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MULTI-BETA CAPITAL ASSET PRICING MODEL AND AN APPLICATION IN TURKEY

Hatice DOĐUKANLI *
Serkan Yılmaz KANDIR **

Abstract

Capital asset pricing model (CAPM) has been making a significant contribution in solving the decision-making problems of portfolios. Yet, the model has its restrictive assumptions. Multi-beta CAPM was developed in order to solve the problem stemming from the assumption that the market is the sole source of risk and considers more risk sources. In this study, multi-beta CAPM has been developed by using the ISE National-100 Index and the ISE-DIBS (Index of T. Bills and T. Bonds) indices as risk factors. This study examines whether 32 stocks of the financial sector are priced appropriately and which risk factor is more effective in stock pricing. According to the results of the regression analysis estimated among stock returns and the ISE National-100 Index and the ISE-DIBS indices, 8 stocks provide statistically meaningful returns. In other words, 8 stocks obtained returns more than the model forecasts. When the importance of risk sources is examined, it is concluded that, the ISE National-100 Index is an important factor in determining stock prices for all stocks, whereas the ISE-DIBS index is an important factor for 12 stocks in the 95% confidence level.

I. Introduction

One of the most significant developments in financial theory is the introduction of “Modern Portfolio Theory (MPT)”. Before MPT, the most prominent factor in investing in stocks was to make a basic analysis of the company issuing the

stock. Implementing a basic analysis is an expensive and time-consuming process. Harry Markowitz, the introducer of MPT, brought out an important newness by putting forward that the value of a stock can be determined with respect to the expected return, expected standard deviation of the returns and correlation between stocks. Thanks to MPT, without making comprehensive examination of firms, it has become possible to make investment decisions by just examining the average return of stocks, standard deviation of returns and correlation between stocks.¹

Markowitz model was developed in two types; full-variance and mean-variance. Since it is not practical to use the full-variance type, mean-variance type became popular. (Farrell, 1997). But, the usage of mean-variance type did not prevent the model from being strenuous, time-consuming and complex. Determining the expected return and risk requires the usage of 11.475 and 31.625 data, respectively (Elton and Gruber, 1995). In fact, it is possible to reduce these figures by applying some methods which make simplifying assumptions. Most commonly used of these methods is the capital asset pricing model.

II. Capital Asset Pricing Model in General

William F. Sharpe (1963) and John Lintner (1965), developed a model that could be applied to all securities. This model that states expected return of a security or portfolio as a function of its systematic risk is called CAPM (Kolb and Rodriguez, 1996).

CAPM relates the expected return of an asset or a portfolio to expected return of the market. It is possible to calculate the expected return of an asset or a portfolio by using the beta of the asset or portfolio, provided that expected return of the market and risk free interest rate are known. These statements can be formulated as below (Pettengill, Sundaram and Mathur, 1995):

$$E(R_i) = R_f + \beta_i (E(R_m) - R_f) \quad (1)$$

$E(R_i)$ = expected return of asset or portfolio i

R_f = expected return of the risk-free asset,

β_i = beta of the asset or portfolio i ,

$E(R_m)$ = expected return of the market,

$(E(R_m) - R_f)$ = risk premium of the market.

* Prof. Dr. Hatice Dođukanlı, Çukurova Üniversitesi, İİBF, İşletme Bölümü, Balcalı, Adana 01330, Türkiye.

Tel: (0322) 3387254 Fax: (0322) 3387283 E-posta: hatdog@mail.cu.edu.tr

** Arş. Gör. Serkan Yılmaz Kandır, Çukurova Üniversitesi, İİBF, İşletme Bölümü, Balcalı, Adana 01330, Türkiye.

Tel: (0322) 3387254 Fax: (0322) 3387283 E-posta: skandir@mail.cu.edu.tr

¹ (Goetzmann, <http://viking.som.yale.edu/will/finman540/classnotes/class2.html>).

Beta measures the sensitivity of expected returns from an asset or a portfolio to expected market returns (Chen, 2003):

$$\beta_i = \text{Cov}_{im} / \sigma_m^2 \quad (2)$$

β_i = beta of asset or portfolio i,

Cov_{im} = covariance between returns of asset or portfolio i and market returns,

σ_m^2 = variance of market returns.

CAPM uses two different lines determining the relation between expected return and risk in order to explain how assets are priced. These lines are, the Capital Market Line (CML) and the Security Market Line (SML). Both lines inform investors about the returns any investor can expect for a definite risk level.

CML relates expected returns and standard deviation. To put it differently, it considers all risks without making discrimination between systematic and nonsystematic risk. In equilibrium, all efficient portfolios should be priced so that they can be placed on CML (Haugen, 2001). Other than CML, when expected returns relate to beta, SML is obtained. SML, accepts systematic risk as the appropriate risk measure. SML does not give information about total risk. It reflects just the systematic risk calculated by using beta and only systematic risk is priced in the market (Kolb and Rodriguez, 1996). In balance, all stock returns are located on SML. Then all assets are priced in a level harmonious with their systematic risk (Reilly, 1986).

CAPM has become a widely used model as it provides information about explaining stock returns and can be applied easily. Yet, some assumptions of CAPM oversimplify the realities. CAPM relates stock returns only to stock market that affect stock returns. Some other models were developed considering these factors. These models are, Multi-Beta CAPM, Multi-Index model and Arbitrage Pricing Model. Since it is a transition to Arbitrage Pricing Model and the subject of the study, Multi-Beta CAPM is examined in a detailed way.

III. Multi-Beta Capital Asset Pricing Model

CAPM or Single-Index Models are useful in classifying risks relevant to returns as systematic risk and firm-related risks, though it is hard to understand. Systematic and macro risks are summarized by market index and come from different sources. Changes in interest rates and inflation rate can be counted among those resources. In order to state systematic risk more clearly, standard CAPM model should be developed so that it could measure sensitivity to

different risk sources. At the end of this development process, multi-beta CAPM is obtained.

In CAPM, market return is divided into pieces to be a consolidation of many economic variables or factors. Beta of any stock can be written as linear consolidation of betas relevant to those factors (Shanken, 1985).

Multi-beta CAPM, which was developed first by Merton, has become a leader to the studies which examine how different risk sources affect stock returns. The first one of these studies was performed by King (1966). In this study, King examined the sensitivity of USA stocks to the market between 1927-1960 period. He found out that half of the changes in stock returns were due to market index and 10% to industry effect. Meyers (1973), examined King's findings and reached to results akin to those of King. However, he concluded that industry effect was overstated in King's study. In the following years, Roll and Ross (1980) made a significant research aiming at determining the adequate number of stocks to explain stock returns. Covering 1962-1972 period, Roll and Ross concluded that at least 3 and at most 5 factors should be used to explain stock returns. Kryzanowski and To (1983) made a similar research and got similar results. Covering 1948-1977 period, they applied factor analysis and stated that it is no good to use more than five factors. Another study aiming at determining the important number of factors to explain stock returns was performed by Brown (1989). In his study, he applied arbitrage pricing model and found out that market indices are important in determining stock returns, whereas some other factors have limited importance. Chen, Roll and Ross (1986).

Put forward a different approach to the subject by using macroeconomic variables in determining stock returns. They concluded that some of 7 factors which they used in their study had no effect on stock prices. This conclusion points out an opposite direction from Brown's study.

Whereas CAPM claims that market risk is to be priced; multi-beta CAPM has proved that other risks than the market should be considered. Merton suggested that some factors such as uncertainty in wages, prices of some important consumer goods and increases in risks of some asset groups could be considered as risk sources (Bodie, Kane and Marcus, 1999). The multi-beta CAPM equation that measures the sensitivity to stock index and bond index can be denoted as follows (Elton and Gruber, 1997):

$$R_{pt} - RFR = \alpha_p + \beta_p (R_{mt} - RFR) + \beta_p' (R_{m't} - RFR) + e_{pt} \quad (3)$$

R_{pt} = expected return of the portfolio,
 RFR = risk-free interest rate,
 α_p = constant term,
 β_p = sensitivity of the portfolio to stock index,
 R_m = return of the stock index,
 β_p' = sensitivity of the portfolio to bond index,
 R_m' = return of bond index,
 e_p = error term.

This statement is derived by adding a new term to CAPM. Thus, the expected return of a security is a function of two different sensitivities. This new term consists of multiplication of the sensitivity of stock or portfolio to bond index

(second beta) and risk premium (Elton and Gruber, 1995).

Multi-beta CAPM is a step in passing from CAPM that considers only the risks which stem from market to Arbitrage pricing model that considers many risk sources. Arbitrage pricing model differs from multi-beta CAPM in considering only the risk factors other than the market.

IV. Methodology

In the application part of the study, it is investigated whether the stocks of 32 Turkish financial companies are priced appropriately. In this context, by using multi-beta CAPM, regression equation is estimated between stock returns of financial companies and the ISE National-100 and the ISE-DIBS (Index of T.Bills and T.Bonds) indices.

In the first step, monthly returns of 32 stocks, the ISE National-100 and the ISE-DIBS indices are calculated.

In the second step, whether the stocks are priced properly by using multi-beta CAPM is determined. To achieve this aim, a three-variable regression equation is estimated. In the regression analysis, stock returns are used as dependent variables and the ISE National-100 and the ISE-DIBS indices are employed as independent variables. By performing this analysis, it is possible to gauge the sensitivity of stock returns to each of the index returns. The three-variable regression model used in the study is developed in the light of the models of Chen, Copeland and Mayers (1987) and Clare and Priestley (1998) and formulated as below.

$$R_{it} = \alpha_i + \beta_i R_m + \beta_2 R_B + e_{it} \quad (4)$$

R_{it} = expected return of stock i,
 α_p = constant term,
 β_1 = sensitivity of stock i to ISE-100 index,
 R_m = return of ISE-100 index,
 β_2 = sensitivity of stock i to ISE-DIBS index,
 R_B = return of ISE-DIBS index,
 e_{it} = error term.

V. Data

a) 32 financial sector companies which exist for the 72 month-period between January 1996-December 2001 are taken into the sample.

b) In the study, stock returns for the 72 months are calculated and these returns are used in the regression analysis. Returns are calculated by the help of stock prices. The stock prices are obtained from an internet site.² The stock prices obtained are adjusted for capital raising. So there is no need for any adjusting in the study. Return of each month is calculated by transforming the value obtained by dividing the last month's price by the previous month's price into natural logarithm calculation of monthly return is formulated as below:

$$r_i = \ln (F_t / F_{t-1}) \quad (5)$$

r_i = monthly stock return,

F_t = stock price at the end of the month,

F_{t-1} = stock price at the beginning of the month.

c) One of the independent variable used in the study is the ISE-100 Index. In the study, the calculated values of the ISE-100 Index are obtained from an internet site.³ Later, the ISE-100 Index returns are calculated in the same way as stock returns. This calculation method is formulated as below:

$$r_e = \ln (E_t / E_{t-1}) \quad (6)$$

r_e = monthly ISE-100 Index return,

E_t = ISE-100 Index level at the end of the month,

E_{t-1} = ISE-100 Index level at the beginning of the month.

² http://www.analiz.com/isapi/hisse_anket.asp?url=/isapi/AT01/FIYAT01out.asp

³ <http://tcmbf40.tcmb.gov.tr/cgi-bin/famecgi>

d) The second independent variable used in the regression equations is the ISE-DIBS Performance Index. Performance index reflects the price changes of bonds stemming from approaching to maturity and changes in market interest rates. So, the performance index is an indicator for the return that is obtained in a specific period. Calculated values of the ISE-DIBS index used in the study are obtained via e-mail from the ISE. The ISE-DIBS index returns are calculated in the same way as the ISE-100 returns.

VI. Application of Multi-Beta CAPM

In the application part of the study, it is investigated whether 32 financial sector stocks are priced appropriately. The sensitivity of these stocks to risk factors which are used as independent variables is also detected. Prior to the regression analysis, it is examined whether the regression models used in the study are proper to analyze. In this context, stationarity of the data and existence of a serial correlation are examined. Regression analysis results which belong to the stocks that are not found to be econometrically proper are omitted. The results of the regression equations which give valid test results are presented in the tables and the results are interpreted.

Tests related to the regression models start with detecting stationarity. Stationarity of the data is investigated by unit-root tests. Existence of a relation, as given below, shows the existence of unit-root in series (Maddala, 1992):

$$Y_t = \rho Y_{t-1} + e_t \quad (8)$$

In the study, unit root test is performed by employing “winrats” and “e-views” computer programs. The results are presented in Table 6.1.

Table 6.1: Unit-Root Test Results

Stocks and Indices	Constant		Constant and Trend		None		Lag Length**
	Tau Value*	McKinnon Critical Value*	Tau Value*	McKinnon Critical Value*	Tau Value*	McKinnon Critical Value*	
Akbank	-6,627	-2,904	-6,743	-3,475	-6,028	-1,945	0
Alternatifbank	-7,044	-2,904	-7,044	-3,475	-6,943	-1,945	0
Dışbank	-6,569	-2,904	-6,571	-3,475	6,167	-1,945	0
Finansbank	-6,016	-2,904	-5,994	-3,475	-5,812	-1,945	0
Garanti Bankası	-5,703	-2,904	-5,891	-3,475	-5,609	-1,945	0
İş Bankası-B	-5,403	-2,904	-5,579	-3,475	-5,267	-1,945	0
İş Bankası-C	-5,228	-2,904	-5,414	-3,475	-4,739	-1,945	0
Türk. Sınai Kalk. Bank.	-6,212	-2,904	-6,188	-3,475	-6,144	-1,945	0
Yapı Kredi Bankası	-6,924	-2,904	-7,088	-3,475	-6,249	-1,945	0
Tekstilbank	-5,525	-2,904	-5,384	-3,475	-5,138	-1,945	0
Türkiye Kalkınma Bank.	-7,119	-2,904	-7,114	-3,475	-7,053	-1,945	0
Aktif Finans Factoring	-6,084	-2,904	-6,096	-3,475	-5,950	-1,945	0
Facto Finans	-6,744	-2,904	-6,745	-3,475	-6,798	-1,945	0
Finans Finansal Kir.	-6,371	-2,904	-6,338	-3,475	-6,092	-1,945	0
İktisat Finansal Kir.	-5,658	-2,904	-5,745	-3,475	-5,692	-1,945	0
Öz Finans Factoring	-4,576	-2,904	-4,572	-3,475	-4,596	-1,945	1
Rant Finansal Kiralama	-5,288	-2,904	-5,299	-3,475	-5,249	-1,945	0
Vakıf Finansal Kiralama	-6,652	-2,904	-6,585	-3,475	-6,664	-1,945	0
Ak Sigorta	-6,202	-2,904	-6,159	-3,475	-5,813	-1,945	0
Anadolu Sigorta	-5,352	-2,904	-5,295	-3,475	-5,102	-1,945	1
Commercial Union	-56,00	-2,904	-6,031	-3,475	-5,728	-1,945	1
Emek Sigorta	-7,675	-2,904	-7,838	-3,475	-7,692	-1,945	0
Güneş Sigorta	-4,910	-2,904	-4,882	-3,475	-4,867	-1,945	1
Atlantis Yatırım Ort.	-5,749	-2,904	-5,706	-3,475	-5,618	-1,945	0
Atlas Yatırım Ortaklığı	-4,761	-2,904	-4,719	-3,475	-4,555	-1,945	0
Bumerang Yatırım Ort.	-6,553	-2,904	-6,549	-3,475	-6,308	-1,945	0
Demir Yatırım Ortaklığı	-7,613	-2,904	-7,852	-3,475	-7,456	-1,945	0
Evren Yatırım Ortaklığı	-5,439	-2,904	-5,389	-3,475	-5,269	-1,945	0
Global Yatırım Ortaklığı	-4,692	-2,904	-4,614	-3,475	-4,464	-1,945	0
Mustafa Yıl. Yat. Ort.	-6,222	-2,904	-6,189	-3,475	-6,064	-1,945	0
Vakıf Yatırım Ortaklığı	-5,594	-2,904	-5,564	-3,475	-5,383	-1,945	0
Yapı Kredi Yatırım Ort.	-5,496	-2,904	-5,455	-3,475	-5,163	-1,945	0
ISE-100 Endeksi	-5,333	-2,904	-5,347	-3,475	-4,947	-1,945	1
ISE-DIBS Endeksi	-5,336	-2,904	-5,515	-3,475	-2,332	-1,945	0

*: Tau and McKinnon values are calculated in 95% confidence level.
**: Lag length is calculated by Schwartz method.

