NEAR EAST UNIVERSITY

FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES

DEPARTMENT OF BANKING AND FINANCE

BANK 410

SEMINAR ON BANKING GRADUATION PROJECT

HYPOTHESIS TESTING

AND

REGRESSION ANALYSIS OF TURKISH BLUE CHIPS

Submitted By: Özgür YELEĞEN (20020684)
Submitted To: Dr. Turgut TÜRSOY

August 2007
Nicosia

ACKNOWLEDGEMENTS

First and foremost I would like to thank to my advisor Dr. Turgut Türsoy who never left his support and always encouraged me during my study, and giving me a great deal of knowledge and materials and proof reading this thesis. Besides of being a good supervisor Dr. Turgut Türsoy was as close as relative and good my classmates and me. I appreciate a lot to Dr. Turgut Türsoy, and wish for a successful life.

I would like to say 'thank you' to all instructors first of all our department chief Dr. Nil Günsel, Asst. Prof. Dr. Erdal Güryay, Asst. Prof. Dr. Okan Şafaklı, Dr. Berna Serener, Dr. Ali Malek, İmren İbrahimer and Dizem Ertaç. They looked closely at the final version of thesis correcting both and offering suggestions for improvements.

I also would like to say 'thank you' all my friends Nihal Akbaş, Salih Ünal. Finally, and most importantly, I would like to say a big 'thank you' to my mother Saadet Yeleğen, my father Mustafa Yeleğen and my sister Zelal Yeleğen. They always encouraged me during my study and loved me.

ABSTRACT

In this paper we explore the relationship of aggressive and defensive stocks with blue chips in Istanbul Stock Exchange (ISE). We apply Capital Asset Pricing Model (CAMP) and Hypothesis Testing. Suggesting that stocks in the ISE Index are exposed and high demand. We examines 10 stocks in ISE 30 of the leading emerging market Istanbul Stock Exchange in period 2002 and 2007 . Aggressive Blue Chips are more attractive and more competitive in ISE. The test analysis obtain us beta of ISE Blue Chip Stocks.

KEYWORDS: Aggressive and Defensive Stocks, Istanbul Stock Exchange, Blue Chip Stocks, Regression Analysis, Hypothesis Testing.

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ABBREVIATIONS

ISE Istanbul Stock Exchange

EMH Efficient Market Hypothesis

CAMP Capital Asset Pricing Model

OLS Ordinary Least Square

AKBNK Ak Bank Inc.

DOHOL Doğan Inc.

EREGL Ereğli Inc.

GARAN Garanti Bank Inc.

ISCTR İş Bank Inc.

KCHOL Koç Inc.

SAHOL Sabancı Inc.

TCELL Turkcell Inc.

TUPRS Tüpraş Inc.

YKBNK Yapı and Credit Bank Inc.

SECTION 1:

1.1. INTRODUCTION

We first investigate the relation between ISE market shares and aggressiveness. Whether who has more aggressively have larger market shares is an interesting question given the fact that a significant portion of ISE volume is internalized. Although prior studies offer both analytical predictions and experimental evidence regarding the effects of order preferencing on execution costs, they offer limited evidence as the relation between ISE 30 and market share and whether this relation varies with order preferencing. There are two basic classes of motives in the finance literature for investment in a financial instrument. The first is an effort to obtain maximum portfolio returns for the average investor, assuming a minimum level of non-diversifiable risk. In classical financial analysis, this motive is encouraged by the combined implications of EMH and CAPM. The second important investment motive is to attempt to identify and profit by circumstances in which the investor can identify greater than average returns for a given level of non-diversifiable risk. Such market opportunities are called market inefficiencies, and their existence tends to refute EMH. We find that we can reject null hypothesis that the hypoyhesis meaning the variables are not significant, systematic risks are variable, can be forecast by past prices, and are priced in the market, an active trading rule that produces relatively high returns over time is not, by itself, evidence of market inefficiency.

The Classical CAPM compares investment portfolio returns to some measure of returns to the portfolio comprising the market as a whole. More recently it has become common to add to this predictor of returns other putative non-diversifiable risks borne by the market as a whole.

The systematic risk (also called market risk) are unanticipated events that affect almost all assets to some degree because the effects are economy wide. Unsystematic risk are unacticipated events that affect single assets or small groups of assets. Unsystematic risks are also called unique or asset-specific risks. Because systematic risk is the crucial determinant of an asset's expected return, we need some way of measuring the level of systematic risk for different investments. The specific measure we will use is called the beta coefficient, for which we will use the Greek symbol β.

So; if a β coefficient is higher than one we called that stock is an aggressive stock but if that stock beta coefficient is smaller than one we called that stock is a defensive stock.

1.1.a. The definition of blue chip, aggressive and defensive stock:

The exact criteria used to classify a company's stock as a blue chip is relatively subjective. Most professional investor agree that blue chips share several important characteristics including:

- An establish record of stable earning power over several decades
- An equally long record of uninterrupted dividend payments to common stock holders
- A history of regulary increases in the dividend payable to each share
- Strong balace sheets with a moderate debt burden
- High credit ratings in the bond and commercial paper markets
- Large size relative to Turkey businesses as a whole in terms of revenue and market capitalization
- Diversified product lines (e.g. Tüpraş) and / or geographic location (e.g. Akbank).
- A competitive advantage in market place due to cost efficiencies, franchise value or distribution control.

1.1.b. The Istanbul Stock Exchange 30 (ISE30).

These characteristics usually help blue chip companies maintain their leading industry positions. Perhaps the most famous list of blue chip companies in the world is the ISE. This collection of ten stocks is selected by the Turkish Derivatives and Option Markets (TURDEX) experts.

The only requirement for inclusion in the index is ISE 30 leadership. Despite this seemingly low-hurdle, each potential ISE component undergoes incredibly scrutiny, resulting in a list that stands as the most prestigious roster of blue chips in Turkey. The individual companies that make up the index are rarely changed; considering the inherent stability of blue chip stocks, this should come as little surprise.

1.1.c. An extereme knowledge for investor:

We want to give some knowledge about the Exchange Traded Funds in ISE, these funds are very similar derivative funds. Dow Jones Titan 20 Index is constituted by the investor demands in one of the biggest emerging market Turkey.

These stocks are the biggest and has more liquidty in ISE.

The list of Dow Jones Turkey Titan 20 Stocks. (1)

From the 30th of 2004

Company

Adjusted Weight

KOÇ Holding A.Ş.

10.86%

Akbank T.A.Ş.

9.97%

Türkiye İş Bankası A.Ş.

9.74%

Yapı ve Kredi Bnakası A.Ş.

7.13%

Turkcell İletişim Hizmetleri A.Ş.

6.60%

Arçelik A.Ş.

6.33%

Ereğli Demir ve Çelik Fabrikaları T.A.Ş.

6.26%

Türkiye Garanti Bankası A.Ş.

6.07%

Anadolu Efes Biracılık ve Malt Sanayi A.Ş.

5.39%

Türkiye Petrol Rafinerileri A.Ş.

4.77%

Hacı Ömer SabanCI Holding A.Ş.

4.68%

Doğan Şirketler Grubu Holding A.Ş.

3.31%

Ford Otomotiv Sanayi A.Ş.

3.06%

Migros Türk T.A.Ş.

2.72%

Enka İnşaat ve Sanayi A.Ş.

2.64%

Doğan Yayın Holding A.Ş.

2.61%

Türkiye Şişe ve Cam Fabrikaları A.Ş.

2.33%

Vestel Elektronik Sanayi ve Ticaret A.Ş.

1.97%

Hürriyet Gazetecilik ve Matbaacılık

1.93%

Turk Otomobil Fabrikası A.Ş.

1.74%

(1) www.turk.internet.com

1.2. LITERAUTURE REVIEW

Hypothesis assumes that passive liquidity providers are challenged by immediate price increases related to large sales and compensated for their liquidity service since they are ready to trade immediately by carrying the risk and transaction costs which they otherwise would not trade. Although it is unlikely that changes in index composition convey new information, they do shift in demand. Many very large index funds try to mimic the performance of the index by holding a portfolio of those stocks included in index employing the same weights used to compute the index. Portfolios change only when the cash inflow outflow realized or when the index composition changes. When the index composition changes, the index funds frequently purchase the added stocks and sell the deleted stocks within a few days of the announcement and/or change date. The potential shift in demand can be quite large based upon the total money invested inpublic or private index funds and non-index funds and other institutional investors such as self-indexing pension funds who use the index as a benchmark in their portfolio management, relative to total market value of index.

There are five different explanations raised by the researchers for the price an volume effects associated with the revisions of the index composition.

1. Price Pressure Hypothesis: Prices increase before the change date by the excess demand of fund managers and then reverse back after change date.(2)
2. Imperfect Substitutes Hypothesis: Stocks in index on which there exists opportunities to speculate or to hedge using the relative derivative are no longer perfect substitutes of stock without such an opportunity. Hence price increases are expected to be permanent and the demand curve for stocks is downward sloping.(3)

3. Attention Hypothesis: Index stocks receive much more attention by the media and analysts and so that investors. Thus lowering the trading costs by reducing the time spent in searching and elaborating public information.(4)

4. Liquidity Hypothesis: Inclusion into the index is beneficial for the stock since trading is more frequent and costs of trading are reduced, while the exclusion causes vice versa.(5)

5. Information Hypothesis: Price reaction is permanent since adding or deleting the stock from the index conveys information to the market, which also means that the entity deciding which firms to include must have private information.(6)

(2) See Bhasin, Cole and Kiely (1997) and Haddock (1998).

(3) The perception of stocks as defensive in nature is fairly common in the general investment community. For example, Morgan Stanley (2002) attributes the weak performance of s relative to overall stocks during late 2001 and early 2002 to the observation that, " the broad rally predominantly excluded defensive stocks."

(4) Peterson and Hsieh (1997) find that returns are significantly related to risk premiums on a market portfolio of stocks and to the returns on mimicking portfolios for size and book-to-market equity factors in common stock returns. Glascock, Lu and So (2000) study behavior relative to stock and bond market behavior using cointegration and autoregressive models and find that the diversification benefits of stocks diminished and that s appear to be more 'stock-like' after 1992. Their work is supportive of Ambrose and Linneman (1998) who argue that the industry went through a fundamental change in the early 1990s. Thus, the issue of to what extent provide diversification benefits remains unresolved.

(5) It could be that over long periods of analysis, are well correlated with the overall market. But if behave differently during periods of high volatility, they could still offer unique diversification benefits.

