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INVESTORS' SELECTION BETWEEN TWO FINANCIAL MARKETS: A CONDITIONAL CORRELATION APPROACH

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Abstract

This study focuses on a certain aspect of substitution effect between FX and stock market investments. The motivation for this approach is that a forecast of future correlations and volatilities is the basis for pricing models, according to Engle (2002). Forecasts are obtained via a methodology based on a bivariate GARCH model. For illustration, we choose the Turkish market, since the two markets, the FX and the stock markets, are perceived as alternative investment opportunities by Turkish investors. Our conclusion is that investors should be aware of the degree of substitution, and hence of risk spillovers, at the time of their investment.

I. Introduction

The investors of stock market are usually arbitrage investors between FX and stock market investments. The change in the behavior of FX market rates can also easily change the stock market prices. Accordingly a certain aspect of substitution effect between FX and stock market investments is a subject of investigation. To support this view, Turkish stock market and FX market as an emerging market have been investigated. We select a Multivariate GARCH model, following Engle (2002), since a forecast of future correlations and volatilities is the base for pricing models. In order not to miss the joint structure of the markets, an autoregressive co-movement model is needed. Since we would have one measure that explains the relationship between the FX and stock market, we can more easily compare markets by using MGARCH. By not using simply the constant correlation coefficient but substituting the BEKK correlation, we can combine autoregressive approach with a conditional variance approach.

After Akgiray (1989) strongly recommended the use of the GARCH model in time series analysis of stock returns, Ferson and Harvey (1991) indicate that time variation in equity risk premium is significant. They suggest that very little of the variation in US stock returns can be explained by variation in the risk exposures of those returns. On the other hand, Fama (1984) and Korajczyk (1985) note evidence of time-varying risk premium in currency markets. Mc Curdy and Morgan (1992) suggest some relationship between time-varying risk premium for currencies and global stock return. Furthermore, Kearny and Patton (2000) indicated the importance of checking for specification robustness in Multivariate GARCH modeling. Since there is a transmission of volatility between foreign exchange markets according to them, we are interested in the volatility transmission between markets.

Bailey and Chung (1995) found significant associations between expected equity market premiums for these risks and related premiums from the currency and sovereign debt markets. They examined the importance of exchange rate fluctuations and political risks for stock prices. According to them, firms with any significant foreign financial activities or assets are relatively exposed to adverse changes in currency controls, capital flow barriers, and related regulations. They explained that the cross-sectional differences in exposures to exchange rate and political risk measures yield significant differences in stock returns. Narrowing their approach, Erdoğan and Schmidbauer (2003) investigated the relationship between the FX and stock market of Turkey, and recommended the use of a multivariate model to accommodate both markets simultaneously.

By using GARCH mean models to examine the relationship between mean returns on a stock portfolio and its conditional variance or standard deviation, Baillie and De Gennaro (1990) conclude that any relationship between the returns and variance or standard deviation is weak.

Engle (2002) refers to dynamic conditional correlation models. He defends them with their flexibility of multivariate GARCH models coupled with parsimonious parametric models for the correlations. Engle starts with the conditional correlations between two random variables: The conditional correlation is also the conditional covariance between the standardized disturbances. The ever-popular rolling correlation estimator is defined for returns with a zero mean.

Markowitz (2002) stresses the importance of the covariance or correlations among the random variables. He still ignores the change in the correlation and either the asymmetric change in correlation from the theoretical point of view. Domowitz, Glen, and Madhavan (1998) state that country and currency premia help explain equity returns and closed-end fund discounts. Kroner and Ng (1998) demonstrate that the choice of a multivariate volatility model can lead to substantially different conclusion in any application that involves forecasting dynamic covariance matrices. They introduce a general model which nests the

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four models and their natural asymmetric extensions. They confirm that time-varying covariance between asset returns is essential for asset pricing, portfolio selection and risk management. Their model nests the constant correlation model of Bollerslev (1990), the GARCH model of Engle, Ng, and Rothshild (1990), the BEKK model of Engle and Kroner (1995), and the VECM model of Bollerslev, Engle, and Woolridge (1998).

Turtle, Buse and Korkie (1994) distinguish between myopic CAPM and the ICAPM in terms of variance efficiency on grounds of the market portfolio being mean-variance efficient in a CAPM, but not being efficient in an ICAPM. The ICAPM market portfolio is a combination of the CAPM efficient market portfolio and inefficient hedge portfolios. They answer, saying that because of the strong support found for this process in recent empirical work, and the tractability provided by low order variance processes in a multivariate setting (c.f., Bollerslev, Chov and Kroner (1992)).

Tse and Tsui (2002) explained and applied a varying-correlation MGARCH model. They first assume a vech-diagonal structure in which each conditional-variance term follows a univariate GARCH formulation. The remaining task in their study is to specify the conditional correlation structure. They apply an autoregressive moving average type of analogue to the conditional-correlation matrix. In particular, the estimated conditional-correlation path provides an interesting time history that would not be available in a constant correlation model. They hope that the varying-correlation MGARCH model would provide a useful alternative for modeling multivariate conditional heteroscedasticity in empirical applications.

The rest of the present article is organized as follows. Section 2 presents the MGARCH-BEKK model approach of this study. Section 3 gives the data and methodology of the empirical study. Empirical findings are presented in Section 4, and conclusions are the subject of the last section.

II. The MGARCH-BEKK Model

We restrict our attention here to bivariate MGARCH-BEKK processes, since the application intended in the present paper is to fit a process to a bivariate time series. Many bivariate time series $(Z_t)=(X_t, Y_t)'$ can be described and analyzed in terms of a conditional mean specification $Z_t = M_t + \varepsilon_t$, where (M_t) is the bivariate conditional mean of (Z_t) , that is, $E(Z_t|F_{t-1})=M_t$; and (M_t) could be a vector autoregressive model or a vector error correction model, if (X_t) and (Y_t) are cointegrated. In the BEKK model¹ $\varepsilon_t=(\varepsilon_{1t}, \varepsilon_{2t})'$ follows the equations

¹ This model was termed BEKK model in Engle and Kroner. BEKK is an acronym for Baba, Engle, Kraft, and Kroner.

$$\varepsilon_t = H_t^{1/2} v_t, \quad H_t = C'C + \sum_{i=1}^q A_i' \varepsilon_{t-i} \varepsilon_{t-i}' A_i + \sum_{j=1}^p B_j' H_{t-j} B_j \quad (1)$$

with parameter matrices

$$C = \begin{pmatrix} c_{11} & c_{12} \\ 0 & c_{22} \end{pmatrix}, \quad A_i = \begin{pmatrix} a_{11}^{(i)} & a_{12}^{(i)} \\ a_{21}^{(i)} & a_{22}^{(i)} \end{pmatrix}, \quad B_j = \begin{pmatrix} b_{11}^{(j)} & b_{12}^{(j)} \\ b_{21}^{(j)} & b_{22}^{(j)} \end{pmatrix} \quad (2)$$

and v_t is two-dimensional white noise with covariance matrix $\text{cov}(v)=I_2$.² In the following, this model will be called a BEKK model of order (p,q) ($p=0, 1, \dots$; $q=1, 2, \dots$). It holds that $\text{cov}(Z_t|F_{t-1})=H_t$, that is, H_t is the conditional covariance matrix of Z_t , given all the information about the process until time $t-1$. As in the univariate case, an order $q=0$ is not interesting because the model would lose its conditional heteroskedasticity property.

The BEKK model has advantages and disadvantages with respect to alternative multivariate GARCH specifications. The number of parameters of the model in equation (1) is $4(p+q)+3$, which is much smaller than the number of parameters that the most general formulation of an MGARCH model would require: $9(p+q)+3$ (see Chan, 2002). The BEKK model lends itself easily to specializing on the model structure, for example to using diagonal matrices for A_i and B_j . The main advantage is probably that the parameters in (1) are easy to estimate because no intricate constraints need to be imposed to ensure that H_t is positive definite. A disadvantage of the BEKK model is that its parameters are not directly interpretable in terms of their impact on H_t because they enter the model equations via matrices as well as via transposed matrices. For a full account of the properties of the MGARCH-BEKK process, see Bauwens et al. (2003), Chan (2002), Tsay (2002) and their references.

The logic of stochastic time-series models is to exploit the autocorrelation (and cross-correlation) structure of an observed time series for analysis and forecasting. White noise, void of autocorrelation structure, is the essential stochastic ingredient in building stochastic time series models. Conversely, when a stochastic model is fitted to an observed series, the residuals should be such that they could be the realization of a white-noise process. When an MGARCH is found useful to analyze a vector time series Z_t with $Z_t = M_t + \varepsilon_t$, residuals are given as $v_t = H_t^{-1/2} \cdot \varepsilon_t$, and the success of the model depends on whether this series could be the realization of a white-noise process.

² The symbol I_2 denotes the unity matrix of order 2.

III. Data and Methodology

The empirical part of the present study deals with a bivariate time series consisting of

- the weekly quotes of *IMKB 100* (= *XU 100*)
- the weekly *USD-TL* parity.

“Weekly” means: the closing price on Fridays. The time series cover a period from 1987-10-23 through 2004-04-30 (863 observations). Both series, given in Figure 1 and 2, are non-stationary, but they were not found to be co-integrated.

Figure 1: XU 100

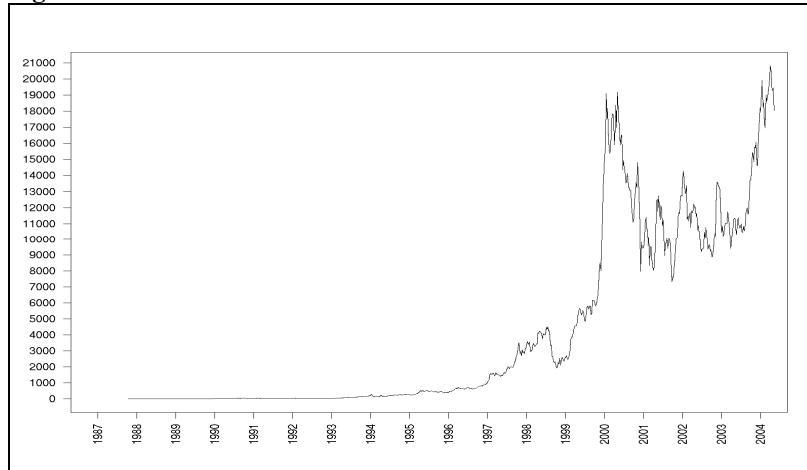
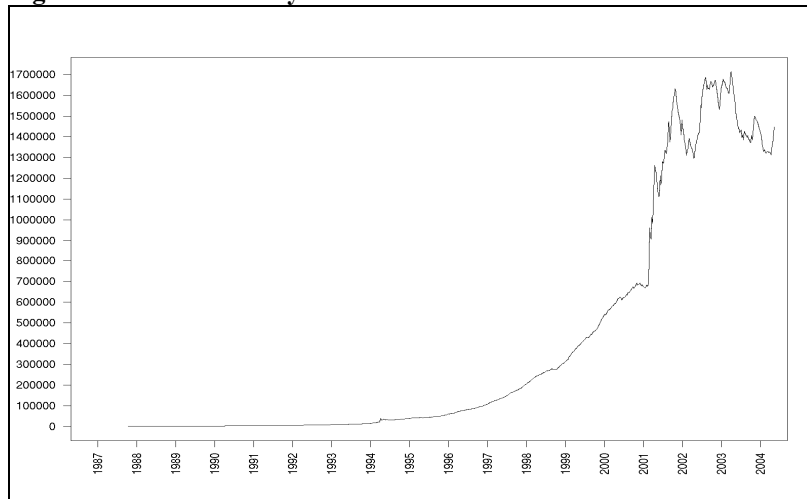


Figure 2: USD-TL Parity



Therefore, we can proceed with analyzing their respective returns, using a model which does not contain the level series (see Figure 3 and 4). Define

X_t^* = return in percent on *XU 100* in week t ,

Y_t^* = return in percent on *USD – TL* parity in week t .

Figure 3: Return on XU 100

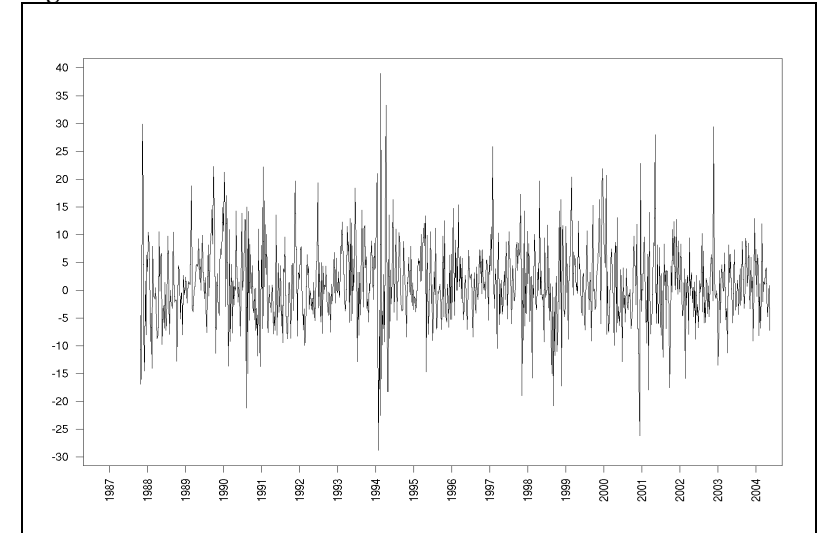
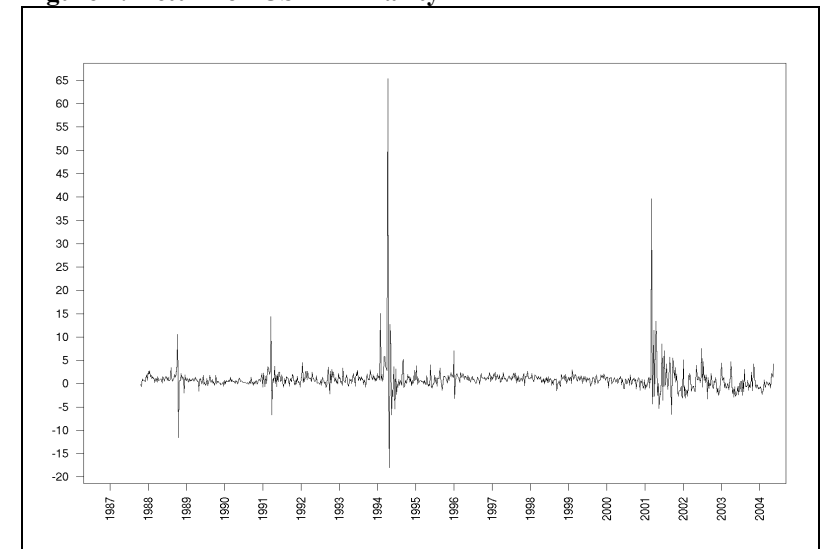


Figure 4: Return on USD-TL Parity



The MGARCH-BEKK model is appropriate for our purposes insofar as it provides a sequence of conditional correlation matrices and thus provides insight into the time-dependent nature of the relationship between returns on different assets. On the other hand, correlation and covariance are known to be outlier-sensitive measures. Indeed, the huge jumps in the USD-TL parity series (see Figures 2 and 4) were found prohibitive to fitting a time series model with Gaussian white noise residuals. We are therefore faced with the dilemma of moderating the impact of outliers without corroding the properties of the time series. One solution to this problem is to transform the original series using the hyperbolic tangent. This function was found to smooth a series of observations robustly and efficiently in a number of contexts; see, for example, Jain and Ross (2004). We used the hyperbolic tangent such that the original time series of returns, (Y_t) , was transformed using the function.

$$x \rightarrow 25 \cdot \tanh(x/25) \quad (3)$$

The graph of this function is shown in Figure 5. The parameter 25 was found to be a fair compromise between cutting off the returns too abruptly and leaving them as they are. Figure 6 shows that this transformation leaves the smaller returns almost as they are, but dampens the more extreme ones. It holds that

$$\lim_{x \rightarrow \infty} [25 \tanh(x/25)] = +25, \quad \lim_{x \rightarrow -\infty} [25 \tanh(x/25)] = -25, \quad (4)$$

so that the transformed returns cannot exceed -25% or 25%. This transformation made it possible to fit a covariance-stationary MGARCH-BEKK to the bivariate series of returns on XU 100 and transformed returns on USD-TL parity. From now onwards, we use the following notation³:

X_t : return in percent on XU 100 in week t ,

Y_t : transformed return in percent on USD – TL parity in week t ,

$Y_t^* = 25 \tanh(Y_t^*/25)$.

The effect of the transformation on (Y_t) is also shown in Figure 6 where a circle marks the original return series Y_t^* , while the solid line shows the transformed series (Y_t) . Circles are only shown for original returns outside the interval $[-3, +3]$, in order not to impede the clarity of the chart (Some basic statistics of the two pairs of series, (X_t^*) and (Y_t^*) on the one hand and (X_t) and (Y_t) on the other hand, are given in Table 2 of Findings Part).

³ It was not found necessary to transform returns on XU 100.

