AN INVESTIGATION OF THE LEVERAGE ANOMALY AT ISTANBUL SECURITIES EXCHANGE

MBA THESIS

CELAL AKKAYA

DECEMBER, 1995

AN INVESTIGATION OF THE LEVERAGE ANOMALY AT ISTANBUL SECURITIES EXCHANGE

A THESIS

Submitted to the Faculty of Management

and the Graduate School of Business Administration

of Bilkent University

in Partial Fulfillment of the Requirements

For the Degree of

Master of Business Administration

By

CELAL AKKAYA

December, 1995

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of the Master of Business Administration.

Assoc. Prof. Kürşat Aydoğan

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of the Master of Business Administration.

Assist. Prof. Gülnur Muradoğlu Şengül

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of the Master of Business Administration.

Assist. Prof. Ayşe Yüce

Approved for the Graduate School of Business Administration

Prof. Dr. Sübidey Togan

A B S T R A C T

AN INVESTIGATION OF THE LEVERAGE ANOMALY AT ISTANBUL SECURITIES EXCHANGE

CELAL AKKAYA

M.B.A. in Management

Supervisor: Assoc. Prof. Kürşat Aydoğan

December 1995, 55 pages

This study investigates the presence of 'leverage effect' at Istanbul Securities Exchange for the period January 1990 - December 1993.

Two leverage variables are used, the ratio of book equity to book assets, BE/A and the ratio of market equity to book assets, ME/A. We interpret BE/A as a measure of book leverage, while ME/A as a measure of market leverage.

In portfolio comparison methodology, each year, portfolios are formed according to the previous year's ratio of book equity to book assets and ratio of market equity to book assets and then the average monthly returns of the current year are compared. In addition, the cross-sectional regression approach of Fama-MacBeth (1973) is applied to determine which of the variables significantly explain the average return of stocks. The results show that a significant 'leverage effect' is not encountered at Istanbul Securities Exchange for the period of January 1990 - December 1993 in terms of book leverage and market leverage variables.

Keywords: Anomaly, market efficiency, leverage effect

Ö Z E T

İSTANBUL MENKUL KIYMETLER BORSASINDA BİR ANOMALİ ARAŞTIRMASI

CELAL AKKAYA

Yüksek Lisans Tezi, İşletme Enstitüsü

Tez Yöneticisi: Doç. Dr. Kürşat Aydoğan

Aralık 1995, 55 sayfa

Bu çalışma İstanbul Menkul Kıymetler Borsası'nda firma borçluluğu etkisi olup olmadığını Ocak 1990 - Aralık 1993 döneminde araştırmaktadır.

Borçluluk durumunun değişkenleri olarak, sermayenin kitap değerinin (book value) toplam aktiflere oranı, BE/A ve sermayenin pazar değerinin (market value) toplam aktiflere oranı, ME/A kullanılmıştır. BE/A kitap borçluluğu, ME/A pazar boçluluğu olarak tanımlanmıştır.

Portföy karşılaştırmaları ile yapılan analizde , her sene, hisse senetleri bir önceki senenin kitap borçluluk durumu ve pazar borçluluk durumu değerlerine göre sıralanarak portföyler oluşturulmuş ve portföylerin o seneki aylık getirileri karşılaştırılmıştır. Ayrıca, hangi değişkenlerin hisse senedi getirilerini istatiksel olarak açıkladığını bulabilmek için Fama-MacBeth(1973)'in kesit regresyonu metodu kullanılmıştır. Ocak 1990 - Aralık 1993 döneminde, kitap ve pazar borçluluk durumu değişkenleriyle yapılan analizde, güçlü bir firma borçluluk etkisine rastlanmamıştır.

Anahtar Kelimeler: Anomali, pazar etkinliği, borçluluk durumu etkisi

ACKNOWLEDGEMENTS

I wish to express my gratitude to Associate Professor Kürşat Aydoğan for his supervision during the preparation of this thesis.

I also wish to express my thanks to my family for their invaluable supports all my life.

TABLE OF CONTENTS Page

I. INTRODUCTION

Capital markets serve to transfer funds between lenders (savers) and borrowers (producers) efficiently. A market is evaluated as allocationally efficient when prices are determined in a way that equates the marginal rates of return (adjusted for risk) for all producers and savers. But operational efficiency deals with the cost of transferring funds. In perfect capital markets, transaction costs are assumed to be zero. So, efficient capital markets imply operational efficiency as well as asset prices that are allocationally efficient. According to market efficiency hypothesis, security prices reflect all relevant information in an efficient market.

Several research have been conducted on market efficiency tests. The 1970 review by Fama divides work on market efficiency into three categories:

(1) weak form tests (How well do past returns predict future returns?)

(2) semi-strong form tests (How quickly do security prices reflect public information announcements?)

(3) strong-form tests (Do any investors have private information that is not fully reflected in market prices?) [Fama 1991]

But the first category now covers the more general area of tests for return predictability. It also includes the work on forecasting returns with variables like dividend yield and interest rates. However, an asset pricing model and capital market efficiency are joint and inseparable hypothesis. If capital markets are inefficient , then the assumptions of the asset pricing model are invalid and a different model is required. If the asset pricing model is inappropriate, even though capital markets are efficient, then the asset pricing model is the wrong tool to use in order to test for efficiency. So tests are only conducted on the reflection of information in the context of equilibrium pricing model. In addition, the discussion of predictability also considers the cross-sectional predictability of returns, that is, tests of asset pricing models and the anomalies (like the size effect) discovered in the tests.

One of the asset pricing models is the model of Sharpe(1964), Lintner(1965) and Black(1972). The SLB model gave a summary measure of risk, market β interpreted as market sensitivity. It suggested that (1) expected returns are a positive linear function of market beta (the covariance of a security's return with the return on the market portfolio divided by the variance of the market return) and (2) β is the only measure of risk needed to explain the cross-section of expected returns.

The empirical attacks on the SLB began in the late 1970's with studies that identify variables that contradict the model's prediction that market βs suffice to describe the cross-section of expected returns. In an efficient market, if SLB is correct, we do not expect an anomaly to explain the variation in cross-sectional returns.

Size effect, dividends/price (D/P) ratio effect, leverage effect, book/market value (B/M) effect and earnings/price (E/P) ratio effect are identified and determined as the different types of anomalies in the cross-section of regression of expected returns. Leverage effect refers to average returns of stocks with high leverage are substantially higher than that of the stocks with low leverage.

At Istanbul Securities Exchange, some studies has been conducted about the presence of weak and semi-strong form efficiency. Civelekoðlu(1993) used the cross-sectional predictability of returns with an asset pricing model and the anomalies for the first time. He has found that there exists a weak "E/P effect" in the years 1991 and 1992. However, a significant "Size effect" is not encountered at ISE as opposed to the case in developed capital markets.

In this study, the aim is to jointly test the market efficiency with an asset pricing model by investigating the presence of a leverage anomaly at ISE for the period January1990 - December 1993 by using two variables, book leverage and market leverage.

The arrangement of this thesis is in the following manner. In Section 2, the empirical studies on anomalies and a rewiew of literature about market efficiency is presented. In section 3, the data and methodology used in this study are explained. In section 4, leverage effect is tested by portfolio comparison approach and by cross-sectional regression approach. The findings are also discussed for market leverage and book leverage. In Section 5 the findings are presented with a summary of the model and the results.

II. THE PREVIOUS RESEARCH ON MARKET EFFICIENCY

The purpose of capital markets is to transfer funds between lenders (savers) and borrowers (producers) efficiently. In a somewhat limited sense, efficient capital markets imply operational efficiency as well as asset prices that are allocationally efficient. Asset prices are correct signals in the sense that they fully and instantaneously reflect all available relevant information and are useful for directing the flow of funds from savers to investment projects that yield the highest return (even though the return may reflect monopolistic practices in product markets). Capital markets are operationally efficient if intermediaries, who provide the service of channeling funds from savers to investors, do so at the minimum cost that provides them a fair return for their services.

Fama(1970,1976) has done a great deal to operationalize the notion of capital market efficiency. He defines three types of efficiency, each of which is based on a different notion of exactly what type of information is understood to be relevant in the phrase "all prices fully reflect all relevant information."

1.Weak Form Efficiency; No investor can earn excess returns consistently by developing trading rules based on historical price or return information. In other words, the information in past prices or returns is not useful or relevant in achieving excess returns. In a weakly efficient

market, present prices reflect all information contained in the record of past prices, that is, investors cannot consistently earn abnormal returns by observing the past prices.

2. Semi-strong Form Efficiency; No investor can earn excess returns consistently from trading rules based on any publicly available information. Examples of publicly available information are annual reports of companies, investment advisory data such as "Heard on the Street" in the Wall Street Journal, or ticker tape information. In a semistrongly efficient market, prices reflect all available information, that is, security prices adjust rapidly and correctly to the announcement of all available information.

3. Strong Form Efficiency; No investor can earn excess return consistently using any information, whether publicly available or not. In a strongly efficient market, present prices reflect all information, both privately held and insider information together with publicly available information.

Early research on weak-form efficiency only concerns with the forecast power of past returns. But this category now covers the more general area of tests for return predictability, which also includes the work on forecasting returns with variables like dividend yields and interest rates. Since market efficiency and equilibrium pricing issues are inseperable, the discussion of predictability also considers the cross-sectional predictability of returns, that is,

tests of asset pricing models and the anomalies (like the size effect, the leverage effect) discovered in the tests.

According to the CAPM, the only relevant parameter necessary to evaluate the expected return for every security is its systematic risk. Therefore if the CAPM is true and if markets are efficient, the expected return of every asset should fall exactly on the security market line. Any deviation from the expected return is interpreted as an abnormal return, and can be taken as evidence of market inefficiency if the CAPM is correct. However, CAPM and capital market efficiency are joint and inseperable hypotheses. If capital markets are inefficient, then the assumptions of the CAPM are invalid and a different model is required. And if the CAPM is inappropriate, even though capital markets are efficient , then the CAPM is the wrong tool to use in order to test for efficiency.

The joint hypothesis problem is more serious obstacle to inferences about market efficiency as it's mentioned in the CAPM model. But market efficiency per se is not testable. It must be tested jointly with a model of equilibrium, an asset pricing model. According to the 1970 review [Fama(1970)], what can be only tested is whether information is properly reflected in prices in the context of an asset pricing model. As a result, if an anomalous evidence is found on the behavior of security returns, it is ambiguous that market is inefficient or the model of equilibrium, the asset pricing model is bad.[Fama(1991)]

The asset pricing model of Sharp (1964), Lintner (1965) and Black (1972) has long shaped the way academics and practioners think about average returns and risk. The central prediction of the model is that the market portfolio of invested wealth is mean-variance efficient in the sense of Markowitz (1959). The efficiency of the market portfolio implies that (a) expected returns on securities are a positive linear function of their market β (the slope in the regression of a security's return on the market's return) and (b) market βs suffice to describe the cross-section of expected returns.

