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GLOBAL FACTORS AND STOCK RETURNS: EMPIRICAL EVIDENCE FROM THE ISTANBUL STOCK EXCHANGE

Alpaslan AKÇORAOĞLU & Funda YURDAKUL*

Abstract

The objective of this paper is to explore the effects of some global factors on stock returns for the Istanbul Stock Exchange (ISE). To this end, a set of global variables such as current account balance, international capital flows, exchange rates and U.S. stock price index are employed in our empirical analysis. We utilized the modeling strategy of Hendry (1980) and an error correction model (ECM) in order to analyze the dynamic short-run relations between global variables and stock prices. The findings of this paper suggest that global factors are important in explaining the variations in stock returns for the specific case of Turkey. Thus, the empirical evidence presented in this paper support the view that the dynamic linkages between emerging markets and global factors may be significant due to increased integration of international financial markets in the past decade.

I. Introduction

Since the late 1980s, the spectacular increase in financial flows to developing countries has led to a profound trend toward the globalization of financial markets. The major stock markets have become increasingly internationalized by deregulation and liberalization of international financial flows in the recent decades. Thus, national stock markets are influenced by a range of international factors. Purely internal shocks could also have global consequences if stock markets are subject to contagion effects. The primary purpose of this paper is to investigate the relations between stock returns and global factors for the specific case of Turkey by employing the modeling strategy of Hendry (1980) and the error-correc-

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tion models (ECM).

Dynamic linkages between stock markets and global factors have been examined only recently and extensively for the major stock markets (Aggarwal and Schrim 1992; Chan et al. 1992; Beckers et al. 1996; Masih and Masih 2001). However, such linkages in the emerging stock markets of developing economies have been largely ignored in the literature. The relations between emerging markets and global factors may be significant, however, mainly due to greatly increased interest by international asset holders in the emerging market economies. In many developing countries, the liberalization of international capital flows have bolstered international asset-holders' confidence that they will be able to move funds freely into or out of emerging capital markets. It should be noted, however, that liberalization of international financial flows has not yet been supported by strengthened supervision of the domestic financial institutions in many developing countries.

On the other hand, the large capital flows to emerging market economies have also stemmed from some important developments in the industrial countries (Knight, 1998). First, the continuing process of financial innovation in developed countries encouraged a greater spreading of risk exposures to emerging markets. Secondly, many portfolio managers in advanced economies have viewed emerging financial markets as a means to diversify portfolios. These factors were reinforced especially in the second half of 1990s as low interest rates in developed economies caused asset-holders to seek higher yields and to take on higher risks by increasing financial investments in emerging market economies.

The increased integration of international stock markets has invoked further research on the effects of global factors on national stock markets. While one group of empirical research attempts to compare the relative importance of national versus global influences on stock returns, another group of research investigates the interdependence of returns across national stock markets (see the Section 3 for a detailed review of previous empirical studies). In this article, we focus on four global (or international) factors influencing stock returns in Istanbul Stock Exchange (ISE) during the period 1987-2000. This paper employs a set of global factors such as exchange rate, current account balance, the U.S. stock price index, and international capital flows in explaining the variations in the ISE index.

The organization of the paper is as follows. Section 2 briefly describes the theoretical basis. Section 3 reviews relevant prior research regarding

the influence on stock returns of global factors. Section 4 contains a discussion of the data and the estimation results. Finally, the conclusions are presented in Section 5.

II. Theoretical Basis

There are two main theories related to asset pricing: the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT). Since most of the assumptions of the CAPM are not sufficiently realistic, Ross (1976, 1977) proposed an alternative theory for asset pricing (APT). The APT states that assets' expected returns are based on risk factors. However, there is no consensus about the number of risk factors in the finance literature. The APT does not provide sufficient information either to specify the macroeconomic risk factors or to determine the effect of these factors on stock returns. In fact, there seems to be no generally accepted asset pricing models that clearly include certain macroeconomic variables. Hence, the selection of a specific macroeconomic variable as a risk factor should be based on economic theory.

The earlier empirical tests of the APT employed factor analysis technique to determine systematic factors affecting stock prices. Chen et al. (1986) attempted to specify and use certain macroeconomic factors as proxies for the theoretically undefined state variables in the APT. They concluded that sources of risk from three important macroeconomic factors appeared to be priced in the stock market. Several other empirical studies analyzed the relations between stock prices and macroeconomic variables by interpreting macroeconomic variables as the known risk factors that affect the expected returns

The exchange rates can be thought of as a risk factor since fluctuations in exchange rates influence both international (or export oriented) firms and domestic firms. The adoption of flexible exchange rate system by industrialized countries after the collapse of Bretton Woods system and the globalization of international trade and finance have increased the importance of this risk factor. The fundamental macroeconomic factors generating changes in exchange rates may also influence the stock returns (Asprem, 1989). The local stock market will benefit from an exchange rate overshooting, resulting in higher stock prices. In this case, international or export oriented firms will benefit directly from the depreciation of domestic currency because the competitive position of these firms will improve. Moreover, the depreciation of local currency will improve the relative competitiveness of domestic products with imported goods. On

the other hand, the depreciation of domestic currency will have a negative effect on the local stock market when a deteriorating domestic economy leads to a change in the exchange rate. In Turkey, investors consider foreign currencies as one of the main investment alternatives to equities. Thus, we may expect a negative relationship between exchange rate and stock returns due to substitution effects in the specific case of Turkey (Ozcam, 1997).

The increased liberalization of international trade and globalization of capital markets have increased the sensitivity of financial markets to announcements of international macroeconomic data such as current account balance. Balance of payments accounts provide a detailed picture of the composition and financing of all transactions between a country and the rest of the world. The current account of the balance of payments reflects international transactions involving goods and services. Although current values of some macroeconomic variables such as the current account balance are unobservable by economic agents, the announcement of the current account balance may provide valuable new information about the supply and demand for local currency and the performance of the national economy (Aggarwal and Schrim, 1992). In addition, the current account balance data have become increasingly important as a source of information that can be utilized to formulate Central bank operating procedures and policies. Thus, it is expected that changes in the current account balance influence international net asset positions and thereby prices of various assets.

The rapid growth of international versus domestic investment in stock markets in recent years indicates that there exists a substantial degree of interdependence among national stock markets in the world. The integration and interdependence of stock markets constitute a major focus of modern portfolio theory that analyzes issue of diversifying assets. The advantages of international portfolio diversification have been widely discussed in the finance literature in which theoretical and empirical studies attempted to quantify risk-reduction and its associated benefits.

Investors will trade off lower expected return for lower risk due to risk aversion. The portfolio theory proposed that whenever there is imperfect correlation between returns on different assets, risk can be reduced by maintaining only a portion of wealth in any asset (Levi, 1990). Therefore, it is argued that, ceteris paribus, the lower the correlations between asset returns, the greater are the benefits of portfolio diversification (Markowitz, 1959). There exists some degree of independence of asset

returns within a national economy and this provides some diversification opportunities for domestic investors. However, we expect smaller correlations of expected returns between investments in different countries than within any one country due to different industrial structures and patterns of cycles. This implies that international investments offer diversification benefits that cannot be obtained by investing only in the domestic assets (Levi, 1990).

On the other hand, there exists the possibility of added risk of unanticipated changes in exchange rates when international stocks are held by the investors. However, the benefits from international diversification more than compensate for the risk introduced by exchange rates. First, it is possible to diversify internationally without an exchange rate risk by hedging in the forward market, by borrowing in the foreign currencies, or by using futures or currency options. Secondly, international portfolio diversification is beneficial in spite of exchange rate variability even without hedging. Solnik (1974) showed that the variance of the dollar return on an internationally diversified portfolio of stocks remains lower than the variance of the expected dollar return on holding the domestic stock market. It is clear that the benefits from international diversification are even greater when hedged.

One of the fundamental questions involving the pricing of assets is whether they are determined in an integrated, global capital market, or in local, segmented markets. Capital market integration can be defined in at least three ways (Beckers et al., 1996). One definition argues that markets are fully integrated if all investors have equal access to all world securities. Segmentation of capital markets can occur for a variety of different barriers to international investing, such as regulatory, fiscal, or administrative impediments. A second definition implies that capital markets are fully integrated if any two assets with the same level of risk and the same expected cash flows have the same price irrespective of the markets in which they trade. A third definition of international financial integration claims that if markets are fully integrated, then the factors explaining security returns across different markets will be international (or global) ones, with no role for domestic factors.

If assets are priced in an internationally integrated capital market, the factors and influences that affect the world as a whole are reflected within each country. This means that domestic fund management is a special case of global fund management (Grinold et al., 1989). On the other hand, if assets are priced in segmented capital markets, single-country manage-

ment should vary country by country, as there will be different risk/reward trade-offs across countries. In this case, asset returns should be in accordance with the systematic risk of each domestic market. That is, with segmented capital markets, different factors will be significant in explaining risk, and the asset characteristics will vary internationally. Consequently, it is important to examine whether assets are priced in internationally integrated or in segmented capital markets. However, it is generally accepted that the level of capital market integration is high but is gradually increasing over time (Beckers et al., 1996).

Furthermore, the international extensions of CAPM and APT were formulated to investigate whether financial markets are internationally integrated. International CAPM predicts that the capital market structure of international stock prices can be approximated by a single index market model. If the international index is priced, then this means that the international factor is a significant determinant of for equity return variations (Akdoğan, 1995). On the other hand, international APT assumes that international investors adjust nominal returns by a random variable. In the international version of APT, capital markets are claimed to be integrated if arbitrage ensures that risk carries the same price in different financial markets.

Stock markets in emerging market countries have grown in importance in the recent decade as an element of the globalization of financial markets. Equity markets in these countries tend to become larger, more liquid, more volatile, and more integrated following the liberalization of international financial flows (Levine and Zervos, 1998). In the 1990s, many developing countries generally followed the principles of the dominant neo-liberal ideology and reduced the restrictions on international capital flows. According to the calculations of Cooper (1999), total international flows of financial capital expanded fourfold between 1978 and 1995. The emerging market economies experienced large capital inflows since the late 1980s (Knight, 1998). Moreover, the composition of financial flows to developing countries has drastically changed in the 1990s. The growth in capital flows has concentrated in foreign direct investment and portfolio capital. On the other hand, the effects of international financial flows on domestic stock prices can explained through changes in the demand for domestic stocks by foreign investors. The increased demand by international investors for stocks traded in emerging market economies may pos-

itively affect stock returns in these markets.

III. Previous Empirical Studies

The relation between the balance of payments and stock returns has been supported by some recent empirical studies. Aggarwal and Schirm (1992) examine the impact of trade balance announcements on stock returns in the 1980s by employing the data for the United States. The authors conclude that the balance of trade announcements significantly affects stock returns and that the sensitivity of stock market to such announcements has increased as a consequence of international policy coordination. The results documented in Aggarwal and Schirm (1992) further indicate that unexpectedly large trade balance deficits are associated with lower stock returns. On the other hand, Sadeghi (1992) investigates the effects of current account balance on stock returns for the Australian stock market and discovered that unanticipated changes in the current account deficit significantly influences stock returns.

Asprem (1989) explored the relationship between stock returns and macroeconomic variables in ten European countries and found that exchange rates were correlated with stock returns for the period 1968-1984. Employing the Granger non-causality tests and the cointegration technique, Bahmani-Oskooee and Sohrabian (1992) obtained some evidence of bi-directional relationship between exchange rates and stock returns in the short run. Brown and Otsuki (1992) analyzed the effects of exchange rates on stock returns within the framework of a multiperiod APT model by employing the data for 21 national stock markets. Utilizing the non-linear seemingly unrelated regression procedures, they reached the conclusion that exchange rate risk was an important risk factor in national stock markets. On the other hand, Muradoğlu et al. (2000) finds that stock returns are Granger caused by exchange rates in some emerging market countries such as Brazil, Colombia, Greece, Korea, Mexico and Nigeria.

There exists a growing body of empirical literature, which examines the linkages and co-movements between international stock markets. A large proportion of the empirical literature on the relations between international stock markets focuses on short-run relations between markets. Hamao et al. (1990) and Longin and Solnik (1995) analyze the interdependence of equity returns across national equity markets. Eun and Shim (1989) explores the international transmission mechanism of stock market movements by using the data for the nine largest stock markets in the world: Australia, Canada, France, Germany, Hong Kong, Japan,

Switzerland, the United Kingdom, and the United States. Employing simulated responses of the estimated VAR system, they examine all the main channels of interactions among international stock markets and attempt to find out the dynamic responses of one stock market to innovations in another. Papers by Wheatly (1988), Campbell and Hamao (1992), Chan et al. (1992), Korajczyk and Viallet (1992), King et al. (1994) analyze the relations between international stock markets within the framework of asset price modeling. In general, the results of these studies reveal a variety of short-term linkages and interactions between international stock markets. Thus, these empirical studies suggest that international stock markets are becoming reasonably well integrated.

Another branch of empirical research concerning stock market dynamics has examined long-term co-movements among international stock market prices. These empirical studies have employed multivariate cointegration techniques to investigate the number of common stochastic trends in a system of national equity markets. Relevant studies include Kasa (1992), Leachman and Francis (1995), Chung and Liu (1994), Corhay et al. (1995), Blackman et al. (1994), Francis and Leachman (1998), and Masih and Masih (2001). Papers by Kasa (1992) and Leachman and Francis (1995) utilize the methodology of Johansen (1988) for cointegration testing to analyze the long-run relationships among international equity markets. The results of these studies suggest that international stock markets possess common stochastic trends or equivalently, common long-term equilibrium paths. A very recent paper by Masih and Masih (2001) explores the dynamic causal linkages amongst nine major international stock markets by utilizing the methods of vector error-correction modeling and level VAR modeling with possibly integrated and cointegrated process. The results of their study provides evidence of significant interdependencies between the OECD and the emerging Asian markets, and also the leadership of the US and the UK markets over the short and long run. In addition, the evidence presented by Masih and Masih (2001) illustrate the strengthening Japanese market as an additional force in influencing the international stock market linkages. On the other hand, Francis and Leachman (1998) combine the Johansen cointegration technique with tests of weak and super exogeneity in order to assess the linkages and co-movements between international stock markets. Their findings imply that the system of national stock markets possesses one long-run equilibrium path and that all stock markets are endogenous in this long-run relationship.

IV. Data, Empirical Methodology and Empirical Results

In order to test the relationship between stock returns and global variables for the Turkish stock market, quarterly data for the period January 1987-January 2001 are used. The data for the U.S. stock price index is obtained from Morgan Stanley Capital International (http://www.msci.com). The data set for the other variables in this study is taken from the electronic database system of the Central Bank of Turkey. We employed a set of global variables such as the current account balance, exchange rate, U.S. stock price index and international capital flows for our empirical analysis.

The Istanbul Stock Exchange (ISE) composite index[1] is utilized as a proxy for the stock prices (SP) variable. The exchange rate (E) is represented by the US$ exchange rate. International capital flows (ICF) are proxied by capital account balance. The risk factor related to the balance of payments is measured by the current account balance (CA). The global information variable is depicted by the U. S. stock price index (USI). Eun and Shim (1989) emphasizes that the U.S. stock market is the most influential among major international stock markets. The results of their empirical study reveal that innovations in the U.S. market are rapidly transmitted to other major markets in the world, whereas no single foreign market can significantly explain the U.S. market movements.

One of the main methodological innovations of the Hendry (1980) approach is that in econometric model building, in order to derive credible models, it is preferable to start with a general model and attempt to reduce it by a sequence of tests of economically sensible restrictions. The general to specific modeling proposed by Hendry (1980) implies that a fairly unrestricted dynamic model is subsequently tested, transformed and reduced in size by performing a number of tests for restrictions. Hendry and Richard (1983) suggest various criteria for selecting the specific model that will serve as the approximation. The criteria include consistency with both data and economic theory, and a requirement for what is known as the encompassing of rival models. A proposed model is said to encompass an alternative model if the proposed model can explain results generated from the alternative model.

Engle and Granger (1987) have revealed that any cointegrated series have an error correction representation. The converse is also true, in that cointegration is a necessary condition for error correction models to hold.

[1] This paper employs ISE Composite Index until 1995 and ISE National-100 Index after 1995.

A principal feature of an error correction model is that the short-term dynamics of the variables in the system are influenced by the deviation from equilibrium (see Engle and Granger (1991) for a detailed analysis of cointegration and error correction models).

The preliminary step in our empirical analysis is concerned with examining the time series properties of the series. The results of augmented Dickey-Fuller (ADF) tests portrayed in Table 1 indicate that exchange rate and U.S. stock price index are level stationary whereas the ISE composite index, current account balance and capital account balance are integrated of first order I(1) at 1% significance level.

Table 1: Test Results for Unit Roots

Variables	k*	ADF (Levels)	ADF (First Differences)
SP	(1, 1)	-0.71	-5.22[a]
E	(1, 1)	-0.30	-4.77[a]
USI	(1, 1)	0.099	-4.14[a]
ICF	(2, 2)	-4.35[a]	-6.33[a]
CA	(1, 2)	-5.13[a]	-8.35[a]

Notes: * k is the optimal lag length chosen by Schwarz Criteria (SC). a indicates significance at the 1% level.

In examining the long-run relationship between stock returns and global variables, we specified the following long-run static equation for the Turkish stock market.

$$SP_t = ß_0 + ß_1\, CA_t + ß_2\, ICF_t + ß_3\, E_t + ß_4\, USI_t + u_t \qquad (1)$$

where u_t is a disturbance term. We have estimated the model hypothesized in equation 1 by ordinary least squares (OLS). The estimated static long-run equation are given below:

$$SP = \underset{(-5.07)}{-8.37} - \underset{(-0.109)}{0.00016}\, CA + \underset{(0.20)}{0.00000017}\, ICF - \underset{(9.01)}{0.99}\, E + \underset{(1.79)}{0.58}\, USI \qquad R^2=0.976 \qquad (2)$$

where the values in parentheses are the t-statistics. Since the current account balance and international capital flows are I(0), the estimated coefficients associated with these two variables are statistically insignificant. Dropping these variables from model 1, we reestimated the static long-run relationship by OLS.

$$SP = \underset{(-5.85)}{-9.53} - \underset{(-8.38)}{0.947\,E} + \underset{(1.97)}{0.851\,USI} \qquad R^2 = 0.972, \qquad ADF = -4.30 \qquad (3)$$

where the t-statistics are given in parentheses. The ADF test on the residuals from this regression indicates that the variables in the model are cointegrated because the residuals appear to be non-stationary at the 5% significance level. With evidence of cointegration, an error-correction procedure to model short-run dynamics of the system is available to us.

Table 2 reports the estimation results of the general dynamic model based on error correction mechanism. As it is evident from Table 2, the CA and ICF variables which are hypothesized to have short-run effects on stock returns have been added into the error correction model. On the other hand, various dummy variables are included in our empirical models to capture the effects of structural breaks in the economy after a visual inspection of the macroeconomic time series. The dummy variables used in this study are as follows:

Q1: 1 for 1994:2; 0 otherwise.
Q2: 1 for 1999:3; 0 otherwise.
Q3: 1 for 2000:3; 0 otherwise.

However, none of the dummy variables appeared to be statistically significant at the conventional levels.

Table 2: Error Correction Model (General)

Variables	Coefficients	t-statistics
$DLSP_{t-1}$	0.269	1.995
DLE_t	-0.711	-1.985
DLE_{t-1}	0.495	1.249
$DLUSI_t$	-0.309	-0.555
$DLUSI_{t-1}$	1.180	2.579
DCA_t	-0.00011	-3.060
DCA_{t-1}	-41×10^{-5}	-0.915
$DICF_t$	57×10^{-8}	0.134
$DICF_{t-1}$	59×10^{-7}	0.992
$DLSP_{t-2}$	0.377	3.038
DLE_{t-2}	-0.0057	-0.015
$DLUSI_{t-2}$	0.0877	0.190
DCA_{t-2}	14×10^{-5}	-0.370
$DICF_{t-2}$	16×10^{-6}	2.151
$DLSP_{t-3}$	0.1979	1.538
DLE_{t-3}	-0.133	-0.384
$DLUSI_{t-3}$	0.0549	0.118
DCA_{t-3}	-18×10^{-5}	-0.522
$DICF_{t-3}$	20×10^{-6}	2.496
U_{t-1}	-0.326	-3.591
Q1	0.418	1.270
Q2	0.420	1.272
Q3	-0.015	-0.065
Intercept	0.0258	0.231
$R^2 = 0.74$; F = 9.98; ESS = 0.899		

Notes: D denotes first differences. L denotes the natural logarithm of the variable.The lag length chosen by the Schwarz Criteria (SC) was set to 3.

Table 3 presents the results of estimation for the specific error correction model. The specific error-correction model has been developed by performing a number of tests for restrictions. The model reduction sequence adopted in this paper can be summarized as follows: (i) a general model is formulated on the basis of economic theory; (ii) the statistical significance of each regressor and overall performance of the model are considered in formulating the specific model; (iii) joint tests for restrictions are performed with the use of F-test; (iv) if diagnostic check-

ing indicates inadequacies, the specification of the model is revised.

For diagnostic checking, we employed Breusch (1978) and Godfrey (1978) Lagrange multiplier test for the first-order serial correlation, the White (1980) test for heteroscedasticity, the Jarque and Bera (1980) test for normality, the Ramsey (1969) reset test for specification error. In addition, the Autoregressive Conditional Heteroscedasticity (ARCH) model developed by Engle (1982) is utilized to test for autoregressive heteroscedasticity effects. The results of the diagnostic tests indicate that there is no serious evidence for misspecification in the specific error correction model.

Table 3: Error Correction Model (Specific)

Variables	Coefficients	t-statistics
$\mathbf{DLE_t}$	-0.673	-2.111^b
$\mathbf{DCA_t}$	-0.00011	-4.311^a
$\mathbf{DLSP_{t-1}}$	0.278	2.719^a
$\mathbf{DLE_{t-1}}$	0.541	2.015^b
$\mathbf{DLUSI_{t-1}}$	1.242	3.247^a
$\mathbf{DCA_{t-1}}$	-0.000056	-2.048^b
$\mathbf{DLSP_{t-2}}$	0.344	3.781^a
$\mathbf{DLSP_{t-3}}$	0.185	2.102^b
$\mathbf{DICF_{t-2}}$	13×10^{-6}	3.016^a
$\mathbf{DICF_{t-3}}$	12×10^{-6}	3.151^a
$\mathbf{U_{t-1}}$	-0.315	-4.299^a
Q1	0.394	1.960^b
$R^2 = 0.704$; F = 7.95; RSS = 1.034 ; J-B χ^2 (2) = 0.67; B-G LM test: F (1, 41) = 0.22; WHITE test : F (12, 27) = 0.84; RESET: F (1, 41) = 0.85; ARCH(1) = 0.065; ARCH(2) = 0.21; ARCH(3) = 0.18; ARCH(4) = 0.20.		

Notes: D denotes first differences. L denotes the natural logarithm of the variable. a indicates significance at the 1% level. b indicates significance at the 5% level.

The main results obtained from Table 3 may be summarized as follows. The exchange rate and current account balance are significantly and negatively associated with the ISE stock price index. On the other hand, the lagged values of U.S. stock price index, exchange rate, capital account balance, and the ISE composite index are significantly and positively correlated with stock returns in Turkey. In addition, current account balance

lagged one quarter has a negative and significant impact on the ISE composite index. However, the estimated coefficients associated with the lagged values of capital account balance appear to be very small even though they are statistically significant. Furthermore, the coefficient of error correction term has the expected negative sign and significant at the 1 percent level. These results will be compared to those of general to specific modeling developed by Hendry (1980). Table 4 reports the estimation results of the general model specified within the framework of Hendry's approach.