Figure 5: The function $x \rightarrow 25 \tanh(x/25)$

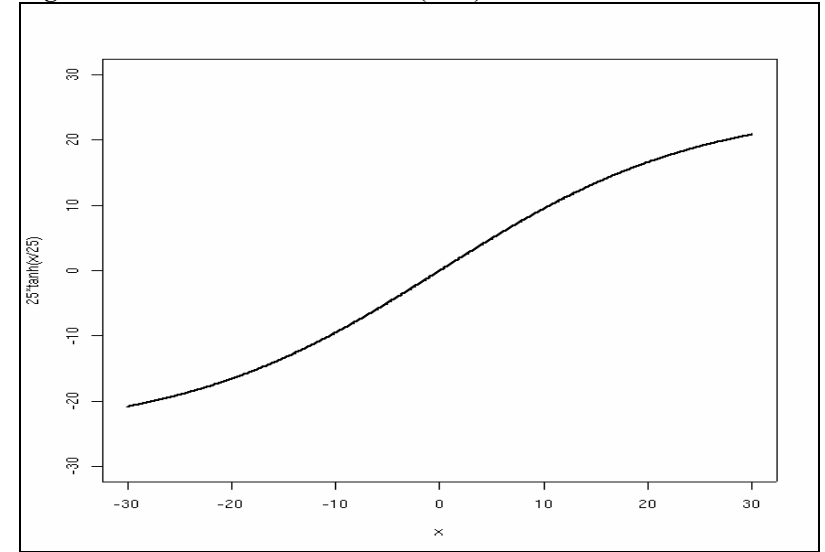
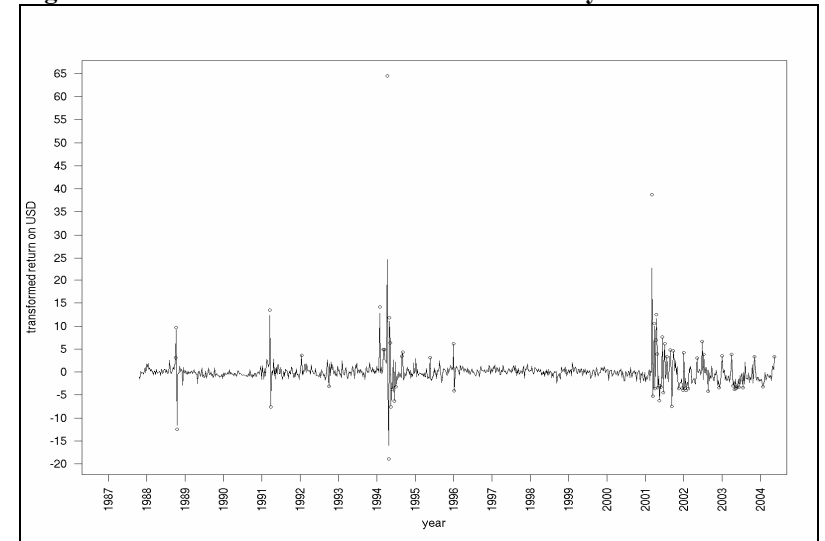


Figure 6: Transformed Return on USD-TL Parity



IV. Findings

Since there is significant autocorrelation in (Y_t^*) (not shown here), it was found necessary to first fit a vector autoregressive (VAR) model and then fit an MGARCH-BEKK to the residuals of the VAR model. For our purposes, it was found a good compromise to fit a VAR model with lag 1. The fitted VAR model is:

$$\begin{pmatrix} X_t \\ Y_t \end{pmatrix} \equiv \begin{pmatrix} \omega_1 \\ \omega_2 \end{pmatrix} + \begin{pmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{pmatrix} \begin{pmatrix} X_{t-1} \\ Y_{t-1} \end{pmatrix} + \begin{pmatrix} e_{1t} \\ e_{2t} \end{pmatrix} \quad (5)$$

where the estimated parameters have been given in Table 1. The parameters γ_{11} and γ_{12} are on the verge of being significant, which means that returns on USD-TL parity Granger-causes returns on XU100. It should be mentioned that this VAR model with lag 1 does not entirely remove the autocorrelation in (Y_t). However, a higher lag order was not found to perform substantially better in this respect. This is why, for reasons of parsimony, a lag order of 1 was chosen.

Table 1: Parameters of the Fitted Model

VAR part:						
parameter	w_1	w_2	γ_{11}	γ_{21}	γ_{12}	γ_{22}
estimate	0.910	0.845	0.067	-0.013	0.259	-0.007
standard error	0.358	0.238	0.035	0.012	0.155	0.051
MGARCH, c:						
parameter	c_{11}	c_{12}	c_{22}			
estimate	3.699	0.235	-0.830			
standard error	0.458	0.087	0.048			
MGARCH, A_1 and A_2 (ARCH part):						
parameter	$a_{11}^{(1)}$	$a_{21}^{(1)}$	$a_{22}^{(1)}$	$a_{21}^{(2)}$	$a_{12}^{(2)}$	$a_{22}^{(2)}$
estimate	0.459	0.489	0.549	0.361	0.164	-0.626
standard error	0.040	0.140	0.055	0.156	0.010	0.050
MGARCH, B (GARCH part):						
parameter	b_{11}					
estimate	0.737					
standard error	0.052					

Let (e_{1t}, e_{2t}) designate the bivariate series of residuals of the VAR model. Basic statistical properties of these series are given in Table 2.

Table 2: Basic Properties of the Distributions of the Involved Series

	X_t^*	Y_t^*	X_t	Y_t	e_{1t}	e_{2t}	ν_{1t}	ν_{2t}
mean	1.174	0.896	1.174	0.823	-0.020	-0.002	0.000	-0.003
variance	56.554	10.452	56.554	4.740	56.033	4.735	0.983	1.006
skewness	0.382	11.273	0.382	3.004	0.399	3.032	0.411	2.389
standard error	0.202	4.233	0.202	1.412	0.184	1.426	0.130	0.946
kurtosis	2.111	208.409	2.111	37.609	2.217	37.998	1.072	21.241
standard error	0.539	76.433	0.539	9.594	0.604	9.375	0.397	9.520
correlation	-0.008		-0.080		-0.077		-0.028	
Here: X_t^* = return on XU 100 Y_t^* = return on USD-TL parity X_t = return on XU 100 Y_t = transformed return on USD-TL parity e_{1t} = residual of return on XU 100 in VAR e_{2t} = residual of transformed return on USD-TL parity in VAR ν_{1t} = residual of return on XU 100 in BEKK ν_{2t} = residual of transformed return on USD-TL parity in BEKK								

There is significant autocorrelation in the squares of these series (see Figure 7). The next step is therefore to fit an MGARCH-BEKK model to the bivariate series (e_{1t}, e_{2t}). The following model structure of a BEKK of order (1,2) was found to be adequate:

$$\begin{pmatrix} e_{1t} \\ e_{2t} \end{pmatrix} \equiv H_t^{1/2} \begin{pmatrix} \nu_{1t} \\ \nu_{2t} \end{pmatrix} \text{ with}$$

$$H_t = C'C + A_1'e_{t-1}e_{t-1}'A_1 + A_2'e_{t-2}e_{t-2}'A_2 + B'H_{t-1}B \quad (6)$$

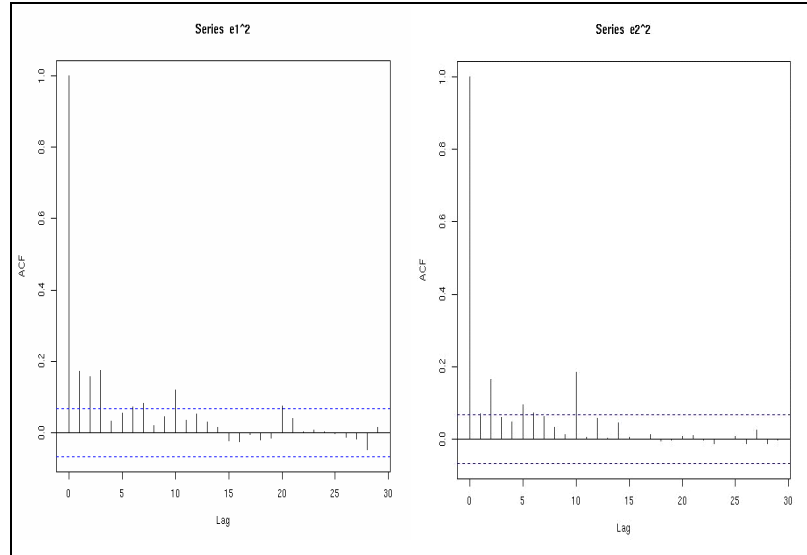
with parameter matrices

$$C = \begin{pmatrix} c_{11} & c_{12} \\ c_{21} & c_{22} \end{pmatrix}, \quad A_1 = \begin{pmatrix} a_{11}^{(1)} & 0 \\ a_{21}^{(1)} & a_{22}^{(1)} \end{pmatrix}, \quad A_2 = \begin{pmatrix} 0 & a_{12}^{(2)} \\ a_{21}^{(2)} & a_{22}^{(2)} \end{pmatrix},$$

$$B = \begin{pmatrix} b_{11} & 0 \\ 0 & 0 \end{pmatrix}, \quad (7)$$

and the parameter estimates have been given in Table. The structure of the BEKK model shows that (X_t) has no own second order ARCH term, and that (Y_t) is modeled as an ARCH (2) process. The non-zero off-diagonal elements in A_1 and A_2 signify that there is volatility spillover and a non-constant correlation structure.

Figure 7: Autocorrelation Functions of Squared Residuals of the Fitted BEKK Model



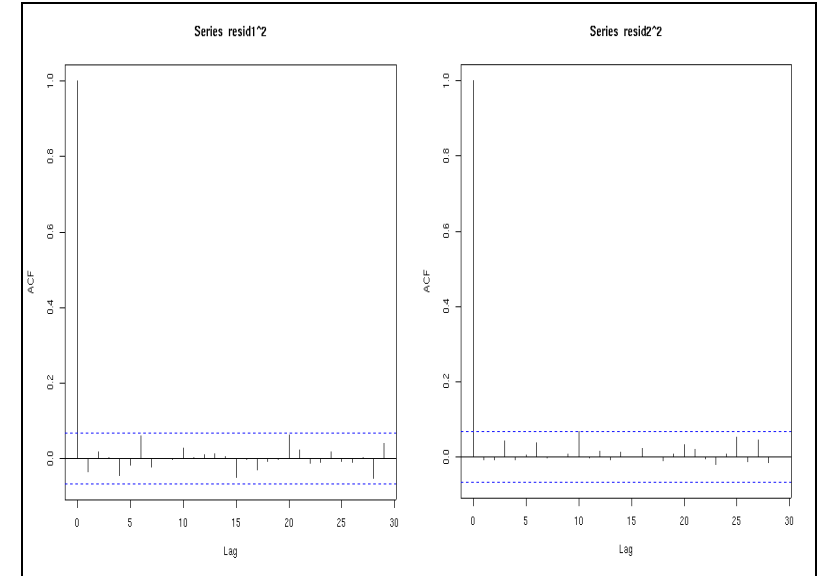
There is no significant autocorrelation left in the squared residuals of the BEKK model (see Figure 8). This BEKK model has ten parameters, all of which are significant. Furthermore, the eigenvalues and the unconditional covariance matrix are⁴:

- eigenvalues 0.9719, 0.6249, 0.2750, 0.1930;
- unconditional covariance matrix:

$$\Sigma = \begin{pmatrix} 64.80 & 7.54 \\ 7.54 & 82.79 \end{pmatrix} \quad (8)$$

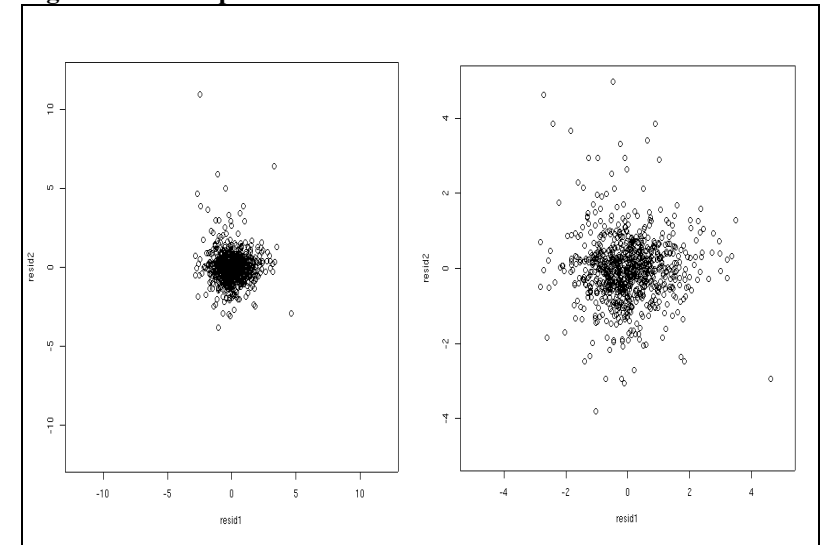
⁴ These are the eigenvalues of $A \otimes A + B \otimes B$ (\otimes denotes the Kronecker product). The model is covariance stationary if the eigenvalues are smaller than one in modulus; (see Bauwens et al).

Figure 8: Autocorrelation Functions of Squared Residuals of the Fitted BEKK Model



A scatterplot of the residuals is shown in Figure 9. Some basic statistical properties of the residual series (v_{1t}, v_{2t}) are shown in Table 2. This table reveals that a large part of the skewness and the kurtosis in the original data has been absorbed.

Figure 9: Scatterplot of Residuals of the Fitted BEKK Model



To summarize, we state the model equations of this final model for the weekly returns on XU 100 and USD-TL parity:

$$\begin{pmatrix} X_t \\ Y_t \end{pmatrix} = \begin{pmatrix} 0.910 \\ 0.845 \end{pmatrix} + \begin{pmatrix} 0.0666 & 0.2585 \\ -0.0131 & -0.0068 \end{pmatrix} \begin{pmatrix} X_{t-1} \\ Y_{t-1} \end{pmatrix} + \begin{pmatrix} e_{1t} \\ e_{2t} \end{pmatrix} \quad (9)$$

where the error term follows the MGARCH-BEKK of order (1,2) with equations

$$\begin{pmatrix} e_{1t} \\ e_{2t} \end{pmatrix} = H_t^{1/2} \begin{pmatrix} v_{1t} \\ v_{2t} \end{pmatrix} \text{ with}$$

$$H_t = C'C + A_1'e_{t-1}e_{t-1}'A_1 + A_2'e_{t-2}e_{t-2}'A_2 + B'H_{t-1}B \quad (10)$$

where $(v_{1t}, v_{2t})'$ is white noise, and estimated parameter matrices

$$C = \begin{pmatrix} 3.699 & 0.235 \\ 0.000 & -0.830 \end{pmatrix}, \quad A_1 = \begin{pmatrix} 0.459 & 0 \\ 0.489 & 0.549 \end{pmatrix}, \quad A_2 = \begin{pmatrix} 0 & 0.164 \\ 0.361 & -0.626 \end{pmatrix},$$

$$B = \begin{pmatrix} 0.737 & 0 \\ 0 & 0 \end{pmatrix} \quad (11)$$

The series of conditional volatilities and conditional correlations are shown in Figure 10.

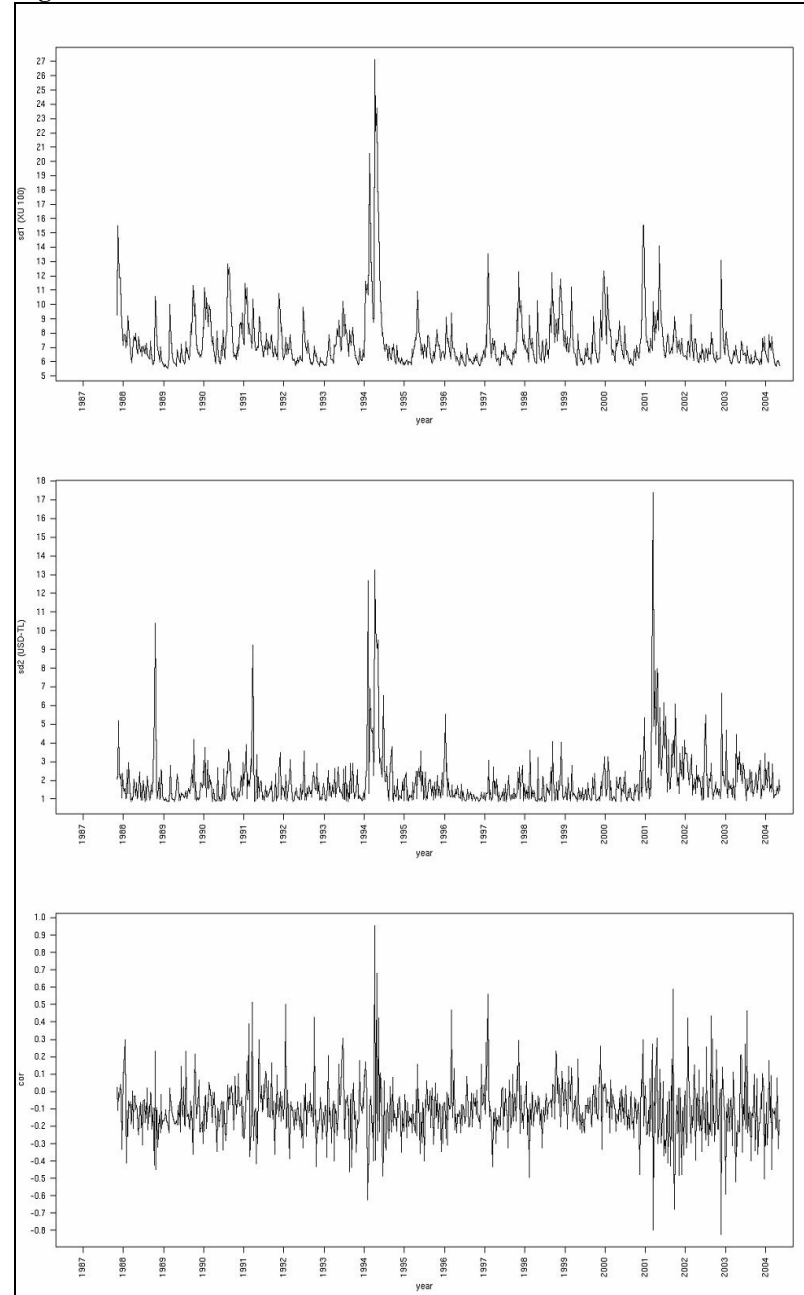
V. Conclusion

The empirical evidence presented in this paper indicates that there is a certain aspect of substitution effect between FX and stock market investments. A measure for the co-movement of the two markets has been obtained via a methodology based on a bivariate GARCH model. For illustration, we have used the Turkish market, since the two markets, the FX and the stock markets, have been perceived as alternative investment opportunities by Turkish investors.

According to the empirical results of the study, the structure of the MGARCH-BEKK model shows that return in percent on ISE 100 in week t has no own second order ARCH term, and that return in percent on USD-TL parity in week t is modeled as an ARCH (2) process. The non-zero off-diagonal elements in A_1 and A_2 signify that there is volatility spillover and a non-constant correlation structure. Since a non-

constant correlation structure exists between the two markets, it is obvious that the degree of the substitution effect and hence of risk spillovers at the time of investment should be carefully observed by the investors. Increasing conditional risk in the markets is a reason for increasing correlation. If an investor expects a risk increase in stock market, she thinks of replacing her stocks with currency investment such as USD and Euro, and *vice versa*. If there is no high expectation for increasing risk, then the correlation between the FX returns and stock returns is relatively low and the spillover effect decreases. As is also specifically seen in this study (see Figure 10), the pattern of the conditional correlation figure can be decomposed into three periods between 1987-10-23 and 2004-04-30 (863 observations). The first period starts from the first observation date to April 1994 when the devaluation of TL was announced. The second period is from the devaluation time to the decision of free floatation of TL, and the third term is from that decision to the end of whole analysis period. For an extension to this study, the investigation of the effect of monetary authorities on the stock market behavior and/or on the volatility spillover is suggested.