Lag length in the unit-root test is calculated by the Schwartz method. By using this lag length, Tau and McKinnon values are calculated. The rule for the series to show the absence of unit-root is that, Tau value must be greater than McKinnon critical value. Since none of the McKinnon values are higher than Tau values in the series, it is concluded that there is no unit-root in these series. In other words, the series are stationary. Taking these results into consideration, all of the series are covered in the study.

In the second stage of testing the validity of the model, existence of serial

correlation is investigated. The existence of relationship between error terms shows that there is serial correlation. This condition determines a deviation from the assumption of the linear regression model which states independence of error terms. In the study, serial correlation is investigated by “Durbin Watson-d test”. Results of Durbin Watson-d test are presented in Table 6.2.

Table 6.2: Results of Durbin-Watson-d Test

Stocks	DW	Stocks	DW
Akbank	2,62*	Rant Finansal Kiralama	2,08
Alternatifbank	1,80	Vakıf Finansal Kiralama	2,16
Dışbank	2,48*	Ak Sigorta	2,63*
Finansbank	2,10	Anadolu Sigorta	2,38*
Garanti Bankası	2,30	Commercial Union	1,86
İş Bankası-B	2,15	Emek Sigorta	2,10
İş Bankası-C	2,55*	Güneş Sigorta	2,27
Türk. Sınai Kalkınma Bankası	2,05	Atlantis Yatırım Ortaklığı	2,46*
Yapı Kredi Bankası	2,79*	Atlas Yatırım Ortaklığı	2,25
Tekstilbank	2,19	Bumerang Yatırım Ortaklığı	2,71*
Türkiye Kalkınma Bankası	2,53*	Demir Yatırım Ortaklığı	2,65*
Aktif Finans Factoring	2,45*	Evren Yatırım Ortaklığı	2,35
Facto Finans	1,99	Global Yatırım Ortaklığı	2,13
Finans Finansal Kiralama	2,40*	Mustafa Yıl. Yat. Ortaklığı	2,78*
İktisat Finansal Kiralama	2,23	Vakıf Yatırım Ortaklığı	1,76
Öz Finans Factoring	2,24	Yapı Kredi Yatırım Ortaklığı	2,00

According to the Durbin Watson-d test results, existence of serial correlation is determined for 13 stocks and regression analysis results belonging to these 13 stocks are omitted.

After determining the regression equations which are econometrically valid, regression equations are performed and analysis results are summarized in Table 6.3.

Table 6.3: Results of the Regression Analysis

Stocks	Alpha	Beta-1	Beta-2
Alternatifbank	-0,024 (-1,23)	1,104 (5,59)	0,926 (1,26)
Finansbank	-0,030 (-2,14)	0,998 (7,124)	1,409 (2,70)
Garanti Bankası	-0,047 (-2,52)	0,973 (5,214)	2,004 (2,88)
İş Bankası-B	-0,019 (-1,32)	0,628 (4,41)	0,982 (1,85)
Türkiye Sınai Kalkınma Bankası	-0,038 (-3,02)	0,890 (7,13)	1,490 (3,20)
Tekstilbank	-0,022 (-1,70)	0,797 (6,02)	1,014 (2,06)
Facto Finans	-0,068 (-3,61)	0,715 (3,81)	2,594 (3,71)
Finans Finansal Kiralama	-0,049 (-2,78)	0,904 (5,15)	1,723 (2,63)
Öz Finans Factoring	-0,039 (-2,23)	0,769 (4,38)	1,439 (2,19)
Rant Finansal Kiralama	-0,028 (-1,52)	0,820 (4,38)	1,126 (1,62)
Vakıf Finansal Kiralama	-0,037 (-1,86)	0,768 (3,85)	1,531 (2,06)
Commercial Union	-0,022 (-1,19)	0,843 (4,57)	1,313 (1,91)
Emek Sigorta	-0,041 (-2,29)	0,583 (3,25)	1,715 (2,56)
Güneş Sigorta	-0,023 (-1,58)	1,165 (7,844)	0,667 (1,21)
Atlas Yatırım Ortaklığı	-0,027 (-1,77)	1,109 (7,19)	1,353 (2,35)
Evren Yatırım Ortaklığı	-0,024 (-1,48)	1,145 (6,94)	1,196 (1,94)
Global Yatırım Ortaklığı	-0,030 (-1,50)	0,903 (4,45)	1,804 (2,39)
Vakıf Yatırım Ortaklığı	-0,018 (-0,80)	0,573 (2,63)	1,359 (1,68)
Yapı Kredi Yatırım Ortaklığı	-0,029 (-2,43)	0,985 (8,32)	1,515 (3,43)

Results in Table 6.3 show that excess returns (alpha values) of 8 stocks are statistically meaningful. This result is not consistent with multi-beta CAPM assumptions and it is suggested that stock returns are not explained by risk factors used in the study. The ISE National-100 Index is an important factor in determining stock prices for all of the stocks. Beta-1 which indicate the sensitivity of stock returns to the ISE National-100 returns is meaningful in the 95% confidence level. This result is confirmed by t-statistics which are in parenthesis in the Beta-1 column. All of the t-statistics are greater than 2. That is, all of the Beta-1 values are statistically meaningful. The ISE-DIBS Index is related factor in determining stock prices for only 12 stocks. This is shown in Beta-2 column in Table 6.3.

Explanatory powers of the independent variables are examined by calculating determination coefficient (R^2). R^2 values are shown in Table 6.4.

Table 6.4: Determination Coefficients

Stocks	R ²	Stocks	R ²
Alternatifbank	0,37	Vakıf Finansal Kiralama	0,27
Finansbank	0,52	Commercial Union	0,32
Garanti Bankası	0,41	Emek Sigorta	0,26
İş Bankası-B	0,30	Güneş Sigorta	0,52
Türk. Sınai Kalkınma Bankası	0,54	Atlas Yatırım Ortaklığı	0,52
Tekstilbank	0,43	Evren Yatırım Ortaklığı	0,49
Facto Finans	0,36	Global Yatırım Ortaklığı	0,33
İktisat Finansal Kiralama	0,39	Vakıf Yatırım Ortaklığı	0,16
Öz Finans Factoring	0,32	Yapı Kredi Yatırım Ortaklığı	0,61
Rant Finansal Kiralama	0,29		

Determination coefficients vary between 16% and 61%. According to these values, The ISE National-100 and the ISE-DIBS indices are not sufficient in explaining stock returns. Also it can be suggested that there may be other factors which affect stock returns. Statistically meaningfulness of the model is detected by F-tests shown in Table 6.5.

Table 6.5: F-Probabilities

Stocks	F (Probability)	Stocks	F (Probability)
Alternatifbank	0,000	Vakıf Finansal Kiralama	0,000
Finansbank	0,000	Commercial Union	0,000
Garanti Bankası	0,000	Emek Sigorta	0,000
İş Bankası-B	0,000	Güneş Sigorta	0,000
Türk. Sınai Kalkınma Bankası	0,000	Atlas Yatırım Ortaklığı	0,000
Tekstilbank	0,000	Evren Yatırım Ortaklığı	0,000
Facto Finans	0,000	Global Yatırım Ortaklığı	0,000
İktisat Finansal Kiralama	0,000	Vakıf Yatırım Ortaklığı	0,002
Öz Finans Factoring	0,000	Yapı Kredi Yatırım Ortaklığı	0,000
Rant Finansal Kiralama	0,000		

All of the F-probabilities in Table 6.5 are meaningful in the 95% confidence level. That is, the model established in the study is valid in the 95% confidence level.

VII. Conclusion

CAPM is a useful and simple asset pricing model that is widely used in determining whether the assets are priced appropriately. However, CAPM accepts the market as the only risk factor. This approach causes negligence to some other risk sources. To overcome this deficiency, multi-beta CAPM is

developed. So that, risk factors other than market can be included in the model.

In this study, multi-beta CAPM is applied to 32 Turkish financial sector companies between the 1996-2001 period. The ISE National-100 and the ISE-DIBS indices are used as independent variables for stock returns and multiple regression is estimated between stock returns and index returns.

In order to determine the validity of regression analysis, stationarity of the series and existence of serial correlation are investigated. Results of these tests specify that all of the series are stationary. However, there is serial correlation for 13 stocks. Regression analysis results of the stocks which show serial correlation are omitted.

Regression results of the 19 stocks fit econometric assumptions. 8 stocks have statistically meaningful excess returns according to the results. In other words, 8 stocks provide a return that is greater than the level model estimated. The ISE National-100 index is found to be an important factor in determining stock prices for all stocks in the 95% confidence level. On the other side, the ISE-DIBS index is important for only 12 stocks.

Determination coefficients of the stocks are not in high levels. That is, the ISE National-100 and the ISE-DIBS indices are not sufficient in explaining stock returns. Adding extra risk factors to the analysis may provide greater determination coefficients. However, adding these extra risk factors to the analysis may be the subject of a new study.

Finally, F-probabilities of regression models are examined. F-test results suggest that all of the regression equations are statistically meaningful in the 95% confidence level.

If the analysis results are evaluated, generally, stock returns covered in the study are explained to some degree by the ISE National-100 and the ISE-DIBS indices. However, taking the low level of debt coefficients into consideration, a new study that employs other risk factors in the model may be helpful.

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A NEW FINANCIAL INSTRUMENT FOR THE TURKISH CAPITAL MARKETS: EXCHANGE TRADED FUNDS (ETFs)

Çetin Ali DÖNMEZ*

Abstract

In this paper, the Exchange Traded Funds (ETFs) as one of the fastest growing products of the last decade have been covered in detail. This product was introduced to the financial markets in early 1990s and has shown a remarkable success which lead us to believe that the ETFs will make great contribution to the Turkish Capital Markets.

Exchange Traded Funds are mainly passive index tracking funds that are traded just like ordinary common stocks, however a very special feature distinguishes them from the classical mutual funds. The ETF shares can be redeemed which means that the investor can deliver the ETF share and get the actual common stocks in the fund. The reverse of this process is also possible. The investor can deliver the stocks in the ETF portfolio and create the ETF share in return. Due to this special feature, the ETFs provide investors the ability to trade the spot index and the price of ETF cannot move outside the arbitrage band. In this paper, the types of ETFs, historical background and their advantages are explained in detail and numerical examples are provided. Using different methods, different hypothetical fund types are constructed and the sources of divergence of prices of the funds and the Istanbul Stock Exchange index are explored. The mechanics of creation/redemption process and arbitrage are explained in detail by well-designed fictitious examples. Moreover, the special cases of dividend payments, stock splits and rights issues are explained with easy to understand examples. In the last section, the necessary amendments in the Turkish regulations are summarized in order for this product to be launched. It is strongly argued that the ETFs which has shown quite rapid progress in other financial markets will draw quite a lot of investors' interest and will provide new horizons for the market participants. Therefore, it is suggested that the work should be speeded up to introduce this product to the Turkish capital markets as soon as possible.

I. Introduction

The two very important theories of modern finance namely, Modern Portfolio Theory¹ and the Capital Asset Pricing Model² say that the diversified equity portfolio should always be preferred over non-diversified one since diversification eliminates the unsystematic risk and therefore improves the risk return profile of the entire portfolio. It is also almost an empirical fact that majority of investors hold equity portfolios comprised of more than one common stock. It is clear that an investor having invested only in one stock will be affected quite heavily if something unwanted occurs to a certain company traded in the exchange, compared to the investors with a well-diversified portfolio. However in practice, diversification may not be as easy as put forward by theory. For instance, investors with low wealth may find it very difficult to diversify since they may have to buy stocks less than a round lot, meaning that they should buy odd lot amounts. This brings a problem in terms of the spread costs since the odd lots are traded off-the-exchange and therefore, the bid and ask spreads are usually larger. Additionally it is very difficult to execute all the orders at once when one decides to buy or sell an entire portfolio. Therefore instead of investors trying to diversify their individual portfolios it will be much more feasible to buy an already diversified portfolio in the form of mutual fund, or investment trust. It is a generally observed phenomenon that investors do increasingly prefer to behave this way, instead of directly buying stocks, bills or bonds.³

In addition to the above mentioned trend, investors are more and more preferring to buy passive funds or index tracking funds instead of buying actively managed funds. Many of the latest research provide confirming evidence that it is almost impossible to beat the market consistently by active portfolio management and thus investors should prefer passive funds in order to minimize their costs. On the other hand the proposition that it is possible to beat the market by active management is a contradicting evidence to the efficient market hypothesis⁴ which has found increasingly greater support

1 Markowitz H. M. (1952) Portfolio Selection , Journal of Finance, 7, No: 1.

2 Sharpe, W. F. (1964), "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk," Journal of Finance, 19, 425-442.

Lintner, J. (1965), "The Valuation of Risk Assets and the Selection of Risky Investment in Stock Portfolios and Capital Budgets," Review of Economics and Statistics, 47, 13-37.

Mossin, J. (1966), "Equilibrium in a Capital Asset Market," Econometrica, 34, No.4, 768-783.

³ FEFSI (Federation Europeenne Des Fonds et Societes d'investissement).

