On Properties of Return Distributions

in Istanbul Stock Exchange

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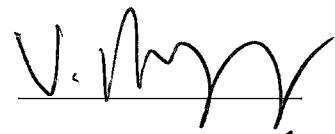
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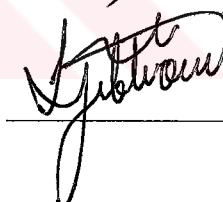
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ABSTRACT

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In this thesis study, the distributional behavior of return series of Istanbul Stock Exchange (ISE) stocks and some ISE indices are analyzed. Normality tests are conducted by employing Kolmogorov-Smirnov and Jarque-Bera statistics, it is shown that the normality of ISE indices and most stock returns are rejected by both statistics for daily data. The stability of these series is also investigated by using different characteristic exponent estimation techniques. Estimated α parameters are significantly larger than that are implied by the stable Paretian laws. To explore portfolio normality, a simulation experiment is conducted by generating random portfolios. It is observed that normal return series are dominated by the non-normal ones, resulting in increased deviation from normality as the number of firms in the portfolio increases.

KISA ÖZET

İstanbul Menkul Kıymetler Borsasındaki

Getiri Dağılımlarının İstatistiksel Özellikleri

Mehmet Oğuz Karahan

Bu tez çalışmasında İstanbul Menkul Kıymetler Borsası'ndaki (İMKB) hisse senetlerinin ve bazı endekslerin getiri serilerinin dağılımsal davranışları incelenmiştir. Kolmogorov-Smirnov ve Jarque-Bera istatistikleri kullanılarak normallik sınamaları yapılmıştır. Günlük veriler için İMKB endekslerinin ve çoğu hisse senedinin normalliği her iki istatistik tarafından reddedilmiştir. Aynı zamanda bu serilerin Paretian dağılımlara uygunlukları farklı karakteristik üs tahmin etme teknikleri kullanılarak araştırılmıştır. Tahmin edilen α parametreleri Paretian dağılımların gerektirdiği aralıktan anlamlı derecede yüksek çıkmıştır. Portföy normalliğini incelemek için rastsal portföyler oluşturularak bir simülasyon deneyi yapılmıştır. Normal olmayan getiri serilerinin normal serilere baskın olduğu, bunun sonucunda da portföydeki şirket sayısı arttıkça normallikten sapmanın arttığı gözlenmiştir.

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1 Introduction

The distributions of stock returns have been subject to a continuous debate since the beginning of the 20th century. First, Bachelier in 1900, in his seminal doctoral dissertation, argued that stock *prices* follow normal distribution. However, since this argument had a major flaw in its reasoning, in the sense that the normal distribution allows for negative values -that prices can never be-, this argument is ignored until 1950's. Osborne, in his 1959 paper, revived the reasoning of Bachelier by a slight change. He claimed that stock returns, not prices, do follow normal distribution whereas stock prices follow a lognormal distribution.

This assumption of normality became an important topic of interest, primarily due to its place in mainstream asset pricing models. Central Limit Theorem formed the basis for this assumption, since price returns are formed by summations of the incremental returns within the given time period and these incremental changes are assumed to be independently and identically distributed. Markowitz's mean-variance model, Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT) and Black-Scholes-Merton Option Pricing Model assume that stock returns follow normal distribution or Brownian motion, which implicitly assumes normality. Consequently, the accuracy of these theories depends on whether the empirical distribution is normal or not. If the extreme tail probabilities for empirical distributions are higher than expected, then this may possibly result in misevaluation of the associated risk and therefore underpricing of such assets.

After the seminal work of Fama in 1965, a voluminous research is made on empirical cumulative distribution functions of stock returns and these studies show that the tail probabilities of empirical distributions are much higher than the probabilities implied by the normal distribution and these empirical cumulative distribution functions show leptokurtic behavior, i.e. the frequency around the mean is higher than is implied by the normal distribution. Mandelbrot (1963) suggested that the stable (Paretian) laws can be used as an alternative to the normal distribution, which in fact is a specific case of the former, in describing the stock market behavior.