Figure 10: Conditional Volatilities and Conditional Correlations



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EXCHANGE RATE EXPOSURE: AN EMPIRICAL APPLICATION FOR TEXTILE INDUSTRY ON THE ISTANBUL STOCK EXCHANGE

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Abstract

Exchange rate exposure has been one of the most important subject in international finance after the introduction of the flexible exchange rate system at the beginning of 1970s. Firms' financial positions are affected due to unexpected and continuous fluctuations in foreign exchange rates. The changes in economic variables will affect the value of the firm unavoidably. Therefore, the relationship between foreign exchange rates and the market value of the firm should be investigated. We present a study on the Istanbul Stock Exchange (ISE) Market for textile industry at the firm level. We construct a sectoral real effective exchange rate instead of general real effective exchange rates. We attempt to explain the exposure with this explanatory variable. We also use lead models instead of contemporaneous or lagged model and find that lead model shows a clear exposure effect for the textile industry.

I. Introduction

The volatility of foreign exchange market has become one of the most important subjects in international finance area since the beginning of 1970s. Foreign exchange rates may increase or decrease in every time under freely floating regime and hence they affect countries, industries and firms either positively or negatively. Therefore this risk source should be evaluated carefully.

Foreign exchange rate exposure is classified as accounting types of exposures and operational (economic) exposure. Accounting exposure contains translation and transaction exposure. Translation exposure arises when a company operates in more than one currency areas. This is because at

the end of the fiscal year, balance sheets and income statements are consolidated in parent company's account. If a change occurs between two consolidation times, translation exposure exists unavoidably. Transaction exposure is related with the contracts and/or payments denominated with the foreign currency. The amount of payment in terms of domestic currency may increase and decrease according to foreign exchange rate changes, that occurred between the contract date and the payment date. It is obvious that, accounting exposures are related with the nominal exchange rates at specific dates. Moreover, they start and end at specific times. At the end of this time period, the magnitude and the quantitative dimension of this effect can be measured. Accounting types of risk do not affect the value of the firm as it is related with the book values and can be eliminated by using financial instruments. The risks that can be eliminated are not taken into account during security pricing process.

Operational exposure, on the other hand, is a more complicated risk than accounting types. First of all, it is related to the real values unlike accounting types. Economic exposure exists when a change in Real Exchange Rate (RER) - nominal exchange rates adjusted by inflation differential-happens. A firm may be affected from different channels against RER increases or decreases. Firm's sales, profits, profit margin and in general the competitive position are affected. Some authors¹ assert that even if RER moves back to original value, the effect of this risk may still last. It is now clear that management of this risk is very difficult especially in the short-term. The instruments used to hedge exposure can also be a source of risk. Operational exposure is one of the most difficult situations to deal with for managers. Miller (1998) states that the lack of clear guidelines for measuring economic exposure is a major obstacle to implementing economic exposure assessment and hedging. Managers' reaction to this risk perhaps can be summarized with one answer on Belk and Glaum's (1990) questionnaire.

'We do think about our economic exposures a lot, it is difficult to say exactly what we do.'

I. Economic Exposure

Let us define the exchange rate s to be number of units of domestic currency per unit of foreign currency. Let P and P^* be the price indices at home and

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¹ Milberg and Grey (1992) state that if the currency movement is long-lasting, the companies or industries will suffer lack of investment expenditure relative to the competitors, and competitors will improve their R&D expenditure, capital equipment, distribution and marketing activities, or may operate a brand loyalty by keeping the prices constant. If the currency moves back to the original level, the company will still suffer because the competitors are stronger.

abroad. Assume that Law of one price² and hence Purchasing Power Parity (PPP) is valid. This implies that

$$P = s \cdot P^*$$

RER can be formulated as

$$RER = s \cdot P^* / P$$

As it can be noted from the above equations, if PPP is violated a change in RER will exist and hence operational exposure starts. Empirical studies agree that PPP is not valid in the short-term. If PPP is not valid in the short-run, RER changes and hence economic exposure exists. The important point is not RER movements but its effects. Edwards (1989) asserts that a devaluation of RER will improve the competitiveness of the country against trade partners. Because country's products will be less costly in the eyes of foreigners. On the other hand, a revalued RER will decrease the competitiveness.

This point is valid both for industries and companies. If the exchange rate is overvalued, one solution to overcome this position for an export-oriented firm is to increase the prices in terms of foreign currency. This is because the inflation in home country leads the costs up and the amount of foreign currency receipts will not change if the firm do not change export prices. As a result, domestic currency equivalent of foreign receipts will decline and hence cash-flow of the firm will change. On the other hand, if the firm increases product's price in terms of foreign currency, the result of this choice can not be estimated. Normally a decline of sales is expected because of international competitiveness. Again the firm's income and cash-flow may decline. It seems that the firm has no remedy.

At the first glance, if PPP is valid, it is perceived that there is no economic exposure. After a careful consideration, one may notice that economic exposure may still exist. This effect is explained as the third country effect. If PPP is valid vis-à-vis, but is not valid between trade partners and the third country, firm will be affected again.

Another point is that exchange rate exposure is not only for exporter or importer but also for purely domestic firms. Domestic firms, produce and sell in home country, will also be affected by foreign competition.

It is also possible to say that a movement of RER affects industries oppositely. For example, an overvaluation of currency makes exported commodities relatively expensive but makes imported materials relatively cheap.

² The price of similar commodity should be equal in everywhere when they are converted into the same currency.

II. Literature

The first empirical work on economic exposure belongs to Franck and Young (1972). They investigated the reaction of 287 largest U.S. industrial corporations against devaluations and found no uniform or definite pattern in change of share prices against exchange rate devaluations.

The early studies³ were mostly interested in the effect of high devaluations for a specific date. Common samples were usually Multinational Companies and Cumulative Average Residual Method (CAR) has been used to measure this effect. The conclusions of these studies can be summarized as that the investors react to devaluations with a minimum lag and changes of share prices are affected by these reactions.

The freely floating regime and development of econometric methods and availability of data have led researchers to analyze stock market reactions based on time-series analysis during 1980s and 1990s.

Aggarwal (1981), Amihud (1994), Bartov and Bodnar (1994), Chow, Lee and Solt (1997) try to explore the relationship between real effective exchange rate (REER) changes and equity price changes by using regression method. Some of these studies⁴ conclude that the lagged effect is important while Amihud (1994) reports no effect. He claims that no effect is a result of companies' successful hedging policies.

Some authors⁵ have preferred to use Seemingly Unrelated Regression (SUR) method. The findings show that exposure is present and important. Ajayi and Mogue (1996) have used cointegration method to test exposure. They assert that currency depreciation has negative short-run and long-run effect on the stock markets.

It is fair to say that the regression method is the generally accepted model for studying economic exposure. The early studies have used stock market index as the dependent variable. Firm and industry specific analyses have become more important consideration of the most recent works. This evolution is necessary since stock market index can not capture exposure completely. Since an index contains many companies including exporter and importer companies, the opposite characteristics of these companies may eliminate each other's effects. Therefore, one would not expect to find a significant relationship.

As the independent variable, real effective exchange rate has been used and general price indices have been used for the construction of the real exchange rate series. This implies that all industries, domestic and foreign trade partners, have the same inflation rate. This is an unrealistic assumption as the industry price indices may diverge from each other. Therefore, we construct and use sectoral real effective exchange rates (SREER) to overcome this deficiency.

³ Ang and Ghallab (1976), Ayarslan (1982).

⁴ Aggarwal (1981), Bartov and Bodnar (1994), Chow, Lee and Solt (1997).

⁵ Prasad and Rajan (1995), Bodnar and Gentry (1993).

III. Method and Data Definition

As we have mentioned before it is very difficult to define exchange rate exposure and hence the measurement of this effect is even more difficult than the definition. There has been a common agreement in literature about the model created by Adler and Dumas (1984) and developed by Jorion (1990). This model assumes that the return of security is characterized by the change of stock market index and the real effective exchange rate changes. This is

$$R_{i,t} = \alpha_i + \beta_1 R_{m,t} + \beta_2 S_t + \varepsilon_{i,t} \quad T: 1, \dots, t$$

where $R_{i,t}$ is the rate of return on the i th firm's stock in period t , $R_{m,t}$ is the rate of return on the stock market index in period t and S_t is the change in the real effective exchange rates in the same period, $\varepsilon_{i,t}$ represents the error term. Security returns and stock market index returns are considered in real terms.

This model shows that if a firm is affected positively by a change in exchange rate, the β_2 coefficient will be positive. For example, a firm that is in exporting industry is expected to have a positive coefficient since a devaluation of RER makes the exporting industry more competitive.

This model shows the contemporaneous relationship between a change in RER and the return of securities. However, investors may wait to see the real effect of RER changes and this is known as the lagged effect. This situation may be incorporated into the above model as

$$R_{i,t} = \alpha_i + \beta_1 R_{m,t} + \beta_2 S_t + \beta_3 S_{t-1} + \beta_4 S_{t-2} + \beta_5 S_{t-3} + \varepsilon_{i,t}$$

β_3 , β_4 and β_5 stand for the coefficient of 1, 2 and 3 months lagged RER. This is, of course, a conflict with the Efficient Market Hypothesis. However, the empirical works supports the lagged effect.

Our work is organized at the industry and firm level. We have selected textile industry, as this sector is known as the exporter industry of Turkey. Therefore, we would expect a positive β coefficient.

We have selected those firms that are listed on the Istanbul Stock Exchange (ISE) and have continuous data between April 1992 and September 2001. According to this criteria 8 companies⁶ are chosen as sample. We also create an equally weighted textile industry portfolio by using these companies' values. The compounded monthly return of these securities and the ISE index data are taken from the ISE database available in the ISE web pages. All variables are equalized to 100 in December 1991.

⁶ Akal Tekstil, Altınyıldız, Derimod, Kordsa, Lüks Kadife, Okan Tekstil, Sönmez Filament, Yünsa.

As it is explained before, operational exposure exists when a change in RER occurs. It is very difficult to quantify this effect since the effect of each currency changes on the cash-flow of the company can not be exactly measured. Real effective exchange rates may be a remedy to overcome this difficulty. This is because RER is constructed on the assumption of having one trade partner whereas real effective exchange rates are constructed by including all trade partners' data if possible.

We use the SREER. This is a better approach in terms of analyzing the textile sector's competitiveness against other trade partners than general price indice approach. To do so, we have selected trade partners of Turkey⁷ on the basis of trade volume in textile sector.

Textile industry Producer Prices (PPI) is taken from DataStream except two countries⁸. Some countries' data cannot be taken from the same source, unfortunately. Data for Belgium are taken from Belgium Statistical Office and for the U.K. National Statistics web pages. Turkey's PPI data are taken from the Central Bank of Turkey (CBRT) web pages. All PPI values are equalized to 100 in December 1991.

The second stage of the construction of sectoral RER is to use nominal exchange rates. All of the nominal exchange rates except for Spain are taken from the CBRT. We use cross-rates between U.S.A and Spain to determine the exchange rate between Turkey and Spain. Data are taken from the Federal Statistical Office of U.S.A. Again all values are equalized to 100 in December 1991. This gives us that the SREER is 100 in December 1991.

IV. Results

The effect of SREER changes on the share price changes is investigated by using two-factor model that was explained in section 4 for the period of April 1992-September 2001. The results are presented in Table 1.

The coefficient of β_1 , which shows the relationship between security price changes and stock market index changes, is positive and statistically significant for all of the cases at 1% confidence level. They are close to unity. The highest coefficient is 1.08 and the smallest coefficient is 0.66.

β_2 , which shows the relationship between asset returns and SREER changes, is negative except for 2 cases. This means that a change of RER will affect companies negatively. When we check t-statistics, we realize that only 3 cases are statistically significant at 5% confidence level. The value of R^2 lies between 0.23-0.65 and these values generally come from the stock market index changes. D.W. statistics generally report no first order serial autocorrelation.

⁷ U.S. 30.4%, U.K. 15.3%, Italy 15.2%, France 12.6%, Netherlands 8.7%, Belgium 5.7%, Spain 3.8 %, Denmark 3.1%, Switzerland 2.2%, Sweden 2.1% and Norway 1%. Germany, the biggest the trade partner of Turkey is not included in the analysis because of unavailability of continuous data. Selected countries' volume on textile industry is around 50%.

⁸ Data for Italy are taken from two parts, 1990.12-1998.07 and 1998.07-2001.09, and they are combined.

Table 1: The Effect of SREER Changes on the Asset Returns
($R_{i,t} = \alpha_i + \beta_1 R_{m,t} + \beta_2 S_t + \varepsilon_{i,t}$)

Firms			R _m		S		R ²	D.W.	F- Test
	α_i	t-test	β_1	t-test	β_2	t-test			
-							-	-	-
Portfolio	0,80	0,69	0,86	14,29*	-0,66	-2,28*	0,65	2,03	104,52 (0,00)
Akal	0,72	0,45	1,08	13,25*	-0,46	-1,17	0,62	2,00	93,06 (0,00)
Altın	-0,61	-0,32	1,09	11,26*	-0,26	-0,55	0,53	2,35	63,58 (0,00)
Derimod	5,17	1,77**	0,64	4,27*	-0,81	-1,12	0,15	1,98	9,72 (0,00)
Kordsa	0,61	0,44	1,02	14,23*	0,51	1,46	0,65	1,92	102,5 (0,00)
Lüks	3,95	1,28	0,83	5,20*	-1,99	-2,56*	0,23	1,72	16,74 (0,00)
Okan	0,55	0,23	1,04	8,40*	-0,78	-1,30	0,39	2,11	36,05 (0,00)
Sönmez	2,35	0,92	0,80	6,12*	0,13	0,21	0,25	2,24	18,77 (0,00)
Yünsa	0,51	0,29	0,87	9,73*	-0,96	-2,21*	0,47	2,18	49,66 (0,00)

We test this effect also using nominal effective exchange rates instead of SREER. The results are documented in Table 2. Only 3 cases are statistically significant at 10 % level. When we compare Table 1 and Table 2 together, there are no radical changes in results, but Table 1's results show more effect of exposures than Table 2. This is what the theory expects: only real changes affect the value of the firm.

Table 2: The Effect of Nominal Effective Exchange Rate Changes on the Asset Returns
($R_{i,t} = \alpha_i + \beta_1 R_{m,t} + \beta_2 S_t + \varepsilon_{i,t}$)

Firms			R _m		S		R ²	D.W.	F-Test
	α_i	t-test	β_1	t-test	β_2	t-test			
-							-	-	-
Portfolio	2,18	1,52	0,86	14,19	-0,31	-1,80**	0,64	1,95	101,81 (0,00)
Akal	1,06	0,54	1,08	13,17	-0,08	-0,37	0,61	1,99	63,80 (0,00)
Altınyıldız	0,28	0,12	1,09	11,28	-0,19	-0,71	0,53	2,34	63,80 (0,00)
Derimod	7,17	2,02*	0,64	4,28	-0,45	-1,07	0,14	1,98	9,66 (0,00)
Kordsa	-1,29	-0,76	1,02	14,32	0,41	2,04*	0,65	1,95	105,37 (0,00)
Lüks	6,90	1,78**	0,83	5,12	-0,68	-1,48	0,20	1,64	14,05 (0,00)
Okan	2,98	1,01	1,04	8,44	-0,53	-1,51	0,39	2,09	36,54 (0,00)
Sönmez	1,46	0,46	0,80	6,11	0,18	0,50	0,25	2,23	18,91 (0,00)
Yünsa	2,18	1,52	0,86	14,19	-0,31	-1,80**	0,64	1,95	101,81 (0,00)

We exclude the stock market index and use only SREER changes as the explanatory variable. The results are presented in Table 3 and only 1 case is significant at the 5 % level and R² values are close to zero.

Table 3: The Effect of SREER Changes on the Asset Returns
($R_{i,t} = \alpha_i + \beta_1 S_t + \varepsilon_{i,t}$)

Firms			S		R ²	D.W.	F- Test
	α_i	t-test	β_1	t-test			
-					-	-	-
Portfolio	6,23	3,37	-0,63	-1,29	0,01	1,67	1,68 (0,19)
Akal	7,58	3,15	-0,43	-0,67	0,00	1,78	0,45 (0,50)
Altınyıldız	6,22	2,42	-0,22	-0,32	0,00	1,82	0,10 (0,74)
Derimod	9,15	3,12	-0,79	-1,01	0,00	1,83	1,03 (0,31)
Kordsa	7,10	3,21	0,54	0,92	0,00	1,71	0,86 (0,35)
Lüks	9,21	2,83	-1,96	-2,27*	0,04	1,63	5,16 (0,02)
Okan	7,13	2,47	-0,75	-0,97	0,00	2,04	0,95 (0,33)
Sönmez	7,46	2,68	0,16	0,22	0,00	2,08	0,05 (0,82)
Yünsa	6,02	2,70	-0,93	-1,58	0,02	1,87	2,50 (0,11)

Three models we have examined so far seem are not successful explaining the exchange rate exposure. These results are not surprising when we compare our results with the results of previous studies. Our results and results from similar studies in the literature fail to capture the exposure, which is very clear at the theoretical level, empirically. Jorion (1990) model, a generally accepted model, is correct academically but fails to explore this effect. At this stage, one should attempt to change variables instead of changing the model empirically.

Financial markets work with forecasting the future. Our work and most of the previous works usually investigate the contemporaneous relationship between exchange rate changes and security price changes. In order to test this relationship, one needs domestic and foreign inflation rates derived from price indices when constructing a real effective exchange rate index. The related term's inflation rates are usually released one period later. This means that the current return of securities is regressed with the past return of exchange rates in which a conflict arises with the Efficient Market Hypothesis. In other words, the source of the failure of the models' not capturing exposure may be due to a timing problem among variables.

Another idea might be that the investors make forecasts about next period's exchange rates and incorporate their beliefs into the security prices in the current period. This time, the contemporaneous relationship between exchange rates and security prices will be minimum since the effect is already incorporated into the stock prices.

We propose a modification in Jorion (1990) model with these motivations. We try to explain the current period security price changes with the next period's exchange rate changes. The model can be written as

$$R_{i,t} = \alpha_i + \beta_1 S_{t+1} + \varepsilon_{i,t}$$

where S_{t+1} stands for one period ahead SREER change. The results of this model are documented in Table 4. The results show a serious exposure compared to Table 3. The coefficients are negative and 6 cases are statistically significant at 5%, 1 case at 10%. R^2 values are on average 4 % level, which are not high. But when we compare Donnelly and Sheey (1995) and Bartov and Bodnar (1994), we see that these values are quite significant for this kind of study.