Mutual Fund Fact Book, 2002 Investment Company Institute.

⁴ Eugene F. Fama, "Efficient Capital Markets II", The Journal of Finance, December, 1991, Vol. 46, Issue No.5.

* Çetin Ali Dönmez, Director of Derivatives Market of the Istanbul Stock Exchange.
Tel: 0212 298 24 90 Fax: 0212 298 25 00

among academicians in recent years. Even if the active management brings some extra return to the investors it will probably be eliminated by portfolio management fees and other costs related to active management. On the other hand, if the portfolio manager turns out to be unsuccessful, the shareholder of the fund will suffer and will lose some of his/her wealth while the portfolio manager will be deprived of his premiums only or may at most lose his job. Due to all these reasons investors are increasingly recommended to invest passive index tracking funds and they seem to choose to do that way more and more in recent years.

Although the Turkish Capital markets have shown some progress after 1980s, it can not be termed as satisfactory when compared to other developed financial markets. Our capital markets are mainly driven by individual investors and thus the small amount of institutional investors is regarded as an important handicap to the fast development of the markets. The mutual fund and investment trusts which are the very important institutional investors could not have flourished, due to lack of marketing and advertising of these products, reluctance of banks in marketing these products, the liquidity problems in buying selling process of the fund shares and the trading costs. The fact that the Turkish investors are very short sighted and therefore concentrating on the intraday trading is a very important obstacle to the development of the fund industry since it is not currently possible to trade fund shares during the day. The exchange traded closed-end investment funds provide intraday trading however the fund shares diverge from the book values and this fact discourages the investors in buying these funds which in turn constrains the growth of the institutional investor base.

II. Recent Developments in Turkish Capital Markets

The Turkish capital markets could not grow and not efficiently overseen by the public authorities due to the lack of the necessary regulatory framework especially in the earlier phases. Capital Market Law was enacted in 1981 and the Istanbul Stock Exchange has been established in 1996. When we evaluate the progress afterwards, we can say that the investors are not provided new financial instruments, the number of stocks traded and the total capitalization has not grown to the desired levels.

In terms of market turnover, the progress is much more promising. The total turnover in 1986 which was the year of the foundation of Istanbul Stock Exchange, was 13 million US Dollars while the yearly volume in 2001 reached 80 billion US Dollars. This makes the ISE the fourth biggest exchange among

the emerging markets⁵. Although some of this turnover came from aggressive speculations, we can still say that the market is quite liquid.

On the hand, when one looks at the number and size of mutual funds and closed-end investment funds, it can easily be seen that the progress is also far from satisfactory. The first mutual fund was established in 1987 and the number and portfolio size of the mutual funds have increased since then. According to the Capital Market Board Bulletins, the total portfolio size of all the funds was 766 million US Dollars in 1994, this number is slightly above 3 billion US Dollars in 2001. On observation of the US capital markets on the other hand, the yearly growth rate of the funds is almost the same implying that the growth rate of the Turkish fund industry is far from being satisfactory.

As mentioned before, closed-end investment funds can be traded in the exchange and thus provide the investor an extra facility trading during the day. However, since they are close-end they provide some privileges for the founder institutions, the stock price and book values of close-end fund differs quite a lot and this makes the investors refrain from investing in the closed-end fund shares. For example, in order to protect the fund founders, the existing regulations do not allow the liquidation of the closed-end funds even if the majority of the other shareholders agree to. The founding individuals or institutions seemingly get some benefit from the management of these funds and they do not want to liquidate the assets of the funds. Due to this fact, the closed-end investment fund shares are not regarded as an alternative to a well diversified portfolio by the investors, they rather see the closed-end funds as ordinary stocks that are traded on the exchange. Thus the closed-end funds did not flourish and did not make a remarkable contribution to the development of capital markets in the Turkish case.

III. Exchange Traded Funds (ETFs)

3.1. Definition and History

Exchange Traded Funds are traded just like ordinary shares. The founder of the fund is not obliged to buy or sell the fund shares. The investors can buy the fund shares from the exchange or can create the ETF share by buying the underlying stock portfolio. When the investors want to sell the ETF shares they either sell them in the market or request an authorized institution (usually clearing and settlement institutions) to redeem the securities and thus the underlying stock portfolio will be given in exchange for the ETF share. This

⁵ Istanbul Stock Exchange Annual Report 2001.

feature makes the ETFs a hybrid instrument between the close-end and open-end investment funds. ETFs can be regarded as closed-end funds since the founder of the fund is not obliged to buy or sell the fund shares from the investor.

Therefore, the size of the fund does not usually change on a day to day basis. However, some institutions are authorized to create or redeem ETF shares, which means that the size of the ETF portfolio may change. With this feature, the ETFs can be defined as open-ended funds. Majority of the ETFs usually have index tracking stock portfolios and they usually have some small amount of cash to transfer the dividend payments of the stocks in their portfolio to the fund shareholders. Many of the ETFs are priced as a percentage of the value of the index being tracked⁶.

In developed markets, the largest and most famous ETFs are founded and managed by the US financial institutions, the various well known ETFs are briefly mentioned below⁷.

- 1 SPDRs can be defined as depositary receipts, which mimic the S&P 500 index. They are traded on AMEX with quite large turnover and they are the first ETFs introduced in the US market. One interesting feature of this product is that they pay dividends quarterly and they do not pay any interest on cash held in the ETF portfolio⁸.
- 1 Ishares are known previously as WEBS and they track various US and foreign indexes.
- 1 DIAMONDS track the Dow Jones Industrial Average.
- 1 QQQ tracks NASDAQ composite index.
- 1 HOLDRs are the ETFs first founded and introduced to the US market by Merrill Lynch and they can be called as basket of stocks rather than a fund.

Exchange traded funds may deviate from the index they track since it is not so easy to fully replicate the indexes. In addition to that, the stocks in the index may at times pay dividends which require re-balancing and the composition of the index may also change at different periods. Therefore, trading costs and timing of buying and selling stocks brings some extra costs for the ETFs.

3.2. Types of ETFs

There are mainly three different types of ETFs⁹.

⁶ Deborah Fuhr, "Exchange Traded Funds: A Primer", Journal of Asset Management, Vol 2, 3, 2001.

⁷ Jim Wiandt, Will McClatchy, "Exchange Traded Funds", 2002, John Wiley & Sons.

⁸ Elton Edwin J., Gruber Martin J., Comer George, Li Kai, "Spiders: Where are the Bugs?", Journal of Business 2002, Vol. 75, No: 3.

⁹ David Lerman, "Exchange Traded Funds and E-Mini Stock Index Futures", 2001, John Wiley & Sons.

1. Partially index tracking ETFs (Management Investment Company)
2. Fully Index Tracking passive Exchange Traded Funds (Unit investment Trust)
3. Exchange Traded Basket Trusts, which do not aim at index tracking but provide the investors with a basket of stocks.

The most prominent examples of the first category are the ETFs known as Ishares and the Select Sector SPDRs. These type of funds do not have to replicate the underlying index completely and thus they usually apply some sampling methods instead of full replication. For example such a fund may aim at tracking the ISE-30 index but may construct a portfolio of 30 stocks that are not all included in the ISE-30 index. Alternatively such a fund may buy less than 30 stocks by an appropriate sampling method and still aim at tracking the ISE-30 index. These type of funds are usually allowed to use derivative instruments, they can also lend the stocks in order to raise some extra money to cover some of their costs. The voting rights of the constituent stocks usually belong to the fund manager. These funds can either reinvest the dividends paid by the stocks in their portfolios or they can distribute these dividends to the fund holders. The creation and redemption process is allowed for large amount of shares and can be realized by large investors and certain specified institutions.

The funds in the second category are those that must completely replicate the holdings of the underlying index. Therefore, such a fund for example has to have all the 30 stocks in the ISE-30 and at the exact percentage weights in the index. These funds are usually not allowed to lend the stocks in their portfolio. Although there are no restrictions as to the use of derivative products, these types of ETFs do not usually involve in derivative transactions. These funds may reinvest the dividends or may distribute them depending on the nature of the index they track. The creation/redemption process requires large amounts of money as in the case of the first category and not all investors can do this. The voting rights of the stocks in the fund portfolio can be used by the fund manager. SPDRs and QQQs can be given as examples of such ETFs.

The ETFs in the third category are actually quite different from the above mentioned two fund categories. These type of funds do not change their portfolio composition after they are founded and therefore there will be no management fee charge for this type of funds. The HOLDRs are an example of this type. These type of funds may not even be called as mutual funds, since they give the investors a receipt proving the ownership of a basket of stocks. The voting rights of this type of funds are used by the fund holders. Since there is no fund management for these types of ETFs, the stocks in the portfolio can

not be lent by the founder and the founder cannot realize any derivatives trading by using the fund assets. In case of any dividend payments of stocks in the fund portfolio, the investors receive the dividends directly just like ordinary stocks. The creation and redemption process for these type of funds can be realized almost by any investor and in quite small amounts.

3.3. Advantages of ETFs

Although the classical mutual funds and closed-end funds provides well diversified portfolios to the investors, the ETFs have important advantages over these instruments. These advantages are explained below in detail.

1. Because of creation/redemption process, the price of the fund and the portfolio value of the fund will not diverge from each other. In case of any divergence, arbitrageurs will intervene and they will buy the cheap and sell the expensive and thus ensure that the price of the fund and the book value of the fund come close to each other again. A study conducted by Salomon Smith Barney in September 2000 revealed that 91 % of randomly selected fund shares are traded within the arbitrage band. When we consider the fact that the creation redemption process can only be done at large amounts and by pre-specified institutions or investors¹⁰, we can evaluate that 91 % is a quite high percentage which shows the efficient mechanism of the arbitrage process. In another study conducted for the ETFs called SPDRs, it has been found that only 15 % of transactions resulted in creation redemption process during the 1993-1999 period¹¹.
2. An ordinary mutual fund share can be sold or bought from the founding institution or the fund managing organization. The buying or selling price is determined by the fund manager and the transaction usually takes place at the end of the trading day. On the other hand, the investors usually prefer buying or selling the fund shares during the day. Since the fund shares are being sold or bought at the closing price, the price at the time of buy or sell turns out to be irrelevant. For instance, assume that the index is above 10 % compared to the previous closing value and the session has not ended yet. At that moment an investor who wants to sell the fund share will not be sure about the sell price of his fund and will sell the fund at the closing price. Therefore, the investor may not benefit from the price increase during the session.

¹⁰ Phyllis J. Bernstein, "A Primer on Exchange Traded Funds", Journal of Accountancy, January 2002.

¹¹ Jim Wiandt, Will McClatchy, "Exchange Traded Funds", 2002.

3. It can be said that the fund investor should have long investment horizons and should not be concerned with intraday price movements. However, in markets where the investment horizons are quite short, the ability to benefit from intraday price fluctuations becomes quite important and lack of this feature will surely decrease the investors' interest in mutual funds. In a study conducted in US in 2001, the average holding period for mutual fund investors are found to be 3 years while the average holding period for ETFs has been found to be less than one month¹². Some analysts claim that the ETFs makes it much easier to trade short-term and thus makes the markets more myopic. However, there are some other studies claiming just the opposite. For example Financial Research Corporation has shown empirical evidence that 75 % of investors buying ETF shares are willing to hold this product for a long term¹³.
4. Although closed-end funds can be traded on the exchange, it is not so easy for investors to monitor the investment decisions of the founding or managing institutions. The investors may suffer from the wrong security selection or market timing decisions of fund managers. The index tracking passive funds do not have this drawback.
5. When an investor wants to buy a mutual fund share, many banks put an extra margin to the prevailing market price due to uncertainty of the closing price. This in turn reduces the ability of the investors to move quickly from one instrument to another. In the case of ETFs, the investors are required to pay only the value of the fund at the prevailing price.
6. In Turkey, mutual funds do not distribute dividends. An investor in need for cash must sell his fund shares. The ETFs, on the other hand, may pay dividends when a stock in the portfolio pays dividends. In certain types of ETFs, dividends are transferred directly to the investors. In the case of closed-end funds however, the fund itself may distribute some dividends but this decision depends solely on the fund managers' discretion.
7. When investors buy mutual fund shares, the classical mutual funds have to enlarge their portfolio meaning that they should buy some securities. Conversely, when investors sell some fund shares, the fund manager must sell some of the securities in the fund portfolio. This structure does not pose an important problem for the founding institutions, but it will

¹² Phyllis J. Bernstein, "A Primer on Exchange Traded Funds", Journal of Accountancy, January 2002.

¹³ Wilfred Dellva, "Exchange Traded Funds Not For Everyone", Journal of Financial Planning, April 2001.

cause the trading costs to increase that may result in tax obligations which is not a desirable consequence for the fund investors. Since the ETFs do not have to buy or sell the securities in the fund portfolio, this results in rather important tax advantages. In addition, the ETFs are usually taxed just like ordinary stocks in most of the jurisdictions and thus there are no other extra tax advantages of ETFs over stocks or other mutual funds¹⁴.

8. Investors can short sell the ETFs in most of the markets. Moreover, in the US the ETFs are exempt from the up-tick rule which is applied for stock short sale transactions. This exemption makes it easier for investors to sell the ETFs short even in down market¹⁵.
9. Since the ETFs can be bought and sold in very small amounts, it is much easier and more advantageous for investors to buy or sell the market compared to index futures¹⁶. However, ETFs and stock index futures should not be regarded as pure competing products. Sometimes index futures might be the best solution, while some other time for some other investor an index tracking ETF might be the best alternative¹⁷. Trading in stock index futures may not be available for some investors due to detailed documentation requested from investors who want to trade futures and in some countries the use of derivatives is prohibited for some investors types, therefore, the ETFs having none of these restrictions may satisfy the needs of some investors. On the other hand, stock index futures are not available for as many stock indexes as the ETFs track. Therefore, ETFs provide a wider range of indexes for investors. Moreover, the prices of ETFs have seemingly lower tracking error compared to the prices of index futures. For example, a study conducted in 2000 revealed that the average difference between the price of an index tracking ETF and the index is 2.6 %, while the difference between the index futures and the index itself is found to be 4.5 %¹⁸.
10. ETFs can be bought on margin meaning that the investors can buy the ETF share partly by their own equity and partly by borrowing cash. This feature makes the ETFs much more advantageous over ordinary mutual

¹⁴ Phyllis J. Bernstein, "A Primer on Exchange Traded Funds", Journal of Accountancy, January 2002.

¹⁵ Deborah Fuhr, "Exchange Traded Funds: A Primer", Journal of Asset Management, Vol. 2, 3, 2001.

¹⁶ Deborah Fuhr, "Exchange Traded Funds: A Primer", Journal of Asset Management, Vol. 2, 3, 2001.