Muradoglu, Berument and Metin (1999) rejects normality of Istanbul Stock Exchange (ISE) composite index for three sub-periods in the sample period January 1988 - April 1995. In this paper, normality and stability issues on ISE returns are analyzed for the time period January 1998 - December 2003. In Section 2, the literature on behavior of stock returns is discussed. In Section 3, the empirical findings about ISE returns are introduced. In Section 4, a simulation on portfolio returns and their properties are presented. Section 5 concludes the paper.

2 Literature Review

2.1 Normality

There are numerous statistics for testing normality in the literature, most common of which are Chi-square, Kolmogorov-Smirnov, Anderson-Darling, Shapiro-Wilk and Jarque-Bera test statistics. In this study, Kolmogorov-Smirnov and Jarque-

Bera statistics are used, due to the non-parametric nature of the former and the emphasis on kurtosis parameter in the latter.

The literature on the determination of empirical distribution functions began with the 1933 work of Kolmogorov. In that article, he introduced a non-parametric test statistic, which is based on the maximum distance between theoretical and empirical cumulative distribution functions. This statistic, which is also widely known as Kolmogorov-Smirnov (KS) statistic, can be written as: $D_n = \sup |F(x) - \hat{F}(x)|$, where F(x) is the theoretical cumulative distribution function and $\hat{F}(x)$ is the empirical cumulative distribution function, which is defined as: For n mutually independent observations $X_1, X_2, \ldots, X_n$, ordered increasingly, i.e. $X_1 \leq X_2 \leq \cdots \leq X_n$;

$$\hat{F}(x) = \begin{cases} 0 & \text{, if } x < X_1 \\ k/n & \text{, if } X_k \leq x < X_{k+1} \quad \text{,for } k=1,2,\ldots,n\text{-}1 \\ 1 & \text{, if } X_n \leq x \end{cases}$$

The limiting properties for this statistic are derived in the paper. Kolmogorov shows that the distribution of this statistic is independent from F(x), but only dependent on n, the number of observations, provided that F(x) is continuous and completely specified, in the sense that all of the population parameters must be known. Since KS statistic calculates the distance between the *cumulative* distribution functions, each observation has an explanatory power and consequently no

information is lost. However, the requirement of complete specification is the major drawback of this statistic, since population parameters are usually unknown in empirical studies.

A solution for this problem is first introduced by Lilliefors (1967) which supplied the critical values for testing normality with the KS statistic where the mean and the variance are unknown. Similar to the general case the critical values are functions of the number of observations. On the other hand, the theoretical distribution is derived by using the estimates of the population parameters. Stephens (1974) modified the KS statistic by Monte-Carlo simulations. He adjusted the KS statistic with some functions of n for different cumulative distribution functions and fixed the critical values. He argued that this methodology yields better asymptotic results than Lilliefors'. Stephens' Modified Kolmogorov-Smirnov Statistic is given by, $d_n = D_n(\sqrt{n} - 0.01 + 0.85/\sqrt{n})$. Its critical values are 0.819, 0.895 and 1.035 for 0.1, 0.05 and 0.01 levels of significance, respectively.

The other statistic that is used to test for normality in this study is Jarque-Bera (JB) statistic. This Lagrange Multiplier statistic is provided by Jarque and Bera (1987) and given by the formula:

$$JB = N \cdot [\frac{\sqrt{\hat{b}_1}}{6} + \frac{(\hat{b}_2 - 3)^2}{24}],$$

where N is the number of observations, $\hat{b}_1 = \hat{\mu}_3^2/\hat{\mu}_2^3$, $\hat{b}_2 = \hat{\mu}_4/\hat{\mu}_2^2$ and μ_i is the ith moment around the mean. The kurtosis parameter, $\hat{b}_2$, has a critical importance

in financial data, since it is shown by numerous studies that most of the security return distributions (such as stocks, foreign exchange rates and bond returns) show fat tail behavior. Therefore, the normality of security returns can be analyzed with a different point of view by a statistic which utilizes the kurtosis parameter.

