15
EGSER	TTS	0,18	0,32	0,18	0,21	0,26	0,18	0,14	0,16
NETAS	MMG	0,16	0,17	0,20	0,18	0,21	0,23	0,23	0,22
RAKSE	MMG	0,16	0,17	0,20	0,18	0,21	0,23	0,23	0,22
TATKS	GIT	0,05	0,10	0,10	0,09	0,17	0,18	0,13	0,15
MILYT	KBY	0,11	0,06	0,09	0,14	0,21	0,24	0,12	0,14
BUCIM	TTS	0,18	0,32	0,18	0,21	0,26	0,18	0,14	0,16
AKIPD	DGD	0,12	0,09	0,13	0,11	0,25	0,16	0,11	0,11
EPLAS	PKM	0,13	0,20	0,22	0,29	0,25	0,21	0,20	0,13
TUKAS	GIT	0,10	0,10	0,09	0,17	0,18	0,13	0,15	0,12
ISAMB	KBY	0,06	0,09	0,14	0,21	0,24	0,12	0,14	0,07
KERVT	GIT	0,10	0,10	0,09	0,17	0,18	0,13	0,15	0,12
DARDL	GIT	0,10	0,10	0,09	0,17	0,18	0,13	0,15	0,12

MUTLU	MMG	0,17	0,20	0,18	0,21	0,23	0,23	0,22	0,20
MERKO	GIT	0,10	0,10	0,09	0,17	0,18	0,13	0,15	0,12
VKING	KBY	0,06	0,09	0,14	0,21	0,24	0,12	0,14	0,07
AEFES	GIT	0,10	0,10	0,09	0,17	0,18	0,13	0,15	0,12
BRSAN	MET	0,05	0,04	0,07	0,14	0,12	0,12	0,14	0,10
RKSEV	MMG	0,17	0,20	0,18	0,21	0,23	0,23	0,22	0,20
SNPAM	DGD	0,09	0,13	0,11	0,25	0,16	0,11	0,11	0,07
CEMTS	MET	0,32	0,18	0,21	0,26	0,18	0,14	0,16	0,14
GOLT	TTS	0,18	0,21	0,26	0,18	0,14	0,16	0,14	0,09
BTCIM	TTS	0,18	0,21	0,26	0,18	0,14	0,16	0,14	0,09
SKTAS	DGD	0,18	0,21	0,26	0,18	0,14	0,16	0,14	0,09
OTKAR	OTO	0,14	0,23	0,14	0,18	0,20	0,19	0,12	0,08
CBSBO	PKM	0,18	0,20	0,30	0,23	0,23	0,24	0,18	0,15
ESEMS	DGD	0,20	0,22	0,29	0,25	0,21	0,20	0,13	0,10
ECYAP	TTS	0,18	0,21	0,26	0,18	0,14	0,16	0,14	0,09
TUMTK	DGD	0,13	0,11	0,25	0,16	0,11	0,11	0,07	0,06
BOSSA	DGD	0,13	0,11	0,25	0,16	0,11	0,11	0,07	0,06
UKIM	DGD	0,14	0,28	0,21	0,15	0,15	0,15	0,13	0,08
ATEKS	DGD	0,11	0,25	0,16	0,11	0,11	0,07	0,06	0,05
MDRNU	GIT	0,09	0,17	0,18	0,13	0,15	0,12	0,09	0,05
IHEVA	MMG	0,21	0,23	0,23	0,22	0,20	0,14	0,12	0,21
BRMEN	DGD	0,14	0,28	0,21	0,15	0,15	0,15	0,13	0,08
YATAS	DGD	0,11	0,25	0,16	0,11	0,11	0,07	0,06	0,05
AKCNS	TTS	0,18	0,21	0,26	0,18	0,14	0,16	0,14	0,09
AGIDA	GIT	0,09	0,17	0,18	0,13	0,15	0,12	0,09	0,05