¹⁷ John Demaine, "Exchange Traded Funds for the Sophisticated Investor", Derivatives Use Trading & Regulation, Volume 7, 2002.

¹⁸ John Demaine, "Exchange Traded Funds for the Sophisticated Investor", Derivatives Use Trading & Regulation, Volume 7, 2002.

funds. It is also less risky for banks and brokerage houses to lend money to investors in buying ETFs since ETFs are less volatile than individual stocks.

11. With the introduction of ETFs it has become much easier for the investors to buy or sell the emerging stock markets, which in turn facilitates the capital flow among countries.
12. When compared to investing in stocks individually and thus establishing a portfolio by the investors themselves, the ETFs are more costly due to fund management fees. For instance, for the period 1993-1998 it has been found that the SPDRs which is an ETF tracking the S&P index, have provided lower returns to investors compared to the S&P index, the passive index tracking mutual funds and stock index futures¹⁹. But this can also be seen as the cost of providing an easy way to buy or sell the market and the cost of intraday buying or selling ability.
13. ETFs are much transparent in terms of their portfolio composition than ordinary mutual funds and closed-end funds.

3.4. A Brief History of ETFs

The first ETF has been founded in the Toronto Stock Exchange, Canada in 1989. Almost four years later, in 1993, the United States financial markets began trading the ETFs. Although Canada is the first country to trade this product, the most striking development of ETFs has been experienced in the US. The following table shows the growth of ETFs in the US markets both in terms of the number of funds introduced and in terms of the total size of their portfolio.

Table 1: ETFS in US²⁰

Year	Total Assets	Number of Funds
1993	464	1
1994	424	1
1995	1,052	2
1996	2,401	19
1997	6,702	19
1998	15,564	29
1999	33,862	30
2000	65,585	80
2001	82,993	102

¹⁹ Elton Edwin J., Gruber Martin J, Comer George, Li Kai, "Spiders: Where are the Bugs?", Journal of Business, 2002, Vol. 75, No: 3.

²⁰ FEFSI (Federation Europeenne Des Fonds et Societes d'investissement). Mutual Fund Fact Book, 2002 Investment Company Institute.

The total portfolio value of all types of funds in the US has grown four times between 1994 and 2001. Meanwhile, as seen from the table, ETFs have grown 178 times within the same period. In spite of the big sell off and bear market in the Wall Street during 2001, the rise in portfolio values of ETFs has continued. A research done by the Financial Research Corporation estimates that the total assets of ETFs will be over 200 billion US Dollars as of the year 2005²¹. It is also worth noting that as of the end of 2000, the two-thirds of total turnover in AMEX is done in ETFs, and the total daily turnover of ETFs in North America has reached 6 billion US Dollar level as of the end of 2001²².

The introduction of ETFs into European financial markets occurred quite late compared to that of the US. The European financial markets are usually shows a conservative approach almost for any new financial product. This has been the case also for ETFs. The first ETF has been introduced in April 2000 in Europe. Although the history of ETFs is quite short in Europe, it has gained widespread interest from all the investors and showed a rapid progress. Daily turnover in the European ETF market is currently around 250 million USD Dollars²³. Almost 80 % of total turnover are realized in the Deutsche Borse and Euronext.

ETFs generally hold stock portfolios, but in recent years new ETFs having bills and bonds in their portfolio have also been introduced to the market²⁴. In addition to this development, ETFs pursuing active portfolio management have also been introduced to the market in the recent years. The first actively managed ETF has been established and introduced in the Deutsche Borse in November 2000²⁵.

Additionally, parallel to the rapid progress achieved in total market value, turnover and the variety types of ETFs, futures and options on ETFs have also been introduced thus, they have drawn considerable investor attention²⁶.

IV. Illustrative Examples for ETFs in the Turkish Capital Markets

In this section, we briefly explain typical portfolio compositions of the three

²¹ Deborah Fuhr, "Exchange Traded Funds: A Primer Journal of Asset Management", 2001, Vol. 2, 3.

²² Massoud, Mussavian, Jacques, Hirsch, "European Exchange-Traded Funds: An Overview", Journal of Alternative Investments", Fall 2002.

²³ Massoud, Mussavian, Jacques, Hirsch, "European Exchange-Traded Funds: An Overview", Journal of Alternative Investments", Fall 2002.

²⁴ Futures and Options World, Arabk 2002.

²⁵ Antony Ragozino, Charlie J. Gambino, "Actively Managed Exchange Traded Funds: Coming Soon to a Market Near You", Investment Lawyer, Volume 8, No: 5, May 2001.

²⁶ Risk Magazine, Ocak 2003.

different ETF types mentioned in section 3.2 and the examples will be provided for the mechanics of these ETFs. Before moving further, the composition of the ISE-30 index will be provided so that the examples that follow will be more understandable. The composition of the ISE-30 index is provided in the following table.

Table 2: The ISE-30 Index Constituent Stocks as at End-2000

Item Number	Name of the Stock	Weight (%)
1	İŞ BANKASI (C)	18,65
2	YAPI VE KREDİ BANK.	15,55
3	AKBANK	6,80
4	MİGROS	6,31
5	GARANTİ BANKASI	5,37
6	KOÇ HOLDİNG	5,21
7	SABANCI HOLDİNG	5,10
8	EREĞLİ DEMİR CELİK	4,32
9	DOĞAN HOLDİNG	3,63
10	VESTEL	3,38
11	ARÇELİK	2,62
12	ŞİŞE CAM	1,90
13	PETROL OFİSİ	1,73
14	TÜPRAŞ	1,68
15	DOĞAN YAYIN HOL.	1,62
16	HÜRRİYET GZT.	1,53
17	TANSAS	1,45
18	AKSİGORTA	1,38
19	ALARKO HOLDİNG	1,28
20	NETAŞ TELEKOM.	1,27
21	ENKA HOLDİNG	1,24
22	PETKİM	1,23
23	FORD OTOSAN	1,21
24	TOFAŞ OTO. FAB.	1,08
25	İHLAS HOLDİNG	1,01
26	ALCATEL TELETAS	0,85
27	EFES HOLDİNG	0,84
28	AKÇANSA	0,78
29	TÜRK HAVA YOLLARI	0,52
30	BAGFAŞ	0,47

If we want to establish an ETF which aims at exact tracking of the index, the composition of the fund should be the complete replication of the ISE-30 index. This type of ETFs belongs to the second category mentioned in section 3.2. Since this type ETFs tracks an index, the portfolio composition of the fund

should change following a change in the composition of the index that is being tracked. For example, when a certain stock is no longer included in the index calculation that stock should be sold from the ETF portfolio as soon as possible and the portfolio composition of the fund should be adjusted accordingly. Since the ISE-30 index is a price index, in case of any dividend payments of the stocks in the underlying portfolio, the dividend payments should be transferred to the fund shareholders. Otherwise, the deviation of the value of the fund from the value of the index will be larger as in time.

If one establishes an ETF which do not completely track an index, but rather aims at a certain correlation, the situation will be different. This type of an ETF will probably have less number of stocks in the portfolio and may have different weights of the stocks to some extent. The following table will show the portfolio composition of such an ETF.

Table 3: Portfolio Composition of an ETF with Sampling Logic

Item Number	Name of the Stock	Weight (%)
1	YAPI VE KREDİ BANK.	13
2	İŞ BANKASI (C)	12
3	AKBANK	10
4	EREĞLİ DEMİR ÇELİK	8
5	MİGROS	7
6	SABANCI HOLDİNG	6
7	ARÇELİK	5
8	GARANTİ BANKASI	5
9	KOÇ HOLDİNG	5
10	DOĞAN HOLDİNG	4
11	VESTEL	4
12	ALARKO HOLDİNG	2
13	DOĞAN YAYIN HOL.	2
14	HÜRRİYET GZT.	2
15	PETROL OFİSİ	2
16	ŞİŞE CAM	2
17	TANSAŞ	2
18	TÜPRAŞ	2
19	AKSİGORTA	1
20	ENKA HOLDİNG	1
21	FORD OTOSAN	1
22	İHLAS HOLDİNG	1
23	NETAŞ TELEKOM.	1
24	PETKİM	1
25	TOFAŞ OTO. FAB.	1

As seen from the above table, the index tracking ETF includes 25 stocks in the portfolio and the selection of stocks are done by a certain sampling logic. This kind of ETF is an example of the first category ETFs mentioned in section 3.2. In this category, the manager of the fund need not change the portfolio composition when the composition of the index changes. For example, when the stock named BAĞFAŞ is dropped from the calculation of the index and another stock named Türk Demir Döküm A.Ş. is included in the index, portfolio composition of the fund will not probably change since BAĞFAŞ is not already in the portfolio. When another stock in the ETF portfolio i.e. TANSAŞ is excluded from the index calculation, the fund manager may or may not adjust the composition of the fund depending on the related regulations or depending on the portfolio management principles that are declared to the investors at the time of the establishment of the fund. The portfolio manager of the above fund may also hold some cash. Since this type of ETF is formed by sampling and do not completely follow the changes in the index, the tracking error will be greater compared to the exact index tracking ETFs.

The ETFs belonging to the third category do not actually aim at tracking a certain market index, but still they aim at providing a well-diversified portfolio to the investors, and the value of this type ETFs usually moves in parallel to the value of the market indexes. To give an example, assume that an ETF founding institution markets an ETF with the following portfolio composition.

Table 4: ETF (Third Category) Portfolio Composition

Item Number	Name of the Stock	Weight (%)
1	İŞ BANKASI (C)	10
2	AKBANK	8
3	GARANTİ BANKASI	8
4	KOÇ HOLDİNG	8
5	MİGROS	8
6	YAPI VE KREDİ BANK.	8
7	SABANCI HOLDİNG	7
8	ARÇELİK	5
9	DOĞAN HOLDİNG	5
10	EREĞLİ DEMİR ÇELİK	5
11	ŞİŞE CAM	5
12	VESTEL	5
13	BOSSA (*)	5
14	PETROL OFİSİ	4
15	TÜPRAŞ	4
16	DOĞAN YAYIN HOL.	3
17	SASA (*)	2

As seen from the above table, the fund seemingly tries to provide a well-diversified portfolio and does not probably aim at tracking any market index. A careful look will reveal that some of the stocks are overweighed and some are underweight compared to the index composition. In addition, some of the stocks in the basket are not included in the ISE-30 index (* : BOSSA, SASA) Therefore, the main objective of this ETF is not to track any market index but simply to provide a well-diversified portfolio to the investors.

We expect to have a very little tracking error for the ETF which completely mimics the index, slightly more tracking error for the ETF which applies a sampling methodology to replicate the index performance and a larger tracking error for the last type of ETF whose primary objective is to provide a diversified portfolio since it is formed by less number of stocks and even two of the stocks in the portfolio are not even included in the index calculation. The closing values of the stocks as of the year 2000 and January 2001 are provided in the following table.

Table 5: Prices of Stocks

Name of the Stock	Closing Price (2000 Year-end)	Closing Price (end-Jan., 2001)
AKBANK	4.850	4.250
AKÇANSA	7.600	7.100
AKSİGORTA	12.500	9.900
ALARKO HOLDİNG	26.500	26.000
ALCATEL TELETAŞ	63.000	71.000
ARÇELİK	13.500	11.500
BAGFAŞ	17.750	15.500
DOĞAN HOLDİNG	5.500	5.200
DOĞAN YAYIN HOL.	5.500	4.650
EFES HOLDİNG	74.000	72.000
ENKA HOLDİNG	12.500	13.750
EREĞLİ DEMİR ÇELİK	28.500	27.500
FORD OTOSAN	5.050	3.750
GARANTİ BANKASI	5.100	4.050
HÜRRİYET GZT.	2.900	4.050
İHLAS HOLDİNG	13.500	11.000
İŞ BANKASI (C)	1.950	2.000
KOÇ HOLDİNG	35.500	28.500
MİGROS	76.000	86.000
NETAŞ TELEKOM.	74.000	69.000
PETKİM	12.250	11.250
PETROL OFİSİ	30.000	27.000
SABANCI HOLDİNG	6.000	5.800
ŞİŞE CAM	5.400	5.000
TANSAŞ	16.750	16.500
TOFAŞ OTO. FAB.	5.500	4.450
TÜPRAŞ	28.000	25.000
TÜRK HAVA YOLLARI	8.700	9.800
VESTEL	2.950	2.475
YAPI VE KREDİ BANK.	4.900	3.450
BOSSA	2.500	1.750
SASA	16.000	14.250

By using the above closing prices, the value of each of the three ETFs can be found by multiplying the closing prices and corresponding weights of the stocks and the sum can be calculated. The values that are calculated by using this formula are given below.

Table 6: The Returns of ETFs

ETF Type	Portfolio Value (at the beginning)	Portfolio Value (at the end)	Change (%)
1. Fund	1499165	1539292	1.026766
2. Fund	1558600	1601300	1.027396
3. Fund	1588175	1640550	1.032978

As shown in the above table, the precise index tracking ETF will change exactly the same amount as the index being tracked if we assume that there are no dividend payments or rights issues. Since the second ETF is formed by sampling, there is a tracking error, the return of this ETF is 27.4, which is slightly over the return of the first ETF (or the index). The third ETF, which does not aim at tracking any index, has shown an increase of 33 % and the difference between the return of this ETF and the index is larger.

Although the returns of the second and third ETFs are greater than the first ETF and greater than the index, this does not mean that these funds will always perform better than the index. Therefore, if one wants to track the market, the best is to buy the first ETF, which exactly replicates the index composition. Even if we choose the complete replication option, we can still not avoid tracking errors since there occurs dividend payments and right issues which cause some portfolio rebalancing and this imposes certain difficulties in practice. In addition to that, zero tracking error is almost impossible due to portfolio management costs, which should be reflected in the value of the fund.

V. Arbitrage with ETFs

In this section, because of the simplicity of the creation and redemption process, the mechanics of arbitrage is shown by using the third type of ETF mentioned in section 3.2. In this section, assume that an ETF of third type with a portfolio of 20 stocks is formed and the portfolio composition of the fund is shown in table below. The closing and best bid and offer prices of the stocks in the ETF portfolio are also provided in the table.