(6) The database used in this study begins in January 1993. As a result, this study examines the only large single-day market decline to occur during the period for which data is available.

1.3. EMPRICAL RESEARCH

Consistent with prior research, the sample includes only financial firms that traded in the ISE during the 2002 - 2007 period. This was a period during which the economic, political, and financial environment did not change a lot, enabling us to examine the relative explanatory power of return factors and determine whether they are risk proxies. Monthly stock returns, adjusted for dividends and splits, and the National 30-market index (ISE-30) returns are obtained from the ISE electronic database. As the risk-free rate, we use government debt securities (GDS), which have been very high during the sample period due to the high rate of inflation and the high stock of public debt. Although the Istanbul Stock Exchange (ISE) was established just a decade ago in1986, it has achieved rapid development. As a leading emerging market, ISE's progressive infra structure and dynamism are attracting increasing international interest. In average, foreign and international institutional investors own 50% of the free float of the shares at the ISE. Total market capitalization is approximately US$ 80 billion where as it is a highly active market with an average daily trading value of US$ 753 million and 320 listed stocks at year end of 2006.

The "National-100 Index" (ISE-100) which is the main market indicator of the Istanbul Stock Exchange is a market capitalization-weighted index and represents at least 75% of the total market capitalization, traded value, number of shares traded and number of trades realized in the market. ISE has also been calculating and broadcasting a new index since 1997 which is called ISE-30 that contains 30 the largest-market value stocks. We create ISE-10 these stocks are the 40% weighted of traded values and 47% of the market value of Istanbul Stock Exchange (ISE).

1.4. DATA

The first step is to identify all additions to and deletions from the ISE-100 and ISE-30 indices in the period Febuary 2002 through March 2007 and with the related announcement dates. Data belongs to ISE-30 begins from the beginning of 1997 since that index has been implemented on this date. This information has been taken from the ISE's Official Daily Bulletin. We use monthly closing prices and trading volume (turnover) for the stocks and the ISE-30 which are obtained from the ISE. All prices are adjusted for dividends, rights issues and stock splits.

1.5. METHODOLOGY

The advances in panel data econometrics during the last decade have opened the way for estimating the CAPM model by using data regressions which are significantly different from the estimation methodologies used. In data we used estimated correlation matrix of variables, ordinary least square estimations and diagnostic tests (several units are observed over a period of time in a data setting). The basic model using observations is as follows:

$$Y_{i,t} = \alpha + \beta_k x_{k,,i,t} + u_{i,t}$$

The data has observations t = 1....T of each of i = 1....n observation units i where:

i = 1....n is the cross-sectional units in the sample;

t = 1....T is the sample period;

β_k are the parameters that will be estimated;

k = 1,2,.... denotes the independent (explanatory) variables;

u is a stochastic error term assumed to have mean zero and constant variance. (7)

(7)Granger and Newbold, (1974) "Regressions in Econometrics." Journal of Econometrics.

1.5.a. The Capital Asset Pricing Model:

If we let $E(R_i)$ and β_i stand for the expected return and beta, respectively, on any asset in the market, then we know that asset must plot on SML. As a result, we know that its reward-to-risk ratio is the same as the overall market's:

What the CAPM shows is that the expected return for a particular asset depends on three things:

1. The pure time time value of money: As measured by the risk-free rate, R_f this is the reward for merely waiting for your money, without taking any risk.

2. The reward for bearing systematic risk. As measured by the market risk premium, $E(R_M)$- R_f, this component is the reward the market offers for bearing an average amount of systematic risk in addition to waiting.

3. The amount of systematic risk. As measured by β_i, this is the amount of systematic risk present in a particular asset or portfolio, relative to that in an average asset.

1.6. ESTIMATION

"Statistical inference is concerned with drawing conclusions about the nature of some population (e.g. the normal) on the basis of a random sample that has supposedly been drawn from that population. Thus, if we believe that a particular sample has come from a normal population and we compute the sample mean and sample variance from that sample, we may want to know that population may be."

The Meaning of statistical inference :

The concept of population and sample are extremely important in statistcs. Population, is the

totality of all possible outcomes of a phenomenon of interest (e.g. the population of Nicosia). A sample is a subset of a population (e.g. the people living in Famagusta, which is one of the five boroughs of the city). Statitical inference, loosely speaking, is the study of the relationship between a population and a sample drawn from that population. (8)

1.6.a. R square:

R square shows us how much percentage of the variation in the dependent variable is explained by the explanatory variables as a whole. It shows us the fit of the model.

One of the most important indicator is ***R-square, values range from 0 to 100.***

An R squared of 100 means that all movements of a security are completely explained by movements in the index. A high R-squared between 85 and 100 indicates the fund's performance patterns have been in line with the index. ***A fund with a low R-square*** *(70 or less)* ***doesn't act much like the index***. A higher R-squared value will indicate a more useful beta figure. For example, if a fund has an R-squared value of close to 100 but has a beta below 1, it is most likely offering higher risk-adjusted returns. A low R-square means you should ignore the beta."(9)

(8) Broadly speaking there are two approaches to statistical inference, Bayesian and classical. Classical approach as, propounded by statisticians Neyman and Pearson, is generally the approach that a beginning student in statistics first encounters. Although there are basic philosophical differences in the two approaches, there may not be gross differences in the inferences that result.

(9) Levin, Richard I. Rubin, David S. (No date) "Statistics for Management" 7th edition.

1.6.b. Diagnostic Test:

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

A: Serial Correlation or autocorrelation is one of the most important assumptions of the OSL estimation technique. This assumption imposes zero correlation between different error terms and this excludes any form of autocorrelation. Autocorrelation usually occurs with time series data and it indicates a misspecified model, incorrect functional forms, omitted variables and an inadequate dynamic specification of the model may lead to finding of serial correlation.

B: Functional form show a whether the model is a linear model or a nonlinear model. If the null is rejected, this means that the model is not linear.

C: Normality tests the linear regression model for normal errors. If the model does not pass the normality tests, this means that the distribution of the error term is not symmetric around zero.

D: Heteroscedasticity happens when the error terms in the regression have too much variation in different observations. If heteroscedasticity is found, one way to eliminate is to change the functional form from linear to log-linear.(10)

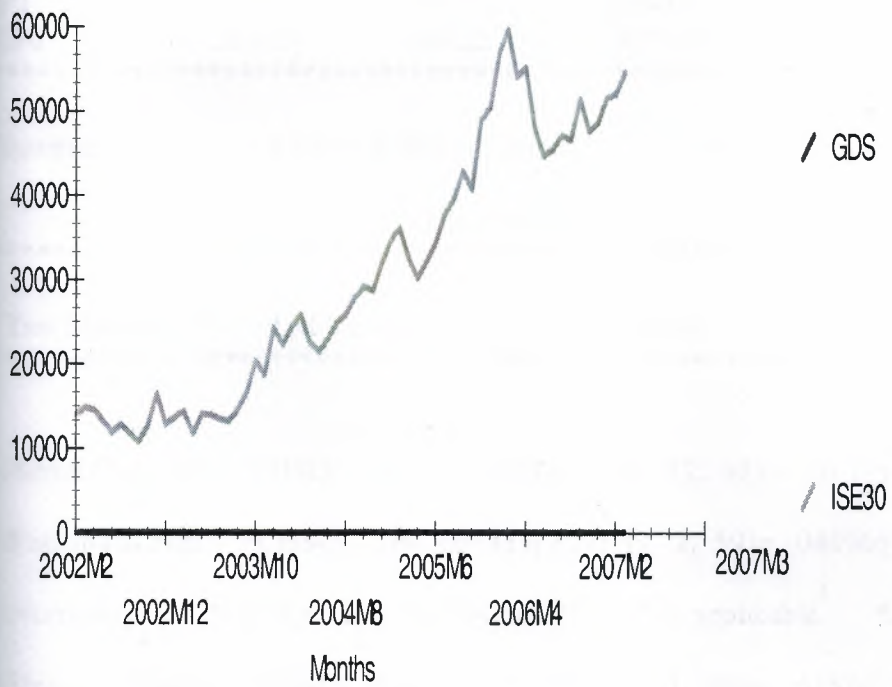
(10) www.wikiprdia.org

1.7. Identification of the Risk Free Investment in Turkey

We prefer ***monthly*** Government Debts Securities for risk free rate between ***2002 and 2007***.

The GDS are guaranteed to meet their promise to pay a fixed amount of future Turkish Lira that narrow sense is only sense in which Turkish Government Debt Securities are risk free.

GDS and ISE 30 INDEX



This Chart suggests that Turkish Government Debt Securities is a good measure of the risk free return so we used the GDS.

SECTION 2

2.1 Regression Analysis – OLS Estimation – Interpretation

2.1.a. AKBNK = α + β ISE30 + e_t

Ordinary Least Squares Estimation

```
*******************************************************************************
*
Dependent variable is AKBNK
62 observations used for estimation from 2002M2  to 2007M3
*******************************************************************************
*
Regressor          Coefficient      Standard Error       T-Ratio[Prob]
INPT                .017011          .011415           1.4902[.141]
ISE30               .80059           .10822            7.3975[.000]
*******************************************************************************
*
R-Squared                .47700   R-Bar-Squared              .46828
```

Diagnostic Tests

```
*******************************************************************************
*
*   Test Statistics  *       LM Version       *       F Version        *
*******************************************************************************
*
*              *                  *                    *
* A:Serial Correlation*CHSQ(  12)=  12.1323[.435]*F(  12,  48)=  .97316[.487]*
*              *                  *                    *
* B:Functional Form   *CHSQ(   1)=  .051413[.821]*F(   1,  59)=  .048966[.826]*
*              *                  *                    *
* C:Normality         *CHSQ(   2)=  5.5394[.063]*      Not applicable      *
*              *                  *                    *
* D:Heteroscedasticity*CHSQ(   1)=  .62980[.427]*F(   1,  60)=  .61574[.436]*
*******************************************************************************
*
```

*The β coefficient of AKBNK is 0.80059 so we can say that stock is a ***defensive stock***,

*The p – value of AKBNK stock is .000 < 0.05 so we accept the hypothesis meaning that the ***variable is significant***.

The AKBNK R square is .47700, this means that 47.70% of the variation in the dependent

variable can be explained by the explanatory variables, so ***the model has a bad fit.***

So the Serial correlation of AKBNK is . 487 > 0.05 we accept H0. AKBNK stock is linear and symmetric around zero, also we can change the functional form from linear to log linear.