BISAS	DGD	0,11	0,25	0,16	0,11	0,11	0,07	0,06	0,05
SASA	PKM	0,22	0,29	0,25	0,21	0,20	0,13	0,10	0,07
BERDN	DGD	0,25	0,16	0,11	0,11	0,07	0,06	0,05	0,14
GUMUS	DGD	0,25	0,16	0,11	0,11	0,07	0,06	0,05	0,14
ASUZU	OTO	0,14	0,18	0,20	0,19	0,12	0,08	0,12	0,06
BYRBY	PKM	0,30	0,23	0,23	0,24	0,18	0,15	0,12	0,15
UZEL	MMG	0,20	0,25	0,24	0,24	0,20	0,13	0,11	0,08
KRSTL	GIT	0,17	0,18	0,13	0,15	0,12	0,09	0,05	0,00
MEMSA	DGD	0,28	0,21	0,15	0,15	0,15	0,13	0,08	0,22
CMBTN	TTS	0,26	0,18	0,14	0,16	0,14	0,09	0,06	0,10
VANET	GIT	0,18	0,13	0,15	0,12	0,09	0,05	0,00	
VAKKO	DGD	0,21	0,15	0,15	0,15	0,13	0,08	0,22	
PASTA	GIT	0,18	0,13	0,15	0,12	0,09	0,05	0,00	
BAKAB	KBY	0,24	0,12	0,14	0,07	0,05	0,04	0,05	
IDAS	DGD	0,16	0,11	0,11	0,07	0,06	0,05	0,14	
ARSAN	DGD	0,16	0,11	0,11	0,07	0,06	0,05	0,14	

V. CHANGES IN OPERATING RETURN ON ASSET RATIOS OF THE MATCHED INDUSTRY OF THE SAMPLE FIRMS RELATIVE TO THE YEAR PRIOR TO IPO

N=		81	81	81	81	75
Mean		**-0,01**	**-0,01**	**-0,03**	**-0,03**	**-0,03**
	Indstr.	**-1 to 0**	**-1 to +1**	**-1 to +2**	**-1 to +3**	**-1 to +4**
BSPRO	MMG	-0,03	-0,02	0,01	-0,01	0,02
YUNSA	DGD	-0,01	-0,04	0,00	-0,02	0,12
SABAH	KBY	-0,03	-0,08	-0,05	0,00	0,07
ECILC	PKM	-0,03	-0,01	-0,01	0,00	0,10
VESTL	MMG	-0,03	-0,02	0,01	-0,01	0,02
PETKM	PKM	-0,16	-0,14	-0,25	-0,26	-0,18
ASELS	MMG	-0,03	-0,02	0,01	-0,01	0,02
KLBMO	ORM	0,02	-0,01	0,05	0,04	0,04
FENIS	MET	-0,14	-0,14	-0,16	-0,12	-0,05
MRSHL	PKM	-0,03	-0,01	-0,01	0,00	0,10
KONYA	TTS	-0,09	0,06	-0,08	-0,05	0,00
KENT	GIT	-0,04	0,01	0,01	0,00	0,08
TRKCM	TTS	-0,09	0,06	-0,08	-0,05	0,00
UNYEC	TTS	-0,09	0,06	-0,08	-0,05	0,00
EDIP	DGD	-0,03	0,02	-0,01	0,13	0,05
ADANA	TTS	0,14	0,01	0,04	0,09	0,00
PTOFS	PKM	0,03	-0,08	-0,10	-0,01	0,04
TUPRS	PKM	0,03	-0,08	-0,10	-0,01	0,04
TIRE	KBY	-0,05	-0,02	0,02	0,09	0,12
TOASO	OTO	-0,09	-0,03	0,06	-0,03	0,01
SONME	DGD	-0,03	0,02	-0,01	0,13	0,05