2.2 Stable Laws

Mandelbrot (1963) suggested that stock returns can be explained by a special family of distribution functions, called stable laws (distributions). Stable laws are defined by logarithms of their characteristic functions, (density functions of these distributions can not be explicitly defined, except a few cases such as Cauchy and Normal) given by the following equation:

$$\log f(t) = \log E(e^{iut}) = i\delta t - \gamma |t|^{\alpha}[1 + i\beta(\frac{t}{|t|})\omega(t, \alpha)],$$

where u is the random variable, t is any real number $i = \sqrt{-1}$, and

$$\omega(t, \alpha) = \begin{cases} \tan(\frac{\pi\alpha}{2}) & \text{, if } \alpha \neq 1 \\ \frac{2}{\pi}\log|t| & \text{, if } \alpha = 1 \end{cases}$$

As can be seen, any stable law is defined by four parameters, α, β, δ and γ. The parameter α is generally called as the characteristic exponent or tail index parameter. It basically determines the extreme tail thickness of the distribution and is defined on the interval (0,2]. In the case, where $\alpha = 2$, this stable law is normal and 2nd and higher order moments exist. However, if $\alpha \in (0, 2)$ the tails of

the stable law have higher probability than Gaussian distribution and 2nd moment (variance) does not exist, i.e. it is infinite. Even for values of α that are less than 1, the mean does not exist.

The parameter β is the skewness parameter and the distribution is symmetric when $\beta = 0$. δ is the location parameter and is equal to the mean provided that the mean exists. γ is the scale parameter of the distribution. In the case of Gaussian distribution γ parameter is equal to half of the variance.

Stable laws possess three important properties:

1. They follow the weak form of Pareto Law. That is, $Pr(X > x) \sim kx^{-\alpha}$, where k is some constant. This property has a crucial importance since it forms the basis for the empirical determination of the characteristic exponent of the stable distributions.

2. They are stable under addition. The sums of independent and stable Paretian variables with same characteristic exponent α, is also stable Paretian with the same α parameter.

3. They are the only possible limiting distributions for the sums of independently and identically (i.i.d.) distributed random variables. So, this property can be regarded as a Generalized Central Limit Theorem, in the sense that, unlike its stronger version it allows for infinite variance.

The third property is the main reasoning behind the argument of the stock returns to follow stable laws. Fama (1965) used autocorrelation functions in 30 stocks in the New York Stock Exchange to check for independence and argues that zero autocorrelation in stock return series should not be expected, whereas series with negligible correlation coefficients can be assumed to be independent. Even though he discussed various methods for estimating the characteristic exponent, the lack of a sampling theory supporting these estimators make their significance questionable.

2.3   Estimators of the Characteristic Exponent

The property 1 of stable distributions on weak form of Pareto's law, plays an essential role in the estimation of α. The Pareto type tail behavior asymptotically implies;

$\log Pr(X > x) = k - \alpha \log x$, or equivalently,

$\log x = k' - \gamma \log Pr(X > x)$, where $\gamma = \alpha^{-1}$.

By manipulating this relation many estimates are derived in the literature. There are three prominent estimators in the literature, namely Pickands (1975), Hill (1975) and deHaan and Resnick (1980) estimators. All three estimators utilize order statistics of upper tails of distributions.