Table 4: The Effect of One Period Ledged SREER Rate Changes on the Asset Returns ($R_{i,t} = \alpha_i + \beta_1 S_{t+1} + \varepsilon_{i,t}$)

Firms			S_{t+1}		R^2	D.W.	F- Test
-	α_i	t-test	β_1	t-test	-	-	-
Portfolio	6,44	3,63	-1,46	-3,08*	0,07	1,67	9,53 (0,00)
Akal	8,05	3,48	-1,78	-2,90*	0,07	1,81	8,43 (0,00)
Altunyıldız	6,70	2,67	-1,48	-2,22*	0,04	1,86	4,93 (0,00)
Derimod	9,03	3,05	-1,45	-1,84**	0,02	1,75	3,38 (0,00)
Kordsa	7,83	3,64	-1,15	-2,01*	0,03	1,75	4,08 (0,00)
Lüks	9,42	2,89	-1,10	-1,27	0,01	1,65	1,63 (0,20)
Okan	7,61	2,73	-2,01	-2,71*	0,06	2,03	7,35 (0,00)
Sönmez	8,11	2,98	-1,17	-1,61	0,02	2,13	2,61 (0,10)
Yünsa	6,44	2,96	-1,47	-2,55*	0,05	1,88	6,52 (0,00)

The negative coefficients present a dilemma for textile industry known as an exporter industry. Expected sign is positive because a devaluation of RER improves the competitiveness of this industry. In order to overcome this dilemma, we have also investigated annual reports and income statements of these companies. It seems that these companies have both exporter and importer characteristics. For example, the ratio of imported materials to cost of goods sold is between 13 % and 79 %⁹. On the other hand, the ratio of overseas sales to total sales lies between 2 % and 82 %. This indicates that a devaluation is expected to increase these firms' sales and hence an increase in terms of domestic currency. However, devaluation brings an increase in costs in terms of domestic currency. Therefore, it is not surprising to find significant and negative values.

V. Conclusions

Our work is organized by using SREER. Therefore, it is quite different from the previous works as they usually have used general effective exchange rates. We also analyze not only the industry level but also the firm level. On the other hand, we use nominal effective exchange rates as well as the SREER.

⁹ These values are obtained from the annual reports and income statements and show the average values between 1992 and 2001.

In the first part of this study, the classical model of exposure effect, Jorion (1990) is used with real and nominal exchange rates. We do not capture a significant exposure like most of the previous empirical works. We just may note that the real exchange rate changes are more important than nominal exchange rate changes for investors and this is consistent with the theory as it reveals that only real changes affect the value of the firm and nominal rates are only exchange rates between currencies.

These results are not enough in order to present the exposure effect. Some of the previous works use the lagged exchange rate changes as the explanatory variable. In this study, we propose leaded values instead of lagged values. The results of the lead model imply a significant negative effect of the exchange rate changes. Some previous works find a significant effect of the lagged model. Ayarslan (1992) reports that investors need a time lag in order to see the real effect of 1971 and 1973 devaluations. Ang and Ghallab (1976) assert the same idea. Bartov and Bodnar (1994) support the lagged effect with a different explanation that the investors are able to analyze the effect of exchange rate changes but they do not tend to use this data. Moreover, Jorion (1991) says that investors do not consider the current changes or lagged changes when they decide to make an investment. None of the above or other works mention the leaded model, to best of our knowledge. Therefore, this work is quite different from the previous works.

The results of this study indicate a serious exchange rate exposure for the textile industry. One should emphasize that exchange rate exposure is not only of accounting types of exposures but also of operational exposure. This exposure exists unavoidably and it will continue to exist unless firms develop new strategic approaches to manage this risk.

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MUDARABA-VENTURE CAPITAL CLOSED-END MUTUAL FUNDS AND MUDARABA-VENTURE CAPITAL OPEN-END MUTUAL FUNDS

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Abstract

The important part of this study attempts to explain that both venture capital and interest-free financing are based on similar ground, if not the same. Two new models called Mudaraba-Venture Capital Closed-End Mutual Funds and Mudaraba-Venture Capital Open-End Mutual Funds, based on both the similarities and the needs of financial innovation in the interest-free financing system, are detailed. It is believed that the development of these two models could make some improvements not only in the interest-free financing system but also in the venture capital, the entrepreneurial finance and the capital markets.

I. Introduction

In the contemporary world, it has become much more difficult to see the developments of institutions and products due to technological speed. Therefore, today's institutional organizations should be built in such a flexible way that such developments could be met.

Today's world economy's structural features are much more different from those of the beginning of the Islamic era. Before Islam, business contracts were very simple meeting the needs of those days. After the acceptance of Islam, those contracts were kept in use due to the consideration that such contracts were also fit to the Islamic thoughts. Furthermore, without having any important changes in those days' institutions and instruments of such contracts, those institutions and instruments have also been tried to be used in today's global economy. Recently it has been criticized sharply that interest-free financing applications are very similar to those of conventional banking system. The narrow frame of the current applications of the interest-free financing system is seen as a main reason of that criticism. In the Islamic World, however, there has been an evolution towards business contracts as

approaches for modern financing instruments in essence commensurate with Islamic teaching. In the Islamic Law, on the contrary to the common beliefs that there is enough room for new financing techniques and institutions.

The macroeconomic management that exists today is very much different from the environment of some 1500 years ago when Islam came into existence. Central monetary and fiscal arrangements were non-existent in the sense that we know today. The present environment wherein fiscal, monetary, and legal infrastructure bears extensively on market processes hardly provides a semblance to the early days of Islam (Iqbal, 2001).

The classical books of the Islamic Law were written in an environment where the large scale commercial enterprises were not in vogue and the commercial activities were not so complex as they are today. Therefore, they did not generally dwell upon the question of such a running business ([www.failaka.com / Library / Articles / Usmani % 20 _ % 20 Modes % 20 of % 20 Finance.pdf](http://www.failaka.com/Library/Articles/Usmani%20-%20Modes%20of%20Finance.pdf), 2004).

The legal form of Islamic business enterprises or contracts shed light on how capital is raised, how labor is employed, how factors are remunerated, who makes decisions, and who bears the risk of failure. Those types of business contracts and organisations which were in use before and during the time of the Prophet Muhammad who did not prohibit contracts which are accepted as legal forms of Islamic enterprises or contracts. Therefore, the Islamic Law provides various modes of finance or business contracts each of which has its own distinctive features and utilisation modalities (Sarker, 1999).

It is well known from the literature of Islamic economics that raising and mobilising financial resources in Islamic economy must be guided by the interest-free instruments. The Islamic law invokes an extensively participatory form of profit-sharing system that in turn can replace interest-based financial instruments. Such instruments are traditionally termed as a profit sharing, called *mudaraba*, and equity participation with both profit and loss sharing, called "*musharaka*" (Choudhury, 2001).

Mudaraba and *musharaka* are emphasized greatly as a proper modes of financing in Islamic economy. However, recent applications show that little attention has been given to them. Islamic banks are currently criticized on the ground that their operations are almost similar to those of interest based banks (Choudhury, 2001; Çizakça, 1993; Dar and Presley, 2000; Khan, 1999; Henry, 2001).

Interests in the financial contracts compatible with the Islamic Law have renewed during the past three decades. In contemporary world, there are, consequently, various financial institutions offering financial services. A capital market is also emerging and regulatory frameworks are being developed. Thus the feasibility of providing financial services in compliance with the Islamic Law is now being widely recognized (Bendjilali, 2002).

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However, the current available literature suggests that there has been a lack of progress in innovating financial techniques for interest-free banks since those initial ideas were first put into practice (Noman, 2002).

In the first part of the study, the needs of financial innovation in the interest-free financing are emphasized. Due to those needs, mudaraba and musharaka are transferred into a more integrated financing instrument, basically called mudaraba. Thus, we have produced a functional instrument meeting today's business needs. Mudaraba technique in the interest-free financing is essentially venture capital. The similarities between mudaraba and venture capital and between mudaraba and mutual funds were pinned down by summarizing related literature. This study ends with the details of two new models called mudaraba-venture capital closed-end mutual funds and mudaraba-venture capital open-end mutual funds.

II. The Reasons for the Lack of Mudaraba and Musharaka Applications in the Interest-Free Financing System

Current applications of the interest-free financing is a cry far from mudaraba and musharaka models for the following reasons:

1. Interest-free banks which are universal banks do not have proper corporate organizational structure that suits their commercial and investments banking activities (Karim, 2001; Khan, 2002).

2. Pro-Islamic forms of mudaraba and musharaka are not suitable for raising and mobilising funds (Choudhury, 2001).

3. There is a liquidity problem occurs from raising short-term funds and mobilising them long-term (Çizakça, 1993).

4. In the profit and loss sharing contracts, transferring ownership is a quite tough issue for the the fund owners (Dar and Presly, 2000).

5. Secondary markets for trading in Islamic financial instruments, particularly mudaraba and musharaka, are non-existent. Consequently, they have so far failed to effectively mobilise financial resources (Çizakça, 1993; Dar and Presley, 2000).

6. Agency problems are more severe in mudaraba and musharaka than in conventional banks and non-bank financial institutions (Presley, 1998).

7. In mudaraba and musharaka, uncertainty of the rate of return on capital is very high due to asymmetric information which creates moral hazard and adverse selection problem. On the other hand, the rate of return is fixed and pre-determined in other modes of financial contracts (Sarker, 1999; Iqbal, 2001).

8. Problems have arisen because of the restrictive and dichotomous ways in which these two instruments are used causing the non-participatory nature of sharing profits through them as agents remain sleeping partnership between being owners of capital who are not entrepreneurs, and workers who provide effort in producing profits. Therefore, interest-free banks tend to use "murabaha"* financing technique as a riskless and an easy way (Al-Deehani, 1998; Choudhury, 2001; Dar and Presley, 2000; Sarker, 1999).

9. Unlike conventional banks, Islamic banks offer profit and loss sharing accounts, among others, which do not guarantee a fixed certain return on investment deposits. This leads to a reluctance of deposit holders, who have no representation in the organization, to use profit and loss sharing accounts (Dar and Presley, 2000; Obaidullah, 20004; Al-Deehani, 1999).

10. A competitive pressure on the interest-free banks from the conventional banks to give a profit rate as much as interest rate given to saving accounts by conventional banks. Murabaha is seen as a mean of reaching this target (Çizakça, 1993).

11. Opportunistic entrepreneurial typology is not developed in those societies. On the other hand, artisan entrepreneurial typology is not uncommon (Gafoor, 2004).

12. The function of the intermediary is very important in mudaraba and musharaka financing. Intermediation is responsible for identifying good projects for financing as well as for monitoring their progress and ensuring proper accounting and auditing. It is here that mudaraba and musharaka as participatory financing differ from conventional financing practices. This allows the intermediary to have true picture of the health of the projects at all times. The intermediary can then take any preventive or corrective action. They must have an entrepreneur's natural talent to spot profitable projects and to avoid bad ones, and should develop it into a professional tool. The intermediary's staff will have to be carefully picked and trained to bring out inherent entrepreneurial talent. However, on the main, interest-free banking lacks those kind of human resources (Akın, 1986; Çizakça, 1993; Gafoor, 2004).

III. The Needs of Financial Innovation in the Interest-Free Financing System

The views of the schools of the Islamic Law on mudaraba and musharaka differ from each other. Beside, Islamic jurists and academicians have also different point of views on mudaraba and musharaka (Choudhury, 2001; Gafoor, 2004; Sarker, 1999; Usmani, 2004; [www.failaka.com / Library / Articles / Usmani %20 - %20 Modes %20 of %20 Finance.pdf](http://www.failaka.com/Library/Articles/Usmani%20-%20Modes%20of%20Finance.pdf), 2004; <http://islamicworld.net/economic/mudarabah/mudarabah.html>, 2004). Nabil

* Murabaha is a short-term financing technique; on the similar ground, interest-free banks and conventional banks reveal same features.

A. Salah gives some details about mudaraba and musharaka including those different news on the subject in his book “Unlawful Gain and Legitimate Profit in Islamic Law” (Gafoor, 2004).

The interest-free financial movement has been attempting to adapt Islamic financial instruments originally designed for pre-industrial trade and handicrafts period to a post-industrial global economy (Henry, 2001). Thus, the evolution of business contracts has been in progress in Islamic world. These developments are in compliance with Islamic teaching and towards modern financial instruments (Çizakça, 1999). However, Iqbal et al have identified lack of financial engineering and innovation as the topmost of the major challenges facing contemporary interest-free banks. The authors define the term financial engineering in its broad sense to include development of new financial products in all areas. They regard financial engineering as an “art of designing financial products” (Noman, 2002).

One may suppose that a very small room is left for financial innovation in the Islamic finance because of the strict condition of the Islamic Law compliance. In response to such claims, it could be suggested that there is enough room for financial innovation with the framework of the fundamental Islamic Law principle of “muamalat”. This principle, which is clearly defined in jurisprudence, relates to human dealings and contracts along with issues regarding human relations. It simply states that everything is permitted unless clearly prohibited. The Islamic Law, in fact, is flexible within its ethical and juristic framework to accommodate new financing modes and institutions. It is, therefore, time to address the issue of developing innovative modes and techniques within interest-free banking framework (Al-Rifai and Khan, 2004; Noman, 2002).

A need is always felt to synthesise more instruments to broaden and deepen financial intermediation and investment prospects. Mudaraba financing could be structured in a variety of forms to best suits contemporary business needs. Concerning of period and business environment, business contracts could be shaped in a variety of ways in the light of fundamentals of the Islamic Law (Iqbal, 2001; Khan, 2002). According to Choudbury (2001), a methodology should be developed to manifest the desired goal of co-operative participation in technical understanding of mudaraba and musharaka methods. An Islamic transformation of such instruments in the light of the Islamic Law is thus required (Choudhury, 2001).

There is clearly a need to create a greater variety of Islamic financial products. By utilising the mudaraba structure, almost any permissible business activity can be entered into. The mudarib can be any institution capable of conducting such business, whether it be an interest-free bank, a Western commercial bank, or a specialised investment company established for a particular purpose (Stewart, 1995).

Dramatic changes across the globe have compelled Islamic finance to reinvent itself. Globalisation throws a lot of challenges at Islamic banking. It calls for innovation and reinvention. It is time for Islamic finance to look beyond such traditional modes. Some of these modes represent pre-Islamic practices, which were subsequently adapted only because they were in conformity with the principles of Islam. There is certainly a need to devise modern financial instruments that will conform fully to the Islamic Law (http://www.mier.org.my/mierscope/drariff31_8_2002.pdf, 2004).

IV. Mudaraba Financing and Venture Capital

4.1. Conceptual Frame

Certain attempts have been made to identify both venture capital and mudaraba financing. In this study; bearing in mind the needs of financial innovation approaches in the interest-free financial system, mudaraba and musharaka* are combined with a new and complementary financing technique which is called solely mudaraba. The very similar infrastructure between venture capital and mudaraba financing will come to surface by differentiating both venture capital and mudaraba financings from other financing techniques in the financial system as a whole. The common features of venture capital and mudaraba financing will be listed as following** :

* The difference between musharaka and mudaraba can be summarized in the following points (Usmani, 2004):

1. The investment in musharaka comes from all the partners, while in mudaraba, investment is the sole responsibility of rabb-ul-mal.
2. In musharaka, all the partners can participate in the management of the business and can work for it, while in mudaraba, the rebb-ul-mal has no right to participate in the management which is carried out by the mudarib only.
3. In musharaka all the partners share the loss to the extent of the ratio of their investment while in mudaraba the loss, if any, is suffered by the rabb-ul-mal only, because the mudarib does not invest anything.
4. The liability of the partners in musharaka is normally unlimited. Contrary to this is the case of mudaraba. Here is the liability of rabb-ul-mal is limited to his investment.
5. In musharaka, as soon as the partners mix up their capital in a joint pool, all the assets of the musaraka become jointly owned by all of them according to the proportion of their respective investment. Therefore, each one of them can benefit from the appreciation in the value of the assets, even if the profit has not accrued through sales. The case of mudaraba is different. Here all the goods purchased by the mudarib are solely owned by the rabb-ul-mal, and the mudarib can earn his share in the profit only in case he sells the goods profitably. Therefore, he is not entitled to claim his share in the assets themselves, even if their value has increased.

** With respect to the range of references to be used in this section, it is found to be appropriate to avoid excessive list of sources.

Venture Capital (VC)	Mudaraba Financing (MF)
<ul style="list-style-type: none"> VC technique is based on profit sharing and loss carry. There is no connection between VC and interest-based financing. 	<ul style="list-style-type: none"> MF technique is based on profit sharing and loss carry. MF avoids interest-based financial contracts.
<ul style="list-style-type: none"> VC is a kind of equity capital for users. 	<ul style="list-style-type: none"> Mudaraba finance is a kind of equity capital for users.
<ul style="list-style-type: none"> Users of venture capital are not responsible to pay the capital back. 	<ul style="list-style-type: none"> It is not the kind of finance that should be paid back by users.
<ul style="list-style-type: none"> Capital users do not give any guarantee, instead the project itself is taken as a guarantee. 	<ul style="list-style-type: none"> Capital users do not give any guarantee, instead the project itself is taken as a guarantee.
<p>It is the usual case that conventional banks do not supply finance to small and medium enterprises. On the other hand, VC fills this gap for the small and medium size enterprises and thus it becomes a tool for entrepreneurial development.</p>	<ul style="list-style-type: none"> Conventional banks are usually reluctant to supply capital to small and medium size enterprises. On the contrary, MF fills this gap for the small and medium size enterprises and thus it is an instrument for entrepreneurial development.
<ul style="list-style-type: none"> VC system comprises three main parts including capital owners, VC companies and entrepreneurs. 	<ul style="list-style-type: none"> Rebbül-mal, interest-free financial institution and amil or mudarib that constitute MF.
<p>Investors ← → Rebbül-Mal Venture Capitalists ← → Interest-free financial institution Entrepreneurs ← → Amil or Mudarib</p>	
<ul style="list-style-type: none"> Investors are persons and/or a variety of institutions that pool VC fund. 	<ul style="list-style-type: none"> Rebbül-mal, is persons and/or a variety of institutions that pool interest-free financial institution's mudaraba fund.