ALTIN	DGD	0,00	0,01	-0,02	0,12	0,05
ALCAR	MMG	0,02	0,00	0,04	0,05	0,05
HURGZ	KBY	0,03	0,08	0,15	0,17	0,06
CMENT	TTS	-0,14	-0,11	-0,06	-0,14	-0,18
BEKO	MMG	0,02	0,00	0,04	0,05	0,05
BANVT	GIT	0,00	-0,01	0,07	0,08	0,03
KOTKS	DGD	-0,04	0,10	0,03	-0,02	-0,02
EGSER	TTS	0,03	0,08	0,00	-0,04	-0,02
NETAS	MMG	-0,02	0,02	0,03	0,03	0,02
RAKSE	MMG	-0,02	0,02	0,03	0,03	0,02
TATKS	GIT	-0,01	0,07	0,08	0,03	0,05
MILYT	KBY	0,05	0,12	0,15	0,03	0,05
BUCIM	TTS	0,03	0,08	0,00	-0,04	-0,02
AKIPD	DGD	-0,02	0,12	0,03	-0,02	-0,03
EPLAS	PKM	0,07	0,03	-0,01	-0,02	-0,09
TUKAS	GIT	0,08	0,09	0,04	0,06	0,03
ISAMB	KBY	0,07	0,10	-0,02	0,00	-0,07
KERVT	GIT	0,08	0,09	0,04	0,06	0,03
DARDL	GIT	0,08	0,09	0,04	0,06	0,03

MUTLU	MMG	0,04	0,05	0,05	0,04	0,02
MERKO	GIT	0,08	0,09	0,04	0,06	0,03
VKING	KBY	0,07	0,10	-0,02	0,00	-0,07
AEFES	GIT	0,08	0,09	0,04	0,06	0,03
BRSAN	MET	0,08	0,05	0,05	0,07	0,04
RKSEV	MMG	0,04	0,05	0,05	0,04	0,02
SNPAM	DGD	0,14	0,06	0,00	0,00	-0,04
CEMTS	MET	0,05	-0,03	-0,07	-0,06	-0,08
GOLT	TTS	-0,08	-0,12	-0,10	-0,12	-0,18
BTCIM	TTS	-0,08	-0,12	-0,10	-0,12	-0,18
SKTAS	DGD	-0,08	-0,12	-0,10	-0,12	-0,18
OTKAR	OTO	0,04	0,06	0,05	-0,01	-0,05
CBSBO	PKM	-0,07	-0,06	-0,06	-0,12	-0,14
ESEMS	DGD	-0,04	-0,08	-0,09	-0,16	-0,19
ECYAP	TTS	-0,08	-0,12	-0,10	-0,12	-0,18
TUMTK	DGD	-0,09	-0,14	-0,14	-0,18	-0,19
BOSSA	DGD	-0,09	-0,14	-0,14	-0,18	-0,19
UKIM	DGD	-0,06	-0,06	-0,06	-0,08	-0,13
ATEKS	DGD	-0,05	-0,06	-0,09	-0,11	-0,12
MDRNU	GIT	-0,05	-0,03	-0,06	-0,09	-0,13
IHEVA	MMG	0,00	-0,03	-0,09	-0,11	-0,02
BRMEN	DGD	-0,06	-0,06	-0,06	-0,08	-0,13
YATAS	DGD	-0,05	-0,06	-0,09	-0,11	-0,12
AKCNS	TTS	-0,08	-0,12	-0,10	-0,12	-0,18
AGIDA	GIT	-0,05	-0,03	-0,06	-0,09	-0,13
BISAS	DGD	-0,05	-0,06	-0,09	-0,11	-0,12
SASA	PKM	-0,04	-0,05	-0,12	-0,15	-0,18
BERDN	DGD	-0,01	-0,04	-0,05	-0,06	0,03
GUMUS	DGD	-0,01	-0,04	-0,05	-0,06	0,03
ASUZU	OTO	-0,01	-0,08	-0,12	-0,08	-0,14