Black , Jensen and Scholes (1972) and Fama and French (1973) find that, as predicted by the SLB model, there is a positive simple relation between average stock returns and β during the pre-1969 period. But Reinganum (1981) and Lakonishok and Shapiro (1986) and Fama and French (1992) find that the relation between β and average return disappears during the more recent 1963-1990 period, even when β is used alone to explain average returns. Fama and French (1992) show that the simple relation between β and average return is also weak in the 50 year 1941-1990 period. Tests do not support the most basic prediction of the SLB model, that average stock returns are positively related to market βs.

There are other empirical contradictions of the SLB model . The most prominent is the size effect of Banz (1981). He finds that market equity, ME (a stock's price times shares outstanding), adds to the explanation of the cross-section of average returns provided

by market βs. Average returns on small (low ME) stocks are too high given their β estimates, and average returns on large stocks are too low.

Statman (1980) and Rosenberg, Reid, and Lanstein (1985) find that average returns on U.S stocks are positively related to the ratio of a firm's book value of common equity ,BE, to its market value, ME. Chan, Hamao, and Lakonishok (1991) find that book to market equity, BE/ME, also has a strong role in explaning the cross-section of average returns on Japanese stocks. Chan, Hamao and Lakonishok (1991) and Fama (1991) find that BE/ME has strong explanatory power; controlling for β, higher BE/ME are associated with higher expected returns.

Basu (1983) shows that earnings-price ratios (E/P) help explain the cross-section of average returns on U.S stocks in tests that also include size and market β. Ball (1978) argues that E/P is a catch-all proxy for unnamed factors in expected returns; E/P is likely to be higher (prices are lower relative to earnings) for stocks with higher risks and expected returns, whatever the unnamed sources of risk.

Fama and French (1988) use D/P to forecast returns on the value-weighted and equally weighted portfolios of NYSE stocks from 1 month to 5 years. They find that D/P explains small fractions of monthly and quarterly return variances. However, fractions of variance explained grow with the return horizon and are around 25% for 2 to 4 year returns.

DeBondt and Thaler (1985-1987) find that the NYSE stocks identified as the most extreme losers over a 3- to 5- year period tend to have strong returns relative to the market during the following years. On the contrary, the stocks that are extreme winners tend to have weak returns relative to the market in subsequent years.

Zarowin (1989) finds no evidence for the DeBondt- Thaler hypothesis that the winner-loser results are because of overreaction to extreme changes in earnings. He argues that the winner-loser effect is related to the size effect of Banz (1981).

Another contradiction of the SLB model is the positive relation between leverage and average return documented by Bhandari (1988). It is plausible that leverage is associated with risk and expected return, but in the SLB model, leverage risk should be captured by market β . Bhandari finds, however, that leverage helps explain the cross-section of average stock returns in tests that include size(ME) as well as β. Firm's debt equity ratio (DER) is used as the natural proxy for the risk of common equity of a firm. An increase in the DER of a firm increases the risk of its common equity. Though it does not follow that, cross-sectionally, the common equity of a higher DER firm always has higher risk since the firm-level may vary, DER is expected to be positively correlated to the risk of common equity across firms.Thus, DER is used as a proxy for the risk of common equity when an adequate measure of risk is not known or cannot be calculated from available information. In conjunction with the estimation errors in β, use of a proxy for the market portfolio, and possible changes in β over time suggests that β alone may

not be as good a proxy for true β during test period. For example, to the extent that the firm β is relatively stable, a higher DER during the test period relative to that during the β calculation period will indicate a higher-than-estimated common equity β during the test period in addition to (β; an estimate of β, is used to control for β, based on a market proxy and calculated from a period termed the β calculation period, which does not overlap with the corresponding test period). Also, usually the data requirements are such that the β calculation period for a firm excludes the period surrounding the time it drops out of the data set. Then the combination of low return on the market proxy and low "residual" return for a firm is more likely to be excluded from β calculation since such a combination is more likely to cause that firm to go bankrupt and drop out. This sample selection bias will bias β downward in all practical cases. Since the probability of bankruptcy increases as DER increases, a higher DER may indicate more downward bias in β .

Bhandari (1988) concluded that the expected common stock returns are positively related to the ratio of debt (non-common equity liabilities) to equity, controlling for the β and firm size and including as well as excluding January, though the relation is much larger in January. This relationship is not sensitive to variations in the market proxy, estimation technique, etc.

$$DER = \frac{\text{Book value of total assets - Book value of common equity}}{\text{Market value of common equity}}$$

Fama and French (1992) find that unlike the simple relation between β and average return, the univariate relations between average return and size , leverage, E/P, and BE/ME are strong. Their bottom line results are: (a) β does not seem to help explain the cross-section of average stock returns , and (b) the combination of size and book to market equity seems to absorb the roles of leverage and E/P in average stock returns, at least during 1963-1990 sample period. They used two variables as a measure of leverage effect in the Fama-MacBeth regressions. The ratio of book assets to market equity , A/ME, and the ratio of book assets to book equity, A/BE. A/ME and A/BE are interpreted as a measure of market leverage and book leverage. The average slopes for the two leverage variables are opposite in sign but close in absolute value. So the difference between market and book leverage that helps explain average returns. But the difference between market and book leverage is book-to-market equity, In(BE/ME)=In (A/ME) - In (A/BE). A high book-to-market ratio says that a firm's market leverage is high relative to its book leverage; the firm has a large amount of market imposed leverage because the market judges that its prospects are poor and discounts its stock price relative to book value. So, tests suggest that the relative-distress effect, captured by BE/ME, can also be interpreted as an involuntary leverage effect, which is captured by the difference between A/ME and A/BE.

Some empirical tests are also achieved to investigate the market efficiency at Istanbul Securities Exchange (ISE). On these studies, market is generally found as inefficient in terms of weak-form efficiency and strong-form efficiency.

Başçı (1989) carried out a study on distributional and time series behavior of common stock returns at ISE for the period 1986-1988. He finds that published past price information cannot be used to obtain better forecasts of future prices. This observation is parallel with the random walk behavior, that is the weak form efficiency. However, the test of variance-time function indicate significant long term dependence for most stocks which is against the weak form efficiency hypothesis.

Alparslan (1989) carried out a study by applying weak-form efficiency tests at ISE. He used statistical tests of independence (autocorrelation and run tests) and tests of trading rules (filter rules) in these tests. Runs and autocorrelation tests could not reject the weak-form efficiency. However, the results of the filter tests show that for some stocks the market could have been beaten by an investor. Alparslan concluded that the market is inefficient in the weak sense.

Ünal (1992) uses daily adjusted closing prices of twenty major stocks for the period 1986-1991. The tests are carried out on independence , randomness and distribution of daily

prices. He also tests whether some mechanical trading rules consistently and significantly profitable over a buy-and-hold policy by trade rules tests. All his results are against weak-form efficiency at ISE.

Çadırcı (1990) carried out a study as an empirical test on semi-strong form efficiency. Market adjustment to the release of stock dividend / rights offering information for the stocks listed at ISE first market for the period 1986-1989 is investigated. The results of her study demonstrates that the adjustment process is slow and, positive cumulative abnormal returns are observed after the event date. So, she rejects the market efficiency in semi-strong form efficiency at ISE.

Civelekoğlu (1993) carried out a study by jointly testing the market efficiency with an asset pricing model by investigating the presence of a size effect and E/P effect anomalies at ISE for the period January 1990 - December 1992. The results reveal that there exists a weak "E / P effect" in the years 1991 and 1992. However, a significant "size effect" is not encountered at ISE as opposed to the case in developed capital markets.

Kurdoğlu (1994) investigated the performance of portfolios consructed by single index model with historical (least squares regression) βs and estimated future βs by Vasieck's Bayesian Estimation Technique. The βs of the stocks were very volatile. Even if previous studies have

shown that Vasieck's adjusted β outperforms the historical one, in this study, this could'nt be shown for ISE.

Timur (1993) found that the information reflected in the past prices of the monetary variables have significant effects on the ISE composite index.

Many of the front line empirical anomalies in finance (like the size effect) come out of tests directed at asset pricing models. Given the joint hypothesis problem, one can't tell whether such anomalies result from misspecified asset pricing models or market inefficiency. This ambiguity is sufficient justification to review tests of asset pricing models.

The aim of this study is to jointly test the market efficiency with an asset pricing model by investigating the presence of a leverage effect anomaly at ISE for the period January 1990 - December 1993.

III.DATA AND METHODOLOGY

A. Data

The data used in this study includes the monthly returns of the stocks listed at the Istanbul Securities Exchange (ISE) and the leverage figures over the period January 1988 to December 1993. The stocks that satisfy the following condition are considered in the study. The condition is to have 36 consecutive monthly returns starting 24 months before and ending 12 months after the beginning of the year T (T=1990..1993). Financial firms are excluded because the high leverage that is normal for these firms probably does not have the same meaning as for nonfinancial firms, where high leverage more likely indicates distress.

Adjusted monthly closing price figures , book value of total assets and book value of common equity values as of the last trading day of year T, are obtained by using data from the monthly bulletins of ISE and balance sheets that are publicly available at SPK. The above mentioned figures are used in the calculation of monthly returns and leverage ratios of the stocks.

For monthly "risk-free rate", monthly returns of the treasury bills with three months of maturity are used. This data is taken from the monthly bulletins of Central Bank of Turkey.

The firms that satisfy the condition at ISE are taken into consideration. For the tests in 1990, total number of stocks traded during the year is 114, 37 of them satisfy the condition. For the year 1991, 45 stocks out of 142, for the year 1992, 62 out of 152 satisfy the condition. In 1993, 85 stocks have 36 consecutive monthly returns. (Appendix 1 through 4)

Book leverage of a stock for the year T is computed as the ratio of book equity to total assets as of the last trading day of the year T-1. Market leverage of a stock for each month of the year T is also computed as the ratio of market equity to total assets. Market equity figures for each month of year T are obtained in the following way. For each month of test year T, total number of shares outstanding in year T-1 are multiplied with the closing price of the stock in the previous month. Total number of shares outstanding are also calculated by dividing paid-in-capital figures in year T-1 by 1000 that is taken as a nominal value of one stock.

B.Methodology

1. Calculation of βs:

For the calculation of β coefficients for individual stocks, 24 months of data prior to year T are used to estimate the market model regression.

$$R_{j\,t} - R_{f\,t} = \alpha_{jt} + \beta_{jt}\,(R_{m\,t} - R_{f\,t}) + \varepsilon_{j\,t}$$

$$t = T\text{-}24,.....,T\text{-}1 \quad (1)$$

where

$R_{j\,t}$: return on stock j in month t

$R_{m\,t}$: return on equally weighted market portfolio in month t

$R_{f\,t}$: return on risk free asset in month t measured as monthly return of quarterly treasury bills.