<ul style="list-style-type: none"> Entrepreneurs are the owners of small and medium sized enterprises which are young, innovative, and being unable to issue shares in public markets. Those enterprises carry a great potential for growth and development with a new product and a new method. 	<ul style="list-style-type: none"> Amil or mudarib is the owner of new and small and medium sized enterprises which carry a great potential for profit and growth with a high absorptive capacity for new technology.
<ul style="list-style-type: none"> Venture capitalist who manages the venture capital fund is an agent for investors. Venture capitalist's know-how consists of selecting projects, structuring and pricing deal and adding hands-on management, and sectors and stages. 	<ul style="list-style-type: none"> The interest-free financial institution which manages Mudaraba fund is a kind of investment bank that has a know-how chain in selecting projects, structuring and pricing deal and adding hands-on management.
<ul style="list-style-type: none"> Venture capital fund is pooled by a large number of investors. 	<ul style="list-style-type: none"> Mudaraba fund is pooled by a large number of investors.
<ul style="list-style-type: none"> Investors' investment in venture capital fund is not a joint partnership but it is a capital investment. 	<ul style="list-style-type: none"> Investors' investment in mudaraba fund is not a joint-venture but it is only a capital investment.
<ul style="list-style-type: none"> Venture Capital fund's profit is shared as a percentage, not as a fixed amount, between investors and venture capitalist and between venture capitalist and entrepreneurs. 	<ul style="list-style-type: none"> The most prevailing feature of MF is that profit is shared as a percentage not as a fixed amount, between investors and interest - free financial institution and between interest - free financial institution and entrepreneurs
<ul style="list-style-type: none"> Profit sharing rate is predetermined; however, profit share amount depends on the entrepreneurs's project profitability. 	<ul style="list-style-type: none"> Profit sharing rate is predetermined; however, profit share amount depends on the profitability of the entrepreneurs's project.
<ul style="list-style-type: none"> A venture capital fund splits profits on a prenegotiated basis. A fund's profits are generally split with 20 % of net profits going to the fund's management and the remaining 80 % to the investors in proportion to their contributed capital. 	<ul style="list-style-type: none"> A mudaraba fund splits profits on a prenegotiated basis. A fund's profits are generally split with 20 % of net profits going to the fund's management and the remaining 80 % to the investors in proportion to their contributed capital.

<ul style="list-style-type: none"> • Profit realization occurs usually by initial public offering. 	<ul style="list-style-type: none"> • Selling and buying mudaraba shares in capital markets are more convenient due to the infrastructure of mudaraba financing.
<ul style="list-style-type: none"> • Venture capital finance demands a necessity that the shares of small and medium sized enterprises can be traded in capital markets. 	<ul style="list-style-type: none"> • MF demands a necessity that capital markets built in such a way that stocks of small and medium sized enterprises can be traded.
<ul style="list-style-type: none"> • Financial losses is borne by investors while entrepreneur's loss by his labor. 	<ul style="list-style-type: none"> • Financial losses is borne by investors while entrepreneur's loss by his labor.
<ul style="list-style-type: none"> • In a venture capital partnership, investor carries a limited liability while venture capitalist carries full liability. 	<ul style="list-style-type: none"> • Investors carry limited liability as of their capital in mudaraba fund while the interest-free financial institutions carry full responsibility.
<ul style="list-style-type: none"> • Entrepreneurs can also put their money in the venture besides venture capital. Thus entrepreneurs' liability becomes as much as their shares in the venture. 	<ul style="list-style-type: none"> • Entrepreneurs can also put their money into the venture besides mudaraba capital. Thus entrepreneurs' liability becomes as much as their shares in the venture.
<ul style="list-style-type: none"> • Some venture capitalists also finance entrepreneurs with convertible bonds and warrants. 	<ul style="list-style-type: none"> • There is no sense in debt financing as regarded misconduct of the Islamic Law.
<ul style="list-style-type: none"> • Venture capital fund's investment portfolio consist of different stages and sectors of ventures. Thus, the risk is minimized. 	<ul style="list-style-type: none"> • To avoid big losses, investment portfolio is formed from different stages and sectors of ventures.
<ul style="list-style-type: none"> • Venture capital fund's risk is limited to the amount of capital supplied to each venture. However, the prospect of return is endless. 	<ul style="list-style-type: none"> • The interest - free financial institution's risk is limited to the amount of capital supplied to each venture. However, the prospect of return is endless.
<ul style="list-style-type: none"> • Conventional bank credit evaluation techniques are not important in selecting ventures to finance. Instead, the entrepreneur himself/herself and his/her product idea are the criterions to evaluate ventures. 	<ul style="list-style-type: none"> • The most important criterion in selecting ventures to finance is not conventional criterions in credit evaluation techniques such as balance sheet or guarantees, but the entrepreneur himself/herself and the profitability of the project.

<ul style="list-style-type: none"> • Venture capitalist supply entrepreneurs with not only capital but also hands-on management. This is one of the main differences between venture capital and conventional financing techniques. 	<ul style="list-style-type: none"> • The interest-free financial institution in MF does not supply the entrepreneurs with only capital as it is the case for conventional banks. The institution has a very close relationship with the entrepreneur it finances and it supplies hands-on management.
<ul style="list-style-type: none"> • Venture capital type investments require a very close relationships between venture capitalist and entrepreneurs. 	<ul style="list-style-type: none"> • The interest-free financial institution should carry an effective role on monitoring business operations of the firm.
<ul style="list-style-type: none"> • Venture capital sector is characterized by two-tier relationships. Venture capitalist acts as an agent for investors, while he becomes an owner on the prospects of his relations to entrepreneurs. 	<ul style="list-style-type: none"> • Mudaraba financing has a two-tier relationships. The interest-free financial institution is an agent with relation to investors, but an owner on the prospects of his relation to entrepreneurs.
<ul style="list-style-type: none"> • Venture Capital sector is characterized with information asymetry. The information asymetry between investors and venture capitalist and between venture capitalist and entrepreneurs are severe. 	<ul style="list-style-type: none"> • Information asymetry is very severe in mudaraba financing. The information asymetry between investors and the interest-free financial institution and between the interest-free financial institution and entrepreneurs makes agency problems more severe.
<ul style="list-style-type: none"> • Reputational capital is very important in venture capital sector. 	<ul style="list-style-type: none"> • Reputational capital is very important in mudaraba financing.

A definition for mudaraba financing and venture capital can be made in the light of the above features:

Mudaraba financing is an equity type finance that is given by an interest-free financial institution with hands-on management with the profit and loss base to any venture small and medium sized, which has a great potential of absorptive capacity for new technology and growth. Whereas, venture capital is an equity type of finance that is given by the venture capital companies to any venture that is small and medium sized, which are usually unable to obtain credit from the conventional banks and which has a new product or method ideas and has a great potential of absorptive capacity for new technology and growth.

4.2. Venture Capital and Mudaraba Financing: A Literature Review

In the absence of the interest, financing entrepreneurs attracts attention. A recent issue is to supply venture capital for small and medium sized enterprises. Mudaraba and Musharaka is a kind of finance for small sized enterprises and long-term projects (Cizakça, 1999).

Al-suwailem (2004) explained that supplying capital to small and medium sized enterprises can be based on musharaka. BenDjilali and Khan (2002) detailed an Islamic venture capital model by taking both the importance of exit mechanism of venture capital investments and the unavailability of capital markets into consideration.

Some of the more “purist” economists argue that the distinctively Islamic financial instruments are mudaraba and musharaka, both of which involve profit-sharing. Economists in this group take mudaraba and musharaka as venture capital. The purists criticize existing Islamic financial institutions as deviating from an Islamic ideal of venture capitalism. They note that Islamic banks currently allocate less than 10 percent of their credit facilities or investments to these distinctively Islamic profit-sharing instruments (Henry, 2000).

Cizakca (1993) states that venture capital originates from mudaraba and musharaka. He claimed that mudaraba and musharaka is, in fact, venture capital. Cizakca compared venture capital system to the interest-free financial system on the aspect of infrastructural features. He emphasized very much similarity between these two financial systems. He also emphasized this occurrence by no means of coincidence but its root lies on the historical base. Moreover, it is mentioned that venture capital companies and interest-free financial institutions work according to same principles and interest-free financial institutions become as venture capital companies as long as they use mudaraba financing technique. Cizakca (1993) elaborated his model that how the interest-free financial institutions can indicate some features as venture capital companies. Thus those institutions’ activities will consist of mainly mudaraba and musharaka and less likely murabaha, in comparison to.

Mudaraba, a major Islamic mode of financing, provides limited control rights to shareholders, thus creating an imbalance in the governance structure of “profit and loss sharing” as proposed in Islamic banking and finance. This is one of the prime reasons for lack of profit and loss sharing on the assets side of Islamic banks. Thus a consistent and complimentary management and control system is essential for steady functioning of Islamic finance (Dar and Presley, 2000).

Venture capital is a modern example of mudaraba and this Western version of mudaraba is in essence commensurate with Islamic teachings and provides a balance between managers and financiers in terms of control of business decisions (Dar and Presley 2000). They made suggestions as to how venture capital can be developed in an Islamic setting, without fear of the system collapsing. They propose an organisational structure based on venture

capital, called venture capital organisation, in which interest-free financial institutions establish venture capital funds. For monitoring investments, interest-free financial institutions should jointly set up a monitoring agency a major task of which would be collecting data and other relevant information about the firms in which interest-free financial institutions have stake. Besides, individual interest-free financial institution may also create separate monitoring sections in their credit departments. The model has detailed the key issues involved in relationship between investor and interest-free financial institution and between interest-free financial institution and entrepreneurs (Dar and Presley, 2000).

The well-known modes of raising and mobilising venture capital in Islam known as mudaraba and musharaka. It is shown in his paper that the proper instrument for raising and mobilising Islamic venture capital is centrally premised on a single unified or interactive principle between mudaraba and musharaka. This would be capable of bringing about extensively cooperative and coordinated participation among agents, firms and sectors in view of the socio-economic relations that interactions generate and by the increase in entitlement, empowerment and ownership that results. In this context, it may be possible to retain the integrated mudaraba and musaraka terminology only if this is understood as a unified financial instrument of extensively cooperative and coordinated participation (Choudhury, 2001).

Taking today’s economic environment into consideration, Gafoor (2004) explained a system developed to address this special concern of Muslims. It is based on the ancient concept of mudaraba and called “participatory financing”. His model was detailed as if it were venture capital. In essence, participatory financing combines features of time deposits, business organisations (partnerships, shareholder companies and holding companies), and unit trust on the one hand, and equity capital and commercial bank loans and advances on the other. It makes use of well-known rules and techniques of financing, company laws and accounting procedures. That makes it easy to implement, but the combination of all these in one single system within an entrepreneurial environment is a new formulation. The implementation of this system requires the cultivation of new attitudes on the part of all the participations. The function of the intermediary is very important. The intermediary is a separate physical and legal entity, independent of both the investors and the entrepreneurs. He is responsible for identifying good projects for financing as well as for monitoring their progress. It requires a new culture, aculture of entrepreneur-financiers and of professionally run partnership companies. Funds obtained by selling new partipatory financing share to a variety of investors to be used as venture capital for new projects. The system emphasized the features that the intermediaries and entrepreneurs should carry (Gafoor, 2004).

Shariah scholars are in agreement that venture financing at the early stages of a company's life is a classic form of mudaraba financing, not only because of the relationship between the provider of capital and the user, but also because investors can stipulate how they want their funds used. It is time now to look at how this can fit into a sharia compliant structure. There are a few basic questions that need to be answered to determine this. First, is venture capital an acceptable investment vehicle for Islamic investors? If so, then the next question would be whether or not the structure mentioned above is shariah compliant (A-Rifai and Khna, 2004).

A few Islamic financial institutions have been involved in venture capital deals. Their approach, however, has been more as a provider of funds rather than a lead investor. Such institutions tend to rely on the knowledge and expertise of other and would simply "piggyback" on the transaction. The interest-free financial institutions are slowly realizing the potential of this industry (Al-Rifai and Khan, 2004).

Private equity and venture capital are perfectly acceptable modes of finance and investment provided they meet certain Islamic guidelines. Even though some financial instruments used in conventional venture capital structures are not compliant with sharia guidelines, there are alternatives already available and used on the conventional side that can immediately be used by the Islamic venture capitalist. Thus, a simple and ready to use solution is available for Islamic investors. Islamic investors can pool their resources into a venture capital fund to seek out lucrative investments, while at the same time, minimize their risk by spreading it across a diversified investment portfolio of companies (Al-Rifai and Khan, 2004).

Qureshi (1995) considered of specific items of the agenda for a new strategy of equity financing by Islamic Development Bank at the conceptual level. He insisted that more fundamentally a planned program may be chalked out to design and introduce new instruments of Islamic finance. These could include: Venture capital companies for financing start-up projects and the like. The techniques used by International Finance Corporation, Asian Finance and Investment Corporation and Private Sector Department of Asian Development Bank in this sphere will provide a store house of experience for adoption by Islamic Development Bank when it embarks upon the new strategy for equity financing (Qureshi, 1995).

V. Mudaraba Financing and Mutual Funds

In the interest-free financing literature, it has been stated that there is a great similarity between mudaraba financing and mutual funds.

Mudaraba may be organized in many forms, meeting the needs of today's business environment. A mudaraba may assume the form of a business corporation if its shares are sold to the general public and the financiers form a Board of Directors that formulates a broad-based policy for the operation of the business and makes decisions regarding distribution of

profits among shareholders. The other party, called management, is responsible for the business operations, procurement of raw materials, hiring and firing of labor, marketing of goods, etc. This type of mudaraba appears to be closer to a modern incorporated business. If the creation of a corporation-type mudaraba necessitates establishment of a stock market and speculation, it can not be considered lawful in Islam (Khan, 2004).

Investment accounts of Islamic financial institutions operate in a manner similar to open-end or closed-end mutual funds depending upon whether or not account holders have a right to withdraw (Obaidullah, 2004).

Growth of the interest in the equity-based (or profit loss sharing) modes of financing requires that the ownership rights should be easily transferable or tradeable. Mutuals as prevalent in countries like UK may offer a working example of non-transferable and non-tradable ownership rights (Dar and Presley, 2000).

The mutual fund structure with all of its material aspects is identical to a mudaraba. With minor adjustments to the investment management agreement, a mutual fund structure can easily be tailored to accommodate the specific contractual aspects of a mudaraba which must be present under Islamic law. There is tremendous opportunity to increase the number of Islamic financial products available for performing the different types of financial activities required. There is no problem in establishing these funds in Western regulatory environments. Because of the flexibility that the mutual fund structure allows in terms of defining the business activity of the fund and the way in which it is to be carried out, almost any Islamically structured fund can receive approval and be registered in a Western regulatory environment (Stewart, 1995).

The mudaraba principle is applicable to a range of situations, from a simple local two-person partnership to a multiparty international corporation. A shareholder company works essentially on the mudaraba principle. But the participatory financing scheme envisaged in his article aims at the middle section of this range. It brings in the intermediary, and provides the investors with a unit trust type of investment opportunity (Gafoor, 2004).

Musharaka is a mode of financing which can be securitized easily, especially in the case of big projects where huge amounts are required which a limited number of people cannot afford to subscribe. Every subscriber can be given a musharaka certificate which represents his proportionate ownership in the assets of the musharaka, and after the project is started by acquiring substantial non-liquid assets, these musharaka certificates can be treated as negotiable instruments and can be bought and sold in the secondary market ([www.failaka.com / Library / Articles / Usmani %20 - %20 Modes %20 of %20 Finance.pdf](http://www.failaka.com/Library/Articles/Usmani%20-%20Modes%20of%20Finance.pdf), 2004).

According to Al-Rifai and Khan (2004), it is time to look at how venture capital can fit into Islamic Law compliant structure. A simple and ready to use solution is available but may not be an optimal solution for some Islamic investors. The solution is to use a combination of vesting and covenants along with the issuance of common stock. But vesting and covenants can be easily designed for the Islamic venture capitalist and will avoid costly structuring of untested financial instruments.

A Mudaraba can be formed as a unit trust. It comprises a management company which runs the unit trust and the subscribers or holders of the units (investors). The management company puts in the management expertise and the investors the money (Kadri, 1998).

The Mudarabas promoted in Pakistan were well-researched and seen as a legal entity, based on the modern concept of a unit trust. All Mudarabas are listed on the Karachi Stock Exchange. Mudaraba in Pakistan are for a specific purpose with a limited life, or a perpetual legal entity; and there are multipurpose Mudarabas. The Mudaraba floated was for specific financing. It was like a close-end mutual fund and was wound up after a certain time (Kadri, 1998).

Cizakça (1993) explained in his model that interest-free banks should enter the secondary markets for the transactions of shares of venture capital companies as a solution to the liquidity problem inherent in their accounts. He emphasized the importance of availability of rating agencies of rating venture capital companies. His model is in essence a kind of mutual fund mechanism for interest-free financial institutions' equity type financing activities.

VI. The Venture Capital Spectrum *

The venture capital industry recognizes identifiable stages in corporate development to the extent that most funds specialize in one or more (but rarely all). However, the industry has no standard terminology for describing the different firms in the venture capital market. Interviews with market participants did not reveal enough precision or consistency in the classification of firms to justify a breakdown into categories. Most market participants made a distinction merely between "early-stage" and "later-stage" venture capital. These specialisms are as follows:

1. Early-stage Venture Financings:

- I. Seed or R&D Project Finance;
- II. Start-up Finance;

2. Later-stage Venture Financings:

- I. Expansion Finance;
- II. Mezzanine or Bridge Finance;
- III. Turnarounds;
- IV. Buy-outs.

Early-stage new ventures fit the conventional image of a firm seeking venture capital: They are firms that have a substantial risk of failure because the technology behind their production method or the logic behind their marketing approach has yet to be proved.

Early-stage firms vary somewhat in size, age, and reasons for seeking external capital. The smallest type of venture in this category is the entrepreneur who needs financing to conduct research and development to determine whether a business concept deserves further financing. The concept may involve a new technology or merely a new marketing approach. Financing may be needed to build a prototype, conduct a market survey, or bring together a formal business plan and recruit management.

Early-stage finance is also where the venture capitalists have to adopt a "hands-on" approach for their investments. It is rarely sufficient, in providing equity risk capital for businesses at the seed, start-up or even early development stage, to provide the money and walk away-relying on six-monthly and annual financial reporting. Both to protect the investment from failure and to enhance its progress, the venture capitalist will play an active partner's supporting role to the entrepreneur's "lead". Investors in early-stage ventures recognize that their investments are for the long term and that they may be unable to liquidate them for many years.

Later-stage financing is about funding established business, which have passed through the hazards of early-stage financing. These businesses may be mature but can still have attractive yield and capital growth prospects. They usually have at least a three-year record, are profitable, and have an identifiable market position and a formal organization structure with one or more layers of management below the entrepreneur's top team. Such businesses are generally more stable, and thus lower-risk, than the typical early-stage business. Exceptions are turnaround or recovery situations, where the venture capitalist has to accept a significantly higher degree of risk.

Firms that need later-stage venture funds have less uncertainty associated with the feasibility of their business concept. They have a proven technology and a proven market for their product. Their risk comes less uncertain about the feasibility of their business concepts than the myriad uncertainties that affect all small business. They are typically growing fast and generating profits. Such firms need private equity financing to add capacity or to update their equipment to sustain their fast growth.