2.1.b. DOHOL = α + β ISE30 + e_t

Ordinary Least Squares Estimation

```
*******************************************************************************
*
Dependent variable is DOHOL
62 observations used for estimation from 2002M2  to 2007M3
*******************************************************************************
*
Regressor          Coefficient      Standard Error       T-Ratio[Prob]
INPT               -.0072691         .011863           -.61278[.542]
ISE30               1.3173           .11247           11.7127[.000]
*******************************************************************************
*
R-Squared                .69572   R-Bar-Squared              .69065
```

Diagnostic Tests

```
*******************************************************************************
*
*  Test Statistics  *       LM Version       *       F Version       *
*******************************************************************************
*
*                   *                  *                  *
* A:Serial Correlation*CHSQ(  12)=  11.0257[.527]*F(  12,  48)=   .86520[.586]*
*                   *                  *                  *
* B:Functional Form  *CHSQ(   1)=   .61194[.434]*F(   1,  59)=   .58814[.446]*
*                   *                  *                  *
* C:Normality        *CHSQ(   2)=  36.6818[.000]*      Not applicable       *
*                   *                  *                  *
* D:Heteroscedasticity*CHSQ(   1)=   1.3486[.246]*F(   1,  60)=   1.3341[.253]*
*******************************************************************************
*
```

*The β coefficient of DOHOL 1.3173 so we can say that stock is a ***agressive stock,***

*The p – value of DOHOL stock is .000 < 0.05 so we accept the hypothesis meaning that the ***variable is significant.***

The DOHOL R square is .69572, this means that 69.572% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a bad fit.***

So the Serial correlation of DOHOL is .586 > 0.05 we accept H0. DOHOL stock is linear and symmetric around zero, also we can change the functional form from linear to log linear.

2.1.c. EREGL = α + β ISE30 + e_t

Ordinary Least Squares Estimation

```
*******************************************************************************
*
Dependent variable is EREGL
62 observations used for estimation from 2002M2 to 2007M3
*******************************************************************************
*
Regressor          Coefficient      Standard Error       T-Ratio[Prob]
INPT                .016481          .011893          1.3859[.171]
ISE30               .97245           .11275           8.6246[.000]
*******************************************************************************
*
R-Squared                .55352   R-Bar-Squared              .54607
```

Diagnostic Tests

```
*******************************************************************************
*  Test Statistics  *       LM Version       *       F Version       *
*******************************************************************************
* A:Serial Correlation*CHSQ( 12)=  3.8764[.986]*F( 12, 48)=  .26677[.992]*
*                     *                       *
* B:Functional Form   *CHSQ(  1)= .010320[.919]*F(  1, 59)= .0098223[.921]*
*                     *                       *
* C:Normality         *CHSQ(  2)=  .19861[.905]*      Not applicable      *
*                     *                       *
* D:Heteroscedasticity*CHSQ(  1)=  1.4290[.232]*F(  1, 60)=  1.4156[.239]*
```

The β coefficient of EREGL is .97245 so we can say that stock is a ***defensive stock,***

The p – value of EREGL stock is .000 < 0.05 so we accept the hypothesis meaning that the ***variable is significant.***

The EREGL R square is .55352, this means that 55.35% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a bad fit.***

The Serial correlation of is .992 > 0.05 we accept hypothesis That's nearly perfect serial correlation. EREGL stock is linear and symmetric around zero, also we can change the functional form from linear to log linear.

2.1.d. GARAN = α + β ISE30 + e_t

GARAN = α + β ISE30 + e_t

Ordinary Least Squares Estimation

****

Dependent variable is GARAN
62 observations used for estimation from 2002M2 to 2007M3

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	.0059316	.011166	.53123[.597]
ISE30	1.2537	.10586	11.8426[.000]

****

R-Squared .70037 R-Bar-Squared .69538

****

Diagnostic Tests

****

* Test Statistics *	LM Version *	F Version *

****

* A:Serial Correlation*CHSQ(12)= 18.6529[.097]*F(12, 48)= 1.7213[.092]*

* B:Functional Form *CHSQ(1)= .36054[.548]*F(1, 59)= .34510[.559]*

```
* C:Normality      *CHSQ(  2)=  1.5970[.450]*      Not applicable     *
*              *                *                 *
* D:Heteroscedasticity*CHSQ(  1)=  .27093[.603]*F(  1,  60)=  .26334[.610]*
*******************************************************************************
```

*The β coefficient of GARAN is 1.2537 so we can say that stock is a ***agressive stock,***

*The p – value of GARAN stock is .000 < 0.05 so we accept the hypothesis meaning that the ***variable is significant.***

The GARAN R square is .70037, this means that 70.04% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a good fit.***

The Serial correlation of is .092 > 0.05 we accept hypothesis . GARAN stock is linear and symmetric around zero, also we can change the functional form from linear to log linear

2.1.e. ISCTR = α + β ISE30 + e_t

ISCTR = α + β ISE30 + e_t

Ordinary Least Squares Estimation

```
*******************************************************************************
*
Dependent variable is ISCTR
62 observations used for estimation from 2002M2  to 2007M3
*******************************************************************************
*
Regressor          Coefficient      Standard Error       T-Ratio[Prob]
INPT              -.0049008          .011645          -.42086[.675]
ISE30               1.2101           .11040          10.9608[.000]
*******************************************************************************
*
R-Squared                .66692   R-Bar-Squared              .66137
```

Diagnostic Tests

```
*******************************************************************************
*
*   Test Statistics  *       LM Version        *        F Version        *
*******************************************************************************
```

* A:Serial Correlation*CHSQ(12)= 13.1161[.361]*F(12, 48)= 1.0733[.403]*
* * * *
* B:Functional Form *CHSQ(1)= 1.0575[.304]*F(1, 59)= 1.0238[.316]*
* * * *
* C:Normality *CHSQ(2)= 36.3941[.000]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)= .082942[.773]*F(1, 60)= .080374[.778]*
****

*The β coefficient of ISCTR is 1.2101 so we can say that stock is a ***agressive stock,***

*The p – value of ISCTR stock is .000 < 0.05 so we reject the hypothesis meaning that the

variable is significant.

The ISCTR R square is .66692, this means that 66.69% of the variation in the dependent

variable can be explained by the explanatory variables, so ***the model has a bad fit.***

The Serial correlation of is .403 > 0.05 we accept hypothesis . ISCTR stock is linear and

symmetric around zero, also we can change the functional form from linear to log linear.

2.1.f. KCHOL = α + β ISE30 + e_t

KCHOL = α + β ISE30 + e_t

Ordinary Least Squares Estimation

****
*
Dependent variable is KCHOL
62 observations used for estimation from 2002M2 to 2007M3
****
*

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	-.0083310	.0086685	-.96107[.340]
ISE30	1.0472	.082185	12.7421[.000]

****
*

R-Squared .73017 R-Bar-Squared .72567

Diagnostic Tests

****
* Test Statistics * LM Version * F Version *
****

```
* A:Serial Correlation*CHSQ( 12)= 13.8051[.313]*F( 12, 48)= 1.1458[.348]*
*            *                *                *
* B:Functional Form  *CHSQ( 1)= .035663[.850]*F( 1, 59)= .033957[.854]*
*            *                *                *
* C:Normality        *CHSQ( 2)= 5.5257[.063]*      Not applicable      *
*            *                *                *
* D:Heteroscedasticity*CHSQ( 1)= .25196[.616]*F( 1, 60)= .24483[.623]*
*********************************************************************
```

*The β coefficient of KCHOL is 1.0472 so we can say that stock is a ***agressive stock,***

*The p – value of KCHOL stock is .000 < 0.05 so we reject the hypothesis meaning that the ***variable is significant.***

The KCHOL R square is .73017, this means that 73.02% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a good fit.***

The Serial correlation of is .348 > 0.05 we accept hypothesis . KCHOL stock is linear and symmetric around zero, also we can change the functional form from linear to log linear.

2.1.g. SAHOL = α + β ISE30 + e_t

SAHOL = α + β ISE30 + e_t

Ordinary Least Squares Estimation

```
*********************************************************************
*
Dependent variable is SAHOL
62 observations used for estimation from 2002M2 to 2007M3
*********************************************************************
*
Regressor        Coefficient     Standard Error      T-Ratio[Prob]
INPT             -.0054949       .0083222        -.66026[.512]
ISE30             1.1550         .078903        14.6377[.000]
*********************************************************************
*
R-Squared              .78123   R-Bar-Squared              .77758
```

Diagnostic Tests

```
*********************************************************************
*  Test Statistics  *      LM Version      *      F Version      *
*********************************************************************
```

* A:Serial Correlation*CHSQ(12)= 12.3581[.417]*F(12, 48)= .99578[.467]*
* * * *
* B:Functional Form *CHSQ(1)= .22199[.638]*F(1, 59)= .21201[.647]*
* * * *
* C:Normality *CHSQ(2)= 1.0985[.577]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)= .23314[.629]*F(1, 60)= .22648[.636]*
****

*The β coefficient of SAHOL is 1.1550 so we can say that stock is a ***agressive stock,***

*The p – value of SAHOL stock is .000 < 0.05 so we reject the hypothesis meaning that the ***variable is significant***.

The SAHOL R square is .78123, this means that 78.12% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a good fit.***

The Serial correlation of is .467 > 0.05 we accept hypothesis . SAHOL stock is linear and symmetric around zero, also we can change the functional form from linear to log linear.

2.1.h. TCELL = α + β ISE30 + e_t

TCELL = α + β ISE30 + e_t

Ordinary Least Squares Estimation

****
*
Dependent variable is TCELL
62 observations used for estimation from 2002M2 to 2007M3
****
*

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	.0040658	.011839	.34341[.732]
ISE30	.81454	.11225	7.2565[.000]

****
*

R-Squared .46741 R-Bar-Squared .45853

Diagnostic Tests

****
* Test Statistics * LM Version * F Version *
****

```
* A:Serial Correlation*CHSQ( 12)= 18.2254[.109]*F( 12, 48)= 1.6654[.105]*
*            *                *                *
* B:Functional Form  *CHSQ( 1)= .33802[.561]*F( 1, 59)= .32343[.572]*
*            *                *                *
* C:Normality        *CHSQ( 2)= 16.8650[.000]*      Not applicable      *
*            *                *                *
* D:Heteroscedasticity*CHSQ( 1)= .34582[.556]*F( 1, 60)= .33654[.564]*
*******************************************************************************
*
```

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

*The β coefficient of TCELL is .81454 so we can say that stock is a ***defensive stock,***

*The p – value of TCELL stock is .000 < 0.05 so we reject the hypothesis meaning that the ***variable is significant.***

The TCELL R square is .46741, this means that 46.74% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a bad fit.***

The Serial correlation of is .105 > 0.05 we accept hypothesis . TCELL stock is linear and symmetric around zero, also we can change the functional form from linear to log linear.