BYRBY	PKM	0,01	-0,06	-0,08	-0,12	-0,08
UZEL	MMG	0,00	-0,03	-0,10	-0,13	-0,16
KRSTL	GIT	0,02	-0,01	-0,04	-0,08	-0,13
MEMSA	DGD	0,00	0,00	-0,02	-0,07	0,07
CMBTN	TTS	0,02	0,00	-0,06	-0,08	-0,04
VANET	GIT	-0,03	-0,06	-0,10	-0,15	
VAKKO	DGD	0,00	-0,02	-0,07	0,06	
PASTA	GIT	-0,03	-0,06	-0,10	-0,15	
BAKAB	KBY	-0,07	-0,09	-0,10	-0,09	
IDAS	DGD	-0,03	-0,05	-0,06	0,04	
ARSAN	DGD	-0,03	-0,05	-0,06	0,04	

VI. INDUSTRY-ADJUSTED CHANGES IN OPERATING RETURN ON ASSET RATIOS OF THE SAMPLE FIRMS RELATIVE TO THE YEAR PRIOR TO IPO

N=		81	81	81	81	75
Mean		**-0,01**	**-0,02**	**-0,04**	**-0,03**	**-0,07**
	Indstr.	**-1 to 0**	**-1 to +1**	**-1 to +2**	**-1 to +3**	**-1 to +4**
BSPRO	MMG	-0,02	0,04	-0,01	0,05	0,03
YUNSA	DGD	0,08	0,10	0,19	0,15	0,09
SABAH	KBY	0,09	0,12	0,09	-0,06	-0,05
ECILC	PKM	-0,20	-0,25	-0,22	-0,16	-0,19
VESTL	MMG	0,03	-0,01	-0,09	-0,13	-0,03
PETKM	PKM	0,19	0,15	0,25	0,27	0,48
ASELS	MMG	0,04	-0,03	0,01	0,03	0,06
KLBMO	ORM	-0,10	-0,15	-0,30	-0,18	-0,12
FENIS	MET	0,16	0,19	0,22	0,16	-0,02
MRSHL	PKM	-0,08	-0,17	-0,04	-0,11	-0,09
KONYA	TTS	0,30	-0,02	0,13	0,09	-0,03
KENT	GIT	-0,02	0,04	0,04	-0,01	0,01
TRKCM	TTS	0,06	-0,03	0,16	0,12	0,14
UNYEC	TTS	0,16	-0,06	0,18	0,23	0,07
EDIP	DGD	0,03	-0,03	-0,10	0,30	0,02
ADANA	TTS	-0,24	-0,18	-0,23	-0,22	-0,28
PTOFS	PKM	0,12	0,15	0,19	0,19	0,09
TUPRS	PKM	-0,04	0,04	0,01	-0,14	-0,17
TIRE	KBY	0,14	0,18	0,25	0,40	0,25
TOASO	OTO	-0,17	-0,07	-0,03	-0,14	-0,24
SONME	DGD	0,07	0,11	-0,10	-0,08	-0,08
ALTIN	DGD	0,05	0,00	0,05	-0,07	-0,06
ALCAR	MMG	-0,01	0,19	0,25	0,16	0,11
HURGZ	KBY	-0,07	-0,06	-0,19	-0,17	-0,08
CMENT	TTS	0,18	0,16	0,09	0,09	0,06
BEKO	MMG	-0,04	-0,11	-0,15	-0,12	-0,14
BANVT	GIT	-0,13	0,06	-0,09	0,16	-0,26
KOTKS	DGD	0,04	-0,02	-0,17	0,03	0,02
EGSER	TTS	-0,08	0,14	0,07	-0,04	-0,12
NETAS	MMG	-0,02	-0,22	-0,26	-0,13	-0,02
RAKSE	MMG	0,07	0,13	-0,03	0,10	0,03
TATKS	GIT	0,05	0,05	-0,19	0,02	-0,09