Generally, later-stage venture investments are larger than early-stage investments and are held for a shorter term, simply because the firm is closer to being sold to the public or to another firm. Because the risk is generally lower and the liquidity higher, later-stage investments carry somewhat lower required returns than early-stage investments.

6.1. Early-Stage Venture Financings

6.1.1. Seed or R&D Project Finance

Before a product-based business can be established, there is often a lengthy process of research and development (R&D), starting with initial concept. This concept will form the basis of a research project which may then proceed to the development phase prior to commercial application in the form of a corporate entity-usually a limited company. The financial risks mount progressively as the research phase moves into the development phase, where a prototype product is tested prior to commercialisation. The key financial risk is the marketing risk. It is during this phase that external finance is often sought by the inventor/entrepreneur as his own capital is consumed.

Evaluation of seed capital projects is hazardous, and here the venture capitalist's instinctive judgement is called to the fore. Often the project will not result in a working model, let alone a commercial prototype. There may not be an adequate market for the product/service, or others may get there first. There are rarely any assets, by definition no income, a stream of costs whose magnitude is uncertain and a timescale of one-way stretching elasticity. It is probable that the estimated costs and timescale until start-up or commercialisation will at least double or triple, and allowance should be made for this in the financing structure. The entrepreneur may be overtaken by technology, or may not be able to produce at a user-acceptable price. Genuine evidence for the project's potential may not exist.

6.1.2. Start-up Finance

The start-up is widely regarded as the essence of venture capital activity, so much so that many people have used the terms "start-up" and "venture capital" interchangeably. Perhaps the most exciting and risky aspect of venture capital is the launch of a new business, often after a period of R & D. At the start-up stage, the entrepreneur and his product or service are as yet untried, the finance required usually dwarfs his own resources, and the problems he has to overcome to realise even a modest success are manifold.

No all start-ups are of the first-time inventor or "greenfield" variety, so beloved of transatlantic venture capital myth. Many new enterprises are formed by experienced people wishing to launch their own business in an industry they know well. Still other start-ups occur where an existing, generally smaller, company wishes to license new technology from a research source or overseas-based business and does not have adequate financial resources.

With a start-up (unlike R&D projects) there is, or should be, some indication of the potential market for the product or service which forms the basis of the new business.

Start-ups are undoubtedly the most fertile source of the "big winners" of which all venture capitalists dream. This area is also a graveyard of failed projects. The risks are probably higher with start-ups than with seed capital projects, largely because the amounts invested are substantially greater. Start-ups are the most demanding of a venture capitalist's skill, involving continuous management effort.

Early Development Finance: A somewhat more mature type of firm in the early-stage category already has some evidence that production on a commercial scale is feasible and that there is a market for the product. Such firms need financing primarily to establish operating companies, by setting up initial manufacturing and distribution capabilities, so they can sell their product on a commercial scale. Slightly more mature firms may already have basic manufacturing and distribution capabilities but may need to expand them and to finance inventories or receivables. The most mature of the early-stage firms are those that are starting to turn into profits but whose demand for working capital and capital for further expansion is rising faster than their cash flow.

6.2. Later-Stage Venture Financing

Recognisable types of development capital are expansion finance, mezzanine finance, turnaround finance and buy-outs.

6.2.1. Expansion Finance

If the product sells successfully in its initial marketing phase, the entrepreneur will need finance for further expansion of manufacturing or product enhancements and sales capabilities to expand. Even if the company has made a progress, the company is probably still unprofitable, or only marginally profitable. So it probably needs more capital for equipment purchases, inventory, and receivable financing. But, the rapid expansion requires more working capital than can be generated from internal cash flow.

Middle-Market Firms: Over the 1980s, middle-market private firms found increasing opportunities to raise private equity as the market looked beyond pure venture capital investment. These firms differ in a number of ways from firms seeking venture financing. First, they are generally well established, having been founded for decades, rather than years or months, earlier. Second, they are typically much larger than early-stage new ventures and are in most cases larger than later-stage new ventures. Third, they are typically not in high technology sectors, but are more often than not in basic retail and manufacturing industries. Fourth, most have much more stable cash flows and much lower growth rates than firms seeking venture finance, and they are typically profitable. Finally, they typically have a significant asset base to borrow against (such as inventories or receivables) and consequently almost always have access to bank loans.

These firms' reasons for seeking external equity financing are also quite different from those of firms seeking venture capital. Many are family-owned enterprises that have no desire to go public. Such firms generally seek private equity to achieve one of two objectives: to finance an expansion (an acquisition of another firm or the purchase of additional plant and equipment) or to effect a change in ownership or capital structure.

6.2.2. Mezzanine or Bridge Finance

In bridge or mezzanine investment situations, the company may have some idea which form of exit is most likely, and even know the approximate timing, but it still needs more capital to sustain rapid growth in the interim.

Mezzanine financing is commonly referred to as "bridge" financing, or pre-public expansion capital. Mezzanine means that company is between the venture financing stages and the public equity markets. At this stage, a company frequently manufactures and ships a product or sells its services with a reliable degree of success. The company may want to hire its own sales force, expand its product line, expand its research and development efforts, increase its marketing efforts, and broaden its manufacturing capabilities or service capabilities.

The company's management and its operations established a successful track record, so the risk factor has declined significantly. Mezzanine investments are a "quick in and out" for the venture capitalist and tend to be more liquid than investments in other stages.

6.2.3. Turnarounds

Venture capitalists, also occasionally provide funds for turnaround situations, for companies in bankruptcy or with extremely poor equity and cash positions. In many cases, the turnaround company will be a mature business in a traditional industry. Where the business is in a modern sector of industry, it may have lost a market or technological lead and cannot completely fulfil its original growth prospects.

Turnarounds are risky to finance, and in fact, few venture capitalists will even entertain such proposals. This is specialists form of venture capital activity. A turnaround case requires specialist skills. It will probably mean a vigorous renegotiation of the company's borrowing facilities with its bankers, possibly including a creditor's moratorium. Above all, it means management changes. "Hands-on" venture capital management is required with turnarounds, which can last anywhere from six months to several years. When confronted by a potential recovery situation, the venture capitalist must decide quickly whether the business has genuine prospects not simply of returning to health, but also of sustaining profitable growth thereafter.

6.2.4. Buy-Outs

The buy-out involves the creation of independent businesses by separating them from their existing owners, which may be successful or unsuccessful corporations, or family-controlled businesses. A buy-out will involve the existing or a new management team (usually known as a buy-in) and a set of assets which may simply be a trade name or a small group of people.

The fundamental characteristics which differentiate venture buy-outs from mainstream buy-out businesses include complex due diligence and active aftercare. This leads to a requirement in the investor group for venture capital skills to a greater extent than a financial engineering capability-the reverse of the mainstream buy-out business. The importance of correct assessment of product life cycle and technology risks, as well as sustainability of product acceptance by the company's markets, are also key features of venture buy-outs.

As regards the financing constraints on venture buy-outs, these are relatively high-risk investments, with the consequently higher reward requirements being underpinned by consistently low entry prices.

VII. Mudaraba-Venture Capital Closed-End Mutual Funds

Mudaraba-venture capital closed-end mutual funds is a public company which establishes partnerships with entrepreneurial firms. The shares of mudaraba-venture capital closed-end mutual funds will be transacted in the primary and the secondary markets as it is the case for any publicly held corporation. Mudaraba-venture capital closed-end mutual funds is, in essence, an ordinary closed-end mutual funds*; however, mudaraba-venture capital closed-end mutual funds, unlike ordinary ones, is not allowed to use debt financing such as bank credit and bond issuing. Mudaraba-venture capital closed-end mutual funds is also, in fact, a venture capital fund and it works exactly how a venture capital fund works. Any financial institution as well as interest-free banks can establish mudaraba-venture capital closed-end mutual funds.

A variety of mudaraba-venture capital closed-end mutual funds depends on different investment strategies and purposes. Investment strategies and purposes will be written in the partnership agreement. Some of them, like venture capital funds' investment strategies, will follow specialization approach based on certain stages of ventures and certain sectors/industries while others will follow portfolio approach in their investment strategies. Mudaraba-venture capital closed-end mutual funds which follows specialisation strategies for their investment whose venture portfolio will consist of a less number of stages and sectors/industries than that of mudaraba-venture capital closed-end mutual funds which follow portfolio strategies whose investment portfolio will consist of a larger number of stages and sectors/industries.

* For closed-end Mutual Funds, See Bozkurt 1988.

In our model, four different types of mudaraba-venture capital closed-end mutual funds are identified such as:

1. *A Type Mudaraba-Venture Capital Closed-End Mutual Funds:* This fund's investment portfolio will consist of ventures in either any of stages from seed and start-ups of similar sector/industries or a mixed of those stages of similar sectors/industries.

A Type Mudaraba-Venture Capital Closed-End Mutual Fund

Ventures in Investment Portfolio	Sectors/Industries of Ventures	Venture Stages
Venture 1 Venture 2 Venture 3 ... Venture n	Similar	Seed and/or Start-up

2. *B Type Mudaraba-Venture Capital Closed-End Mutual Funds:* This fund's investment portfolio will consist of ventures in either any of stages from expansion, mezzanine and turnaround of similar sectors/industries or a mixed of those stages of similar sectors/industries.

B Type Mudaraba-Venture Capital Closed-End Mutual Fund

Ventures in Investment Portfolio	Sectors/Industries of Ventures	Venture Stages
Venture 1 Venture 2 Venture 3 ... Venture n	Similar	Expansion and/or mezzanine and/or turnaround

3. *C Type Mudaraba-Venture Capital Closed-End Mutual Funds:* This fund's venture portfolio will be made from only buy-outs in similar and/or different sectors/industries.

C Type Mudaraba-Venture Capital Closed-End Mutual Fund

Ventures in Investment Portfolio	Sectors/Industries of Ventures	Venture Stages
Venture 1 Venture 2 Venture 3 ... Venture n	Similar and/or Different	Buy-outs

4. *D Type Mudaraba-Venture Capital Closed-End Mutual Funds:* This fund's venture portfolio will be made from any two or more different stages of seed, start-up, expansion, mezzanine, turnaround and buy-outs and of any two or more different sectors/industries.

VIII. Mudaraba-Venture Capital Open-End Mutual Funds

Mudaraba-venture capital open-end mutual funds is a kind of financial intermediary which makes a portfolio of stocks of mudaraba-venture capital closed-end mutual funds and/or venture capital companies with the capital supplied by investors in exchange of participation certificates. Mudaraba-venture capital open-end mutual funds will manage the portfolio according to the investment management agreement. The participation certificates owners do not have any right to participate in the fund's management. The founder's responsibility of the fund is to manage the portfolio based on risk dispersion and on the behalf of investors. Mudaraba-venture capital open-end mutual funds is in essence any commonly known as open-end mutual funds* and they carry the general features of open-end mutual funds. However, unlike commonly known ones, mudaraba-venture capital open-end mutual funds' investment portfolios will only include the stocks of mudaraba-venture capital closed-end mutual funds and/or venture capital companies.

There will be a variety of mudaraba-venture capital open-end mutual funds depend on different investment strategies and purposes. Investment strategies and purposes will be written in the funds' investment management agreement. The stocks of investment portfolio will be made up depending on investment purposes. Some portfolios will include the stocks of mudaraba-venture capital closed-end mutual funds and-or venture capital companies whose investment ventures are derived from the certain venture stages. Some portfolios will include the stocks of venture capital companies and/or mudaraba-venture capital closed-end mutual funds which use diversification approach consisting of more stages and sectors/industries in their investment strategies.

* For Open-end Mutual Funds, See Bozkurt 1988.

There should be a rating agency as a part of this model to monitor and rate venture capital companies and mudaraba-venture capital closed-end mutual funds. Besides, those rating agencies will also supply consultative services for investors.

In our model, the following four different types of mudaraba-venture capital open-end mutual funds are identified such as:

1. *A Type Mudaraba-Venture Capital Open-End Mutual Funds*: This fund's investment portfolio will consist of the stocks of mudaraba-venture capital closed-end mutual funds and/or venture capital companies whose venture portfolios are made up from seed and start-ups stages.

A Type Mudaraba-Venture Capital Open-End Mutual Fund

The Stocks of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies in Investment Portfolio	Sectors/Industries Of Ventures in Investment Portfolio of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies	Venture Stages in Investment Portfolio of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies
MVCMF** 1 MVCMF 2 MVCMF 3 ... MVCMF n VCF*** 1 VCF 2 VCF 3 ... VCF n	Similiar	Seed and/or Start -up

2. *B Type Mudaraba-Venture Capital Open-End Mutual Funds*: This fund's investment portfolio will consist of the stocks of mudaraba-venture capital closed-end mutual funds and/or venture capital companies whose venture portfolios are made up from expansion, mezzanine and turnaround stages.

** Mudaraba-Venture Capital Open-End Mutual Fund.
 *** Venture capital companies.

B Type Mudaraba-Venture Capital Open-End Mutual Fund

The Stocks of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies in Investment Portfolio	Sectors/Industries of Ventures in Investment Portfolio of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies	Venture Stages in Investment Portfolio of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies
MVCMF 1 MVCMF 2 MVCMF 3 ... MVCMF n VCF 1 VCF 2 VCF 3 ... VCF n	Similiar	Expansion and/or Mezzanine and/or Turnaround

3. *C Type Mudaraba-Venture Capital Open-End Mutual Funds*: This fund's investment portfolio will consist of the stocks of mudaraba-venture capital closed-end mutual funds and/or venture capital companies whose venture portfolios are made up from buy-outs.

C Type Mudaraba-Venture Capital Open-End Mutual Fund

The Stocks of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies in Investment Portfolio	Sectors/Industries of Ventures in Investment Portfolio of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies	Venture Stages in Investment Portfolio of Mudaraba-Venture Capital Closed-end Mutual Funds and/or Venture Capital Companies
MVCMF 1 MVCMF 2 MVCMF 3 ... MVCMF n VCF 1 VCF 2 VCF 3 ... VCF n	Similiar and/or Different	Buy-Outs

4. *D Type Mudaraba-Venture Capital Open-End Mutual Funds*: This is a mixed fund. This fund's investment portfolio will consist of the stocks of mudaraba-venture capital closed-end mutual funds and/or venture capital companies whose venture portfolios are made up from any two or more different stages of seed, start-up, expansion, mezzanine, turnaround and buy-outs and of any two or more different sectors/industries.

IX. Conclusion

In this study, we began to explain the need of innovative approaches for not only product base but also organizational infrastructure base which will respond properly to today's business environment in the interest-free financing system. Then it is put forward that there is a very close similarity between venture capital system and Mudaraba and Musharaka which are the core of interest-free financing. Two new models called Mudaraba-Venture Capital Closed-End Mutual Funds and Mudaraba-Venture Capital Open-End Mutual Funds are detailed based on the similarities between venture capital and mudaraba and musharaka as well as the needs of financial innovation in the interest-free financing.

Financial institutions, basically the interest-free banks, can enter into Mudaraba and Musharaka financing as a real interest-free financing activity by establishing mudaraba-venture capital closed-end mutual funds and/or mudaraba-venture capital open-end mutual funds. Thus, the liquidity problem inherent in the interest-free banks' accounts will be overcome. Besides, the development of a venture capital sector will be improved and the gap in entrepreneurial finance caused by conventional banks will be filled. In the light of these, there will be also a further healing in the capital markets.

The interest-free financial institutions are universal banks. However; their activities, in theory, mainly consist of investment banking. The organizational infrastructure of those institutions does not let them function their investment and commercial banking activities in a distinguishable manner. Existing interest-free financial institutions have been criticized as deviating from the core activities of the interest-free financing and as their activities are almost the same as that of commercial banks' activities. So the interest-free financial institutions should tailor their organizational infrastructure to accommodate the distinctive investment and commercial banking activities. In order to achieve a distinctive investment banking activities, it is recommended that the interest-free financial institutions should institute mudaraba-venture capital open-end mutual funds and/or mudaraba-venture capital closed-end mutual funds.

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GLOBAL CAPITAL MARKETS

The global growth moderated, accompanied by a significant slowdown in industrial production and global trade, reflecting both a return to a more sustainable pace of expansion and the adverse impact of higher oil prices. Most recent data suggest that this slowdown has begun to bottom out, and forward looking indicators appear consistent with solid global expansion in 2005, interest rates and credit spreads have remained low although rising oil prices are an increasing risk. Growth has been stronger in the United States driven by strong domestic demand. In contrast growth in Europe and Japan has been disappointing, reflecting faltering exports and weak final domestic demand. In the Euro area growth slowed markedly, in the second half of 2004 as the contribution of net exports turned sharply negative. Growth in Japan has stalled since the second quarter of 2004, as exports, investment, and consumption faltered, however, recent data generally suggest activity is picking up, and strong corporate profits and solid consumer and business confidence should support a renewed expansion during 2005.

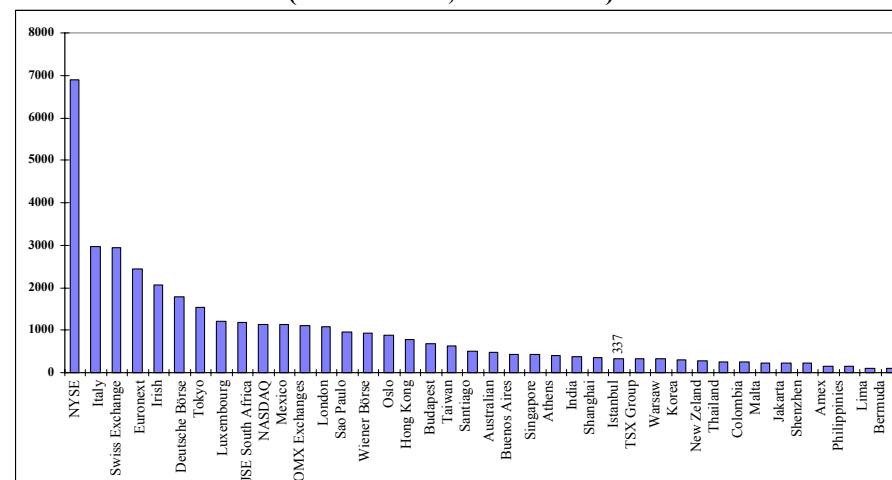
The performances of some developed stock markets with respect to indices indicated that DJIA, FTSE-100, Nikkei-225 and Xetra DAX changed by -2.8%, 0.5%, -3 % and -2.7% respectively at the end of March 2005 in comparison with the Dec. 31st 2004. When US\$ based returns of some emerging markets are compared in the same period, the best performer markets were: Egypt (50.0%), Russia (15.3%), Hungary (12.6%), S.Korea (12.6%), Peru (11.1%), Philippines (10.4%), Czech Rep. (10.1%). In the same period, the lowest return markets were: Venezuela (-12.4%), Mexico (-6.5%), Hong Kong (-5.0%), Malaysia (-5.0%) and China (-4.2%). The performances of emerging markets with respect to P/E ratios as of end-March 2005 indicated that the highest rates were obtained in Jordan (39.4), Argentina (30.2), Czech Rep. (25.0), China (19.9), Hungary (19.5) and Chile (18.3) and the lowest rates in Venezuela (5.8), Brazil (10.2), Russia (11.2), Peru (11.3), Pakistan.(11,8), Mexico (12.5) and Turkey (12.5).