Table 4: The General Model Based on Hendry's Approach

Variables	Coefficients	t-statistics
$\mathbf{DLSP_{t-1}}$	0.154	0.996
$\mathbf{DLE_{t}}$	-0.866	-1.921
$\mathbf{DLE_{t-1}}$	0.881	1.959
$\mathbf{DLUSI_{t}}$	-0.470	-0.716
$\mathbf{DLUSI_{t-1}}$	1.294	2.401
$\mathbf{DCA_{t}}$	-0.00014	-3.196
$\mathbf{DCA_{t-1}}$	-0.00010	-2.063
$\mathbf{DICF_{t}}$	62×10^{-8}	0.012
$\mathbf{DICF_{t-1}}$	78×10^{-7}	1.109
$\mathbf{DLSP_{t-2}}$	0.235	1.690
$\mathbf{DLE_{t-2}}$	0.231	0.535
$\mathbf{DLUSI_{t-2}}$	0.114	0.209
$\mathbf{DCA_{t-2}}$	40×10^{-5}	-0.947
$\mathbf{DICF_{t-2}}$	21×10^{-6}	2.396
$\mathbf{DLSP_{t-3}}$	0.00861	0.062
$\mathbf{DLE_{t-3}}$	0.139	0.347
$\mathbf{DLUSI_{t-3}}$	0.350	0.651
$\mathbf{DCA_{t-3}}$	54×10^{-5}	-1.429
$\mathbf{DICF_{t-3}}$	23×10^{-6}	2.482
Q1	0.549	1.422
Q2	0.366	0.938
Q3	0.005	0.017
Intercept	-0.015	-0.117
$R^2 = 0.63$; F = 7.75; ESS = 1.299		

Notes: D represents first differences. L denotes the natural logarithm of the variable. The lag length chosen by the Schwarz Criteria (SC) was set to 3.

General to specific modeling requires exhaustive testing, using a range of different procedures, many of which we have outlined through the earlier paragraphs of this paper. Table 5 reports the estimation results of specific model developed by testing the various restrictions. The results of the diagnostic tests reveal that there is no significant evidence for misspecification in the specific model based on Hendry's approach. The estimation results of the specific model portrayed in Table 5 indicate that Turkish lira/$US exchange rates are significantly and negatively associated with stock prices at the Istanbul Stock Exchange. On the other hand, the current and one period lagged values of the current account balance negatively and significantly affect the ISE composite index.

Table 5: The Specific Model Based on Hendry's Approach

Variables	Coefficients	t-statistics
$\mathbf{DLE_t}$	-0.575	-2.648[a]
$\mathbf{DCA_t}$	-0.00011	-3.657[a]
$\mathbf{DLSP_{t-1}}$	0.226	2.909[a]
$\mathbf{DLE_{t-1}}$	-0.831	-2.757[a]
$\mathbf{DLUSI_{t-1}}$	1.185	2.993[a]
$\mathbf{DCA_{t-1}}$	-0.000069	-2.364[b]
$\mathbf{DLSP_{t-2}}$	0.233	2.366[b]
$\mathbf{DICF_{t-2}}$	11×10^{-6}	2.463[a]
$\mathbf{DICF_{t-3}}$	12×10^{-6}	2.339[b]
Q1	0.298	1.923[b]
$R^2 = 0.601$; F = 6.56; RSS = 1.562 ; J-B χ^2 (2) = 0.52; B-G LM test: F (1, 43) = 0.99; WHITE test: F (13, 28) = 0.44; RESET: F (1, 43) = 0.0055; ARCH(1) = 0.45; ARCH(2) = 0.54; ARCH(3) = 0.86; ARCH(4) = 0.74		

Notes: D denotes first differences. L denotes the natural logarithm of the variable. a indicates significance at the 1% level. b indicates significance at the 5% level.

Furthermore, the U.S. stock price index has a positive and significant impact on the ISE index with a lag of one quarter. As regards the lagged variables related to the capital account balance and ISE composite index, they appeared to be significantly and positively correlated with stock prices for the specific case of Turkey. As can be seen from the comparison of Tables 3 and 5, the estimation results for the specific model based on Hendry's approach are very similar to those of specific error correction

model. Furthermore, Table 6 presents a summary of the model reduction process that leads from a general model to a specific form.

Table 6: Process of Model Reduction

Model	Parameters	ESS§	SC¶
1	23	1.299	0.852
2	19	1.313	0.563
3	13	1.426	0.196
4	10	1.562	0.017

Notes: § ESS denotes error sum of squares; ¶ SC denotes Schwarz criteria.

Tests of Model Reduction:
From Model 1 to Model 2:
Model 1: F(4, 30) = 0.08
Reductions from models 1 through 2 to model 3:
Model 1: F(6, 34) = 0.48
Model 2: F(10, 30) = 0.29
Reductions from models 1 through 3 to model 4:
Model 1: F(3, 40) = 1.27
Model 3: F(9,34) = 0.71
Model 4: F(13, 30) = 0.46

V. Conclusion

In this article we have examined some empirical regularities between global factors and stock returns in the Istanbul Stock Exchange. Empirical papers investigating dynamic linkages between emerging stock markets and global variables are very scarce in finance literature. Utilizing the data for four global variables such as the current account balance, international capital flows, U. S. stock price index, and exchange rate, we explored the effects of these variables on the ISE index for the period January 1987-January 2001. We used 'general to specific modeling' strategy developed by Hendry (1980) and error correction models (ECM) in analyzing short-run dynamic relations between some international factors and stock prices.

Emerging market countries attracted substantial amounts of international capital inflows in the recent decade. Stock markets in emerging market economies have grown in importance since the late 1980s as a consequence of the liberalization of financial markets. The empirical evi-

dence based on data for Turkey suggests a significant relationship between global factors and stock returns. The results of the specific error correction model indicate that each global variable has a significant short-run impact on the ISE composite index. The signs of the estimated parameters are generally consistent with those implied by economic and financial theory. The current values of exchange rate and current account balance are significantly and negatively associated with the ISE composite index. On the other hand, the lagged values of U.S. stock price index, current account balance, exchange rate, capital account balance, and the ISE composite index are significantly correlated with stock returns. Moreover, the coefficient associated with disequilibrium term has the negative sign as expected and statistically significant.

The results of specific empirical model based on Hendry (1980) approach appear to be similar to those of specific ECM. However, the sign of the coefficient associated with lagged exchange rate turned out to be negative in the specific model developed according to the modeling strategy of Hendry (1980). Thus, the empirical results related to Hendry's approach also support the hypothesis that changes in the global factors influence the emerging Turkish stock market.

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CONDITIONAL CAPM AND AN APPLICATION ON THE ISE

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Abstract
In the empirical studies carried out on standard CAPM, widely used in finance literature, it has been argued that static CAPM could not entirely explain the portfolio returns. One of the assumptions for one period application is that the beta coefficients of assets are assumed to be constant over time. However, in a dynamic world the expected returns and betas deviate over time. In this study, returns of ISE-30 securities have been estimated by employing conditional CAPM; it has been found that those returns estimated by conditional CAPM were so similar to actual returns. It is concluded that conditional CAPM would present more significant results while forecasting the expected returns of the stocks traded on the ISE, in order for this method to be beneficial for the investors in the portfolio selection process.

I. Introduction

In most of the studies in finance literature, it has been pointed out how investors evaluate risky assets. Generally, it is assumed that investors expect high returns from risky assets. Furthermore, it is also difficult to state how the investors evaluate the risk level of cash flows and calculate the excess returns that they demand. Most of the asset pricing models in literature identify in which way the investors evaluate the risk and risky cash flows. Capital asset pricing model (CAPM), developed by Sharpe (1964), Lintner (1965) and Mossin (1966), has become the most popular

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model, pricing the risky assets. In CAPM;

- The asset risk is measured by beta coefficient, which relates the market portfolio (including entire assets in the economy) return and cash flows of assets.
- The relation between expected return and beta is linear.

Many empirical studies about the performance of static CAPM in explaining the average return, have been carried out for more than 20 years. In these studies, it is concluded that static CAPM is not wholly able to explain the returns (Jagannathan and Wang, 1996).

Fama and French (1992) had shown critical evidence with regard to CAPM's insufficiency. Fama and French employed static CAPM on return data for a wide group of assets and found out the non-linear relation between market beta and average return.

As Fama and French had stated, the power of the effect of size and existence of a weak relation between beta and average return are the main evidences against CAPM.

In the following years, Fama and French's (1992) study has been criticized by Black (1993) and Grinold (1993). Kothari, who had made the most important criticism, stated Fama and French's (1992) study had a Survival Bias.

But Chan, Jegadessh and Lakonishok (1995), by using lateral cross section data, found out that Survival Bias was insufficient to explain high returns of cheaper stocks and Fama and French (1996) betas had no linear effect on returns.

The most important studies against CAPM has been carried out by means of "Expected Returns Factor Models" ((Roll (1984), Jegadeesh and Titman (1993), Haugen (1999a and 1999b)). Those models estimated the stock returns by applying many factors influencing the returns. The mentioned models have shown that risk measures, including betas are the poorest criterions in explaining the potential returns of securities.

CAPM has been developed following the completion of studies on identifying the investors' behavior in one period by means of an assumptional model. However, in reality, there have to be some assumptions, since investors live in multi periods and actual data are applied in empirical studies for CAPM.

In general, one of the assumptions of the CAPM is that the asset betas are constant over time. But, this assumption could not be defended, since cash flow risk deviates with the business cycle of corporations. For instance, financial debt of a firm during a recession may increase in com-

parison to the others, so that the stock beta of the company may also increase. Beta coefficients depend upon business cycles, technological innovations and prevailing shocks.

The ratios of the various sectors in the economy and the betas of these sectoral firms also deviate. Hence, betas and expected returns depend on the structure of the information for a time period and deviates by time (Ng, 1991).

Some researchers have tested empirically the conditional version of CAPM (Buse, Korkie and Turtle; Jagannathan and Wang, 1996). Unfortunately, there exist a limited number of studies that explain the average return of a portfolio including large group of security by conditional CAPM (Garcia and Bonomo, 2001). The main goal of this study is to fill this gap by testing the conditional CAPM's ability for estimating the portfolio returns in the Istanbul Stock Exchange (ISE).

II. Static CAPM

The static CAPM formula is as follows, let us define R_i, the return for asset i and R_m, the return of market portfolio.

$$E[R_i] = \gamma_0 + \gamma_1 ß_i \quad (1)$$

$$ß_i = Cov(R_i, R_m) / Var[R_m] \quad (2)$$

Here,

$E(R_i)$: Expected return of asset i.

$Cov(R_i, R_m)$: Covariance between asset return and market return.

Fama and French (1992) found that γ_1 is close to zero. According to this finding, the average return and the beta relation is so weak that it can be a strong evidence against the CAPM.

Although the weak relation between the average return and the beta reveals an important evidence for criticizing static CAPM, it does not mean that the conditional CAPM may also be criticized in the same manner. CAPM is developed by assumptional studies that based on only one period (Jagannathan and Wang, 1996).

In fact, real life is dynamic and as it has been mentioned before, the expected returns and betas vary over time. The relationship will depend upon the information for a time period if there exists a linear relation

between expected returns and betas for every time period. For this reason, the relation for unconditional expected returns and unconditional beta may be weak.

For instance, in a hypothetical economy in which CAPM is being calculated periodically, let us assume two period beta coefficients for the first period 0.5, 1.5 and second period 0.75, 1.25, respectively. In addition, let us assume that the excess returns for the first and second period are 10% and 20%, respectively. After estimating the CAPM for each period, we may find first security's excess return for the first and second period as 5% and 25%, whereas the second security's excess return as 15% for both periods.

In this example, it is shown that betas and excess returns vary over time and CAPM may be miscalculated. Although, both securities have 15% excess return, average betas are different. But, these numbers are so unreal and are outliers in this example. However, since the betas vary over time, it can be stated that empirical studies for CAPM might give incorrect results (Jagannathan and Wang, 1996).

III. Conditional CAPM

The conditional CAPM and excess return formulas are as follows. If we identify; R_{it}, nominal return of asset i in t period, R_{mt}, nominal return of market portfolio in period t and r_{it} and r_{mt} , excess returns from risk free rate of asset i and market portfolio.

$$E(r_{it}/ I_{t-1}) = ß_{iI}^{t-1} \; E(r_{mt} / I_{t-1}) \tag{3}$$

$$ß_{il}^{t-1} = \frac{Cov(R_{it}, R_{mt} / I_{t-1})}{Var(R_{mt}/I_{t-1})} = \frac{Cov(r_{it}, r_{mt} / I_{t-1})}{Var(r_{mt} / I_{t-1})} \tag{4}$$

Here, I_{t-1}, is the mathematical expression of expected conditional information set for the investor. Expectations are rational, since mathematical expectations interpret the subjective expectations of investors. In the second equation, the return of treasury bond (nominal r_f) at period t , is calculated according to t-1 by the I_{t-1} information set. For conditional CAPM, excess return of asset i depends on 3 variables, which vary by time. These variables are as follows; conditional variance of market portfolio, conditional covariance between asset return and market portfolio

return, and/or market risk premium (Vorkink, 1999).

Market risk premium is defined as the difference between market return (index return) and risk free rate. In models for estimating returns, risk free rate is always included in the calculations. Basically, this depends on the investors' option for providing a specified return without risk. It is supposed that the investors' security returns would be at least risk free rate, since the securities assumed to be risky investment instruments.

The return for asset i and for the market can be rearranged, so that the equation has both predictable and unpredictable parts. This is shown in the following formulas:

$$r_{it} = ß_{il}{}_{t-1} E(r_{mt} / I_{t-1}) + \mu_{it},\ i=1,...,n\ . \tag{5}$$

$$r_{mt} = E(r_{mt} / I_{t-1}) + \mu_{mt} \tag{6}$$

μ_{it} and μ_{mt} are the estimation errors and indicates an orthogonal structure in the I_{t-1} information set. $\{\mu_{it}\ ,\ \mu_{mt}\}$ and $\{\mu_{mt}^2\}$ values can also be written in predictable and unpredictable parts.

$$\mu_{it}\mu_{mt} = E(\mu_{it}\mu_{mt}/I_{t-1}) + \eta_{it}, \qquad i=1,...n,\ . \tag{7}$$

$$\mu^2_{mt} = E(\mu^2_{mt}/I_{t-1}) + \eta_{mt} \tag{8}$$

The predictable portions of $\{\mu_{it}\ ,\ \mu_{mt}\}$ is the conditional covariance of r_{it} and r_{mt}, whereas $\{\mu_{mt}^2\}$ conditional variance for r_{mt}.

$$Cov(r_{it},r_{mt}/I_{t-1}) = E(\mu_{it}\mu_{mt}/I_{t-1}) \tag{9}$$

$$Var(r_{mt}/I_{t-1}) = E(\mu^2_{mt}/I_{t-1}) \tag{10}$$

Having substituted the equations (2), (9) and (10) into (5), the below formula would be derived.

$$r_{it} = \frac{E(\mu_{it}\mu_{mt}/I_{t-1})}{E(\mu^2_{mt}/I_{t-1})}\ [E(r_{mt}/I_{t-1})] + \mu_{it} \tag{11}$$

Four predictable equations arise for asset "i" in equations (6), (7), (8), (11) and these constitute the conditional expectation parameters. For N

asset, the model can be constituted by 2(N+1) equations (Garcia and Bonom, 2001).

3.1. Modeling the Conditional Variance and Conditional Covariance

To evaluate the calculations and the results, conditional expectation parameters of equations (6), (7), (8), (11) have to be constituted. In general, these conditional expectations are the non-linear functions of the information set. But, theory for functional structure of conditional expectations are indefinite. These parameters become a guide for measuring the appropriateness and selecting the specifications that harmonize with the data. For the calculation problem, firstly $\{\mu_{mt}^2\}$ and $\{\mu_{it}, \mu_{mt}\}$ values are defined by auto regression.

$$E(\mu^2_{mt}/I_{t-1}) = \gamma_0 + \sum_{j=1}^{s} \gamma_j \mu^2_{mt-j} \tag{12}$$

$$E(\mu_{it} \mu_{mt}/I_{t-1}) = \alpha_{i0} + \sum_{j=1}^{k} \alpha_{ij} \mu_{it-j} \mu_{mt-j} \tag{13}$$

This assumption depends upon the application of past random variable data in estimating the forthcoming data and modeling the ARCH (Autoregressive conditionally heteroscedasticity).

In order to ease the calculation, the similarity between the variance process rank "s" and covariance process rank "k" of market excess return and the available "k" values are tested in every step. These specifications fit into the generalized ARCH (GARCH) model. (Bodurtha and Mark, 1991).

3.2. Modeling the Market Excess Return

As a natural process, finite auto regression is applied in constituting the excess market return. The implemented estimation formula is given below:

$$E(r_{mt}/I_{t-1}) = \pi_0 + \sum_{j=1}^{h} \pi_j r_{mt-j} \tag{14}$$

An alternative method for presenting market excess return can also be the average ARCH (ARCH-M) model shown below.

$$E(r_{mt}/I_{t-1}) = \psi_0 + \psi_1 f[Var(r_{mt}/I_{t-1}] \quad (15)$$

There exist 3 different formulas for function f in the literature. Firstly, f is defined as a convergent function. The risk price in this approach is defined as the ratio of expected excess return to conditional variance. Second, f can be the square root function, so that the ratio of expected market return to conditional standard deviation (or Sharpe risk measure) would be constant. Third, f is a logarithmic variance function. The mentioned models can be applied in the tests (Bodurtha and Mark, 1991).

IV. Implementing the Model on the ISE

4.1. The Framework, Goals and Assumptions

For emerging stock markets, the validity of conditional CAPM, which may reveal more significant results in comparison to a static one, has been tested on a portfolio comprised of stocks included in the ISE-30 Index.

In this study, the data pertains to the period between January 2, 2000-May 27, 2001.

The portfolio used in the analysis, is the ISE-30 Index. The below assumptions, which also belong to static CAPM, are taken into consideration.

- Competitive market conditions are valid (price is an input data), investment is limited to the traded financial instruments and all investors have access to the same information set (I) without any costs.
- All investors have homogeneous expectations (investment periods are the same, there is a return maximization, equal variance-covariance matrices and expected return are equal due to the same information set).
- Apart from the static CAPM, it is assumed for the conditional model that beta varies over time, since the betas are inconsistent within the specified period and the risks arise from the uncertainty on the cash flows of the firm.
- "t" period pertaining to the conditional model is defined as one week. Furthermore, the market portfolio is considered as the ISE-All National Index.

4.2. Methodology

As mentioned before, the portfolio to be investigated comprises constituent stocks in the ISE-30 Index. The weights of these stocks in the ISE-30 index are given in appendix A. Firstly, daily returns and hence weekly nominal returns (R_{it}) are calculated by the daily closing data of all firms. Short-term treasury bond is used as the risk free rate[2].

In order to calculate the actual excess return (r_{it}) for t period in conditional CAPM, weekly risk free rate (r_f) values are subtracted from weekly nominal returns (R_{it}) of the stocks.

Daily values of the ISE-All National Index have been used in determining the market data and the underlying weekly average returns ($E(r_{mt})$) calculated as mentioned before.

Weekly conditional covariance and conditional beta ($ß_{it}$) values are found by means of daily returns for all stocks Then, we use the data in the preceding period to calculate the returns in the following period.

At this stage, conditional CAPM is employed. As it is recalled, the model is conditioned to the previous period data set (I_{t-1}) and then the current returns are estimated by the previous period data.

Beta ($ß_{pt}$) values are calculated using the average weights of the stocks in the specified portfolio. In addition, excess returns (r_{it}^*) of stocks are calculated by multiplication of the weekly average market returns with weekly betas.

To calculate the weekly average returns of the portfolio ($E(r_p)$), weights and returns of each stock is multiplied. These returns represent the actual excess returns.

In the next step, the similarity of the distributions of weekly average returns, calculated by actual average excess returns and conditional CAPM, has been tested statistically. In other words, the validity of the model is tested by conditional CAPM returns.

4.3. Results

Actual portfolio excess returns has to be revealed before investigating the excess returns of the specified portfolio in comparison to risk free rate.

With this respect, corresponding excess return values of sub-periods for the investigated time period horizon, are presented in Figure 1.

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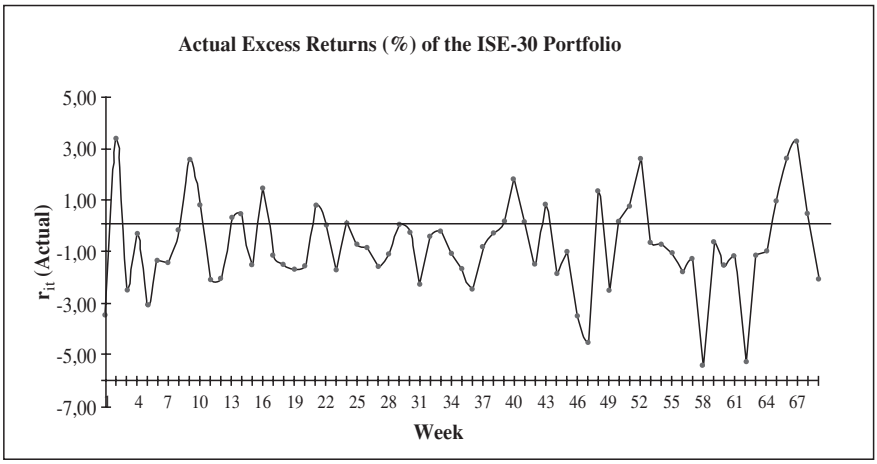
[2] Risk free rate is defined as the return of assets having no default risk. Purchasing power risk is not taken into consideration.

Figure 1: Actual Excess Returns (%) of the Portfolio

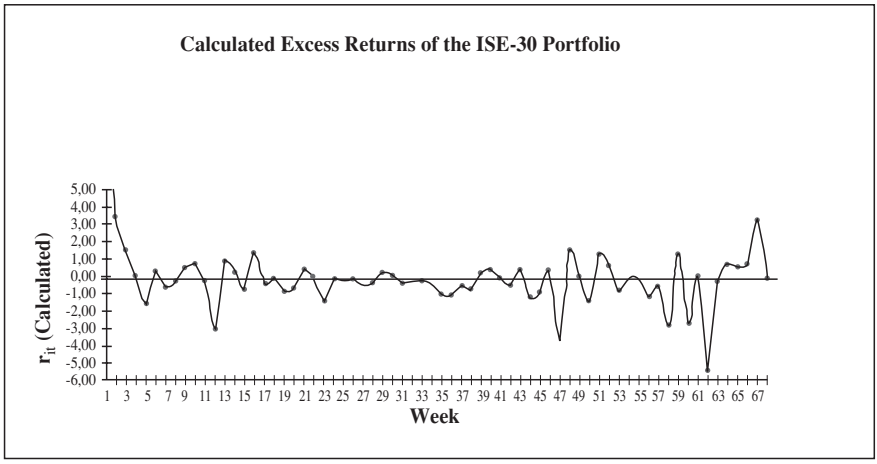


As seen in Figure 1, returns corresponding to 69 weeks in the period between January 2, 2000-May 27, 2001 deviates in both positive and negative manner. Generally, it has been observed that actual excess returns were less volatile in year 2000, whereas deviation level increased as of the last weeks of year 2000. The main reason for the returns deviating between positive and negative values are considered to be the result of the economic crisis that prevailed in October 2000, February 2001 and ongoing.