Table 7: Portfolio Composition and Price Information of the Stock in the ETF Portfolio

Name of the Stock	Amount (LOT)	Best Bid	Best Offer	Close
AKBANK	0,10	4.250	4.300	4.250
ALCATEL TELETAŞ	0,05	71.000	72.000	71.000
ARÇELİK	0,20	11.250	11.500	11.500
DOĞAN HOLDİNG	0,20	5.100	5.200	5.200
DOĞAN YAYIN HOL.	0,10	4.600	4.650	4.650
EREĞLİ DEMİR ÇELİK	0,50	13.500	13.750	13.750
FORD OTOSAN	0,30	27.000	27.500	27.500
GARANTİ BANKASI	0,20	3.700	3.750	3.750
İŞ BANKASI (C)	0,40	11.000	11.250	11.000
KOÇ HOLDİNG	0,20	28.500	29.000	28.500
MİGROS	0,10	86.000	87.000	86.000
PETKİM	0,50	11.000	11.250	11.250
PETROL OFİSİ	0,50	26.500	27.000	27.000
SABANCI HOLDİNG	1,00	5.700	5.800	5.800
ŞİŞE CAM	0,20	4.900	5.000	5.000
TURKCELL	0,50	20.500	21.000	21.000
TOFAŞ OTO FAB.	0,20	4.400	4.450	4.450
TRAKYA CAM	0,20	5.300	5.400	5.400
TÜPRAŞ	0,20	24.500	25.000	25.000
VESTEL	1,00	2.450	2.475	2.475

The minimum required number of shares for creation and redemption process is assumed to be 100.

The portfolio value of one ETF share is calculated by using the best bid, best offer and closing prices shown below:

From the Best Bid Price:	86,965,000 TL
From the Best Offer Price:	88,580,000 TL
From the Closing Price:	88,225,000 TL

The best bid and offer price of one ETF share that is quoted on the exchange is shown below:

Best Bid 87,000,000 TL
Best Offer 88,000,000 TL

In other words, any investor wishing to buy the ETF can purchase it immediately at a price of 88,000,000 TL or can enter the buy order at a price of 87,000,000 TL in the order book and wait.

From the above example we can easily see that the market price of the ETF share and its portfolio value is very close to each other and thus it is not possible to make any pure arbitrage in such market conditions. Pure arbitrage means that the investor will sell (buy) the ETF share and buy(sell) the underlying stocks in the ETF portfolio at the same time and makes a riskless profit. In our example, the cost of buying the ETF share from the market is 88,000,000 TL while the money that we receive by selling the ETF portfolio on the equity market (i.e. selling the stocks in the ETF portfolio individually) is 86,965,000 TL and thus we make a loss. On the other hand, if we buy the stocks individually from the market our cost will be 88,580,000 TL, while the total value of the ETF share in the market when we sell will be 87,000,000 TL. In this case we again incur a loss. Therefore, pure arbitrage is not profitable with the prevailing prices.

Although pure arbitrage is not profitable, investors can make use of quasi arbitrage opportunities in the market. Quasi arbitrage activities will also help to bring the price of ETF and the value of its underlying portfolio closer. In our example since the cost of buying an ETF share directly from the secondary market (88,000,000 TL calculated by using the best offer price of ETF) is less than the cost of establishing the underlying portfolio of the fund by purchasing the stocks individually from the equity market (88,580,000 TL calculated by using the best offer prices of the constituent stocks) the investor will prefer to buy the ETF directly instead of establishing the portfolio by himself, if he wants to buy the market. This is defined as quasi arbitrage, which also helps the price of the ETF, and the prices of the underlying stock portfolio come close to each other.

Assume that the price of the stocks named Eregli Demir Çelik, Petrol Ofisi and Turkcell have increased and the best offer prices have become 14000 TL, 27500 TL, and 22000 TL, respectively. All the other stocks in the fund portfolio are supposed to remain unchanged and the best bid and offer price of the ETF share are assumed to remain the same (best bid is 87,000,000 TL and best offer 88,000,000 TL).

In this case the value of the ETF portfolio calculated by using the best bid prices will be 88,465,000 TL. Here, the pure arbitrage opportunity can be used.

In other words, one can buy the ETF immediately from the market at 88,000,000 TL and sell the underlying stocks at a total of 88,465,000 TL and make a 465,000 TL arbitrage profit. After the trading fees and other expenses are deducted from this amount, the remaining will be the pure risk free arbitrage profit from the arbitrageur. In order for this to happen of course, there should be enough number of ETF shares and individual stocks available for buying and selling. In our case, the number of ETF shares waiting in the best offer should at least be 100 and the order amounts waiting in the best bid prices of each stock should be greater than or equal to the amount corresponding to the amounts in the 100 ETF shares (i.e. Akbank 10 lots, Eregli 50 lots.).

Both pure arbitrage and quasi arbitrage strategies will ensure that the price of the ETF share in the market will not deviate from the value of the underlying portfolio and thus the investor will have an instrument that will surely allow them to buy or sell the whole market or a certain market index.

VI. Dividend Payments and Rights Issues in ETFs

Since the ETF in our example belongs to the third category, in case of any dividend payments of the stocks in the portfolio, dividends are transferred to the ETF holders. Assume for example that an investor has 200 shares of ETF and one of the stocks in the ETF portfolio, namely, Petrol Ofisi pays 200 % dividends to the shareholders. In this case, since each ETF share has 0.5 lots (500,000 TL nominal value) of Petrol Ofisi A.Ş., the investor having 200 ETF share will get a total of 200 million TL as dividend.

When there is a stock split of any of the constituent stocks in the ETF portfolio, the new shares will not usually be distributed to the investors. If, however, after the stock split, any of the stocks is not a round lot for the creation/redemption process then some of the new shares after the split may be distributed to the ETF holders. For instance, assume that the stock named Garanti Bankası makes one for two split, the number of Garanti Bankası stock in the minimum creation/redemption amount in 100 will increase to 30 lots from 20 lots. It will still be a round lot and thus the ETF need not distribute any of the Garanti Bankası A.Ş. shares. The weight of Garanti Bankası in the ETF portfolio will not change after the split, since the price of the stock will adjust accordingly.

On the other hand, if for example Otosan A.Ş. increases its paid in capital by 35 % and distributes new shares to the investors free meaning that the capital increase is financed by the internal sources of the company, then the number of Otosan stocks in 100 shares of ETF (The minimum amount that can be created or redeemed) will increase to 40,5 lots from 30 lots. Since all

the shares are traded in terms of round lots, the 0.5 lots (half a lot) amount will be distributed to the ETF holders in order to avoid the delivery of odd lots during the creation/redemption process. An investor holding 200 shares of ETF will get 1 lot of Otosan A.Ş. stock after the split. The number of Otosan A.Ş. stock in one ETF share will increase to 0.4 lots from 0.30 lots and since the price of the stock is adjusted after the split, the weight of Otosan will change very little which is mainly due to the distribution odd lots of Otosan A.Ş. to the investors

When any of the stocks in the ETF portfolio undergoes a capital increase through rights issue there are two alternatives for the ETF. In the first alternative rights issue can directly be used by the investors holding the ETF share. In the second choice, the clearing firm or the clearing center may do this for the investor. In this case the investors will deposit the necessary cash in the clearing center so that this cash will be transferred to the company undergoing the capital increase through the rights issue.

For example assume that TÜPRAŞ increases its paid-in capital by 100 % percent and finance this increase by receiving cash from its shareholders.

In the first alternative, the number of TÜPRAŞ stocks in the ETF portfolio will not change since the ETF holding investors will be exercising the rights issues separately. In our case the investor having 200 ETF shares will be entitled to get 0.20 shares of TÜPRAŞ for each ETF share and will be paying 200,000 TL in return as the price of the rights issues. Therefore, the investor will pay a total of 40 million TL and get 40 lots (0.20x200) of TÜPRAŞ. After this operation, since the investor exercises the rights issue separately, the number of TÜPRAŞ in one ETF share will remain the same but the price of TÜPRAŞ will be adjusted according to the new paid-in capital which means that the price will drop nearly 50 % and this will decrease the weight of TÜPRAŞ in the ETF.

In the second alternative, the ETF will buy the rights issues on behalf of the investors and thus 200,000 TL of cash per ETF share will be requested from the ETF holders and the clearing firm will be conducting these operations. The number of TÜPRAŞ stocks in one ETF share will double and become 0.4 lots. The investor in our example will be paying again 40 million TL for the rights issue but this time he will not be receiving the TÜPRAŞ stocks separately, but will own the stocks through the ETF. After this operation the weight of TÜPRAŞ stocks in the ETF will increase slightly due to the cash injected by the investors for the rights issue of TÜPRAŞ. This situation is shown by a numerical example given below.

Closing price of TÜPRAŞ before the rights issue is 25,000 TL.

The opening price of TÜPRAŞ after the 100 % rights issue is calculated by using the following formula

$$(\text{Price before the rights issue} + \text{price of the rights issue} \times \text{percent increase in paid-in capital}) / (1 + \text{percent increase in paid-in capital})$$

the new price is found to be 13000 TL.

The total value of TÜPRAŞ in one ETF share is found by multiplying the number of shares of TÜPRAŞ in one ETF share by the price of TÜPRAŞ (0.2 x 25000 x 1000) and the result of this calculation renders a value of 5 million TL as the new value of TÜPRAŞ in one ETF share.

After the rights issue, the total number of TÜPRAŞ stocks becomes 0.4 lots (since the increase in paid-in capital is 100 %) and thus the total value of TÜPRAŞ in one ETF share is found by multiplying the newly calculated number of TÜPRAŞ shares (0.4) with the newly calculated opening price of TÜPRAŞ after the exercising of rights issue (13000 TL) and with the number of shares in one lot of TÜPRAŞ (1000). When we do the above calculation, we find that the total value of TÜPRAŞ shares in one ETF share is 5,2 million TL. Note that the difference between the new value of TÜPRAŞ shares and the old value is 200,000 TL, which is exactly the amount that is requested from shareholders per ETF share for the TÜPRAŞ rights issue.

VII. Proposed Exchange and Clearing Mechanism and Regulatory Framework for ETFs in Turkey

ETFs can be traded just like ordinary stocks. The settlement of trades is done two days after the trade date (T+2) on the Istanbul Stock Exchange. The same settlement rule can also be applied for ETFs in Turkey. Investors pay trading fees calculated as percentage of the value they trade and they also pay the annual custody fee for the stocks they keep in the Clearing and Settlement Bank (Takasbank). The same type of costs may also be applicable for the ETF shares. In addition to these costs, the investors may also be required to pay some amount of fee if they want to create new ETF shares or redeem some of their existing ETF shares.

On the other hand, in case when one or more of the stocks in the ETF portfolio are temporarily closed to trading, it is believed that the ETFs should continue to be traded. In this case, by using the price of ETF in the exchange and by using the price of the other stocks in the underlying portfolio, one can

calculate the implied price of a stock which has been temporarily banned from trading. However, if the regulatory authority closes the market of the stock for a long time then it will be better to distribute these stocks to the shareholders and continue the ETF with the other stocks which are currently available for trading. It is very important that regulatory authorities should clearly define cases in which the ETF will continue to be traded or will be suspended from trading depending on the certain predefined conditions. The rules of construction of portfolio composition and periodic rebalancing should also be put forward by the regulatory authorities.

The item 37 of the Decree named ‘Principles Regarding Mutual Funds’ published on 19/12/1996 with the serial number VII No :10 states that the mutual fund shares can be traded in an organized exchange on condition that it is also explicitly stated so in the fund statement. Therefore, it is currently possible to trade mutual fund shares in an exchange. But the rules of the creation and redemption process is not allowed and therefore it should be clearly specified in the capital market regulations, the institutions and investors who are entitled for undertaking creation/redemption process and the use the voting rights of the stocks in the ETFs should also be clarified.

Additionally, item 42 of the above mentioned Decree states that mutual funds can not invest more than 10 % of their total portfolio in a single stock. These type of restrictions do exist in some of the European jurisdiction for certain type of investment funds ((UCITS -Undertakings for Collective Investment in Transferable Securities-Directive). But these restrictions do not apply for indexes in many European countries including Turkey. For example as of the year 2000 the weight of İş Bankası C included in the ISE-30 was 18,65 while the weight of Yapı Kredi Bankası was 15,55. This means that with the above-mentioned restriction it is impossible to establish a pure index tracking fund, because there will be considerable tracking error due to the 10 % limit for a single stock in reality. Therefore, either the current restrictions should be removed or the index composition and formulation should be changed accordingly so that pure index tracking funds will be established, otherwise the investors should be informed about the situation.

VIII. Conclusion

In this paper we try to cover all aspects of one of the fastest growing financial products of the capital markets, namely, the ETFs as much as possible along with their types and benefits they provide to investors. The most important feature of ETFs as said before is the creation/redemption process, which is a very novice innovation in order to assure the parallel movement of the stock

t price and the book value of ETFs. The arbitrage process is explained in detail to show the mechanics of creation/redemption process. It has been shown that the tracking error of ETFs may differ and this fact is illustrated by forming sample portfolios with easy to understand applications. It has also been emphasized that the ETFs will also differ in practice from the traditional mutual funds in case of dividend payments and stock splits or rights issues. Since ETFs allow the investor to trade the index itself, it is strongly believed that the Turkish investors who are known by their short-sighted investment strategy will enjoy this product. ETFs will probably contribute to the overall turnover in the stock market due to the arbitrage activities stemming from the creation/redemption facility.

It is observed that after the introduction of ETFs to the market, futures and options contracts on ETFs are increasingly being opened up to the investors by the derivatives exchanges and these derivative products prove to be quite successful²⁷. Since ETFs are usually index tracking passive funds, we believe that the introduction of ETFs to our capital markets will pave the way for index futures, facilitate the understanding of the market and increase the investor interest towards derivative products. The need for index futures will also be understood after the introduction of ETFs to the Turkish investors, since the market makers of ETFs in the developed financial markets are from time to time actually found to get heavily involved in index futures markets²⁸. Moreover, it is believed that the demand for financial product is usually proportional to the market liquidity, and the ETFs are expected to improve the liquidity and thus enlarge the investor base and decrease the volatility, which is said to be the result of the lack of institutional investors. With the help of the newly introduced ETF products, the portfolio composition of all the other funds will probably be more transparent which in turn will boost the investor confidence in our capital markets.

ETFs are expected to contribute to Turkey’s privatization efforts, an area where satisfactory results are not taken yet. Instead of offering the shares of public companies individually to the investors, the shares of state- owned enterprises may form a basket and the basket may be offered to the public just like an ETF and this will in turn improve the investor demand towards the shares. For example an index fund with an underlying portfolio of public stocks (e.g. Türk Hava Yolları, Ereğli, Tüpraş, Petkim) will provide investors an instrument which tracks the ISE indexes quite closely and the investors will

²⁷ www.eurexchange.com, www.futuresindustry.org.

²⁸ Futures Industry Magazine, May’s 2001.

be eliminating much of the unsystematic risks which are caused by the individual stocks. By using this instrument the government may boost the privatization process. It is strongly recommended however, that, before the commencement of such a public offer, Türk Telecom should be sold to the public and traded in the exchange and after that step the ETF including the Türk Telecom shares should be offered to the public.

Since ETFs are quite new to the financial markets, tax incentives should be provided and the profits gained from the buying and selling of ETFs should be exempt from tax for a certain period of time and a minimum time interval between the buying and selling activity should not be imposed as is the case for the stock transactions in Turkey.