Market Capitalization (USD Million, 1986-2004)

	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
2002	23,391,914	20,955,876	2,436,038	33,958
2003	31,947,703	28,290,981	3,656,722	68,379
2004	38,904,018	34,173,600	4,730,418	98,299

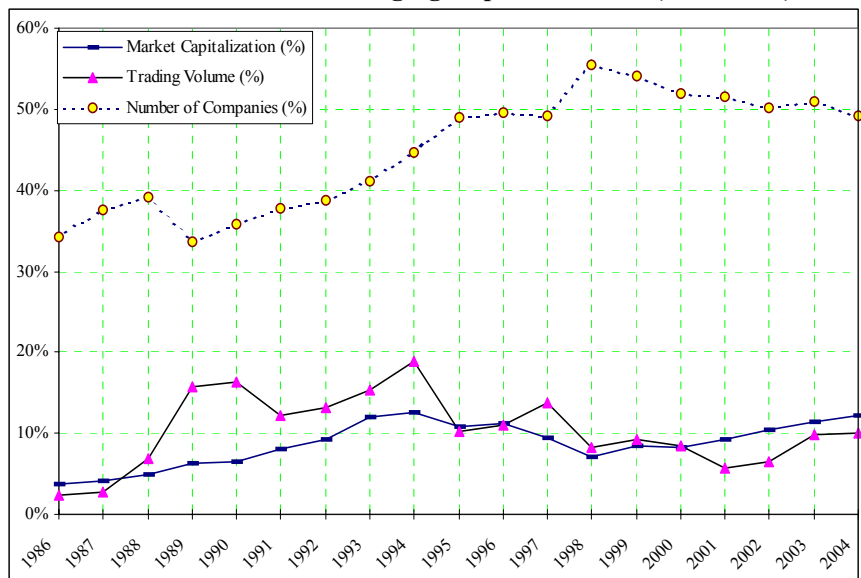
Source: Standard & Poor's Global Stock Markets Factbook, 2005.

Comparison of Average Market Capitalization Per Company (USD Million, March 2005)



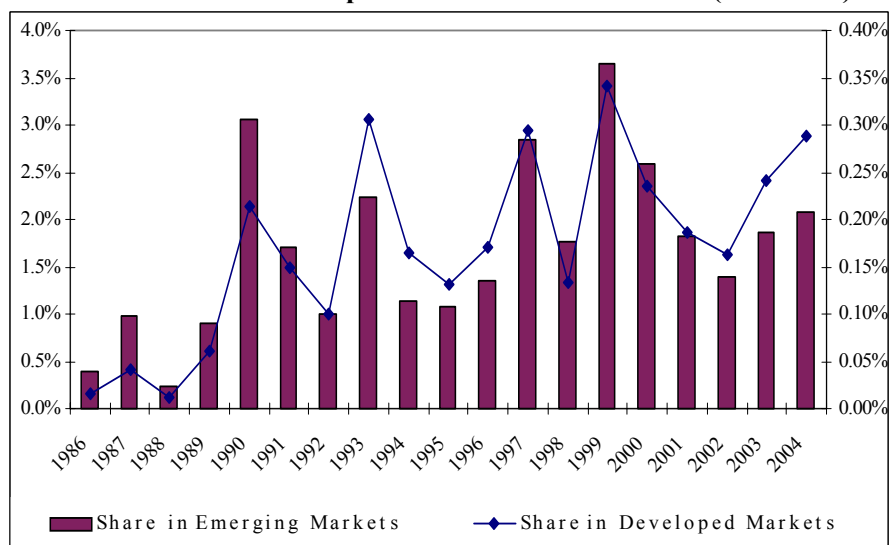
Source: FIBV, Monthly Statistics, March 2005.

Worldwide Share of Emerging Capital Markets (1986-2004)



Source: Standard & Poor's Global Stock Markets Factbook, 2005.

Share of ISE's Market Capitalization in World Markets (1986-2004)



Source: Standard & Poor's Global Stock Markets Factbook, 2005.

Main Indicators of Capital Markets (March 2005)

	Market	Monthly Turnover Velocity (March 2005) (%)	Market	Value of Share Trading (millions, US\$) Up to Year Total (2005/1-2005/3)	Market	Market Cap. of Share of Domestic Companies (millions US\$) March 2005
1	NASDAQ	260.84	NYSE	3,416,700	NYSE	12,627,029
2	Istanbul	186.27	NASDAQ	2,610,227	Tokyo	3,513,475
3	Spanish Exchanges (BME)	179.36	London	1,412,993	NASDAQ	3,274,788
4	Korea	148.04	Tokyo	883,841	London	2,799,608
5	Taiwan	145.01	Euronext	653,816	Euronext	2,438,438
6	Italy	133.43	Deutsche Börse	454,342	Osaka	2,255,899
7	Deutsche Börse	129.32	Spanish (BME)	399,166	TSX Group	1,224,103
8	OMX Exchanges	115.55	Italy	300,874	Deutsche Börse	1,176,300
9	London	112.61	Korea	254,139	Spanish (BME)	929,761
10	Euronext	110.34	Swiss Exchange	246,866	Hong Kong	842,564
11	Shenzhen	104.72	OMX Exchanges	227,650	Swiss Exchange	820,322
12	Oslo	104.34	TSX Group	217,405	Italy	803,201
13	Swiss Exchange	101.39	Australian	158,547	OMX Exchanges	733,257
14	Thailand	98.89	Amex	150,910	Australian	725,842
15	Tokyo	96.55	Taiwan	125,854	Korea	484,661
16	NYSE	91.28	Hong Kong	117,980	Taiwan	439,911
17	India	90.29	India	71,568	JSE South Africa	427,770
18	Australian	81.30	Istanbul	54,790	Mumbai	389,146
19	Shanghai	72.19	Oslo	54,114	India	363,291
20	Budapest	64.89	Shanghai	50,929	Sao Paulo	341,307
21	TSX Group	64.16	Osaka	47,380	Shanghai	294,728
22	Hong Kong	53.43	JSE South Africa	46,156	Singapore	227,390
23	Jakarta	50.80	Sao Paulo	39,001	Malaysia	175,039
24	Singapore	50.58	Mumbai	35,043	Mexico	169,839
25	Irish	47.72	Thailand	32,622	Oslo	149,925
26	JSE South Africa	44.20	Shenzhen	31,540	Shenzhen	125,773
27	Sao Paulo	42.74	Singapore	27,146	Thailand	124,085
28	New Zealand	42.45	Irish	17,507	Athens	121,520
29	Tel-Aviv	42.15	Athens	16,619	Santiago	117,371
30	Athens	41.01	Malaysia	16,475	Irish	104,575
31	Mumbai	38.12	Jakarta	14,575	Istanbul	100,075
32	Wiener Börse	36.48	Mexico	13,457	Tel-Aviv	99,697
33	Warsaw	36.44	Tel-Aviv	12,813	Wiener Börse	91,463
34	Malaysia	31.13	Wiener Börse	9,710	Amex	80,260
35	Tehran	27.88	Warsaw	8,571	Jakarta	77,699
36	Mexico	27.52	Budapest	5,957	Warsaw	69,233
37	Colombo	18.15	New Zealand	4,744	Luxembourg	49,643
38	Philippine	17.64	Santiago	3,396	Buenos Aires	45,173
39	Colombia	14.99	Tehran	2,470	New Zealand	42,393
40	Ljubljana	13.98	Philippine	2,456	Tehran	39,229
41	Santiago	13.32	Buenos Aires	1,719	Philippine	35,752
42	Buenos Aires	11.97	Colombia	971	Budapest	30,993
43	Lima	7.34	Ljubljana	402	Colombia	27,266
44	Osaka	6.38	Lima	356	Lima	20,329
45	Malta	3.66	Colombo	234	Ljubljana	9,043

Source: FIBV, Monthly Statistics, March 2005.

Trading Volume (USD millions, 1986-2004)

	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
2002	38,645,472	36,098,731	2,546,742	70,667	6.59	2.77
2003	29,639,297	26,743,153	2,896,144	99,611	9.77	3.44
2004	39,309,589	35,341,782	3,967,806	147,426	10.09	3.72

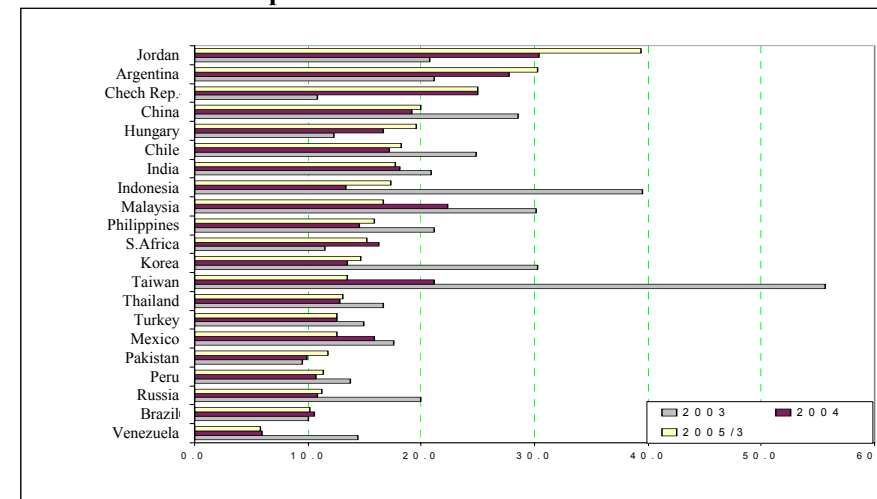
Source: Standard & Poor's Global Stock Markets Factbook, 2005.

Number of Trading Companies (1986-2004)

	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
2002	48,375	24,099	24,276	288	50.18	1.19
2003	49,855	24,414	25,441	284	51.03	1.12
2004	48,806	24,824	23,982	296	49.14	1.23

Source: Standard & Poor's Global Stock Markets Factbook, 2005.

Comparison of P/E Ratios Performances



Source: IFC Factbook 2001. Standard & Poor's, Emerging Stock Markets Review, March 2005.

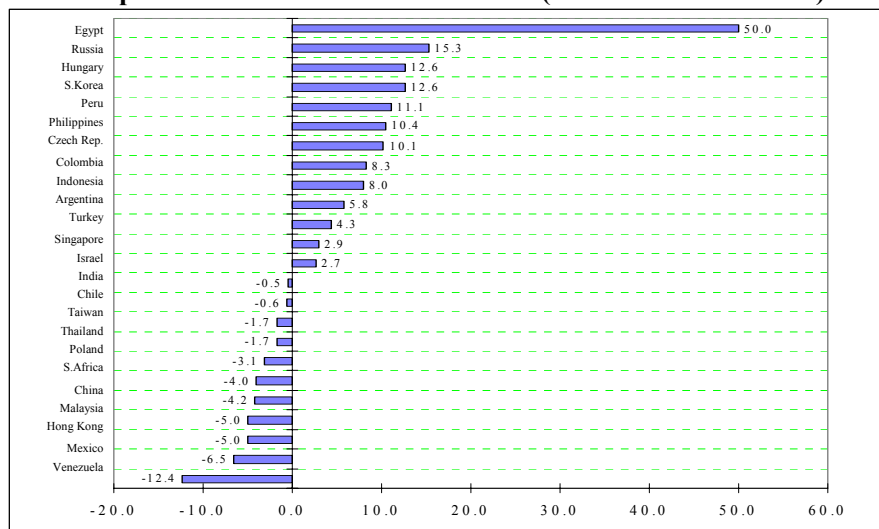
Price-Earnings Ratios in Emerging Markets

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005/3
Argentina	38.2	16.3	13.4	39.4	-889.9	32.6	-1.4	21.1	27.7	30.2
Brazil	14.5	12.4	7.0	23.5	11.5	8.8	13.5	10.0	10.6	10.2
Chile	14.6	14.7	15.1	35.0	24.9	16.2	16.3	24.8	17.2	18.3
China	27.8	34.5	23.8	47.8	50.0	22.2	21.6	28.6	19.1	19.9
Czech Rep.	17.6	37.1	-11.3	-14.9	-16.4	5.8	11.2	10.8	25.0	25.0
Hungary	17.5	27.4	17.0	18.1	14.3	13.4	14.6	12.3	16.6	19.5
India	12.3	15.2	13.5	25.5	16.8	12.8	15.0	20.9	18.1	17.7
Indonesia	21.6	10.5	-106.2	-7.4	-5.4	-7.7	22.0	39.5	13.3	17.3
Jordan	16.9	14.4	15.9	14.1	13.9	18.8	11.4	20.7	30.4	39.4
Korea	11.7	17.9	-47.1	-33.5	17.7	28.7	21.6	30.2	13.5	14.7
Malaysia	27.1	9.5	21.1	-18.0	91.5	50.6	21.3	30.1	22.4	16.7
Mexico	16.8	19.2	23.9	14.1	13.0	13.7	15.4	17.6	15.9	12.5
Pakistan	11.7	14.8	7.6	13.2	-117.4	7.5	10.0	9.5	9.9	11.8
Peru	14.2	14.0	21.1	25.7	11.6	21.3	12.8	13.7	10.7	11.3
Philippines	20.0	10.9	15.0	22.2	26.2	45.9	21.8	21.1	14.6	15.8
Poland	14.3	11.4	10.7	22.0	19.4	6.1	88.6	-353.0	39.9	8.6
Russia	6.3	8.1	3.7	-71.2	3.8	5.6	12.4	19.9	10.8	11.2
S.Africa	16.3	10.8	10.1	17.4	10.7	11.7	10.1	11.5	16.2	15.2
Taiwan	28.2	28.9	21.7	52.5	13.9	29.4	20.0	55.7	21.2	13.5
Thailand	13.1	-32.8	-3.6	-12.2	-6.9	163.8	16.4	16.6	12.8	13.1
Turkey	10.7	20.1	7.8	34.6	15.4	72.5	37.9	14.9	12.5	12.5
Venezuela	32.5	12.8	5.6	10.8	30.5	-347.6	-11.9	14.4	6.0	5.8

Source: IFC Factbook, 2004; Standard&Poor's, Emerging Stock Markets Review, March 2005

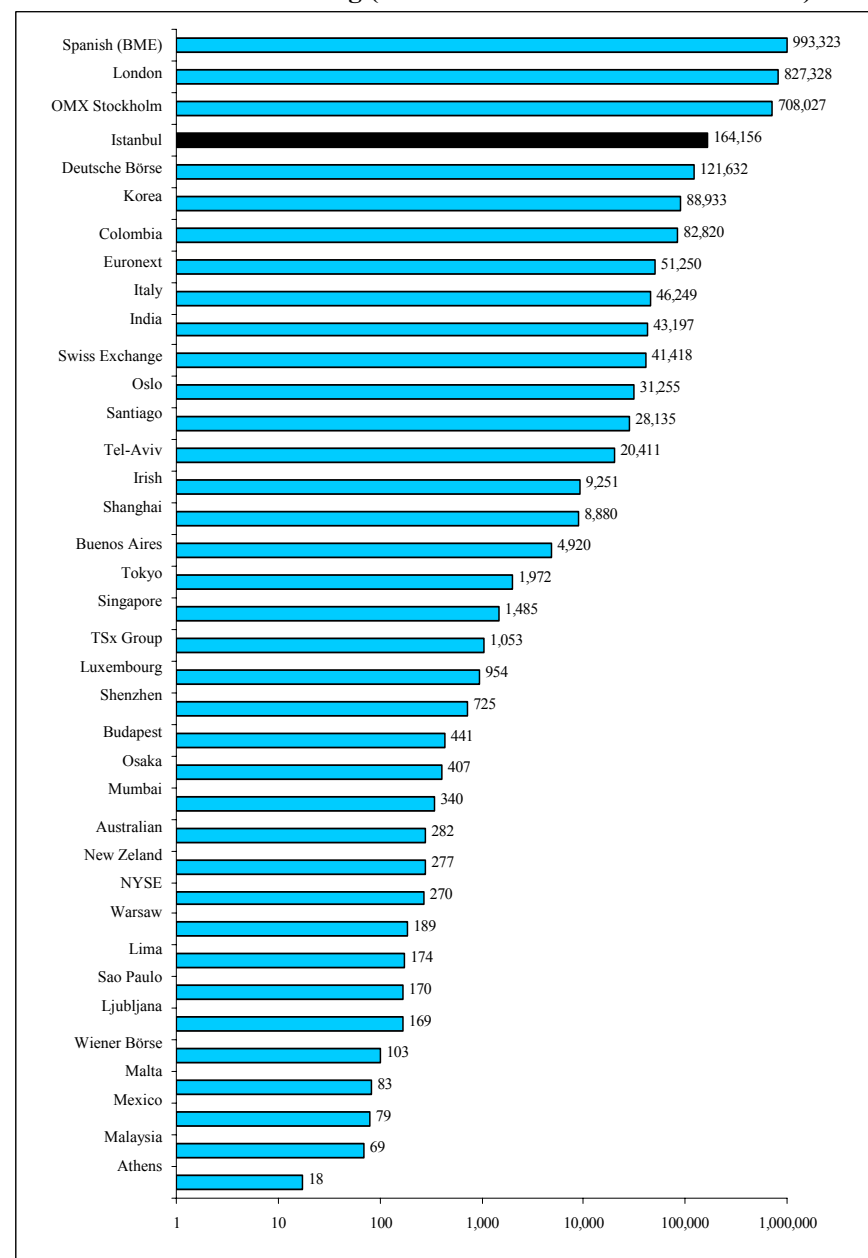
Note: Figures are taken from S&P/IFCG Index Profile.

Comparison of Market Returns in USD (31/12/2004-06/04/2005)



Source: The Economist, April 9th –15th 2005.

Value of Bond Trading (Million USD Jan. 2005-March 2005)



Source: FIBV, Monthly Statistics, March 2005.