After applying the conditional CAPM, excess return values are shown in Figure 2, calculated by the information set which was conditioned on the previous period (in this study pervious week) data. It can be stated that these values are quite similar to the actual.

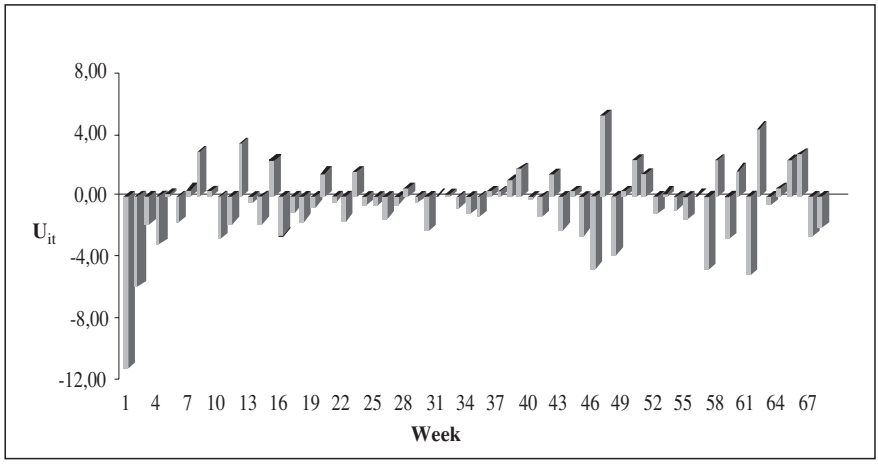
In addition, Z-Score analysis was applied in the final part of the study in order to determine the level of mentioned similarity.

Figure 2: Portfolio Excess Returns (%) Calculated by Conditional CAPM



The deviation between negative and positive values of calculated returns and returns corresponding to economical crisis in the late 2000, early 2001 and in the current period due to the ongoing crisis are also reflected similarly in Figure 2. Excluding the crisis periods, which is considered as external shocks, it is found that the model reflects the return deviations quite well. Some differences exist between actual and calculated u_{it} values as shown in Figure 3.

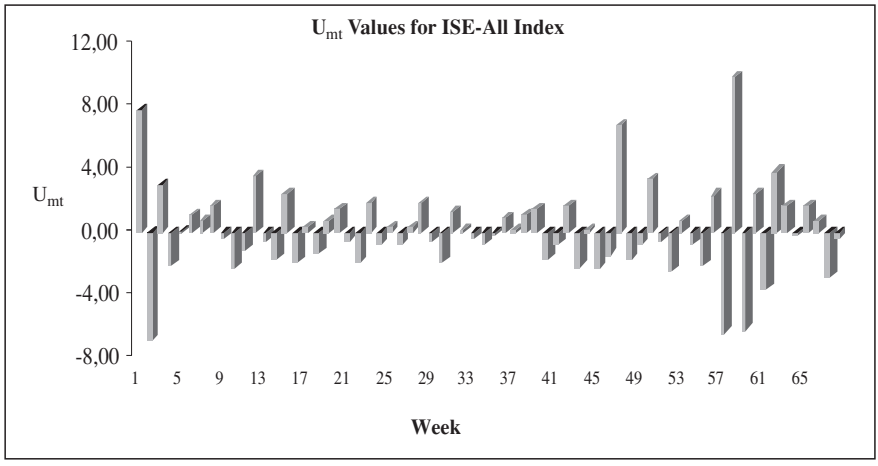
Figure 3: Calculated (U_{it}) Values for the ISE-30 Portfolio



As it is evident from the difference values shown in Figure 3, it is observed that the differences between the actual and estimated values are close to zero in the period in which the return deviations are low (between 7-46 weeks), whereas there occurs an increase in difference values in the crisis periods in which high return deviations prevail (after 46th week). The differences between actual and estimated values are considered to be acceptable, since high daily and instantaneous volatility prevails in the ISE.

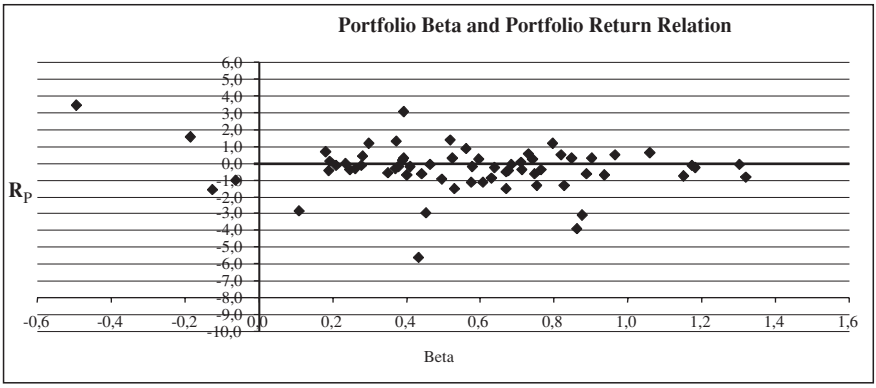
Besides the portfolio returns, the differences (U_{mt}) between the actual and the estimated returns, which are calculated by conditional CAPM with ISE-All National Index's previous week data, are presented in Figure 4. It is found that U_{mt} values in Figure 4, are also similar to Figure 3, i.e. the lower the deviation in return, smaller the U_{mt} values for the specified period and vice versa. With respect to the results in Figure 3 and Figure 4, it is found that conditional CAPM would give better estimates expect for financial crisis periods.

Figure 4: The Differences (U_{mt}) Between Actual Returns and the Returns Calculated by Conditional CAPM for ISE-All National



On the other hand, the most distinctive element in conditional CAPM studies is the non-linear relation between beta coefficient and asset return. In this respect, the relation of calculated beta coefficients and returns is illustrated in Figure 5.

Figure 5: The Relation of ISE-30 Portfolio Beta Values and Portfolio Returns



In Figure 5, it is observed that the relation of calculated excess returns and beta coefficients for a specified portfolio is non-linear and weak. In other words, with respect to findings, there is no strong relation between beta and return as the static CAPM puts forward. This finding is significant for the investors dealing with beta coefficients.

As mentioned, statistical analysis is carried out for testing the validity of the conditional CAPM on the portfolio that consists of the stocks listed on the ISE. Under this framework, two-sided Z-Score test was applied.

It is assumed that the actual and estimated weekly excess returns fit into the normal distribution (since n>30) in accordance with "Central Limit Theorem". The established hypothesis H_o (indifference) and H_a (alternative) are given below.

H_o = There are no differences between the actual weighted average excess returns of the ISE-30 stocks' returns from the weekly risk free rates and excess returns calculated by the conditional CAPM.

$(H_o \Rightarrow r_{it} - r_{it}^* = 0)$

H_a = There exist differences between actual weighted average excess returns of the ISE-30 stocks' returns from the weekly risk free rates and excess returns calculated by the conditional CAPM.

$(H_a \Rightarrow r_{it} - r_{it}^* \neq 0 \text{ or } r_{it} - r_{it}^* \leq 0 ; \; r_{it} - r_{it}^* \geq 0)$

The average standard deviation and Z-Score values of actual and calculated excess returns are presented in Table 1.

According to the values in the table, H_o indifference hypothesis is verified, since ($Z<Z_{\alpha/2}$) 1.69<2.58 for α=0.01 significant level and ($Z<Z_{\alpha/2}$) 1.69<1.96 for α=0.05 significant level.

Table 1: Statistical Results

	Actual Excess Return for ISE-30	**Calculated Excess Return $E(r_{mt})x\beta_{it}$**
Average	-0,78	-0,34
Standard Deviation	1,67	1,34
x1-x2		0,44
(S1)2/N2	0,04	0,03
(S1)2/N1+(S2)2/N2		0,07
Square Root		0,26
Z:		1,69

Finally, the estimations of the weekly excess returns were found by conditional CAPM and the actual calculated values are compliant with each other, so that this result is significant at both 95% and 99% confidence levels.

V. Conclusion

This study has two critical results. The first one is that the conditional CAPM can give better results in comparison to the static CAPM in estimating the expected returns of the stocks. Second finding reveal that there are no positive linear relation between the beta and the expected returns of the stocks (and portfolio) as argued in the static CAPM. This finding is quite important for both the individual and institutional investors. Higher systematic risk will not always provide higher expected return.

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ANNEX: The Weights of the Stocks Comprised in the ISE-30 Index and the ISE- All National Index

ISE-30 Index

Corporate Name	Weight in ISE-All National Index	Weight in the ISE-30 Index
Anadolu Efes	0,88%	1,15%
Akbank	5,88%	7,70%
Ak Enerji Elektrik	1,28%	1,67%
Aksigorta	0,37%	0,49%
Alarko Holding	0,98%	1,28%
Alcatel Tel.	0,47%	0,61%
Arçelik	1,02%	1,33%
Doğan Holding	4,62%	6,05%
Doğan Yay. Holding	4,13%	5,41%
Enka Holding	0,69%	0,90%
Ereğli Demir ve Çelik	2,48%	3,25%
Otosan	1,18%	1,54%
Garanti Bankası	7,51%	9,85%
Hürriyet Gazetecilik	1,26%	1,65%
İş Bankası C	4,22%	5,53%
İş GYO	0,33%	0,43%
Koç Holding	5,24%	6,87%
Migros	0,68%	0,89%
Netaş	0,94%	1,23%
Petkim	0,34%	0,45%
Petrol Ofisi	1,34%	1,76%
Sabancı Holding	6,45%	8,46%
Türkiye Şişe ve Cam	0,63%	0,83%
Turkcell İletişim Hizmetleri	1,06%	1,39%
Tansaş	1,04%	1,36%
Tofaş Oto Fabrika	1,23%	1,62%
Trakya Cam	0,29%	0,38%
Tüpraş	4,39%	5,75%
Vestel	5,50%	7,20%
Yapı Kredi Bankası	9,89%	12,97%
Total	**76,28%**	**100,00%**

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ANCHORS IN IMPLEMENTATION OF MONETARY POLICIES IN TURKEY IN 1990'S

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Abstract

In this study, the monetary and exchange rate policies followed by the Central Bank of Turkey (CBT) in the period between 1990 and 2000 are examined with the help of anchors. The CBT executed the monetary policies by means of monetary programs. In order to increase its credibility and reduce inflation, the Central Bank of Turkey established binding rules through these monetary programs between 1990 and 2000. These rules are called anchors. There are varieties of anchors ranging from foreign exchange rates to inflation targeting. In the first section of this study, anchors, aspects of ideal anchors, the independence and credibility of the Central Bank are examined theoretically. In the second section, there is an empirical analysis of the monetary and exchange rate policies implemented in Turkey in the period between 1990 and 2000. In conclusion, the problems encountered in application of anchors are determined.

I. Introduction

Inflation and the instability caused by it form one of the most important economical problems in any society. The inflation is unexpectedly destructive. It both spoils the income distribution and decreases the investments by increasing the risk and uncertainty. So it affects the growth rates of countries negatively. These economic aspects of the inflation threaten the social peace and welfare, too.

The final objective of the central banks application of monetary policies in 1990's was to decrease inflation and secure price stability. In order

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to achieve these, central banks plan monetary policies by aiming at intermediate targets or inflation directly. Building monetary policy on intermediate targets or on inflation and making it public increase the confidence in it. Anchors consist of monetary multipliers, foreign exchange rates, interest rate and GNP. Central Banks try to reach their objectives by affecting the liquidity in the markets and interest rates. These tools are open market transactions, ratios of provision, rediscount rate, compulsory turnover ratios and markets within central banks. The success of central bank's monetary policy depends on its ability to solve the following four problems: 1- minimizing the delay between the monetary policy and inflation, 2- the problem at estimation, 3- problem of measurement, 4- political intervention. Monetary policy in Turkey can be assessed according to these four criteria. There are four factors hindering monetary policy of Turkey; first, the biggest problem that Central Bank faces in implementation of monetary policy in Turkey is the deficit in public finance. Without political authorities' plan for fiscal policy against the inflation by Central Bank will not suffice. This is because Central Bank loses its independence in an environment without financial discipline. Second, the over-devaluation of exchange rates to prevent the negative effects in the balance of current account in Turkey accelerates the inflation. On the other hand, high interest rates caused by public borrowing and high domestic demand attract considerable amount of capital into Turkey where capital movements are freer and because polarization has become common and the monetary and interest rate multipliers that the Central Bank may use to maintain the price stability tend to move variables out of Central Bank's control. Third, the standing high inflation in Turkey has strengthened the inflationist expectation. Gaining the confidence of economic units to fight the inflation is not easy because of recent experiences in Turkey and monetary policy does not cover all the inefficient control over the forward markets and financial markets, economic unit's making Turkish economy vulnerable to crisis is another obstacle before the Central Bank's monetary policy[1].

Central Bank has shaped its monetary policies under the limitation of the factors mentioned above. In this study, emphasis will not be on the limitations above but on the monetary policies followed in the period between 1990-2000 in view of the anchors. Analysis will be on which

[1] Hacer Oğuz, "*Türkiye'de Para Politikası Uygulamasında İzlenen Nihai Amaçlar*", İMKB Dergisi, Ocak-Mart 2000, p.25-28.

anchors the Central Banks used and how effective were these anchors to fight the inflation in the given period. 1990's were the years Central Bank anchors within the framework of monetary programmes to prevent the inflation and instability it caused. In 1990's Central Bank rendered itself responsible and transparent to the public by binding its monetary policy to some rules (anchors) and public trust to minimize the lag between monetary policy and inflation. For this reason analyzing the given period will help envisage the future monetary policies more appropriately.

This study consists of two parts: First part includes the varieties of anchors, the aspects of ideal anchors, advantages and disadvantages of anchors. Second part evaluates the Turkey Republic Central Bank's monetary policies in 1990's in view of anchors. Problems encountered in use of anchor will be given in conclusion part.

II. Price Stability and the Role of Anchors

"The final aim of a monetary policy is to attain a reasonable price stability by keeping inflation rate so low that it wouldn't affect the economic decisions. The uncertainty caused by the fluctuations in inflation influences the economic growth dynamism negatively more than inflation itself"[2]. In an environment where price stability is secured, this uncertainty diminishes. As economic units can make contracts freely in stable environment, economy gains dynamism. For example, the risk premiums of the projects will decrease and cost estimations can be done accurately.

Central Bank uses the monetary policy tools it owns to accomplish the price stability target. However the outcome of a monetary policy can be obtained in relatively long term. The disharmony of time between means and ends is viewed as time inconsistency in economic literature[3]. Central bank's are directed to use different anchors as the way monetary policy tools will affect the prices are not certain and their effects being delayed and variable. In order to create trust on economic units and overcome the time inconsistency problem of monetary policy tools, Central banks lay down rules and holds themselves in a position of transparency and accountability. Therefore, the uncertainty and time inconsistency can be overcome by meeting the expectations of economic units through anchor

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[2] Merih Paya, Para Teorisi or Para Politikası, Filiz Kitabevi, İstanbul, 1998, p.146.

[3] C. Jeffery Fuhrer, "*Central Bank Independence and Inflation Targeting: Monetary Policy Paradigms for the Next Millennium*", New England Economic Review, Jan/Feb 1997, p.2-3.

and inflation targeting.

To change the expectations, Central Bank's need a nominal anchor. If the inflation expectations can be deflected with support of a nominal anchor to secure the price stability, the markets will be informed of accurate inflation rate. If economic units are accurately informed of price levels in the future and make contracts accordingly, the fluctuations in production will decrease. Nominal anchor is an apparent and applicable rule, which gives information to the economic units in order to affect the prices in the future. Fixed exchange rate and a constantly growing monetary figure form the primary examples of such rules (anchors). But Central Banks have recently used direct inflation targeting rather than anchors. The targeted inflation can be viewed as a kind of anchor. Because nominal anchor is a tool with which Central bank announces its inflation target it wants to reach. In this case Central Bank directs inflation targeting without using any intermediate target (anchor) in inflation targeting.

2.1. Strategies to Decrease Inflation in View of Monetary Policies and Anchors

Theoretically monetary policy has several final aims; to maintain the level of employment, to provide the continuity of payment system, to secure the balance of payments, to keep economic growth at a satisfactory level and so on[4]. However, the only reason Central Banks employs price stability, as final aim is that it is an aim, which can be attained through monetary policy[5]. Central Banks have two basic strategies to reach the final target price stability. First is to set monetary policy on an intermediate target variable like monetary multiplier control. In this case Central Bank gets use of policy tools to control the growth rate of targeted monetary multiplier. The variables to be taken as an intermediate target are as follows[6]:

-Monetary multipliers
-GNP
-Exchange Rates
-Interest Rates

Second strategy is to set monetary policy directly a general level of

[4] Paya, a.g.e., p.145-151.

[5] Gazi Erçel, "*Türkiye'de Para Politikası Uygulamaları ve Etkileri*", İktisat İşletme Finans, Aralık 1996, p.5.

[6] Kamuran Malatyalı, Enflasyon Hedeflemesi Ülke Uygulamalarına Örnekle ve Türkiye'de Uygulanabilirliği, DPT Yayını, Ankara, 1998, pp.1-5.

prices, which is final target. Since the intermediate targets have not been able to build confidence on final targets, the inflation has recently been targeted directly. As inflation targeting can be followed by economic units, it enables monetary policy to succeed. Inflation targeting is a kind of anchor, too. Because the basic function of an anchor is to give the public correct information about central bank policy. Inflation target is the ultimate anchor to implement. Naturally, each anchor has its own advantages and disadvantages. But an ideal anchor should bear the characteristics given below for its functionality.

2.2. The Characteristics of Anchors

1. The figure related to the targeted anchor should be within the issue of capability of the Central Bank[7]. In other words, the central bank should be able to control and monitor the intermediate and final targets effectively to reach the final target.
2. Since the results of the policies followed depend on the expectations of economic units, the easy intelligibility and applicability of the indicator targeted facilitate reaching the final target; the anchor should be followed and understood easily.
3. There must be a high correlation between the anchor and the final target[8]. The most important issue for the effectiveness of monetary policy applied is the necessity to determine the interaction mechanism. If the magnitude targeted is not fixed, it is impossible to reach the target with an appropriate margin[9]. If unexpected deviations in the anchor occur or in other words if the standard deviation is too high, anchor magnitude will be adjusted less or more than needed according to the inflation rate targeted. This will make inflation estimation meaningless. So central bank will not attain the inflation target.
4. Along with these characteristics as the effect of targeted magnitude over inflation comes about with a certain delay, an anchor which will minimize the delay to follow the monetary policy should be chosen as

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[7] İlker Parasız, Para Banka ve Finansal Piyasalar, Ezgi Kitabevi, Bursa, 1991, p.290.

[8] Nuran Gökbudak, "*Money Multiplier and Monetary Control*", TCMB Yayını, No: 9505, October 1995, p.1-15.

[9] Kevin Dowd, "*A Rule to Stabilize the Price Level*", The Cato Journal, Vol:15, No.1, 2000, p.3.

[10] Enzo Croce, Mohsin S. Khan, "*Monetary Regimes and Inflation Targeting*", Finance and Development: A Quarterly Magazine of IMF, Vol: 37, Number 3, September 2000, p.3.

anchor[10]. This also requires the use of sophisticated econometry. Recent developments in econometry have provided the monetary policy makers with substantial facilities. The effects of various anchors over inflation and how much delay they involve can be calculated through econometric models.

5. While the chosen anchor is directed to final target, it should not contradict with the other economic targets.

The characteristics of anchors above are called operational necessity. When a monetary indicator (for instance, reserve money) is taken as an intermediate target, it should have operational aspects such as controllability, relevance to final target, quick and clear observance.[11] Up to day four kinds of anchors having the aspects mentioned have been used in the fight against the inflation.

2.3. The Implemented Anchors

2.3.1. Money Multipliers

The variables targeted, as monetary multiplier may be M1, M2 or M2Y multipliers. However, as the targeted variable grows, it becomes difficult for Central Bank Money and Net Domestic Assets to be taken as targets. Monetary multipliers are good anchors because they can be quickly controlled by Central Bank and yield results immediately. Monetary anchors can be followed easily and are transparent. As financial liberalization and technological developments experienced in the last twenty years have hardened the control on monetary multipliers by Central Bank's, use of monetary multipliers as target or anchor has been difficult. Targeting monetary multipliers means assuming that demand for money is stable. Today both free capital movement and money substitution have obscured the demand for money. Thus, since the variables like M2 or M2Y are not much meaningful to fight the targeted inflation, the targeted monetary multipliers have been gradually decreased. The monetary multipliers used as a target came down from M2Y to Net Domestic Assets.

2.3.2 Foreign Exchange Rate

Foreign exchange rate as an anchor means binding the national currency to the currency of a country with a low inflation rate or fixing the value of

[11] Enzo Croce, Mohsin S. Khan, p.3.

the national currency. It is a frequently used anchor. Foreign exchange targeting yields in a shorter period than monetary targeting. Time delay is less than other intermediate targets. Because this aspect, in order to eliminate the inflationist expectation in the countries where chronic inflation is experienced, targeting foreign exchange or use of it as an anchor are very functional to fight the inflation. Because applying foreign exchange target as an anchor will facilitate the elimination of inflation expectations[12]. "Under pulling the inflation down with the minimum cost lies the desire to pull down the community's inflationist expectation. One of the biggest problems the countries with standing high inflation face in an effort to fight against inflation is determination of future inflation by past inflation. Any kind of contract (wage, rent and soon) based on the past inflation to be protected from inflation creates a rigidity to pull down the inflation. This rigidity is very closely related to the programme to be applied. Thus, to take the inflation down with minimum cost, the habit of indicating the past should be abandoned. The rate declared in advance will support this in great deal. While applying tight monetary policy, the old habits in price formation and wage demands will cause the production and employment to shrink"[13]. The more and longer confidence on an anchor and the more the anchor is adopted by every walk of life of the society, the higher the success will be against fighting inflation while the cost is being minimized[14].

Using foreign exchange rate is more advantageous as the relation between money supply and the price is uncertain. There must be very strong relation between foreign exchange and inflation in order to target the foreign exchange rate[15]. In other words, foreign exchange targeting is a more suitable target if its effect is great on price channel of balance of payments and the use of foreign exchange in the economy is too common.

Along with all these advantages, the foreign exchange has it negative effects as well. Fixing the price of the foreign exchange takes the chance of applying monetary policy from the CB. This makes the economy fragile against any internal an external shocks. The disadvantage is the nega-

[12] Melike Altın Kemer, "*Problems with Stabilization Programs and Outline For Turkish Stabilization*", TCMB Yayını, No: 9624, Aralık 1996, p.2.

[13] www.tcmb.gov.tr/ 2000 Yılı Monetary Policy.

[14] www.tcmb.gov.tr/ 2000 Yılı Monetary Policy.

[15] Kemer, Fahrettin Yağcı, "*Choice of Exchange Rate Regimes for Developing Countries*", World Bank Africa Region Working Paper Series, Number 16, April 2001, p.2.

tive developments in the balance of payments due to the over valuation of foreign exchange. When both of these happen together, balance sheet of banks and corporations deteriorate because of the interest rates going up to a level that the system can no longer bear and leading to a heavy crisis. Choosing foreign exchange as an anchor and quitting it at the right time are crucial to the success of inflation targeting[16].

