ISE REVIEW

Istanbul Stock Exchange

ISSN 1301-1642 Volume: 1 No: 4 October/November/December 1997

The Effects of Turkish Liberalization Measures on Stock Prices
Ayşe Yüce

An Analysis of the "Day of the Week Effect" on the Istanbul Stock Exchange
Kıvılcım Metin, Gülnur Muradoğlu, Bilgehan Yazıcı

Causal Relations among ISE, Inflation, Interest Rates and Real Activity in Turkey: A VAR Analysis
Nihal Kargı, Harun Terzi

Forecasting of Corporate Performances on the Basis of Financial Indicators
Levent Alkan

The ISE Review

Quarterly Economics and Finance Review

On Behalf of the Istanbul Stock Exchange

Publisher

Acting Chairman & CEO

Yavuz Canevi

Managing Editor

Dr. Meral VARIŞ TEZCANLI

Editorial Board

Arıl SEREN
Abdullah AKYÜZ
Dr. Esin Y. AKBULUT
Dr. Meral VARIŞ TEZCANLI
Kudret VURGUN
Hikmet TURLİN

Contributors

Adalet POLAT
Demet BOZKURT
Erhan EKER
Murat BOLAT
Gürsel KONA
Murad KAYACAN
Ali KÜÇÜKÇOLAK
Çağatay ERGENEKON
Recep BİLDİK
Sedat UĞUR
Cengiz DÜNDAR
Gökhan UGAN
Dr. Oral ERDOĞAN
Efser UYTUN
Levent ÖZER
Altuğ AKSOY
Yeşim KARTALLI
Gökhan ÖNDEROĞLU

Editorial Production

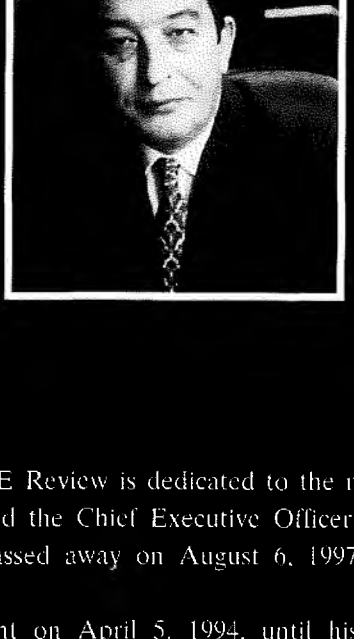
Mi Medya İlişkileri

Printing

Stil Matbaacılık A.Ş.

This review is published quarterly. Due to its legal status, the Istanbul Stock Exchange is exempt from corporate tax.

Address: IMKB (ISE), Research Department, 80860 Istinye, Istanbul/TURKEY
Phone: (90 212) 298 21 00 Fax: (90 212) 298 25 00-03-09
Internet web site: http://www.ise.org
e-mail: imkb-f@ planet.com.tr



In Memoriam

This edition of The ISE Review is dedicated to the memory of Mr. Tuncay ARTUN, Chairman and the Chief Executive Officer of the Istanbul Stock Exchange, who has passed away on August 6, 1997, due to a pancreatic inflammation.

Since his assignment on April 5, 1994, until his death, Mr. ARTUN introduced a set of reforms and innovations that substantially transformed the ISE, reinforcing its stature domestically and enhancing its recognition abroad.

It was a loss of grand scale not only for the ISE but the entire Turkish financial community which has acquired a fresh perspective and inspiration from his unyielding strides and far-reaching ideals an vision.

Dr. Meral VARIŞ TEZCANLI
Managing Editor

The ISE Review

Volume 1 No 4 October/November/December 1997

CONTENTS

Articles

The ISE Review Volume: 1 No: 4 October-December 1997
ISSN 1301-1650 © İMKB 1997

The Effects of Turkish Liberalization Measures on Stock Prices

Ayşe YÜCE*

Abstract

This paper examines the the effects of Decree No. 32 issued on August 11, 1989, on the stock price patterns of an emerging stock market: the Istanbul Stock Exchange. After this date, the stock market removed restrictions on foreign investors and made it possible to repatriate gains generated on the securities market. It is shown that the mean of stock price changes has stayed same, but the variances displayed significant behavior with this government decision. The variances of the majority of the stock prices (36 out of 56) increased after August 11, 1989. In both periods the price change distributions are abnormal and highly leptokurtic.

I. Introduction

Over the last two decades, the flow of capital across national borders has become much less restricted. Investors have begun including assets of foreign markets into their portfolios in an effort to further reduce risk and diversify effectively. At the same time, developing countries that borrowed heavily from the commercial banks, during the 1970s, have realized that the external capital markets are not the only, nor necessarily, the best source of funds for development. The claims of international creditors during times of recession create financial burdens on developing countries. In an effort to obtain capital from different sources, some developing countries have established their own stock markets while others that already had

* Faculty of Business Administration Bilkent University 06533 Bilkent, Ankara, Turkey. Phone 90-312-2664000/1436 Fax 90-312-2664958 E-Mail yuce@bilkent.edu.tr

stock markets have decreased restrictions on foreign investment.

As the market for capital becomes more global and less local, the importance of stock exchanges outside the developed countries increases. Investors perceive that growth opportunities are greater in those nations that are not yet economically mature.

Until recently, very little was known about the statistical properties and diversification possibilities prevailing at emerging markets. Traditionally, investors avoided these markets because of the political risks involved and also because of the restrictions imposed against foreign investors. However, in recent years, the political risk of emerging markets has subsided substantially. Additionally, there exists a trend within developing countries to ease the restrictions that discourage foreign investment.

Beginning in the mid-1970s, both developed and developing countries removed foreign investment barriers in order to encourage foreign investors to invest in their countries. Errunza and Losq (1989) predict that the removal of restrictions leads to an increase in the aggregate market value of the affected securities and improve the welfare of the country. Bonser-Neal, Brauer, Neal and Wheatley (1990) find that removal of restrictions cause markets to be more integrated and less segmented.

The Istanbul Stock Exchange removed all the barriers to foreign investment with Decree No 32 (August 11, 1989), giving (1) foreign investors the right to invest in Turkish stocks and mutual funds without getting the permission of the government and (2) domestic investors the right to invest in foreign markets.

This paper examines and compares the statistical characteristics of Turkish stocks before and after August 11, 1989 to ascertain whether the opening of the exchange to foreign investors caused statistically significant changes in the price change distributions.

The rest of the paper is organized as follows: In section II, the previous studies are reviewed. In section III, the data and the test statistics utilized in testing the hypotheses are introduced. In section IV, the results of the pre- and post-August 11, 1989 data are presented and compared.

II. Previous Studies

Black (1974) develops a capital market equilibrium where there are explicit barriers to international investment in the form of a tax on holdings of assets in one country by residents of another country. Black's model predicts that the optimal risky portfolio contains long positions in domestic securities and short positions in foreign securities, and that the optimal portfolio for a taxable investor is not a mixture of national market portfolios.

Stulz (1981) proposes a model in which barriers to international investments are also in the form of proportionate tax to conclude that investors should be very careful in forming a portfolio of foreign stocks. Buying the market portfolio in a foreign country might be equivalent to buying a highly inefficient portfolio for domestic investors.

In their latest study, Errunza, Losq and Padmanabhan (1992) test two polar cases: 1. complete integration, 2. complete segmentation in addition to mild segmentation for six emerging markets with maximum likelihood estimation procedure. The complete integration hypothesis is rejected in all countries. They conclude that while Brazil, Chile, Greece, Korea and Mexico are mildly segmented, Argentina and Zimbabwe appear to lie on a continuum from mild segmentation to complete segmentation. For India, all three models are rejected.

Eun and Janakiramanan (1986) list the restrictions imposed on foreign equity holdings in the following countries: Australia, Burma, Canada, Finland, France, India, Indonesia, Japan, South Korea, Malaysia, Mexico, the Netherlands, Norway, Spain, Sweden and Switzerland. The majority of these restrictions are of the form that the fraction of equity that can be held by foreigners is uniform and restricted across all firms.

Hietala (1989) studies asset pricing in a partially segmented market (Finland). Until 1986, the Finnish law restricted the foreign ownership in any company to a maximum of 20% of the shares and prohibited domestic investors from investing in foreign securities. The unrestricted and restricted stocks of the same company have different prices. Hietala shows that most unrestricted stocks are sold at a premium.

Bonser-Neal, Brauer, Neal and Wheatley (1990) examine the effect of an announcement of changes in investment restrictions on closed-end country funds which trade at large premiums relative to their net asset values. The authors find that an announcement of a liberalization is associated with a 6.8% decrease in the price-net asset value ratio during the three weeks surrounding the announcement, and this decline is significant at the 1% level. Their results indicate that government-imposed barriers are effective in segmenting international markets.

Booth, Chowdhury and Martikainen (1993) explore the dynamic properties of the price differential paid for Finnish unrestricted shares during the 1984-1989 period. The authors first compare the distributional characteristics of the unrestricted and restricted series. The mean unrestricted return is not significantly different from the mean restricted return. However, unrestricted stock returns are more volatile than the restricted ones. The two return series are co-integrated while the restricted returns lead Granger to cause the unrestricted returns.

The liberalization process in the Turkish economy started with the announcement of the January 24, 1980 decree and continued with additional measures during the 1980s. The revitalization of the capital markets and the opening of the Istanbul Stock Exchange were parts of these measures. Based on the previous studies, it is hypothesized that this event caused a structural shift in stock price changes. We hypothesize that means of the stocks will not be different in the two periods but variances will differ during the terms. Booth, Chowdhury and Martikainen (1993) find that the mean return on the restricted Finnish Stock Index is not significantly different from that of the unrestricted one. However, unrestricted share prices are significantly more volatile than that of the restricted shares. As is documented by the previous authors, policy changes by the government cause structural transformation and, particularly contribute to volatility. In the next stage, the statistical properties of the 56 stocks that were listed on the Exchange before August 11, 1989, are examined and the distribution of the series before and after this date are compared to determine whether the opening of the stock exchange to foreign investors influenced the stocks significantly.

III. Data and Test Statistics

The Istanbul Stock Exchange began its operations on January 3, 1986. Although the Istanbul Stock Exchange was established on January 1, 1986, data on individual stocks are available only for the period after 1988. The data used in the paper contains the price changes of the stocks that were listed on the Istanbul Stock Exchange before August 1989 and continued to be traded until July 31, 1992. Those stocks that were delisted before July 31, 1992 were eliminated. Our data consists of 56 stocks listed on the Istanbul Stock Exchange.

The price changes are computed as the first differences of the closing prices.

$$D_t = \ln P_{t+1} - \ln P_t \qquad (1)$$

where P_t = price of the security at the end of day t.

The decision of opening the stock exchange to foreign investors led to two different types of actions that affected the stock prices: 1- Foreign investors started investing heavily in the Istanbul Stock Exchange. 2- Domestic investors started investing in other stock exchanges. Both of these actions are expected to increase the efficiency of the companies in order to satisfy foreign investors and domestic investors who can invest in other markets if they are not satisfied with the companies. Foreign investors' entry and exit decisions will increase volatility.

It is hypothesized that the means of stocks will not change as a result of this event. However, this event will increase volatility. Theoretical literature show that government actions regarding liberalization affect stock returns significantly. However, all the cited countries are developed and politically stable. This paper examines effects of liberalization movements in an emerging stock market.

Our first null hypothesis is that the means of stock returns are not different from each other after liberalization of stock markets in politically unstable countries. The second hypothesis states that the variances of the stock price changes will be significantly different after liberalization.

We can write our first null hypothesis as follows:

$$H_{10}: m_a = m_b \quad (2)$$

The means of stock returns before and after the liberalization of the stock market are not different from each other. Our second hypothesis is that actions of foreign investors will cause a statistical change in volatility. We test the null hypotheses of equal variances in both periods. If we reject the null hypothesis, we may conclude that the liberalization program has significantly changed the stock variances and caused a structural change in price distributions.

$$H_{20}: s^2_a = s^2_b \quad (3)$$

First, we describe the series by using various statistics. The location of each series is reported with a mean and a median value. The dispersion of the series is reported with standard deviation, and an interquartile range. Finally, skewness and kurtosis of the series are reported.

Table I: Summary of Descriptive Statistics Daily Data (Before August 11, 1989)

	Mean	T H_0:μ= 0	Std. Dev.	Skew	Std. Error	Kurt.	Std. Err. Kurt.	Range
Mean	-0.0024	-0.5480	0.0572	-3.9334	0.1579	46.7328	0.3165	0.6575
Negative obs.	47	-	-	51	-	0	-	-
Securities with values greater than 50.00	-	-	-	-	-	-	21	-
Securities with values less than -10.00	-	-	-	2	-	-	-	-
Significant obs for mean test	-	1	-	-	-	-	-	-

Table II: Summary of Descriptive Statistics Daily Data (After August 11, 1989)

	Mean	T $H_0:\mu = 0$	Std. Dev.	Skew	Std. Error	Kurt.	Std. Err. Kurt.	Range
Mean	0.0001	0.0744	0.0638	-4.5482	0.0926	69.4220	0.1847	0.9966
Negative obs.	27	-	-	55	-	1	-	-
Securities with values greater than 50.00	-	-	-	-	-	24	-	-
Securities with values less than -10.00	-	-	-	4	-	-	-	-
Significant obs for mean test	-	0	-	-	-	-	-	-

Table I and Table II present the descriptive statistics of the price changes before and after August 11, 1989. Forty-seven stocks have negative means before August 11, 1989. This number decreases to 27 stocks after that date. After August 11, 1989, 29 stocks have positive means. Prior to August 11, 1989, 51 stocks exhibit negative skewness. After August 11, 1989, 55 stocks show negative skewness. Almost all stocks are extremely leptokurtic both before and after that date. All stocks have zero median price changes in both periods. The data does not indicate any trend in various statistics when we compare them.

The tables also report the t statistics for the null hypothesis of population means are equal to zero. Before August 11, 1989, one stock has a mean that is statistically different from zero. We fail to reject the hypothesis for all stocks after August 11, 1989.

Next, the equality of the population variances is tested with F statistic. Table III shows the results. The hypothesis is rejected for 38 stocks and the hypothesis of equal population variances is not rejected for 18 stocks.

To test the hypothesis of equality of population means; if the population variances are equal, the t statistics is used, and the approximate t statistics is used if they are not equal. Table III presents the results. In every case, the null hypothesis of equal population means is not rejected at the 5% significance level. The

Table III: Summary Table for Equality of Two Population Variances and Means

	F	T	W
Number of significant observations leading to rejection of equality of variances	38	-	-
Number of significant observations leading to rejection of equality of means	-	0	0

results of the Wald statistics also fail to reject the equality of means for all stocks.

The null hypothesis that the means of stock price changes are not different before and after the opening of the stock exchange to foreigners is not rejected. This is an expected result. However, the variances of majority of the stocks are significantly different between the two periods.

The hypothesis of population means of the distributions equal to zero is tested with usual t statistic. The averages of the t statistics and the standard errors of skewness and kurtosis are presented. The results indicate that the mean of one stock is significantly different from zero. All the other means are not significantly different from zero.

The null hypothesis of normality is tested by using Shapiro-Wilk and Kiefer Salmon test statistics. Table IV and Table V exhibit the values of the normality test statistics. Both the Shapiro-Wilk statistic and the Kiefer-Salmon statistic reject normality for all stocks in both periods. Normality tests indicate that all stocks are abnormal in both periods.

Spectral analysis is an alternative to studying auto-correlations. It

Table IV: Summary of Tests for Normality, White Noise Processes and Heteroskedasticity Data (Before August 11, 1989)

	W Shapiro Wilk	KS Kiefer Salmon	κ Fisher	B Bartlett	ARCH	B.P.G.	Harvey
Mean	0.7999	80.499	5.209	0.1016	-	-	-
Percentage of significant observations rejecting normality	100.00	100.00	-	-	-	-	-
Number of significant observations rejecting white noise	-	-	1	36	-	-	-
Number of daily observations that rejects homosked	-	-	-	-	9	9	15

Table V: Summary of Tests for Normality, White Noise Processes and Heteroskedasticity Data (After August 11, 1989)

	W Shapiro Wilk	KS Kiefer Salmon	κ Fisher	B Bartlett	ARCH	B.P.G.	Harvey
Mean	0.8099	352.049	5.6778	0.0590	-	-	-
Percentage of significant observations rejecting normality	100.00	100.00	-	-	-	-	-
Number of significant observations rejecting white noise	-	-	0	36	-	-	-
Number of daily observations that rejects homosked.	-	-	-	-	8	3	16

is particularly appropriate when cycles occur in the process, instead of random distribution. Based on spectral analysis and periodogram, we use Fisher's Kappa and Bartlett's Kolmogorov Smirnov statistics to test the strict white noise hypothesis.

The Fisher's Kappa statistic rejects the hypothesis for one stock before August 11, 1989, and fails to reject the hypothesis after August 11, 1989, for all stocks. The Bartlett's test, on the other hand, rejects the white noise hypothesis for 36 stocks in both periods.

The existence of an ARCH effect in the data is investigated. The Ljung Box statistics need to be modified if ARCH effects exist in the data.

The null hypothesis of no hetero-skedasticity in the data is ascertained with three tests: 1- ARCH test, 2- Breusch, Pagan and Godfrey test (B.P.G) and, 3- Harvey's test. Tables IV-V represent the results of ARCH and other hetero-skedasticity tests for the data. The null hypothesis is the following; Ho: the time series is homo-skedastic.

ARCH statistic rejects homo-skedasticity for nine stocks before and eight stocks after August 11, 1989. The BPG test rejects the hypothesis for nine and three stocks and the Harvey test rejects the hypothesis for 15 and 16 stocks in the two periods, respectively. The next hypothesis which has been subjected to a test concerned the hypothesis of strict white noise. The question of whether there is non-linear dependence, in the series or dependence in squared and absolute return series, is investigated. First, the Box-Pierce "portmanteau" test is used to test whether the return series follow white noise and to check the presence of non-linear dependence in the squared return series and in the absolute value series.

Next, the degrees of auto-correlation in the mean and the variance are examined. Since the hypothesis that the population means are equal to zero is not rejected, squared returns can be used for variance in auto-correlation tests. If a time series is strict white noise, then all of its moments are independent and uncorrelated. To verify the null hypothesis that the series is white noise, auto-correlation in the original data, squared data and the absolute value data are investigated. The Ljung-Box statistics on the original price changes D, the squared changes and the absolute changes of D are exploited.

Table VI: Summary Statistics for Tests of Linear and Nonlinear Dependence Daily Data (Before August 11, 1989)

	LB (6) D	LB (6) D^2	LB (6) |D|	Autocorrelation for lag-1		
				D	D^2	|D|
Mean	8,22	8,38	25,09	0,068	0,055	0,140
Number of significant obs. leading to accept dependence	9	10	33	23	10	41

Table VII: Summary Statistics for Tests of Linear and Nonlinear Dependence Daily Data (After August 11, 1989)

	LB (6) D	LB (6) D^2	LB (6) |D|	Autocorrelation for lag-1		
				D	D^2	|D|
Mean	8,93	6.59	36.21	0,059	0,025	0,120
Number of significant obs. leading to accept dependence	8	7	38	22	7	44

is particularly appropriate when cycles occur in the process, instead of random distribution. Based on spectral analysis and periodogram, we use Fisher's Kappa and Bartlett's Kolmogorov Smirnov statistics to test the strict white noise hypothesis.

The Fisher's Kappa statistic rejects the hypothesis for one stock before August 11, 1989, and fails to reject the hypothesis after August 11, 1989, for all stocks. The Bartlett's test, on the other hand, rejects the white noise hypothesis for 36 stocks in both periods.

The existence of an ARCH effect in the data is investigated. The Ljung Box statistics need to be modified if ARCH effects exist in the data.

The null hypothesis of no hetero-skedasticity in the data is ascertained with three tests: 1- ARCH test, 2- Breusch, Pagan and Godfrey test (B.P.G) and, 3- Harvey's test. Tables IV-V represent the results of ARCH and other hetero-skedasticity tests for the data. The

IV. Results and Discussion

The tests indicate that there is no statistical difference between the population means for all stocks. The price changes are not normally distributed in both periods. For the majority of the stocks, the hypothesis of no linear dependence and no non-linear dependence in squared series are not rejected. On the other hand, majority of the stocks exhibit dependencies in the absolute price changes in both periods.

The previous findings indicate that opening of the stock market causes a structural change (not in the mean, but in the variance). In summary, the hypothesis that liberalization in the stock market did not cause a change in means of stock prices is not rejected. However, this process causes a structural change in the variance of the stock prices. The evidence indicates that the Decree No. 32 did not affect the mean of the series. However, the variances of the majority of the stocks changed significantly after the opening of the market. It is concluded that the opening of the market to international investors caused a structural change in price distributions.

V-Conclusion

In this paper, the price changes of 56 stocks between January 4, 1988 and July 31, 1992 are examined. The data are investigated in two periods: 1. Before August 11, 1989, at which the stock exchange was opened to foreign investors. 2. Between August 11, 1989 and July 31, 1992. The basic statistics are provided and the normality of the data is checked. For all of the two periods, normality and strict white noise processes are rejected. Turkish stocks are abnormal and heavily leptokurtic, similar to those in the U.S. and in other markets. Both linear dependence and dependence in the squared series are rejected. But dependence in the absolute value series is not rejected.

Then, the stock distributions before and after August 11, 1989 are compared and the hypothesis that the means of the first two periods are equal is not rejected. However, the hypothesis that variances of the two periods are equal is rejected. It is concluded that the August 11, 1989 Decree caused significant variance changes.

References

Black, Fischer, "International Capital Market Equilibrium with Investment Barriers," *Journal of Financial Economics* 1, pp. 337-352, 1974.

Bonser-Neal, Catherine, Gregory Brauer, Robert Neal, and Simon Wheatley, "International Investment Restrictions and Closed-End Country Fund Prices," *Journal of Finance* 45, pp. 523-547, 1990.

Booth, G. Geoffrey, Mustafa Chowdhury, and Teppo Martikainen, "The Effect of Ownership Restrictions on Stock Pricedynamics," *LSU Working paper*, 1993.

Errunza, Vihang and Etienne Losq, "The Behavior of Stock Prices on LDC Markets," *Journal of Banking and Finance* 9, pp. 561-575, 1985.

Errunza, Vihang and Etienne Losq, "International Asset Pricing Under Mild Segmentation: Theory and Test," *Journal of Finance* 40, pp. 105-124, 1985.

Errunza, Vihang and Etienne Losq, "Capital Flow Controls, International Asset Pricing, and Investors' Welfare: A Multi-Country Framework," *Journal of Finance* 44, pp. 1025-1036, 1989.

Errunza, Vihang, Etienne Losq and P. Padmanabham, "The Behavior of Stock Prices on LDC Markets," *Journal of Banking and Finance* 16, pp. 949-972, 1992.

Eun, Cheol S. and S. Janakiramanan, "A Model of International Asset Pricing with a Constraint on the Foreign Equity Ownership," *Journal of Finance* 41, pp. 897-914, 1986.

Eun, Cheol and Shangai Shim, "International Transmission of Stock Market Movements," *Journal of Financial and Qualitative Analysis* 24, pp. 241-256, 1989.