Compared to the developed financial markets, we believe that there is a great potential of development for mutual funds industry in Turkey and this instrument will be helpful for the investors. It will generate new income opportunities for brokerage firms, banks, the stock exchange and clearing houses. For all the reasons cited above, the necessary regulatory framework should be completed and the intermediaries should be encouraged to introduce the ETFs in the Turkish Capital Markets.

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GLOBAL CAPITAL MARKETS

Concerns that had increased about the pace and sustainability of an economic recovery in the second quarter of 2002 continued also in the third quarter. Industrial production has stagnated in the major advanced countries accompanied by a slowdown in global trade growth. In the United States, Canada, and United Kingdom, monetary and fiscal policies have been eased significantly more in response to the global slowdown than in the Euro area and Japan, partly reflecting the smaller room for policy maneuver in the latter two. Financial market developments during the third quarter can be characterized by heightened investor risk aversion. However, the global financial system so far have remained resilient despite a number of challenges namely, economic recessions and growth slowdowns in various countries, the bursting of the technology, media, and telecom (TMT) bubble and more widespread equity price declines.

The continued mature equity market weakness and volatility were detrimental to emerging market financing, including foreign direct investment. Global financial markets have weakened significantly with equity markets falling since end-March accompanied by a depreciation of the U.S. dollar. The fall in equity markets, if sustained, will significantly affect U.S. consumption and investment although the impact will be partly offset by lower long-run interest rates as well as the weaker dollar. In the Euro area and Japan, the effect of equity market declines is smaller; but not negligible; however, long-term interest rates have fallen less than in the United States.

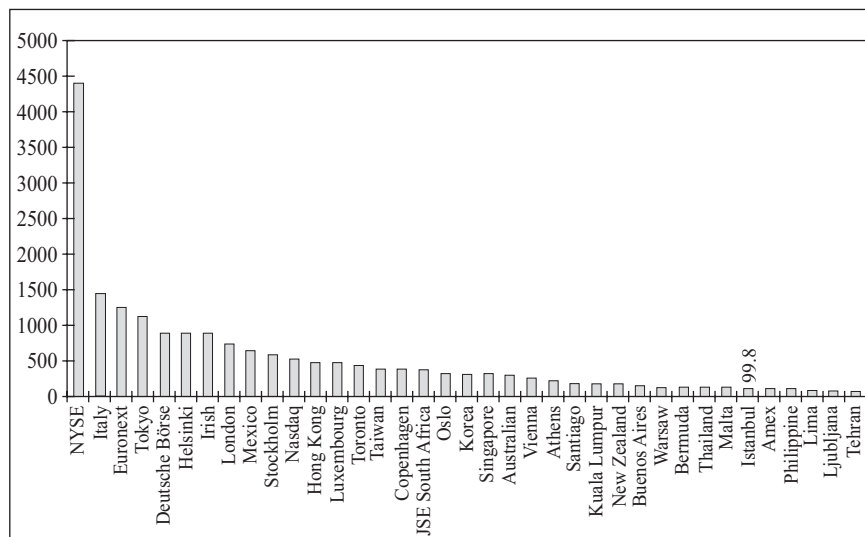
The performances of some developed stock markets with respect to indices in US dollar terms indicated that Nikkei-225, FTSE-100, DJIA and Xetra DAX decreased by -8.6 %, -19.5 %, -22.6 % and -37.3 % respectively at the end of September 2002 in comparison with the December 31st 2001. When US\$ based returns of some emerging markets are compared in the same period, the best performer markets were: Russia (31.3 %), Czech Rep. (28.8 %), Indonesia (20.6 %), Thailand (12.3 %), Hungary (8.3 %) and S. Africa (5.0 %). In the same period, the lowest return markets were: Argentina (-64.6 %), Brazil (-58.3 %), Turkey (-42.1 %), Venezuela (-41.3 %) and Israel (-31.4 %). The performances of emerging markets with respect to P/E ratios as of end-September 2002 indicated that the highest rates were obtained in Philippines (57.9), Malaysia (34.4), Korea (32.5), Indonesia (25.4), Turkey (22.9) and Taiwan (19.5), and the lowest rates in Argentina (-3.6), Poland (5.2), Brazil (9.3) and Czech Rep. (10.7).

Market Capitalization (USD Million, 1986-2001)

	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	11,712,673	10,967,395	745,278	6,756
1990	9,398,391	8,784,770	613,621	18,737
1991	11,342,089	10,434,218	907,871	15,564
1992	10,923,343	9,923,024	1,000,319	9,922
1993	14,016,023	12,327,242	1,688,781	37,824
1994	15,124,051	13,210,778	1,913,273	21,785
1995	17,788,071	15,859,021	1,929,050	20,782
1996	20,412,135	17,982,088	2,272,184	30,797
1997	23,087,006	20,923,911	2,163,095	61,348
1998	26,964,463	25,065,373	1,899,090	33,473
1999	36,030,810	32,956,939	3,073,871	112,276
2000	32,260,433	29,520,707	2,691,452	69,659
2001	27,818,618	25,246,554	2,572,064	47,689

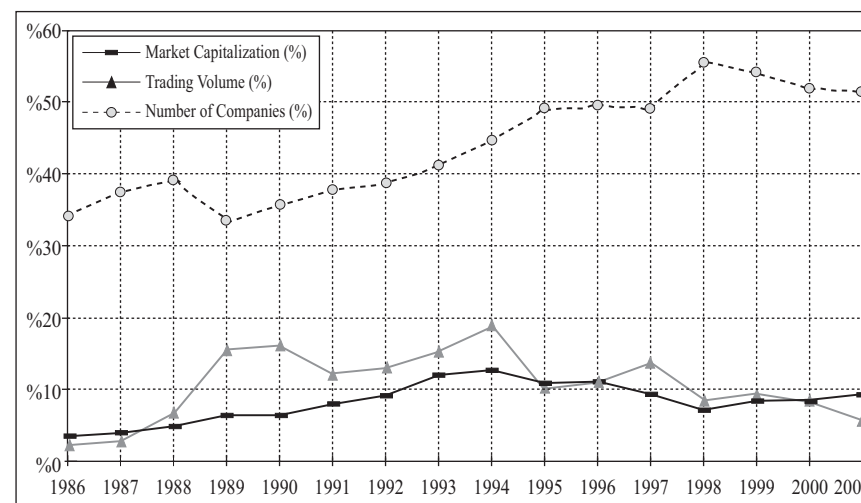
Source: IFC Factbook 2002.

Comparison of Average Market Capitalization Per Company (USD Million, September 2002)



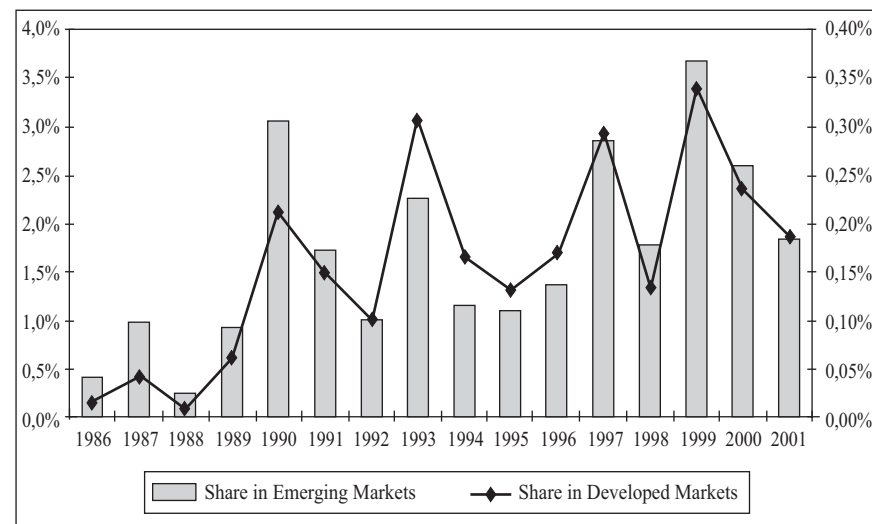
Source: FIBV, Monthly Statistics, Sept. 2002.

Worldwide Share of Emerging Capital Markets (1986-2001)



Source: IFC Factbook, 2002.

Share of ISE's Market Capitalization in World Markets (1986-2001)



Source: IFC Factbook, 2002.

Main Indicators of Capital Markets (Sept. 2002)

	Market	Value of Share Trading (Millions, US\$) Up to Year Total (2002/1-2002/9)	Market	Market Cap. of Share of Domestic Companies (Millions, US\$) Sept. 2002
1	NYSE	7,900,987	NYSE	8,489,951
2	Nasdaq	5,671,213	Tokyo	2,177,146
3	London	3,074,503	Nasdaq	1,714,041
4	Euronext	1,543,440	London	1,649,814
5	Tokyo	1,221,228	Euronext	1,331,292
6	Deutsche Börse	951,443	Deutsche Börse	620,596
7	Amex	486,221	Toronto	538,712
8	Taiwan	485,554	Swiss Exchange	444,100
9	Spanish Exchange	485,354	Hong Kong	433,416
10	Korea	471,942	Italy	418,353
11	Swiss Exchange	468,861	Spanish Exchanges	398,570
12	Italy	458,982	Australian	355,645
13	Chicago	413,690	Taiwan	235,560
14	Bermuda	320,57	Korea	214,128
15	Toronto	310,664	JSE South Africa	153,525
16	Australian	224,292	Stockholm	149,263
17	Stockholm	209,810	Kuala Lumpur	124,265
18	Hong Kong	153,347	Helsinki	123,585
19	Helsinki	128,707	Singapore	98,845
20	Osaka	91,904	Mexico	97,151
21	JSE South Africa	59,734	Brazil	95,768
22	Singapore	51,321	Copenhagen	70,914
23	Istanbul	44,295	Athens	66,141
24	Copenhagen	41,447	Oslo	60,716
25	Oslo	41,160	Irish	54,368
26	Sao Paulo	38,917	Amex	50,663
27	Thailand	34,118	Santiago	42,438
28	Mexico	28,334	Tel-Aviv	41,730
29	Kuala Lumpur	28,012	Thailand	41,147
30	Irish	24,566	Istanbul	28,849
31	Athens	17,493	Jakarta	28,848
32	Jakarta	10,277	Vienna	26,326
33	Tel-Aviv	9,209	Warsaw	23,726
34	New Zealand	6,590	Luxembourg	20,785
35	Warsaw	6,003	Philippine	20,557
36	Vienna	4,411	New Zealand	20,190
37	Budapest	4,088	Bounes Aires	13,248
38	Philippine	2,746	Budapest	11,021
39	Santiago	2,171	Tehran	10,547
40	TSX Venture	1,669	Lima	10,328
41	Tehran	1,455	TSX Venture	6,341
42	Ljubljana	1,043	Ljubljana	5,163
43	Buenos Aires	1,022	Bermuda	2,379
44	Lima	655	Colombo	1,811
45	Luxembourg	392	Malta	1,203

Source: FIBV. Monthly Statistics, Sept. 2002.

Trading Volume (USD millions, 1986-2001)

	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	0.03
1989	7,467,997	6,298,778	1,169,219	773	15.66	0.07
1990	5,514,706	4,614,786	899,920	5,854	16.32	0.65
1991	5,019,596	4,403,631	615,965	8,502	12.27	1.38
1992	4,782,850	4,151,662	631,188	8,567	13.20	1.36
1993	7,194,675	6,090,929	1,103,746	21,770	15.34	1.97
1994	8,821,845	7,156,704	1,665,141	23,203	18.88	1.39
1995	10,218,748	9,176,451	1,042,297	52,357	10.20	5.02
1996	13,616,070	12,105,541	1,510,529	37,737	11.09	2.50
1997	19,484,814	16,818,167	2,666,647	59,105	13.69	2.18
1998	22,874,320	20,917,462	1,909,510	68,646	8.55	3.60
1999	31,021,065	28,154,198	2,866,867	81,277	9.24	2.86
2000	47,869,886	43,817,893	4,051,905	179,209	8.46	4.42
2001	42,076,862	39,676,018	2,400,844	77,937	5.71	3.25

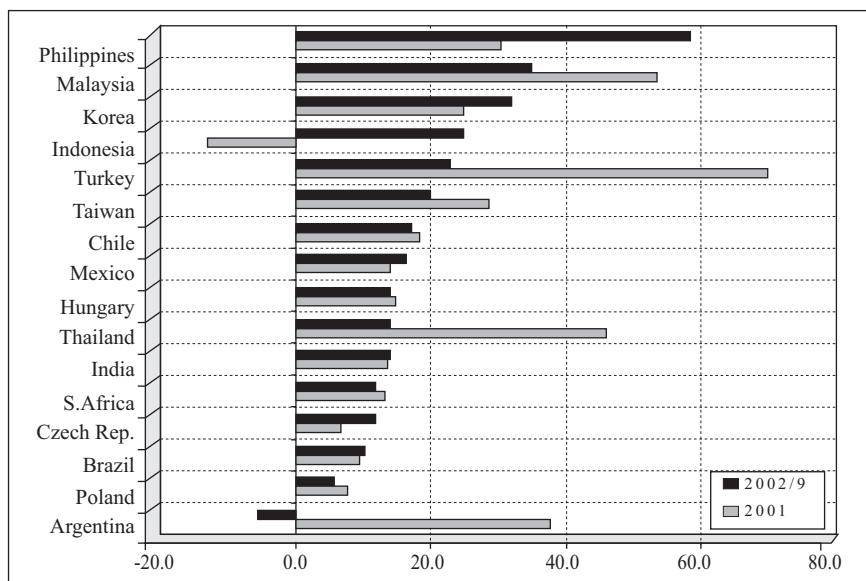
Source: IFC Factbook, 2002.