MILYT	KBY	0,18	-0,24	-0,25	-0,12	0,05
BUCIM	TTS	-0,03	-0,21	-0,19	-0,12	-0,05
AKIPD	DGD	-0,11	-0,26	-0,15	-0,01	-0,11
EPLAS	PKM	-0,06	-0,05	-0,27	-0,19	-0,22
TUKAS	GIT	0,26	-0,03	-0,21	-0,09	-0,07
ISAMB	KBY	-0,19	-0,17	0,05	-0,06	-0,03
KERVT	GIT	-0,08	-0,13	-0,20	-0,22	-0,16

DARDL	GIT	-0,04	-0,26	-0,31	-0,20	-0,28
MUTLU	MMG	-0,09	-0,08	-0,07	-0,24	-0,22
MERKO	GIT	0,15	0,02	0,08	-0,01	-0,01
VKING	KBY	0,00	-0,03	-0,09	-0,24	-0,27
AEFES	GIT	-0,10	-0,32	-0,33	-0,40	-0,42
BRSAN	MET	0,22	0,13	0,04	0,14	0,10
RKSEV	MMG	-0,11	-0,08	-0,03	-0,09	-0,13
SNPAM	DGD	0,12	0,01	-0,01	0,05	0,02
CEMTS	MET	0,17	0,27	0,13	0,08	-0,15
GOLT	TTS	0,01	0,03	-0,03	-0,10	-0,11
BTCIM	TTS	-0,08	-0,08	-0,12	-0,17	-0,18
SKTAS	DGD	-0,16	-0,12	-0,21	-0,28	-0,29
OTKAR	OTO	-0,12	-0,14	-0,27	-0,09	-0,02
CBSBO	PKM	0,00	0,12	0,19	0,10	0,15
ESEMS	DGD	0,09	0,15	0,14	0,15	0,12
ECYAP	TTS	-0,03	-0,09	-0,11	-0,12	-0,10
TUMTK	DGD	-0,09	-0,01	-0,03	-0,14	-1,11
BOSSA	DGD	-0,09	-0,10	-0,09	-0,19	-0,26
UKIM	DGD	-0,06	-0,04	-0,25	-0,32	0,75
ATEKS	DGD	-0,04	-0,08	-0,02	-0,07	-0,18
MDRNU	GIT	-0,16	-0,16	-0,04	-0,15	-0,72
IHEVA	MMG	-0,08	-0,11	-0,04	0,09	-0,02
BRMEN	DGD	0,22	0,66	0,66	0,76	0,17
YATAS	DGD	0,04	-0,01	0,00	-0,10	-0,09
AKCNS	TTS	-0,07	0,04	0,07	0,05	0,02
AGIDA	GIT	0,06	0,00	0,07	0,09	0,09
BISAS	DGD	-0,07	-0,07	-0,07	-0,26	-0,11
SASA	PKM	-0,06	0,00	-0,04	-0,03	0,01
BERDN	DGD	-0,04	-0,04	-0,05	-0,20	-0,13
GUMUS	DGD	-0,08	-0,08	-0,07	-0,10	-0,44
ASUZU	OTO	-0,08	-0,15	-0,19	-0,10	-0,18
BYRBY	PKM	-0,04	-0,09	-0,11	-0,09	-0,12
UZEL	MMG	0,04	0,03	-0,23	-0,20	-0,28
KRSTL	GIT	0,08	0,20	0,25	0,11	0,16
MEMSA	DGD	0,11	0,14	0,11	0,16	0,10
CMBTN	TTS	-0,10	-0,14	-0,17	-0,12	-0,17
VANET	GIT	0,00	0,10	-0,03	-0,03	
VAKKO	DGD	-0,14	-0,19	-0,11	-0,22	
PASTA	GIT	-0,24	-0,22	-0,12	0,02	
BAKAB	KBY	-0,17	-0,09	-0,13	0,03	
IDAS	DGD	-0,07	-0,24	-0,36	-0,38	
ARSAN	DGD	-0,04	-0,02	-0,06	0,00	