2.3.3 Interest Rates

Interest rates are not a good target for it is affected by various factor and they have a volatile nature. Both financial liberalization and financing public deficits by borrowing have hardened controlling this price[17].

Big and strong economics are able to control interest rates (short term) in an environment where flexible foreign exchange rate and capital movements are free. Strong economics can not target the interest rates in an open economy through fixed exchange rate. In an open economy, economic authorities can control only two of these variables of interest rates, exchange regime and exchange rate. This is called criteria of trilemma. For instance, as part of the programme to fight the inflation in Turkey in 2000, because exchange rate was fixed and capital movements were freed, interest rate was left to fluctuate as an uncontrollable variable. In a flexible exchange rate regime, while the exchange rate fluctuates the CBs are able to control the interest rates. However, even if the weak and developing countries follow flexible exchange rate regime, their ability to control the interest rates remains weak[18]. Since these countries are affected by the capital movements excessively and money substitution renders money demand uncertain, interest rates can not be targeted, too[19].

These three anchors have gradually lost the qualities required for an anchor because of the technological developments, uncertainly in capital movements and enrichment of financial tools. The weak correlation between inflation and these anchors have directed the CBs to search for a new anchor in order to achieve the inflation target. New anchor is the

[16] Stanley Fischer, "*Maintaining Price Stability*", Federal Reserve Bank of Minneapolis, June 1997, p.3-5.

[17] Dornbush, Fischer, Makro Ekonomi, Trans. Salih Ak & Others, Akademi Yayını, Ankara, 1999, p.421-423.

[18] Stanley Fisher, "*Exchange Rate Regimes: Is the Bipolar View Correct?*", /wwwimf.org/external/np/2001/010601a.htm.

[19] P. Krugman, "*The Return of Demand-Side Economics*", www.nber.com, December 1998, p.4-6.

inflation itself.

2.3.4. Inflation Targeting

Inflation targeting is a search for attaining an inflation rate determined by the CB. Inflation targeting tries to reach the targeted inflation rate without using any other anchor. In inflation targeting the anchor is the inflation itself.

The success of the monetary policy depends on its ability to affect the expectations. Inflation targeting has two objectives: First, providing the market with reliable information about possible inflation and price in order to enable to make other decisions related to markets, investments and wages. Second, maintaining the continuity of an inflation rate as low as possible by increasing the price indicator. Such a policy is able to minimize the difference between the realized and expected inflation whose results are reflected upon the real economy. Undoubtedly, while a monetary policy of this kind is eliminating the inflationist effects, it is apparent that nominal interest rates will decrease. In addition, a reliable nominal anchor will decrease the inflation risk so the anchor will help target the inflation without conflicting with the objectives of economic growth[20].

2.4. The Conditions for Inflation Targeting

For inflation targeting the aspects below should be provided:

a- There is only one objective; price stability. In order to achieve this, inflation index is targeted TEFE (whole sale price Index-WSPI), TÜFE (Consumer's price index-CPI).

b- Whether the target is a point or a band is determined[21]. Both band application and point targeting have their advantages and disadvantages. Band application brings about some uncertainty even tough it is achieved easily. Even if the band application gives accurate inflation information to economic units, taking into consideration the difficulty of attaining it in practice, it might destroy the reliability on the programme when targeted inflation is not achieved. Consequently, a narrow band appears to be the best solution. Generally, inflation rate to be targeted is a value between 1 and 25 %. In the countries with an inflation rate higher than this, the inflation is tried to be pulled down to these levels before targeting the inflation.

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[20] Gazi Erçel, www.tcmb.gov.tr/Enflasyon Hedeflemesi, Conference Speech.

[21] In practice this band ranges between 1,5-25 %. For detail see Lars Svensson, "*Monetary Policy and Inflation Targeting*", NBER Working Paper, No: 97198, p.5.

c- Considering the delay of monetary tools on inflation, the period the policy will be applied should be determined. Inflation is targeted for mid-term, generally for three years.
d- To achieve the inflation targeting, which will be in charge of the programme (transparency) should be known.
e- The CB should be independent.
f- Having solved the structural problems in the country is another condition for inflation targeting[22].

Advantages and disadvantages of inflation targeting can be as follows[23]. Inflation targeting help break the expectations in short term. This results in minimum production and employment loss by eliminating the inflation rigidity in a short time. The CBs are provided with flexibility as how the monetary policy tools are used in inflation targeting is not defined. In this case, the CB can use all monetary tools freely and without any limitation in order to reach the inflation target. To do so, inflation targeting is used in floating exchange rate regime. Within trilemma limitation, floating exchange regime enables the CB to control the interest rates. This facilitates reaching the inflation target easily. There are some problems in implementation of inflation targeting as well. Even if the CB uses the monetary policy tools to reach the inflation target, it may not control the inflation directly. Because the CB may not be aware of the influence of its tools on inflation. Other disadvantages are that the CB may cause unexpected volatility on output while declaring the target. Once the inflation is targeted, the other macro economic objectives can not be followed. If it is interpreted strictly, it may cause considerable production loss. The attitude the CB will adopt against the shocks of supply and demand determines the amount of output. Unemployment and its relative importance on the whole may result in deviations in the inflation target.

The crucial point here is how to create confidence on anchors in an effort to fight against the inflation.

To control the inflation, it is essential that monetary policy to be used be conducted within a policy agreed before, instead of the requirements of the day or using a variable as an anchor. In this respect, to increase the effect of monetary policy, two basic concepts "credibility/transparency" and "independence" become important.

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[22] Stanley Fischer, p.3-4.
[23] D. Rudenbusch, Carl Walsch, "*US Inflation Targeting: Pro and Com*", FRBSF Economic Letter, 1998, p.18.

2.5. The Concepts of Credibility and Independence for the Success of Monetary Policy

Independence means the independence of the CB from government in all respects. Specifically, this means that the CB has single authority over the tools they are going to use. The CB should have the right to use the tools like foreign exchange, interest rates, open market operations and rediscount rate for the target to be reached[24]. Necessary legal adjustments should be effected for the CB. So a CB equipped with legal rights will be responsible and accountable to the public for the implementation of the monetary policy. The independence of a CB can not be maintained by only legal support. There are other economic conditions required for independency; for example public financing should not pose any burden on the CB and the CB should not have any problem with balance of payments[25]. For a successful monetary policy, the CB should be independent in respect to following;

- In operational terms, full inspection on monetary policy tools
- no problem with public financing
- Legally guaranteed independence[26].

"The most important point in implementing monetary policies is the continuos inflation and unbreakable or insisting inflation expectation. In such a case or in the lack of a monetary multiplier to choose as a target, reaching price stability may be difficult. Under these conditions what the CB is supposed to do is to convince the public about its determination in providing the price stability and to maintain this by attaining its credibility"[27]. If the credibility can be defined as the CB`s power to realize its promise, the promise are brought about with the monetary programmes or targeted multipliers: "For instance, monetary policy can be defined as a programme which shapes the way the CB will follow to reach the final target. This declared target is essentially a "declaration of will" of the CB and closely related to its credibility"[28]. The CB binds itself before the public in respect to reaching inflation target it declares with the help of anchors and this result in obtaining credibility. The more successful a CB

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[24] Erçel, a.g.m., p. 7-8.
[25] Suat Oktar, "*T.C. Merkez Bankası Ne Ölçüde Bağımsız*", Banka ve Ekonomik Yorumlar, Sayı: 43, 1997, p.3-9.
[26] Jeffery C. Fuhrer, p.4.
[27] Erçel, a.g.m., p.7.
[28] TCMB, Annual Report, 1997, p.62.

is to realize its promises, easier its ability to reach its final targets.

In maintaining price stability, the CBs should be transparent along with the consistent and continuos monetary policy. Publishing the developments in monetary policy, inflation estimates and improvements will increase the credibility of the CB, thus facilitating the objectives of pulling the inflation down.

2.6. Strategies of Building Credibility

In a dynamic economic environment it is not easy to target a multiplier and to attain it with monetary policy. When the conditions change, the promises cannot be kept. When the promises are not kept, the credibility of the CB is affected negatively. The credibility of a monetary policy is theoretically termed with two approaches; i. the CB may follow a policy depending on the economic conditions, ii. the CB may follow a rule-based strict policy without considering the economical developments or shocks. Both approaches claim to be more effective to attain the price stability objective. There are four ways that a CB maintains its credibility.

"Targeting inflation directly" as a first approach will be enough to build credibility. If the CB succeeds in inflation targeting, credibility will follow it. While such direct targeting brings the credibility the CB looks for, its rigid nature may become a burden on economic problems. The most important disadvantage of a tight inflation targeting is its possibility of creating recession and shrinkage: shocks originating from supply increases the prices and increased interest rates as a result of deteriorating balance of real money results in recession. For instance, in an environment where oil prices rapidly increase, a monetary policy based on the initial target (an inflation rate of 5%) may result in considerable amount of unemployment and loss of production. Thus, the loss of production and unemployment created by a tight inflation targeting may shake the trust on the programme[29].

Second approach is defined as "state contingent rule approach". According to this approach, while the effects of shocks from supply origin is being minimized, a "time - consistent" and "rule-based" monetary policy is being implemented. In other words, the CB owns a set of plans

[29] A. Karasay, M. Saygılı, C. Yalçın, Enflasyonun Doğrudan Hedeflenmesi ve Bazı Ülke Deneyimleri, TCMB Araştırma Yayınları No: 9801, 1998, p.2, Marvin Goodfried, "*Using the Term Structure of Interest Rate For Monetary Policy*", Economic Quarterly Federal Reserve Bank of Richmond, Summer 1998, p.10.

against any potential shocks. In this approach, it is essential to determine whether shocks are supply of origin or demand origin. For example, it is not practically easy to determine whether the fluctuations in exchange rates are of demand origin (resulting from internal demand boost) or supply origin. So, the answer to how to build credibility on the policy in this approach remains unanswered[30]. If the CBs are fully informed to separate the shocks, by following this method the CB may build credibility. But this assumption is not very realistic. In case the CB lacks full information about the economy, it is argued that the inconsistency between the policies and outcomes (due to delay in diagnosis, implementation and result) will both decrease the credibility and boost the inflationist expectations, so the CB will fail.

Third approach is "conservative central banker approach" which includes the "rule dependent" or "situation dependent (discretion)" monetary policy implementation depending on the assumption of the difficulty in having a set of plan against any external shocks[31]. The CB applies the policies without any concession for any situation with a programme it declares in advance. Growth or shrinkage of economy does not cause any change in monetary policy. Policies, which are not dependent on the rules, are inflationist policies. Policies should be rule-dependent and applied without any concession. The reason for such a policy implementation is the problem of time-inconsistency in monetary policy. As known, outcomes of a monetary policy yield in a long term. A measure to be taken by the CB today will effect the inflation in one or two-year term. Long and variable time periods obscure the determination of the policies required to tune the economic activities in the future. Whereas, political power may prefer the tendency for instant or short-term profit that may be created by the growth of real economy with the cost of increasing inflation in the long term. The time diversity and short term political desires together will increase the inflation in the long term more than it is estimated to be, on the other hand real production will not maintain a continuous growth. In tuning the economical activities, the more systematically the monetary policy is used, the more inflationist outcomes of such policies are[32].

Fourth approach is the "option to override to policy rule" approach. According to this approach, the governments decide on the final target of

[30] A. Karasay, M. Saygılı, C. Yalçın, a.g.e. , p.10.
[31] Karasay, Saygılı, Yalçın, a.g.e., p.10.
[32] Erçel, www.tcmb.gov.tr.Enflasyon Hedeflemesi-Conference Speech.

monetary policy but the tools of monetary policy remain under the CB's control and government just intervenes the CB's policy temporarily in crucial cases. In other words the government undertakes the responsibility of deviations in targeted inflation rate in critical situations, by doing so governments tries to secure the credibility of monetary policy aiming at price stability[33].

The Central Bank of Turkish Republic, TCMB or, MB shortly, aimed at the monetary multipliers in its balance sheet to decrease or control the inflation in 1990s. It put its objectives into practice through monetary policies. In this period, Central Bank used not only monetary multipliers but also the exchange rate as anchor. In this study, first the developments in the monetary policy and then the exchange rate policy will be analyzed.

III. The Monetary Policy of Turkish Central Bank in 1990's

3.1. Monetary Policies and Development of Nominal Anchors

Monetary programme can be defined as a rule-promise that shapes the path the CBs will follow to reach the final target through monetary policy[34]. The CB needs to affect the expectations and gain confidence in order to decrease the inflation and maintain the price stability. Monetary programmes constitute the rules of the game for the public and the CB by explaining concrete method, which defines the process of how to reach the final target. As long as actors remain within the limits set out, it is assumed that the CB will gain confidence and it will be permanent. In 1990's, the CB fought against the inflation and inflation expectations by announcing monetary anchors it decided through the monetary programme. The reason the CB chose monetary multipliers could be explained this way. "Theoretically, it is accepted that the CBs can control the growth of monetary multipliers in the economy by controlling the balance sheet multipliers. Considering the control over monetary multipliers may lead to limitations on the nominal demand in the economy through either interest rates or loans, it is expected to create a decreasing effect an inflation"[35].

The CB's monetary policy in the 1990's can be analyzed under three periods. First period; 1990-1994, second period; 1995-2000, third period 2000 and later. In each period, the CB aimed at balance sheet multipliers

[33] Karasay, Saygılı, Yalçın, a.g.e., p.10-11.
[34] TCMB, 1997 Yıllık Raporu, p. 62.
[35] www.tcmb.gov.tr, "*1998 Yılı İlk Altı Aylık Para Programı Uygulaması*".

as operational target and avoided a monetary enlargement over liquidity demand[36]. In this period, the CB focused on keeping the growth of monetary multipliers parallel to inflation as well as its sources. The growth in monetary multipliers and its relation to public financing will be more influential on inflation than the monetary growth created by buying foreign exchange. For this reason, while the CB was trying to keep monetary growth under control, it tried to change the composition of the source of growth and relate the growth in monetary multipliers with the growth in the net external assets.

In the monetary policy in 1990 (1991, 1992, 1993, 1994) there were four multipliers targeted: Central Bank Money, Total Domestic Assets, Total External Assets and the Central Bank's balance sheet multiplier[37]. Such an option is explained by the CB in this way: It was seen that targeting M1 or M2 was not meaningful within the monetary programming framework. This is because the realized financial liberalization had blurred the monetary multipliers like M1 or M2. It was also revealed through econometric studies that the use of these multipliers in inflation targeting was not much meaningful[38].

Table 1: 1990-1994 Monetary Programme Targets and Realisation (%)

	1990 PT	**1990 R**	**1991 R**	**1992 PT**	**1992 R**	**1993 PT**	**1993 R**	**1994 PT**	**1994 R**
Balance Sheet	12-22	24.1	58.9	37-47	85	-	60	-	142
Total Domestic Obligation	15-25	21.6	66.6	38-48	101	-	49	-	73
Total Domestic Assets	6-16	11.9	64.3	27-39	75	-	55	-	106
CB Money (CBM)	35-48	26.6	82.6	40-50	100	-	46	-	51
Wholesale Price Index	-	53	59	-	62	-	58	-	120
Exchange Rate Position (Billion USD)	-	-3.90	-2.75	-	-1.59	-	-2.29	-	-3.94

Source: CBT Annual Report, PT: Programme Target, R: Realisation

[36] CBT, 1997 Annual Report, p.62.
[37] CBT, 1997 Annual Report, p.30.
[38] CBT, 1997 Annual Report, p.30.

As seen in Table 1, the CB could not control the growth of balance sheet multipliers expect in 1990. The reason was the increased public debts and the use of CB sources for this deficit. As shock factors like the Gulf Crisis, change of governments and the European monetary crisis increased the need for borrowing by the Treasury and the CB was not able to control monetary multipliers. In the first half of 1990, the CB's monetary policy was essentially to facilitate public financing by sterilizing over-growth of liquidity without causing great losses in the reserves. In this period, as the inflow of foreign capital increased because of high interest rates, the CB was able to minimize its open position.

The Central Bank stopped using balance sheet multipliers and central bank money as anchor in 1996. As required by Stand-by of IMF in 1994 and 1995, net domestic assets were targeted. The targets were achieved as seen below.

Table 2: Monetary Programme Targets and Realisation

	1994		1995	
Billion TL	**Realisation**	**Target**	**Realisation**	**Target**
Reserve Money	185.7	-	343.5	-
Net External Assets	-22.2	-	53.1	-
Foreign Exchange Accounts of Banks	97.6	-	102.6	-
Net Domestic Assests	305.5	293	393.1	366.3

Source: CBT 1994-1995 Annual Report (December 1994-1995 figures).

The Central Bank explains the reason of changing the anchor: "When reserve money multiplier is compared to the Central Bank money, it is easier to interpret and understand and it is a better indicator if mid-term money demand in the economy. On the other hand, since the Central Bank money is directly influenced by the short-term liquidity movements in the market through open markets operations and the Central Bank includes a variable like public account which can display instant great fluctuations beyond the Central Bank's control, its estimation will decrease. Reserve money is a more stable variable and in this respect it is chosen as a target variable in implementation of monetary policy"[39]. As seen in Figure 1, the fluctuations of the Central Bank money increased compared to reserve money.

[39] CBT, 1998 Annual Report, p.62-63.

In 1996-1997, the Central Bank implemented a monetary policy whose details were not made public. As in the earlier period, while the Central Bank was trying to keep reserve money growth under control, it tried to change the source composition of this growth and to relate the reserve money growth with the growth in net external assets.

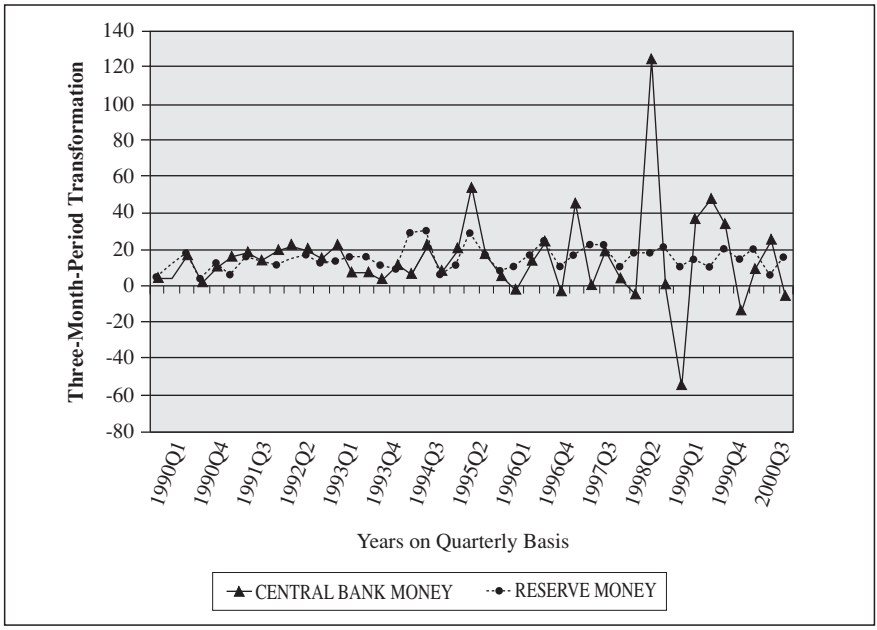
Table 3: 1996-1997 Central Bank Monetary Programme Targets and Realisation

	1996		1997	
Billion TL	**Realisation**	**Target**	**Realisation**	**Target**
Reserve Money	80	-	78	-
Net Domestic Assets	-10	-	-48	-
Net External Assets	148	-	116	
Index of Wholesale Price (TEFE)	84	-	91	-

Source: CBT.

As indicated in Table 3, the CB succeeded to direct the reserve money parallel to the inflation. Following the fact that the treasury cancelled to use short-termed advance in accordance with the protocol in 1997 between the Treasury and the CB, the CB gained an opportunity to be able to control its domestic assets. As seen in Table 3, the source of the money increase was the foreign source besides the decrease of the domestic assets.

Figure 1: The Fluctuation in the Monetary Magnitudes



Source: CBT

The CB considered the net domestic assets as operational target instead of the reserve money in 1997, 1998, 1999 and 2000. If the reserve money is defined as equal to net foreign asset plus net domestic asset, the CB attached a great importance to the definition of net domestic asset[40] and to the control of it. The presidents of the CB continuously complained especially of public sector finance deficits in the 1990s. The CB stipulated that the governments pay primary surplus in order to achieve the monetary policy targets in the 1990s, because the CB cannot control both the interest rates and exchange rates unless the policy of the CB is in accordance with the fiscal policy. Public sector's borrowing with high interest rates will increase the dept stock quickly.

On one hand, while the increase in interest rates as a result of the increasing fiscal pressure are attracting the foreign source into the country, this will make it more difficult for the CB to sterilize this source; on the other hand, this will also make it more difficult for the CB to control

[40] Definition of the net domestic assets in 1997 differs than the definition in 1998, TCMB, Annual Raport.

the monetary magnitudes when public share certificates are considered to be issued to create money by means of repo transactions. At this point, the CB fell into a dilemma either to provide aid to finance the public sector or to struggle with the inflation. Not only a strict monetary policy will accelerate the inflation by increasing the interest rates, but also a monetary policy to provide aid to finance the public sector will accelerate the inflation. Under these conditions, realization of the anchor, accepted as the main variable of the monetary policy application, in the estimated level, depends particularly on the realization of the consolidated budget magnitudes and on the other estimated balances in the economy.

Some type of developments that will emerge in the international economies during the application of this program may also influence the domestic balances and consequently the application of monetary policy; therefore, some variables, that should closely be considered while evaluating the monetary policy, should be underlined:[41] "In an open economy, to meet only the primary surplus is not sufficient. In order to meet the reserve money target, petroleum prices should not increase abnormally, and monetary and real shocks should not emerge in the foreign environments. The changes in these variables make it essential to reconsider the targets"[42]

Table 4: Monetary Program in 1998

	31 March		30 June		31 December	
Rate of Increase (%)	**Target**	**Realisation**	**Target**	**Realisation**	**Target**	**Realisation**
Reserve Money	18-20	17.3	14-16	13.1	-	-
Net Domestic Asset (Trillion TL)	-	-	-	-	700	579

Source: www.tcmb.gov.tr/ Continual Publication/1998 Annual Report.

The monetary policy was declared in 1998 as 3-month-period programs. It was targeted to decrease the inflation to the level of 50% by means of the strict monetary and fiscal policies. As seen in Table 4, the values targeted in the first 6 months were achieved. The government co-

[41] Erçel, www.tcmb.gov.tr. money program/1997 Yılında Türkiye Ekonomisi/ 8 Ocak 1998.
[42] TCMB, 1998 Yıllık Raporu.

signed a convention stand-by with the IMF on June 26, 1998 in order to show the constancy to struggle with the inflation and in order to gain credit. Despite these positive progresses, the Russia crisis in the second half of 1998 forced the CB to change the anchor. The reason why the CB targeted net domestic asset (NDA) as a new magnitude is the possibility of an unestimated change in the demand for TL following the decrease trend of the inflation. "In the procedures when the inflation is within the decreasing trend, the estimation of the reserve money magnitude that is a need for economic activity, gets more difficult as a result of the change of the functional relationship in the known monetary demand. With this change of the target, the CB tried to overcome the difficulties in the estimation of reserve monetary magnitude, which is essential for the economic activity. Consequently, net domestic assets were applied as the new target variable."[43] The NDAs are much more ideal anchors than the reserve money as they indicate the net credit relationship between the CB and fiscal system.