2.1.i. TUPRS = α + β ISE30 + e_t

TUPRS = α + β ISE30 + e_t

Ordinary Least Squares Estimation

```
*******************************************************************************
*
Dependent variable is TUPRS
62 observations used for estimation from 2002M2 to 2007M3
*******************************************************************************
*
Regressor          Coefficient      Standard Error      T-Ratio[Prob]
INPT                .010009          .011403           .87774[.384]
ISE30               .73047           .10811           6.7565[.000]
*******************************************************************************
R-Squared              .43209   R-Bar-Squared              .42263
```

Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(12)= 11.2035[.512]	F(12, 48)= .88222[.570]
B:Functional Form	CHSQ(1)= .76430[.382]	F(1, 59)= .73640[.394]
C:Normality	CHSQ(2)= .96803[.616]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 2.6572[.103]	F(1, 60)= 2.6866[.106]

*The β coefficient of TUPRS is .73047 so we can say that stock is a ***defensive stock,***

*The p – value of TUPRS stock is .000 < 0.05 so we reject the hypothesis meaning that the ***variable is significant.***

The TUPRS R square is .43209, this means that 43.21% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a bad fit.***

The Serial correlation of is .570 > 0.05 we accept hypothesis . TUPRS stock is linear and symmetric around zero, also we can change the functional form from linear to log linear.

2.1.j. YKBNK = α + β ISE30 + e_t

YKBNK = α + β ISE30 + e_t

Ordinary Least Squares Estimation

Dependent variable is YKBNK
62 observations used for estimation from 2002M2 to 2007M3

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
INPT	-.013092	.015772	-.83005[.410]
ISE30	1.2504	.14953	8.3623[.000]

R-Squared	.53821	R-Bar-Squared	.53051

Diagnostic Tests

```
*****************************************************************************
*
*  Test Statistics  *      LM Version      *       F Version       *
*****************************************************************************
*
*                   *                      *                      *
* A:Serial Correlation*CHSQ( 12)= 10.6434[.560]*F( 12, 48)= .82898[.621]*
*                   *                      *                      *
* B:Functional Form  *CHSQ( 1)= .14943[.699]*F( 1, 59)= .14254[.707]*
*                   *                      *                      *
* C:Normality        *CHSQ( 2)= 568.1844[.000]*     Not applicable     *
*                   *                      *                      *
* D:Heteroscedasticity*CHSQ( 1)= .10640[.744]*F( 1, 60)= .10315[.749]*
*****************************************************************************
```

*The β coefficient of YKBNK is .1.2504 so we can say that stock is a ***agressive stock,***

*The p – value of YKBNK stock is .000 < 0.05 so we reject the hypothesis meaning that the

variable is significant.

The YKBNK R square is .53821, this means that 53.82% of the variation in the dependent variable can be explained by the explanatory variables, so ***the model has a bad fit.***

2.2. THE SUMMARY TABLE OF ISE-10

BLUE CHIP	BETA	AGRAESSIVE BLUE CHIP		DEFENSIVE BLUE CHIP	
AKBNK	0.80059	DOHOL	1.31730	AKBNK	0.80059
DOHOL	1.31730	GARAN	1.25370	EREGL	0.97245
EREGL	0.97245	ISCTR	1.21010	TCELL	0.81454
GARAN	1.25370	KCHOL	1.04720	TUPRS	0.73047
ISCTR	1.21010	SAHOL	1.15500		
KCHOL	1.04720	YKBNK	1.25040		
SAHOL	1.15500				
TCELL	0.81454				
TUPRS	0.73047				
YKBNK	1.25040				

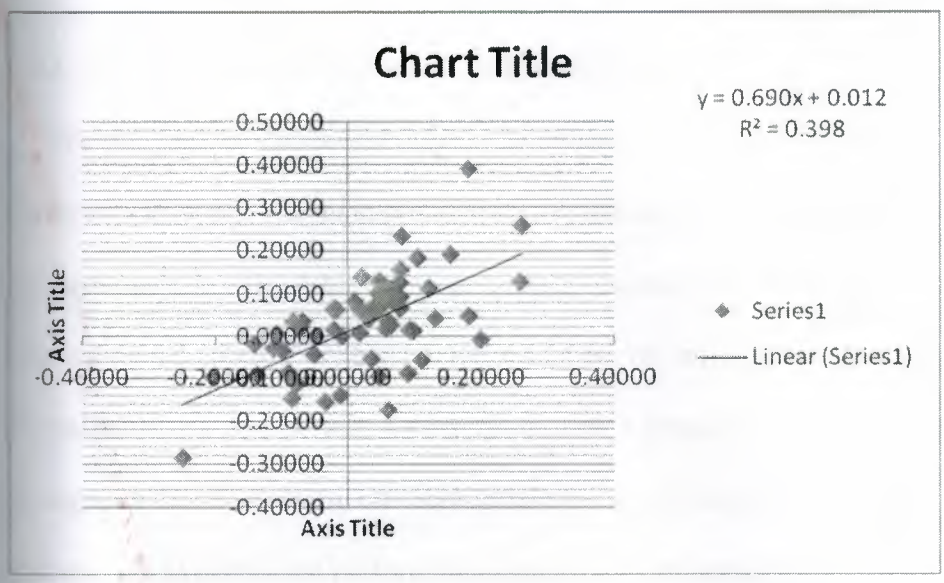
MOST AGRESSIVE		MOST DEFENSIVE	
DOHOL	1.31730	TUPRS	0.73047

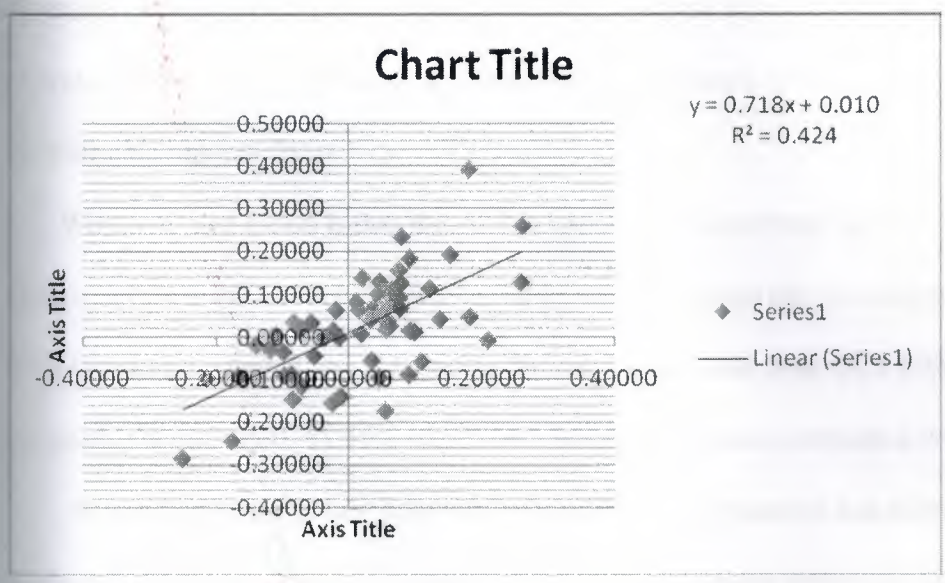
ISE-10 β 1.05

	AKBNK	DOHOL	EREGL	GARAN	ISCTR	KCHOL	SAHOL	TCELL	TUPRS	YKBNK
I	0.012	0.007	0.165	0.006	0.005	0.008	0.005	0.004	0.010	0.013
Є	0.114	0.012	0.012	0.011	0.012	0.009	0.008	0.012	0.011	0.016
β	0.80*	1.32*	0.97*	1.25*	1.21*	1.05*	1.16*	0.82*	0.73*	1.25*
R^2	0.477	0.696	0.554	0.700	0.667	0.730	0.781	0.467	0.432	0.538
A	0.49*	0.59*	0.99*	0.09*	0.40*	0.35*	0.47*	0.11*	0.57*	0.62*
B	0.83*	0.45*	0.92*	0.56*	0.32*	0.85*	0.65*	0.57*	0.39*	0.71*
C	*	*	*	*	*	*	*	*	*	*
D	0.44*	0.25*	0.24*	0.61*	0.78*	0.62*	0.64*	0.56*	0.11*	0.75*
ISE30 COR.	0.691	0.834	0.744	0.837	0.817	0.855	0.884	0.684	0.658	0.734

The average value of the ISE – 10 is 1.05 so we can say if we have a portfolio that will be an aggressive portfolio, we want to stress that the risk free rate is very important in calculation of β

value the risk free rate has positive effect on the β. As a sample of TUPRS;





If we compare two charts we will see β value is positively effected from the risk free rate.

SECTION 3.

3.1. CONCLUSION AND RECOMENDATIONS

We find that we can accept the null hypothesis the CAPM applies and Turkish Blue Chips are efficient. The main problem is the systematic risk in the Turkish security market. In an efficient market, no investor has incrementally valuable price forecasting information for forecasting next period's change in returns unless the information forecasts a change in non-diversifiable risk next period. All portfolios with a given diversified risk can expect to receive, on average, an identical return, one appropriate the non-diversifiable risk they are taking; and no investor can expect to out perform the average performance of all investments with the same non-diversifiable risk over a sustein period of time. Prices are all consistent with any portfolio's expected return being no more and no less than the expected return to the minimum non-diversifiable risk portfolio.

What we have found is that the market appears to compensate investors for risks that can't be eliminated from the market as a whole. Firstly we found that the correlation estimation of Turkish Blue Chips and Istanbul Stock Exhange 30 Index is positive, SAHOL (0.88387) has the best correlation with ISE30, TUPRS (0.65734) has the minimum correlation with ISE30.

As we mentioned in our study we defined that the aggressive and defensive blue chips in Turkish Security Market and we found that six of these stocks which are DOHOL (1.3173), GARAN (1.2537), ISCTR (1.2101), KCHOL (1,0472), SAHOL (1.1550), and YKBNK (1.2504) are aggressive however four of them AKBNK (0.8006), EREGL (0.9725), TCELL (0.8145) and TUPRS (0.7304) are defensive stocks. The national financial corporations especially holdings and banks have more volatility in prices so invest in that companies will be

risker than invest in defensive stock.

For example theoretically DOHOL has 1.3173 β that means that stock is 31.73 % more volatile than the market. Many utilities stocks have a beta of less than 1.