Let x_t be the asset return for $t = 1, \ldots, T$ and the data $x_1, \ldots, x_T$ are reordered to form the order statistics $x_{(1)}, \ldots, x_{(T)}$, where $x_{(1)} > x_{(2)} > \cdots > x_{(T)}$. Then,

$$\hat{\gamma}_P = (\log 2)^{-1}[\log(x_{(m)} - x_{(2)}) - \log(x_{(2m)} - x_{(4m)})]$$

$$\hat{\gamma}_H = [(m-1)^{-1} \sum_{i=1}^{m-1} \log x_{(i)}] - \log x_{(m)}$$

$\hat{\gamma}_{HR} = (\log m)^{-1}(\log x_{(i)} - \log x_{(m)})$, where $x_{(m)}$ is the mth order statistic, $\hat{\gamma} = \hat{\alpha^{-1}}$ and $\hat{\gamma}_P, \hat{\gamma}_H$ and $\hat{\gamma}_{HR}$ are Pickands, Hill and deHaan-Resnick estimators, respectively.

Goldie and Smith (1987) and Dekkers and deHaan (1989) show that Hill and Pickands estimators have the following asymptotic properties:

$$m^{1/2}(\hat{\alpha_H} - \alpha) \xrightarrow{d} N(0, \alpha^2)$$

$$m^{1/2}(\hat{\alpha_P} - \alpha) \xrightarrow{d} N(0, v), \text{ where } v = \gamma^{-2}(2^{2\gamma+1} + 1)/[2(2^\gamma - 1)\log 2]^2.$$

The determination of the variable m, i.e. the number of order statistics used, is another point of consideration. DuMouchel (1983) argues that using more than one-tenth of the upper tail of the sample would create too much dependence on the central part of the distribution. Kearns and Pagan (1997) ran a Monte Carlo simulation by generating a stable distribution with $\alpha=1.5$ and indicate that $m=60$ and $m=250$ seem to be the best choices for the sample sizes 2,000 and 29,000, respectively.

On the other hand, the characteristic exponent still plays an important role, even if the underlying distribution is nonstable. The parameter α is restricted to be between 0 and 2 in the case of stable distributions. However Kearns and Pagan (1997) state that it can take any positive value for nonstable processes, such as Student or ARCH processes. In that study, they compared the characteristic expo-

nent estimates of a computer generated stable distribution with an IGARCH (1, 2) process by also analyzing the efficiency of Pickands, Hill and deHaan and Resnick estimators. Their findings for stable distributions indicate that the Pickands estimator is quite less efficient when compared to the other estimators and may lead to misleading results for small samples, due to its slow convergence rate. deHaan and Resnick estimator show less bias than Hill estimator, however Hill estimator is much more efficient than the other. They state that even though IGARCH(1,2) is a nonstable process, it is expected to have Pareto type tail behavior and thus infinite variance. For the small samples, they show all three estimators give contradictory results. For large samples, Hill estimator is still superior to the other estimators.

From the findings of Kearns and Pagan (1997) it can be deduced that Hill estimator is robust in detecting the characteristic exponents of stable Paretian processes but can give misleading results in nonstable processes in small samples.

3 Empirical Findings

3.1 Normality

In this study, the Istanbul Stock Exchange (ISE) data for the time period January 1998 and December 2003 are used. The data set consists of 298 listed companies, as of December 2003 and two ISE indices, namely ISE 30 and ISE 100. An equal weighted index is generated using the individual stock price series. From these series the continuously compounded rate of return series are generated. The continuously compounded rate of return is given by: $r_{i,t} = \log(p_{i,t}/p_{i,t-1})$, where $r_{i,t}$

is return and $p_{i,t}$ is the price at time t for each asset i. Weekly and monthly return series are generated assuming no holidays, i.e. 5-day weeks and 20-day months.

The Jarque-Bera and Kolmogorov-Smirnov (with Stephens' modification) test statistics for ISE indices are given at Table 1 and Table 2. (For test statistics for individual stock return series, see Appendix.) Both Jarque-Bera and Kolmogorov-Smirnov test statistics reject the hypothesis of normality of return distributions of ISE 100 and ISE 30 indices for daily and weekly data. The normality hypothesis for these series cannot be rejected for monthly data. On the other hand, the equal weighted index does not become normal even in monthly data.