Hietala, Pekka T., "Asset Pricing in Partially Segmented Markets: Evidence from the Finnish Market," *Journal of Finance* 44, pp. 697-718, 1989.

Solnik, Bruno, "Note on the Validity of the Random Walk for European Stock Prices," *Journal of Finance* 28, pp. 353-348, 1973.

Solnik, Bruno, "The Advantages of Domestic and International Diversification," in Elton and Gruber's International Capital Markets, Amsterdam: North Holland, 1975.

Stulz, Rene, "On the Effects of Barriers to International Investment," *Journal of Finance* 36, pp. 923-933, 1981.

The ISE Review Volume: 1 No: 4 October-December 1997
ISSN 1301-1650 © İMKB 1997

An Analysis of the "Day of the Week Effect" on the Istanbul Stock Exchange

Kıvılcım METİN*,
Gülnur MURADOĞLU**,
Bilgehan YAZICI***

Abstract

This paper examined the weak form of efficiency by using the random walk test and the day of the week effect at the Istanbul Stock Exchange (ISE) during the period of January 4, 1988 - December 27, 1996. The random walk model is rejected for all periods under consideration and test results provide an evidence in favor of the rejection of a weak form of efficiency. Testing for the day of the week effect demonstrated that both Friday and Monday effects are observed and, thus, it is concluded that the market is inefficient.

'The primary role of the capital market is allocation of ownership of the economy's capital stock. In general terms, the ideal is a market in which prices provide accurate signals for resource allocation: that is, a market in which firms can make production investment decisions, and investors can choose among the securities that represent ownership of the firms' activities under the assumption that security prices, at any time 'fully reflect' all available information. A market in which prices always 'fully reflect' the available information is called 'efficient.' Fama, 1970.

* Associate Professor of Economics, Bilkent University, Department of Economics, 06533, Bilkent, Ankara, Turkey.
** Associate Professor of Finance, Bilkent University, Faculty of Management, 06533, Bilkent, Ankara, Turkey.
*** ABN Amro Hoare Govett, İstanbul. Tel: 0212 251 21 51, Fax: 0212 249 81 52.

I. Introduction

The process generating stock returns has been one of the popular research topics in finance. Eugene F. Fama, in his seminal article in 1970, reviewed the theory and empirical work on efficient capital markets and considered the adjustment of security prices to three relevant information subjects: first, weak form tests, in which the information set is just historical prices; then, semi-strong form tests, in which the concern is whether the prices efficiently adjust to other information that is obviously publicly available (e.g., announcements of annual earnings, stock dividends, etc.); and finally, strong form tests concerned with whether given investors or groups have monopolistic access to any information relevant for price formation.

Any predictable pattern in asset returns may be exploited to earn abnormal profits and, therefore, can be considered as an indication of inefficiency in the asset markets. Predictable patterns in stock returns may depend on several sources. Seasonal variation constitutes an important source of predictable patterns and many researchers have studied seasonal anomalies in developed financial markets.

The day of the week effect is one of the frequently analyzed anomalies in finance. Empirical findings show that common stock returns, on average, are abnormally low on Mondays and abnormally high on Fridays. For example, Fama (1965) reports that the variance of returns on Monday is 20% greater than the variances of returns on the other days for the US stock market. Jaffe and Westerfield (1985) find similar results in Japanese, Canadian and Australian stock markets. Keim and Stambaugh (1984) observed consistently negative Monday returns for the S&P Composite as early as 1928, for exchange-traded stocks of all sizes and actively traded over-the-counter stocks. French (1980) examined two alternative models of the process generating stock returns, calendar time hypothesis and trading time hypothesis, and found significant negative-returns for Mondays and positive returns for the other four days of the week.

However, it seems more difficult to find studies with special reference to daily seasonality in the emerging stock markets. Some

studies concerning daily anomalies in the stock markets are Erbil (1993), Aydoğan (1994) and Balaban (1995). Erbil (1993) employed the data using percentage returns for 1988-1991 period and stated that highest returns are on Fridays where Monday has the highest standard deviation. Balaban (1995) used log returns for the period of 1988-1994 and found negative returns for Tuesdays and highest returns for Fridays and stated that these effects change in direction and magnitude through time.

The purpose of this paper is to test the weak form efficiency by testing for the possible existence of the day of the week effect in the Istanbul Stock Exchange (ISE) during the period January 4, 1988 - December 27, 1996. This paper also contributes to the knowledge on day of the week effect at the ISE by considering the following two issues. First, tests are conducted by using dollar returns at the ISE which is appealing for foreign investors as well as domestic investors who want protection against inflation. In addition to, a comprehensive analysis of the whole research period, the data is divided into subperiods, based on two important criteria; the economic crisis in 1994 and the changes in the settlement day. This enables us to test whether the day of the week effect is due to the settlement procedure and whether that effect is still observed at times of a crisis when risk-return relationship changes.

a) Economic crisis period is defined 22.12.1993 through 29.7.1994 as described in Muradoğlu, Berüment and Metin (1997). Then the 4.1.1988 - 22.12.1993 period is defined as the before-crisis period and the 29.7.1994 - 27.12.1996 period is specified as the after-crisis period.

b) The data set is divided into two sub-periods considering the differences in settlement days. Before 14.7.1994, settlement was made within one day (T+1), but after 14.7.1994, settlement was extended to two business days (T+2).

The paper is organized as follows: the first section outlines data set and its description. The second section presents the empirical results of the efficiency tests, followed by the final section that presents a general evaluation of the empirical results given in the previous section.

The Data

We used the daily observations of the Istanbul Stock Exchange Composite Index (ISECI) to examine the daily anomalies. ISECI is an equally-weighted index using closing prices. Daily stock indices are obtained from the Central Bank of Republic of Turkey's data bank. The sample period is between January 4, 1988 and December 27, 1996. The closing index values are then used to calculate the daily returns.

$$R_t = 100 [(I_t - I_{t-1}) / I_{t-1}] \quad (1)$$

where I_t and R_t are ISECI closing price and the return of the ISECI

Table 1: Descriptive statistics

TL-Based	Mean	St. Dev.	Skewness	Kurtosis	Jarque-Bera
B. Crisis	0.2676	29.398	0.1761	43.595	122.2985**
Crisis	0.1773	44.304	-0.0392	23.423	27.597
A.Crisis	0.2782	23.112	-0.1744	46.412	71.6784**
T+1 Sett.	0.2628	311.046	0.1148	40.645	80.5540**
T+2 Sett.	0.2657	23.072	-0.1666	46.229	70.8000**
1988-1996	0.2628	29.114	0.0790	43.397	170.4660**
USD-Based					
B.Crisis	0.0920	30.289	0.2111	45.993	169.6521**
Crisis	-0.2695	56.741	-0.0495	31.593	0.221518
A.Crisis	0.0791	24.475	-0.3043	48.097	92.8123**
T+1 Sett.	0.0624	33.651	0.0614	51.342	310.3832**
T+2 Sett.	0.0657	24.427	-0.2953	47.918	91.8091**
1988-1996	0.0626	31.384	0.0169	54.035	541.2204**

Notes: (1) For skewness and kurtosis coefficients, test results, together with the p-values, are obtained from the standard normal distribution.

(2) To test for normality of the series, the Jarque-Bera (1980) test statistic is used. The statistic is given as

$J\text{-}B=((T - k) / 6)\{(S^2 + 0.25(K-3)^2)$

where T is the number of observations, k is zero for an ordinary series and the number of regressors when examining residuals to an equation, S is skewness and K is kurtosis. Under the null hypothesis of normality, the Jarque-Bera statistic is distributed with 2 degrees of freedom and p-values are obtained from the Chi-squared distribution.

**Statistically significant at 1%.

on day t, respectively. Returns for each day of the week are calculated for each sub-periods of our interest, as well as for the whole period. There are a total of 2248 return observations. Since emerging markets have gained importance for the foreign financiers who are also ready to invest at the ISE, returns are reported in terms of TL and US-dollar based for the rest of the study. Table 1 provides descriptive statistics for the stock returns. The analysis is conducted for three sub-periods, before and after the crisis and the crisis period, and also for the T+1 and T+2 settlement periods and finally, the whole period. Each period is also defined in terms of TL-based and also US dollar-based returns. Firstly, skewness coefficients show that, none of the returns are skewed. Secondly, as expected, kurtosis coefficients indicate that stock returns are leptocurtic. Finally Jarque-Bera normality test results indicate that normality is rejected for all periods except for the crisis period for TL- and the US dollar-based returns.

Empirical Results

1. Random Walk Tests:

The random walk model is a special case of the AR(1) process as:

$$R_t = \rho_0 + \rho_1 R_{t-1} + e_t$$

when $\rho_0 = 0$ and $\rho_1 = 1$. A simple random walk test investigates weak form efficiency by using equation (2);

$$R_t = \rho_1 R_{t-1} + e_t \qquad (2)$$

where ρ_1 can be considered to be the first order auto-regression coefficient and the current value of return will be equal to the last period's value plus a white noise term, et which is the random disturbances. It is normally distributed with mean zero and constant variance, ρ^2 and also $Cov(e_t, e_s) = 0$, $t \neq s$. If $\rho_1 = 1$, stock index returns follow a random walk, while if $\rho_1 \neq 1$ then, stock index returns can be considered as a first order the auto-regressive model.

Table 2 presents the random walk tests using equation (2). The

Table 2: Random Walk Tests

	$R_t=\rho_1 R_{t-1}+e_t$	$H_0: \rho_1=1$ $H_1: \rho_1\neq 1$
TL-Based	ρ_1	t-value
Before-crisis period	0.2665	-30.8193**
Crisis period	0.4232	-7.7841**
After crisis	0.0499	-23.5173**
T+1 sett. period	0.2671	-30.7941**
T+2 sett. period	0.0484	-23.7307**
Whole period	0.229	-37.6098**
USD-Based		
Before-crisis period	0.2073	-31.3320**
Crisis period	0.2843	-9.1405**
After crisis	0.0626	-23.2030**
T+1 sett. period	0.2278	-32.0415**
T+2 sett. period	0.0619	-23.3940**
Whole period	0.2000	-38.8350**

**rejects the random walk hypothesis at 1%.

first order auto-regression coefficient, ρ_1 is found to be statistically significantly different from unity for TL- and US dollar-based returns for the periods of the interests. Therefore, we reject the null hypothesis of the random walk.

We found that all estimated coefficients are positive with different size. The highest coefficient is found to be 0.4232 for the crisis period for the TL-based returns and current returns are well explained by the previous day returns for each period. The results also support the findings of Balaban (1995). The random walk test results also provide an evidence in favor of the rejection of a weak form of efficiency in the Istanbul Stock Exchange.

2. Day of the Week Effect

Equation (3) is used to test whether there is any statistically significant difference among index returns on different days of the week for the related sample periods.

$$G_t=B_1D_{1t}+B_2D_{2t}+B_3D_{3t}+B_4D_{4t}+B_5D_{5t}+u_t \quad (3)$$

where the OLS coefficients from B_1 to B_5 represent the mean returns for Monday to Friday, respectively, and, relevant dummy variables can be defined as;

D_1 = 1 if it is a Monday, 0 otherwise.
D_2 = 1 if it is a Tuesday, 0 otherwise.
D_3 = 1 if it is a Wednesday, 0 otherwise.
D_4 = 1 if it is a Thursday, 0 otherwise.
D_5 = 1 if it is a Friday, 0 otherwise.

The stochastic disturbance term is indicated by u_t. The hypothesis to be tested is ;

$$B_1=B_2=B_3=B_4=B_5$$

The regression results based on equation (3) are given in Table 3. For the whole period, positive and statistically significant coefficients are reported for Wednesday, Thursday and Friday for the TL-based returns. This means that higher returns on these days are obtained in comparison with the other days of the week. The lowest coefficient is observed for Tuesday. It should be noted that a significant negative coefficient for Tuesday and the highest positive significant coefficient for Friday appeared in the whole sample set for the US dollar-based returns.

The effects of economic crisis on the day of the week effect is also examined regarding the usual period divisions. In the before- and after-crisis period, significant coefficients for Monday, Wednesday and Friday are observed while, in crisis period no significant coefficient is obtained for the TL-based returns. After-crisis period, as it is expected, negative coefficient is realized for Monday, contrary to the before crisis period for the TL-based returns. An interesting observation is that an entirely different return behavior appeared in the US dollar-based estimations. In the before-crisis period, we observed only positive and significant Friday effect. In the after-crisis period, we find significant Monday, Thursday and

Friday effect. As expected, after-crisis period, Monday has negative effect on the stock returns whereas, in the crisis period no significant coefficient for the particular day is obtained for the US dollar-based returns. This means that one cannot observe any day of the week effect in crisis period and, therefore the stock market is efficient. However, there is almost no empirical evidence in the literature that supports the idea that the crisis might strengthen the efficiency of the stock markets.

Levi and Lakonishok (1982) argued that stock returns should depend on the day of the week, and base their argument on the delay between trading and settlements in stocks and in clearing checks. Lakonishok and Levi (1982) also stated that ... the explanation that we offer for different measured daily returns does not contradict the efficient market hypothesis, as correctly adjusted expected returns should not differ according to the day of the week."

In the Istanbul Stock Exchange, the settlement period was one day until 14.7.1994, but after that day the settlement period was increased to two business days which resulted in a clearing delay. The clearing delay means that, in weeks without a holiday, stocks purchased on Thursday and Friday give the buyer four calendar days before losing funds for stock purchases.

We, then, consider the developments in the settlement periods at ISE and their possible effects on the estimated coefficients of the days of the week . We estimated equation 3 for the data set which is divided for two periods with respect to the T+1 and T+2 settlement periods. For TL-based returns, we find positive and significant Friday effect for the T+1 period. When the system was converted to the T+2 settlement period calculations, negative but insignificant Monday effect is emerged. Before the settlement period was extended to the T+2 period, Friday has the highest significant coefficient. The T+1 settlement period gave three days opportunity to buyer to keep funds at hand before investing them. But, after settlement has been extended to two days, T+2 settlement (with Thursday and Friday) gives four days opportunity to buyer by keeping funds over the weekend. We detected almost the same kind of behavior in the US dollar based calculations for the respective

Table 3: Test for the day of the week effect

TL-Based	B1	B2	B3	B4	B5	F-value	p-value
B. Crisis	0.319**	0.0180	0.399**	0.1166	0.5070*	15.047	0.1983
Crisis	-0.2353	-0.4956	0.3759	0.8627	0.3443	0.4317	0.7855
A. Crisis	-0.1778	0.1824	0.4224*	0.4908*	0.4617*	18.151	0.1242
T+1 Sett	0.2893	-0.0296	0.3882*	0.1898	0.4915*	14.280	0.2222
T+2 Sett	-0.2219	0.1717	0.4246*	0.4795*	0.4706*	21.067	0.0785
1988-96	0.1483	0.0251	0.3982*	0.2689*	0.4827*	18.980	0.1081
USD-Based							
B,crisis	0.1264	-0.1854	0.1931	-0.0547	0.4027*	17.081	0.1456
Crisis	0.3295	-1.791**	-0.4997	0.9593	-0.2437	0.9835	0.4185
A.crisis	-0.611*	-0.0762	0.2007	0.4390*	0.4290*	40.059	0.0032
T+1 sett	0.1655	-0.334**	0.1168	0.0431	0.337**	17.938	0.1274
T+2 sett	-0.667*	-0.0862	0.1906	0.4239*	0.4318*	44.106	0.0016
1988-96	-0.0614	-0.266**	0.1391	0.1482	0.3622*	22.995	0.0345

*, ** denote statistical significant parameter values at the 5% and 1%, in two tailed tests respectively.

settlement periods, except statistically significant negative Monday effect appeared on the stock returns. These findings are consistent with those of Lakonishok and Levi (1982).

Conclusion

This paper examined the weak form of efficiency by using the random walk test and the day of the week effect at ISE. The random walk model is rejected for all periods under consideration and test results provide an evidence in favor of the rejection of the weak form of efficiency for the stock returns.

This paper provides some strong evidence in favor of significant Friday effect for the entire sample period, for the settlement periods, for before- and after-crisis periods, except for the crisis period as for both TL- and US dollar-based returns. In addition we observed some negative Monday effects for crisis, after-crisis and T+2 settlement periods however, they are insignificant . It is quite expected that, positive Monday effect might emerge for TL-based calculation. Since Turkish economy is suffering from severe inflation

for almost two decades, nominal returns increases continually while real returns fluctuates. In that case, it is not surprising that one might obtain positive coefficients for Mondays. For US dollar-based calculations, negative and significant Monday effect appeared clearly for after crisis, and T+2 settlement period. For the whole sample period, negative Monday effect appeared again but, with insignificant coefficient. US dollar-based calculations can be considered as real stock returns, and it is believed, real returns are well related to the estimation of the day of the week effect. Consequently, our findings will contribute to the existing literature on the day of the week effect regarding the emerging market characteristics of the ISE.

This paper provides some counter arguments to those results obtained by Erbil (1993) and Aydogan (1994) while confirming the most of the results of Balaban (1995). Aydogan (1994) reported that both parametric and non parametric tests showed that there were no statistically significant differences among daily returns on the ISECI. On the other hand, Balaban (1995) verify that day of the week effects are present in the stock return data and these effects change in direction and magnitude through time. Balaban also found negative returns on the Tuesdays for the whole period and, also, each year of the sample period. Our findings on Tuesday effects are mixed. We found negative but insignificant Tuesday coefficients for crisis and T+1 settlement periods. The contradiction between Balaban (1995) and this research may come from the different data periods under consideration. This paper employs a data set at least 100% larger than Erbil (1993) and 33% larger than that of Balaban (1995). However, the results are obtained from US dollar-based calculations are more stronger than the TL based results regarding the Tuesday effects. In fact, we find all coefficients for Tuesdays are negative. Negative and significant ones are the crisis, T+1 and the whole period.

The findings of this paper are also consistent with those of Lakonishok and Levi (1982) with regard to the settlement periods division. Before the settlement period was extended to two days, Friday had the highest significant coefficient. However, for the T+2 settlement period, we found that Thursday and Friday gave the

buyer enough adjustment time for gaining interest earnings from other financial instruments available in the financial media. Consequently, the argument that the measured daily returns should depend on the day of the week is supported by this research. Therefore, we concluded that market is inefficient using the test for the day of the week effect. To sum up, both the random walk test and the tests for the day of the week effect provide the similar results of inefficiency at ISE.

References

Agrawal, A. and Tandon, K. (1994) "Anomalies or Illusions? Evidence from Stock Markets in Eighteen Countries," *Journal of International Money and Finance*, Vol. 13, pp. 83-106.

Aydogan, K. (1994) "Hisse Senedi Fiyatlamasında Aykırılıklar (Anomalies on Stock Price Valuations)," *İşletme ve Finans*, Vol. 100, pp. 83-89

Balaban, E. (1995) "Day of the Week Effects: New Evidence from an Emerging Stock Market', *Applied Economics Letters*," Vol. 2, pp. 139-143.

Balaban, E. (1996) "Informational Efficiency of the Istanbul Securities Exchange and some rationale for public regulation," *Institute of European Finance.*

Demirer, R. and Karan, M. B. (1996), "An Investigation of the Week Effect on Stock Returns in Turkey: Existence of Monday Volatility," Unpublished Thesis, Bilkent University

Erbil, A.F. (1993), "Stock Market Seasonality in the ISE," Unpublished MBA Thesis, Bilkent University.

Fama, E. F. (1965) "The Behavior of Stock Market Prices," *Journal of Business*, Vol. 28, 34-105.

Fama, E. F. (1970) "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, vol. 25, pp. 383-417.

Fama, E. F. (1965) "Efficient Capital Markets: II," *Journal of Finance*, Vol. 46, pp.1575-1617.

French, R. K. (1980), "Stock Returns and the Weekend Effect," *Journal of Financial Economics*, vol. 8, pp. 55-69.

Jaffe, J. and Westerfield, R. (1985) "The Weekend Effect in Common Stock Returns: The International Evidence," *Journal of Finance*, Vol. 40, pp. 433-454.

Keim, D and Stambaugh, R. (1984), "A Further Investigation of the Weekend Effect in Stock Returns," *Journal of Finance*, Vol. 39, pp. 883-889.

Lakonishok, J. And Levi, M. (1982), "Weekend Effects on Stock Returns: A note," *Journal of Finance*, Vol. 37, pp. 883-889.

Muradoğlu, Berument and Metin, (1997), "An Empirical Investigation of Stock Returns and Determinant of Risk in an Emerging Market: Istanbul Stock Exchange', Paper presented at MEA Meeting in conjunction with ASSA, January 1997.

The ISE Review Volume: 1 No: 4 October-December 1997
ISSN 1301-1650 © İMKB 1997

Causal Relations Among the ISE, Inflation, Interest Rates and Real Activity in Turkey: A VAR Analysis

Nihal KARGI[1]
Harun TERZİ[2]

Abstract

Using a vector auto-regression (VAR) approach, this paper investigates the causal relations and the dynamic interactions between stock returns, inflation, interest rates and the real economic activity in Turkey. Major empirical findings can be summarized as follows: (1) in the VAR system, stock returns explain little variation in inflation, although interest rates explain a substantial fraction of the variation in inflation; (2) inflation explains little variation in real economic activity while it explains a substantial fraction of the variation in stock returns, and (3) stock returns do not appear to explain real economic activity. All these findings indicate that the stock market in Turkey fails to offer a perfect hedge against inflation.

1. Introduction

Several studies have been made to explain the direction of the relationship between inflation and stock returns and examine the commonly-held view that stock returns are a hedge against inflation. Although the findings obtained from these studies are different from each other, majority of them reach the conclusion that performances of stock markets decline in inflationary periods

[1] KTU-Economics Department, 61080 Trabzon. Tel:(0462) 325 3224/ 2067
Fax: (0462) 325 7281
[2] KTU-Economics Department, 61080 Trabzon. Tel:(0462) 325 3224/ 3311
Fax: (0462) 325 7281

(Bodie, 1976; Nelson, 1976; Fama and Schwert 1977; Geske and Roll, 1983; Ram and Spencer, 1983; Gultekin, 1983; Stulz, 1986; Kaul, 1987). Findings of most of these studies, aiming to explain the relationship between stock markets and inflation, are obtained by the regression of stock returns on inflation. However, such models are not structured to determine relations between the two variables in the long-run (Ely and Robinson, 1994). In addition, as Mehra (1978) and Sims (1980b) point out, relations obtained from the bi-variate models can change dramatically when other variables are added to the model.

According to generalized Fisher hypothesis, real rates and inflation move independently, because real and monetary sectors of the economy are independent from each other. However, Fisher argues that nominal rates and real rates in an economy have one-to-one relationship with inflation. Thus, stock returns and inflation should move in the same direction. As a result, since stock returns eliminate changes in inflation, inflation will not affect the investor's purchasing power. That is the stock market will undertake the role of being a hedge against inflation.