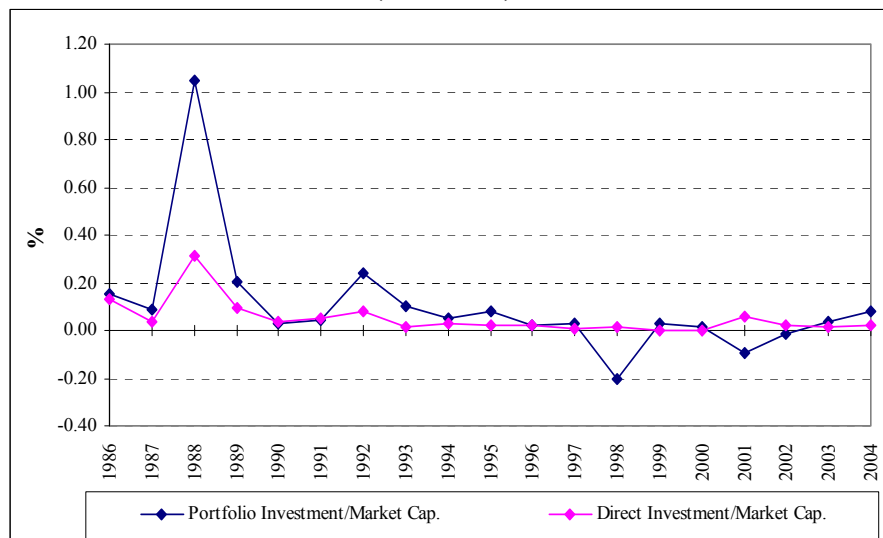
Market Value/Book Value Ratios

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005/3
Argentina	1.6	1.8	1.3	1.5	0.9	0.6	0.8	2.0	2.2	2.4
Brazil	0.7	1.0	0.6	1.6	1.4	1.2	1.3	1.8	1.9	2.0
Chile	1.6	1.6	1.1	1.7	1.4	1.4	1.3	1.9	0.6	0.6
China	2.1	3.9	2.1	3.0	3.6	2.3	1.9	2.6	2.0	2.1
Czech Rep.	0.9	0.8	0.7	0.9	1.0	0.8	0.8	1.0	1.6	1.8
Hungary	2.0	4.2	3.2	3.6	2.4	1.8	1.8	2.0	2.8	3.3
India	2.1	2.3	1.8	3.3	2.6	1.9	2.0	3.5	3.3	3.2
Indonesia	2.7	1.4	1.5	3.0	1.7	1.7	1.0	1.6	2.8	3.1
Jordan	1.7	1.8	1.8	1.5	1.2	1.5	1.3	2.1	3.0	3.9
Korea	0.8	0.5	0.9	2.0	0.8	1.2	1.1	1.6	1.3	1.4
Malaysia	3.8	1.4	1.3	1.9	1.5	1.2	1.3	1.7	1.9	1.9
Mexico	1.7	2.3	1.4	2.2	1.7	1.7	1.5	2.0	2.5	2.3
Pakistan	1.5	2.3	0.9	1.4	1.4	0.9	1.9	2.3	2.6	3.0
Peru	2.5	2.0	1.6	1.5	1.1	1.4	1.2	1.8	1.6	1.7
Philippines	3.1	1.3	1.3	1.4	1.0	0.9	0.8	1.1	1.4	1.5
Poland	2.6	1.7	1.5	2.0	2.2	1.4	1.3	1.8	2.0	1.3
Russia	0.4	0.5	0.3	1.2	0.6	1.1	0.9	1.2	1.2	1.2
S.Africa	2.3	1.6	1.5	2.7	2.1	2.1	1.9	2.1	2.5	2.4
Taiwan	3.3	3.1	2.6	3.4	1.7	2.1	1.6	2.2	1.9	1.8
Thailand	1.8	0.8	1.2	2.1	1.3	1.3	1.5	2.8	2.0	2.1
Turkey	4.0	6.8	2.7	8.9	3.1	3.8	2.8	2.6	1.7	1.8
Venezuela	3.3	1.2	0.5	0.4	0.6	0.5	0.5	1.1	1.2	1.2

Source: IFC Factbook, 2004; Standard & Poor's, Emerging Stock Markets Review, March 2005.

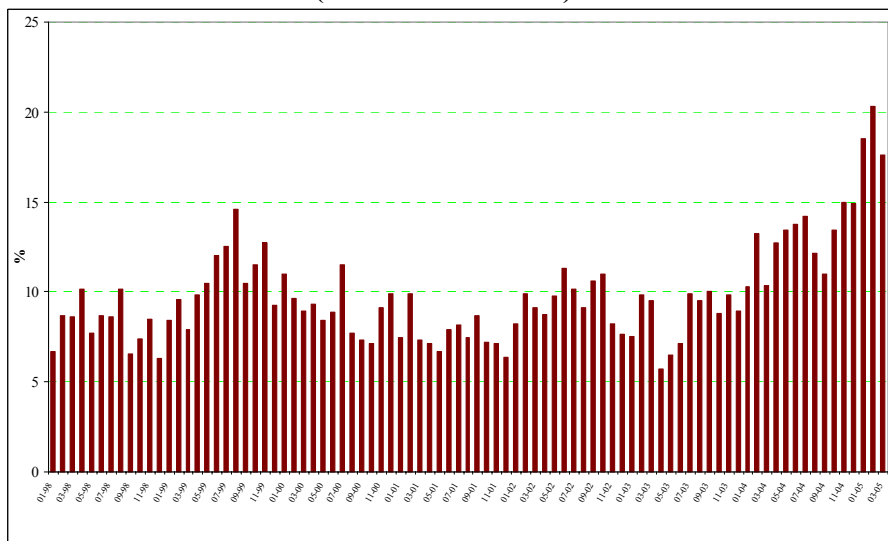
Note: Figures are taken from S&P/IFCG Index Profile.

Foreign Investments as a Percentage of Market Capitalization in Turkey (1986-2004)



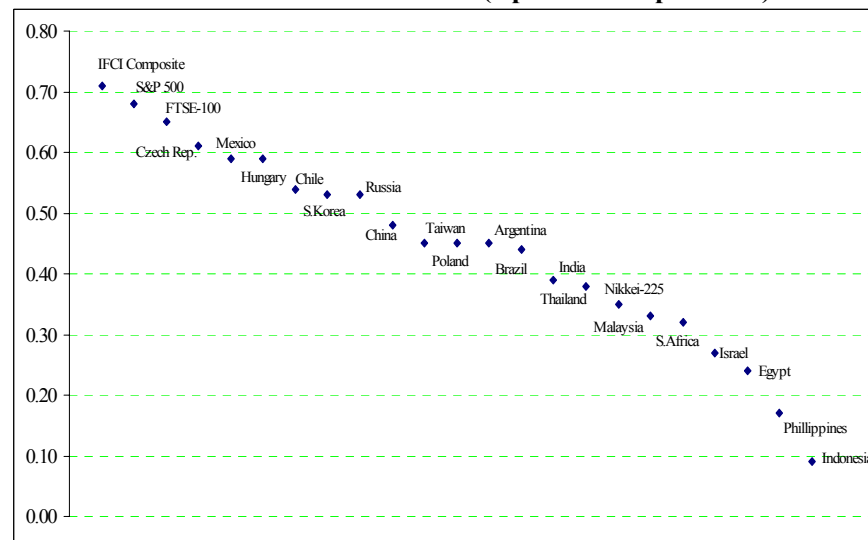
Source: ISE Data, CBTR Databank.

Foreigners' Share in the Trading Volume of the ISE (Jan. 98-March 2005)



Source: ISE Data.

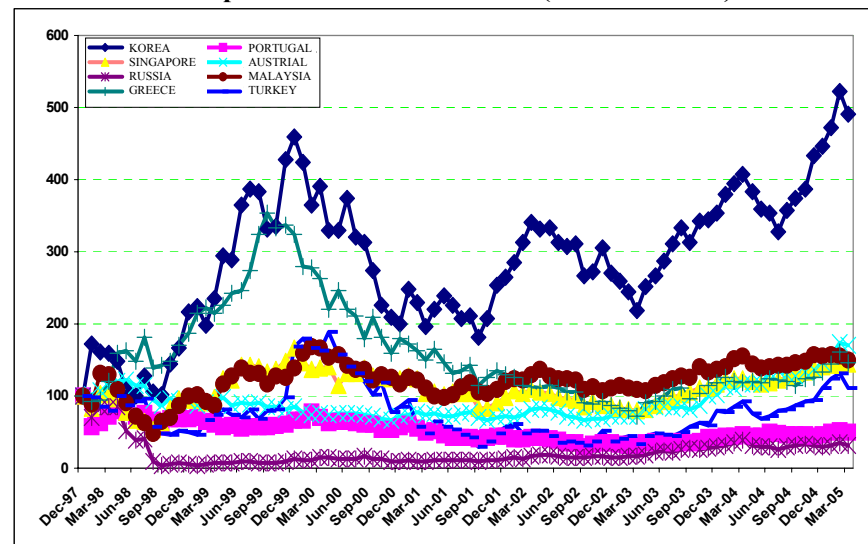
Price Correlations of the ISE (April 2000- April 2005)



Source: Standard & Poor's, Emerging Stock Markets Review, April 2005.

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

Comparison of Market Indices (31 Dec 97=100)



Source: Reuters.

Note: Comparisons are in US\$.

ISE Market Indicators

STOCK MARKET											
		Traded Value		Market Value		Dividend Yield	P/E Ratios				
	Number of Companies	Total		Daily Average							
		(YTL Million)	(US\$ Million)	(YTL Million)	(US\$ Million)		(YTL Million)	(US\$ Million)	(%)	YTL (1)	YTL (2)
1986	80	0,01	13	---	---	0,71	938	9,15	5,07	---	---
1987	82	0,11	118	---	---	3	3.125	2,82	15,86	---	---
1988	79	0,15	115	---	---	2	1.128	10,48	4,97	---	---
1989	76	2	773	0,01	3	16	6.756	3,44	15,74	---	---
1990	110	15	5.854	0,06	24	55	18.737	2,62	23,97	---	---
1991	134	35	8.502	0,14	34	79	15.564	3,95	15,88	---	---
1992	145	56	8.567	0,22	34	85	9.922	6,43	11,39	---	---
1993	160	255	21.770	1	88	546	37.824	1,65	25,75	20,72	14,86
1994	176	651	23.203	3	92	836	21.785	2,78	24,83	16,70	10,97
1995	205	2.374	52.357	9	209	1.265	20.782	3,56	9,23	7,67	5,48
1996	228	3.031	37.737	12	153	3.275	30.797	2,87	12,15	10,86	7,72
1997	258	9.049	58.104	36	231	12.654	61.879	1,56	24,39	19,45	13,28
1998	277	18.030	70.396	73	284	10.612	33.975	3,37	8,84	8,11	6,36
1999	285	36.877	84.034	156	356	61.137	114.271	0,72	37,52	34,08	24,95
2000	315	111.165	181.934	452	740	46.692	69.507	1,29	16,82	16,11	14,05
2001	310	93.119	80.400	375	324	68.603	47.689	0,95	108,33	824,42	411,64
2002	288	106.302	70.756	422	281	56.370	34.402	1,20	195,92	26,98	23,78
2003	285	146.645	100.165	596	407	96.073	69.003	0,94	14,54	12,29	13,19
2004	297	208.423	147.755	837	593	132.556	98.073	1,37	14,18	13,27	13,96
2005	299	72.453	54.910	1.169	886	134.350	99.866	2,02	13,41	13,53	14,22
2005/Q1	299	72.453	54.910	1.169	886	134.350	99.866	2,02	13,41	13,53	14,22

Q: Quarter

Note:

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

TL(1) = Total Market Capitalization / Sum of Last two six-month profits

TL(2) = Total Market Capitalization / Sum of Last four three-month profits.

US\$ = US\$ based Total Market Capitalization / Sum of Last four US\$ based three-month profits.

* Companies which are temporarily de-listed and will be traded off the Exchange under the decision of the ISE's Executive Council are not included in the calculations.

Closing Values of the ISE Price Indices

	YTL Based								US \$ Based								EURO 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 (Jun.30.2000=14.466.12)	INVESTMENT TRUSTS (Dec.27.1996=976)	SECOND NATIONAL (Dec.27.1996=976)	NEW ECONOMY (Sept. 02. 2004 =20525.92)	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. 30.2000=1.360.92)	INVESTMENT TRUSTS (Dec. 27. 96=534)	SECOND NATIONAL (Dec. 27. 96=534)	NEW ECONOMY (Sept. 02. 2004 =796.46)	NATIONAL - 100 (Dec. 31. 98=484)
1986	1,71	---	---	---	---	---	---	131,53	---	---	---	---	---	---	---	---	
1987	6,73	---	---	---	---	---	---	384,57	---	---	---	---	---	---	---	---	
1988	3,74	---	---	---	---	---	---	119,82	---	---	---	---	---	---	---	---	
1989	22,18	---	---	---	---	---	---	560,57	---	---	---	---	---	---	---	---	
1990	32,56	---	---	---	---	---	---	642,63	---	---	---	---	---	---	---	---	
1991	43,69	49,63	---	33,55	---	---	---	501,50	569,63	---	385,14	---	---	---	---	---	
1992	40,04	49,15	---	24,34	---	---	---	272,61	334,59	---	165,68	---	---	---	---	---	
1993	206,83	222,88	---	191,90	---	---	---	833,28	897,96	---	773,13	---	---	---	---	---	
1994	272,57	304,74	---	229,64	---	---	---	413,27	462,03	---	348,18	---	---	---	---	---	
1995	400,25	462,47	---	300,04	---	---	---	382,62	442,11	---	286,83	---	---	---	---	---	
1996	975,89	1.045,91	---	914,47	---	---	---	534,01	572,33	---	500,40	---	---	---	---	---	
1997	3.451,--	2.660,--	3.593,--	4.522,--	---	2.934,--	2.761,--	982,--	757,--	1.022,--	1.287,--	---	835,--	786,--	---	---	
1998	2.597,91	1.943,67	3.697,10	3.269,58	---	1.579,24	5.390,43	484,01	362,12	688,79	609,14	---	294,22	1.004,27	---	---	
1999	15.208,78	9.945,75	13.194,40	21.180,77	---	6.812,65	13.450,36	1.654,17	1.081,74	1.435,08	2.303,71	---	740,97	1.462,92	---	1.912,46	
2000	9.437,21	6.954,99	7.224,01	12.837,92	10.586,58	6.219,00	15.718,65	817,49	602,47	625,78	1.112,08	917,06	538,72	1.361,62	---	1.045,57	
2001	13.782,76	11.413,44	9.261,82	18.234,65	9.236,16	7.943,60	20.664,11	2001	557,52	461,68	374,65	373,61	321,33	835,88	---	741,24	
2002	10.369,92	9.888,71	6.897,30	12.902,34	7.260,84	5.452,10	28.305,78	2002	368,26	351,17	244,94	458,20	257,85	1.005,21	---	411,72	
2003	18.625,02	16.299,23	9.923,02	25.594,77	8.368,72	10.897,76	32.521,26	2003	778,43	681,22	414,73	1.069,73	349,77	1.359,22	---	723,25	
2004	24.971,68	20.885,47	13.914,12	35.487,77	7.539,16	17.114,91	39.240,73	2004	1.075,12	899,19	599,05	1.527,87	324,59	736,86	1.008,13	1.689,45	924,87
2005	25.557,76	21.646,66	13.817,46	36.662,47	9.968,14	16.550,04	24.590,86	2005	1.105,50	936,33	597,67	1.585,84	431,17	715,87	860,05	1.063,68	1.000,19
2005/Q1	25.557,76	21.646,66	13.817,46	36.662,47	9.968,14	16.550,04	24.590,86	2005/Q1	1.105,50	936,33	597,67	1.585,84	431,17	715,87	860,05	1.063,68	1.000,19

Q: Quarter

BONDS AND BILLS MARKET

Traded Value

Outright Purchases and Sales Market

	Total		Daily Average	
	(YTL Million)	(US\$ Million)	(YTL Million)	(US\$ Million)
1991	1	312	0,01	2
1992	18	2.406	0,07	10
1993	123	10.728	0,50	44
1994	270	8.832	1	35
1995	740	16.509	3	66
1996	2.711	32.737	11	130
1997	5.504	35.472	22	141
1998	17.996	68.399	72	274
1999	35.430	83.842	143	338
2000	166.336	262.941	663	1.048
2001	39.777	37.297	159	149
2002	102.095	67.256	404	266
2003	213.098	144.422	852	578
2004	372.670	262.596	1.479	1.042
2005	142.312	108.076	2.295	1.743
2005/Q1	142.312	108.076	2.295	1.743

Repo-Reverse Repo Market

Repo-Reverse Repo Market

	Total		Daily Average	
	(Y TL Million)	(US\$ Million)	(Y TL Million)	(US\$ Million)
1993	59	4.794	0,28	22
1994	757	23.704	3	94
1995	5.782	123.254	23	489
1996	18.340	221.405	73	879
1997	58.192	374.384	231	1.486
1998	97.278	372.201	389	1.489
1999	250.724	589.267	1.011	2.376
2000	554.121	886.732	2.208	3.533
2001	696.339	627.244	2.774	2.499
2002	736.426	480.725	2.911	1.900
2003	1.040.533	701.545	4.162	2.806
2004	1.551.410	1.090.477	6.156	4.327
2005	394.243	299.150	6.359	4.825
2005/Q1	394.243	299.150	6.359	4.825

Q: Quarter

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

YTL Based

	3 Months (91 Days)	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)	General
2001	102,87	101,49	97,37	91,61	85,16	101,49
2002	105,69	106,91	104,87	100,57	95,00	104,62
2003	110,42	118,04	123,22	126,33	127,63	121,77
2004	112,03	121,24	127,86	132,22	134,48	122,70
2005	112,80	122,87	130,38	135,61	138,66	127,05
2005/Q1	112,80	122,87	130,38	135,61	138,66	127,05

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

YTL Based

	3 Months (91 Days)	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)
2001	195,18	179,24	190,48	159,05	150,00
2002	314,24	305,57	347,66	276,59	255,90
2003	450,50	457,60	558,19	438,13	464,98
2004	555,45	574,60	712,26	552,85	610,42
2005	579,78	599,78	750,31	591,88	653,52
2004/Q1	579,78	599,78	750,31	591,88	653,52

ISE GDS Portfolio Performance Indices (December 31, 2003 = 100)

YTL Based

Equal Weighted Indices (YTL Based)

Market Value Weighted Indices

	EA180-		EA GENERAL	PDA180-		PDA180+		PDA GENERAL	REPO
	EA180-	EA180-	EA GENERAL	PDA180-	PDA180+	PDA GENERAL	REPO		
2004	125,81	130,40	128,11	125,91	130,25	128,09	118,86		
2005	131,92	139,26	135,47	132,10	139,13	135,65	122,70		
2005/Q1	131,92	139,26	135,47	132,10	139,13	135,65	122,70		

Q: Quarter