Table 5: The Analytic Balance-sheet of CB (According to the IMF Staff Monitored Program)

	December 98	December 99	Change
Assets (Billion TL)	3321.1	6322.1	0.90
1- Net Foreign Asset	2878	7641.3	1.65
2- Net Domestic Asset	434.1	-1319.2	-4.03
Liabilities=1-Reserve Money(X)	3312.1	6322.1	0.90

Source: TCBT Annual Report 1998-99.

The monetary policy of 1999 targeted to keep the inflation under control to establish stability in the financial markets. Even the earthquake of 17 August did not prevent the monetary policy of the CB. The CB continued to reduce the net domestic assets and to implement the policy of basing the reserve money increase upon the foreign assets.

performance criterion during 2000 with the letter of intention declared to the public in the end of 1999 and in the beginning of 2000. Net domestic assets were suggested to fluctuate within a certain band. By means of this band, net domestic assets were targeted to adapt to market conditions within short terms. Net domestic assets were released to fluctuate within

[43] TCMB, Yıllık Rapor 1998, www.tcmb.gov.tr.

a parallel band identified by the (+/-) 5 % of monetary base magnitude; the policy to reduce net domestic assets was discontinued, besides that TL applied in the periods when the inflow of foreign exchange increased, sterilized the liquidity. This policy, with the application of fixed foreign exchange rate, indicates that the CBTR was reformed as a semi-monetary council.[44]

Besides, net international reserve (NIR) variable was also applied as performance criteria. A certain base value for NIR was determined. The determined base value for NIR was 12.000$ and above. Thus, the CBTR wanted to base the monetary expansion upon the foreign assets by fixing the net domestic assets.

The CBTR successfully applied this policy until October 2000. As seen in Table 12 and 13, the CBTR had to revise the target variables as a result of the crisis in November 2000. As the details about 2000 will be emphasized under the title "November Crisis", it will be useful to evaluate the monetary policy of the CBTR until 2000, in general.

3.2. A General Evaluation of Monetary Anchors

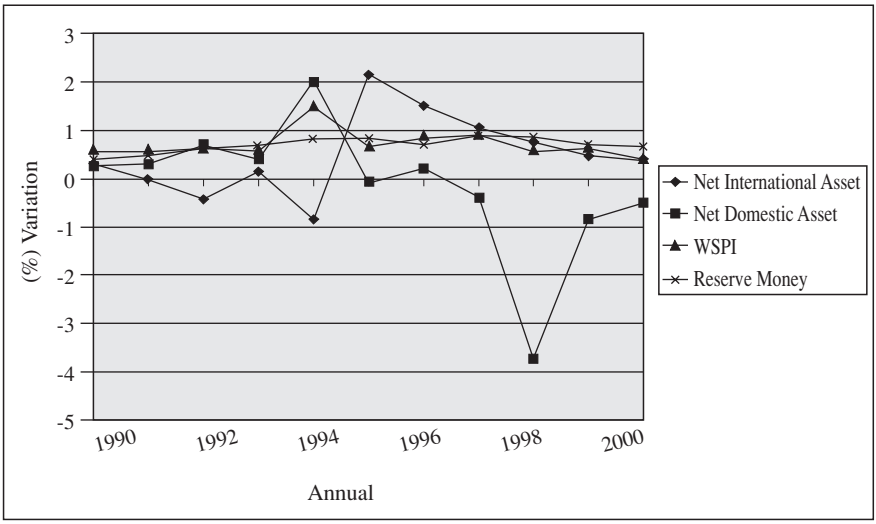
Even if the external shocks such as the Asia crisis in 1997, the Russia crisis in August 1998 and the earthquake in 1999, which all were experienced between 1995 and 2000, forced the revision of the net domestic asset items, the CB could have controlled the balance-sheet magnitudes. That public sector supplied primary surplus played an important role to control the net domestic assets.

Even if the targeted monetary magnitudes between 1995 and 2000 were diverted as a result of the influence of the external shocks, the CB relaxed the markets with the temporary intervention approach; and revised the deviations from the monetary magnitudes in the following periods. As seen in Figure 2, the CB, undertaking a similar attitude in the crisis, in November 2000, funded the markets and tried to meet the net domestic value targeted in accordance with foreign source inflow. Despite all these target/anchor changes and foreign crisis, the monetary policy of the CBRT within last 10 years period can be evaluated according to the progress of net domestic assets. The criteria for this evaluation will be "The reliable measure of how much money the CB created; the magnitude

[44] For details see: Haydar Akyazı, Para Kurulu ve Türkiye'de Uygulanabilirliliği Üzerine Bir Araştırma, TBB Yayını, No:214, İstanbul 1999.

of the net domestic assets; and the speed of transformation within a certain period of time"[45]. If this rate of increase is below the inflation rate and the source of the increase is the net foreign assets, we can say that the CB applied a successful policy from the monetary viewpoint. This case can be seen in Figure 2, clearly. The CB could not have controlled the net domestic assets in the period between 1990 and 1994; and net domestic assets increased in a level over the inflation. The source of the monetary expansion within these years when the foreign source level was negative, was the credits provided to the public and financial units. The net domestic assets were controlled with the positive developments in the primary budget between 1995 and 2000; and monetary demand was based upon the foreign sources with the increase of foreign source inflow.

Figure 2: Sources of the Monetary Expansion



Source: Central Bank of Turkish Republic (CBTR).

The Central Bank targeted stability in the interest rate that it is not an anchor and in the exchange rate that is an anchor. Both in the period between 1990 and 1995, and between 1995 and 2000; and the CB had controls over the interest rates only in the interbank money market.

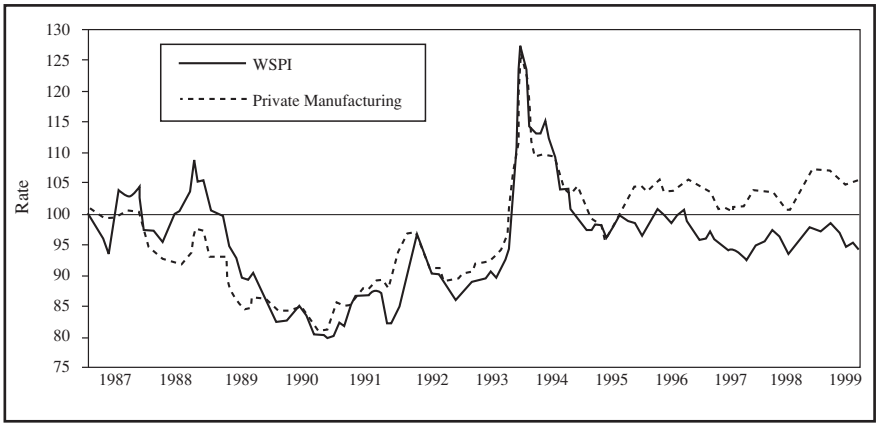
[45] Deniz Gökçe, "*İstikrar Politikası Bağlamında Merkez Bankası ve Para Politikası*", Türkiye İçin Orta Vadeli Yeni Bir İstikrar Programına Doğru, Tüsiad Yayını, İstanbul, 1995, p.89.

Interest rate followed its own route in the primary and secondary markets according to the situation of the economy; However, the CB managed to decrease interest rate fluctuations in the interbank market but the interest rate was not applied by the CB as an anchor. Another anchor applied by the CB is the exchange rate. The development analysis of this anchor is essential for the monetary policy.

3.3. Interest Rate Policy

To target the exchange rate causes a decrease in inflation by bringing stability in both the markets for goods and the financial markets. However, the interest rate policy that the CB will follow has to be applied by considering not only the inflation expectations in the conditions of Turkey but also by considering the balance of payments and public finance. Following the relative progress in the needs of public sector borrowing right after the crisis in 1994, Turkey implemented a type of rate policy to establish a balance among the rate, budget and balance of payments. Following the stand-by convention in 1995, the CB has started to apply a managed exchange rate system. In 2000, this system of exchange rate was transformed into a system of exchange rate system for targeting the inflation.

Figure 3: The Progress in the Real Exchange Rates in the period Between 1987 and 1999



Source: www.tcmb.gov.tr./Yıllık Rapor 1999.

*Year 1997 was based upon for the prices of private manufacturing industry and Whole Sale Price Index (WSPI). An exchange rate basket of 1,5 DM and 1 US Dollar ($), and 1990=100 WSPI for USA and Germany were applied for the calculation. The increase in the index indicates the depreciation in the Real Exchange Rates.

As seen in Figure 3, the real exchange rates had appreciated extremely in Turkey until 1993. The liberation of the movements of capital in 1990 and the high interest rates of public shares caused the appreciation of the exchange rates by attracting the foreign capital into Turkey[46].

After 1994, the CB started to apply managed exchange rate system. According to the stand-by convention co-signed with the IMF in 1995, it was planned to increase the exchange rate basket of 1 $ and 1,5 DM in accordance with suggested inflation target. The suggested annual increase ratio of exchange rate basket for 1995 was 38.4 % [47] while the CB achieved the target until September in accordance with the stand-by convention; the political instability and political election increased the exchange rates. At this point, the CB started to follow a realistic exchange rate policy that will be applied until 2000. The CB carried out the exchange rates parallel to the inflation. By this way, the exchange rate was increased to the level of inflation and was not really allowed to appreciate. Foreign equilibrium was not allowed to be demolished. As a result of achieving the exchange rate policy targets applied in 1996 on a large scale, fluctuations in the real exchange rate index progressed in a limited period of time; and the real effective exchange rate maintained its level in the end of 1995. According to the monthly averages, the depreciation of the Turkish Lira (TL) in 1996 against the US dollar (one of the currencies in the exchange rate basket) reached up to 84,1 % while by 70,8 % against the DM. By the end of the year, the monthly average increase in the rate basket was 77,3 % while the monthly average increase of the WSPI reached 75,9 %[48]. The CB continued to increase the rate basket in 1997 in accordance with the estimated monthly inflation as suggested in the stand-by convention in 1995. By this means, the fluctuations in the real exchange rate index were maintained at a limited level and the CB successfully achieved its target to establish stability in the economic markets either by reducing the instability of the exchange rates or by reducing it to a narrow level[49].

Figure 3 indicates the real rate progress in the period between 1996 and 1997. As seen, the real effective exchange rate index in this period fluctuates between the 96 and 106 range. When the Asian economic crisis in

[46] TCMB, Annual Report, 1990, p.36.
[47] TCMB, Annual Report, 1995, p.50.
[48] www.tcmb.gov.tr./TCMB Annual Report 1996.
[49] TCMB, Annual Report 1997, p. 74.

1997 was considered, this rate policy indicates to be successful. The negative progress in the foreign markets was reflected into the domestic markets. In 1998, the CB continued to determine the monthly nominal devaluation ratio in the rate basket as parallel to the suggested inflation rate as well. By the end of the year, monthly average increase in the rate basket was 58,2 % and the annual increase in WSPI was 54,2 %[50]. The CB replaced the DM in the rate basket with Euro (€) in 1999. The CB tried to realize the possible depreciation in the rate basket of 1 $ and 0,77 € in consequence with the inflation target. As in 1998, the CB took into account the targetted inflation while determining the rate policy that will be applied in 1999; However, the CB applied a rate policy in the first half of 1999 in accordance with the current inflation rather than the target inflation while determining the rate policy that will be applied in 1999, as realized in the periods when both uncertainty and inflation increased.

In the second half of 1999, the CB applied a rate policy according to the target inflation. By the end of the year, monthly average increase in the rate basket was 60,8 % while annual increase was 62,9 % in WSPI[51].

The rate policy in the monetary program in 2000 was transformed from a managed rate policy to inflation targeting rate system. Exchange rate was applied as an anchor to break the inflation expectations. There should be a strong correlation between exchange rate and inflation to be able to target the exchange rate[52]. In other words, targeting the exchange rate is generally a more suitable target if the balance sheet of payments has a stronger effect on the economy.

Turkey has such an economic structure that it imports 25 % of its gross national income (GNP). Besides that, when the importance of circulating foreign capital is considered (there approximately exists exchange accounts that amount to 50 billion $). Targeting the exchange rate is effective to break the inflation expectations. Therefore, the ratio of the rate basket of 1 $ and 0,77 € was increased 20 %. The value of the basket was determined by the CB on a daily basis. The rate policy of 2000 is a medium termed policy of 3 years. Within the first 18 months comprising the June period of 2000-2001, the CB declared the rate basket values of the following 9 months at the end of each 3-month-period, which means that the rate values are determined for 12 months. By this way, the CB elimi-

[50] www.tcmb.gov.tr./TCMB Annual Report 1998.
[51] TCMB, Annual Report 1997, p.97-98.
[52] Kemer, a.g.m., p.2.

nated the rate-based risk completely. However, beside the fact that the rate basket is stable, there exists a cross-rate risk because the cross-rate exchanging of € / $ will change the value of € and $ in the exchange rate.

The CBTR planned to apply the band procedure instead of a stable rate basket in order to provide flexibility in the program of 2000 to decrease the rate-based inflation. It was suggested to increase the total extent of the band mentioned, gradually. According to this program, it would be increased gradually up to 7,5 % between July 1-December 31, 2001; up to 15 % until June 30, 2002 and up to 22,5 % until December 31, 2002. "Declaring that the CBTR will intervene the movements of the rate within the band, the CBTR aimed to indicate that the market mentality will dominate the foreign exchange market in the long term"[53]. By following such a strategy, the CB both established a pathway for getting out of exchange rate stabilization and aimed to relax the exporters who were financially depressed in the foreign markets as a result of the real appreciation of the exchange rates correlated with the monetary program of 2000. However, the TL appreciated as the exchange rate anchor was implemented. Foreign exchange rate basket appreciated 10 %, compared to WSPI.

Such an appreciation of the exchange rate increased the import ratio by means of income and replacement effects. When the balance of current account is demolished, the possibility of a crisis to break out increases. According to Dornbusch, when the GNP reached 4 % within an instability of current account in which the currency of a country appreciated 25 %, that country is in the crisis zone[54]. Correlated with the change of expectations by the end of 2000, Turkey got rid of the attack to the foreign exchange with a high cost. The political crisis on February 19 and the attack following this crisis caused the rate to be released to fluctuate[55].

In general, the exchange rate policy of 1990-2000 fiscal years (at least until November 2000) brought a rate stability to the economic markets. As in Figure 3, the real exchange rate (that appreciated until 1994 and was unstable) was carried out parallel to the inflation without really appreciating between 1995 and 1999.

While no negative progress was experienced in the current account

[53] www.tcmb.gov.tr/ 2000 Yılı Para Politikası.

[54] Ercan Uygur, Krizden Krize Türkiye: 2000 Kasım ve 2001 Şubat Krizleri, 22 Mayıs 2002, p.14.

[55] www.tcmb.gov.tr. 2001 Annual Monetary Policy Report.

balance, the exchange rate premium which is the basis of high real interest rates were not decreased as requested from the public. Fixed foreign exchange rate began to be applied to be able to decrease this exchange rate premium risk, the interest rates and the inflation decreased; However, the Turkish economy experienced a crisis owing to the negative effects of fixed exchange rate regime.

Foreign exchange was released to fluctuate after February 22, 2001. The CBTR regularly sold out foreign exchange in the foreign exchange markets in order to minimize the extreme fluctuations that broke out during the period of fluctuating exchange rate regime.

Compensation of the banks' foreign exchange obligations with the foreign sources provided a relative stability in the foreign exchange market by the end of the year. However, the balance in the economy can be established with achieving the fundamental macro targets only. The same economic fundamentals may achieve different balances according to the expectations. The economy turns to lower interest and exchange rate if the expectations are positive and good while it turns to higher interest and exchange rates in an opposite case. The political tension about Türk Telecom that broke out in July 2000 increased the interest rates. The fear (emerged out of the fact that the interest rates increased and domestic debt would not be converted) increased the foreign exchange demand in the shallow markets and increased the foreign exchange rates. Besides, the incidents that broke out in Argentina; the terrorist attack in the USA on September 11, 2001 and the military operation of the USA against Afghanistan increased the demand for the foreign exchange and speculations. In such a critical situation, the IMF declared the financial aid amounting to 15 billion $ and the government declared that it will not concede about the serious economic policies applied, the pessimistic expectations were broken and stability was established in the markets[56]. The exchange rate policy of the CB aims to intervene in a lowest level. The CB only plans to intervene in the extreme movements.

Besides the fact that the application of the foreign exchange rate as an anchor is appropriate in Turkey where monetary substitution was experienced on a large scale, it caused an economic crisis as the optimal ascending point was not appropriate. Extreme appreciation of the exchange rates until November 2000, and the deterioration of the balance of payments

[56] www.tcmb.gov.tr. 2002 Yılında Para ve Kur Politikası ve Muhtemel Gelişmeler.

showed the negative side of the exchange rate anchor. This progress influenced the expectations negatively. However, the progress that would cause a radical change in the expectations was experienced in the banking sector. The crisis that broke out in the banking sector in November caused the appreciation of interest rates by increasing the risk perception in Turkey; and the difference between targeted inflation and the interest rate strengthened the devaluation expectations.

In spite of overcoming the crisis in November, the crisis made the banking sector more rigid compared to the past. Sudden increase in the interest rates destroyed, especially the financial structures of the public banks and of some of the private banks; and made the existing structural problems of the banking system more serious[57].

3.4. November Crisis

"The Turkish financial markets within the last 10 days of November and in the beginning of December, experienced a period of high turbulence. Following this period, the financial problems of a medium degree bank that was acquired by the deposit insurance fund and the fact that this bank sold the large amount of government bonds in the secondary market caused the major market makers to suspend their declarations about the rates of the government bonds. This situation prompted outflow of the capital in large amounts, in spite of the appreciation of the interest rates up to 100-200 %. At the same time, the CB increased the net domestic asset supply in a higher level than anticipated in the program corridor. Correlated with the negative viewpoint of the international markets for the developing economies, these incidents caused the loss of the foreign exchange reserves in the amount of 6 billion $. The CB stopped the reserve loss on November 30 by indicating that it would stop supplying the market with high liquidity. However, the interest rates suddenly appreciated up to 1000 %. The pressure over the financial markets could hardly be calmed down following a statement about strengthening policies and following the statement about the demand to make use of the additional reserve possibility" [58].

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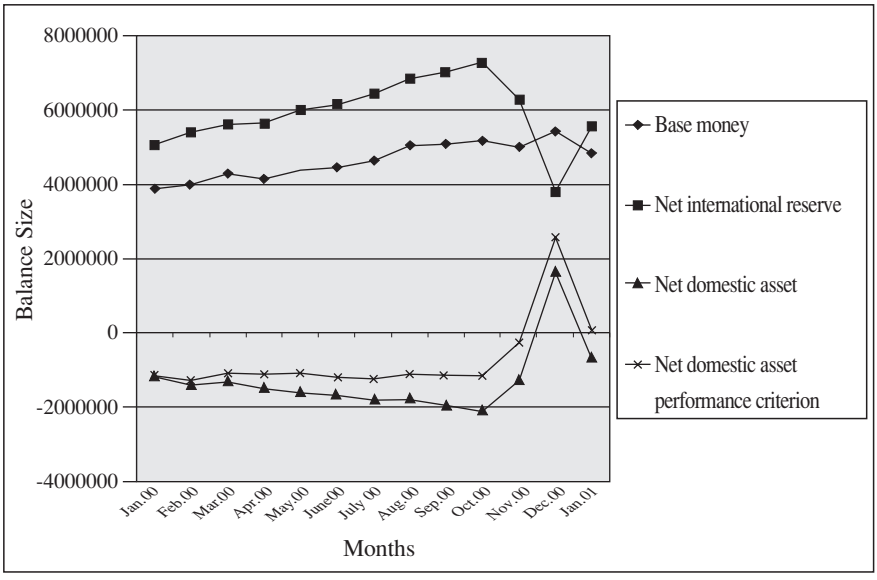
[57] www.tcmb.gov.tr/ Remarks of the Governor, CBTR/19 March 2001. See "*Finansal Krizlerin Bilanço Üzerindeki Bozucu Etkisi*", Ben Branke, Mark Getler, "*Inside the Black Box: The Credit Channel of Monetary Policy Transmission*", Journal Economic Perspective, Vol:9, 1995, p.29-33.

[58] Letter of Intent given to the IMF on December 18, 2000.

As indicated in Table 12 and Table 13 (see appendix), as a result of the November crisis, the CB had to revise the targets. The CBTR, applying the monetary program of 2000, continued to use NDAs and NIAs as performance criteria. As in Table 12, each NDA item that was the performance criteria for the end of 2000 was fixed to be 1.650 trillion TL and realized as 1.060 trillion TL. Performance target at NIA was achieved. Besides, the CB declared in the letter of intent dated December 22 and stated that it will remove the fluctuation corridor of +/- 5 % of net domestic asset in 2001. Despite the November Crisis, the main reason how the CB could have achieved the estimated targets, is the inflow of foreign sources. With the additional reserve aid of IMF, the CBTR could have achieved the revised values of the end-2000 by means of the short termed syndication credits that the Treasury provided from the international markets. As to sum up, in 2000 the CBTR preserved the general principles of the monetary policies of 2000. Figure 4 indicates the decrease in foreign assets and how the CB funded the market during the crisis. However, the appreciation of the foreign exchange rate that started as a result of the political tension in February 2001 reached up to 21.5 billion $ in the period between January and September 2001 and became the main reason of the instability in the foreign exchange market.

Figure 4: The Progress of the Monetary Magnitudes in November Crisis



Source: CBTR.

3.5. February Crisis

Following the November crisis, the interest rates appreciated, which demolished the fiscal structure of the banking system. Both the funds and the requirement of funds of the public banks increased on a large scale. While the interest rates appreciated, the terms were shortened; the rigidity of the economic system for the shocks (the sensitivity for the crisis) increased. Serious damages were observed in real sector and the expectations of the economic units turned to be pessimistic.

Besides the negative progress in the balance of payments, extremely high levels of interest rates, compared to the change in the foreign exchange rates following the November crisis, increased the risk premium and strengthened the expectations for a devaluation. Despite the positive progress in the balance sheet of the CB assisted by the IMF, the risk attitudes of economic units against Turkey changed. The perception change in the economic markets increased the rigidity of the exchange rate policy.

A political tension in February started the crisis in the Turkish economy that has already been quite sensitive for the crisis. "The negative progress before the Treasury auction in February caused a mistrust on the applied program and a serious attack started against the TL. As a matter of fact, there appeared a demand for foreign exchange in the amount of 7,6 billion $ valorized for a term of one-day and the CB tried to control the liquidity for such a large amount of foreign exchange demand. The urgent need of liquidity caused the system of payments to be locked because of the daily liquidity requirements of the public banks. Under these circumstances, by considering the economic damages as a result of continuing the application of the foreign exchange rate system, the foreign exchange rates were released to fluctuate on February 22"[59].

3.6. General Evaluation of November and February Crisis

Both the crisis in November 2000 and the crisis in February 2001 broke out as a result of the weakness of the program to decrease the inflation.