Jarque-Bera statistic do not reject normality for 1 stock for daily data, 4 stocks for weekly data and 153 stocks in monthly data, whereas Kolmogorov-Smirnov statistic do not reject normality of any stock for daily and weekly data, but unable to reject normality of 24 stocks in monthly data.

Table 1: Jarque-Bera Statistics for ISE Indices

	Daily data		Weekly Data		Monthly Data	
	P-value	JB statistic	P-value	JB statistic	P-value	JB statistic
ISE 100	0	650.96	0	52.16	0.68	0.759
ISE 30	0	542.76	0	48.4	0.79	0.4595
ISE EW	0	2222.64	0	108.25	0.001	13.5794

Table 2: Modified Kolmogorov-Smirnov Statistic for ISE Indices

	Daily data	Weekly Data	Monthly Data
ISE 100	3.99	2	0.67
ISE 30	3.79	1.87	0.74
ISE EW	6.32	2.99	1.42

There is a continuous improvement in the test statistics of the returns for ISE indices, as Central Limit Theorem suggests. However when the convergence rate is questioned, it can be seen that it is very slow, so the asset pricing that utilize the assumption of normality may lead to misleading results for ISE. For individual stock returns, unlike the indices, there are cases for which the test statistics do not improve as the time interval increases. These cases yields some doubts for the possibility of infinite variance in these series. This possibility will be analyzed later by estimating the characteristic exponents.

The normality in the sub-periods is analyzed by dividing the data into parts, for the 1998-2000 period and the 2001-2003 period by using daily data and the same test statistics. The results for normality do not change significantly. Jarque-Bera statistic does not reject normality of 7 stocks for the first period and 3 stocks for the second period. Kolmogorov-Smirnov statistic rejects the normality of all stocks at both sub-periods. Both statistics reject the normality of all three indices for both periods. (See Table 3 and Appendix)

Table 3: JB and Modified KS Statistics for ISE Indices for Sub-periods(Daily Data)

	1998-2000		2000-2003		1998-2000	2000-2003
	P-value	JB statistic	P-value	JB statistic	KS statistic	KS statistic
ISE 100	0	189.78	0	569.85	2.67	2.929
ISE 30	0	152.70	0	491.93	2.49	2.63
ISE EW	0	683.02	0	1877.36	4.39	4.48

3.2 Estimation of Characteristic Exponents

The obvious question that appears due to the rejection of normality for almost all stocks and some signs of infinite variance is "If stock returns are not distributed normally, how are they distributed?" Of course, the first alternative is the stable Paretian distributions, since it is shown that for *i.i.d.* random variables, the stable distributions are the only limiting distributions. To check for independence, the autocorrelation coefficients for the return series are calculated. As Fama (1965) argued, perfect zero-autocorrelation does not exist for ISE return series, either. (The autocorrelation coefficients up to order 8 for ISE indices are given at Table 4; for individual stocks, see Appendix.) However, they are quite low so one can assume independence of these series. In the light of this observation and the rejection of normality of these series, it is expected that characteristic exponent estimators should give consistent results in line with the theory of stable distributions.

Pickands, Hill and deHaan-Resnick estimators are calculated for $\frac{m}{T} = 0.01$, $0.02, \ldots, 0.1$, as duMouchel suggested. The estimates for low $\frac{m}{T}$ values yield higher estimates, but as $\frac{m}{T}$ increases, the estimates seem to get stabilized.(See Figure 1) The most striking result is that the estimates for characteristic exponents are significantly larger than 2, except Pickands estimator which is unreliable for small samples. Evidently, this result conflicts with the stable distribution hypothesis.