β_{jt} : stock j's relative risk for year T (estimated OLS slope)

α_{jt} : differentials or abnormal return for stock j

t : month t of year T (T=1988..1992)

2. Tests of Leverage Effect by Portfolio Comparison Approach:

The methodology of this section is based on the studies of Basu (1983) and Reinganum (1981). The leverage ratios are calculated for each year T (T=1990..1993) with the figures of year T-1. Then the stocks are sorted in **ascending order**. According to its leverage ratio, each stock is assigned one of three portfolios. For example; portfolio P1 contains highly risky stocks with the lowest leverage ratios (since as (equity/total assets) ratio decreases, (debt/total assets) ratio increases for the same stock), whereas P3 contains the stocks with highest leverage ratios.

The above portfolio formation procedure is repeated each year from 1990 to 1993. So the portfolio composition changes each year. The reason beyond why we form three portfolios is to make meaningful statistical inferences from these data. Tests are applied between the low leveraged portfolio (LLP) and the high leveraged portfolio (HLP) by discarding the middle leveraged portfolio (MLP).

With this data, the null hypothesis that whether there exists a difference in average returns and mean βs between high and low leverage portfolios is tested with a t-test at the 0.05 significance level. In addition, whether the abnormal returns of the portfolios formed are different

than zero or not is also tested with a t-test. Abnormal return can be defined as the difference between average monthly return of a portfolio formed based on book leverage or market leverage and average monthly return of the equally weighted market portfolio.

2. Tests of Leverage Effect by Cross-sectional Regression Approach:

The methodology of this section is based on the cross-sectional regression approach of Fama and MacBeth (1973). The following linear relationship is the assumption;

$$E(R_i) = x_0 + x_1\beta_i + x_2 LR_i$$

where

$E(R_i)$ = expected return on stock i

x_0 = expected return on zero-beta portfolio

x_1 = expected market risk premium

x_2 = constant as a measure of contribution leverage ratio to the expected return of stock i.

LR_i = natural logarithm of market leverage ratio of stock i

β_i = stock i's relative risk (estimated OLS slope)

The parameters in the linear equation will be estimated by using that past data. Fama (1976) used a constrained optimization procedure to generate minimum variance portfolios with mean returns. The cross-sectional regression will be performed on the defined linear relation on a period by period basis.

Each month the cross-section of returns on stocks are regressed on the stock β and leverage ratio. β and leverage ratio are the hypothesized factors to explain the expected returns. At the beginning of each year T (T= 1990 ... 1993), the hypothesized factors β and leverage ratios are updated. As in the previous test,β is the slope of the regression line of the most recent 24 months time series monthly return data of each stock in the monthly return data of equally weighted market portfolio. Leverage ratio is also calculated from the figures as it's mentioned in the portfolio comparison approach.

The time series mean of the monthly regression slopes between Jan.1990 and Dec.1993 provides standard Fama-MacBeth tests of which explanatory variables, β and/or leverage ratio have nonzero expected premiums over the test period. So, null hypothesis that mean of time series regression coefficient (x) is zero tested for β and leverage ratios for each x_i, i=1,2.

IV.FINDINGS

A. Summary Statistics About Data

Not all stocks traded at ISE are used in tests. As described before, for a stock to be taken in the sample, it should have 36 consecutive monthly returns starting 24 months before and ending 12 months after the beginning of year T (T=1990, 1991, 1992, 1993). Number of securities that satisfy condition is 37 for the year 1990. This number is 45, 62 and 85 for the years 1991,1992 and 1993 respectively.

For each stock in the sample, descriptive statistics about their monthly returns are given in Appendix 1, 2, 3, 4. They consist of average, minimum, maximum, standard deviation and median of the monthly returns for each stock.

The regression results for each test year T to determine the market risk of each security are presented in Appendix 7, 8, 9, 10. 24 monthly returns of stocks before the year are used as the data in the calculations. The monthly closing prices are adjusted for any stock-split, rights offering and dividend payments. β and α coefficients, F values and their t-statistics are presented in the above mentioned appendices.

All the t-ratios for β are found to be significant. However, t-ratios for α coefficients are found to be insignificant. Calculated F-values are greater than the critical F values.

So the regression is considered as significant. Finally, t-statistics for α means that the stocks are neither underpriced nor overpriced.

B. Results of t-tests Based on Portfolio Comparison Approach

In each test year T (T= 1990 ....1993), 3 portfolios (HLP, MLP, LLP) are formed based on book and market leverage ratio of stocks as described in the methodology section. Summary statistics about those portfolios are summarized in Table 1. They include the average book equities, market equities, total assets, leverage ratios with the average β coefficients and the monthly returns for the year T.

Years	No.of Stocks Included In The Portfolios
1990	12
1991	15
1992	21
1993	28

As it can be seen in the above summary table, the minimum number of stocks in the portfolios is 12 in 1990 and the maximum number of stocks is 28 in 1993.

TABLE 1. SUMMARY STATISTICS

SORTED ON BOOK LEVERAGE

	Leverage Ratio				β				Average Return			
	1990	1991	1992	1993	1990	1991	1992	1993	1990	1991	1992	1993
LLP	.725	.744	.778	.763	.928	.892	.858	.978	.074	.065	-.015	.208
MLP	.496	.522	.523	.501	.911	.903	1.116	.998	.059	.055	.031	.206
HLP	.302	.296	.281	.302	.774	.925	1.073	.986	.064	.066	-.018	.211

SORTED ON MARKET LEVERAGE

	Leverage Ratio				β				Average Return			
	1990	1991	1992	1993	1990	1991	1992	1993	1990	1991	1992	1993
LLP	.931	1.001	1.089	3.246	.904	.924	1.066	.964	.025	.274	.101	.112
MLP	.341	.320	.402	.943	.872	. 951	.946	.905	.606	.515	-.052	.184
HLP	.150	.135	.132	.283	.995	.942	.881	.826	.048	.006	-.050	.169

t-statistics indicating whether the mean returns of the portfolios are equal or not and t-statistics showing whether the abnormal returns of the portfolios (average monthly portfolio return minus average return on equally weighted market portfolio) are different from zero or not are presented in Table 2 and Table 3.

According to the results, t-statistics suggest that there is no "Book Leverage Effect" and "Market Leverage Effect" for the stocks traded at ISE, that is the stocks with high leverage do not outperform the stocks with low leverage.

In terms of book leverage, in 1990, low leveraged firms earned average monthly return of 7.4% while the average monthly return of high leveraged firm 6.4% as opposed to the expectations. But in 1991 and 1993, high leveraged firm returns were slightly above the ones of the low leveraged firm. In 1992, they were slightly below; -1.81% versus -1.53%.

With market leverage figures, in 1990 and 1993, high leveraged firm returns were considerably above the returns of the low leveraged firms. But even in these years' tests, leverage effect is not encountered.

TABLE 2. LOW AND HIGH LEVERAGE PORTFOLIOS

SORTED ON BOOK LEVERAGE

1990

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	0.725	0.928	0.074	0.021	0.22
HLP	0.302	0.774	0.064	0.010	0.09
		t= -1.81	t= -0.11		

1991

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	0.744	0.892	0.065	0.024	-0.64
HLP	0.296	0.925	0.066	-0.037	0.29
		t= 0.24	t= -1.05		

1992

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	0.778	0.858	-0.015	-0.018	-0.32
HLP	0.281	1.073	-0.018	-0.0002	-0.003
		t= 1.19	t= 0.29		

1993

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	0.763	0.978	0.208	0.052	0.83
HLP	0.302	0.986	0.210	0.054	0.89
		t= 0.07	t= 0.04		

Note:

1) t- statistics for β and average return of portfolios are for the null hypothesis that mean β and return of high and low leverage portfolios are equal
2) t-statistics for average excess return of portfolios are for the null hypothesis the mean excess return of the portfolios are zero.

TABLE 3. LOW AND HIGH LEVERAGE PORTFOLIOS

SORTED ON MARKET LEVERAGE

1990

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	0.931	0.904	0.025	-0.029	-0.033
HLP	0.150	0.995	0.048	0.042	0.37
		t= 6.13	t= 0.66		

1991

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	1.001	0.924	-0.009	**-0.051**	-0.65
HLP	0.135	0.944	0.006	-0.036	-0.39
		t=1.41	t= 0.18		

1992

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	1.089	1.066	-0.053	-0.056	-0.93
HLP	0.132	0. 881	-0.050	-0.052	-0.85
		t=-7.93	t= 0.05		

1993

	LEVERAGE RATIO	β	AVERAGE RETURN	AVERAGE ABNORMAL RETURN	t-stat
LLP	3.246	0.964	**0.**112	-0.044	-0.75
HLP	0.283	0.826	0.169	0.013	0.21
		t=-5.44	t= 0.95		

Note:

1) t-statistics for β and average return of portfolios are for the null hypothesis that mean β and return of high and low leverage portfolios are equal.
2) t-statistics for average excess return of portfolios are for the null hypothesis thatmean excess return of the portfolios are zero.

For the mean βs of high and low book leverage portfolios, tests in 1990, 1991, 1992, 1993 indicated that they are not different from each other. But it is interesting that mean β of the low leveraged firms is smaller than the one of high leveraged firms except 1990.

In the tests of the mean βs of high and low market leveraged portfolios, it can be concluded that they are different from each other in 1990 and 1992. In 1990 and 1991, the mean βs conform with the expectations that high leveraged firms has higher risk level and accordingly higher βs than βs of low leveraged firms. But in years 1992 and 1993, the figures is opposed to the expectations.

Average abnormal return data shows that in 1990, high book leveraged stocks earned average monthly abnormal return 1% while this number is only 2.1% for low book leveraged stocks. t-statistics testing the null hypothesis that abnormal returns for low and high market leveraged portfolios in 1990 are -0.3250 and 0.3682 respectively. For the period between January 1990-December 1993 , we can not conclude that high leveraged firms outperform above the equally weighted market portfolio.

Book leverage figures are minimum 0.2814 in 1992, and maximum 0.7782 in the same year and portfolio average does not change slightly over the years. But in the analysis with market leverage, low leveraged portfolio changes from 0.9305 in 1990 to 3.2458 in 1993. So the use of market leverage increases the sensitivity of the analysis.

C. Results of t-tests Based on Cross-sectional Regression Approach

For each month of test year T (T= 1990...1993), cross-section of monthly stock returns are regressed on β and leverage ratio as described in the methodology section. β and leverage ratio data for each stock are updated every year.