Fama (1981) hypothesizes that the negative correlation between stock returns and inflation is puzzling. He also points out that inflation is a proxy for real activity variables in the models set to ascertain the relationship between stock returns and inflation. In the light of proxy hypothesis, the negative association between inflation and stock returns results from two factors: (1) a positive relationship between stock returns and economic activity, and (2) a negative relationship between economic activity and inflation. Therefore, having a negative and significant coefficient, inflation in the equation of stock returns implies that those relationships actually occur. Fama explains the negative association between inflation and the real economic activity with the "money demand" theory. However, such relationships are not causal. Geske and Roll (1983) argue that stock returns cause changes in inflation because of a chain of macroeconomic events. A decline in economic activity will coerce the government to run a deficit and increase money supply to monetize the deficit. Geske and Roll point out that a negative relationship between the real

activity or stock returns and inflation arises due to the intervention of the central bank. Ram and Spencer (1983), however, find evidence of uni-directional causality running from inflation to stock returns. The findings of Geske and Roll (1983) and Ram and Spencer (1983) are based on a bi-variate causal test and may not be robust in a large system of variables.

The purpose of this paper is, therefore, to investigate the causal relationship and dynamic interactions among stock returns, interest rates, real economic activity and inflation by using a multivariate VAR approach.

2. VAR (Vector Auto-Regression) Analysis and Causality

The VAR models, contrary to structural models, treat all variables as endogenous and impose no restrictions based on *a priori* knowledge or theory. The VAR is a commonly used a technique, especially, when the true structural relations among variables are unknown.

In this technique, each variable is regressed on its own and other variables' lagged values. The lag length of the variables is determined so that no auto-correlation among error terms exists. That is, lag length is small enough not to create any problem but large enough also not to cause auto-correlation among error terms. Variables with lags take place in the right hand side of the equation and the model is estimated by OLS if the auto-correlation is absent (Charemze and Deadman, 1992).

The VAR is an important econometric technique from the point of view that it shows interactions between variables in the model as a system. In this section, the Granger-causality impulse response analysis and the variance decompositions, which provide a basis for the VAR analysis, will be discussed. For a more detailed and technical discussion, see Sims (1980a, 1980b), Literman and Weiss (1988) and Cooley and Roy (1985).

Granger causality, impulse response functions and variance decompositions, which are the tools of the VAR analysis, are used to determine the inter-relationships among the variables. If one of the variables in the model (y) does not increase the estimation power of the independent variable (z), in this case, one can say that

y does not allow Granger to cause z. To determine the Granger causality in a VAR model, the standard F-tests are used (Jeon and Fustenberg, 1990).

To determine the dynamic relations among variables, the moving average representation of the VAR model is used. The impulse response functions obtained from the moving average representation of the VAR show the responses of the variables against an unanticipated shock occuring in one of the variables in the model. Variance decompositions, obtained from the moving average representation of the VAR, illustrate the effects of a shock given to one variable on its own and other variables as a percentage. If the most of the changes in a variable result from the shock given to itself, one can conclude that the variable is exogenous. Variance decompositions also give information about the degree of the causality among variables (Abell). Since the order of the variables in variance decompositions is important, the alternative orders are also examined and, it has been found that the results are insensitive to alternative orders.

3. Macroeconomic Variables and Data Set

In this study, a four-variable VAR system is employed. The variables are the Istanbul Stock Exchange Index (ISE), the Consumer Price Index (CPI), the interest rate on the 1-year savings deposit (INT) and the Industrial Production Index (IPI). The lag length is found to be 8, by using the AIC and BIC tests. The main purpose of the study is to determine the relationship between stock returns and inflation. The ISE index, inflation and interest rates are included in the model. IPI is also added to the model as a measure of the real economic activity.

The sample period for this study is from 1986:1 to 1996:6. The ISE index is obtained from the ISE's monthly statistics. Interest rates and the industrial production index are obtained from the Quarterly Bulletins of the Central Bank of Turkey. The CPI is used as a measure of inflation and obtained from the SIS. All variables, except the interest rates, are in a logarithmic form. Seasonal movements are also considered in the model. To estimate the model defined, the RATS (Regression Analysis in Time Series 4.1) package program is utilized.

4. Empirical Evidences

A. Causality Relationships

F-tests obtained from the VAR model are an important tool in determining the Granger-causality among the variables. F statistics and the significance levels, based on H_0 hypothesis indicating estimated coefficients of the lagged variables in each equation, are equal to zero and are illustrated in Table 1. For example, the value of 0.011 appearing in column 3 and row 2 indicates that the hypothesis of 8 lagged coefficients of the CPI variable in the ISE equation are equal to zero (H_0: $\beta_1=\beta_2=....=\beta_8=0$) and is accepted only 0.01 times out of 100 and rejected as many as 99.9 times out of 100.

In Table 1, F-statistics show that the IPI is an exogenous variable and not affected by the other variables in the system. The ISE, one of the target variables, is influenced by inflation at the 5% significance level while not influenced by interest rates and the industrial production index. On the other hand, all variables, except the industrial production index, have influence on the CPI. Interest rates are affected by inflation at a %5 significance level.

Table 4.1: F- Test Results[3]

	ISE	CPI	IPI	INT
ISE	29.379	2.752	1.364	1.278
	(0.000)*	(0.011)*	(0.228)	(0.269)
CPI	1.845	499.826	0.882	1.849
	(0.083)**	(0.000)*	(0.536)	(0.082)**
IPI	0.507	0.920	1.795	1.579
	(0.847)	(0.506)	(0.093)**	(0.147)
INT	0.781	2.184	0.976	24.702
	(0.621)	(0.039)*	(0.462)	(0.000)*

[3] The first values are F-statistics, Values in the parentheses are P-values.
*: significant at 5%, **: significant at 10%.

The results of the F-tests can be summarized as follows:

1. A Granger-causality relationship exists between the ISE and inflation. This causality is bi-directional. That is, the inflation Granger influences the ISE index and, inversely, the ISE index Granger affects the inflation. Relations between the ISE and the inflation are significant at the 5% level. Both of these variables are also influenced by their lagged values at the 5% significance level.

2. Inflation, besides the ISE index, has a close relationship with the interest rates. Since interest rates are also influenced by inflation, this relationship, too, appears to be bi-directional.

3. An important relationship does not exist between the industrial production index and other variables. The IPI is influenced only by its own lagged values. The lack of a relationship between the ISE and IPI can be explained by the absence of an interaction between the real economic sector and the stock market in Turkey. The ISE, at present, is far from functioning as a barometer of the over-all economic activity which is one of the basic functions of the stock markets. Thus, it is possible to contend that the ISE is influenced by some external factors other than the real economic activities.

B. Dynamic Interactions

Sims (1980a) has proposed that, using impulse response functions in the analysis of the effects of a random shock given to one variable on the other variables, is more useful because the coefficients obtained from the VAR model do not provide appropriate information on the dynamic behavior of the model.

Fisher (1981), introducing the impulse response functions as a dynamic multiplier analysis, implies that impulse responses are important in determining the effects of a shock given to one variable on the others. Therefore, impulse response analyses have a great deal of importance for the decision-makers in determining the economic policy. Figure 1-12 illustrates the standard deviation shock given to each variable on the other variables for a 24-month period.

Variance decompositions are used to determine the direct and

indirect effects of shocks occurring in one variable as a percentage. Table 2 presents the results of variance decompositions. The majority of the variations in the ISE results from the variations of its own and partly variations of the CPI and the interest rates.

Table 4.2: A Summary on Results of Variance Decompositions

Relative Variations	Period (Months)	ISE	CPI	IPI	INT
ISE	1	99.996	0.004	0.000	0.000
	3	93.384	3.243	3.090	0.283
	6	73.450	17.329	6.476	2.745
	12	63.543	24.398	8.087	3.971
	24	56.257	22.646	8.166	12.932
CPI	1	0.000	100.000	0.000	0.000
	3	0.467	90.403	0.471	8.659
	6	0.889	64.129	0.745	34.238
	12	2.798	54.705	0.909	41.588
	24	6.516	53.132	3.632	36.720
IPI	1	0.931	1.451	97.618	0.000
	3	1.921	4.243	83.352	10.484
	6	6.335	4.664	71.311	17.690
	12	6.689	5.581	65.445	22.285
	24	6.933	5.716	63.379	23.970
INT	1	1.085	16.162	0.347	82.405
	3	3.896	14.852	0.961	80.290
	6	7.655	10.344	1.747	80.254
	12	8.090	11.078	5.320	75.510
	24	11.240	11.169	8.146	69.445

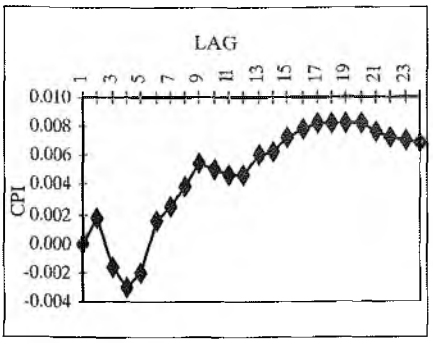


Figure 1: Response of CPI to One Standard Deviation Shock in the ISE

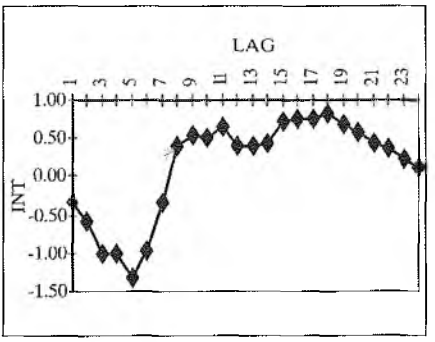


Figure 2: Response of INT to One Standard Deviation Shock in the ISE

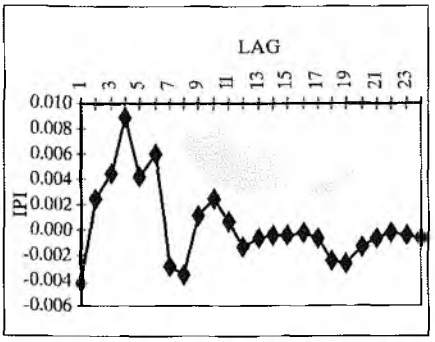


Figure 3: Response of IPI to One Standard Deviation Shock in the ISE

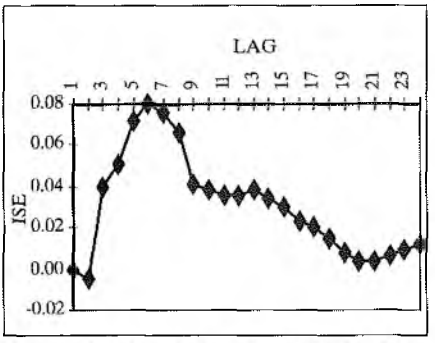


Figure 4: Response of ISE to One Standard Deviation Shock in the CPI

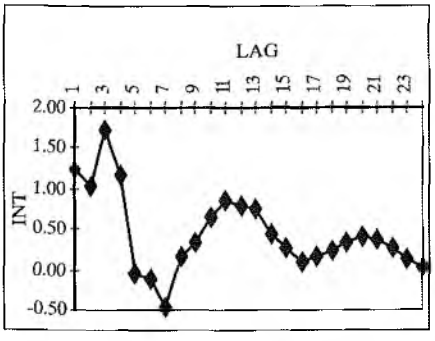


Figure 5: Response of INT to One Standard Deviation Shock in the CPI

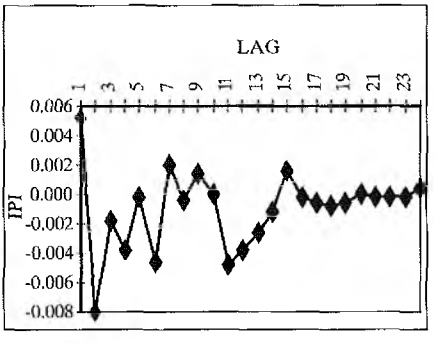


Figure 6: Response of IPI to One Standard Deviation Shock in the CPI

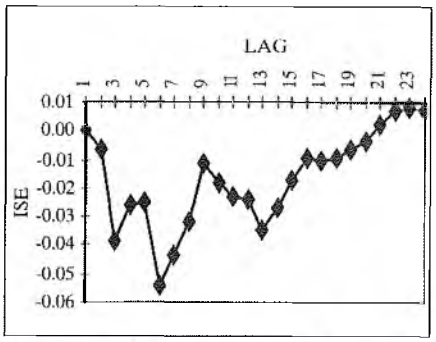


Figure 7: Response of ISE to One Standard Deviation Shock in the IPI

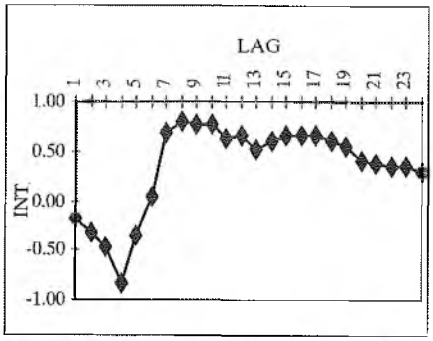


Figure 8: Response of INT to One Standard Deviation Shock in the IPI

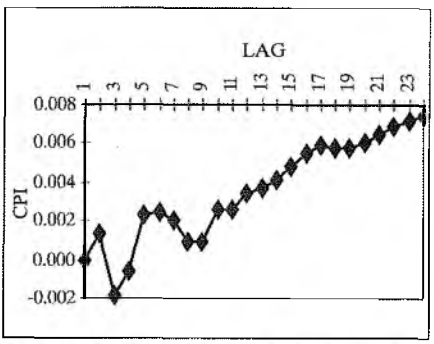


Figure 9: Response of CPI to One Standard Deviation Shock in the IPI

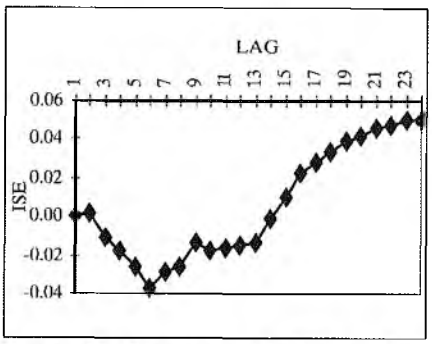


Figure 10: Response of ISE to One Standard Deviation Shock in the INT

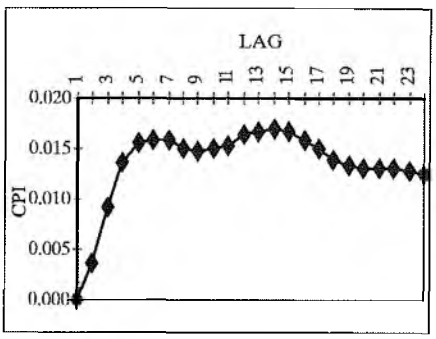


Figure 11: Response of CPI to One Standard Deviation Shock in the INT

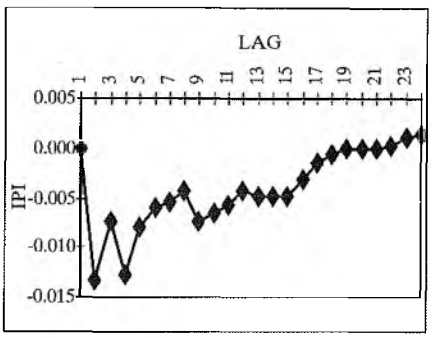


Figure 12: Response of IPI to One Standard Deviation Shock in the INT

The effects of unanticipated shocks on each variable or their dynamic interactions in the model can be expressed as follows:

B.1. ISE and Real Sector

In Table 2, it seems that 56.3% of the 24-month forecast error variance in the ISE is accounted for by its own innovation. The ISE seems to explain 6.9% of the variance in the IPI. Figure 3 shows that the response of the IPI to shocks on the ISE is positive, up to the first six months and, subsequently, the effect is quite negligible. This observation indicates that the ISE does not rationally signal changes in the real economic activity.

B.2. ISE and Inflation

Table 2 indicates that a small fraction of the inflation is explained by the ISE. In the presence of interest rates (INT) in the VAR system, only 6.6% of the 24-month forecast error variance of the CPI is explained by innovations in the ISE. On the other hand, a substantial fraction (22.6%) of the variance in the ISE is explained by the CPI. This observation indicates that the explanatory power of the ISE to explain the variations in the real sector is quite low.

B.3. Interest Rates and Inflation

As can be seen from Table 2, interest rates appear to explain a substantial fraction of forecast error variance in inflation. While interest rates explain 36.7% of the variance in inflation, inflation explains only 11.2% of the variation in interest rates. Figure 11 shows that the response of inflation to the one standard error deviation shock is evident in interest rates. Inflation increases up to the first six months and then recovers quickly, but still the effects of interest rates on inflation remain positive.

B.4. Inflation and Real Sector

Table 2 shows that inflation does not have significant explanatory power for industrial production in the presence of the ISE and the interest rates. Inflation explains 5.7% of the variance of the IPI. Figure 6 shows the response of the IPI to shocks in inflation, which is not strong. Figure 9 also shows that the shock presence in the IPI has

no significant impact on inflation. So, variations in industrial production are mostly explained by the interest rates (24%).

5. Conclusion

This study, based on a VAR analysis, performs an investigation of causal relationships and dynamic interactions among stock returns, interest rates, inflation and the real economic activity. The major findings can be summarized as follows:

1. Explanatory power of the stock returns to explain the changes in economic activity is not strong enough. Although the real sector responds positively to changes in the stock market, the degree of this response is not significant.

2. Interest rates explain a substantial fraction of the variations in inflation. Inflation also responds positively to the changes in interest rates.

3. Even though inflation is capable of explaining only a small part of the variations in the real sector, the real sector responds negatively but weakly to shocks in inflation.

4. With interest rates in the VAR system, the ISE explains little variations in the inflation. The ISE responds to changes in the inflation positively but not strongly. However, inflation explains a substantial fraction of the variation in the ISE. To be a perfect hedge against inflation, the stock market should move together with inflation. The ISE, responding to the changes in the inflation weakly, leads to doubts about the existence of such a co-integration between the ISE and inflation in the long-run.

The findings in this paper demonstrate that bi-directional causal linkages exist between the ISE and inflation. There is no causal relation between the ISE and industrial production. The results of impulse response analyses and variance decompositions show that most of the variations in the ISE result from the changes in inflation. Thus, it is possible to maintain that the source of changes in the ISE index originates from inflationary pressures rather than changes in the real economic activity.

In summary, the stock market in Turkey has not yet reached the level of developed markets to be able to offer a perfect hedge against inflation. To be an alternative in avoiding the negative impact of inflation, first of all, it is urgently needed to introduce some major financial and legal regulations to eliminate the barriers between the stock market and the real sector.

References

Abell, J. D., "Twin Deficits during the 1980s: An Empirical Investigation," *Journal of Macroeconomics*, Vol. 12, No. 1, Winter 1990, pp. 81-96.

Bodie, V., "Common Stocks as a Hedge Against Inflation," *Journal of Finance*, Vol. 31, May 1976, pp. 459-70.

Charemza, W. and Deadman D., "New Directions in Econometric Practice," Edward Edgar Publishing Limited, England 1992.

Cooley, T. F. and Roy, S. F., "Atheoretical Macroeconometrics: A Critique," *Journal of Monetary Economics*, Vol. 16, 1985, pp. 283-308.

Ely, D. P. and Robinson, K. J., "Are Stocks a Hedge Against Inflation?" International Evidence Using Cointegration Analysis, Federal Reserve Bank of Dallas, *Financial Industry Studies Working Paper*. No. 3-94, 1994.

Enders, W., "RATS Handbook for Econometric Time Series," John Wiley & Sons, Inc. New York 1996.

Fama, E. F. and Schwert, W., "Asset Returns and Inflation," *Journal of Financial Economics*, Vol. 5, November 1977, pp. 115-46.

Fama, E. F., "Stock Returns, Real Activity, Inflation, and Money," *American Economic Review*, Vol. 71, September 1981, pp. 545-65.

Fischer, S., "Relative Shocks, Relative Price Variability and Inflation," *Brookings Papers on Economic Activity*, Vol. 2, 1981, pp. 381-431.

Geske, R. and Roll, R., "The Fiscal and Monetary Linkage between Stock Returns and Inflation," *Journal of Finance*, Vol. 38, March 1983, pp. 1-33.

Gültekin, N. B., "Stock Market Returns and Inflation: Evidence from Other Countries," *The Journal of Finance*, Vol. 38, March 1983, pp. 49-65.

Jeon, B. N. and Furstenberg, G. M. V., "Growing International Co-movement in Stock Price Indexes," *Quarterly Review of Economics and Business*, Vol. 30, No.3, 1990, pp. 15-30.

Kaul, G., "Stock Returns and Inflation: The Role of the Monetary Sector," *Journal of Financial Economics*, Vol. 18, June 1987, pp. 253-76.

Lastrapes, W. D. and Koray, F., "Exchange Rate Volatility and U.S. Multilateral Trade Flows," *Journal of Macroeconomics*, Vol. 12, No.3, 1990, pp. 341-62.

Litterman, R. and Weiss, L., "Money, Real Interest Rates and Output: A Reinterpretation of Postwar U.S. Data," *Econometrica*, Vol. 53, 1985, pp. 129-56.

Mehra, Y. P., "Is Money Exogenous in Money Demand Equations?" *Journal of Political Economy*, Vol. 86, 1978, pp. 211-28.

Nelson, C., "Inflation and Rates of Return on Common Stocks," *Journal of Finance*, Vol. 31, May 1976, pp. 471-83.

Ram, R. and Spencer, D. A., "Stock Returns, Real Activity, Inflation and Money," *American Economic Review*, Vol. 73, 1983, pp. 463-70.

Sims, C. A. , "Macroeconomics and Reality," *Econometrica*, Vol. 48, 1980a, pp. 1-46.

_____,"Comparison of Interwar and Postwar Business Cycles: Monetarism Reconsidered," *American Economic Review*, Vol. 70, 1980b, pp. 250-57.

Stulz, R. M., "Asset Pricing and Expected Inflation," *Journal of Finance*, Vol. 41, 1986, pp. 209-23.

The ISE Review Volume: 1 No: 4 October-December 1997
ISSN 1301-1650 © İMKB 1997

Forecasting of Corporate Performances on the Basis of Financial Indicators

A. Levent Alkan*

Abstract

The main public facts display a homogeneous nature inside each country. Financial highlights describing each country's economic conditions and the so-called "resistance power" against expected and unexpected fluctuations would change homogenity in specific situations. The nation is heterogeneous in the case of critical evaluations and expectations. Because of this factor, analytical consideration changes dramatically from one country to another. The main financial phenomena, like the book-market equity, size effect, E/P and leverage, are valid for all capital markets. But the application of such concepts differ on a country basis. The attitude definition of companies is homogeneous in each country, but it is heterogeneous in a multi-country context. Although most of the phenomenon is transparent enough to be a guiding factor for all countries, the application phases are specific and unique for each country. Corporate profiles could be clarified definitely, using their fundamental financial indicators. The accepted company profile definition for high performance and low performance cases are searched for two different time intervals, such as the long-term and the short-term. The short-term and long-term high/low performance company definitions are designed separately. The performance evaluation regarding the investors' buying or selling patterns on the ISE concluded that high performance companies have a definite preference for taking positions in any common stock.