The implications of these high characteristic exponent estimates are quite important. First, by Property 3, we can say that either the random variables are not identically distributed or long-range dependence exists for these series. Long-range

Figure 1: Behavior of the Hill estimator for various m values
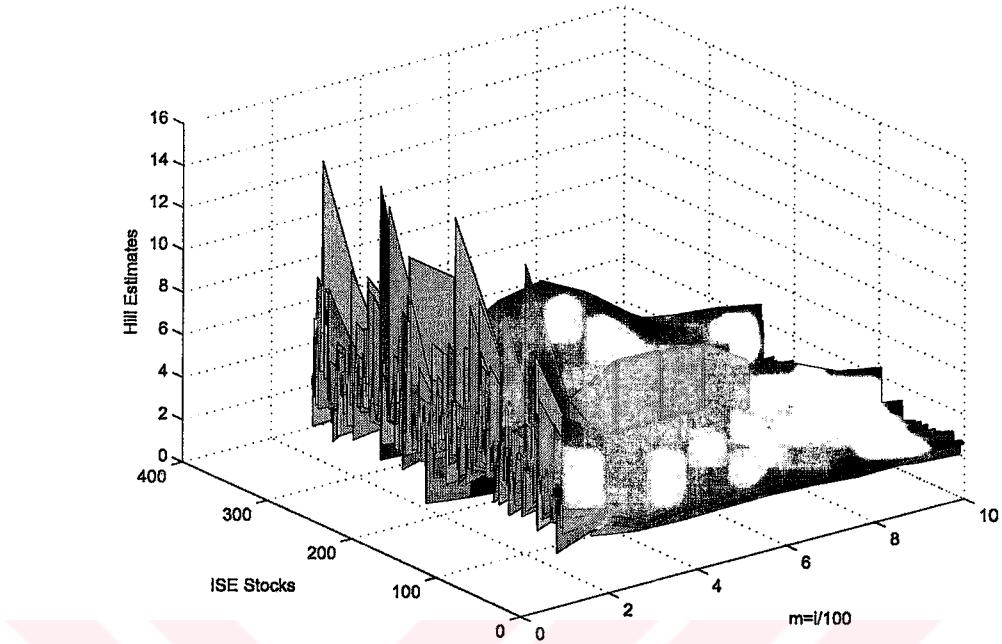
dependence is generally defined as the slow decay of autocorrelation coefficients and so the divergence of their sum. Therefore, even though individual autocorrelation coefficients may seem to be insignificant, long-range dependence may exist, disabling the use of stable distribution theory.

On the other hand, the identical distribution assumption may not be valid. A possible and most likely alternative nonstable process might be an ARCH based process, since the variables in ARCH processes do not come from identical distributions. Also, Kearns and Pagan (1997) claim that Student distribution may also be an alternative nonstable law.

Table 4: Autocorrelation Coefficients for ISE Indices

ACC of Order	1	2	3	4	5	6	7	8
ISE 100	-0.0081	0.0534	-0.0248	0.032	-0.0507	-0.02	0.01572	0.0415
ISE 30	-0.0086	0.0484	-0.031	0.0252	-0.0572	-0.0196	0.00775	0.038
ISE EW	0.0435	0.0698	0.0099	0.0798	-0.0217	-0.0127	0.0469	0.0588

Table 5: Characteristic Exponent Estimates for ISE Indices for $m/\mathrm{T} = 0.05$

	Pickands Estimator		Hill Estimator		deHaan-Resnick Estimator
	α	P-value	α	P-value	α
ISE 100	-0.50047	0.003043	2.783646	0.000407	3.620521
ISE 30	-0.45718	0.003513	2.658124	0.002466	3.74157
ISE EW	-0.47098	0.003356	2.894365	6.65E-05	3.030396