Average slopes of each monthly cross-sectional regressions with R^2 value of the regressions are presented in Appendix 5 and Appendix 6. Mean of each monthly Fama-MacBeth coefficients together with their t-statistics testing whether they are equal to zero or not are presented in Table 3. The results reveal that all of the variables, β or leverage ratio are found to be insignificant.

A major shortcoming of using Fama-MacBeth approach is that the approach assumes that the coefficients estimated every period are drawn from a stationary distribution. Changes over time in the levels of the explanatory variables will invalidate this assumption. The use of estimated βs rather than true βs are another drawback in the cross-sectional regressions.

In addition to above mentioned shortcomings, due to small number of stocks in the sample, individual stocks are used in this test rather than portfolios which, in fact, give better results. (Fama and French (1992)). Therefore, R^2 values are quite low in each monthly cross-sectional regression.

TABLE 4. RESULTS OF CROSS-SECTIONAL REGRESSION APPROACH

BOOK LEVERAGE

	MEAN	STANDARD DEV.	T-VALUE
x_1 (β)	-0.0008	0.082	0.060
x_2 (LR_i)	0.005	0.105	0.330

MARKET LEVERAGE

	MEAN	STANDARD DEV.	T-VALUE
x_1 (β)	-0.010	0.111	-0.65
x_2 (LR_i)	-0.006	0.039	-1.12

In the analysis, β is also found to be insignificant. So the results of this approach are not consistent with the findings of Fama and MacBeth (1973) and Black, Jensen and Scholes (1972). However, our findings on the relationship between β and average return are similar to the more recent work by Fama and French (1992), and Lakonishok and Shapiro.

V. CONCLUSIONS

The existence of leverage effect is investigated for common stocks traded in Istanbul Stock Exchange for the period January 1990 - December 1993. Two different methods are implemented for this purpose.

First method makes use of a comparison of the average return and other characteristics of portfolios of common stocks based on leverage ratios. Due to insufficient number of stocks that meet the criteria to be included in the test sample in each year, HLP and LLP are formed each year where HLP consist of high leveraged stocks (with low leverage ratio) and LLP consist of low leveraged stocks (with high leverage ratio). This procedure is repeated for both market leverage and book leverage. The average returns of these portfolios are compared in each year from 1990 to 1993 and the null hypothesis of the mean difference in returns is zero is tested.

The findings of the comparison of portfolios with different leverage ratio and the market value shows no evidence for the presence of a leverage effect at ISE. However with market leverage figures, in 1990 and 1993,high leveraged firm returns were considerably above the returns of the low leveraged firms.But even in these year's tests, leverage effect is not encountered in tests.

The second method implemented is the procedure of Fama-MacBeth (1973) applied to the stocks for the same period. Each month from January 1990 to December 1993, monthly stock returns are regressed on the hypothesized variables of estimated βs and leverage ratio of the common stocks. Then, the average of the slopes of these regressions form a time series data that indicates which variables are significant in explaining the average monthly returns of the common stocks.

The results of Fama-MacBeth procedure shows that β and leverage ratio are insignificant in explaining the average monthly returns of the common stocks as it is consistent with the results of the first method.

With the results of two approaches, it can be concluded that there is no leverage effect at ISE for the period January 1990 - December 1993. Even the use of updated βs and market leverage figures has not improved the results in such a way that to conform with the studies of Bhandari (1988) and Fama and French (1992).

VI. LIST OF REFERENCES

Alparslan, S.M. (1989) " Tests of weak form efficiency in Istanbul Stock Exchange", Thesis submitted to the Department of Management and the Graduate School of Business Administration of Bilkent University.

Ball, Ray. (1978) " Anomalies in relationships between securities' yields and yield surrogates", Journal of Financial Economics 6, 159-178.

Banz, Rolf W. (1981) "The relationhip between return and market value of common stocks", Journal of Financial Economics 9, 3-18.

Basci E. (1989) "The behavior of stock returns in Turkey:1986-1988", Thesis submitted to the Department of Management and the Graduate School of Business Administration of Bilkent University.

Basu, Sanjoy. (1983) " The relationship between earnings yield, market value, and return for NYSE common stocks:Further evidence", Journal of Financial Economics 12, 129-156.

Bhandari, Laxmi Chand. (1988) "Debt/Equity ratio and expected common stock returns:Empirical Evidence", Journal of Finance 43, 507-528.

Black, Fischer. (1972) "Capital market equilibrium with restricted borrowing", Journal of Business 45, 444-455.

Black, Fischer, Michael C. Jensen, and Myron Scholes. (1972) "The capital asset pricing model: Some empirical tests, in M. Jense, ed." Studies in the Theory of Capital Markets (Praeger, New York, NY)

Campbell, John Y., and Robert Schiller.(1988) " Stock prices, earnings and expected dividends", Journal of Finance 43, 661-676.

Cadirci, Begum. (1990) "The adjustment of security prices to the release of stock dividend/ rights offering information", Thesis submitted to the Department of Management and the Graduate School of Businesss Administration of Bilkent University.

Chan, Louis K., Yasushi Hamao and Josef Lakonishok, (1991) "Fundamentals and stock returns in Japan", Journal of Finance 46, 1739-1789.

Christie, Andrew A. and Michael Hertzel, (1981) " Capital asset pricing anomalies: Size and other correlations " , Manuscript (University of Rochester, Rochester, NY)

Civelekoglu, Hakan. (1993) " An investigation of anomalies at ISE: Size and E/P effects", Thesis submitted to the Department of Management and the Graduate School of Businesss Administration of Bilkent University.

DeBondt, Werner F.M., and Thaler, Richard H. (1987), "Further evidence on investor overreaction and stock market seasonality", Journal of Finance, 42, 557-581.

Fama, Eugene F. (1970) " Efficient capital markets:A review of theory and empirical work", Journal of Finance 25, 383-417.

Fama, Eugene F. (1991) " Efficient capital markets: II ", Journal of Finance 46, 1575-1617.

Fama, Eugene F., and MacBeth James D. (1973) "Risk, Return and Equilibrium: Empirical Tests", Journal of Political Economy 31; 607-36

Fama, Eugene F., and Kenneth R. French. (1988) " Dividend yields and expected stock returns", Journal of Financial Economics 25, 23-49.

Fama, Eugene F., and Kenneth R. French. (1992) "The cross-section of expected stock returns", Journal of Finance 47, 427-465.

Jensen, Michael C. (1978) " Some anomalous evidence regarding market efficiency ", Journal of Financial Economics 6, 96-101.

Jobson J.D. and Korkie B. (1982) "Potential Performance and Tests of Portfolio Efficiency", Journal of Financial Economics10, 433-66.

Kurdoglu, C.Gurer.(1994)."Performance measure of portfolios with historical and adjusted rates", Thesis submitted to the Department of Management and the Graduate School of Businesss Administration of Bilkent University.

Lakonishok, Josef and Alan C. Shapiro (1986) "Systematic risk, total risk and size as determinants of stock market returns", Journal of Banking and Finance 10, 115-132.

Lintner, John. (1965) " The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets", Review of Economics and Statistics 47, 13-37.

Markowitz, Harry. (1959) Portfolio Selection: Efficient Diversification of Investments (Wiley, New York, NY)

Reinganum, Marc R. (1981) "Misspecification of Capital Asset Pricing: Anomalies Based on Earnings' Yields and Market Values.", Journal of Financial Economics 9, 19-46.

Rosenberg, Barr, Kenneth Reid and Ronald Lanstein. (1985) " Persuasive evidence of market inefficiency", Journal of Portfolio Management 11, 9-17.

Sharpe, William F. (1964) " Capital asset prices: A theory of market equilibrium under conditions of risk", Journal of Finance 19, 425-442.

Statman, Dennis. (1980) " Book values and stock returns", The Chicago MBA: A journal of Selected Papers 4, 25-45.

Timur, Murat (1993)."Production of ISE Composite Index", Thesis submitted to the Department of Management and the Graduate School of Business Administration of Bilkent University.

Unal, Mustafa. (1992) " Weak form efficiency tests in Ýstanbul Stock Exchange" Thesis submitted to the Department of Management and the Graduate School of Business Administration of Bilkent University.

Zarowin, Paul.(1989) "Does the stock market overreact to corporate earnings information?", Journal of Finance 44, 1385-1399

MONTHLY RETURN STATISTICS

1990

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
AKÇİMENTO	0.008	-0.127	0.591	0.200	-0.070
ANADOLU CAM	0.048	-0.244	0.511	0.190	0.031
ARÇELİK	0.039	-0.205	0.480	0.212	-0.048
BAGFAŞ	0.072	-0.281	0.677	0.279	-0.026
BOLU ÇİMENTO	0.074	-0.311	0.738	0.294	0.036
BRİSA	0.020	-0.266	0.594	0.226	0.006
ÇELİK HALAT	0.032	-0.206	0.804	0.282	-0.060
ÇUKUROVA	0.045	-0.218	0.767	0.241	-0.009
ÇİMSA	0.018	-0.219	0.478	0.190	-0.016
DÖKTAŞ	0.056	-0.387	0.413	0.231	0.077
ECZACIBAŞI YAT.	0.164	-0.345	1.685	0.510	0.000
EGE GÜBRE	0.065	-0.340	1.114	0.407	0.018
ERDEMİR	0.150	-0.412	2.440	0.735	0.000
GOOD YEAR	0.019	-0.306	0.814	0.303	-0.021
GÜBRE FAB.	0.035	-0.250	1.000	0.376	-0.105
GÜNEY BİRA	0.050	-0.149	0.337	0.154	0.022
HEKTAŞ	0.024	-0.274	0.541	0.198	0.009
İZMİR D.ÇELİK	-0.054	-0.367	0.455	0.222	-0.047
İZOCAM	0.045	-0.290	0.605	0.237	0.006
KARTONSAN	0.027	-0.167	0.644	0.211	-0.022
KAV	-0.002	-0.339	0.378	0.222	-0.057
KEPEZ ELEKTRİK	0.146	-0.180	1.652	0.497	-0.014
KOÇ HOLDİNG	0.201	-0.325	1.591	0.514	0.050
KOÇ YATIRIM	0.100	-0.217	0.482	0.208	0.112
KORDSA	-0.007	-0.184	0.471	0.186	-0.062
KORTARIM	-0.017	-0.273	0.539	0.259	-0.105
METAŞ	0.049	-0.340	1.636	0.517	-0.085
OLMUKSA	0.063	-0.254	0.543	0.245	-0.043
OTOSAN	0.099	-0.408	0.593	0.301	0.039
PINAR SU	0.081	-0.310	0.773	0.324	0.024

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
PINAR SÜT	0.038	-0.300	0.567	0.211	0.015
PİMAŞ	0.125	-0.400	0.775	0.353	0.015
SARKUYSAN	0.070	-0.169	0.414	0.203	0.034
T.DEMİRDÖKÜM	0.122	-0.286	0.836	0.317	0.016
T.SIEMENS	0.117	-0.337	0.732	0.338	0.026
T.ŞİŞECAM	0.246	-0.351	1.650	0.526	0.060
YASAŞ	0.054	-0.211	0.853	0.291	-0.041