"For example the most popular index Nasdaq-based stocks have beta of greater than 1."

So if we study with DOHOL stock again the R^2 of stock is 69.57 % that means this indicate is not useful for beta figure, but the indicator for GARAN (70.04%), KCHOL (73.02%),SAHOL (78.12%) stocks have been with the index and act much like index, so these three stocks are useful for beta figure.

For the YKBNK has also conversely indicator for the β of YKBNK stock is 1.2504 that means this stock is theoretically 12.50 % more volatile than the market, maybe that can be a good indicator for a bullish investor but if we scrutinize more closely we'll see that the R^2 number (53.82 %) is not enough to explain the model so we should ignore the beta.

So we can say as a last sentence ***there is no problem,*** ***mostly*** that all of the explanatory variables are highly correlated with one another, we can see that analysis especially in plot grahps. If it is present, the regression model has telling which explanatory variables is influencing the dependent variables.

So we cam take long position for Turkish Blue Chips although there is systematic risk in Turkish Security Market.

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TURDEX	(www.vob.org.tr)
ISTE YATIRIM	(www.isteyatirim.com)
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APENDIX

LIST OF ESTIMATION RESULTS

E1. AKBNK

Sample period :2002M2 to 2007M3
Variable(s) : AKBNK ISE30
Maximum : .27614 .26138
Minimum : -.35742 -.24952
Mean : .032240 .019023
Std. Deviation : .12124 .10459
Coef of Variation: 3.7606 5.4983

Estimated Correlation Matrix of Variables

****
*

	AKBNK	ISE30
AKBNK	1.0000	.69065
ISE30	.69065	1.0000

****

E2. DOHOL

Sample period :2002M2 to 2007M3
Variable(s) : DOHOL ISE30
Maximum : .51083 .26138
Minimum : -.41985 -.24952
Mean : .017790 .019023
Std. Deviation : .16518 .10459
Coef of Variation: 9.2855 5.4983

Estimated Correlation Matrix of Variables

****
*

	DOHOL	ISE30
DOHOL	1.0000	.83410
ISE30	.83410	1.0000

****

E3. EREGL

Sample period :2002M2 to 2007M3

Variable(s)	EREGL	ISE30
Maximum	.37708	.26138
Minimum	-.29092	-.24952
Mean	.034980	.019023
Std. Deviation	.13671	.10459
Coef of Variation:	3.9082	5.4983

Estimated Correlation Matrix of Variables

****

	EREGL	ISE30
EREGL	1.0000	.74399
ISE30	.74399	1.0000

****

E4. GARAN

Sample period :2002M2 to 2007M3

Variable(s)	GARAN	ISE30
Maximum	.35937	.26138
Minimum	-.37579	-.24952
Mean	.029780	.019023
Std. Deviation	.15668	.10459
Coef of Variation:	5.2614	5.4983

Estimated Correlation Matrix of Variables

****

	GARAN	ISE30
GARAN	1.0000	.83688
ISE30	.83688	1.0000

****

E5. ISCTR

Sample period	:2002M2 to 2007M3		
Variable(s)	:	ISCTR	ISE30
Maximum	:	.33531	.26138
Minimum	:	-.50024	-.24952
Mean	:	.018119	.019023
Std. Deviation	:	.15498	.10459
Coef of Variation:		8.5538	5.4983

Estimated Correlation Matrix of Variables

****
*

	ISCTR	ISE30
ISCTR	1.0000	.81665
ISE30	.81665	1.0000

****
*

E6. KCHOL

Sample period	:2002M2 to 2007M3		
Variable(s)	:	KCHOL	ISE30
Maximum	:	.29424	.26138
Minimum	:	-.24741	-.24952
Mean	:	.011590	.019023
Std. Deviation	:	.12818	.10459
Coef of Variation:		11.0598	5.4983

Estimated Correlation Matrix of Variables

****
*

	KCHOL	ISE30
KCHOL	1.0000	.85450
ISE30	.85450	1.0000

****
E7. SAHOL

Sample period	:2002M2 to 2007M3		
Variable(s)	:	SAHOL	ISE30

Maximum	:	.28451	.26138
Minimum	:	-.31524	-.24952
Mean	:	.016475	.019023
Std. Deviation	:	.13667	.10459
Coef of Variation:		8.2954	5.4983

Estimated Correlation Matrix of Variables

****
*

	SAHOL	ISE30
SAHOL	1.0000	.88387
ISE30	.88387	1.0000

****

E8. TCELL

Sample period	:2002M2 to 2007M3		
Variable(s)	:	TCELL	ISE30
Maximum	:	.37949	.26138
Minimum	:	-.20729	-.24952
Mean	:	.019560	.019023
Std. Deviation	:	.12461	.10459
Coef of Variation:		6.3706	5.4983

Estimated Correlation Matrix of Variables

****
*

	TCELL	ISE30
TCELL	1.0000	.68367
ISE30	.68367	1.0000

****
*

E9. TUPRS

Sample period	:2002M2 to 2007M3		
Variable(s)	:	TUPRS	ISE30
Maximum	:	.39045	.26138
Minimum	:	-.28463	-.24952
Mean	:	.023904	.019023

Std. Deviation : .11623 .10459
Coef of Variation: 4.8622 5.4983
Estimated Correlation Matrix of Variables

****
*

	TUPRS	ISE30
TUPRS	1.0000	.65734
ISE30	.65734	1.0000

****
*

E10. YKBNK

Sample period :2002M2 to 2007M3

Variable(s)	:	YKBNK	ISE30
Maximum	:	.47889	.26138
Minimum	:	-.82869	-.24952
Mean	:	.010695	.019023
Std. Deviation	:	.17827	.10459
Coef of Variation:		16.6686	5.4983