The factors preparing the crisis can be stated as follows:

i. Extreme appreciation of the national currency in the program to struggle with inflation due to application of the foreign exchange as an anchor.
ii. Disorder in the balance of current account as a result of the extreme increase of the domestic demand and the appreciation of exchange rate.
iii. Increase of the open position of the risky banking sector and duty losses of the public banks.

[59] www.tcmb.gov.tr/ Remarks of Governor of the CBTR/22.03.2001.

iv. External shocks[60].

One of the weakest links of the program to decrease the inflation validated on November 9, 1999 was the applied anchor. The decrease of the inflation more slowly than anticipated level made the exchange rates more valuable by enlarging the difference between the inflation and the exchange rate basket. WSPI was realized, as 32 % while the actual target was 25 %. While the exchange rates were permitted to increase 20 % until the end of 2000, WSPI appreciated 13 % by the end of 2000 in accordance with the increase of 32 %. Considering the increase in the consumer price index (CPI) (it was 39 % by the end of 2000), exchange rates appreciated 18 %[61]. Table 6 clearly indicates the large difference between exchange rate and the WSPI. Considering Table 7, 1999=100 ratio balanced effective exchange rate appreciated by 46 % in November Crisis and by 48 % before February Crisis.

Table 6: Extremely Valuable TL

Year-Month	00-1	00-2	91-3	00-4	00-5	00-6	00-7	00-8	00-9	00-10	00-11	00-12
TEFE	5.8	10.1	13.5	16.2	18.2	18.6	19.7	20.8	23.6	27.1	30.1	32.6
Exchange Rate Appreciation	2.1	4.2	6.4	8.2	10	11.9	13.4	14.8	16.3	17.5	18.7	19.9

Source: CBTR.

The increase in hiring expenditures in the amount of 49 %, the fees of the public sector employees in the amount of 60-70 %, and the increase of fees of the private sector employees in the amount of 60 % caused the inflation to decrease more slowly than estimated and caused an appreciation of the exchange rates[62].

The fact that the program was assisted by the WB and the IMF caused the foreign exchange anchor to be trusted. Besides this trust, nominal and real decrease of the domestic borrowing interest rates of the government; the banking sector's ability to acquire large credits from foreign sources increased consumption.

As stated in Table 7, besides the appreciation in the exchange rates, syndi-

[60] Nur Keyder, "*2001 Şubat Krizi*", İktisat İşletme Finans, Haziran 2001, s.38.
[61] Keyder, a.g.m, s.38.
[62] Uygur, a.g.m., ss.8-9.

cation credits increased as well. The increase in consumption turned towards imported products. On the one hand, turning of the consumption towards imported products and consumer durable products (getting cheaper as a result of the appreciation of the foreign exchange rates) influenced the balance of current accounts negatively; on the other hand, the decrease in the Euro/Dollar parity rate (which is an external factor as well) affected exports negatively, which made the balance of current account worse[63]. Consequently, the balance of imports and exports was demolished as indicated in Table 8[64].

Table 7: The Progress in the Foreign Exchange Investment Account, Real Foreign Exchange Rate Index, and Syndication Credit Capacity of the Commercial Banks During the Crisis in Turkey

Months	Real Foreign Exchange Rate Index* 1999 =100	Syndication Credit Capacity (million $)
1999 November	126.37	9.609
December	127.29	9.861
2000 January	128.50	12.609
February	131.59	12.909
March	132.59	13.333
April	132.93	13.521
May	135.67	13.412
June	132.29	14.432
July	133.49	15.240
August	135.92	16.564
September	139.02	16.245
October	142.45	16.702
November	146.50	16.900
December	147.59	17.671
2001 January	148.08	17.945
February	138.40	19.245
March	110.51	16.117

* Calculated by considering the currencies of 19 countries and CPI values,

Source: A. Eren ve Bora Süslü, "Finansal Kriz Teorileri Işığında Türkiye'de Yaşanan Krizlerin Genel Bir Değerlendirmesi", Yeni Türkiye, Cilt:41, Eylül-Ekim 2001.

[63] Uygur, a.g.m., ss.10-16.

[64] "*Finansal Kriz Teorileri Işığında Türkiye'de Yaşanan Krizlerin Genel Bir Değerlendirmesi*", Yeni Türkiye, Cilt:41, Eylül-Ekim 2001.

Table 8: Foreign Trade Values and Their Transformational Ratios in Turkey

Years	Import		Export		Foreign Trade Balance Deficit	
	Million $	Change %	Million $	Change %	Million $	Change %
1999	40.667	- 11.4	26.567	-1.4	14.100	-1.4
2000	54.902	32.7	27.774	2.8	27.128	92.4
2000*	39.506	-	23.331	-	16.175	-
2001*	29.808	-24.5	25.758	9.5	4.050	-75.0

* According to September 2000.

Source: A. Eren ve Bora Süslü, "Finansal Kriz Teorileri Işığında Türkiye'de Yaşanan Krizlerin Genel Bir Değerlendirmesi", Yeni Türkiye, Cilt:41, Eylül-Ekim 2001.

As indicated in Table 8, while the ratio of foreign trade balance deficit to gross national product (GNP) was 6,9 % in 1999, it increased up to a critical value of 12,6 % in September 2000. Consequently, in the period between August and September 2000, as Turkey became a country providing its import needs by borrowing in the international financial markets, it fell into the position of a country that could have difficulty to pay its foreign debts back. In this period, balance of current account was covered with the inflow of short-term capital. Table 9 indicates this case. Although the deficit of the balance of payments planned in the program to decrease the inflation was 1,5 to 2 % of the GNP (that is 3 or 4 billion $), it nearly reached up to 10 billion $[65]. The increase in the petroleum prices, an external shock, had also an effect on the fact that the deficit of current balance of payments was achieved higher than estimated previously. This deficit, on an important scale, has been financed with foreign sources. The bond issuance of the Treasury to the foreign markets in 2000, short-term credits supplied by the banking sector and the other sectors, the portfolio investments of the foreign investors within the period until the November crisis, formed the main part of the capital inflow in 2000. Following the crisis that broke out, there was a net capital loss from all of the channels mentioned above. As indicated in Table 9, there was a capital loss of nearly 14 billion $.

[65] Erçel, "*Türk Ekonomisinin Makro Ekonomik Özellikleri ve Beklentiler*", www.tcmb.gov.tr/ Remarks of the CBTR Governor /September 26, 2000 Prag.

Table 9: Selected Items in the Movements of Capital (Billion US $)

	1999	2000	2001	2001-I	2001-II
Balance of Current Account	-1.360	-9.819	-9.819	3.314	
Movements of Capital	4.670	9.610	-13.882	-3.060	-6.342
Direct Investments (Net)	138	112	2.769	1.574	109
Portfolio Investments (Net)	3.429	1.022	-4.515	-2.868	-348
Long-Term Capital (Net)	344	4.276	-1.130	-510	-1.116
Short-Term Capital (Net)	759	4.200	-11.006	-1.256	-4.987

Source: TCMB 2001 Annual Report.

There used to be nearly 80 banks operating in the Turkish Banking System before the crisis. Most of these banks were small, with insufficient capital capacity and in a form mostly financing their own founders' enterprises and productions. When the liabilities of the Turkish banking system by the end of 2001 is considered, it will be noticed that 70 % of it was from deposits; 15 % of it was from the credits provided from the foreign markets and 15 % of it was from the other economic units. Half of the deposits were based in foreign currency. Both the deposit and foreign sources were short-termed with high interest rates. Because the deposit insurance fund gave the banks the opportunity to give high deposit rates and repo interest rates, more than the burden that their capital could undertake. Besides, they could provide a noticeable amount of source from the foreign markets, as they trusted the rate anchor of weak banking system. Enabling the use of short-term foreign sources as credit with the long-term public sector certificates caused the conflict between the sources and the term in the banking system. Although the deficit position limit of the banking sector was limited with 20 % of their own capital capacity; and those who passed beyond this limit were obliged to cover 100 % of it, the deficit position of the Turkish banking system was far beyond 2,5 billion $ (that is what should actually be).

Table 10: The Deficit Position of the Banks in Turkey

Months	Rate
1998	-8.4
1999	-13.3
2000- I	-15.78
2000 -II	-18.18
2000- III	-20.00
2001-I	-12.16

Source: www.tbb.org,tr www.tcmb.org,tr. Nur Keyder, "Türkiye'de 2000-2001 Krizleri ve İstikrar Programları", İktisat İşletme Finans, Yıl:16, Sayı:183.

As indicated in Table 10, the deficit position of the banking sector reached 20 billion $. This is the deficit of banking system only. Besides, the fact that there is a deficit position of 20 billion $ against the real sector, put the Turkish banking system and the real sector into a much more sensitive position against crisis[66]. If a country finances its growth and welfare with short-term foreign sources, any possible fluctuation in these sources may cause serious damages by increasing the interest rates. This crisis-sensitive structure gave the banking sector an opportunity to realize profits by means of circulating cash money; the inflow of the foreign sources decreased the interest rates; credits appreciated; the increase of domestic demand and the imbalance of current account drove the Turkish economy into a crisis atmosphere. November and February Crisis in Turkey can be evaluated by means of the First Generation Crisis Model (FGCM). According to the FGCM, unsustainable position of the macro balances in the economy and the exchange rate policy applied causes a considerable reaction of the economic units financing the economy.

The imbalance in the current account is one of the critical variables affecting the expectations in both the FGCM and Second Generation Crisis Model (SGCM)[67]. This variable is especially more critical in Turkey which is in a position to pay its foreign and domestic debts.

It seems that discussing about the SGCM will be useful. Macro economy may not be the reason of the crisis: the reason of the attacks (speculative attacks) against the currencies of the countries such as France and

[66] Ben Brnanke, Mark Getler, "*Inside the Black Box: The Credit Channel of Monetary Policy Transmission*", Journal of Economics Perspective, Vol:9, 1995, p.28.

[67] Frederic Mishkin, "*Lessons From the Asian Crises*", NBER Working Paper, No:7102, 1999, p.10-12.

England do not resemble the reasons Mexico and Turkey. It is impossible to mention of an increasing inflation as a result of a serious deficit of balance or the crisis of balance of payments in the European Countries. While the fundamental macro economic inconsistencies of a country are emphasized to be the reason of the crisis in FGCM; the crisis in 1992 in Europe is far beyond to support this emphasis. Economic units make their decisions by considering which costs the public sector can and cannot bear as a result of the speculative attacks. For instance, the highly indebted structure of the public sector enforces the public sector to make a choice between the exchange rate and the interest rate. Consequently, the public sector will have to compare the cost of the increase in the exchange rate regarding the budget and the cost of the increase in interest rates with regard to heavier debts and bringing a stagnancy and unemployment to the economy. If the public sector can not bear the latter cost, it will either have to just observe the loss of capital and release the exchange rate to fluctuate or devaluate. In the European monetary crisis, England has devaluated its currency instead of increasing the interest rates because of the economic stagnancy. The CBTR contrarily let the abnormal increase of the interest rates in the monetary program of 2000. As the cost procedures in both countries are different, different policies were applied. Considering the SGCM, imbalance in a country may force the other countries (by influencing them negatively) to face a speculative attack that will result in leaving the fixed exchange rate.[68] The Asia Crisis in 1997 is an appropriate example of this. Considering from this perspective, the following features of the Second Generation Monetary Crisis Model may be underlined: [69]

- There should be a reason for the public sector to apply the fixed exchange rate;
- There should be a cost of the fixed exchanged rate; consequently, the reason for leaving this fixed rate is the increase of this cost.
- How the economic units perceive the expectations. In other words, how the public sector perceive the applied policies and the indicators is also very crucial.

The expectations have gained importance from the viewpoint of continuing the public economy policy in the SGCM. According to the Theory

[68] F. Özatay, "*Currency Crisis in Turkey*", Yapı Kredi Bank Economic Review, 1996, p.25-27.

[69] Para Krizleri, Dış Ticaret Müsteşarlığı Dünya Ekonomileri Bülteni, p.10-35.

of Rational Expectations, self-applicability of the expectations largely influences the results of the macro-economic policies[70].

What the indicators of the SGC may be is not as clear as of the FGC. Non-linear actions of one or more economic units create the chance for the emergence of more than one result in the SGCM. The action and the reaction process between the public sector and the economic units and expectations directing this process may also create the crisis. For instance, if the economic units think that money will in any circumstances be devaluated and if their expectations are very strong about it, the demand for high rate interest may self-support and may be the reason of the collapse of the exchange rate. The motion of no confidence in the national currency (that causes the interest rates to be kept in short-term and noticeably high), in the public sector or in the economy itself noticeably increase the cost of indexed or fixed exchange rate in real by increasing the interest rates.

The increase in interest rates cause an inflation by means of prices and the imbalance of budgets of the public sector and the private sector enterprises by means of the finance. Besides, the appreciation of the exchange rate in the regime of increasing prices and fixed rate, the economic stagnancy as result of the decrease in exports and increase in imports, and the cost of external borrowing may force the public sector to leave the fixed exchange rate policy. To leave the application of the exchange rate policy will be much more rational and result in a less cost for the public sector when the cost of the exchange rate is lower than the economic stagnancy[71]. Contrarily, there will be no possibility for the emergence of a crisis, as the interest rate targets will maintain the present level if the economic units do not have such a crisis expectation.

Assuming that the welfare of the Turkish economy is dependent upon the foreign sources, analyzing the changes in the interest rates can be considered as an indicator about the optimism or the pessimism of the changes in the expectations of the economic units[72].

Chart 11 indicates the fluctuation in the standard deviation of the

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[70] H. Kirmanoğlu, "*Rasyonel Beklentiler Teori mi Varsayım mı*", İktisat Dergisi, Kasım 1998, aynı yazar, "*Rasyonel Beklentiler*", Toplum Bilim, Sayı 6, 1997.

[71] M. Obstfeld, "*Models of Currency Crises With Self-Fulfilling Features*", European Economic Review, Vol:40 1996, p.1037-1047.

[72] Krugman, Bunalım Ekonomisine Dönüş, Çev: N. Domaniç, Literatür Yayıncılık, İstanbul, 2001, p. 97 and 121.

overnight interest rates to measure the uncertainty and the risk in the interest rates determined according to inflow of net foreign assets. As seen in Table 11, the fluctuation noticeably increased as of June 2000. The increase in the difference between rising interest rates as a result of the increase of the risk and a 20 % increase in exchange rates strengthened the expectation for devaluation. In this situation, a private bank caused the start of the November Crisis. A great financial panic was experienced because the CBTR, applying a system like a semi-monetary council, could not fulfil its role as a financial competent authority for credits against the bank in need of funding.

Mostly criticized feature of the interest rate based stability program is the fluctuation in the interest rates that prevailed as a result of the fact that the increase of the monetary demand and the outflow of foreign sources were not sterilized while net domestic assets were kept fixed in the weak banking system. The interest rates may, on an unbearable scale, increase while the foreign capital is leaving the country. The IMF and the CBTR that cannot intervene the crisis on time and that try to direct it by increasing the interest rates in the applied program with the support of the IMF have been criticized[73]. (Despite the fact that the CBTR suggested a 5 % increase of the monetary base to be able to sterilize the outflow of sources, this could not be sufficient in the November Crisis). While this crisis was overcome with the support of the IMF, (IMF was criticized by some of the authors as it did not fulfil its responsibility as the final competent authority for credits to aid the CBTR) appreciation of the interest rates caused an increase in the loss of the public banks particularly and of all the units that are in short position[74].

The pressure of these banks and the public on the fund market, high interest rates and the inflation decreasing more slowly than estimated prepared the foreign investors (financing the economy that has a noticeable amount of deficit) to leave the Turkish economy. The outflow of the foreign investors in groups for any kind of reason prepared Turkey initially for a financial and then for a real crisis. Due to bankruptcy of Demirbank, the November crisis was triggered and it was controlled by the aid of the

[73] J. Stiglitz, "*İçeriden Biri: Dünya Ekonomik Krizinden Neler Öğrendim*", Mülkiyeliler Dergisi, Sayı:222, ss.124-125. Ersan Öz, Adem Kalça, "*Asya Krizi ve IMF'nin Rolü*" İşletme Finans, Ekim 1999, p.20-21.

[74] Ersin Tunca, "*Dövize Çıpa Atmak Doğru Mu*", Ekonomik Forum, TOBB Yayını, Ocak 2001, p.16-19.

IMF. With the IMF aid of 10 billion $, the interest rates turned back to the level of before the crisis in the second hand; however, the nominal rate in the Treasury bids were around the level of 65 %.

If we remember that CPI was targeted to be 12 % by the end of 2001 and that the exchange rate basket will depreciate by 7,5 % by the end of June according to the program to decrease the inflation, the increase in the exchange rate will be able to reach 19,5 % that is the top point of the band.

According to this depreciation of the exchange rate, the bearable real interest rate in domestic borrowing is 38 %. Such a high interest rate indicates a high risk premium and a tension in the markets. Consequently, the tension between the president and the prime minister right before the Treasury bid in February 2001 fired the markets and a great amount of capital left Turkey. At first step, the outflow of the capital of 7,6 billion $ caused the release of exchange rates to fluctuate. As indicated in Table 9, while the capital inflow in the previous year was 9,6 billion $, the capital outflow of 7,6 billion $ in February 2001 indicates the capital outflow of net 17,2 billion $ in total[75].

The Turkish economy experienced the heaviest economic stagnation of its history in 2001 with the increase of the exchange and interest rates. A new letter of intention was co-signed with the IMF to overcome this crisis and "the Program for Transition to Strong Economy" was started to be applied.

Table 11: The Standard Deviation of the Interbanking Overnight Exchange Rate

Year-Month	00-3	00-4	91-5	00-6	00-7	00-8	00-9	00-10	00-11	00-12	01-1	01-2
Std. Deviation	8.9	6.62	6.55	11.67	5.09	16.90	14.0	9.72	67.6	238.9	12.4	983.8

Source: CBTR.

3.7. Monetary Policy in 2001

Following the application of the fixed exchange rate or the discontinuation of the exchange anchor, the CBTR totally changed the monetary policy. Targeting the monetary growth as prior to 2000, the CBTR on the one hand tried to limit the inflationist influences of depreciation in the TL and

[75] www. tcmb. gov.tr/ 2002 Yılı Para Politikası.

on the other hand to restructure the banking system.

The operations realized concerning the banking sector in 2001, the inflow of foreign capital and the sharing of this capital between the Central Bank and the Treasury, the changes in the borrowing requirement of the public formed the monetary policy of the CBTR. In this period, by setting a top limit for the net domestic asset and a base limit for the net international reserves, they were determined as performance criteria. Monetary base was targeted as an intermediate objective and continued its function as a nominal anchor throughout 2001. The appreciation ratio in the monetary base has been determined by the CBTR in accordance with the inflation and the growth. In the Monetary Policy Report of May 15, 2001, the monetary base target, that was set according to the consumer price index (CPI) expectation of 52,5 % and decreasing GNP expectation of 3 %, was estimated to be 7,3 quadrillion TL. However, the decreasing in the GNP and the inflation target in July 2001 were revised. The CPI was revised from 55,2 % while the decreasing expectation in GNP was revised from 3 % to 5,5 %. As a result, while the monetary base and NDA targets were revised upwards, Net International Reserve (NIR) was not revised. As observed in Table 13, appreciating much more positively than targeted, NDA values decreased to 304 million $ by increasing up to 2946 $ in October 2001. As the Table 12 indicates, monetary base target was revised from 7,3 to 7,75 quadrillion TL and the NIV assets were revised from 21 to 22,4 quadrillion TL. When a general evaluation was made according to the given performance criteria, the progress of NDA item indicating the credit relationship between the financial system and the CBTR seems quite positive. Remaining below the performance criteria of 21,1 quadrillion TL in October 2001, NDA value was 17,9 quadrillion TL. The blocked system of payments was unlocked and the pressure on the interest rates was removed with the source transfer of 21 quadrillion TL to the fund and to the public banks. Withdrawing the extra liquidity that this source transfer may cause, NDA could have been controlled. The CBTR, transferring a noticeable amount of source by means of Treasury for the reformation of the banking sector (covering the short term borrowings), withdrew the liquidity that emerged as a result of the NDA expansion with the process of selling foreign exchange and reverse repo. While the monetary base was 5,8 quadrillion TL on January 31, 2001, by appreciating 22 % by the end of October 31, 2001, remained below the estimated value.

When it is considered that the CPI appreciated at the rate of 56 % and the GNP reduced by -6,4 % in the first nine months in the period of January-October 2001, 22 % increase in the monetary base indicates that the CBTR followed a strict monetary policy. In short, as indicated in the letter of intention dated May 2001, the CBTR fulfilled its promise to control the monetary growth.

3.8. Monetary Policy of 2002

The CBTR had two hypotheses while forming the monetary policy of 2002. The first hypothesis was that it will apply a strict fiscal policy and that this policy will be supported with economic reforms; and the second one was to presume that a crisis similar to the one in 2000-2001 would not break out. The CBTR will have a nominal anchor that can be adjusted according to the inflation target of the following year besides targeting a monetary base growth in 2002. In the end of 2002, the monetary base will appreciate at the rate of 40 % compared to the same period of the previous year. It has been guaranteed by the CBTR that "net international reserves", another variable of performance criteria, will not fall below a certain base limit considering the period. In 2002, the "net domestic assets" have been increased. Monetary base expansion in the monetary policy that will be applied in 2002 is not a rigid but a flexible target. The CBTR expects that the reverse money substitution will occur in 2002. That is why the CBTR declared that the appreciation of monetary base to go over the target of 40 % if a positive progress occurs in the demand for TL.

Interest rate was also planned to be applied as an anchor in the monetary plan for 2002. As the results of the monetary policy depend on the expectations, the CBTR plans to use the short-term interest rates for the inflation to be able to break the pricing habit dependent upon the inflation in the past, which is dominant in Turkey, without waiting for shifting to inflation targeting. This way, the CBTR wants to struggle with the inflation by using the interest rate anchor that it determined according to the future inflation target beside the monetary base that is not sufficient to affect the inflation and the expectations as an anchor positively. "Considering the future values of the inflation, the CBTR will be able to modify the short- term interest rates. In this manner, it was not only contended with the monetary base anchor but also the additional precautions were promised to be taken depending on the pre-estimated inflation." Consequently, to meet the fiscal reforms and the performance criteria is

crucial for the CBTR to use the interest rate anchor. The public borrowing requirement should be lessened, the public intervention must be terminated and these markets should be reorganized for the CBTR to use the interest rate anchor. All of these will be reformed with the new letter of intention that will be declared in 2002 and will continue for a period of three years; however, the application of the inflation targeting strategy that will be applied in 2002 without making public will be difficult in Turkey. The reasons may be indicated as follows:

1- The inflation rate should either be equal to or below 25 % in order to make the inflation targeting.
2- Inflation targeting can not be applied unless the risks that the structural problems of the public and the private banks created in banking sector were removed.
3- Flexible rate system is an advantage in order to make the inflation targeting. It gives an opportunity to apply a monetary policy; however, the success of inflation targeting is in doubt. The money substitution in Turkey limited the influence ability of the monetary policy even under the flexible rate system[76]. The rates should be stable in order to make inflation targeting.
4- It is not certain whether the political power can bear the costs of the positive influences of the inflation targeting on the unemployment and on the production in Turkey where a great scale of unemployment exists.
5- Because of the rigidity in the markets and the prices, it is highly possible to fall over the band in case the band is held too narrow in Turkey where the point application is not possible in inflation targeting.

This will remove the trust and the support of community that are the fundamental conditions of inflation targeting. It may be stated that the community support will not be provided in case the band is held too large.