APPENDIX. 1

MONTHLY RETURN STATISTICS

1991

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
AKÇİMENTO	0.064	-0.221	0.617	0.276	0.009
ANADOLU CAM	-0.049	-0.325	0.286	0.196	-0.077
ARÇELİK	0.135	-0.172	0.660	0.256	0.078
BAGFAŞ	0.008	-0.397	0.333	0.219	-0.018
BOLU ÇİMENTO	0.051	-0.392	0.909	0.342	-0.032
BRİSA	0.002	-0.210	0.255	0.171	0.011
ÇELİK HALAT	0.027	-0.250	0.736	0.283	-0.030
ÇUKUROVA	0.024	-0.288	0.467	0.273	-0.059
ÇİMSA	0.082	-0.269	0.489	0.257	0.009
DEVA	0.038	-0.736	0.840	0.376	0.045
DÖKTAŞ	0.164	-0.680	1.298	0.481	0.126
ECZACIBAŞI YAT.	0.123	-0.327	1.023	0.365	-0.011
EGE GÜBRE	-0.018	-0.278	0.238	0.155	-0.014
ERDEMİR	0.068	-0.247	0.746	0.299	-0.037
GOOD YEAR	0.127	-0.218	1.303	0.391	0.086
GÜBRE FAB.	0.010	-0.262	0.333	0.182	0.015
GÜNEY BİRACILIK	0.148	-0.381	0.882	0.349	0.093
HEKTAS	0.011	-0.365	0.598	0.262	-0.017
İZMİR D.ÇELİK	0.137	-0.286	1.333	0.474	-0.003
İZOCAM	0.156	-0.217	0.655	0.310	0.155
KARTONSAN	0.027	-0.179	0.309	0.148	0.016
KAV	0.067	-0.320	0.831	0.310	0.002
KEPEZ ELEKTRİK	-0.014	-0.307	0.316	0.200	-0.024
KOÇ HOLDİNG	0.064	-0.158	0.489	0.204	0.031
KOÇ YATIRIM	0.098	-0.184	0.619	0.272	0.013
KORDSA	0.063	-0.200	0.333	0.155	0.062
KORTARIM	0.064	-0.292	0.566	0.260	-0.015
KÖYTAŞ	0.067	-0.375	0.426	0.280	0.076
MARET	0.147	-0.250	0.714	0.320	0.047
MARMARİS A.YUNUS	0.030	-0.250	0.310	0.166	0.047
MENSUCAT SANTRAL	-0.014	-0.273	0.500	0.207	-0.047
METAŞ	0.143	-0.275	1.529	0.551	-0.049
OLMUKSA	-0.022	-0.298	0.207	0.135	-0.052
OTOSAN	0.048	-0.338	0.848	0.316	-0.016
PINAR ET	0.065	-0.154	0.885	0.287	-0.041
PINAR SU	0.049	-0.258	0.444	0.237	-0.045
PINAR SÜT	0.019	-0.308	0.447	0.242	-0.033
PİMAŞ	-0.001	-0.324	0.500	0.257	-0.044
RABAK	0.067	-0.352	0.513	0.261	0.043

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
SARKUYSAN	0.107	-0.317	0.667	0.313	0.047
T.DEMİRDÖKÜM	0.172	-0.292	1.069	0.376	0.143
T.SIEMENS	0.104	-0.286	0.850	0.336	0.016
T.ŞİŞECAM	-0.047	-0.275	0.410	0.185	-0.020
TELETAŞ	0.131	-0.306	0.578	0.241	0.097
YASAŞ	0.041	-0.242	0.536	0.227	-0.037

APPENDIX. 2

MONTHLY RETURN STATISTICS
1992

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
AKAL TEKSTİL	0.175	-0.217	0.707	0.137	0.307
AKÇİMENTO	0.035	-0.305	0.535	0.054	0.209
AKSA	0.059	-0.200	0.424	0.042	0.203
ALARKO	0.016	-0.436	0.576	-0.029	0.289
ANADOLU CAM	0.070	-0.296	0.857	0.000	0.314
ARÇELİK	-0.004	-0.241	0.403	-0.037	0.173
AYGAZ	-0.012	-0.208	0.294	-0.028	0.143
BAGFAŞ	-0.032	-0.267	0.240	-0.024	0.149
BOLU ÇİMENTO	-0.030	-0.350	0.367	0.000	0.202
BRİSA	0.029	-0.379	0.318	0.015	0.213
ÇANAKKALE ÇİM.	0.091	-0.194	0.614	0.060	0.255
ÇELİK HALAT	0.029	-0.258	0.447	0.007	0.193
ÇİMSA	-0.006	-0.122	0.081	-0.018	0.059
ÇUKUROVA	0.057	-0.192	0.443	0.036	0.160
DEVA	-0.050	-0.371	0.286	-0.061	0.195
DOĞUSAN	-0.027	-0.327	0.444	-0.057	0.205
DÖKTAŞ	-0.021	-0.324	0.279	-0.063	0.220
ECZACIBAŞI YAT.	-0.046	-0.371	0.202	-0.081	0.192
EGE END.	0.041	-0.253	0.376	0.063	0.213
EGE GÜBRE	0.036	-0.229	0.550	-0.024	0.229
ERCİYAS BİRA	0.092	-0.192	0.425	0.112	0.186
ERDEMİR	-0.029	-0.274	0.403	-0.051	0.173
GOOD YEAR	0.075	-0.149	0.520	0.032	0.200
GORBON IŞIL	0.055	-0.415	0.625	0.036	0.263
GÜBRE FAB.	-0.001	-0.270	0.294	-0.019	0.180
GÜNEY BİRA	0.064	-0.242	0.362	0.048	0.182
HEKTAŞ	0.017	-0.337	0.459	-0.014	0.227
İZMİR D.ÇELİK	-0.052	-0.243	0.233	-0.067	0.141
İZOCAM	0.020	-0.296	0.296	0.035	0.156
KARTONSAN	-0.013	-0.344	0.250	0.000	0.154
KAV	-0.058	-0.359	0.399	-0.083	0.250
KEPEZ	0.044	-0.364	1.037	-0.044	0.347
KOÇ HOLDİNG	-0.012	-0.301	0.415	-0.017	0.201
KOÇ YATIRIM	0.012	-0.195	0.340	-0.043	0.180
KORDSA	-0.055	-0.197	0.180	-0.075	0.116
KORTARIM	-0.056	-0.420	0.167	-0.041	0.174
KÖYTAŞ	-0.005	-0.558	0.389	-0.025	0.297
MAKİNA TAKIM	-0.035	-0.411	0.514	-0.075	0.269
MARET	-0.009	-0.333	0.370	0.042	0.192

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
MAR. MARTI	-0.001	-0.194	0.289	-0.024	0.154
MAR. A.YUNUS	-0.005	-0.223	0.206	-0.027	0.118
MENS.SANTRAL	-0.058	-0.280	0.278	-0.061	0.155
METAŞ	0.049	-0.143	0.364	0.019	0.165
NET HOLDİNG	-0.017	-0.233	0.174	-0.019	0.107
OKANTEKSTİL	-0.049	-0.205	0.238	-0.068	0.123
OLMUKSA	0.009	-0.200	0.500	-0.039	0.193
OTOSAN	0.093	-0.304	0.677	0.000	0.270
PİMAŞ	0.051	-0.441	0.479	0.049	0.239
PINAR ET	0.024	-0.258	0.478	-0.084	0.267
PINAR SU	-0.024	-0.357	0.308	-0.046	0.186
PINAR SÜT	0.045	-0.293	0.519	0.072	0.228
PINAR UN	-0.007	-0.569	0.311	-0.010	0.247
PROFİLO PEG	-0.055	-0.390	0.255	-0.063	0.174
RABAK	-0.074	-0.429	0.229	-0.091	0.206
SANTRAL H.	-0.090	-0.375	0.125	-0.043	0.164
SARKUYSAN	0.002	-0.360	0.507	-0.020	0.205
SİFAŞ	-0.090	-0.586	0.364	-0.092	0.275
T.DEMİRDÖKÜM	0.037	-0.328	0.577	0.026	0.238
T.SIEMENS	0.062	-0.302	0.750	0.018	0.274
T.ŞİŞECAM	-0.049	-0.290	0.364	-0.054	0.176
TELETAŞ	-0.014	-0.338	0.537	-0.060	0.263
YASAŞ	0.042	-0.339	0.548	-0.021	0.293

APPENDIX. 3

MONTHLY RETURN STATISTICS
1993

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
AKAL TEKSTİL	0.158	-0.141	0.354	0.163	0.177
AKÇİMENTO	0.163	-0.177	0.567	0.208	0.155
AKSA	0.092	-0.136	0.347	0.172	0.126
ALARKO	0.267	-0.061	0.596	0.192	0.304
ANADOLU CAM	0.188	-0.041	0.972	0.269	0.120
ARÇELİK	0.181	-0.068	0.506	0.182	0.191
AYGAZ	0.109	-0.120	0.272	0.150	0.128
BAGFAŞ	0.247	-0.120	0.905	0.258	0.239
BOLU ÇİMENTO	0.228	-0.246	0.611	0.273	0.277
BRİSA	0.270	-0.122	0.778	0.308	0.265
ÇANAKKALE ÇİMENTO	0.097	-0.182	0.558	0.184	0.114
ÇELİK HALAT	0.186	-0.359	0.692	0.284	0.219
ÇİMSA	0.207	-0.040	0.655	0.216	0.139
ÇUKUROVA	0.127	-0.110	0.533	0.188	0.145
DEVA	0.190	-0.065	0.403	0.165	0.173
DOĞUSAN	0.374	-0.156	1.500	0.441	0.442
DÖKTAŞ	0.184	-0.196	0.592	0.244	0.161
ECZACIBAŞI YATIRIM	0.191	-0.255	0.546	0.290	0.278
EGE ENDÜSTRİ	0.235	-0.140	0.569	0.219	0.301
EGE GÜBRE	0.377	-0.078	1.490	0.416	0.286
ERCİYAS BİRA	0.093	-0.153	0.623	0.204	0.044
ERDEMİR	0.288	-0.197	1.132	0.423	0.306
GOOD YEAR	0.176	-0.049	0.300	0.128	0.225
GORBON IŞIL	0.235	-0.153	1.917	0.568	0.080
GÜBRE FAB.	0.283	-0.107	0.619	0.215	0.257
GÜNEY BİRA	0.156	-0.125	0.567	0.227	0.087
HEKTAŞ	0.166	0.000	0.515	0.139	0.165
İZMİR D.ÇELİK	0.332	-0.080	0.565	0.234	0.412
İZOCAM	0.130	-0.177	0.500	0.217	0.106
KARTONSAN	0.275	-0.022	0.632	0.220	0.274
KAV	0.218	-0.146	0.605	0.232	0.194
KEPEZ ELEKTRİK	0.190	-0.115	0.867	0.283	0.064
KOÇ HOLDİNG	0.199	-0.146	1.159	0.324	0.160
KOÇ YATIRIM	0.166	-0.267	0.461	0.239	0.222
KORDSA	0.196	-0.089	0.422	0.175	0.262
KORTARIM	0.113	-0.073	0.500	0.184	0.000
KÖYTAŞ	0.167	-0.180	0.809	0.279	0.140
MAKİNA TAKIM	0.367	-0.265	1.366	0.467	0.333
MARET	0.221	-0.042	0.579	0.202	0.164
MARMARİS MARTI	0.207	0.000	0.579	0.205	0.111
MAR. A.YUNUS	0.194	-0.283	1.225	0.383	0.110
MENSUCAT SANTRAL	0.061	-0.254	0.841	0.283	0.000