Estimated Correlation Matrix of Variables

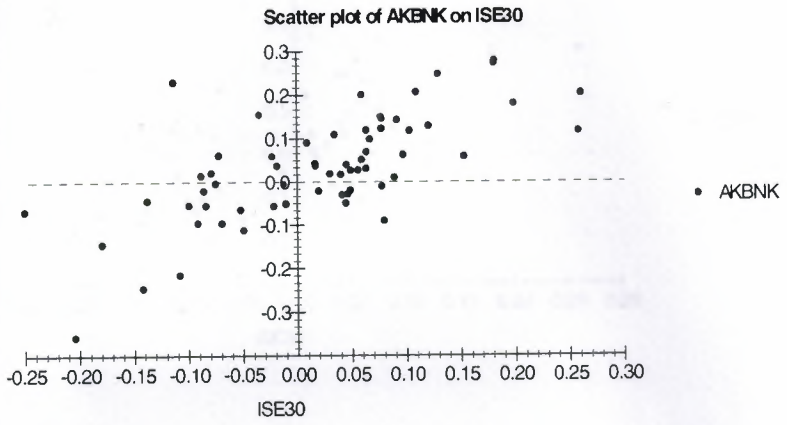
****
*

	YKBNK	ISE30
YKBNK	1.0000	.73363
ISE30	.73363	1.0000

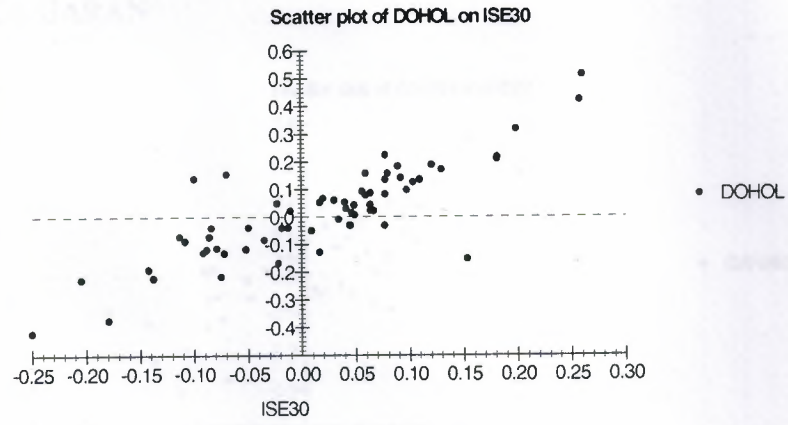
****
*

LIST OF CHARTS

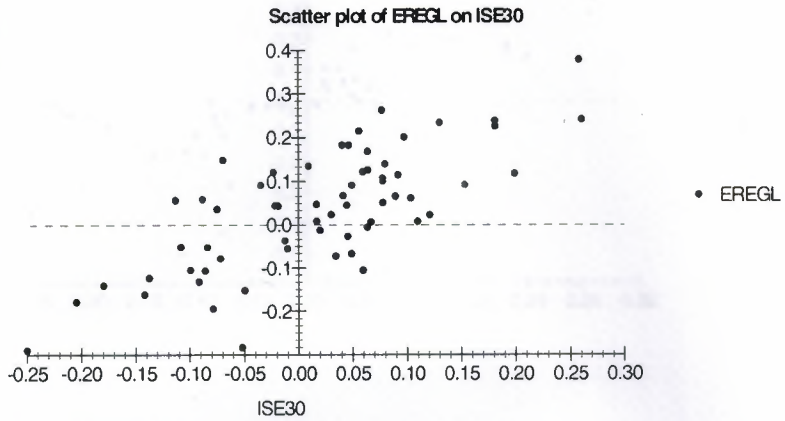
C1. AKBNK



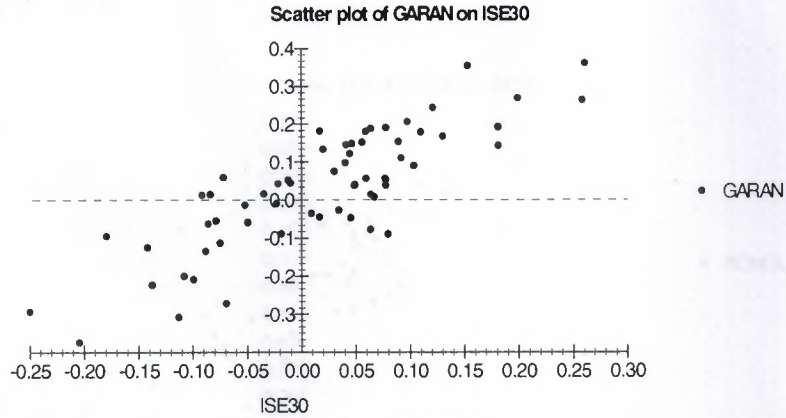
C2. DOHOL



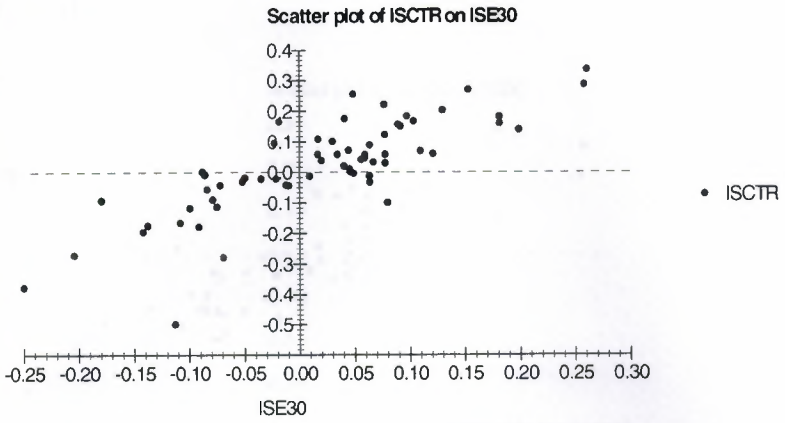
C3. EREGL



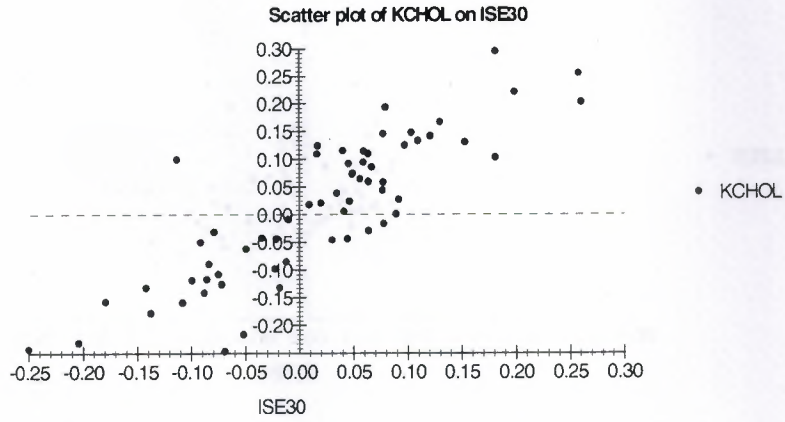
C4. GARAN



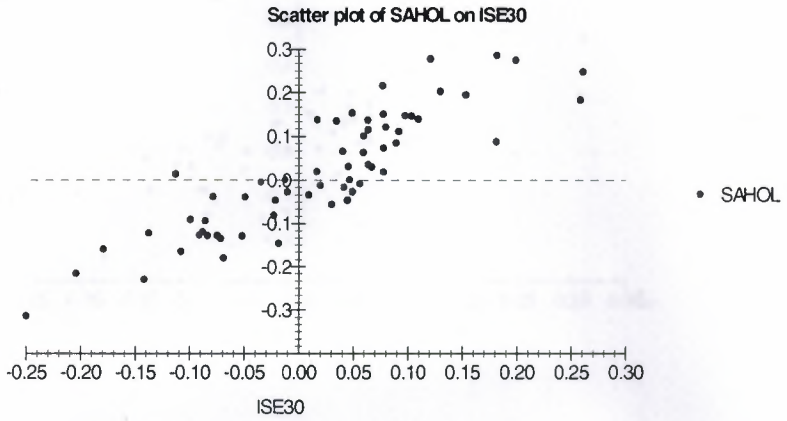
C5. ISCTR



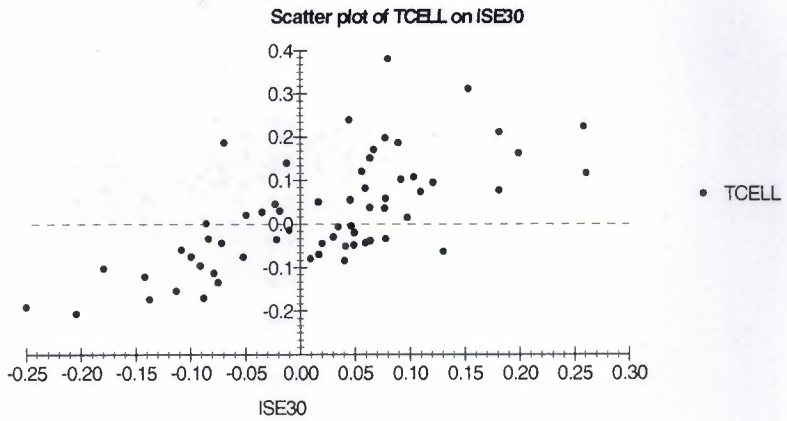
C6. KCHOL



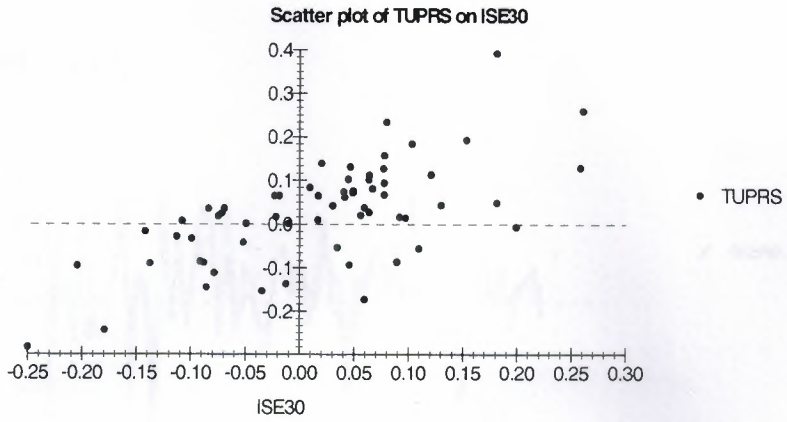
C7. SAHOL



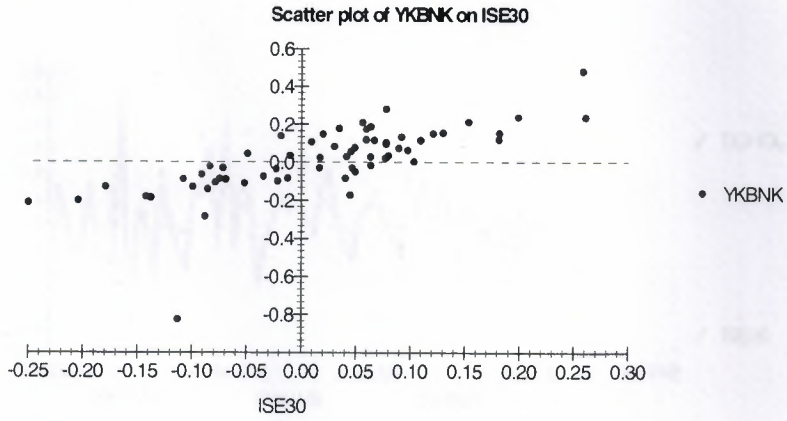
C8. TCELL



C9. TUPRS

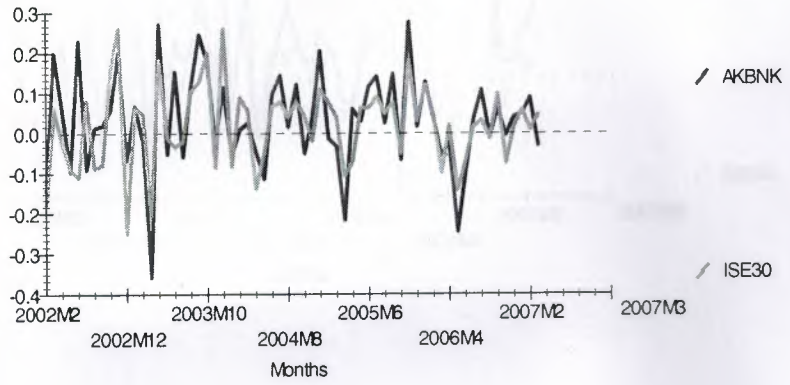


C10. YKBNK

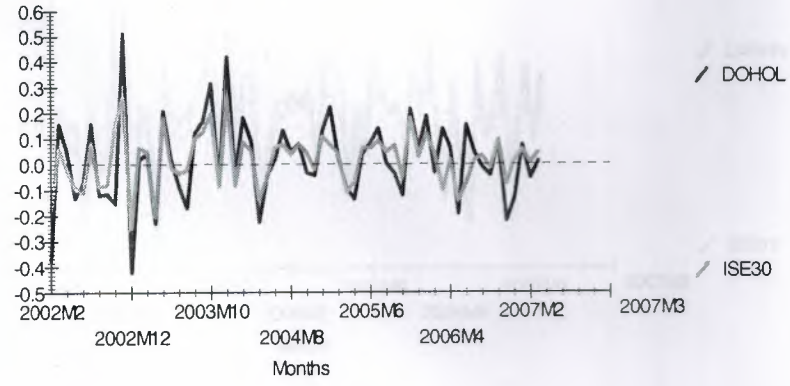


LIST OF PLOTS

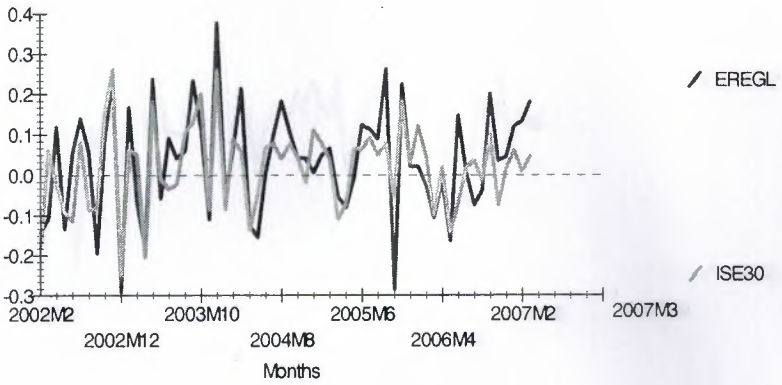
P1. AKBNK



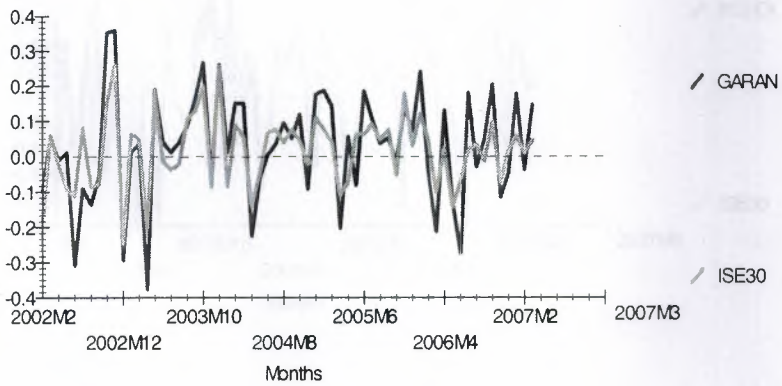
P2. DOHOL



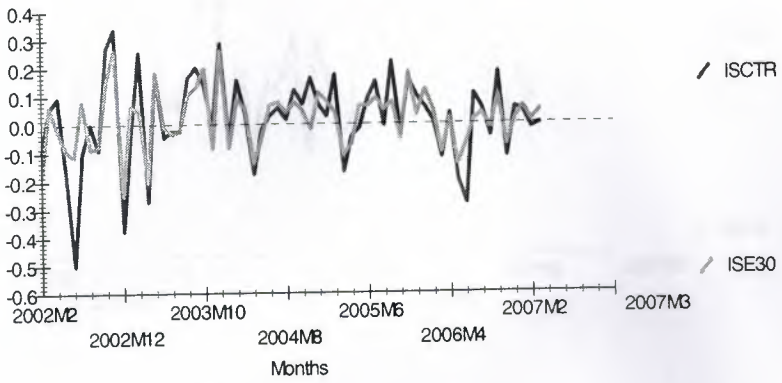
P3. EREGL



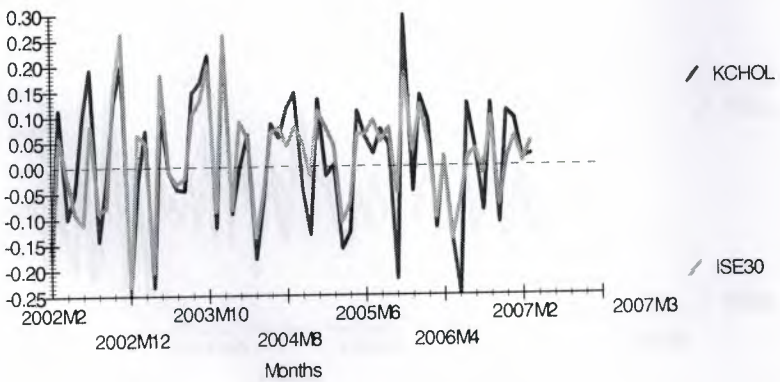
P5.GARAN



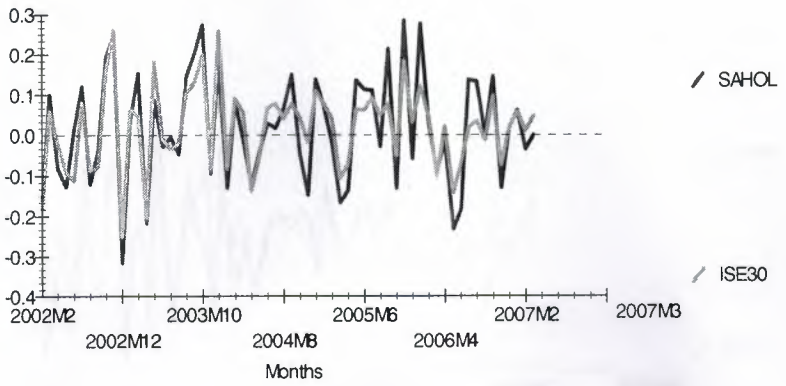
P5. ISCTR



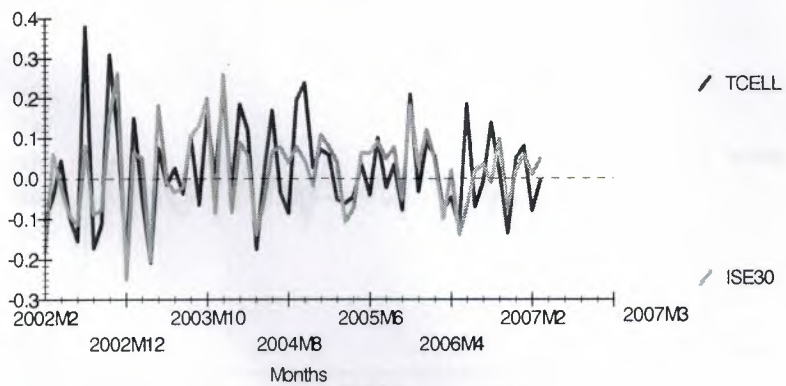
P6. KCHOL



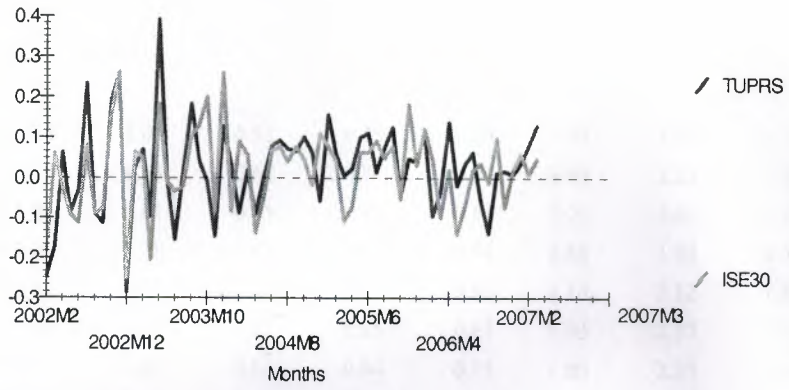
P7. SAHOL



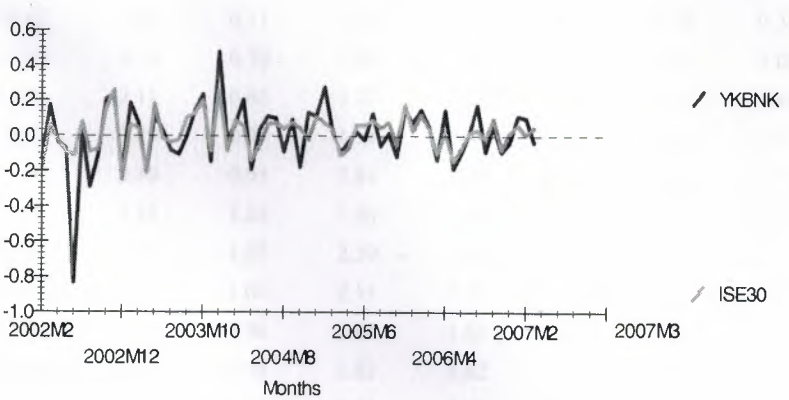
P8. TCELL



P9. TUPRS



P10. YKBNK



LIST OF TABLES

T1. MONTHLY CLOSING PRICE OF ISE 10

	AKBNK	DOHOL	EREGL	GARAN	ISCTR	KCHOL	SAHOL	TCELL	TUPRS	YKBNK
DATE	PRICES									
27/02/02	1.09	0.53	0.79	0.89	1.94	1.99	1.72	1.84	5.08	1.33
30/03/02	1.33	0.62	0.71	0.94	2.05	2.23	1.90	1.76	4.27	1.58
30/04/02	1.41	0.65	0.80	0.93	2.25	2.02	1.75	1.84	4.55	1.52
30/05/02	1.28	0.57	0.70	0.94	1.88	1.92	1.54	1.67	4.17	1.42
30/06/02	1.61	0.53	0.74	0.69	1.14	2.12	1.56	1.43	4.05	0.62