IV. Conclusion

The fundamental rule of an effective monetary policy is that the CB and the other economic units have the same information[77]. The way to do is

[76] Guillermo A. Calvo, Carlos A. Vegh, "*Currency Substitution in Developing Countries*", IMF Working Paper, 1992/40, p.3-4.

[77] Allan H. Meltzer, "*On Making Monetary Policy More Effective Domestically and Internationally*" ed, Iwoa Kruroda Towards More Effective Monetary Policy, Macmillan Press, 1997, p.11-23.

the formulation of the monetary policy rules. That is to say, the anchor application. The main objective of the Central Banks at present is to provide for the stability of the price. The meaning of this for the CB is to minimize the delay between monetary policy and the inflation. As long as the policy that the CB will follow against the inflation with the help of the anchors and the policies of economic units are co-ordinated, the cost of the information decreases on an important scale. At this point, the CB's efforts to gain credibility by means of the anchors have a critical importance. The insufficiency in the credibility does not make possible to achieve the inflation target. If the credibility is defined as continuing with the policies that the CB declared earlier, the CB should implement the following rules in order to increase the credibility:

1- The CB tries to minimize the level of uncertainty by continuing to apply the rules declared.
2- The CB tries to increase the consistency by applying the rules declared. For this reason, the CBs, nowadays, apply the policies that will increase their credibility in order to decrease or/and keep the inflation under control by means of the anchors.

The monetary magnitudes such as M1 or M2 were targeted in the monetary programs and the stand-by conventions implemented in 1990s, and the CB directed the monetary policy by means of the anchors. The reason of this is the structural transformation in the Turkish economy.

The economy of Turkey experienced a structural transformation that started in 1980s and was completed in 1989 with the Decree No. 32. The market sovereignty and the liberalization were the main principles within the transformation. Removing and softening the amount and the price quotation limitations in the institutional structure correlated with the asset holding decisions and the relationship between debt and credit in foreign and national currencies changed the monetary policy on an important scale. Because of the financial liberalization, there was a need to transfer the control of monetary policy from direct methods to indirect methods. Direct monetary policy instruments are the instruments such as the interest rate and selective credit controls determined with the administrative decision targeting to control the amount of money and the interest rates. The indirect control instruments are the monetary control instruments, such as open market transactions and rediscount, affecting the market conditions. The style of the monetary programming and targeting is needed to be changed if indirect control will be implemented together with

monetary programming[78]. The target of the indirect control instruments must be the balance sheet magnitude of the CB while the direct control instruments target the monetary magnitudes covering the whole system.

The CB's directing the monetary policy by influencing all the variables ranging from the balance sheet magnitudes to interest rates forms the main characteristics of 1990s-2000s.

Although the monetary policy has various objectives, the final objective is to prevent the inflation. By targeting the interest rate anchor and the monetary magnitudes between 1990-2000, the CB wanted to control the inflation and wanted to base the currency creating process upon the foreign assets. Because to finance the public by issuing unsecured money in a country (which is in the conditions of Turkey) will intensify the inflation. The broad period between 1990 and 2000 can be evaluated by subdividing this broad period into two periods of 1990-1994 and after 1995. It will be sufficient to consider the net national asset magnitude in order to understand how secured money that the CB created. The items of net domestic assets are a magnitude indicating the relationships among the public, the fiscal system and the CB.

The monetary policy of the CB can be regarded as successful if the net domestic asset item or another target monetary magnitude is increasing at a rate below the inflation; and if the monetary expansion is relying upon foreign sources. By trying to carry out the target monetary magnitude in parallel to the expected inflation rate, the CB tried to avoid the monetary expansion over the liquidity demand. The reason why the CB tried to increase the demand for currency by relying on foreign sources is that the monetary expansion correlated with the public deficits is smaller compared to its influence on the inflation. In short, the CB wanted to base the source of the money increase upon foreign assets while trying to control the increase in money according to inflation. In the period between 1990 and 2000, the CB could have easily achieved its target to control the net domestic assets in the period when the primary surplus of the CB was supplied. The increase in the public expenditures gave an opportunity to the CB to control the net domestic assets between 1990 and 1994.

Within these years, as the level of foreign sources was negative, the net domestic assets increased in a level over the inflation rate; and the source of expansion was the credits opened to the public and economic units.

[78] Gökçe, a.g.e, p.83-85.

Besides these, another factor accelerating the increase of the net domestic assets is the external shocks. The external shocks in 1990s such as the Gulf War in 1991, the ERM Crisis in 1992, and the Mexico-Brazil Crisis in 1994-1995 made it difficult to control the net domestic asset.

In the period between 1990-2000 in which primary surplus was given, the CB succeeded in controlling the net domestic assets, and based the monetary expansion upon foreign assets. Although the inflation rate was at a high level, the CB targeted stability in the inflation, and succeeded it partially.

The WSPI that was around 120 % in 1994, decreased down to 50 % in 2000; however the Asian Crisis in 1997, the Russian Crisis in 1998 and the Monetary Crisis in 2000 made it difficult to control the net domestic assets despite the fact that the primary surplus was provided.

When considered in general, the CB could have controlled the applied anchors partially in Turkey. The CB should be independent to control the targeted anchors. Independence of the CB is not a legal procedure. Beside this, there should be a balanced budget and a well balance of payments in an economy and they should have full control on the instruments of the monetary policy in order to provide independence for the CB. The operational effectiveness of the CB increased after the Crisis in 1994 on a large scale. (For instance, the CB activated the market transactions.)

Despite the increase provided in the primary surplus, the increase of the public debt stock and the negative progress in the balance of current account maintained their existence as two prohibitions awaiting the monetary policy of the CB in the 1990s. A successful monetary policy is correlated with pre-estimation of the inflation and the other variables. The negative development in the balance of payments, the difficulty and unreliability to carry out the public debts, increasing economic liberalization, unstable nature of currency substitution and market movements make the operational targets and performance criteria of the CB meaningless. This case caused the CB to demolish the variables that the CB regarded as intermediate targets, and caused the CB not to keep its promises. These changes may be interpreted as the factors reducing the credibility of the CB.

The CBTR, not being successful to decrease the inflation by means of currency anchors, applied the exchange rate anchor as well. As the balance between the positive features and the negative sides of the exchange rate anchor could not have been established either by the CBTR or by the IMF, the exchange rate anchor, that is an influencing anchor, and an

important part of the resources of Turkey was wasted in 2001. Besides the fact that the exchange rate anchor is an appropriate choice in an economy that is highly dependent upon foreign sources, the exchange rates that appreciated as a result of the inflation decrease more slowly than estimated; increasing imbalance of the current account were not intervened; insufficient banking system and fixed exchange rate application caused a crisis in Turkey as in Asia.

No matter which anchors the CB applies, the policy it followed depends on whether the pricing decisions of the economic units are flexible or not. Inflation increased the amount of money according to the causality tests between inflation and monetary magnitudes in Turkey. Corruption in the economic structure (corruption in distribution of income, little increase of value added in the industry, monopolistic structure, currency substitution) increases the prices. For the stability of the prices, if the CB increases the interest rates, the economic narrowing will emerge. As this policy is not desired because it created high unemployment and it prevented the transformation of the public debt stock, the CB increases the monetary magnitudes in accordance with the increasing prices.

Even if the fixed exchange rate application brings stability for a short term in Turkey where foreign dependency is high, it was experienced that it could not be applied in the long term. The inflation targeting was planned to be applied after June 2002. Inflation targeting will be implemented together with the Flexible Rate System. The main problem that the application of the Flexible Rate System caused in a country such as Turkey where high dollarisation is experienced, is that a shock that will break out in the exchange rates will make it difficult to control the prices. Exchange rates should be stable in order to implement the inflation targeting. When this is not achieved, inflation target will not be achieved and the credibility will be lost. The increases that will emerge in the rates and the prices because of the structural reasons will put the CBTR in a difficulty to achieve its inflation target and to continue its reliability due to the tendency of pricing in the Turkish economy that is based upon the exchange rate and past inflation.

As a conclusion, whichever anchor the CB applies, its success against the inflation depends on the existence of a serious financial policy and structural precautions. While enlarging the domestic demand in a controlled way by means of a serious financial policy, to form a flexible and competitive structure for the Turkish economy by means of the structural reforms, will facilitate the functions of the anchors on an important scale.

The following are needed for the success of inflation targeting and the new letter of intention in 2002:

1- An independent CB,
2- A budget in balance,
3- An economic system with control mechanisms (for both exchange rate risk and term risk)
4- A stable growth
5- A good balance of payments
6- A monetary policy to overcome the external shocks,
7- Regulations to reach the flexible and competitive structures and leaders who aim to implement these regulations.

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Annex

Tablo 12: Net Domestic Asset (NDA) and Base Money (BS) Ceiling (Trillion TL)

	Dec. 22, 2000 IMF Letter of Intent, NDA Ceiling Value		Jan. 30, 2001 CB NDA New Ceiling Value		May 2001, New Annex IMF Letter of Intent, NDA Performance Criteria		July 2001 IMF Letter of Intent, New NDA Ceiling Value			May 2001 IMF Letter of Intent Base Money Ceiling Value	July 2001 IMF Letter of Intent Base Money Ceiling Value		
30 Sep. 2000	-1.308	R	-	R		-							
31 Dec. 2000	1.650	PC	1060	R		-							
31 Jan., 2001	900	PC	-316 (PC) 88,2	R	30 April 2001 PC	7.780		6739	R			5.850	R
28 Feb. 2001	800	PC	1266	R	31 May 2001 PC	9.750		7942	R	5.900		5.815	R
31 March 2001	650	PC	3867	R	31 July 2001 PC	13.250		12943	R	6.050		6.247	R
30 June 2001	600	PC	-		31 Aug., 2001 PC	15.850	17.250	16437	R	6.300	7.175(I)	6.748	R
30 Sep., 2001	480	I	-		31 Oct., 2001 PC	19.500	21250	17933	R	6.800	7.550((I)	7.140	R
31 Dec., 2001	950	I	-		31 Dec., 2001 PC	21.000	22400 (I)		R	7.300	7550(I)		R

Source: CBTR, Treasury.

PC: Performance Criteria, R: Realization, I: Indicative

Table 13: Net International Reserve (NIR) Performance Criteria (Million US$)

	Dec. 22, 2000 IMF Letter of Intent NIR Floor Value		Jan. 30, 2001 IMF Letter of Intent NIR New Floor Value			May 2001, IMF New Letter of Intent Values of Changes in NIR Floor Value		According to Current or Previous Term Values of Changes in NIR surplus 25% Floor Value		
30 Nov., 2000	11.096		11.096	R	12379					
31 Dec., 2000	10.400	PC	10.400	R	13038					
31 Jan., 2001	10.700	PC	10.700	R	13826	30 April 2001 PC			3.860	R
28 Feb., 2001	10.900	PC	12.600	R	12498	31 May 2001 PC	-1.500	-1.500	-837	R
31 March 2001	11.000	PC	12.700	R	639	31 June 2001 PC	-2.900	-3.562	-3.059	R
30 June 2001	12.000	PC	13.700	-		31 July-Aug. 2001 PC	-2.000	-2.500		R
30 Sept., 2001	12.100	I	13.900	-		31 Sep.-Oct. 2001 PC		-3.250	-1.370	R
31 Dec., 2001	12.400	I	14.100	-		31 Nov.-Dec 2001 PC	-600	-3.546	-304	R

Source: TCMB.
PC: Performance Criteria, R: Realization, I: Indicative

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GLOBAL CAPITAL MARKETS

The global economic slowdown began to lose pace with increasing confidence, easing of uncertainties and improving conditions in the emerging market financing. The industrial production including the information technology (IT) sector began to turn up, notably in the United States following rapid and forceful monetary action together with fiscal measures to cut taxes and boost spending. In the Euro area, signs of recovery began to emerge after a stagnation in output in the second half of 2001. In Japan, the economic activity is improving although there are few signs of sustained recovery in domestic demand. In the emerging markets there are signs of recovery in a number of Asian emerging markets, particularly Korea aided by the growing improvements in the IT sector, although not as yet in most Latin American countries.

Despite an improved global economic outlook, stock prices were broadly unchanged in Europe and United States in the first quarter of 2002. Due to unexpected collapse of Enron and other large corporations have effected stock prices of highly leveraged firms and those that have been active in mergers and acquisitions. Emerging bond and equity markets rose strongly in the first quarter of 2002. The return on the S&P /IFCI Composite, a benchmark dollar-based index for emerging market equities, has been about 11 percent in 12 months to the first quarter of this year. The rise in emerging market equity markets was due to an increase, to a great extent, in equity prices in Asia as the IFCI Composite Asia Index rose by about 23 percent in the year to the first quarter of 2002.

Gross capital market financing flows to emerging markets in the first quarter of 2002 amounted to 35.3 billion US dollars, which is 5 billion US dollars lower than in the fourth quarter of 2001. The emerging bond markets rallied in the first quarter, outperforming most of the asset classes.

The performances of some developed stock markets with respect to indices indicated that DJI, Nikkei-225 -100 and GDAX increased by 2.28 %, 4.25 %, 4.33 % respectively, and FTSE decreased by -1.96 % at the end of March 2002 in comparison with the beginning of 2002. When US$

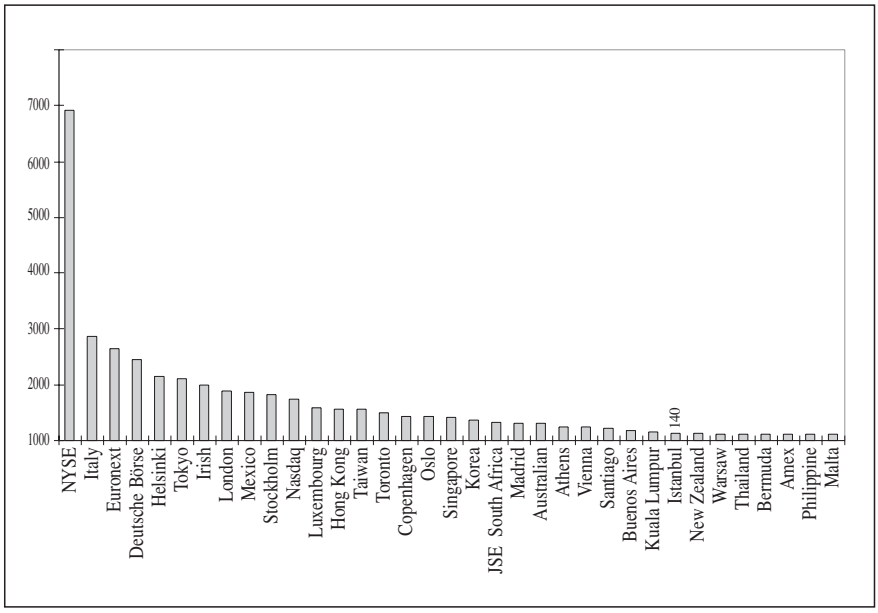
based returns of some emerging markets are compared in the same period, the best performer markets were: Indonesia (32.1 %), S. Korea (31.4 %), Russia (30.7 %), Philippines (22.6 %) and Thailand (21.4 %). In the same period, the lowest return markets were: Argentina (-50.3 %), Israel (-22.3 %), Venezuela (-12.2 %) Turkey (-9.8 %) Hong Kong (-5 %), China (-2.9 %) and Brazil (-2.6 %). The performances of emerging markets with respect to P/E ratios as of end-March 2002 indicated that the highest rates were obtained in Turkey (50.8), Malaysia (38.8), Philippines (34.9) Korea (32.9), Taiwan (31.8) and the lowest rates in Argentina (-191.5), Czech Rep. (6.3), Poland (6.5) and Brazil (9.4).

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	47,150

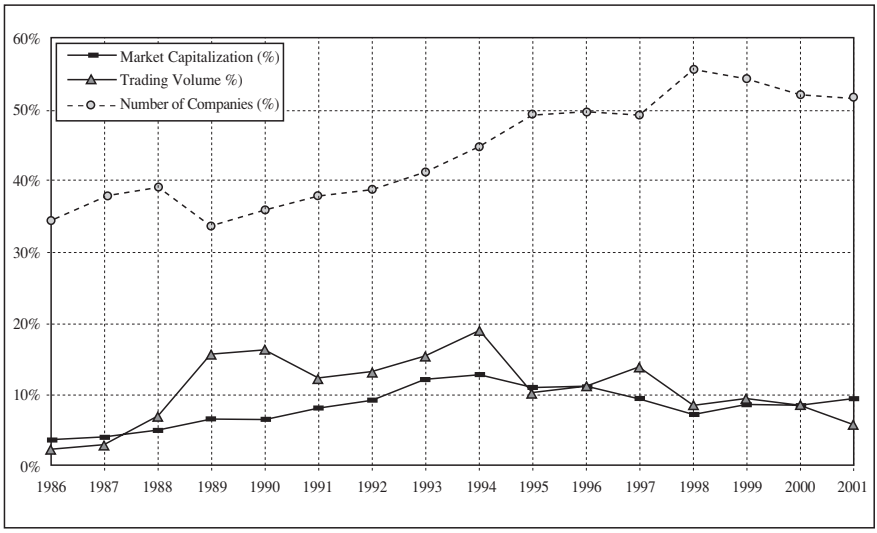
Source: IFC Factbook, 2002.

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



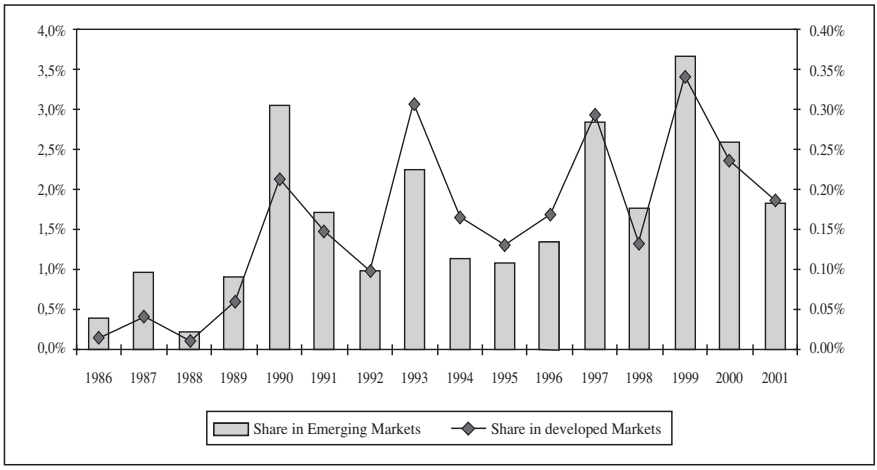
Source: FIBV, Monthly Statistics, March 2002.

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

	Market	Value of Share Trading (millions US $) (2002/1 - 2002/3)	Market	Market Cap. of Share of Domestic Companies (millions US $) March 2002
1	NYSE	2,591,119	NYSE	11,327,859
2	Nasdaq	2,227,731	Nasdaq	2,606,271
3	London	972,820	Tokyo	2,307,296
4	Euronext	466,070	London	2,139,935
5	Tokyo	374,553	Euronext	1,920,390
6	Deutsche Börse	312,174	Deutsche Börse	1,094,147
7	Taiwan	209,739	Toronto	641,259
8	Barcelona	195,241	SWX Swiss Exchange	545,884
9	Korea	179,553	Italy	540,504
10	Chicago	157,180	Hong Kong	503,138
11	Madrid	155,949	Madrid	482,082
12	Amex	153,923	Australian	396,376
13	SWX Swiss Exchange	137,758	Taiwan	330,567
14	Italy	133,679	Korea	253,435
15	Toronto	110,524	Stockholm	228,585
16	Bermuda	92,584	Brazil	192,923
17	Stockholm	84,553	Helsinki	172,216
18	Bilbao	75,747	JSE South Africa	163,085
19	Australian	70,666	Mexico	140,826
20	Hong Kong	50,942	Kuala Lumpur	132,153
21	Helsinki	45,860	Singapore	127,783
22	Osaka	29,396	Copenhagen	90,714
23	Singapore	21,890	Oslo	75,452
24	Istanbul	18,959	Athens	74,765
25	Valencia	18,791	Irish	67,890
26	JSE South Africa	15,401	Amex	60,036
27	Sao Paulo	14,736	Santiago	56,021
28	Oslo	14,379	Tel-Aviv	47,267
29	Thailand	13,775	Thailand	44,829
30	Copenhagen	12,778	Istanbul	43,217
31	Mexico	9,754	Jakarta	32,429
32	Kuala Lumpur	9,135	Luxembourg	28,335
33	Irish	6,654	Warsaw	27,340
34	Athens	5,780	Vienna	26,067
35	Tel-Aviv	3,896	Philippine	25,193
36	Jakarta	3,000	Buenos Aires	19,539
37	Warsaw	2,520	New Zealand	19,279
38	New Zealand	1,785	Budapest	11,199
39	Budapest	1,368	Lima	10,732
40	Vienna	1,317	Tehran	8,073
41	Philippine	1,095	Ljubljana	3,793
42	Santiago	695	Bermuda	2,513
43	Buenos Aires	556	Colombo	1,303
44	Ljubljana	285	Malta	1,300
45	Tehran	262	Chicago	234

Source: FIBV, Monthly Statistics, March 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

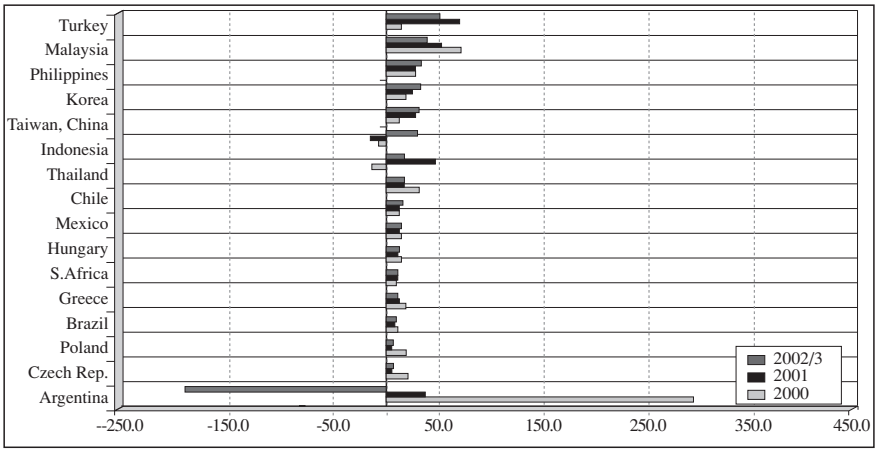
Source: IFC Factbook, 2002.