	AVG.	MIN.	MAX.	STD.DEV.	MEDIAN
METAŞ	0.329	-0.127	0.782	0.322	0.398
NET HOLDİNG	0.250	-0.131	0.656	0.254	0.184
OKAN TEKSTİL	0.221	-0.179	0.477	0.229	0.267
OLMUKSA	0.179	-0.179	0.552	0.230	0.228
OTOSAN	0.280	-0.131	1.071	0.371	0.106
PİMAŞ	0.320	-0.026	1.402	0.490	0.053
PINAR ET	0.211	-0.302	0.778	0.290	0.254
PINAR SU	0.310	-0.151	1.174	0.361	0.303
PINAR SÜT	0.365	0.077	1.131	0.347	0.252
PINAR UN	0.279	-0.143	0.726	0.256	0.237
PROFİLO PEG	0.185	-0.211	0.666	0.255	0.192
RABAK	0.205	-0.179	0.541	0.252	0.258
SARKUYSAN	0.201	-0.064	0.670	0.256	0.135
SİFAŞ	0.226	-0.298	1.027	0.387	0.185
T.DEMİRDÖKÜM	0.140	-0.146	0.440	0.187	0.105
T.SIEMENS	0.147	-0.150	0.400	0.178	0.179
T.ŞİŞECAM	0.298	-0.194	1.310	0.418	0.202
TELETAŞ	0.324	-0.207	0.903	0.384	0.295
YASAŞ	0.283	-0.208	1.133	0.368	0.264
ASLAN ÇİMENTO	0.130	-0.210	0.500	0.211	0.077
DENİZLİ CAM	0.294	-0.021	0.817	0.295	0.169
ECZACIBAŞI İLAÇ	0.139	-0.154	0.347	0.159	0.148
EGE BİRA	0.115	-0.075	0.630	0.203	0.033
ENKA	0.159	-0.028	0.655	0.208	0.060
FENİŞ	0.062	-0.046	0.174	0.063	0.044
GENTAŞ	0.191	-0.105	0.797	0.293	0.127
İMP	0.266	-0.328	1.055	0.396	0.271
İNTEMA	0.154	-0.190	0.677	0.276	0.067
KELEBEK	0.193	-0.219	1.029	0.319	0.107
KENT GIDA	0.086	0.010	0.290	0.085	0.058
KONYA ÇİMENTO	0.105	-0.094	0.300	0.131	0.112
KÜTAHYA	0.121	-0.080	0.580	0.228	0.012
MARDİN ÇİMENTO	0.145	-0.196	0.344	0.199	0.204
MARSHALL	0.202	-0.216	0.692	0.236	0.180
PETKİM	0.387	-0.260	1.167	0.429	0.260
SABAH	0.159	-0.233	0.641	0.285	0.101
THY	0.376	-0.074	1.430	0.422	0.288
TRAKYA CAM	0.223	-0.090	0.496	0.198	0.233
TÜRK TUBORG	0.140	-0.090	1.130	0.332	0.061
ÜNYE ÇİMENTO	0.169	-0.138	0.478	0.192	0.199
UŞAK	0.176	-0.103	0.857	0.311	0.019
VESTEL	0.208	-0.240	0.534	0.235	0.230
YÜNSA	0.229	-0.056	0.710	0.248	0.194

APPENDIX. 4

CROSS - SECTIONAL REGRESSION STATISTICS
BOOK LEVERAGE

	Month	X1(β)	t-stat	X2(LRi)	t-stat	R^2
	1	0.0281	0.09	-0.3020	-1.39	5.40%
	2	-0.0130	-0.11	0.0783	0.91	2.40%
	3	-0.0590	-0.65	0.0454	0.71	2.10%
	4	0.1760	2.46	0.0785	1.55	24.00%
	5	-0.1490	-1.34	0.0001	0.00	5.20%
1990	6	-0.0104	-0.15	0.0677	1.34	5.00%
	7	0.2273	1.01	0.4269	2.67	22.50%
	8	0.0212	0.33	0.0707	1.58	8.10%
	9	-0.0166	-0.19	0.0637	1.04	3.00%
	10	-0.0074	-0.13	0.0014	0.03	0.00%
	11	0.0472	0.92	-0.0457	-1.26	5.30%
	12	-0.0417	-0.85	0.0669	1.93	9.90%
	1	0.0290	0.19	-0.0630	-0.59	1.00%
	2	-0.1790	-1.75	-0.3670	-1.63	10.30%
	3	-0.1190	-2.17	-0.0490	-1.30	11.60%
	4	-0.0289	-0.94	0.0167	0.79	4.00%
	5	0.0529	0.82	0.0681	1.54	5.90%
1991	6	-0.0128	-0.21	0.0316	0.74	1.50%
	7	0.0940	1.28	0.0002	0.00	3.80%
	8	0.1260	1.84	0.0494	1.05	8.40%
	9	-0.0577	-1.33	0.0282	0.94	6.90%
	10	-0.1250	-2.02	0.0243	0.57	10.30%
	11	0.2120	1.67	0.0612	0.70	6.40%
	12	0.0364	0.20	-0.0157	-0.37	1.30%
	1	0.0317	0.94	-0.0848	-2.19	9.60%
	2	-0.0049	-0.20	0.0472	1.67	4.80%
	3	0.0177	0.62	-0.0628	-1.93	7.00%
	4	-0.0037	-0.10	-0.0051	-0.12	0.00%
	5	0.0523	2.26	0.0441	1.67	10.70%
1992	6	0.0023	0.05	0.0067	0.13	0.00%
	7	0.0361	0.99	0.0122	0.29	1.70%
	8	0.0829	2.69	0.0525	1.49	12.80%
	9	-0.0114	-0.33	-0.0513	-1.28	2.70%
	10	0.0191	0.64	0.0010	0.01	0.70%
	11	-0.0187	-0.88	-0.0014	-0.06	1.20%
	12	0.0548	1.57	0.0368	0.92	4.90%

	Month	X1(β)	t-stat	X2(LRi)	t-stat	R^2
	1	0.0000	0.02	-0.0157	-0.48	0.30%
	2	0.0661	1.26	0.0379	1.02	2.90%
	3	-0.0480	-1.08	0.0044	0.14	1.40%
	4	-0.0999	-1.04	0.0359	0.53	1.70%
	5	-0.0276	1.44	-0.1120	-2.12	5.15%
1993	6	-0.0225	-0.30	0.0002	0.00	0.10%
	7	-0.0864	-1.57	-0.0081	-0.20	2.90%
	8	-0.0107	-0.18	0.0084	0.20	0.10%
	9	-0.0780	-1.32	0.0799	1.89	6.40%
	10	-0.0132	-0.31	-0.0208	-0.69	0.70%
	11	-0.0366	-0.43	-0.1053	-1.73	3.60%
	12	-0.0974	-1.39	0.0050	0.11	2.30%

APPENDIX. 5

CROSS - SECTIONAL REGRESSION STATISTICS
MARKET LEVERAGE

	Month	X1(β)	t-stat	X2(LRi)	t-stat	R^2
	1	-0.1428	-0.43	-0.1287	-1.31	4.82%
	2	-0.3976	-3.51	-0.0697	-1.94	28.23%
	3	0.1081	1.15	0.0382	1.19	5.75%
	4	0.1347	1.74	0.0310	1.11	9.16%
	5	-0.2747	-2.78	-0.0233	-0.64	18.56%
1990	6	0.0400	0.54	0.0033	0.12	0.84%
	7	0.0692	0.27	0.0470	0.49	0.74%
	8	0.0976	0.67	0.0228	0.46	1.60%
	9	0.1373	1.65	0.0157	0.56	7.59%
	10	0.0157	0.30	-0.0176	-1.00	3.39%
	11	-0.0776	-1.56	-0.0156	-0.47	7.85%
	12	-0.0037	-0.07	0.0255	1.61	7.39%
	1	0.1353	0.84	-0.0745	-1.36	5%
	2	-0.1531	-1.51	-0.1166	-3.36	26%
	3	-0.0737	-1.19	-0.0161	-0.71	5%
	4	-0.0489	-1.47	0.0035	0.28	5%
	5	0.0933	1.26	0.0177	0.68	5%
1991	6	0.0266	0.38	0.0371	1.58	6%
	7	0.0995	1.15	0.0075	0.27	3%
	8	0.1920	2.34	-0.0128	-0.53	12%
	9	-0.0278	-0.52	-0.0098	-0.60	2%
	10	-0.2071	-2.97	0.0163	0.75	18%
	11	0.0953	0.64	0.0091	0.20	1%
	12	-0.0097	-0.13	0.0222	1.09	3%
	1	-0.0158	-0.24	-0.0542	-2.37	9.23%
	2	-0.1016	-2.34	0.0157	0.88	8.55%
	3	0.0691	1.33	-0.0378	-1.88	7.01%
	4	0.0450	0 65	-0.0057	-0.22	0.72%
	5	-0.0352	-0.78	0.0250	1.50	3.93%
1992	6	0.0422	0.51	0.0342	1.13	3.21%
	7	-0.0580	-0.78	0.0018	0.08	1.07%
	8	-0.0774	-1.15	0.0499	2.49	9.95%
	9	-0.1257	-1.74	-0.0112	-0.53	6.09%
	10	-0.0166	-0.27	-0.0235	-1.32	3.21%
	11	0.0564	1.33	-0.0163	-1.28	4.80%
	12	0.0917	1.41	0.0355	1.72	8.37%