30/07/02	1.47	0.62	0.85	0.63	1.03	2.57	1.76	2.09	5.11	0.64
30/08/02	1.49	0.55	0.90	0.55	1.03	2.23	1.56	1.76	4.67	0.48
30/09/02	1.52	0.49	0.74	0.52	0.94	2.16	1.50	1.57	4.17	0.43
30/10/02	1.61	0.42	0.81	0.74	1.23	2.46	1.82	2.14	5.05	0.53
30/11/02	1.97	0.70	1.03	1.06	1.72	3.01	2.33	2.40	6.54	0.67
30/12/02	1.84	0.46	0.77	0.79	1.18	2.36	1.70	1.98	4.92	0.54
30/01/03	1.97	0.47	0.91	0.80	1.14	2.29	1.76	2.30	5.05	0.65
27/02/03	1.93	0.49	0.85	0.83	1.47	2.46	2.05	2.19	5.42	0.70
30/03/03	1.35	0.39	0.71	0.57	1.12	1.95	1.65	1.78	4.92	0.57
30/04/03	1.77	0.48	0.90	0.69	1.34	2.16	1.80	1.92	7.27	0.64
30/05/03	1.68	0.49	0.85	0.72	1.28	2.14	1.75	1.89	7.27	0.66
30/06/03	1.96	0.45	0.93	0.73	1.25	2.05	1.74	1.94	6.23	0.61
30/07/03	1.85	0.38	0.97	0.76	1.22	1.96	1.66	1.87	6.33	0.55
30/08/03	2.08	0.43	1.03	0.83	1.44	2.27	1.92	2.08	7.60	0.55
30/09/03	2.66	0.51	1.30	0.98	1.76	2.68	2.35	1.95	7.93	0.64
30/10/03	3.18	0.70	1.46	1.28	2.02	3.34	3.09	2.29	7.87	0.81
30/11/03	3.11	0.65	1.31	1.20	2.00	2.97	2.81	2.29	6.80	0.70
30/12/03	3.49	0.99	1.91	1.56	2.66	3.83	3.37	2.86	7.73	1.13
30/01/04	3.30	0.95	1.81	1.58	2.51	3.50	2.96	2.76	8.00	1.10
27/02/04	3.33	1.14	1.93	1.84	2.93	3.50	3.22	3.32	7.33	1.18
30/03/04	3.42	1.25	2.39	2.14	3.05	3.73	3.19	3.74	7.47	1.45
30/04/04	3.27	1.00	2.11	1.71	2.56	3.12	2.82	3.14	6.82	1.20
30/05/04	2.92	0.96	1.81	1.61	2.51	2.93	2.71	3.20	6.82	1.25
30/06/04	3.22	0.98	1.82	1.62	2.59	3.19	2.79	3.79	7.39	1.40
30/07/04	3.72	1.12	2.01	1.68	2.74	3.38	2.84	3.66	8.11	1.55
30/08/04	3.78	1.18	2.41	1.85	2.79	3.79	3.03	3.36	8.72	1.42
30/09/04	4.27	1.28	2.68	1.95	3.15	4.38	3.52	4.09	9.32	1.56
30/10/04	4.06	1.24	2.80	2.20	3.38	4.19	3.36	5.19	10.31	1.31