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



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

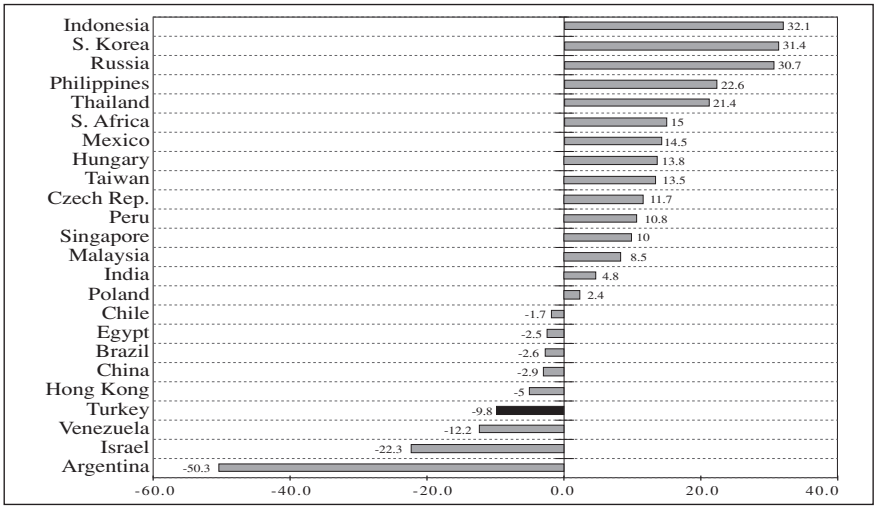
Price-Earnings Ratios in Emerging Markets (1993-2002/3)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002/3
Argentina	41.9	17.7	15.0	38.2	17.1	13.4	39.0	293.3	38.4	-191.5
Brazil	12.6	13.1	36.3	14.5	15.4	7.0	25.1	11.7	8.9	9.4
Chile	20.0	21.4	17.1	27.8	15.9	15.1	37.7	31.8	17.1	17.0
Czech Rep.	18.8	16.3	11.2	17.6	8.8	-11.3	-14.8	21.0	5.6	6.3
Greece	10.2	10.4	10.5	10.5	13.1	33.7	55.6	19.2	12.5	11.0
Hungary	52.4	-55.3	12.0	17.5	25.2	17.0	18.2	14.3	13.3	15.1
India	39.7	26.7	14.2	12.3	16.8	13.5	22.0	14.8	12.3	13.4
Indonesia	28.9	20.2	19.8	21.6	11.2	-106.2	-10.5	-6.5	-14.1	29.9
Korea	25.1	34.5	19.8	11.7	11.6	-47.1	-27.7	19.3	24.9	32.9
Malaysia	43.5	29.0	25.1	27.1	13.5	21.1	-19.1	71.7	53.2	38.8
Mexico	19.4	17.1	28.4	16.8	22.2	23.9	14.1	12.5	13.2	15.7
Philippines	38.8	30.8	19.0	20.0	12.5	15.0	24.0	28.2	28.4	34.9
Poland	31.5	12.9	7.0	14.3	10.3	10.7	22.0	19.4	6.0	6.5
S.Africa	17.3	21.3	18.8	16.3	12.1	10.1	17.4	10.7	11.7	12.3
Taiwan, China	34.7	36.8	21.4	28.2	32.4	21.7	49.2	13.7	28.5	31.8
Thailand	27.5	21.2	21.7	13.1	4.8	-3.7	-14.5	-12.4	47.3	17.9
Turkey	36.3	31.0	8.4	10.7	18.9	7.8	33.8	15.2	69.5	50.8

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

Not :Figures are taken from IFC Investable Index Profile.

Comparison of Market Returns In USD (31/12/2001 - 3/4/2002)



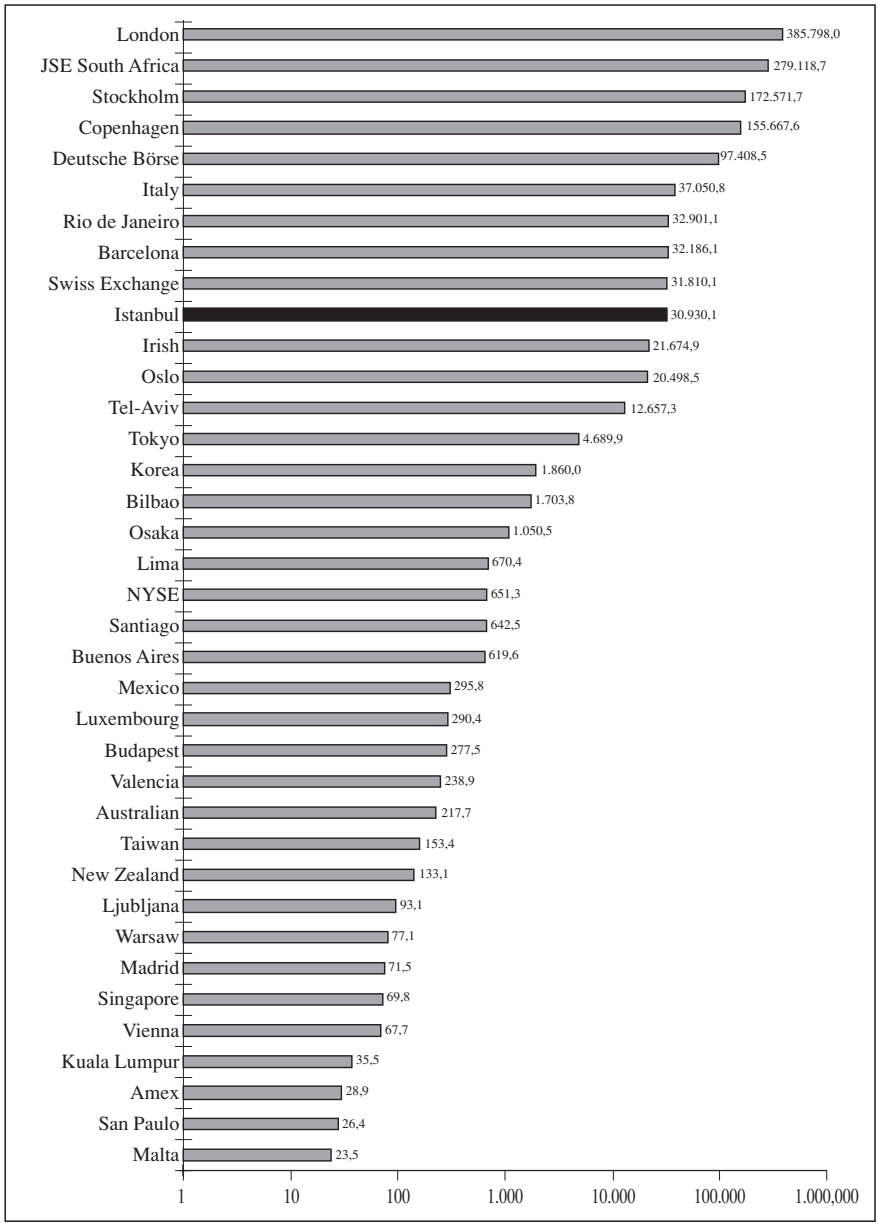
Source: The Economist, April 6th - 12th 2002.

Market Value/Book Value Ratios (1993 - 2002/3)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002/3
Argentina	1.9	1.4	1.3	1.6	1.8	1.3	1.5	1.0	0.6	1.2
Brazil	0.5	0.6	0.5	0.7	1.1	0.6	1.6	1.4	1.2	1.3
Chile	2.1	2.5	2.1	1.6	1.6	1.1	1.8	1.5	1.4	1.4
Czech Rep.	1.3	1.0	0.9	0.9	0.8	0.7	1.2	1.2	0.8	0.9
Greece	1.9	1.9	1.8	2.0	2.9	4.9	9.4	4.0	2.1	1.9
Hungary	1.6	1.7	1.2	2.0	3.7	3.2	3.6	2.5	1.8	2.1
India	4.9	4.2	2.3	2.1	2.7	1.9	3.1	2.5	2.0	2.2
Indonesia	3.1	2.4	2.3	2.7	1.5	1.6	2.9	1.6	1.9	1.2
Korea	1.4	1.6	1.3	0.8	0.6	0.9	2.0	0.8	1.3	1.7
Malaysia	5.4	3.8	3.3	3.8	1.8	1.3	1.9	1.5	1.3	1.5
Mexico	2.6	2.2	1.7	1.7	2.5	1.4	2.2	1.7	1.7	2.0
Philippines	5.2	4.5	3.2	3.1	1.7	1.3	1.5	1.2	1.1	1.3
Poland	5.7	2.3	1.3	2.6	1.6	1.5	2.0	2.2	1.4	1.6
S.Africa	1.8	2.6	2.5	2.3	1.9	1.5	2.7	2.1	2.1	2.0
Taiwan, China	3.9	4.4	2.7	3.3	3.8	2.6	3.3	1.7	2.1	2.4
Thailand	4.7	3.7	3.3	1.8	0.8	1.2	2.6	1.6	1.6	1.8
Turkey	7.2	6.3	2.7	4.0	9.2	2.7	8.8	3.1	3.8	3.2

Source: IFC Factbook, 1996-2001; IFC Monthly Review, March 2002
Note: Figures are taken from IFC Investable Index Profile.

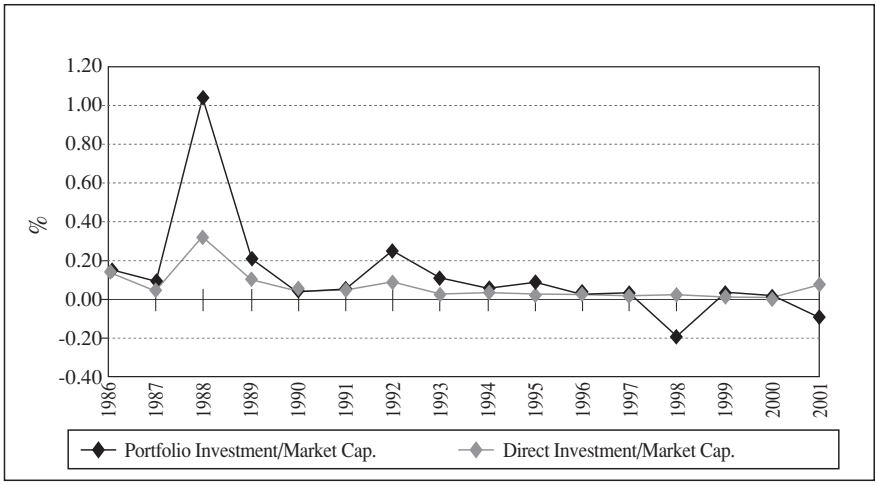
Value of Bond Trading
(Million USD. January 2002 - March 2002)



Source: FIBV, Monthly Statistics, March 2002.

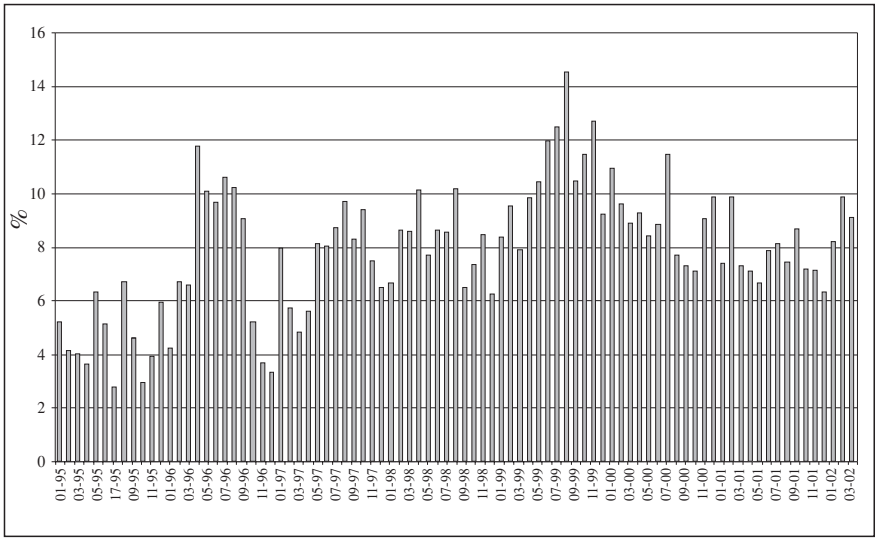
Note: The value of bonds trading pertain to Trading System View figures. For those countries which do not have Trading System View figures, the Regulated Environment figures are used.

Foreing Investments as a Percentage of Market Capitalizion in Turkey (1986-2001)



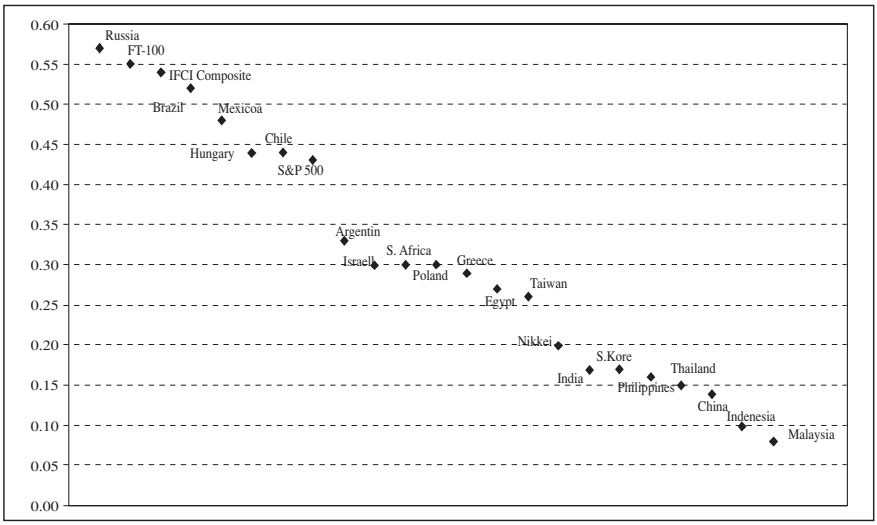
Source: ISE Data. CBTR Databank.

Foreigners' Share in the Trading Volume of the ISE (January 1995 - March 2002)



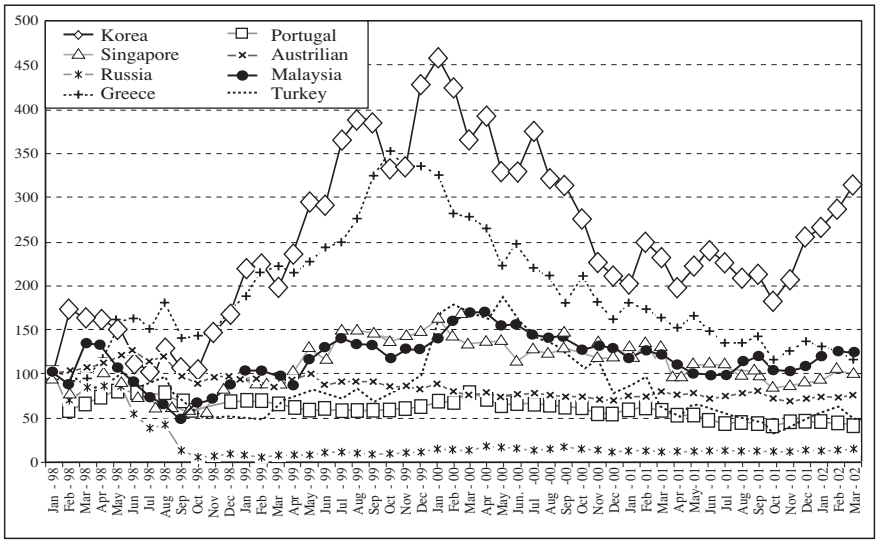
Source: ISE Data.

Price Correlations of the ISE (March 1997 - March 2002)



Source : IFC Monthly Review, March 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 serious of returns. For monthly return index correlations (IFCI) see. IFC. Monthly Review. Oct. 1999.

Comparison of Market Indices (31 Dec 97=100)



Source : Reuters
Note : Comparision are in US$.

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ISE
Market Indicators

STOCK MARKET

		Total Value				Market Value		Dividend Yield	P/E Ratios		
	Number of Companies	Total		Daily Average							
		(TL Billion)	(US$ Million)	(TL Billion)	(US$ Million)	(TL Billion)	(US$ Million)	(%)	TL(1)	TL(2)	US $
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	309	24.857.113	18.382	414.285	306	57.824.887	43.254	1,26	93.13	108,29	100,57
2002/Q1	309	24.857.113	18.382	414.285	306	57.824.887	43.254	1,26	93.13	108,29	100,57

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 capitilization / 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, 96=1046)	NATIONAL-FINANCIALS (Dec. 31, 90=33)	NATIONAL-TECHNOLOGY (June, 30,2000=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	11.679,43	11.427,08	7.165,25	16.370,98	6.972,81
2002/Q1	11.679,43	11.427,08	7.165,25	16.370,98	6.972,81

	US $ Based					EURO Based
	NATIONAL-100 (Jan. 1986=100)	NATIONAL-INDUSTRIALS (Dec. 31, 90=643)	NATIONAL-SERVICES (Dec. 27, 96=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	982,—	757,—	1.022,—	1.287,—	—-	—-
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	508,38	410,34	311,89	712,60	303,51	683,05
2002/Q1	508,38	410,34	311,89	712,60	303,51	683,05

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	14.192.919	10.478	232.671	172
2002/Q1	14.192.919	10.478	232.671	172

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/Q1	184.504.878	155.939	2.882.889	2.437

Q : Quarter

(*) The first quarter includes the January-March 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	106,60	120,76	142,23	124,04
2002/Q1	106,60	120,76	142,23	124,04

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	3.317,83	3.985,20
2002	3.076,72	3.632,78	4.576,96
2002/Q1	3.076,72	3.632,78	4.576,96
	US $ Based		
1996	122.84	132.99	144.74
1997	127.67	137.36	151.95
1998	153.97	169.96	186.24
1999	151.02	173.47	212.18
2000	148.86	169.79	213.28
2001	118.09	136.14	163.55
2002	136.17	160.78	202.57
2002/Q1	136.17	160.78	202.57

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	104,35	101,69	97,16	91,62	103,58
2002/Q1	104,35	101,69	97,16	91,62	103,58

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	207,48	220,50	190,80	169,85
2002/Q1	207,48	220,50	190,80	169,85
	US $ Based			
2001	7,34	7,79	6,52	6,14
2002	9,18	9,76	8,44	7,52
2002/Q1	9,18	9,76	8,44	7,52

Q : Quarter

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Book Review

"*Financial Economics: Making Sense of Information in Financial Markets*", Brian Kettell, Financial Times Prentice Hall, London, 2001.

The book aims to explain what financial economics is, its founding fathers and their theories and its role in the valuation of financial assets and recent developments in the field. Defining what is financial economics is not straight-forward as it is a subject which overlaps with both economics, finance and also with statistics. This fusion of economics, finance and statistics enables investors to gain a true understanding of how the markets behave and how to perfect their trading strategies. The chapters within the book also investigate more closely modern portfolio theory, behavioral finance, bubbleology, some puzzles in financial markets and the relationship between derivatives markets and financial economics. It also explains what are known as time-varying risk premiums in bond and foreign exchange markets as well as in the stock markets.

Chapter 1 explains some of the standard theory of financial economics before moving on to the most recent developments. It looks into a theoretical framework for assessing the relevant level of risk: the capital asset pricing model and provides explanation on how to design an efficient investment portfolio as part of an investment strategy, the theory of options, the term structure of interest rates and analysis of the evolution of academic finance of Robert Haugen through comparing old finance, modern finance and new finance.

Chapter 2 provides the flavour of where the principles ideas in financial economics came from. The work of some of the more noteworthy contributors has been included. The contributors has been guided by three principles. First, it includes those financial economists who have been awarded the Nobel Prize for Economics, more correctly called The Bank of Sweden Prize in Economic Sciences. Second, it includes those economists whose death excluded them from winning the prize but whom, by common consent of the winners, would have shared the prize. Third, included here are those financial economists whose articles are most frequently cited in the academic journals.

Chapter 3 examines the time value of money and its role in the valua-

tion of financial assets. It discusses the future values-compounding which are needed to determine future sums of money resulting from an investment; present value-discounting which is used to evaluate the cash flow associated with the valuation of financial assets; bond and stock valuation, simple and compound interest and nominal and effective rates of interest.

Chapter 4 provides a short guide to financial statistics on measuring risk and return. It shows how the statistical concepts of risk and return can be applied to individual securities and to portfolios of securities. Statistics is all about uncertainty and this is best measured by probability theory. When the degree of uncertainty is established, one can draw inferences and decide on actions.

Interest rates which are at the centre of the key issues in financial economics are explained in Chapter 5. It tells what factors are affecting interest rates and exactly what role interest rates play within the financial system.

In chapter 6, explains how the mathematics of compounding and discounting to determine the present values of financial instruments are used. The chapter begins with a discussion of how bonds are valued.

Chapter 7 explains the valuation of financial assets, namely the stocks/equities. It gives information about the valuation principle, common stock valuation, the dividend discount model, fundamental valuation methods for stocks and what evidence there is that stock prices are not too high.

Modern portfolio theory is discussed in chapter 8. The chapter examines the principles involved in building an efficient investment portfolio. It begins with the Markowitz portfolio selection model and continues with considering how borrowing and lending possibilities affect the efficient portfolio set. In he final section, it provides a study of how the investors should select an optimal portfolio of risky assets.

Chapter 9 deals with the capital market theory which is an extension of portfolio theory. Portfolio theory considers how investors should act in selecting an optimal portfolio of risky securities. Capital market theory extends portfolio theory by asking: what happens to security markets if all investors seek portfolios of risky securities under the Markowitz framework?

Chapter 10 explains the efficient markets hypothesis that imagine a world in which all investors have free access to currently available information about the future, all investors are capable analysts and all investors pay close attention to market prices and adjust their holdings appropriate-

ly. It explains the efficient markets hypothesis by giving examples like the 1987 stock market crash and the catastrophe theory.

Chapter 11 explains the new economic paradigm and how it affects the valuation of financial assets. It begins with the explanation of what the new economic paradigm is. The new economic paradigm may be summarized as the view that globalization and information technology have led to a surge in the productivity of US workers. The relationship between NAIRU, which is supposed to be an unemployment rate that produces a stable rate of inflation and the new paradigm.

Chapter 12 describes the bubble terminology and explains the role of expectations in analyzing bubbles. Rational bubbles and speculative bubbles theory are also discussed in this chapter.

Behavioral finance, prospect theory and efficient markets are dealt with in chapter 13. This chapter attempts to put together the arguments propounded by the efficient market hypothesis critics and proponents. Psychological, quantitative and moral anchors for the stock market are discussed.

Chapter 14 discusses the extent to which valuation models can accurately explain the principal characteristics of recent financial market behavior, both on the part of investors and on the part of the markets themselves. Many standard models break down when applied to the actual behavior of financial markets. The question marks raised so puzzles are the subject of this chapter. The puzzles discussed here are; the equity risk premium puzzle, the international diversification puzzle and the asset allocation puzzle.

Chapter 15 explains derivatives markets and financial economics. It begins by explaining what derivatives and options are. The rest of the chapter follows the option prices, how options are priced and the determinants of the value of a call option.

In Chapter 16, recent developments in financial economics are discussed. It is started with the statistical analysis of past stock returns. Then, it seeks where the market is going. This chapter contains the heterogeneous agents and idiosyncratic risks, technology and investment, general equilibrium and portfolio implications.

Chapter 17 summarized the revolution in how financial economists view the world. Investors can earn a substantial premium for holding dimensions of risk unrelated to market movements, such as recession-related or distress-related risk. Investors earn these premiums by following strategies, such as value and growth, market-timing possibilities gen-

erated by return predictability, dynamic bond and foreign exchange strategies and maybe even a bit of momentum. The exact size of the premiums and the economic nature of the underlying risks is still a bit open to question, but researchers are unlikely to go back to the simple view that returns are independent over time and that the CAPM describes the cross section.

The final chapter answers the question what an investor should do. There is an important current of academic research that investigates how portfolio theory should adapt to new view of the world. This chapter tries to distil its advice for investors.

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