	Month	X1(β)	t-stat	X2(LRi)	t-stat	R^2
	1	0.0493	0.94	0.0181	0.97	2.41%
	2	0.0098	0.18	0.0215	1.19	1.86%
	3	-0.0431	-0.79	0.0022	0.14	0.76%
	4	-0.0936	-0.82	0.0118	0.36	0.85%
	5	-0.0522	-0.59	-0.0523	-2.09	6.14%
1993	6	-0.0229	-0.27	-0.0663	-2.82	9.50%
	7	-0.0317	-0.45	-0.0004	-0.02	0.25%
	8	0.0376	0.51	-0.0128	-1.83	3.92%
	9	-0.0548	-0.66	-0.0097	-1.33	3.45%
	10	-0.0875	-1.53	0.0033	0.28	2.77%
	11	0.0924	0.80	-0.0492	-1.48	3.06%
	12	0.0721	0.81	0.0078	0.28	0.93%

APPENDIX. 6

SUMMARY STATISTICS ABOUT BETA ESTIMATION
1990

	β	t-ratio	α	t-ratio	F-value	R^2
AKÇİMENTO	1.297	5.248	0.006	0.121	27.544	0.555
ANADOLU CAM	0.906	8.87	0.019	0.87	78.686	0.781
ARÇELİK	0.818	6.518	0.04	1.499	42.485	0.659
BAGFAŞ	0.95	5.057	0.0239	0.591	25.576	0.538
BOLU ÇİMENTO	0.831	5.765	0.041	1.33	33.238	0.602
BRİSA	0.692	5.062	0.004	0.139	25.623	0.538
ÇELİK HALAT	0.71	8.712	0	-0.057	75.903	0.775
ÇİMSA	1.93	4.397	0.109	1.66	19.337	0.659
ÇUKUROVA	0.875	8.194	0.024	1.05	67.145	0.753
DÖKTAŞ	0.951	7.583	0.008	0.295	57.495	0.723
ECZ. YAT.	1.349	10.241	0.041	1.454	104.871	0.827
EGE BİRA	0.997	6.468	0.078	2.353	41.84	0.655
EGE GÜBRE	0.858	5.284	-0.03	-0.86	27.916	0.559
ERDEMİR	1.292	7.963	0.109	3.13	63.406	0.742
GOOD YEAR	1.256	4.107	-0.046	-0.693	16.869	0.434
GÜBRE FAB.	0.27	1.739	-0.059	-1.773	3.025	0.121
GÜNEY BİRA	0.967	5.767	0.027	0.736	33.259	0.776
HEKTAŞ	0.686	4.185	0.029	0.831	17.511	0.443
İZMİR D.ÇELİK	0.815	6.091	-0.042	-1.475	37.098	0.628
İZOCAM	0.832	5.212	0.03	0.882	27.167	0.553
KARTONSAN	0.657	4.627	0.018	0.58	21.407	0.493
KAV	0.788	5.764	0.031	1.072	33.228	0.602
KEPEZ ELEKT.	0.704	5.591	0.011	0.416	31.259	0.587
KOÇ HOLDİNG	0.963	7.83	0.017	0.68	61.314	0.736
KOÇ YATIRIM	0.771	8.489	0.009	0.47	72.071	0.766
KORDSA	0.714	4.357	-0.018	-0.523	18.988	0.463
KORTARIM	0.577	3.103	0.045	1.126	9.627	0.304
METAŞ	0.624	3.679	-0.03	-0.818	13.537	0.381
NASAŞ	0.876	3.148	-0.025	-0.417	9.911	0.311
OLMUKSA	1.085	7.54	0.006	0.208	56.848	0.721
OTOSAN	0.868	8.541	0.021	0.961	72.957	0.768
PINAR SU	0.48	2.265	-0.002	-0.046	5.129	0.189
PINAR SÜT	0.623	4.508	0.022	0.774	20.321	0.48
PİMAŞ	0.548	2.026	0.022	0.38	4.106	0.157
SARKUYSAN	0.918	6.318	0.039	1.26	39.916	0.645
T.DEMİRDÖK.	0.884	11.587	-0.018	-1.087	134.248	0.859
T.SIEMENS	1.247	6.845	-0.017	-0.427	46.852	0.68
T.ŞİŞE CAM	0.784	4.413	0.041	1.066	19.477	0.469
YASAŞ	0.755	4.553	0.026	0.735	20.726	0.485

APPENDIX. 7

SUMMARY STATISTICS ABOUT β ESTIMATION
1991

	β	t-ratio	α	t-ratio	F-value	R^2
AKÇİMENTO	0.965	7.499	-0.013	-0.409	56.233	0.719
ANADOLU CAM	0.81	6.944	0.004	0.129	48.223	0.687
ARÇELİK	0.63	4.326	0.031	0.867	18.716	0.46
BAGFAŞ	0.837	5.959	0.011	0.309	35.51	0.617
BOLU ÇİMENTO	0.737	4.129	0.039	0.895	17.045	0.437
BRİSA	0.762	6.49	-0.019	-0.643	42.12	0.657
ÇELİK HALAT	0.894	-0.781	-0.019	8.926	79.676	0.784
ÇİMSA	1.164	6.47	0.011	0.279	41.872	0.655
ÇUKUROVA	0.891	9.854	-0.009	-0.405	97.093	0.815
DEVA	0.999	2.821	0.092	1.055	7.955	0.515
DÖKTAŞ	0.836	6.734	-0.002	-0.051	45.349	0.673
ECZACIBAŞI YAT.	1.242	4.198	0.08	1.101	17.625	0.445
EGE GÜBRE	1.057	5.248	-0.03	-0.599	27.545	0.556
ERDEMİR	2.004	6.74	0.038	0.525	45.433	0.674
GOOD YEAR	1.41	5.89	-0.059	-0.992	34.683	0.612
GÜBRE FAB.	0.673	3.144	-0.043	-0.807	9.887	0.31
GÜNEY BİRA	0.673	3.144	-0.043	-0.807	9.887	0.557
HEKTAŞ	0.737	5.237	0.008	0.225	27.43	0.555
İZMİR D.ÇELİK	0.815	6.589	-0.057	-1.87	43.419	0.664
İZOCAM	0.852	6.423	0.004	0.11	41.256	0.652
KARTONSAN	0.691	4.84	0.018	0.507	23.424	0.516
KAV	0.913	9.12	-0.025	-1.014	83.176	0.791
KEPEZ	1.144	4.854	0.005	0.087	23.56	0.517
KOÇ HOLDİNG	1.229	4.887	0.062	0.995	23.883	0.521
KOÇ YATIRIM	0.736	7.3	0.042	1.683	53.292	0.708
KORDSA	0.647	4.175	-0.043	-1.134	17.433	0.442
KORTARIM	0.836	5.055	-0.033	-0.803	25.551	0.537
KÖYTAŞ	0.368	1.276	0.073	1.026	1.629	0.069
MARET	0.437	2.261	0.035	0.733	5.111	0.188
MAR.A.YUNUS	0.688	3.366	-0.025	-0.503	11.33	0.34
MEN. SANTRAL	0.669	4.578	-0.015	-0.413	20.954	0.488
METAŞ	1.151	4.562	-0.037	-0.595	20.809	0.486
NASAŞ	1.657	4.383	-0.026	-0.284	19.21	0.466
OLMUKSA	0.926	5.801	-0.024	-0.604	33.65	0.605
OTOSAN	0.94	7.918	-0.005	-0.184	62.703	0.74
PINAR ET	0.179	0.802	0.013	0.232	0.643	0.028
PINAR SU	0.673	4.285	-0.031	-0.808	18.361	0.455
PINAR SÜT	0.789	6.406	-0.011	-0.351	41.031	0.651
PİMAŞ	0.679	2.414	0.019	0.275	5.825	0.209
RABAK	1.535	4.842	-0.034	-0.437	23.44	0.516
SARKUYSAN	0.798	5.729	0.031	0.904	32.816	0.599
TELETAŞ	0.986	5.108	-0.043	-0.904	26.095	0.543

	β	t-Ratio	α	t-Ratio	F-value	R^2
T.DEMİRDÖKÜM	1.092	13.37	-0.021	-1.031	178.77	0.89
T.SIEMENS	1.368	9.31	-0.025	-0.692	86.67	0.798
T.ŞİŞECAM	1.425	6.709	0.056	1.076	45.005	0.672
YASAŞ	0.897	5.737	0.012	0.314	32.913	0.599

APPENDIX. 8

SUMMARY STATISTICS ABOUT β ESTIMATION
1992

	β	t-Ratio	α	t-Ratio	F-value	R^2
AKAL TEKSTİL	0.791	3.244	-0.007	-0.145	10.522	0.324
AKÇİMENTO	0.898	7.048	0.009	0.326	49.673	0.693
AKSA	0.414	1.052	0.052	0.625	1.107	0.048
ALARKO	0.881	2.985	0.093	1.483	8.909	0.288
ANADOLU CAM	0.752	6.681	-0.067	-2.826	44.64	0.67
ARÇELİK	0.759	4.569	0.04	1.142	20.878	0.487
AYGAZ	0.454	1.277	0.111	1.474	1.631	0.069
BAGFAŞ	0.901	5.81	-0.007	-0.226	33.76	0.605
BOLU ÇİMENTO	1.101	5.525	0.014	0.341	30.521	0.581
BRİSA	0.751	6.68	-0.036	-1.52	44.666	0.67
ÇAN.ÇİMENTO	1.1	2.393	0.139	1.424	5.725	0.207
ÇELİK HALAT	1.089	7.419	-0.019	-0.604	55.047	0.714
ÇİMSA	0.803	5.811	0.003	0.101	33.766	0.605
ÇUKUROVA	0.977	7.062	-0.013	-0.444	49.874	0.694
DEVA	1.087	5.432	0.031	0.729	29.511	0.573
DOĞUSAN	0.613	2.707	-0.035	-0.731	7.3	0.249
DÖKTAŞ	1.178	4.368	0.062	1.079	19.082	0.464
ECZACI YAT.	1.202	3.481	0.095	1.3	12.116	0.355
EGE ENDÜSTRİ	1.275	5.251	0.055	1.07	27.573	0.556
EGE GÜBRE	1.028	4.916	-0.024	-0.544	24.169	0.523
ERCİYAS BİRA	3.894	4.279	0.161	0.834	18.31	0.454
ERDEMİR	1.999	5.896	0.058	0.804	34.765	0.612
GOOD YEAR	1.172	5.084	0.025	0.506	25.848	0.54
GORBON IŞIL	3.894	4.279	0.161	0.834	18.309	0.454
GÜBRE FAB.	1.048	5.778	-0.025	-0.655	33.39	0.603
GÜNEY BİRA	0.817	4.121	0.052	1.235	16.984	0.435
HEKTAŞ	0.83	5.883	-0.03	-1.004	34.611	0.611
İZMİR D.ÇELİK	1.057	-3.609	-0.006	-0.098	13.024	0.372
İZOCAM	0.997	5.922	0.053	1.477	35.078	0.615
KARTONSAN	0.631	5.497	-0.019	-0.795	30.22	0.579
KAV	0.943	5.547	-0.015	-0.416	30.77	0.583
KEPEZ	1.347	5.519	0.017	0.326	30.46	0.58
KOÇ HOLDİNG	1.338	5.135	0.084	1.517	26.364	0.545
KOÇ YATIRIM	0.902	6.7	0.052	1.825	44.899	0.819
KORDSA	0.59	5.337	-0.018	-0.783	28.481	0.564
KORTARIM	0.903	5.456	-0.024	-0.681	29.763	0.575
KÖYTAŞ	0.616	2.363	0.033	0.601	5.582	0.202
MAKİNA TAKIM	0.689	2.924	-0.017	-0.346	8.548	0.28
MARET	0.78	3.351	0.033	0.662	11.23	0.338
MARM. MARTI	0.315	1.627	-0.034	-0.829	2.647	0.107
MAR.A.YUNUS	0.593	2.726	-0.036	-0.789	7.431	0.253
MENS.SANTRAL	0.916	4.537	-0.015	-0.345	20.585	0.483
METAŞ	1.77	5.514	0.03	0.439	30.402	0.58