Number of Trading Companies (1986-2001)

	Global	Developed Markets	Emerging Markets	ISE	Emerging/ Global (%)	ISE/Emerging (%)
1986	28,173	18,555	9,618	80	34.14	0.83
1987	29,278	18,265	11,013	82	37.62	0.74
1988	29,270	17,805	11,465	79	39.17	0.69
1989	25,925	17,216	8,709	76	33.59	0.87
1990	25,424	16,323	9,101	110	35.80	1.21
1991	26,093	16,239	9,854	134	37.76	1.36
1992	27,706	16,976	10,730	145	38.73	1.35
1993	28,895	17,012	11,883	160	41.12	1.35
1994	33,473	18,505	14,968	176	44.72	1.18
1995	36,602	18,648	17,954	205	49.05	1.14
1996	40,191	20,242	19,949	228	49.64	1.14
1997	40,880	20,805	20,075	258	49.11	1.29
1998	47,465	21,111	26,354	277	55.52	1.05
1999	48,557	22,277	26,280	285	54.12	1.08
2000	49,933	23,996	25,937	315	51.94	1.21
2001	48,220	23,340	24,880	310	51.60	1.25

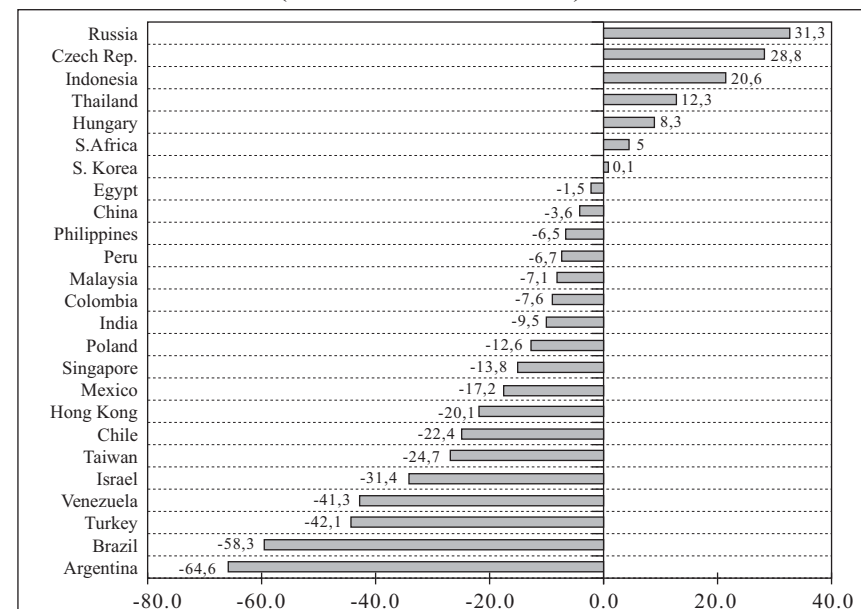
Source: IFC Factbook, 2002.

Comparison of P/E Ratios Performances
2000/12 - 2002/9



Source: IFC Factbook 2001. IFC, Monthly Review, Sept. 2002.

Comparison of Market Returns In USD
(31/12/2001-2/10/2002)



Source: The Economist, October 5th-11th 2002.

Price-Earnings Ratios in Emerging Markets (1993-2002/9)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002/9
Argentina	41.9	17.7	15.0	38.2	17.1	13.4	39.0	293.3	38.4	-3.6
Brazil	12.6	13.1	36.3	14.5	15.4	7.0	25.1	11.7	8.9	9.3
Chile	20.0	21.4	17.1	27.8	15.9	15.1	37.7	31.8	17.1	16.7
Czech Rep.	18.8	16.3	11.2	17.6	8.8	-11.3	-14.8	21.0	5.6	10.7
Hungary	52.4	-55.3	12.0	17.5	25.2	17.0	18.2	14.3	13.3	13.2
India	39.7	26.7	14.2	12.3	16.8	13.5	22.0	14.8	12.3	12.6
Indonesia	28.9	20.2	19.8	21.6	11.2	-106.2	-10.5	-6.5	-14.1	25.4
Korea	25.1	34.5	19.8	11.7	11.6	-47.1	-27.7	19.3	24.9	32.5
Malaysia	43.5	29.0	25.1	27.1	13.5	21.1	-19.1	71.7	53.2	34.4
Mexico	19.4	17.1	28.4	16.8	22.2	23.9	14.1	12.5	13.2	15.6
Philippines	38.8	30.8	19.0	20.0	12.5	15.0	24.0	28.2	28.4	57.9
Poland	31.5	12.9	7.0	14.3	10.3	10.7	22.0	19.4	6.0	5.2
S. Africa	17.3	21.3	18.8	16.3	12.1	10.1	17.4	10.7	11.7	10.8
Taiwan, China	34.7	36.8	21.4	28.2	32.4	21.7	49.2	13.7	28.5	19.5
Thailand	27.5	21.2	21.7	13.1	4.8	-3.7	-14.5	-12.4	47.3	13.1
Turkey	36.3	31.0	8.4	10.7	18.9	7.8	33.8	15.2	69.5	22.9

Source: IFC Factbook, 2001; IFC, Monthly Review, Sept. 2002.

Note: Figures are taken from IFC Investable Index Profile.

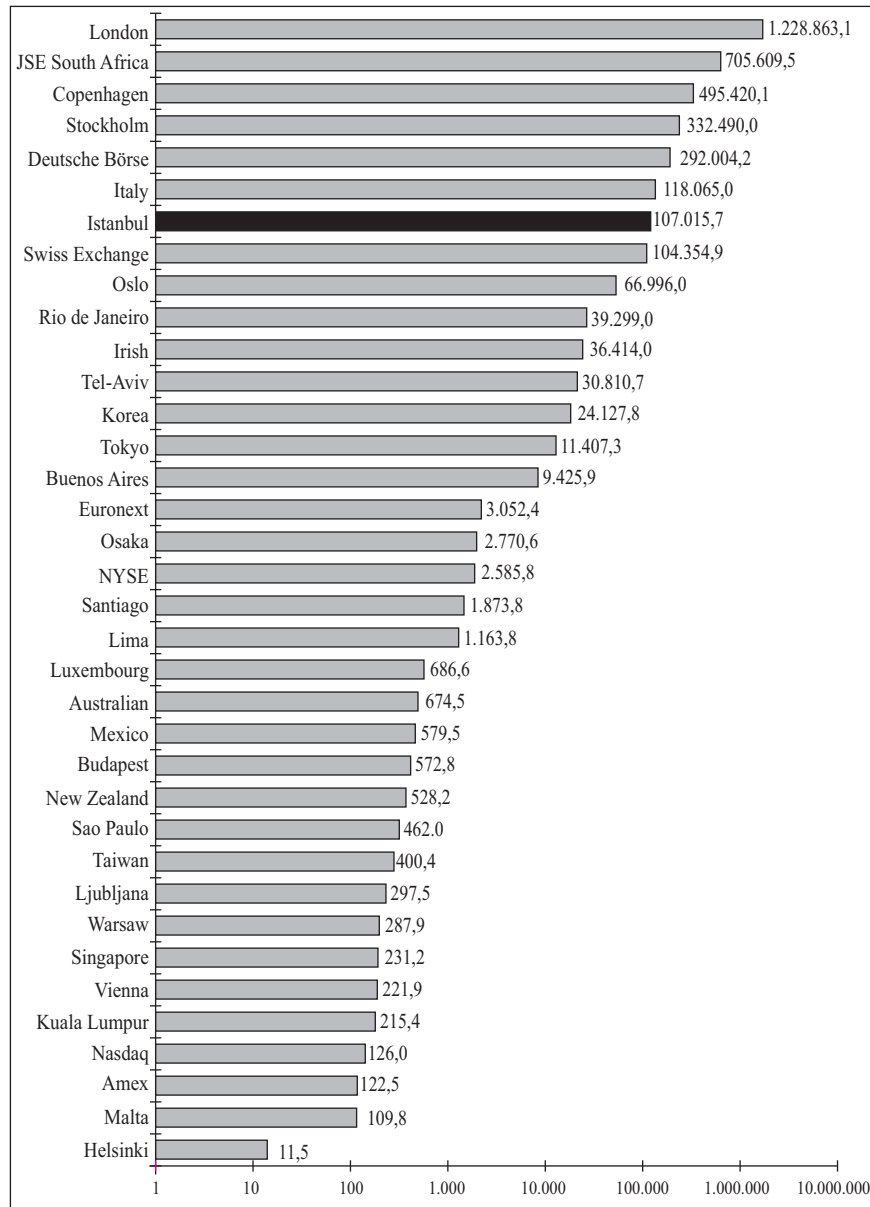
Market Value/Book Value Ratios (1993-2002/9)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002/9
Argentina	1.9	1.4	1.3	1.6	1.8	1.3	1.5	1.0	0.6	1.4
Brazil	0.5	0.6	0.5	0.7	1.1	0.6	1.6	1.4	1.2	1.0
Chile	2.1	2.5	2.1	1.6	1.6	1.1	1.8	1.5	1.4	1.2
Czech Rep.	1.3	1.0	0.9	0.9	0.8	0.7	1.2	1.2	0.8	0.7
Hungary	1.6	1.7	1.2	2.0	3.7	3.2	3.6	2.5	1.8	1.7
India	4.9	4.2	2.3	2.1	2.7	1.9	3.1	2.5	2.0	2.0
Indonesia	3.1	2.4	2.3	2.7	1.5	1.6	2.9	1.6	1.9	1.1
Korea	1.4	1.6	1.3	0.8	0.6	0.9	2.0	0.8	1.3	1.1
Malaysia	5.4	3.8	3.3	3.8	1.8	1.3	1.9	1.5	1.3	1.3
Mexico	2.6	2.2	1.7	1.7	2.5	1.4	2.2	1.7	1.7	1.5
Philippines	5.2	4.5	3.2	3.1	1.7	1.3	1.5	1.2	1.1	1.1
Poland	5.7	2.3	1.3	2.6	1.6	1.5	2.0	2.2	1.4	1.3
S. Africa	1.8	2.6	2.5	2.3	1.9	1.5	2.7	2.1	2.1	1.9
Taiwan, China	3.9	4.4	2.7	3.3	3.8	2.6	3.3	1.7	2.1	1.5
Thailand	4.7	3.7	3.3	1.8	0.8	1.2	2.6	1.6	1.6	1.5
Turkey	7.2	6.3	2.7	4.0	9.2	2.7	8.8	3.1	3.8	2.2

Source: IFC Factbook, 1996-2001; IFC Monthly Review, Sept. 2002.

Note: Figures are taken from IFC Investable Index Profile.

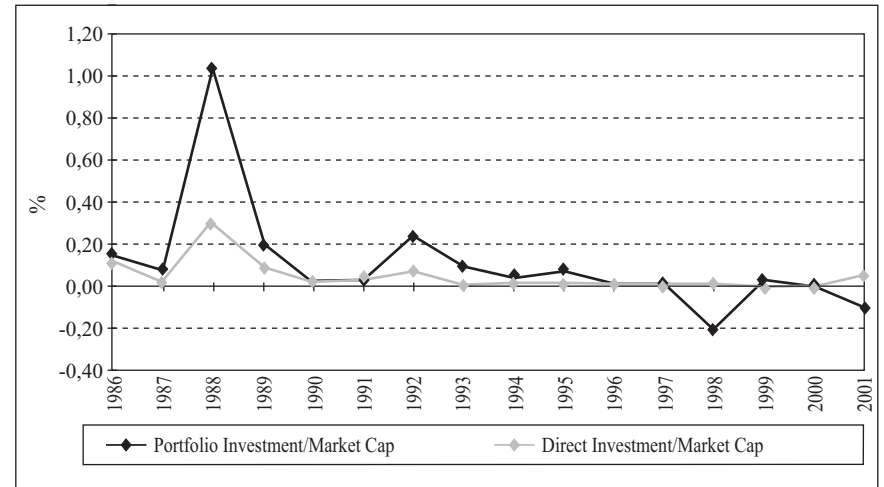
Value of Bond Trading
(Million USD. January 2002-September 2002)



Source: FIBV, Monthly Statistics, Sept. 2002.

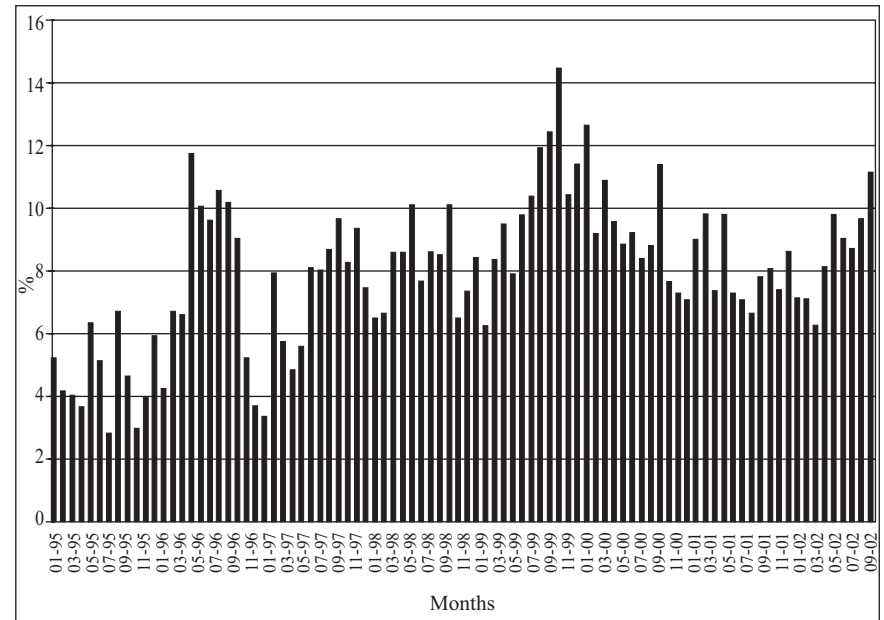
Note: The value of bonds trading pertain to Trading System View figures. For those countries which do not have Trading System View figures, the Regulated Environment figures are used.

Foreign Investments as a Percentage of Market Capitalization
in Turkey (1986-2001)



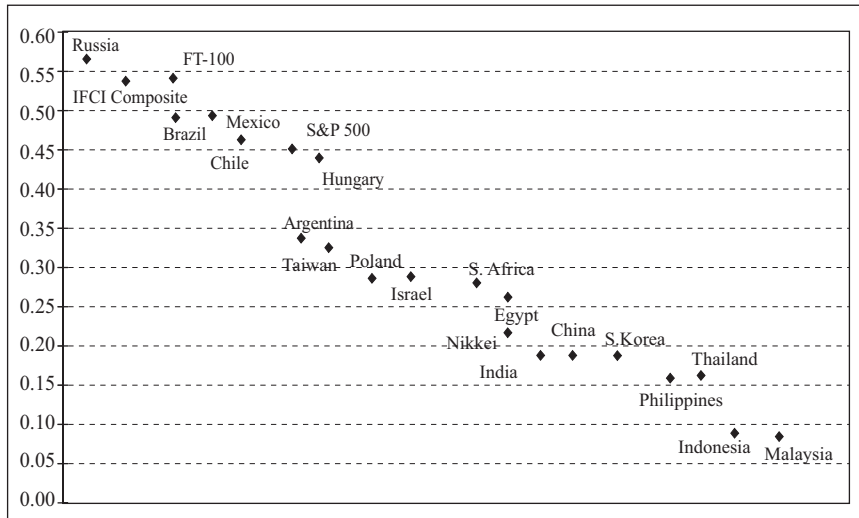
Source: ISE Data. CBTR Databank.

Foreigners' Share in the Trading Volume of the ISE
(Jan. 95-Sept. 2002)



Source: ISE Data.