I. Preliminaries

The CAPM concept offers a criticism on the efficiency of capital markets in NASDAQ, AMEX and the NYSE between the 1968 and 1991 intervals. The analysis on the operationss of financial sector

* Marmara University. Department of Finance and Accounting in Business Administration. Tel: 531 97 57. E-mail: alevent@domi.net.tr

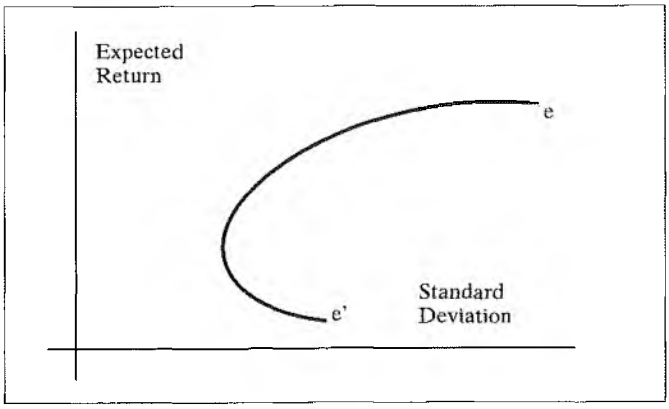
corporations and company attitudes would provide more analytical output instead of a beta description. The analysis of High Performance and Low Performance companies are obtained after that of CAPM.

1.1. What is Meant by the Mean Variance Criteria?:

It is widely accepted that the stock return concept clarifying the risk premium and volatility would start with the mean variance criteria. The purpose of the securities market line analysis is to clarify the CAPM and the the developments obtained without an intention to use financial statement information.

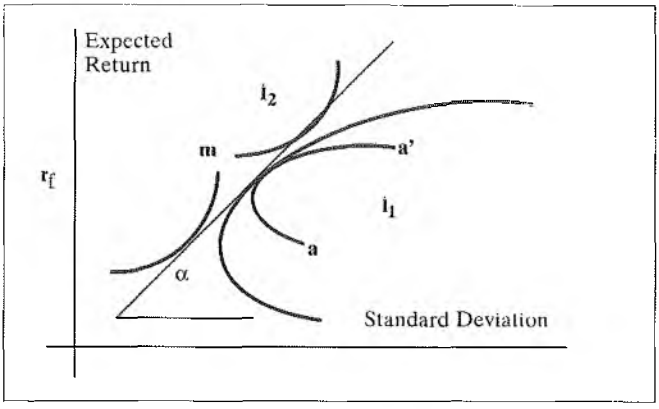
Mean-variance criterion of assets in the studies of Markowitz (1952) implies that the variance (or the standard deviation) of asset returns serves as the risk indicator. A preference for expected return and aversion to variance is implied by monotonically and strict concavity of an individual's utility function, i.e. investors are risk-averse. Another strong assumption of MVC is security returns are normally distributed. A portfolio obeying the quadratic program above is a frontier portfolio, as seen in Figure 1 below.

Figure 1: Frontier Portfolio



Portfolio p will be on the e'-e curve, called the efficient frontier. MVC is normative because of the strong assumptions underlying it. The separation theorem due to Tobin (1958) dichotomizes investment decisions under uncertainty into two steps. Given that

Figure 2: Regardless and Regarding to Taster and Preferences



investors can borrow and lend unlimited amounts of money at a risk-free rate r_f, also investors will first decide on the weights of a portfolio p of risky assets regardless of their tastes and preferences 1. And then, they will decide on the mix of this portfolio with the risk-less asset, whose return is denoted by r_f. Obviously, the second step of the separation property depends on the tastes and preferences of individuals. The figure above shows investment decisions of investors under this framework.

Given that investors 1 and 2 agree on the expected returns and standard deviations of risky investments, they will hold m in their portfolio as risky asset and r_f as the risk-free asset. What they disagree is the risk level being dependent on individual's tastes and preferences, i.e. the mix of m with r_f, the straight line from r_f through m is called the transformation line.

Investor 1 builds a portfolio of positive weights both in m and r_f and reaches the indifference curve I_1. On the other hand, investor 2 builds a "leveraged portfolio," borrowing at rf to invest more in m and reaches the indifference curve I_2. The normative investment choice, as described above, is applied to the positive problem of capital market equilibrium and determination of securities prices by Sharpe (1964) and Lithner (1965a), and named as Capital Asset Pricing Model (CAPM). As we quote from Levy and Sarnat (1984) p.396:

"In addition to the underlying assumption that investors are risk-averse and select their portfolios by the MVC, we shall assume that the capital market implied that the following conditions are perfect:

1) The market comprises many buyers and sellers of securities, none of whose transactions is large enough to affect the prices in the market, and all of whom have an equal opportunity to invest.

2) There are no transactions costs or transfer taxes, nor is there an income or capital gains tax.

3) All investors have all relevant information regarding alternative investments and there are no costs involved in obtaining this information. All investors, therefore, have the same expectations regarding the expected returns and variances of all the alternative investment options.

4) All investors can borrow or lend any amount in the relevant range without affecting the interest rate. The borrowing rate equals the lending rate is the same for all investors, both large and small, institutional and individual.

5) There is a given uniform investment period for all investors; this means that all decisions are taken at a point in time, and all investments are held for the same period.

Sharpe's approach to drive the CAPM at points m in figure 2 is the efficient frontier and the curve aa' have the same tangent whose slope is equal to the slope of the transformation line. Let r denote risk-free rate while r_f, μ denotes the expected rate of return. σij is the covariance between i and j. We create a portfolio p with the rate of return R_p:

$$R_p = x_a \cdot R_a + (1 - x_a) R_m$$

Where

Xa : The proportion invested in stock a.

Ra : The rate of return on security a.

1 - xa : The proportion invested in portfolio m.

Rm : The rate of return on portfolio m.

$$\mu p = xa\ \mu a + (1 - xa)\ \mu m$$

is the rate of return on portfolio.

$$\sigma^2 p = xa^2\,\sigma^2 a + (1 - xa)^2\,\sigma^2 m + 2\,xa\,(1 - xa)\,\sigma am$$

is the variance of the portfolio, what defines the volatility of the portfolio.

$$\sigma p = \{(xa^2\,\sigma^2 a + (1 - xa)^2\,\sigma^2 m + 2\,xa\,(1 - xa)\,\sigma am)\}^{1/2}$$

is the standard deviation of the portfolio, which defines the risk of the portfolio.

At point m, the curves aa' and the efficient frontier coincide. Therefore, the proportion xa invested in security a is zero. So, we take the derivative,

$\frac{\delta \mu p}{\delta xa}$ and $\frac{\delta \sigma p}{\delta xa}$ and evaluate at a point m where xa = 0

$$\frac{\delta \mu p}{\delta xa} = \mu a - \mu m \qquad (1)$$

since at point m, xa = 0 and $\sigma m = \sigma p$ the partial derivative of the portfolio's standard deviation would be as follows:

$$\frac{\delta \sigma p}{\delta xa} = \frac{(\sigma am - \sigma^2 m)}{\sigma \mu} \qquad (2)$$

The chain rule specifies that partial differentiating of the portfolio's rate of return to the xa can be represented as the following.

$$\frac{\delta \mu p}{\delta xa} \cdot \frac{\delta \sigma p}{\delta xa} = \frac{\delta \mu p}{\delta \sigma p} \qquad (3)$$

Using the formulas (1) , (2) and (3), we can describe the rate of return for stock a as the following:

$$\mu a = r + \frac{(\mu m - r).\sigma am}{\sigma^2 m} \qquad (4)$$

since $\beta_a = \frac{\sigma am}{\sigma^2 m}$ the equation can be rewritten as

$$\mu a = r + (\mu m - r).\beta_a \qquad (5)$$

This derivation holds in equilibrium for each security; the expected return of a security equals to risk-free rate plus the risk premium times the systematic risk of the security denoted by β_{α}.

Linther's approach (1965a,1965b) to the same problem is maximizing tangent of the angle α ($\tan\alpha$) in Figure 2. Levy and Sarnat minimizes the portfolio variance when r_f is also included in the minimizing problem instead of maximizing $\tan\alpha$.

There are several extensions of the CAPM, designed to relax the strong assumptions of the model as the importance of fundamental financial information and the importance that knowledge gained importance in the period between 1963 and 1990. The zero-beta model under the no-risk asset is developed by Linther (1969) and Black (1972). The study of Fama and French (1992) emerged as against the studies of Sharp, Linther and Black.

According to the risk definitions, two types of risks are considered. One is the systematic risk and the other is the non-systematic risk. The non-systematic risks have ability to scatter the risk. These types of risks are specific to the company or sector and they are known as company risks or sector risks. On the other hand, the systematic risks are non-scattered. This systematic risk is called the "market risk" and its effects are observed on the all transacted stocks in a market. The risk factors, such as inflation, recession or interest rates, including economic develeopments, affected the prices of all stocks on the same direction but with different rates.

The economic behavior of a company depends on the economic patterns of the financial market, economic policies of the government, competition with other firms and turnover of investments as well as the leveraged or non-leveraged financial situation. Such effects are company-related risks while the market risk is measured by the CAPM. The market risks were defined as the government's interest rate policy, currency policy and the exchange rate risk. On the other hand, the competition in the sector and the company's place in this rivalry, corporate management, marketing strategy and its influence on the sales constitute the company risks.

It is possible to diversify the non-systematic risk by taking stock positions in different groups or sectors.

Furthermore, another well-known option to avoid the systematic

risk is by changing the portfolio composition. Moreover, different portfolio alternatives in the put or call option trading are considered to be a solution to the systematic risk problem. Also, the futures and forward markets have shown an alternative path to overcome the difficulties of systematic risks.

1.2. Stock Return Expectations and Financial Statement Criteria: From Sharpe-Linther-Black until now, some empirical studies contradicted the considerations over Beta suffice description of expected returns. Let us evaluate these empirical studies individually.

Size effect of Banz (1981). Banz focused on the market equity (ME) concept. The effects of ME (stock price times shares outstanding) on average return provided by market Betas are not uniform. Banz has proved the existence of a negative relationship between the ME and the firm's average returns. Average returns on low ME stocks are too high on the basis of their Betas and average returns on large stocks are low as a consequence of the resultant Betas.

Positive relationship between the leverage and average return as developed by Bhandari (1988). Bhandari has noticed that the leverage is associated with the risk and the expected return. In the Sharp, Linther and Black model, the leverage risk should be ascertained by the market Beta. But Bhandari found that the leverage lends considerable support to explain stock returns, including the ME as well as the Beta.

Stattman (1980) and Rosenberg, Reid, and Lanstein (1985). They discovered that average returns on US stocks are positively related to the ratio of the firm's book value of common equity (BE) to its market value (ME). Chan, Hamao and Lakonishok (1991) established that the book-to-market equity (BE/ME) also has a strong role in explaining stock returns in Japanese stocks.

Basu (1983) proposed that the earnings-price ratios (E/P) support the explanations of average returns on US stocks, including the size effects and the market Betas. Also Ball (1978) discusses that E/P captures the delineation for various factors on the expected returns. The E/P is likely to be higher for stocks with higher risk and expected returns.

Chan and Chen (1991) proposed that earnings prospects of the firms are associated with a risk factor in returns. Companies that the capital market judges to have poor prospects, as proven by Chan & Chen by low stock prices and high ratios of book-to-market equity, have higher expected stock returns.

The last one is the study of Fama and French. Fama and French have yielded that the simple relationship between the Beta and the average return disappears during the more recent period of 1963 and 1990. They have discussed the sufficiency of Beta to describe the stock return. In their discussion, the point that they have supported is the combination of size and book-to-market equity. The size effect and book value of common equity-to-market value include the effects of leverage and E/P in average stock returns. On the other hand, Black, Jensen and Scholes (1972) and Fama and MacBeth (1973) concluded that there is a positive simple relationship between the average return and the market Beta during the early years of 1929 and 1968.

Forecasting attitudes using financial statement information would provide analytical approach for each of the researched companies. In this article, the importance of foreseeing gains added dominance. As a conclusion, it is imperative to relieve the uncertainty of the risk remaining on the real earnings (i.e. the survival earnings after the casualties of inflation) of any company and to have a bright decision about the company's future prospects and provide an analytical classification in the ISE.

In this article, in a real sense, the companies' "forecasting attitudes" are intended to provide a sound decision-making capability to the investors with the utilization of their leading financial ratios as much as the relevant financial indicators. Because of the economy's fluctuations, there are some sector priorities. Also, within the same sector, some companies are superior to the others. The company's specified advantages are adequately reflected into its last financial information. Searching for and finding the most lucrative companies while identifying the fragile ones would emerge as a useful service to other researchers and investors.

Another crucial aspect concerns locating manipulative attempts in the capital markets. Because the market capitalizations of some

companies increase and decrease free from their financial prospects, they tend to have a direct influence on future expectations, based on sectoral advantages and/or disadvantages. The other factors affecting the market capitalization of any company are manipulation, speculation and insider information. By clarifying the "forecast earnings," the fundamentally strong companies can be identified, leaving aside the speculatively-driven stocks.

II. Data:

In this article, all non-financial companies are selected for the purposes of the analysis. The companies listed on the Istanbul Stock Exchange are used to represent the parameters defining the attitudes of the companies during the 1989-1995 period. In this parameter design (a) consolidated statements of income (b) consolidated statements of balance sheets and (c) consolidated statements of cash flow are scrutinized.

The ex-ante parameter testing procedure for accuracy and reliability is realized in two different capital markets as represented by the NASDAQ and the ISE. The same form of data is obtained from NASDAQ for the interval between 1995 and 1996. The designed parameters are tested in the subsequent years, up to 1996 also on the ISE.

2.1. Financial Framework

In accordance with the primary purpose of Article 7, different groups of financial indicators are determined. These financial ratios are configured as (a) liquidity, (b) turnover, (c) financial structure, (d) profitability, (e) credibility and other indicators which clarify the attributes of the companies, (f) debt indicators and (g) the growth rate. In liquidity, three; in turnover, six; in financial structure, six; in profitability, four; in credibility and other indicators, clarifying attributes of the company, six; in debt indicators, five; and in growth rate, four financial ratios were tested during the designing phase of the parameters.

In detail, these ratios are listed as follows:

(a): Current Ratio
Acid-test Ratio

Liquidity Ratio
(b) : Receivables Turnover
Inventories Turnover
Assets Turnover
Rounding Capital Turnover
Obligatory Turnover
(c) : Long-Term Assets/Owners' Equity
Interest Coverage
Principal Coverage
Operating Leverage
Financial Leverage
(d) : Gross Profit Margin
Return On Equity
Return On Asset
Net Profit Margin
(e) : Owners' Profit/Assets' Profit
Working Capital/Net Sales
Credit Cost Change
Return On Asset/Credit Cost
Obligatory Turnover
Cost Of Goods Sold/Net Sales
(f) : Short-Term Debt/Total Debts
Short-Term Debt/Owners' Equity
Total Debt/Owners' Equity
Total Debt/ Total Liability
Long-Term Debt/Long-Term Funds
Cash Flow Yield
(g) : Equity Growth Rate
Sales Growth Rate
Assets Growth Rate
Net Profit Growth Rate

In total, 34 parameters of 186 companies are tested between 1989 and 1995. During the interval between 1989 and 1995, a total of 771 periods and alternative characteristics were observed to clarify the status of the companies.

2.2. Relation to Previous Studies:

Fama and Schwert's (1977) asset returns and inflation study suggested that capital might have been a hedge against inflation. They have investigated real estate, Government bonds, Treasury bills and common stocks. Alternative assets against common stocks were found that they were, at least, a partial hedge against expected inflation. But, on the other hand, the negative relationship of common stock with respect to inflation rates does not account for a large portion of variation in common stock returns.

Linther (1975), Jaffe and Mandelker (1976), Body (1976) and Nelson (1976) have observed a negative relationship between the returns on common stocks and the expected inflation rates.

Fisher's study realized that the real and monetary sectors of the economy are largely independent. Thus, he hypothesized that the expected real return is determined by real factors, like the productivity of capital and the investor's time preference.

III. Coverage of the Research

3.1. Short-Term HPC & LPC in Real Conditions of the ISE:

The main purpose of the research is to determine which company is high-performance and which one is low-performance. Because of this approach, the first step of clarification is to define HPC very strictly. In fact, evaluation of the performance of a company needs a multi-dimensional analysis. The companies can have a potential to make profit but fail to respond to that profit capability with production in a continued manner. On the other hand, the company may possess the potential to generate profits but the final income may not justify this potential. The point behind this research is to identify the HPC with an analytical approach.

So, in this article, there are three different alternatives and four different fundamental financial conditions that will help us to discover the HPC and LPC. These three alternatives are real profitability, the power of profit-making against credit costs and leverage.

The leverage concept is analyzed in two different manners. One concerns the operations while the other deals with the financial

ingredients. The leverage[1] concept considered in this article is supported by Miller's study about the relation of leveraging up the corporate capital structure and the allied risks. Also, in 1988, Bhandari found that the leverage supports to explain stock returns, including the size effect as well as the Beta. In addition, Ertuna's study of inflation-adjusted financial statement analysis touched on the aspects of financial and operational leverage.

The leverage concept is combined with the real net income change.[2] Inflation and stock return relations study of Fama and Schwert suggests that common stock returns and the expected inflation rate are negatively related. The study elaborates that, in the case of increasing inflation, stock returns are decreased.

The study supports this article by exuding a message of inflation-critical analysis. When the company's net income overwhelms the expected and unexpected yearly inflation rate, this is an indication of a short-term HPC.

The study of Ertuna[3] has employed another crucial criteria of a company, namely that of ROA in addition to the credit cost comparison. This methodology on investment performance states that any company can be measured by its capability of overcoming the load of the credit cost. According to the study of Ertuna, ROA reflects the operating profitability of a company. And the level that the ROA overpasses is a demonstration of generating profits. So, in order to define a short-term HPC, the ROA and the credit cost ratio is greater than one. For this case, if the company's ROA is higher than the credit cost, then the company could raise a real net income as it may realize this in the following periods.

In order to implement a short-term high performance (HPC), the most popular deterministic characteristic is the company's net profit after tax. The net profit after tax alone has become insufficient to prove the effects of defining the HPC and the low-performance company (LPC). The point behind this disparate phenomenon arises from ignoring the company's total sales. On the other hand, the

[1] Merton H. Miller "Leverage," Journal of Finance, Vol. XLVI, No. 2, June 1991.
[2] İ. Özer Ertuna "Inflation Corrected Financial Statement Analysis" BİLRAPOR 1994
[3] Fama and Schwert, "Asset Returns And Inflation," Journal of Financial Economics 5 1977.

operating profits, financial benefits and credit costs must be considered for defining the HPC and LPC. In addition, the fact that some companies feature non-fiduciary outflow expenses should also be borne in mind. These non-fund outflow expenses can be classified on the basis of costs, due to operational expenditures, and "other activities" expenditures and losses. Some examples of such outflow expenses are listed as below.

Order Advances Received
Provision for Retirement Pay
Provision for Other Payables & Expenses
Depreciation

If the company has substantial non-fund outflow expenses, in this case, it would be possible to conceal its profit-generation capability. On the other hand, the operating efficiency of the companies cannot be clarified if the analysis of a company is based solely on the net profit evaluation only. Although a company may have increased leverage and a bright potential to achieve advanced profitability, it may still be classified as the LPC.

The other financial attitude is the credit cost. The credit cost used in this article to determine the HPC and LPC companies is the ratio of financial expenses to the short- and long-term financial liabilities. The comparitive parameter of the credit cost is compared with the ROA in order to have an analytical output. The threshold level of this comparison is defined as the excess point of ROA against the credit cost. If the ROA of the company is greater than the credit cost, the company has a potential of using its resources as well as investments with a high performance.

In a high inflationary environment, increasing the real net profit is a dramatic objective of any company. In other words, making more profit after taxes over the annual inflation rate is not so easy. Because of that task, the company can be classified as the HPC for the tested time period. But this attitude is like a two-edged sword. One edge concerns the ability to obtain a financial gain against inflation and get a positive result in comparison to other companies. But, the other edge is related to having a probability of obtaining this profit from extraordinary income and operations. According to the analysis, based on this article, the contradiction arising from profit generated

by the extraordinary items may be resolved by adopting a continuous approach. For the discrete time analysis, the company has increased its income against the inflation rate, likewise its HPC for specified period. But, if the company fails to support its income with real operating activities, then, maybe, it should alter its HPC attitude against the inflation rate for the following time as the trait of the company would not be as stable and vice versa. If the real operating activities and the financial activities are logically positive, then the company would provide financial gain against the yearly inflation rate in the future. Hence, the undetermined state of the company is clarified with a new point of view, which is leverage.

The company has two kinds of leverages. One is the operating leverage and the other is the financial leverage. The operating leverage compares the annual changes in the rate of the operation profit and the gross sales. And, the financial leverage compares the annual change rate of the operational profit and the actual operational profit. Leverages are considered logically positive if they are greater than 1. And, in order to define the HPC, both the financial and the operating leverages should be satisfied together. In this manner, any company having a high profit change rate than the inflation rate can be selected

Thus, the HPC definition is concluded with an analytical and systematical approach as follows:

X : If the net profit after tax is greater than that year's declared consumer price index.

Y : If ROA is greater than the credit cost.

Z : Financial leverage is greater than one.

W :Operating leverage is greater than one.

On the columns of X, Y, Z, W, 1s and 0s are described as the following. If the parameters are positive against the definition, then they are denoted as 1. If the companies fail to satisfy the defined criteria, then they are denoted as 0. In the last column, companies reflect high performance if they are denoted as 1 and 0 if they are of low performance.

The company is designated as Low Performance within the

following criteria:

(a) None of the profitability, the ROA, the credit cost and leverage conditions are satisfied.

(b) The probability and credibility conditions are lacking while one of the leverage conditions is satisfied.

Also the company would be High Performance if the following are satisfied.

(a) One of the profitability, credibility or total leverage (financial and operating leverage) conditions are satisfied.

(b) All of the profitability, credibility or total leverage conditions are satisfied.

Table 1: Logical Truth Table Representing Companies' Short-Term Real Attitudes to their Four Different Financial Aspects

X	Y	Z	W	Short Term Real Conditions of HPC and LPC
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Real Company Attitudes	Number of Real HPCs For Long-Term in Overall	Number of Real LPCs For Long-Term in Overall
$2^4 = 16$	13	3

As shown in the above Table 1, companies are defined as low-performance if they achieve only the financial or the operating leverage without having the return-on-assets advantage against their credit costs as well as positive real net profit in comparison to the annual inflation rate.

Since the chosen econometric modeling for the design of any high-performance company is Logistic Regression, the econometric model of high-performance companies on their dichotomous output function phenomenon should also be defined accurately. The dichotomous function is defined logically credible when the company's financial information manages to pass over the threshold level described, in detail, under four different conditions. The design of the HPC that reflects real conditions are described with the logical pretexts and/or statements. Because of this reason, this phenomenon is denoted by ".". Also, it may denoted by "+." Then, the HPC equation is described in the following formula:

$$HPC = X + Y + Z\,W \tag{6}$$

In order to find the effective ratios suitable for describing the high-performance, the company is checked on the four different classified groups. The first group is liquidity, the second one is turnover, the third one is leverages and the financial structuring and the fourth one is the profitability and growth.

In the article, during the analysis stage, instead of forecasting the growth of net income, gross sales or other single-dimensional analysis, or the multi-dimensional and more analytical combinations are taken into consideration. A total of 34 ratios and 771 periods concerning different companies on the ISE, starting from 1989 to 1995, were investigated to detect the parameters of the HPC. The parameters are concentrated on seven different group of ratios against 34 others. During the construction of the parameters, the logistic regression was used.