	β	t-ratio	α	t-ratio	F-value	R^2
NASAŞ	1.727	4.72	-0.013	-0.166	22.278	0.503
NET HOLDİNG	0.726	4.209	-0.041	-1.125	17.717	0.446
OKAN TEKSTİL	0.335	1.873	-0.023	-0.62	3.509	0.138
OLMUKSA	0.496	3.614	-0.059	-2.043	13.062	0.373
OTOSAN	1.243	6.465	0.033	0.814	41.803	0.655
PİMAŞ	0.96	4.187	-0.013	-0.264	17.528	0.443
PINAR ET	0.617	3.364	-0.013	-0.345	11.315	0.34
PINAR SU	0.838	4.668	-0.018	-0.478	21.791	0.498
PINAR SÜT	0.597	3.177	-0.038	-0.965	10.09	0.314
PINAR UN	0.611	2.388	-0.003	-0.048	5.703	0.206
POLYLEN	0.471	2.178	-0.029	-0.64	4.742	0.177
PROFİLO PEG	0.563	3.5	0.003	0.091	12.253	0.358
RABAK	0.895	5.917	-0.045	-1.422	35.015	0.614
SANTRAL HOL.	1.135	5.612	0.023	0.535	31.489	0.589
SARKUYSAN	0.963	6.79	0.018	0.584	46.106	0.677
SİFAŞ	0.717	3.67	0.008	0.193	13.464	0.38
T.DEMIRDÖKÜM	1.345	7.45	0.075	1.954	55.503	0.716
T.SIEMENS	1.385	11.484	0.03	1.186	131.893	0.857
T.ŞİŞE CAM	1.52	6.421	0.025	0.496	41.233	0.652
TELETAŞ	0.919	5.741	0.025	0.732	32.956	0.6
YASAŞ	0.905	5.788	-0.013	-0.384	33.505	0.604

APPENDIX. 9

SUMMARY STATISTICS ABOUT β ESTIMATION 1993

	β	t-Ratio	α	t-Ratio	F-value	R^2
AKAL TEKSTİL	1.083	1.325	0.064	3.931	15.452	0.413
AKÇİMENTO	1.211	8.822	0.035	1.444	77.828	0.78
AKSA	0.919	4.155	0.031	0.786	17.267	0.44
ALARKO	1.625	9.584	0.056	1.898	91.853	0.807
ANADOLU CAM	1.056	4.649	-0.01	-0.249	21.611	0.496
ARÇELİK	1.177	10.349	0.049	2.48	107.111	0.83
ASLAN ÇİM.	1.63	3.707	0.077	1.003	13.741	0.384
AYGAZ	0.977	6.574	0.031	1.204	43.213	0.663
BAGFAŞ	0.919	8.334	-0.036	-1.894	69.456	0.759
BOLU ÇİMENTO	1.468	11.53	0.004	0.173	132.946	0.858
BRİSA	0.845	5.881	-0.012	-0.478	34.586	0.611
ÇAN. ÇİM.	1.101	2.205	0.159	1.818	4.862	0.181
ÇELİK HALAT	1.139	7.214	0.01	0.371	52.04	0.702
ÇİMSA	0.84	5.874	0.011	0.423	34.507	0.611
ÇUKUROVA	1.045	7.074	0.02	0.771	50.036	0.695
DENİZLİ CAM	0.789	3.127	-0.023	-0.528	9.776	0.308
DEVA	1.401	5.928	-0.015	-0.421	48.004	0.686
DOĞUSAN	0.698	3.424	-0.031	-0.865	11.722	0.348
DÖKTAŞ	1.67	5.975	0.08	1.638	35.712	0.619
ECZACI İLAÇ	1.257	8.215	-0.002	-0.086	67.493	0.754
ECZACI YAT.	1.315	5.647	0.027	0.653	31.889	0.592
EGE BİRA	0.79	5.777	0.08	3.359	33.374	0.603
EGE ENDÜSTRİ	0.907	4.387	0.011	0.311	19.244	0.467
EGE GÜBRE	0.73	4.166	-0.022	-0.714	17.352	0.441
ENKA	1.416	3.284	0.104	1.378	10.788	0.329
ERCİYAS BİRA	0.994	4.093	0.088	2.064	16.751	0.432
ERDEMİR	1.144	6.727	0.002	0.079	45.251	0.673
FENİŞ	0.209	1.727	-0.024	-1.143	2.984	0.119
GENTAŞ	0.985	3.72	0.024	0.519	13.836	0.386
GOOD YEAR	1.357	5.901	0.091	2.262	34.821	0.613
GORBON IŞIL	0.955	0.031	0.001	4.401	19.372	0.468
GÜBRE FAB.	0.714	4.612	-0.027	-0.997	21.273	0.701
GÜNEY BİRA	1.325	7.29	0.094	2.968	53.146	0.707
HEKTAŞ	1.103	6.289	-0.005	-0.15	39.551	0.643
İMP.	0.778	3.054	-0.041	-0.913	9.325	0.298
İNTEMA	2.096	9.314	0.106	2.685	86.745	0.798
İZMİR D.ÇELİK	1.364	4.209	0.032	0.574	17.719	0.446
İZOCAM	1.141	6.215	0.071	2.202	38.626	0.637
KARTONSAN	0.616	4.926	-0.027	-1.257	24.269	0.525
KAV	1.258	6.032	0.014	0.373	36.386	0.623
KELEBEK	0.629	2.403	-0.019	-0.423	5.776	0.208
KENT GIDA	0.106	0.973	-0.034	-1.798	0.946	0.041
KEPEZ	1.113	4.663	0.005	0.013	21.74	0.497
KOÇ HOLDİNG	1.04	9.03	0.014	0.677	81.543	0.788

	β	t-ratio	α	t-ratio	F-value	R^2
KOÇ YATIRIM	1.121	7.598	0.037	1.433	57.731	0.724
KONYA ÇİM.	1.361	3.223	0.086	8.924	79.645	0.784
KORDSA	0.624	5.138	-0.031	-1.452	26.404	0.545
KORTARIM	1.023	6.116	-0.017	-0.601	37.4	0.63
KÖYTAŞ	1.139	4.942	0.001	0.029	24.427	0.526
KÜTAHYA	0.839	3.649	0.048	1.2	13.314	0.377
MAK. TAKIM	0.905	-1.264	-0.06	3.313	10.978	0.247
MARDİN ÇİM.	1.931	8.424	0.134	3.337	70.97	0.763
MARET	1.137	5.086	0.051	1.307	25.867	0.54
MAR. MARTI	0.626	2.931	0.019	0.513	8.592	0.281
MAR.A.YUNUS	0.274	1.691	-0.034	-1.191	2.86	0.115
MARSHALL	0.854	4.07	0.036	0.991	16.565	0.43
MENS. SANTRAL	1.183	5.319	-0.017	-0.444	28.29	0.563
METAŞ	1.324	0.918	0.058	3.666	13.437	0.379
NASAŞ	0.782	3.822	-0.03	-0.855	14.61	0.399
NET HOLDİNG	0.696	4.612	-0.028	-1.054	21.27	0.492
OKAN TEKSTİL	0.038	0.191	-0.072	-2.055	0.036	0.002
OLMUKSA	0.445	2.394	-0.038	-1.162	5.731	0.207
OTOSAN	1.613	7.787	0.091	2.529	60.632	0.734
PARSAN	0.176	0.721	-0.045	-1.045	0.52	0.023
PETKİM	0.423	2.664	-0.068	-2.446	7.098	0.244
PİMAŞ	0.905	4	0	0.004	16.004	0.649
PINAR ET	0.746	3.556	-0.008	-0.213	12.645	0.365
PINAR SU	0.74	3.9	-0.026	-0.794	15.213	0.409
PINAR SÜT	0.563	2.206	-0.005	-0.104	4.867	0.426
PINAR UN	0.383	1.413	-0.066	-1.388	1.997	0.083
POLYLEN	0.332	1.05	-0.06	-1.088	1.103	0.048
PROFİLO PEG	1.001	6.192	0.003	0.12	38.335	0.062
RABAK	1.129	6.368	-0.041	-1.329	40.549	0.648
SABAH	-0.015	-0.171	-0.009	-0.048	0.002	0
SANT.HOLD.	1.119	6.288	-0.06	-1.921	39.542	0.643
SARKUYSAN	1.419	12.847	0.046	2.382	165.037	0.882
SİFAŞ	0.925	4.109	-0.076	-1.935	16.888	0.434
SÖKSA	0.625	1.451	0.029	0.386	2.106	0.087
T.DEMİRDÖKÜM	1.506	7.102	0.099	2.676	50.439	0.696
T.SIEMENS	1.309	5.54	0.071	1.721	30.695	0.583
T.ŞIŞECAM	0.804	6.205	-0.076	-3.377	38.505	0.636
TELETAŞ	1.206	6.643	0.043	1.356	44.129	0.667
THY	0.517	1.913	-0.064	-1.35	3.66	0.143
TRAKYA CAM	0.829	6.135	-0.032	-1.351	37.636	0.631
TÜRK TUBORG	0.616	2.148	0.013	0.252	4.612	0.173
ÜNYE ÇİMENTO	1.509	6.078	0.075	1.719	36.938	0.627
UŞAK ÇİMENTO	0.779	2.961	0.014	0.311	8.768	0.285
VESTEL	0.896	-1.468	-0.045	5.094	25.946	0.541
YASAŞ	1.072	5.03	0.022	0.587	25.305	0.535
YÜNSA	0.61	3.541	-0.033	-1.08	12.542	0.363

APPENDIX. 10