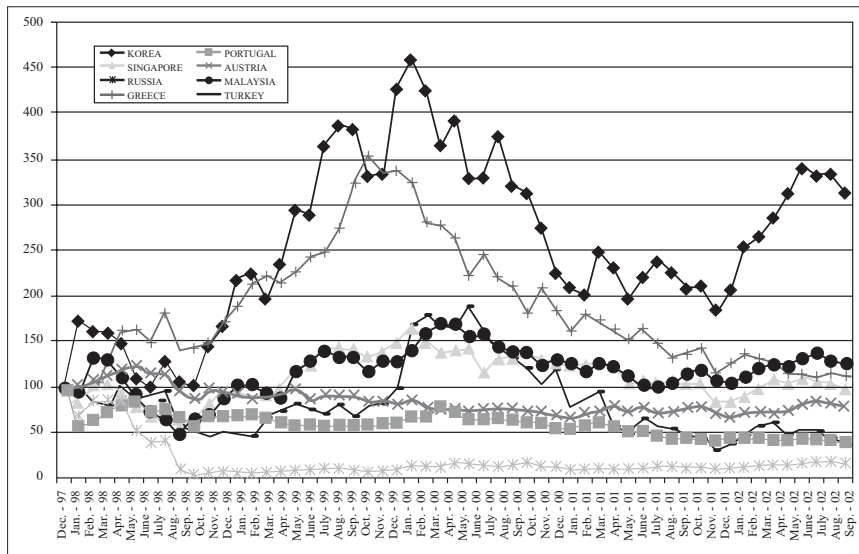
Price Correlations of the ISE (Sept. 1997- Sept. 2002)



Source : IFC Monthly Review, Sept. 2002.

Notes: The correlation coefficient is between -1 and +1. If it is zero, for the given period, it is implied that there is no relation between two series of returns.

Comparison of Market Indices (31 Dec 97=100)



Source: Reuters.

Note: Comparisons are in US\$.

ISE Market Indicators

STOCK MARKET											
Traded Value				Market Value		Dividend Yield	P/E Ratios				
	Number of Companies	Total		Daily Average							
		(TL Billion)	(US\$ Million)	(TL Billion)	(US\$ Million)						(%)
1986	80	9	13	—	—	709	938	9,15	5,07	—	—
1987	82	105	118	—	—	3.182	3.125	2,82	15,86	—	—
1988	79	149	115	1	—	2.048	1.128	10,48	4,97	—	—
1989	76	1.736	773	7	3	15.553	6.756	3,44	15,74	—	—
1990	110	15.313	5.854	62	24	55.238	18.737	2,62	23,97	—	—
1991	134	35.487	8.502	144	34	78.907	15.564	3,95	15,88	—	—
1992	145	56.339	8.567	224	34	84.809	9.922	6,43	11,39	—	—
1993	160	255.222	21.770	1.037	88	546.316	37.824	1,65	25,75	20,72	14,86
1994	176	650.864	23.203	2.573	92	836.118	21.785	2,78	24,83	16,70	10,97
1995	205	2.374.055	52.357	9.458	209	1.264.998	20.782	3,56	9,23	7,67	5,48
1996	228	3.031.185	37.737	12.272	153	3.275.038	30.797	2,87	12,15	10,86	7,72
1997	258	9.048.721	58.104	35.908	231	12.654.308	61.879	1,56	24,39	19,45	13,28
1998	277	18.029.967	70.396	72.701	284	10.611.820	33.975	3,37	8,84	8,11	6,36
1999	285	36.877.335	84.034	156.260	356	61.137.073	114.271	0,72	37,52	34,08	24,95
2000	315	111.165.396	181.934	451.892	740	46.692.373	69.507	1,29	16,82	16,11	14,05
2001	310	93.118.834	80.400	375.479	324	68.603.041	47.689	0,95	108,33	824,42	411,64
2002	302	64.240.891	44.537	339.899	236	48.003.961	29.106	1,41	207,83	215,07	110,16
2002/Ç1	309	25.283.320	18.670	421.389	311	57.824.887	43.254	1,26	93,13	108,29	100,57
2002/Ç2	306	18.501.225	13.432	289.082	210	49.293.803	31.436	1,27	—	—	—
2002/Ç3	302	20.456.347	12.436	314.713	191	48.003.961	29.106	1,41	207,83	215,07	110,16

Q: Quarter

Note:

* Between 1986-1992, the price earnings ratios were calculated on the basis of the companies' previous year-end net profits. As from 1993.

TL(1) = Total market capitalization / Sum of last two six-month profits

TL(2) = Total market capitalization / Sum of last four three-month profits

US\$ = US\$ based total market capitalization / Sum of last four US\$ based three-month profits.

Closing Values of the ISE Price Indices

	TL Based				
	NATIONAL - 100 (Jan. 1986=1)	NATIONAL - INDUSTRIALS (Dec. 31, 90=33)	NATIONAL - SERVICES (Dec. 27, 90=1046)	NATIONAL - FINANCIALS (Dec.31, 90=33)	NATIONAL - TECHNOLOGY (Jun. 30, 90=14.466,12)
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	1.046,00	914,47	—
1997	3.451,—	2.660,—	3.593,—	4.522,—	—
1998	2.597,91	1.943,67	3.697,10	3.269,58	—
1999	15.208,78	9.945,75	13.194,40	21.180,77	—
2000	9.437,21	6.954,99	7.224,01	12.837,92	10.586,58
2001	13.782,76	11.413,44	9.261,82	18.234,65	9.236,16
2002	8.842,24	8.531,86	6.221,22	10.650,94	6.427,05
2002/Ç1	11.679,43	9.427,08	7.165,25	16.370,98	6.972,81
2002/Ç2	9.379,92	8.850,68	5.668,98	12.065,92	5.145,49
2002/Ç3	8.842,24	8.531,86	6.221,22	10.650,94	6.427,05

	US \$ Based					EURO Based
	NATIONAL - 100 (Jan. 1986=100)	NATIONAL - INDUSTRIALS (Dec. 31, 90=643)	NATIONAL - SERVICES (Dec. 27, 90=572)	NATIONAL - FINANCIALS (Dec.31, 90=643)	NATIONAL - TECHNOLOGY (Jun. 30,00=1.360,92)	NATIONAL - 100 (Dec.31, 98=484)
1986	131,53	—	—	—	—	—
1987	384,57	—	—	—	—	—
1988	119,82	—	—	—	—	—
1989	560,57	—	—	—	—	—
1990	642,63	642,63	—	642,63	—	—
1991	501,50	569,63	—	385,14	—	—
1992	272,61	334,59	—	165,68	—	—
1993	833,28	897,96	—	773,13	—	—
1994	413,27	462,03	—	348,18	—	—
1995	382,62	442,11	—	286,83	—	—
1996	534,01	572,33	572,00	500,40	—	—
1997	981,99	756,91	1.022,40	1.286,75	—	—
1998	484,01	362,12	688,79	609,14	—	484,01
1999	1.654,17	1.081,74	1.435,08	2.303,71	—	1.912,46
2000	817,49	602,47	625,78	1.112,08	917,06	1.045,57
2001	557,52	461,68	374,65	737,61	373,61	741,24
2002	311,97	301,02	219,50	375,79	226,76	371,39
2002/Ç1	508,38	410,34	311,89	712,60	303,51	683,05
2002/Ç2	348,09	328,45	210,38	447,77	190,95	410,26
2002/Ç2	311,97	301,02	219,50	375,79	226,76	371,39

Q: Quarter

BONDS AND BILLS MARKET

Traded Value

Outright Purchases and Sales Market

	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	5.503.632	35.472	21.840	141
1998	17.995.993	68.399	71.984	274
1999	35.430.078	83.842	142.863	338
2000	166.336.480	262.941	662.695	1.048
2001	39.776.813	37.297	159.107	149
2002	63.577.237	43.344	334.617	228
2002/Ç1	14.192.919	10.478	232.671	172
2002/Ç2	25.634.521	18.409	400.539	288
2002/Ç3	23.749.797	14.457	365.381	222

Repo-Reverse Repo Market

Repo-Reverse Repo Market

	Total		Daily Average	
	(TL Billion)	(US\$ Million)	(TL Billion)	(US\$ Million)
1993	59.009	4.794	276	22
1994	756.683	23.704	2.991	94
1995	5.781.776	123.254	22.944	489
1996	18.340.459	221.405	72.780	879
1997	58.192.071	374.384	230.921	1.486
1998	97.278.476	372.201	389.114	1.489
1999	250.723.656	589.267	1.010.982	2.376
2000	554.121.078	886.732	2.207.654	3.533
2001	696.338.553	627.244	2.774.257	2.499
2002	501.999.014	334.991	2.642.100	1.763
2002/Ç1	112.784.853	83.282	1.848.932	1.365
2002/Ç2	156.721.973	110.194	2.448.781	1.722
2002/Ç3	32.492.188	141.514	3.576.803	2.177

Q: Quarter

(*) The Third quarter includes July-September period.

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

TL Based

	30 Days	91 Days	182 Days	General
1996	103,41	110,73	121,71	110,52
1997	102,68	108,76	118,48	110,77
1998	103,57	110,54	119,64	110,26
1999	107,70	123,26	144,12	125,47
2000	104,84	117,12	140,81	126,95
2001	106,32	119,29	137,51	116,37
2002	106,98	120,88	139,09	122,48
2002/Ç1	106,60	120,76	142,23	124,04
2002/Ç2	107,05	120,83	138,19	123,99
2002/Ç3	106,98	120,88	139,09	122,48

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

TL Based

	30 Days	91 Days	182 Days
1996	222,52	240,92	262,20
1997	441,25	474,75	525,17
1998	812,81	897,19	983,16
1999	1.372,71	1.576,80	1.928,63
2000	1.835,26	2.020,94	2.538,65
2001	2.877,36	3.317,33	3.985,20
2002	3.499,50	4.297,58	5.746,42
2002/Ç1	3.076,72	3.632,78	4.576,96
2002/Ç2	3.281,30	3.944,90	4.970,20
2002/Ç3	3.499,50	4.297,58	5.746,42

USD \$ Based

1996	122.84	132.99	144.74
1997	127.67	137.36	151.95
1998	153.97	169.96	186.24
1999	151.03	173.47	212.18
2000	148.86	169.79	231.28
2001	118.09	136.14	163.55
2002	125.46	154.07	205.47
2002/Ç1	136.17	160.78	202.57
2002/Ç2	123.81	148.85	187.54
2002/Ç3	125.46	154.07	205.47

Q: Quarter

ISE GDS Price Indices (January 02, 2001 = 100)

TL Based

	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)	General
2001	101,49	97,37	91,61	85,16	101,49
2002	102,21	96,36	88,49	80,11	101,70
2002/Ç1	104,35	101,69	97,16	91,62	103,58
2002/Ç2	101,77	94,97	86,19	77,10	98,81
2002/Ç3	102,21	96,36	88,49	80,11	101,70

ISE GDS Performance Indices (January 02, 2001 = 100)

TL Based

	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)
2001	179,24	190,48	159,05	150,00
2002	271,74	296,44	245,97	208,23
2002/Ç1	207,48	220,50	190,80	169,85
2002/Ç2	232,97	247,59	210,88	170,71
2002/Ç3	271,74	296,44	245,97	208,23

US \$ Based

	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)
2001	7.34	7.79	6.62	6.14
2002	9.72	10.61	8.80	7.46
2002/Ç1	9.18	9.76	8.44	7.52
2002/Ç2	8.79	9.34	7.96	6.44
2002/Ç3	9.72	10.61	8.80	7.46

Q: Quarter

Book Review

“Stock market Overreaction and Fundamental Valuation, Theory and Empirical Evidence”, Mathias Külpmann, Springer-Verlag Berlin Heidelberg, 2002, pp. ix-198.

The purpose of this book is to report on new developments in mathematical economics, economic theory, econometrics, operations research, and mathematical systems. Chapter 1 reviews the methodology and the main findings of the winner-loser effect in the literature. From an economic point of view the decisive question is whether the winner-loser effect occurs within a framework of rational asset pricing. These findings are then related to the concept of market efficiency. Then a more detailed analysis is done on the papers which are most closely related to the author’s own investigation.

Chapter 2 presents the authors own investigation of the winner-loser effect for German data from 1968-1986. Starting point of the investigation is the research design which has been proposed by DeBondt and Thaler (1985). First, the winner-loser hypothesis of long-term reversals in the cross-sectional of stock returns within the setting of DeBondt and Thaler is investigated. In addition, a complementary method of investigation is presented. Also, the probabilities by which loser stocks become winner stocks and vice versa are investigated.

In Chapter 3, a theoretical framework is presented in three steps. The winner-loser effect within a framework of rational asset pricing is investigated. In empirical asset pricing models stock returns are related to aggregate pricing variables. In the CAPM stock returns are related to the market rate of return. The alternative approach pursued is that stock returns are related to fundamentals such as dividends and profits. Two interpretations of this relationship are presented. The first is that unexpected changes in fundamentals drive unexpected returns. According to this interpretation the winner-loser effect is due to a surprise effect: After a period of good performance of the winner stocks investors are surprised by their subsequent underperformance. After a period of poor performance of the loser stock investors are surprised by their subsequent over performance. The difference in returns between the winner and the loser portfolio is due to unexpected changes in the fundamental performance. In the last part of the chapter, an alternative interpretation of the relationship between

stock returns and fundamentals are presented.

Chapter 4, the extent to which CAPM is able to explain the winner-loser effect is investigated. The CAPM turns out to explain the winner-loser effect only imperfectly. Although the differences in the CAPM- β across portfolios are found, these differences are not sufficient to explain the winner-loser effect.

Chapter 5, the author relates the stock returns to movements in fundamentals such as dividends and profits. The main finding in this section is that stock returns and changes in fundamentals move in parallel. For the winner portfolio the author observes a period of increases in profits which is followed by a period of decreases. For the loser portfolio the reverse pattern can be observed. A period of decreases is followed by a period of increases.

In chapter 6, the author compares the explanatory power of fundamentals and the CAMP- β are compared directly. For the cross section of stock returns the explanatory power of the CAMP can almost be neglected whereas fundamentals have significant explanatory power.

In chapter 7, the author investigates whether cycles in stock returns are related to temporary problems in corporate control. Properties of returns and fundamentals are related to the theory of management control. The main hypothesis is that firms which show cycles in their performance suffer from temporary problems of corporate control. Periods of tight management controls are followed by periods of loose control. Tights management control encourages management to show better performance. Afterwards it becomes difficult for the shareholders to encourage management to continue excellent performance as management will always point to its former merits. For the loser firms a period of poor management performance induces a tightening of management control. This hypothesis is investigated by means of accounting variables. This final chapter opens a new field of research which is at the intersection of asset pricing theory and the theory of corporate governance.