3.2. Long-Term HPC & LPC in Real Conditions of the ISE:

From the investors' trading point of view, there are two different

kinds of strategies, such as passive and active trading. Passive trading tries to take position on the HPC's and refrains from trading on it for a long period of time. Although active trading needs to possess a short-term knowledge on corporate attitudes, for the passive trading, it will not be sufficient to have a short-term profile on the company.

Since investment strategies differ greatly between active and passive trading, short-term and long-term company clarification is an obligation. In the passive trading, decisions are concentrated on the long-term performances of the companies. The short-term company attitude projection would not be sufficient to put forth a passive investment. Since the passive trading in application is inevitable, that means the long-term company attitude projection would be as important as the short-term company attitude projection.

In the long-term company projection, determining the criteria would not be as easy as we did in the short-term definition.

3.3. Selecting Criteria Limits for Long-Term Corporate Attitudes: The normal distributions of parameters X, Y, Z and W are configured. According to that configuration, mean and standard deviation make sense in the long-term performance limits.

$$HPC = X \,.\, Y \,.\, (Z + W) \qquad (7)$$

where X: Net profit after tax, Y: ROA over credit cost, Z: Financial leverage, W: Operating Leverage.

The boundaries of designed parameters are listed as follows:

1. The levels of leverage found fault with m + s. The upper level of both the financial and operating leverages is defined as m + s.

2. The boundary m - as. is the assumed control of leverage's lower limit.

3. Net income minimizes the importance of defining long-term company attitudes and disagreed with the annual inflation threshold. If the yearly net income change is greater than zero, then it is exceptional for long-term performance evaluations. There is no upper boundary of the net income.

4. ROA/credit cost should be, at least, greater than zero. The result that is very close to level zero, was obtained by using the relation of m - as.

Table 2: Statistical Table of Four Criteria

Name of Criteria	Mean	Standard Dev.	Kurtosis
Net Profit	177.8	1001.69	102.140
ROA/CC	2.1	5.18	29.846
Financial Leverage	1.1	14.88	167.79
Operating Leverage	0.9	2.01	57.773

Figure 3. Operating Leverage Normal Distribution

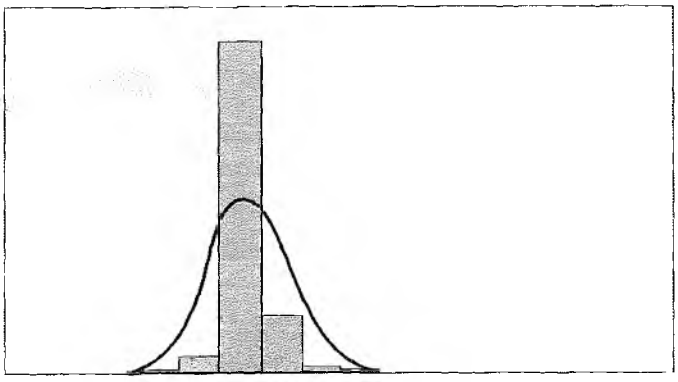


Figure 4. ROA / Credit Cost Normal Distribution

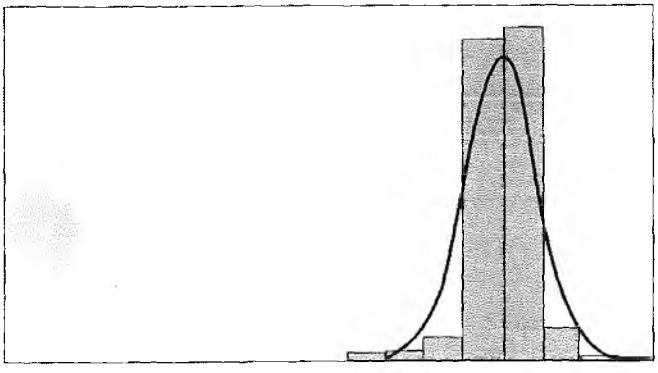


Figure 5. Financial Leverage Normal Distribution

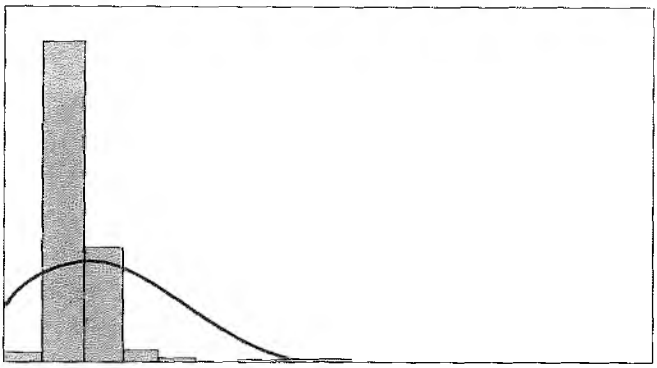
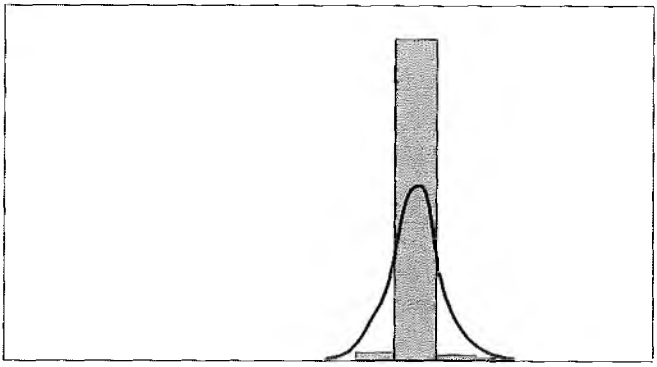


Figure 6. Net Profit Growth Rate Normal Distribution



The study, keeping an eye on the long-term high-performance company definition, is careful to comply with the criteria but considers as insignificant the criteria limits realized in the short-term previously. In other words, in order to satisfy a high-performance company attitude, the criteria set for the net profit, the ROA/credit cost and the leverage are considered to be satisfied synchronously. The threshold limits of the net income, the ROA/credit cost and the leverages are accepted in the lower levels in their normal distribution. These normal distributions are configurated, including all the industrial companies on the ISE.

Table 3: Logical Truth Table Representing Company's Long Term Real Attitudes Regarding to their Four Different Financial Aspects

X	Y	Z	W	Long-Term Real Conditions of HPC and LPC
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Real Company Attitudes	Number of Real HPCs For Long-Term in Overal	Number of Real LPCs For Long-Term in Overal
$2^4 = 16$	3	13

Again, on the truth table, in the columns of X, Y, Z, W, 1s and 0s are described as the following: if the parameters are positive against definition, then they are denoted as 1. If the companies fail to satisfy the defined criteria, then they are denoted as 0. In the last column, the companies are of high-performance if they are denoted as 1 and 0, if they show low performance.

IV. Econometric Model :

In the analysis of the HPC and LPC, Logit modeling is selected. During the Logit analysis, the hetero-scedasticity, the non-normality of the disturbance term, possible values of P(i), lying outside the 0-1 range and the lower coefficient of determination problems are resolved.

Two different types of portfolios are selected from the capital markets of different countries. The selected portfolios of each country's capital market are compared with the regression output of the designed function and the real state of the HPC or LPC.

When we have concluded the result of the real conditions for the HP/LP company, portfolio correlation was checked with the conclusion based on their performance of description. During the whole comparison stage of the regression result and the real attitudes of the companies, three equal groups of portfolios are taken into consideration. The measurement, accuracy and reliability tests are accomplished in two different kinds of tests.

During the analysis of the HPC and LPC, the selected portfolios have the same number of companies on their analyzed period.

4.1. The First Case (Dichotomous Case):

There are only two alternatives, such as displaying high performance or low performance. The logistic regression is concentrated on forecasting of corporate conditions above or below the threshold. In this case, the scales on the high-performance and low-performance companies are omitted. This type of consideration carries accuracy and and determination.

4.2. The Second Case (Multi-Alternative Case):

In the first case, the designed parameters are compelled to be sensitive to how high- or low-performance companies are. On the other hand, ussing this approach focused on the alternative results which are more than dichotomous. So, we can assume that it is more sensitive. On the multi-alternative case, companies can be classified as High Performance (HP), Medium Performance (MP) and Low Performance (LP) companies.

4.2.3. Designing of Parameters:

During the designing stage, 771 time intervals and 28 different financial ratios were tested. The logistic regression result is summarized as follows:

Table 4: Logical Regression Output for High Performance Companies

Observed	**0**	**1**		
0	**0**	187	59	76.02 %
1	**1**	39	486	92.57 %
			Overall	87.29 %

.....Variables in the Equation .....

Variable	**B**	**SE**	**df**	**Sig**	**R**
I_1	1.4996	0.2240	1	0.0000	0.2106
I_2	0.3961	0.2183	1	0.0696	0.0366
I_3	0.8596	0.3440	1	0.0092	0.0703
I_4	0.0052	0.0007	1	0.0000	0.2530
I_5	-0.4437	0.7949	1	0.1767	0.0007
Constant	-1.0732	0.2987	1	0.0003	

$$P(I) = \frac{1}{1 + e^{-(-1.7397 + 1.141I_1 + 4.741I_2 + 0.1232I_3 + 0.0064I_4)}}$$

According to the logistic function, results of the high-performance company were proven by the econometric modeling based on the probability function of the following lines.

I_1: ROA/Credit Cost
I_2: ROE
I_3: Cash Flow Yield
I_4: Net Profit Growth Rate
I_5: Gross Profit Margin
P (I) is the probability of being HPC for any selected company on the ISE.

The parameters of HPC contains five different variables. In order to observe the effect of each variable on the probability of being a HPC, the table is configured graphically. The effects of each variables is observed on the HPC probability output by keeping other variables constant. From mines to positive infinite, the overall axis of the variable is assigned to the changing variable. Since the main purpose is to reflect all of the changes on the probability output, the entire axis should be searched. But, for the graphically-checked variables, if empirically extreme values are detected, they are regarded as meaningless and the investigation is kept at a boundary. The remaining variables are considered to be in unison in order to abandon its effect on the probability of the HPC.

Figure 7. ROA/ Credit Cost Variable Effect on the HPC Probability

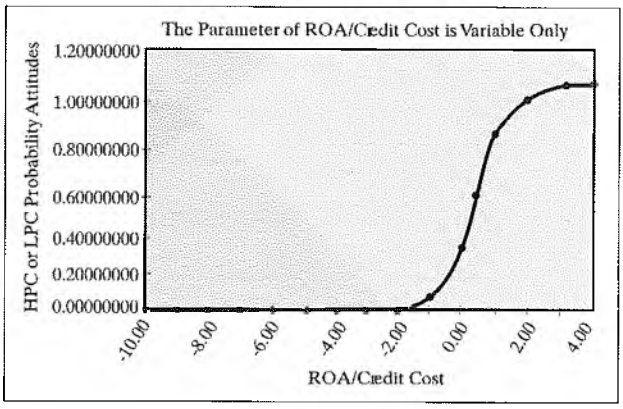


Figure 8. ROE Variable Effect on the HPC Probability

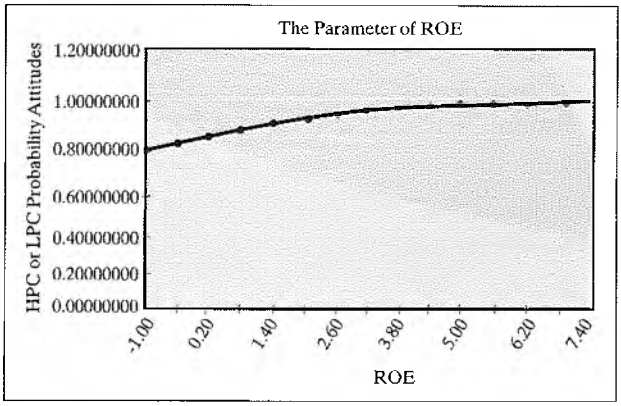


Figure 9: Cash Flow Yield Variable Effect on theHPC Probability

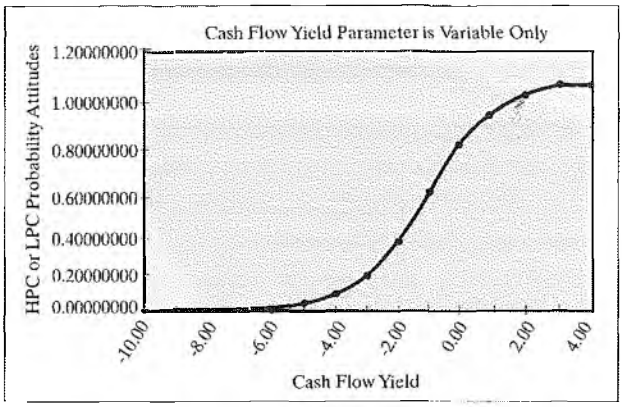


Figure 10: Net Profit Growth Rate Variable Effect on the HPC Probability

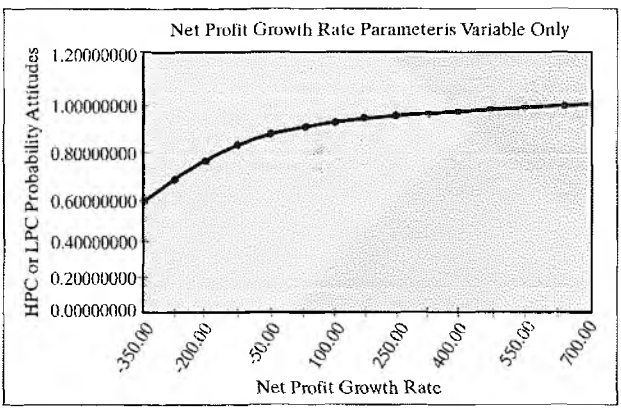
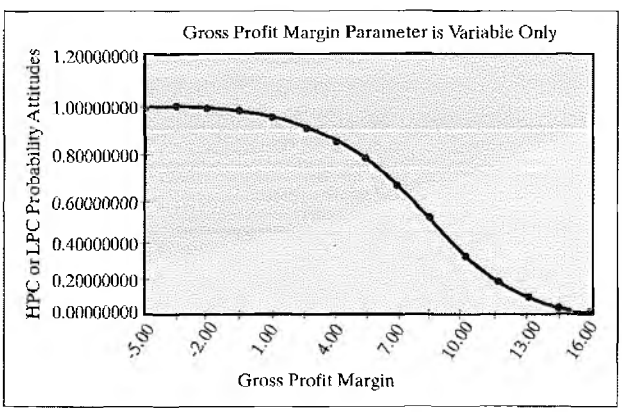


Figure 11: Gross Profit Margin Variable Effect on the HPC Probability



4.3. Graphical Interpretations of Parameters:

The parameter of the ROA/credit cost is the most sensitive variable to determine the high-performance or low-performance companies. If the ROA/credit cost variable is greater than 1 (ROE, cash flow yield, net profit growth rate and gross profit margin are kept constant as 1), the company shows high performance. If the ratio is less than 0, then the company shows low performance (As shown in Figure 7).

The other parameter, the ROE, has insufficiency to describe the traits of companies as high- or low-performance alone. The studies of Wabe and Camara[4] stress that "developing countries have a higher level of capital utilization, at all levels of capital intensity, than do the industrialized countries. Also, the productivity of capital services in the developing countries is less than half of that achieved in developed countries." The designed parameters are constructed in a developing country, such as Turkey. Hence, it was observed that the effect of the ROE on the company attitudes is small because, in the developing countries, the standard deviation of capital utilization is not so high (As shown in Figure 8).

Cash flow yield parameter is deterministic also to define the HP or LP spirit of the companies. Cash flow covers the non-cash provisions and net income performances against debt positioning. The reemaining variables with constant values of less than -1 will define the LP companies, from the cash flow yield point of view. On the other hand, if the ratio is greater than 1, it will define the HP company definitely (As shown in Figure 9).

In contrast, the net profit growth rate variable is not very satisfactory during the determining stage of company features. Even though the growth rate drops with a substantial intensity, the company's traits decrease less than 0.6 probability (As shown in Figure 10).

The last one is the gross profit margin. The graph shows that, if the gross profit margin increases more than the ROE, the net profit growth rate, the ROE/credit cost and the cash flow yield, that means it is can be classified as an LP company. If there is some growth on the gross profit

[4] Stuart Wabe and Gutierrez Camara "Capital Utilization, Capital Intensity and Factor Productivity: A Comparison of Factories in Developing and Industrialized Countries," Journal of Economic Studies. Volume 10, March, 1982.

arising from the decreasing cost of goods sold, as well as increasing quality, this improvement should be observed on the ROE, cash flow yield, the ROA/credit cost or the net profit growth rate. Otherwise, it would be a negative feedback to the company (As shown in Figure 7).

4.4 Hypothesis Study:

H_0: There is no association between the results of Formula 6 and Formula 7.

H_1: There is an association between the results of Formula 6 and Formula 7, according to the two-tail test.

Testing of the correlation between the two populations is employed by Sperkman rank correlation. The parameters of Sperkman rank correlation are n , rs, and ro, where n is the number of observations, rs is the Sperkman rank correlation test coefficient for specified n and levels of significance. On the other hand, ro is the correlation value to test the comparison of the two populations.

The two-tail test would prospect more accurate results. Naturally, the two-tail testing method is chosen. According to this method, on the condition of $r_o > r_s$ and $r_o < -r_s$, we can talk about the association of two populations.

The companies on the ISE are analyzed according to the Real Company Attitudes and Econometric Results of the Model. This comparison is realized with two different situations of the same companies for the specified time intervals.

4.5. Assumptions and Limitations:

1. The qualitative variables help to define the forecasting attitudes of companies. They are not regarded as endogenous or exogenous variables. Assumed that there is no specific effect of these qualitative characteristics to define the company attitude.
2. For the dichotomous approach, there is a limit, like above or below 0.5 output probability. When the output probability is greater than 0.5, then it is interpreted as the HPC.
3. For non-investigated inclusive approach, the probability output between 0.4 and 0.6 is an indecisive region. The probability output logistic distribution is considered as HPC when it is greater than 0.6 and it is considered as LPC when it is greater than 0.4.

4.6. Applying the Methodology:

The level of significance is accepted as 0.005. The testing mechanism is based on the Sperkman rank correlation. According to that testing procedure, if the number of companies tested is greater than 13, then the correlation coefficient would be at least 0.745 in order to accomplish a correlation between the two populations.

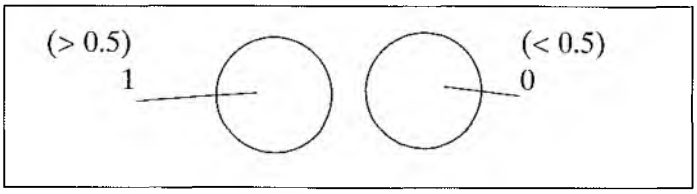
Thus, in the described criteria of Sperkman rank correlation, testing of P (I) function (Formula 7) and the equation of real conditions (Formula 6) would be concluded in a more systematic manner like the following.

{- 0.745 < Correlation (Formula 6 & Formula 7) < 0.745} Concluded as H_0
{Correlation (Formula 6 & Formula 7) > 0.745
Or Correlation (Formula 6 & Formula 7) < - 0.745} Concluded as H_1

The portfolio should be regarded in two different cases.

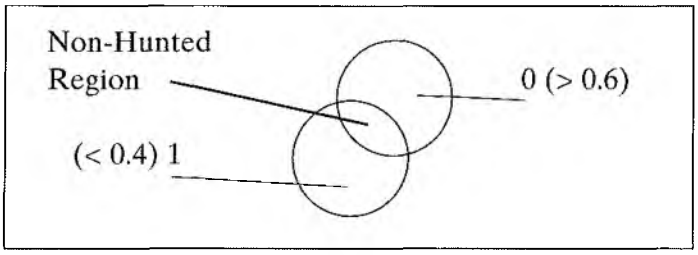
1. Dichotomous Approach

Figure 12. Diagram of the High-Performance Group and the Low-Performance Group Output in the Dichotomous Approach



2. Including Non-hunted Region Approach

Figure 13. Diagram of the HP Group and the LP Group Output Including the Non-hunted Region Approach



4.7. Parameters Reliability and Accuracy Test on the ISE Comparing Another Capital Market's Companies:

The accuracy reliability and accuracy tests of the two different capital markets' companies are realized according to their real logical conditional output and the econometric model-generated output. In order to realize this test, the ISE and NASDAQ companies were used.

In approximating of real conditions, there are two different alternative approaches to describe the attitudes of companies.

Figure 14. Interpretation of the Dichotomous Logistic Regression Output on the Probabilistic Distribution

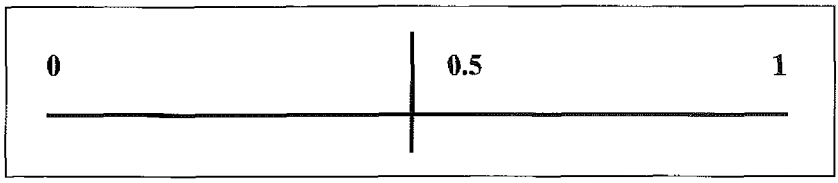
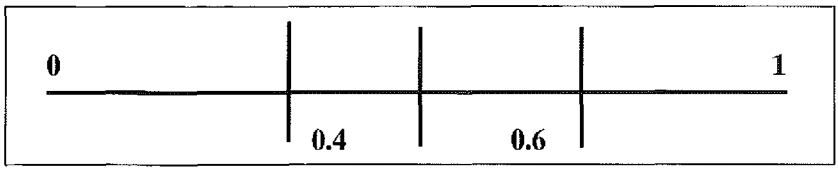


Figure 15. Interpretation of multi alternative logistic regression output on the probabilistic distribution.



On Figure 15, there is a 0.4 and 06 region that is accepted as the non-hunted region. So, the companies that are generating output from Formula 7 would be classified in another group of companies other than the Low- or High-Performance Companies. Since the Formula I is the result of the HPC and reflecting the real conditions of being HP or LP company, the interpretation of the obtained result including the 0.4 - 0.6 region as non-hunted, would cause an error-free condition to the results between 0.4 and 0.6.

Figure 15 only reflects the dichotomous conditions. In this case, error carry conditions of non-hunted region is omitted. The only critical error could be observed in the case of 1's and 0's mismatches.

That error means the real attitudes of the company observed in Formula 6 and fitted into the econometric results in Formula 7 do not match with each other. For example, while Formula 6 is generating an HPC result and expecting a result of HPC from Formula 7, it may also conclude a LPC result.

So, if the obtained results are interpreted in the dichotomous case, this will neglect the non-hunted region errors automatically. As a natural conclusion of this case, the forecasting would be more accurate.

4.7.1. Dichotomous Alternative Results Sensitivity Vs. Multi-Alternative Results Sensitivity

In the dichotomous analysis stage, three portfolios are taken into consideration. These three different portfolios are tested for dichotomous and multi-alternative cases. In this analysis, the same companies are tested in the same time intervals. The result of each dichotomous and multi-alternative cases are compared for overall portfolio weight.