30/11/04	4.21	1.19	2.92	2.01	3.98	3.67	2.90	5.34	10.99	1.50
30/12/04	5.17	1.36	2.94	2.40	4.26	4.19	3.33	5.74	10.38	1.68
30/01/05	5.11	1.70	3.09	2.90	4.38	4.12	3.58	6.08	12.13	2.22
30/02/05	4.95	1.75	3.30	3.35	5.21	4.14	3.52	5.77	12.88	2.28
30/03/05	3.99	1.60	3.13	2.74	4.41	3.53	2.98	5.43	12.96	2.08
30/04/05	4.24	1.40	2.89	2.90	4.22	3.11	2.60	5.19	13.26	2.01
30/05/05	4.37	1.46	2.87	2.68	4.16	3.47	2.98	5.38	14.66	2.06
30/06/05	4.92	1.59	3.25	3.23	4.54	3.68	3.34	5.17	16.38	2.02
30/07/05	5.67	1.83	3.64	3.60	5.27	3.78	3.73	5.72	16.63	2.30
30/08/05	5.82	1.84	3.98	3.74	5.24	4.07	3.63	5.60	17.92	2.18
30/09/05	6.75	1.78	5.17	3.95	6.53	4.25	4.50	5.80	20.32	2.22
30/10/05	6.32	1.58	3.89	3.89	6.32	3.42	3.95	5.37	19.46	1.98
30/11/05	8.33	1.96	4.87	4.48	7.40	4.59	5.25	6.62	20.41	2.30
30/12/05	8.48	2.08	4.98	4.82	8.17	4.38	4.96	6.42	21.26	2.49
30/01/06	9.64	2.51	5.09	6.14	8.66	5.04	6.54	7.05	23.79	2.89
27/02/06	10.02	2.43	4.95	5.85	8.73	5.52	6.74	7.44	21.65	3.05
30/03/06	9.48	2.79	4.45	4.74	7.75	4.90	6.15	6.89	20.92	2.67
30/04/06	9.27	2.98	4.39	5.41	8.03	5.00	6.07	6.58	24.01	3.09
30/05/06	7.25	2.46	3.73	4.77	6.60	4.38	4.82	5.82	23.58	2.57
30/06/06	6.58	2.87	4.32	3.63	4.99	3.42	4.02	7.00	24.42	2.34
30/07/06	6.82	3.02	4.35	4.35	5.55	3.87	4.61	6.52	26.03	2.39
30/08/06	7.60	2.99	4.04	4.23	5.87	4.02	5.27	6.47	24.65	2.85
30/09/06	7.55	2.87	3.89	4.45	5.62	3.69	5.27	7.43	21.47	2.61
30/10/06	8.03	3.16	4.75	5.46	6.74	4.18	6.10	7.53	21.75	2.77
30/11/06	7.99	2.54	4.92	4.87	6.01	3.75	5.36	6.57	22.12	2.53
30/12/06	8.33	2.23	5.15	4.65	6.36	4.18	5.46	6.90	22.30	2.45
30/01/07	8.76	2.41	5.81	5.56	6.65	4.59	5.81	7.48	23.13	2.75
27/02/07	9.58	2.29	6.64	5.36	6.55	4.67	5.61	6.90	25.11	3.05
30/03/07	9.30	2.32	7.96	6.21	6.55	4.78	5.61	6.86	28.57	2.95

T2. ISE 30 MONTHLY INDEX PRICES AND RETURNS

	ISE 30 INDEX RETURN	
DATE	INDEX	RETURN
2/28/2002	14,030.07	-0.17880
3/29/2002	14,898.56	0.06006
4/30/2002	14,569.40	-0.02234
5/31/2002	13,305.61	-0.09074
6/28/2002	11,891.03	-0.11240
7/31/2002	12,886.09	0.08036
8/29/2002	11,805.97	-0.08754
9/30/2002	10,918.49	-0.07815
10/31/2002	12,734.36	0.15385
11/29/2002	16,538.31	0.26138
12/31/2002	12,886.20	-0.24952
1/31/2003	13,742.43	0.06433
2/28/2003	14,439.06	0.04945
3/31/2003	11,776.46	-0.20383
4/30/2003	14,123.13	0.18171
5/30/2003	13,989.06	-0.00954
6/30/2003	13,518.33	-0.03423
7/31/2003	13,236.65	-0.02106
8/29/2003	14,686.86	0.10396
9/30/2003	16,736.33	0.13063
10/31/2003	20,431.73	0.19951
11/20/2003	18,764.66	-0.08511
12/31/2003	24,310.03	0.25891
1/30/2004	22,370.50	-0.08315
2/27/2004	24,472.50	0.08981
3/31/2004	25,899.00	0.05665
4/30/2004	22,584.09	-0.13696
5/31/2004	21,508.91	-0.04878
6/30/2004	23,011.65	0.06753
7/30/2004	24,883.79	0.07822
8/31/2004	25,923.44	0.04093
9/30/2004	28,026.37	0.07800
10/28/2004	29,321.16	0.04516

11/30/2004	28,798.97	0.01797
2/29/2004	32,152.87	0.11016
1/31/2005	34,770.44	0.07827
2/28/2005	36,256.86	0.04186
3/31/2005	32,560.27	-0.10754
4/29/2005	30,319.42	-0.07130
5/31/2005	32,325.14	0.06406
6/30/2005	34,473.76	0.06435
7/29/2005	37,806.83	0.09229
8/31/2005	39,739.74	0.04986
9/30/2005	42,939.38	0.07744
10/31/2005	40,789.03	-0.05138
11/30/2005	48,930.72	0.18199
12/30/2005	50,467.53	0.03092
1/31/2006	56,988.75	0.12152
2/28/2006	59,676.14	0.04608
3/31/2006	54,066.94	-0.09871
4/28/2006	55,190.84	0.02057
5/31/2006	47,916.32	-0.14134
6/30/2006	44,734.31	-0.06872
7/31/2006	45,530.74	0.01765
8/31/2006	47,160.51	0.03517
9/29/2006	46,607.71	-0.01179
10/31/2006	51,403.20	0.09793
11/30/2006	47,720.02	-0.07435
12/29/2006	48,551.38	0.01727
1/31/2007	51,549.16	0.05991
2/28/2007	52,061.64	0.00989
3/30/2007	54,567.36	0.04701

T3. GOVERNMENT DEBT MONTHLY INDEX RETURN AND RISK FREE RATE

DATE	GDS INDICES	GDS RETURN	ISE30 RETURN	rm-rf
30/01/02	106.50			
30/02/02	106.24	-0.00244	-0.17880	-0.17636
30/03/02	106.90	0.00619	0.06006	0.05387
30/04/02	106.65	-0.00234	-0.02234	-0.02000
30/05/02	106.20	-0.00423	-0.09074	-0.08651
30/06/02	106.80	0.00563	-0.11240	-0.11804
30/07/02	106.95	0.00140	0.08036	0.07896
30/08/02	107.90	0.00884	-0.08754	-0.09639
30/09/02	107.20	-0.00651	-0.07815	-0.07164
30/10/02	107.35	0.00140	0.15385	0.15245
30/11/02	107.43	0.00074	0.26138	0.26063
30/12/02	107.55	0.00112	-0.24952	-0.25064
30/01/03	107.87	0.00297	0.06433	0.06136
30/02/03	107.16	-0.00660	0.04945	0.05605
30/03/03	108.21	0.00975	-0.20383	-0.21359
30/04/03	108.40	0.00175	0.18171	0.17996
30/05/03	108.98	0.00534	-0.00954	-0.01487
30/06/03	108.00	-0.00903	-0.03423	-0.02520
30/07/03	108.24	0.00222	-0.02106	-0.02328
30/08/03	109.73	0.01367	0.10396	0.09029
30/09/03	109.06	-0.00612	0.13063	0.13675
30/10/03	108.05	-0.00930	0.19951	0.20881
30/11/03	108.01	-0.00037	-0.08511	-0.08474
30/12/03	108.03	0.00019	0.25891	0.25873
30/01/04	108.05	0.00019	-0.08315	-0.08333
30/02/04	108.07	0.00019	0.08981	0.08962
30/03/04	108.06	-0.00009	0.05665	0.05675
30/04/04	111.30	0.02954	-0.13696	-0.16650
30/05/04	110.00	-0.01175	-0.04878	-0.03703
30/06/04	110.89	0.00806	0.06753	0.05947
30/07/04	111.19	0.00270	0.07822	0.07551
30/08/04	111.44	0.00225	0.04093	0.03869
30/09/04	111.57	0.00117	0.07800	0.07683
30/10/04	111.78	0.00188	0.04516	0.04328

30/11/04	111.91	0.00116	-0.01797	-0.01913
30/12/04	112.03	0.00107	0.11016	0.10909
30/01/05	112.39	0.00321	0.07827	0.07506
30/02/05	112.57	0.00160	0.04186	0.04026
30/03/05	112.80	0.00204	-0.10754	-0.10958
30/04/05	112.95	0.00133	-0.07130	-0.07263
30/05/05	113.09	0.00124	0.06406	0.06282
30/06/05	113.00	-0.00080	0.06435	0.06515
30/07/05	113.12	0.00106	0.09229	0.09123
30/08/05	113.14	0.00018	0.04986	0.04969
30/09/05	113.09	-0.00044	0.07744	0.07788
30/10/05	113.18	0.00080	-0.05138	-0.05217
30/11/05	113.28	0.00088	0.18199	0.18111
30/12/05	113.14	-0.00124	0.03092	0.03216
30/01/06	113.24	0.00088	0.12152	0.12064
30/02/06	113.29	0.00044	0.04608	0.04564
30/03/06	113.29	0.00000	-0.09871	-0.09871
30/04/06	113.37	0.00071	0.02057	0.01987
30/05/06	113.16	-0.00185	-0.14134	-0.13949
30/06/06	111.79	-0.01218	-0.06872	-0.05653
30/07/06	112.03	0.00214	0.01765	0.01550
30/08/06	112.15	0.00107	0.03517	0.03410
30/09/06	112.20	0.00045	-0.01179	-0.01224
30/10/06	112.16	-0.00036	0.09793	0.09829
30/11/06	112.09	-0.00062	-0.07435	-0.07373
30/12/06	111.97	-0.00107	0.01727	0.01834
30/01/07	112.22	0.00223	0.05991	0.05768
30/02/07	112.12	-0.00089	0.00989	0.01078
30/03/07	112.17	0.00045	0.04701	0.04656