Table 5. Logical Regression Results Designed on the ISE Companies Compared with NASDAQ Companies

	Portfolio Formula 6 and 7 Correlation	Overall Weightily Correlation	Capital Markets
Dichotomous Alt.		1	ISE
Portfolio1	1		
Portfolio2	1		
Portfolio3	1		
Multi Alternative		0.8534	ISE
Portfolio1	0.8980		
Portfolio2	0.8854		
Portfolio3	0.7845		
Dichotomous Alt.		0.7483	NASDAQ
Portfolio1	1		
Portfolio2	0.6614		
Portfolio3	0.6667		
Multi Alternative		0.7283	NASDAQ
Portfolio1	0.6720		
Portfolio2	0.6614		
Portfolio3	0.6882		

As shown in the following table, the null hypothesis is rejected for NASDAQ applications and the accuracy test fails. But, in the case of the ISE, the null hypothesis is rejected and the accuracy-reliability test is satisfied. So, the designed parameters are sensitive to the companies of the ISE. On the other hand, the designed parameters of HPC are meaningless for NASDAQ. The accuracy demonstrated that the obtained results are not in the region of acceptance in the case of NASDAQ.

4.8. Findings

4.8.1. Summary of Findings on the ISE :

1. In the ISE, the importance of debt indicators are effective to determine the company attitudes.
2. The gross profit margin, defining the cost operation in the net sales, is a deterministic fact on the HP or LP companies.
3. How high the profit before taxes against the company's equity is an important key point for the analysis on the ISE. This ratio signifies the profit responsibilities of companies via their equity. Assume that owners' equity is very high and yearly profit growth is sufficient on the large overall market, even though the equity and the profit growth are sufficiently high if the ROE remains small and decreases continuously. That means it may be the fault related with the condition of the company and this should be reflected on the attitude simultaneously. That is why the ROE is so important on the ISE.
4. Profit before extraordinary items and tax plus financial expenses were determined as profit, including other operations. This profit defines the profit, including participations and affiliated companies as well as the other operating income. The ratio of the ROA defines profitability of total assets. On the other hand, the credit cost is the ratio of financial expenses to the total financial loans. It is obvious that, in a high inflationary environment, the cost of credit is very important. In the model output determining the HP or a LP company, the ROA/credit cost ratio has an important effect.
5. The cash flow yield is a ratio of provisions plus net income to the total debts. Net income is not enough to determine the power of weak financial situation of a company. In the industrial companies,

there are some provisions like the retirement pay and depreciation. These provisions disguise the attitudes of the companies. That's why keeping a track of provisions as a plus fact of net income carries great importance on the ISE.

6. In the high inflationary environment, the companies should have overcome the yearly inflation rate in order to satisfy the opportunity cost of the alternative risk-free gain. So, the net profit growth rate should be greater than or equal to the annual declared inflation rate. This ratio measures the conclusions of the companies directly.

4.8.2. Summary of Findings on the NASDAQ:

1. Financial leverage on the NASDAQ has little impact on the determination of the HP or LP company. Including financial leverage solutions, results imply meaningless conclusions.
2. Operating leverage has high potential on the determination of company attitudes.
3. The effects of debt indicators within the overall company financial statement information is small.
4. Productivity is the dominant factor.

4.8.3. Comparison of the ISE and the NASDAQ:

1. The statistical model studies for country risk identify significantly independent, exploratory variables, such as the external debt to GNP, the debt service ratio, the level of debt relation to exports, income per capita, level of reserves in relation to imports and the current account of the balance of payments. The risks of different countries would conclude different financial structure and its analysis. The US is a developed country. So, low external debt-to-GNP ratio, a high income per capita, debt service ratio, reserves-to-imports describe a stable country. But, Turkey is a developing country. So, the importance of debt indicators is predominant and, according to the creditworthiness, it is riskier than the US.
2. In the real conditions of company definition, the leverage is composed of two different types, such as financial and operational. Although, in Turkey, operating and financial leverage carry the same importance to determine the company attitudes, in the US, the financial leverage does not carry the same importance. In other

words, it is not so meaningful to forecast the company attitudes including financial leverage criteria in the US.

3. Operating activity carries more importance in the US than in Turkey. Because, in the developed countries, productivity of the capital and labor is quite high against developing countries. In the US, the operating leverage creates a direct success for the companies. It is known that, in the developed countries, the cost of credit is low. Low credit rates imply that US companies have a potential to borrow. But, in the developed countries, annual standard deviations of credit cost is very high. In order to talk about a continuous financial corporate configuration, the company risks should be similar.

V. Conclusion:

The comparison of real conditions and the econometric model output is conducted on the designed parameters of the HPC for the ISE corporate data. Both the ISE and NASDAQ companies are tested in ex-ante sampling. It is concluded that the results are to much deviated from each other. This deviation of results could be interpreted in such a way that the designed parameters are valid only in the designed environment for specific applications.

The industrialized and developing country comparison of Wabe & Camara proposed that "output per input of capital services in some developing countries are half that of comparable industrialized countries."

Because of the macroeconomic differences between the ISE and NASDAQ, the financial structure of the individual markets' companies has been developed variously in the continuous time. Also, this difference is taken into account in the evaluation of consultant groups for country creditworthiness.

This research attempted to demonstrate that the market-specific conditions, like being a High-Performance or a Low-Performance Company or defining a market-specific threshold.[5] Aydoğan and Güney, in their study, defined a market average P/E on the ISE. On the market average P/E, they proposed to determine the investors'

[5]Kürşat Aydoğan & Alparslan Güney. "P/E Ratio & Dividend Yield as Forecasting Tools on the ISE." Bilkent Unv., June 1996.

positions.

The ISE companies conformed exactly with approved model in the case of dichotomous. And it is in the expectance interval for forecasting condition of multi alternative case. Finally, we conclude that such parameters are valid only for the ISE. On the other hand, NASDAQ companies and its financial ratios are meaningless for the definition of an HPC design on the ISE.

Thus, the vice versa of the conclusion is correct. Most of the critical financial research designed for the US can be applied also to the Turkish capital market fundamentally but not one-to-one and verbatim. In order to use any financial design, we should make a system test to realize its accuracy. The system test is like a system fuse. This test would clarify the market-specific conditions obviously.

References

Harry Deangelo, "Dividends and Losses," *Journal of Finance*, Vol. XLVII, No. 5, 1992.

Catherine A. Finger, "The Ability of Earnings to Predict Future Earnings and Cash Flow," *Journal of Accounting Research*, Vol. 32, No: 2, 1994.

Baruch Lev, S. Ramu Thiagarajan, "Fundamental Information Analysis," *Journal of Accounting Research*, Vol. 31, No: 2, 1993.

Mason S. Gerety, J. Harold Mulherin, "Trading Halts and Market Activity: An Analysis of Volume at the Open and The Close," *Journal of Finance*, Vol. XLVIII, No: 5, 1992.

Larry N. Bitner , Robert C. Dolan, "Accessing the Relationship Between Income Smoothing and the Value of the Firm," University of Richmond.

Eugene F. Fama, G. William Schwert, "Asset Returns and Inflation," *Journal of Financial Economics*, 1977.

Narasimhan Jedadeeshi, Sheridan Titman, "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency."

Ashiq Ali, "The Incremental Information Content of Earnings, Working Capital from Operations, and Cash Flows," *Journal of Accounting Research*, Vol. 32, No: 1, 1994.

Eugene F. Fama, Kenneth R. French. "The Cross-Section of Expected Stock Returns," *The Journal of Finance* Vol. XLVIII, No: 2, 1992.

Jane A. Ou. "The Information Content of Non Earnings Accounting Numbers as Earnings Predictors," *Journal of Accounting Research* Vol. 28 No: 1 1990.

Peter D. Easton, Trevor S. Harris, "Earnings as an Exploratory Variable for Returns," *Journal of Accounting Research*, Vol. 29, No: 1 1991.

David B. Cassidy, "Investor Evaluation of Accounting Information: Some Additional Empirical Evidence," Stanford University.

Yasushi Hamao, et all. "Fundamentals and Stock Returns in Japan."

Baruch Lev. "On the Usefulness of Earnings and Earnings Research Lessons and

Directions from Two Decades of Empirical Research," *Journal of Accounting Research*, Vol. 27, 1989.

Robert G. May, University of Washington, "The Influence of Quarterly Earnings Announcements on Investor Decisions as Reflected in Common Stock Price Changes."

Stephen J. Brown, Jerold B. Warner, "Measuring Security Price Performance," *Journal of Financial Economics,* 1980.

Ray Ball, Watts, "Some Time Series Properties of Accounting Income," *Journal of Finance.*

LeRoy D. Brooks, Dale A. Buckmaster, "Further Evidence of the Time Series Properties of Accounting Income."

Jane A. Ou, "The Information Content of Non-earnings Accounting Numbers as Earnings Predictors," *Journal of Accounting Research,* Vol.28, 1990.

Lawrence D. Brown, et all., "An Evaluation of Alternative Proxies for the Market's Assessment of Unpredictable Earnings," *Journal of Acc.& Econ.* 1987.

Ray Ball, Philip Brown, "An Empirical Evaluation of Accounting Income, Numbers".

Jane A. Ou, Stephen H. Penman, "Accounting Measurement, Price-Earnings Ratio, and The Information Content of Security," *Journal of Accounting Research*, 1989

Merton H. Miller. "Leverage, "*Journal of Finance,* Vol.XLVI, No: 2, 1991 (Nobel Memorial Prize Lecture, 1990).

Wabe, Camara, "Capital Utilization, Capital Intensity and Factor Productivity: A Comparison of Factories in Developing and Industrialized Countries," *Journal of Economic Studies*, 1982.

Miller, "Inflation, Unemployment and External Deficit: Theoretical Observation and Policy Consideration," *Journal of Economic Studies*, May 1975.

Miller, "Internal-External Balance and Relative Size: Further Comments," *Journal of Economic Studies*, May 1976.

Robert-Engle, "Autoregressive Conditional Heteroscadatisity With Estimates of UK Inflation," *Econometrica.*, Vol. 50, No: 4, July 1982.

Fischer Black. "Market Equilibrium with Restricted Borrowing," *Journal of Business.*, 45: 444-454., 1972.

John MacRee, "Underdevelopment and the Economics of Corruption: a Game Theory Approach," *Word Development,* Vol. 10, No: 8, pp. 677-687, 1982.

Friend-Landskroner-Losq, "Demand for Risky Assets Under Uncertain Inflation," *Journal of Finance*, Vol. 31, No. 5, December 1976.

Can Eker, "Portfolio Efficiency," Boğaziçi Univ. Master Thesis, June 1994.

William H. Beaver, "The Information Content of Annual Earnings Announcements."

William H. Beaver, "Market Price, Financial Ratios, and the Prediction of Failure."

The ISE Review Volume: 1 No: 4 October-December 1997
ISSN 1301-1650 © İMKB 1997

ISE Market Indicators

STOCK MARKET

Year	Number of Companies	Traded Value				Market Value		Dividend Yield	P/E Ratios
		Total		Daily Average					
		TL Billion	US$ Million	TL Billion	US$ Million	TL Billion	US$ Million	%	
1986	80	9	13	0.03	0.05	709	938	9.15	5.07
1987	82	105	118	0.42	0.47	3,182	3,125	2.82	15.86
1988	79	149	115	0.59	0.45	2,048	1,128	10.48	4.97
1989	76	1,736	773	6.81	3.03	15,553	6,756	3.44	15.74
1990	110	15,313	5,854	61.99	23.70	55,238	18,737	2.62	23.97
1991	134	35,487	8,502	143.67	34.42	78,907	15,564	3.95	15.88
1992	145	56,339	8,567	224.46	34.13	84,809	9,922	6.43	11.39
1993	160	255,222	21,770	1,037.49	88.50	546,316	37,824	1.65	25.75
1994	176	650,864	23,203	2,572.58	91.71	836,118	21,785	2.78	24.83
1995	205	2,374,055	52,357	9,458	209	1,264,998	20,782	3.56	9.23
1996	228	3,031,185	37,737	12,272	153	3,275,038	30,797	2.87	12.15
1997	240	3,055,473	24,372	25,462	203	6,423,060	43,846	3.01	17.09
1997/Q1	233	1,831,881	15,520	30,031	254	5,661,686	44,891	3.40	15.25
1997/Q2	240	1,223,592	8,852	20,393	148	6,423,060	43,846	3.01	17.09

*Q=Quarterly

Closing Values of the ISE Price Indices

TL-Based

Year	National-100 (Jan. 1986=1)	National-Industrials (Dec. 31, 90=33)	National-Services (Dec. 27, 96=1,046)	National-Financials (Dec. 31, 90=33)
1986	1.71	—	—	—
1987	6.73	—	—	—
1988	3.74	—	—	—
1989	22.18	—	—	—
1990	32.56	32.56	—	32.56
1991	43.69	49.63	—	33.55
1992	40.04	49.15	—	24.34
1993	206.83	222.88	—	191.90
1994	272.57	304.74	—	229.64
1995	400.25	462.47	—	300.04
1996	975.89	1,045.91	1,045.91	914.47
1997/Q1	1,613	1,602	1,451	1,769
1997/Q2	1,857	1,729	1,874	2,011

US$-Based

Year	National-100 (Jan. 1986=100)	National-Industrials (Dec. 31, 1990=643)	National-Services (Dec. 27, 1996=572)	National-Financials (Dec. 31, 1990=643)
1986	132	—	—	—
1987	385	—	—	—
1988	120	—	—	—
1989	561	—	—	—
1990	643	643	—	643
1991	501	570	—	385
1992	273	335	—	166
1993	833	898	—	773
1994	413	462	—	348
1995	383	442	—	287
1996	534	572	572	500
1997/Q1	744	739	669	816
1997/Q2	738	687	744	799

*Q= Quarterly

BONDS AND BILLS MARKET

Traded Value

Outright Purchases and Sales Market

Year	Total		Daily Average	
	TL Billion	US$ Million	TL Billion	US$ Million
1991	1,476	312	11	2
1992	17,977	2,406	72	10
1993	122,858	10,728	499	44
1994	269,992	8,832	1,067	35
1995	739,942	16,509	2,936	66
1996	2,710,973	32,737	10,758	130
1997	1,781,802	14,362	14,726	119
1997/Q1	1,172,033	9,893	19,214	162
1997/Q2	609,769	4,469	10,163	74

Repo-Reverse Repo Market

Outright Purchases and Sales Market

Year	Total		Daily Average	
	TL Billion	US$ Million	TL Billion	US$ Million
1993	59,009	4,794	275.74	22
1994	756,683	23,704	2,990.84	93
1995	5,781,776	123,254	22,943.56	489
1996	18,340,459	221,405	72,779.60	878
1997	20.673,217	161,754	170,853	1,337
1997/Q1	9,191,669	78,194	150,683	1,282
1997/Q2	11,481,548	83,560	191,359	1,393

*Q=Quarterly

ISE GDS Price Indices (December 25-29, 1995 = 100)

	30 Days	91 Days	182 Days	General
TL-Based				
1996	103.41	110.73	121.71	110.52
1997/Q1	103.93	112.24	124.53	112.40
1997/Q2	103.32	110.65	122.03	119.23
US$-Based				
1996	57.09	61.13	67.19	61.01
1997/Q1	48.76	52.66	58.42	52.73
1997/Q2	41.73	44.69	49.29	48.16

ISE GDS Performance Indices (December 25-29,1995 = 100)

	30 Days	91 Days	182 Days
TL-Based			
1996	222.52	240.92	262.20
1997/Q1	259.97	284.76	317.11
1997/Q2	305.53	332.68	370.48
US$-Based			
1996	122.84	132.99	144.74
1997/Q1	121.96	133.59	148.77
1997/Q2	123.40	134.37	149.64

*Q= Quarterly

The ISE Review Volume: 1 No: 4 October-December 1997
ISSN 1301-1650

Global Capital Markets

Flows of international capital to emerging markets increase due to high capital gains and portfolio strategy. This raises the importance of the role of foreigners in national market operations and creates differences in market liquidity. Portfolio investments, as well as playing an active role by adding to the efficient operating of the market, can also create a basis for an economic crisis. On the basis of the market indicators of 1997, international investors have the chance for arbitrage advantages. This can be illustrated by following the movements of price/earnings ratio. While increasing in Korea, Taiwan, Hungary, Mexico and Greece, P/E ratio fell drastically in Malaysia, Argentina, the Phillipines and Thailand. On the other hand, the ratio of market capitalization/book value followed widely different developments across various countries.

Due to the recovery of the American economy in the first half of 1997, the value of American capital markets reached high levels. This development can be followed by the Standard Poors Index which has increased from 645,6 to 885,1. In addition to this, the IFCG Index rose to 611.8 from 522.3.

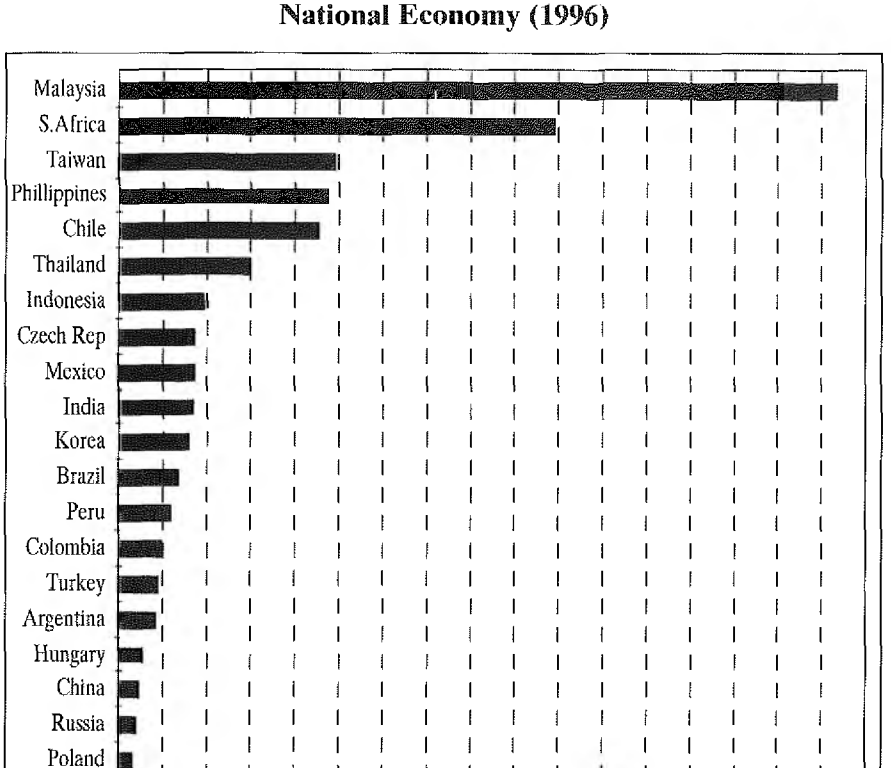
Taiwan, NASDAQ and Paris are the most liquid markets in terms of trade volume, market capitalization and turnover ratio. NYSE, NASDAQ and London have the highest trade volume while the Tokyo and Osaka markets are the biggest. Markets in which trade volumes have increased sharply in 1997 from previous year are Italy, Turkey, Thaiyland, Barcelona, Hong Kong, Bilbao, Copenhagen and Brussels. The trade volume and market capitalization of the NYSE increased while the market capitalization of the Tokyo Stock Exchange fell.

Price/earnings ratio of the ISE shows the trend of market expectations best among the emerging countries. The positive upward trend of 1997 points out to the fact that expectations at

the ISE will be encouraging positive this year, but measures for a stable growth should be taken.

High volumes of bond issues in 1997 increases the importance of such instruments as an alternative market to the equities. Market capitalization of all U.S. firms traded on the NYSE reached $7.3 trillion. The market capitalisation of bonds reached 6.8 trillion in France in the first half of 1997.

Emerging Stock Markets' Importance in the National Economy (1996)



Source: Emerging Markets Investor, Vol. 4, No. 3, March 1997, pp. 49, 56.

Note: The capitalization of the stock market as of December 1996 was the total market value of the listed and traded companies in the country's stock exchange or exchanges. GDP/GNP values are estimated by the Emerging Markets Investor.

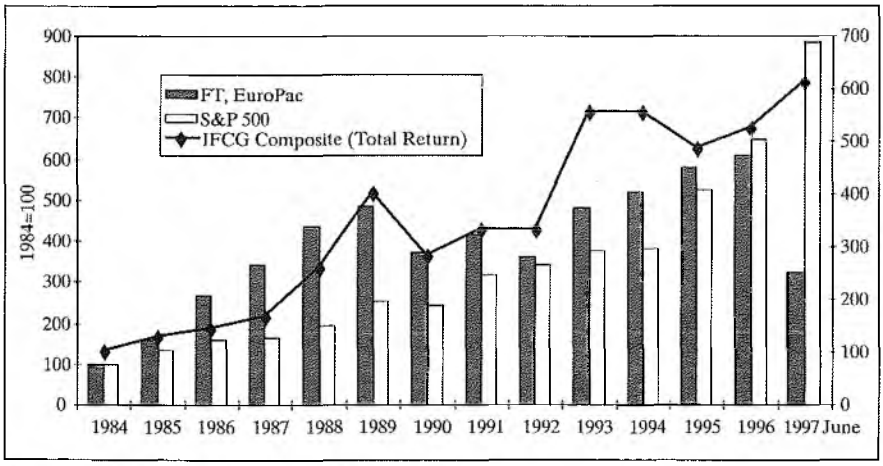
Market Capitalization ($ million, 1986-1997)

	Global	Developed Markets	Emerging Markets	ISE
1986	6,514,199	6,275,582	238,617	938
1987	7,830,778	7,511,072	319,706	3,125
1988	9,728,493	9,245,358	483,135	1,128
1989	11,713,683	10,975,62	2738,061	6,756
1990	9,393,545	8,782,267	611,278	18,737
1991	11,290,494	10,435,686	854,808	15,564
1992	10,833,177	9,949,721	883,456	9,922
1993	13,963,831	12,377,034	1,586,797	37,824
1994	15,154,292	13,241,841	1,912,451	21,785
1995	17,787,883	15,892,174	1,895,709	20,782
1996	20,158,845	17,932,888	2,225,957	30,797
1997*			2,702,741	43,846

Source: IFC Factbook, 1996, pp. 16-17; ISE Monthly Bulletin, January 1997.

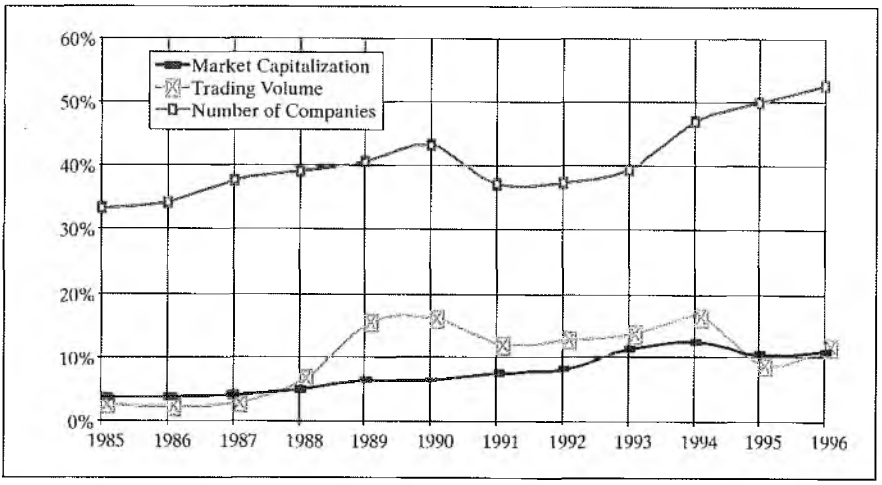
*July

Comparison of Markets' Indices (1984-1997)



Source: IFC Factbook, 1997, IFC Database.

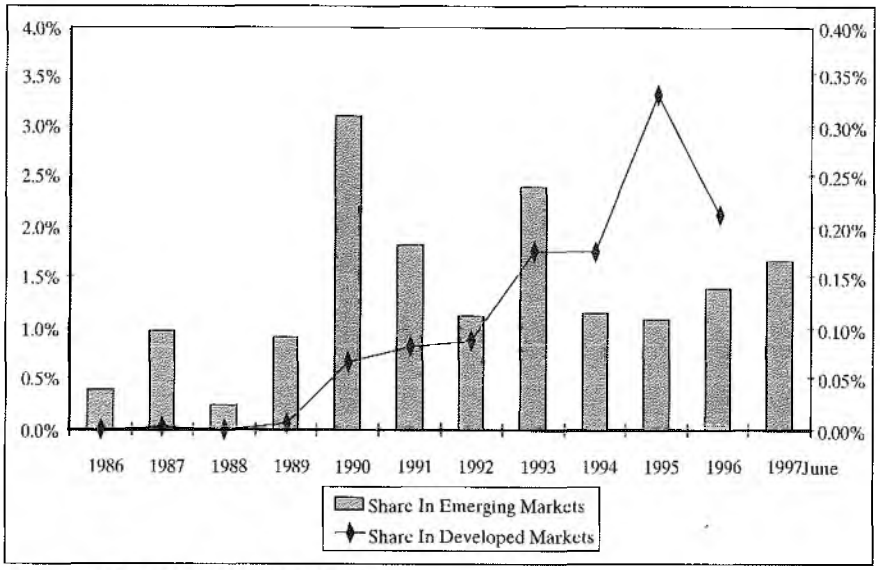
Worldwide Share of Emerging Capital Markets (1985-1997)



Source: IFC Factbook, 1996-1997, pp. 16-23, IFC Database.

Note: Number of traded companies in emerging markets increased dramatically until 1996 and the worldwide share reached above 50%. On the other hand, their share in the global capitalization was relatively very low, since the average sizes of the companies are significantly smaller.

The ISE's Share in World Markets (1986-1996)



Source: IFC, 1996-1997, IFC Database.

Main Indicators of Capital Markets (August 1997)

	Markets	Turnover Velocity (Monthly)	Markets	Value of Share Trading (US$ million, 1997 Jan.-August)	Markets	Market Capitalization of Shares of Domestic Companies (US$ million, August 1997)
1	Taiwan	470.3%	NYSE	3,674,670.00	NYSE	8,224,632.40
2	Paris	204.8%	NASDAQ	2,860,745.70	Tokyo	2,822,391.10
3	NASDAQ	187.9%	London	1,294,959.00	Osaka	2,308,568.60
4	Hong Kong	164.3%	Taiwan	962,043.90	London	1,939,543.80
5	Germany	137.8%	Paris	933,526.70	NASDAQ	1,753,000.30
6	Korea	117.8%	Germany	737,918.40	Germany	763,814.50
7	Switzerland	116.7%	Tokyo	624,152.00	Paris	587,776.90
8	Madrid	106.6%	Switzerland	390,812.20	Hong Kong	559,483.00
9	Jakarta	76.3%	Hong Kong	303,063.30	Toronto	558,876.50
10	Singapore	75.1%	Madrid	263,280.60	Switzerland	490,507.10
11	Bilbao	70.8%	Amsterdam	196,065.60	Amsterdam	445,174.90
12	Istanbul	70.1%	Toronto	194,460.40	Taiwan	346,569.80
13	Amsterdam	69.7%	Osaka	143,829.20	Australia	316,757.50
14	Oslo	67.2%	Korea	129,646.20	Italy	280,720.00
15	Mexico	66.3%	K. Lumpur	121,848.60	Rio de Jan.	278,282.10
16	B.Aires	65.8%	Italy	121,025.50	Madrid	272,250.40
17	K.Lumpur	65.6%	Australia	112,838.00	Johannes.	270,148.00
18	NYSE	63.4%	Stockholm	110,638.80	Stockholm	265,068.00
19	Stockholm	58.4%	Bilbao	105,580.40	Bilbao	204,242.20
20	Lisbon	57.3%	Singapore	51,913.30	Barcelona	200,291.70
21	Warsaw	55.5%	Mexico	36,739.90	K.Lumpur	186,154.30
22	Italy	53.3%	Jakarta	33,297.40	Mexico	144,817.30
23	Thailand	51.7%	Copenhagen	31,660.00	Korea	143,349.40
24	Copenhagen	49.2%	Oslo	30,007.90	Brussels	127,288.50
25	Vancouver	48.9%	Istanbul	29,814.20	Singapore	124,592.60
26	Toronto	48.2%	Johannesburg	29,131.30	Santiago	83,841.30
27	Australia	46.6%	Buenos Aires	25,443.90	Copenhagen	80,171.40
28	Helsinki	46.4%	Thailand	23,846.50	Helsinki	73,889.00
29	Vienna	46.3%	Helsinki	22,218.20	Oslo	65,210.10
30	London	43.6%	Brussels	21,748.60	Jakarta	61,500.50
31	Barcelona	36.5%	Rio de Jan.	17,518.10	B. Aires	58,557.80
32	Ireland	33.8%	Phillippines	16,203.70	Phillippines	47,733.50

Main Indicators of Capital Markets (August 1997)

	Markets	Turnover Velocity (Monthly)	Markets	Value of Share Trading (US$ million, , 1997 Jan.-August)	Markets	Market Capitalization of Shares of Domestic Companies (US$ million, Aug.1997)
33	Phillippines	33.6%	Barcelona	15,079.50	Ireland	46,201.80
34	Tokyo	33.0%	Athens	12,644.00	Tel-Aviv	45,783.50
35	Tel-Aviv	30.5%	Lisbon	12,335.50	Thailand	44,139.40
36	Athens	27.5%	Tel-Aviv	9,852.80	Istanbul	43,765.00
37	N.Zealand	25.9%	Ireland	9,491.80	New Zealand	35,282.70
38	Lima	21.4%	Vienna	8,438.00	Luxembourg	34,552.60
39	Brussels	20.9%	New Zealand	7,183.40	Athens	33,493.30
40	Johannes.	17.6%	Warsaw	5,459.80	Vienna	33,434.60
41	Santiago	7.6%	Santiago	5,313.90	Lisbon	32,139.00
42	Osaka	6.5%	Vancouver	4,544.10	Lima	16,811.80
43	Rio de Jan.	4.9%	Lima	2,714.90	Tehran	15,427.10
44	Tehran	4.5%	Tehran	881.40	Warsaw	13,002.60
45	Luxembourg	2.9%	Luxembourg	688.50	Vancouver	8,007.00

Source: FIBV, Focus, January 1997.

Trading Volume (US$ billion, 1986-1997)

	Global	Developed	Emerging	ISE	Emerging/ Global (%)	ISE/Emerging (%)
1986	3,573,570	3,490,718	82,852	13	2.32	0.02
1987	5,846,864	5,682,143	164.721	118	2.82	0.07
1988	5,997,321	5,588,694	408,627	115	6.81	0.02
1989	7,468,215	6,302,687	1,165,528	773	15.61	0.07
1990	5,512,129	4,617,688	894,441	5,854	16.23	0.65
1991	5,016,379	4,410,855	605,524	8,502	12.07	1.42
1992	4,778,429	4,165,501	612,928	8,567	12.83	1.34
1993	7,702,502	6,633,684	1,068,818	21,770	13.88	2.17
1994	10,085,703	8,445,585	1,640,118	23,203	16.26	1.32
1995	11,666,260	10,632,763	1,033,497	52,357	8.86	4.97
1996	13,580,050	11,993,232	1,586,818	37,737	11.7	2.38
1997*	-	-	-	24,373	-	-

Source: IFC Factbooks 1996-1997, pp. 20-21, IFC Database.
*Jan.-June

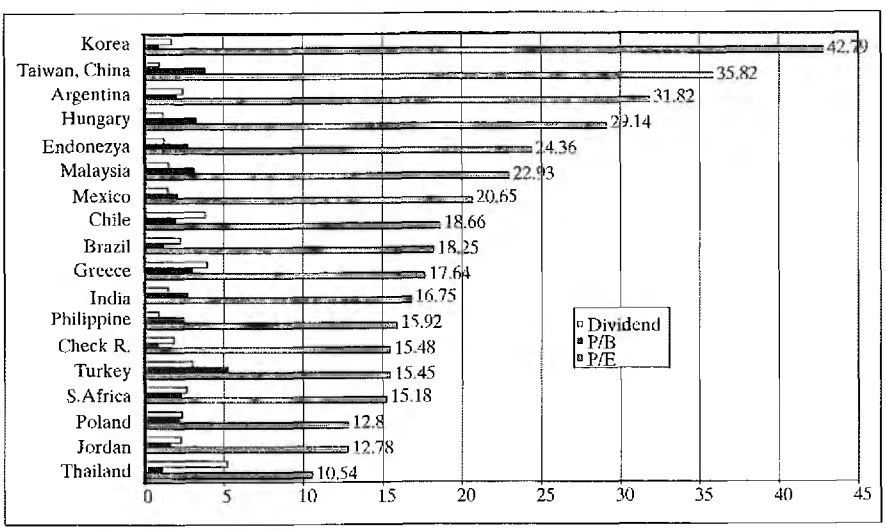
Number of Traded Companies (1986-1997)

	Global	Developed	Emerging	ISE	Emerging/ Global (%)	ISE /Emerging(%)
1986	28,173	18,555	9,618	40	34.14	0.42
1987	29,278	18,265	11,013	50	37.62	0.45
1988	29,270	17,805	11,465	50	39.17	0.44
1989	29,486	17,478	12,008	50	40.72	0.42
1990	28,918	16,403	12,515	110	43.28	0.88
1991	25,951	16,315	9,636	134	37.13	1.39
1992	27,586	17,227	10,359	145	37.55	1.40
1993	28,768	17,431	11,337	152	39.41	1.34
1994	36,078	19,064	17,014	176	47.16	1.03
1995	38,864	19,467	19,397	205	49.91	1.06
1996	42,351	20,088	22,263	228	52.60	1.36
1997*		-	-	-	246	-

Source: IFC Factbooks, 1996-1997, pp. 22, 23.

*June

Comparison of Markets' Performances (June 1997)



Source: IFC, 1996-1997, June 1997.

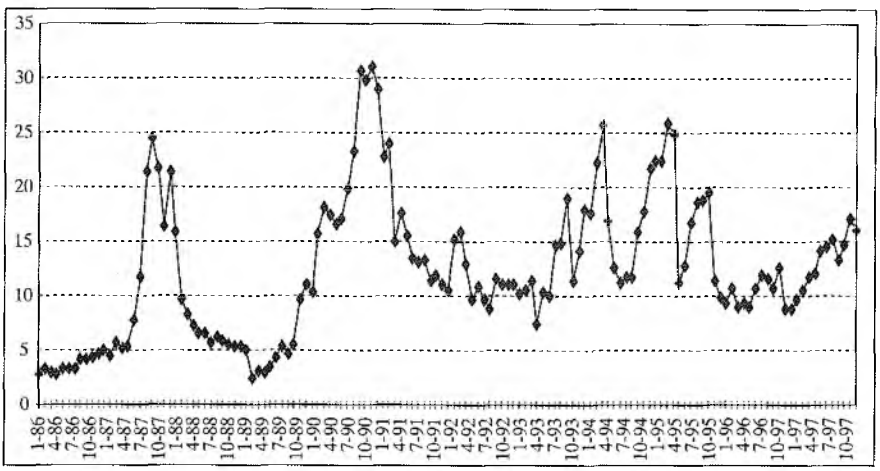
Notes: P/B= Market Value (Price)/Book Value; P/E = Price/Earnings.

Price-Earnings Ratios in Emerging Markets (1992-1997)

Markets	1993	1994	1995	1996	1997 Jan.	1997 June
Korea	25.1	34.5	19.8	11.69	12.57	42.79
Taiwan	34.7	36.8	21.4	28.16	29.45	35.82
Argentina	41.9	17.7	15	38.21	39.81	31.82
Hungary	52.4	-55.3	12	17.48	23.75	29.14
Indonesia	28.9	20.2	19.8	21.62	24.34	24.36
Malaysia	43.5	29	25.1	27.11	27.46	22.93
Mexico	19.4	17.1	28.4	16.79	16.73	20.65
Chile	20	21.4	17.1	27.76	15.85	18.66
Brazil	12.6	13.1	36.3	14.5	15.49	18.25
Greece	10.2	10.4	10.5	10.45	13.13	17.64
India	39.7	26.7	14.2	12.32	13.76	16.75
Philippines	38.8	30.8	19	19.99	20.69	15.92
Czech Rep.	18.8	16.3	11.2	17.62	14.67	15.48
Turkey	36.3	31	8.4	10.74	17.99	15.45
S. Africa	17.3	21.3	18.8	16.27	16.24	15.18
Poland	31.5	12.9	7	14.3	16.15	12.8
Jordan	17.9	20.8	18.2	16.89	14.93	12.78
Thailand	27.5	21.2	21.7	13.06	13.84	10.54

Source: IFC Factbook 1996, pp. 129-233; IFC, January 1997.

ISE's Price-Earnings Ratio (1986-1997)



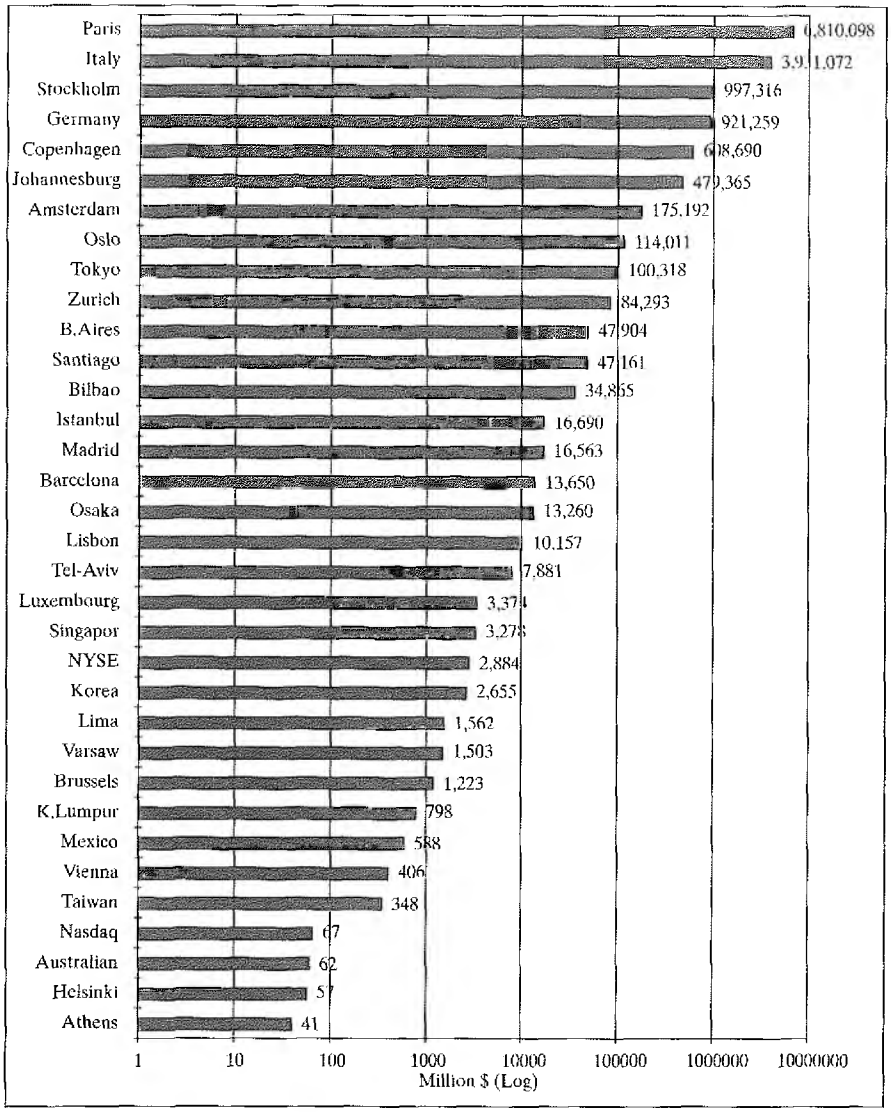
Source: ISE Monthly Bulletin, December 1996, July 1997.

Market Value/Book Value Ratios (1992-June 1997)

Markets	1993	1994	1995	1996	1997 Jan.	1997 July
Turkey	7.2	6.3	2.7	3.98	6.64	5.4
Taiwan. China	3.9	4.4	2.7	3.31	3.48	4.2
Hungary	1.6	1.7	1.2	1.97	2.6	3.7
Malaysia	5.4	3.8	3.3	3.78	3.98	3.1
Greece	1.9	1.9	1.8	2.01	2.58	2.9
Indonesia	3.1	2.4	2.3	2.66	3.01	2.9
India	4.9	4.2	2.3	2.07	2.45	2.8
Phippinnes	5.2	4.5	3.2	3.14	3.24	2.3
S.Africa	1.8	2.6	2.5	2.34	2.33	2.3
Poland	5.7	2.3	1.3	2.59	2.93	2.3
Mexico	2.6	2.2	1.7	1.68	1.88	2
Argentina	1.9	1.4	1.3	1.62	1.76	2
Chile	2.1	2.5	2.1	1.59	1.72	1.8
Jordan	2	1.7	1.9	1.71	1.9	1.7
Brazil	0.5	0.6	0.5	0.73	0.79	1.5
Thailand	4.7	3.7	3.3	1.78	1.73	1.2
Korea	1.4	1.6	1.3	0.76	0.8	0.9
Chech Rep.	1.3	1	0.9	0.89	0.97	0.8

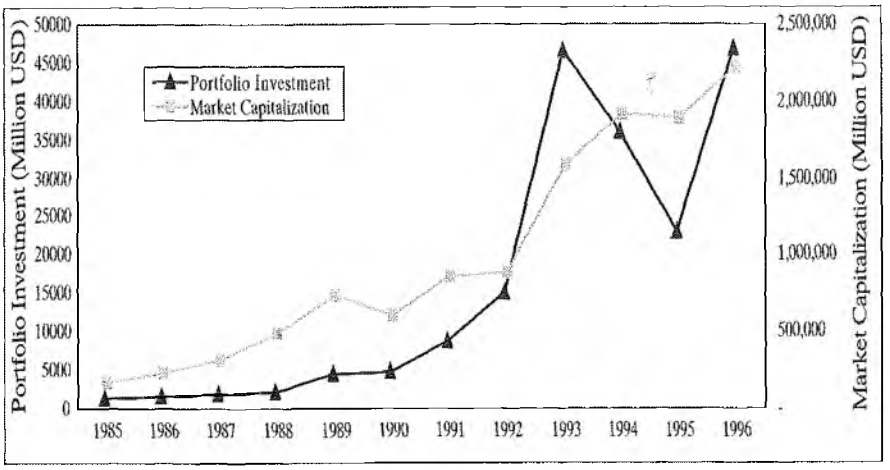
Source: IFC Factbooks, 1996-1997, pp. 129-233, IFC Monthly Review, June 1997.

Market Values of Bonds (US$ million, Jan.-Jul. 1997)



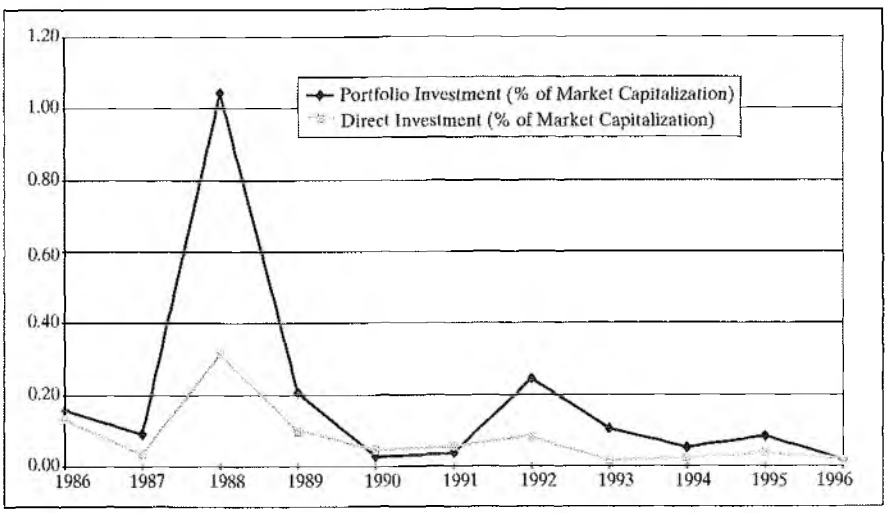
Source: FIBV, Focus, Monthly Statistics, July 1997.

Foreign Investment and Market Capitalization in Emerging Markets (1985-1997)



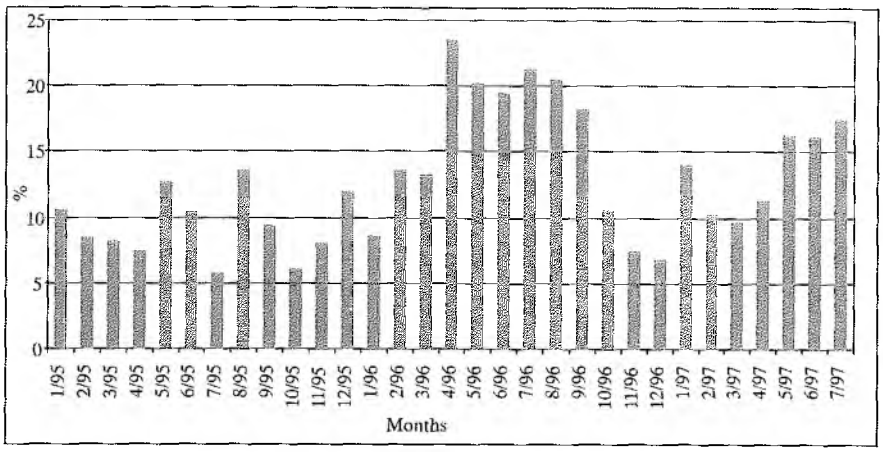
Source: IFC Factbook, 1996, pp. 6-23.
Notes: The portfolio investments as of 1996 were US$ 45,7 billion.

Foreign Investment as a Percentage of Market Capitalization in Turkey (1986-1996)



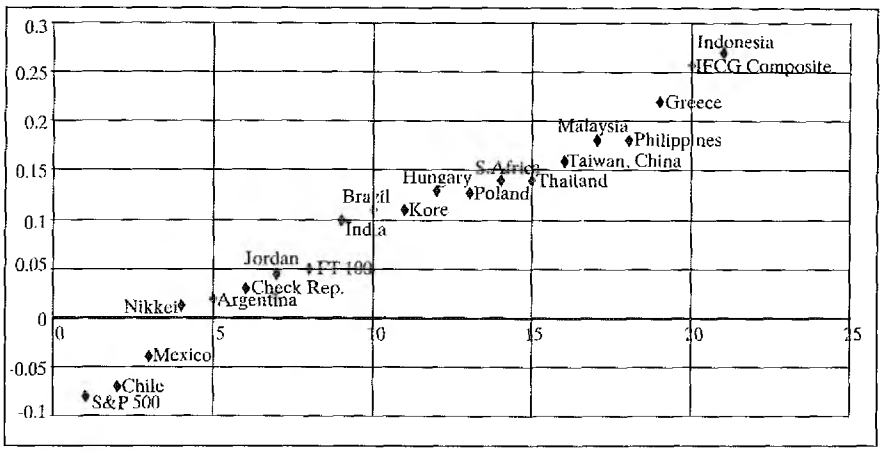
Source: SPO (DPT), Main Economic Indicators, July 1996, p. 47; January 1997; SPO, Economic and Social Indicators, 1950-1995, p. 36; ISE's Monthly Bulletins.

Foreigners' Share in the ISE's Trading Volume (Monthly, 1996-1997)



Source: ISE Monthly Bulletin, May 1997.

Return Index Correlations of the ISE (December 1991-December 1996)



Notes: The correlation coefficient is between -1 and +1. If it is zero, for the given period, it is implied that there is no linear relation between the two series of returns. For monthly return index correlations, IFCG see. IFC, Factbook 1997.

The ISE Review Volume: 1 No: 4 October-December 1997
ISSN 1301-1650 © İMKB 1997

Book Reviews

The Changing Environment of International Financial Markets, Dilip K. Ghosh, Edgar Ortiz, McMillan Press Ltd., Great Britain, 1994, pp. xi+339.

Along with the over-all trends prevailing in the world at the beginning of the 1970s, the rapid change in the financial markets towards globalization, stemming from the developments in computer technology, increased the value of international finance as a theoretical and analytical discipline. The book, titled "The Changing Environment of International Financial Markets," edited by Dilip Ghosh and Edgar Ortiz, systematically explains these rapid structural changes and improvements introduced to the financial system. The book consists of seven parts with the following headings: "Foreign Exchange Markets," "International Interest Rates," "Balance of Payments and International Reserves," "Foreign Debt and Analysis of Country Risk," "Capital Markets," "Taxes" and "International Banking." A total of 21 articles have been chosen from among more than 200 works, handling the specified subjects from different perspectives and clarifying the general framework of the international financial markets.

In the first chapter, written by the editors, a short evaluation of the financial markets is provided in addition to clarifications concerning the contents and parts of the book. The second chapter, focusing on foreign exchange markets, aims to explain long-term exchange rate patterns and market efficiency with unrestrained market fluctuations as well as government intervention "dualization" by establishing new econometric models and improving new techniques. Such analysis is important for companies enthusiastic to improve exchange rate risk management so they can become more competitive in the global economy. In the second chapter, headed the "Efficient Market Hypothesis," the developments on the London Foreign Exchange market is tested. In another article, the intervention of the Central

Bank in the foreign exchange markets is shown as unwarranted by using the time-series model.

The third chapter contains the section on the "International Interest Rates" and shows the importance of rates in the international financial markets. In the first part of this chapter, composed of four articles, topics encompass the Euro-currency and the Treasury Interest Rate Statistical Analysis.

The second article examines a new theory that determines the consumer discount rate which is estimated from the economic growth rate, the real interest rate and the marginal prospensity to consume. Weber, Highfill and Morey have used the "micro foundations of a macro theory." This approach has a dual advantage; it is based on the standard consumer choice theory and provides an easy way to calculate the basic macro economic data.

In the next chapter of the book, the balance of payments and international reserves are handled. The effects of foreign debt on national and international fluctuations are explained by investigating economies of developed and developing countries.

The second part is devoted to issues and trends prevailing in a world in which capital movements exist, with changes in the rate of national savings influencing the rate of investment prospects, causing modifications in the current account in the same proportion, as well. The subject of the other study covers the short- and long-term expectations surrounding the CMEA countries (Bulgaria, Romania, the Czech Republic, Slovakia, former East Germany, Poland and Hungary) in the international trade. Another article offers explanations on foreign debt by using the control cost factor.

According to C.A. Erickson and E. Willman, the optimal politics of governments is to borrow from international markets and distribute such resources to the private sector. The thesis contends that the decrease in the borrowing capacity of a government precipitates a decline in national production and, inversely, in consumption.

In another article in this chapter, the political risk in the Latin American stock markets is thoroughly analyzed through the direction of national expectation tendency. Fiscal and monetary politics are considered as the key determinants that identify the

political risk of the markets. By doing this, a relationship is established between the political variables of the government and the price performances of securities in the Latin American countries.

In the sixth section, Shariar Khaksari and Neil Seitz expand the work of Biger (1976), by adding profit shares in calculations of the outcome of common stocks. Klaus P. Fischer, Edgar Ortiz and A.P. Palasvista improve the theories of alternative corporate management, organization and risk administration based on modern financial thinking in the less developed countries. In addition to this approach, they discuss that, for investors, political risk plays a crucial role as well as the systematic risk in the developing countries.

Joanna Poznanska evaluates the effective economic development episode of South Korea. The author analyzes the stuructural changes in the financial system of the Korean government by sifting through the causes of the last government's functions in the financial sector. Giles Duteil and Abraham Mulugetta conducted a research on the capital markets and listing on the stock market. The research on liquidity, market depth and the micro-structure features assert that such factors are important for investors in their decision-making process and portfolio management.

The last section of the book is related to the tax problems and the tax models under open and closed economies. A. Cabollo probes all of the prime trends and developments observed in the globalization of the international banking industry. Meanwhile, D.K. Ghosh advances another view, arguing that scholars should try to determine when the same or different tax models should be adopted for a specific country. In the latest article, I.F. Honigman concentrates on ideas and solutions designed to improve the international banking sector.

Institutional Investors and Corporate Governance, Carolyn Kay Brancato, Irwin Professional Publishing, 1997, pp:xxii + 242.

Developed capital markets have a very important role as they support the financial system to implement its functions which can be broadly described as: creating a balance between fund supply and

demand while allowing the optimal allocation of financial resources among economic units, in terms of amount and maturity, so they can be utilized effectively in economic development.

In addition, an increase in savings is necessary for attaining economic growth while it is imperative that such saved funds are channeled into productive investments. Diverting the savings pool into productive investments is possible by acquiring information on alternative costs and a subsequent analysis conducted by professionals. An ability to structure the right decision quickly, a comprehensive knowledge base and technical endowment are necessary for a sound analysis and most of the individual investors are not equipped with such assets. They tend to invest in line with institutional investors.

Institutional investment has begun to develop in a fascinating pace after the Second World War. The momentum has gained an added dimension especially in the last two decades. Total assets controlled by institutional investors have tripled between 1970-1980 and even more than this ratio between 1980-1990. The annual growth rate of institutional investors after 1980 is about 10%-15%. In 1995, institutional investors accounted for 22% of total financial assets in the US and their ownership in the Top 1,000 corporations is approximately 57% during the same period. With their total assets amounting to more than 10 trillion dollars, institutional investors constitute an excellent source for corporations with capital needs. The book, written by Kay Brancato, investigates the mutual benefits of institutional investors and corporations and offers a different perspective on the popular subject of institutional investment. It sheds light also on what institutional investors expect from corporations and the extent of the satisfaction of their expectations and the measures designed to create shareholder-investor value. After examining the changes taking place in corporate governance and organization, the strategies projected to maximize such mutual benefits are reviewed.

The book challenges two myths of short-termism, with the first one claiming that investors and shareholders have a short-term view and seek short-term profits, while the second plot suggests that the investors' psychology is an obstacle for corporations in management,

applying pressure on them so that corporations do not indulge in long-term investments. The writer contests the first myth and, by analyzing the portfolios of institutional investors, it attempts to prove that some have very long-term strategies for investment. On the second task, an attempt is made to prove that most of the international corporations are not short-term profit-seekers and vice versa. Hence, the long-term success, the shareholder and the firm's worth are more important for them. In recent times, firms do not have only strategic plans for the future but they also invest in intangibles, such as research, environmental protection etc. for their long-run progress and success. It is more important that the firm provides an expected rate of return to investors at a planned period, making a distinction between the short- and/or long-term intentions.

The takeover phenomenon observed in the 1980s, experiences and the improvements in corporate governance in due time, modern approaches and the increasing power of institutional investors in management constitute the subjects of the second part. In the last decade, American institutional investors, like pension funds and mutual funds, began to realize the importance of the financial power they possessed. The key issues in this chapter may be classified as; the scope of responsibilities, the composition of the board, the number and nature of the board committees, procedures for providing information between boards, management and shareholders, methods to evaluate the Chief Executive Officers (CEO) and board members and procedures to secure accountability to shareholders. The new approach in corporate governance can be summarized as "good governance is good business."

Chapter 5 explains the way corporations can choose for the most suitable investor base and the methods considered for attracting this group of investors. Corporations analyze and then alter their stock ownership base to target investors who display their loyalty. This strategy resembles the one, long adopted by marketing managers to sell new products to a special group of customers. So, the shareholder, in a sense, is another type of customer for corporations.

Institutional investors, the fastest growing group with tremendous assets and increasing power, will certainly shape the future of the financial system since they are not only a very crucial source for the

corporations' capital requirements but also they cause a rapid change in corporate governance. The book, titled "Institutional Investors and Corporate Governance," is an excellent source not only for the purpose of comprehending the cross-current developments in the past but also developing an insight into what the future holds for the global financial system.

Privatization And Capital Market Development, Michael P. McLindon, Preager Publishers, USA 1996, pp. xi + 163.

Along with the break up of the former Soviet Union at the beginning of the 1990s, the view claiming that the economic model depending on free competition is superior to the socialist model in which the decisions are taken by the central authority rather than the market incentives has begun to be more popular than ever before. Imposing a structural change in the economic system without considering the nations' conditions and lack of preparations, have caused most of the Middle and Eastern European countries to become poorer and live through an unstable era. Now, it is well known that for the market economy to work properly, first the charateristics of the economies should be identified correctly, then the solutions should be realistically determined and implemented decisively.

As it is in opposition with the soul of the new system that the production is being made by central planning and the state has most of the ownership of productive vehicles, a rapid mass privatization, - generally starting from huge industrial enterprises - has begun to take place in economies in transition. McLindon, as an expert who took part in many privatization processes in Moldova, systematically expresses his ideas and experiences in a different perspective in the book entitled "Privatization and Capital Market Development." The book contains eight parts investigating the privatization experiences in many countries and constructs a link between privatization and capital market development. As privatization is a redistribution process of the ownership of SOEs, and the redistributed shares of enterprises provide liquidity to the secondary

markets, it is a critical and crucial step in establishment of liquid and dependable secondary markets.

In the introductory chapter, privatization experiences and development of capital markets over the last decade and the contributions to the economic growth are mentioned. The data collected from developing countries indicates that neither privatization nor capital markets have firmly taken root.

Chapter 2, entitled "Privatization" identifies the problems about State-Owned Enterprises (SOEs) and explaining the need for privatization, the writer defines its critical role in economic reform. He shows that the main reasons for privatization are the inefficient and unproductive structure the sales (SOEs).

After determining the reason why SOEs have failed to achieve what was expected of them, he discusses the different types of privatization and explains privatization in different regions of the world. The other section in this chapter is about the benefits of privatization: greater efficiency and productivity of enterprises, capital market development, profitability and attracting foreign investment.

Chapter 3 defines the basic financial terms and explains the role of the financial markets and the capital markets in the economy. The next part discusses three reasons why financial markets and, especially, capital markets are underdeveloped: the impact of government policy and intervention, the dominance of the banking system in the developing countries and the failure to fully privatize the economy. Then, it summarizes the benefits of advanced capital markets.

In chapter 4, the elements which contributes to the development of the capital markets (i.e. public awareness, stock market infrastructure) are analyzed in relation with privatization. It is emphasized that privatizing state owned enterprises will play an important role in increasing supply and demand for shares. The development of corporate bond market is also briefly discussed.

Chapter 5 sheds light on the experiments of countries in Western Europe, Latin America and Asia in privatization and capital market development. Privatization, by using broad-based share sales, are considered to be useful for the capital market to develop.

Chapter 6 focuses on why it was necessary to implement mass

privatization (groups of enterprises had to be transferred to the population, using standart, transparent procedures) techniques in the transition economies of Eastern Europe and the former Soviet Union. When different approaches to privatization are analyzed, the use of privatization certificates, known as "voucher," are found to be the most effective way. Finally, capital markets in countries adopting mass privatization by voucher is more developed than the countries which have used other approaches in privatization.

The following chapter focuses on the interaction of privatization and capital market development for sectors. The sectors which are provisions of economic infrastructure - especially telecommunications and power - and instutional investors, such as social security, pension funds and mutual funds are becoming important for current and future economic growth.

In chapter 8, a summary and conclusions take place. Privatization and capital markets are key components of reform and help to promote economic growthwhen governments privatize successfully they tend to fare well politically because citizens realize that economic reform promotes growth and higher incomes. Privatization and capital market development will not solve all the problems by themselves, but they are the steps required for growth and development.

ISE PUBLICATIONS		
I- PERIODICALS	ISSN/ISBN	DATE
Weekly Bulletin	ISSN 1300-9311	
Monthly Bulletin	ISSN 1300-9303	
Monthly Bulletin*	ISSN 1300-9834	
Quarterly Bulletin (January-September '96/3)	ISSN 1300-9826	
Annual Factbook 1996*	ISSN 1300-9281 and ISBN 975-8027-03-4	1997
Quarterly Bulletin of Newly Trading Stocks at the ISE		1995
Sectoral Analysis of Companies Trading at the ISE		1995
Yearbook of Companies 1996	ISSN 1301-1057 and ISBN 975-8027-13-1 (Vol.I.No: ISBN 975-8027-14-X)	1996
ISE Companies 1995/6 (General Information and Financial Statements)		1996
ISE Companies-Capital, Dividend and Monthly Price Data (1986-1996)	ISSN 1300-929X and ISBN 975-8027-02-6	1996
ISE Annual Report (1995)		1996
ISE Members -General Information 1996	ISSN 1301-0360	1996
Financial Statements and Independent Auditing Reports of Brokerage Houses 1995	ISBN 975-8027-11-5	1996
Capital Increases and Dividend Payments of Companies (1986-1994)		1995
Adjusted Prices and Returns of Stocks (1986-1995/6)		1995
ISE Review (Quarterly)	ISSN 1301-1642	1997

II- RESEARCH PUBLICATIONS		
Taxation of Capital Market Instruments in Turkey - Sibel Kumbasar Bayraktar		1994
International Portfolio Investment Analysis and Pricing Model - Oral Erdoğan		1994
Portfolio Investments in International Capital Movements and Turkey - Research Department		1994
Linkage with International Markets (ADR-GDR) and Alternative Solutions to the Turkish Capital Market - Kudret Vurgun		1994
Modern Developments in Investment Theory and Some Evaluations and Observations at the ISE - Dr. Berna Ç. Kocaman		1995
International Capital Movements and their Macroeconomic Effects on the Third World Countries and Turkey - Dr.. Sadi Uzunoğlu - Dr. Kerem Alkin - Dr. Can Fuat Gürlesel		1995
Institutional Investors in the Developing Stock Exchanges : Turkish Example, Problems and Proposed Solutions - Dr. Targan Ünal		1995
The Integration of European Union Capital Markets and the Istanbul Stock Exchange- Dr. Meral Varış Tezcanlı - Dr. Oral Erdoğan	ISBN 975-8027-05-0	1996

II- RESEARCH PUBLICATIONS		
Personnel Administration- Sebnem Ergül	ISBN 975-8027-07-7	1996
The European Union and Turkey- Prof. Dr. Rıdvan Karluk	ISBN 975-8027-04-2	1996
Repo and Reverse Repo Transactions - Dr. Nuran Cömert Doyrangöl	ISBN 975-8027-12-3	1996
Insider Trading and Market Manipulations - Dr. Meral Varış Tezcanlı	ISBN 975-8027-17-4 and ISBN 975-8027-18-2	1996
The Integration of European Capital Markets and the Turkish Capital Market - Dr. Sadi Uzunoğlu - Dr. Kerem Alkin - Dr. Can Fuat Gürlesel	ISBN 975-8027-24-7	1997
Strategic Entrepreneurship: Basic Techniques for Growth and Access to Foreign Markets for Turkish Companies	ISBN 975-8027-28-X	1997
ISE- Examination Questions (1994-1996)	ISBN 975-8027-29-8	1997
Research Studies on Capital Markets and the ISE	ISBN 975-7869-04-X	1996
Regulations Related to Capital Market Operations- Vural Günal	ISBN 975-8027-34-4	1997
Stock Exchange Conflicts, Law, Regulations and Cases	ISBN 975-8027-33-6	1997
DERIVATIVES MARKET PUBLICATIONS		
Futures and Option Pricing on Capital Market Instruments -		
Futures & Options Department		1995
Interest Rate Futures - Futures & Options Department		1995
Some Basic Strategies with futures and options in the Shares Market -Translated by Mustafa Kemal Yılmaz		1996
SECTORAL RESEARCH		
Automotive Sector- Sibel Kumbasar Bayraktar		1995
Textile Sector (Cotton)- Efser Uytun		1995
Food Sector (Tomato Paste)- Ebru Tan		1995
Glass Sector- Özlem Özdemir		1995
Insurance Sector- Çağatay Ergenekon		1995
Tourism Sector- Oral Erdoğan		1995
Manufacturing Paper and Paper Product Sector- Çağatay Ergenekon	ISBN 975-8027-09-3	1996
Textile Sector (Artificials-synthetic, Woolen, Manufactured Clothing, Leather and Leather Goods)- Efser Uytun	ISBN 975-8027-10-7	1996
Food Sector (Vegetable Oil, Meat, Fruit, Dairy Products, Sugar, Flavour Products, Animal Feed) Research Department	ISBN 975-8027-19-0	1997
RESEARCH ON THE STOCK EXCHANGE HISTORY		
Stock Exchange Guide (1928)		1992
The Stock Exchange and the Financial System During the Ottoman Period		1992
History of the Stock Exchange in Turkey		1993

ISE PUBLICATIONS		
III- EDUCATION	**ISSN/ISBN**	**YIL**
Basic Information Guide on Capital Markets and the Stock Exchange	ISBN 975-8027-20-4	1997
III- BOOKLETS		
Glossary of Stock Exchange Terminology		1995
Investors' Guide		1995
Settlement and Custody		1995
Futures Transactions		1995
ISE 100 Index		1995
Transactions of Fixed-Income Securities		1995
Indexes of Governmental Debt Securities		1995
Administration of the Istanbul Stock Exchange		1995
Catalogue of ISE Publications		1995
Investors Advisory Center		1995

(*) Publications marked by (*) are in Turkish and English.

For further inquiries, please contact :
Training and Publications Department
Tel : 90 (0212) 298 24 24
Fax : 90 (0212) 298 25 00

In order to subscribe to "The ISE Review," please fill out the following form and return to:

Hülya KARADAŞ
IMKB (ISE)
Araştırma Bölümü (Research Department)
80860, Istinye, Istanbul TURKEY
Phone: 90-212 298 21 78
Fax: 90- 212 298 25 00

Objectives and Contents

The ISE Review is a journal published quarterly by the Istanbul Stock Exchange (ISE). Theoretical and empirical articles examining primarily the capital markets and securities exchanges as well as economics, money, banking and other financial subjects constitute the scope of this Journal. The ISE and global securities market performances and book reviews will also be featuring, on merits, within the coverage of this publication.

Copy Guides for Authors

Articles sent to the ISE Review will be published after the examination of the Managing Editor and the subsequent approval of the Editorial Board. Standard conditions that the articles should meet for publication are as follows:

1. Articles should be written in both English and Turkish.
2. Manuscripts should be typed, single space on an A4 paper (210 mm. x 297 mm.) with at least 3 cm. margins. Three (3) copies of the texts should be submitted to:
   Istanbul Menkul Kıymetler Borsası (ISE),
   Araştırma Bölümü (Research Department)
   Istinye, 80860, Istanbul TURKEY
   Articles will not be returned to the authors. The ISE is not responsible for lost copy or late delivery due to complications during the mailing process.
3. Articles should be original, unpublished or shall not be under consideration for publication elsewhere.
4. If and when the article is approved by the Editorial Board, the author should agree that the copyright for articles is transferred to the publisher. The copyright covers the exclusive right to reproduce and distribute the articles.
5. If necessary, the Editorial Board may demand changes, deletions and/or modifications in the contents of the article without infringing on the basic structure of the text.
6. Articles, approved for publication, should be written in Windows, Word and Excel programs for PC and should be despatched to the address above, formatted in a 3.5-inch disk.
7. The first page of the article should contain a concise and informative title, the full name(s) and affiliation(s) of the author(s) and an abstract of not more than 100 words, summarizing the significant points of the article. The full mailing address, telephone and fax numbers of the corresponding author, acknowledgements and other related notes should also appear in the first page as footnote(s).
8. The main text should be arranged in sequentially numbered sections. The first section should be titled "Introduction," while the last section should be titled "Conclusion" as the others should be titled and numbered with a second digit (2.1, 3.2 and so on). Using boldface is necessary to indicate headings.
9. References to personalities in the text should be entered as: Smith (1971) or (Smith, 1971); two authors : Smith and Mill (1965) or (Smith and Mill, 1965); three or more authors: Smith, et al. (1974) or (Smith et al., 1974). References to papers by the same author(s) in the same year are distinguished by the letters a, b, c, etc. (e.g. Smith, 1974a). References should be listed at the end of the paper in alphabetical order.
10. Footnotes should be subsequently numbered and are to be placed at the bottom of the related page. Examples of footnote use are:
    -Books with one author:
    [1]Hormats, Robert D., "*Reforming the International Monetary System; From Roosevelt to Reagan,*" Foreign Policy Association, New York, 1987, pp. 21-25.
    -Books with two authors:
    [3]Hoel, P.G., Port, S.C. "*Introduction to Probability Theory,*" Houghton Mifflin Company, US, 1971, p. 241.
    -Books with more than three authors:
    [5]Mendenhall, W., et al., "*Statistics for Management and Economics,*" Sixth Edition, WPS Kent Publishing Company, Boston, 1989, p. 54.
    -Articles:
    [9]Harvey, Campbell R., "*The World Price of Covariance Risk,*" The Journal of Finance, Vol. XLVI, No.1, March 1991, pp. 11-157.
    -Publications on behalf of an institution:
    [4]*Federal Reserve Bulletin, Washington, 1992-1993-1994.*
11. Tables and figures should be sequentially numbered with a brief informative title. They should be comprehensible without reference to the text incorporating the full text, heading and unit of measurements. Source of the information and explanatory footnotes should be provided beneath the table or figure.
12. Equations should be centered and displayed on a separate line. They should be numbered and referred to in the main text by their corresponding numbers. Development of mathematical expressions should be presented in appendices.