4   Simulation Experiment

The rejection of normality for most ISE return series leads to a question on the possibility of normality of portfolios in ISE. To test the portfolio normality, a simulation experiment with 225 ISE stocks, which are listed in ISE for entire period, is conducted. Portfolios which are formed by n firms are considered for $n = 5, 10, 20, \ldots, 100$. For each case, a $\mathrm{T} \times 10{,}000$ portfolio matrix Λ_n is generated randomly from the set of 225 firms. For each n, define the weight matrix W_n as,

$$W_n = [w_1^n, w_2^n, \ldots w_{10,000}^n], \text{ where } w_i^n = \begin{pmatrix} \tilde{w}_{i,1}^n \\ \tilde{w}_{i,2}^n \\ \vdots \\ \tilde{w}_{i,n}^n \end{pmatrix} \cdot \frac{1}{\sum_{j=1}^n \tilde{w}_{i,j}^n} \text{ and } w_{i,j}^n \sim U[0,1].$$

After generating the weight matrix for each case, n stock series are selected randomly from discrete uniform distribution to form individual portfolios. Then,

the return series for each portfolio $\lambda_{p,n}$ becomes,

$\lambda_{p,n} = w_i^n.\tilde{Z}_p$, where $\tilde{Z}_p$ is the n $\times$ T matrix of randomly selected individual return series. So, as a result, Λ_n is obtained as:

$\Lambda_n = [\lambda_{1,n}, \lambda_{2,n}, \ldots, \lambda_{10,000,n}]$, for all n.

The summary results are given in Table 5. Normality can not be achieved for daily data in all portfolios, for either statistics. However, the interesting result is that as the number of firms in the portfolio increases the total number of rejections of normality increases, especially for the monthly data. Considering the results of normality of individual return series, non-normal series dominate the normal ones when portfolios are generated by a set which includes both types of distributions. This may be a result of the intensity of 3 or more sigma events in non-normal cases. The distributions that have higher extreme tail probabilities than the normal distribution become dominant, when a portfolio of non-normally and normally distributed stocks is formed.

5 Conclusion

The hypothesis of normality for most ISE stocks and three ISE indices are rejected for daily data. Index data and some stocks seem to converge to normal distribution, when data is transformed to weekly and monthly periods. However, the convergence rate is very slow; most stocks converge to normal distribution in monthly data set. So, it can be said that Central Limit Theorem holds, in the sense that

Table 6: Total Number of Non-Rejections at 0.05 Significance

Number of Firms	Daily data		Weekly Data		Monthly Data	
	JB Statistic	KS Statistic	JB Statistic	KS Statistic	JB Statistic	KS Statistic
5	0	0	23	0	4447	359
10	0	0	0	0	3555	147
20	0	0	0	0	2514	27
30	0	0	0	0	2005	6
40	0	0	0	0	1557	1
50	0	0	0	0	1287	0
60	0	0	0	0	955	0
70	0	0	0	0	796	0
80	0	0	0	0	722	0
90	0	0	0	0	635	0
100	0	0	0	0	465	0

the densities in extreme tails diminish as the time-span increases. But, the possible convergent distribution most likely has a more complex structure than the normal distribution, that allows for heavy tails.

Deeper analysis regarding the stability of distributions gives conflicting results with the estimated autocorrelation coefficients. Analysis of the characteristic exponents indicates three ISE indices and most stocks do not follow stable laws. Possible reasons may be the existence of long-range dependence in the series or that the returns follow some nonidentically distributed processes, such as various forms of ARCH processes.

Also, it is shown that normality in portfolios can not be achieved when the underlying stocks do not follow normal distribution by simulation experiments. In the case where the underlying stocks have both normal and non-normal distributions, i.e. for monthly data, it is observed that as the number of stocks in the portfolio

increases, the non-normal distributions seem to dominate the normal ones and deviations from normality of the portfolio return distributions increase.

For further research, various possible alternative distributions can be investigated for a robust identification of data generating process of the stock prices. The possible causes of deviations from normality in portfolios can be investigated by a detailed analysis. A possible procedure, which is likely to identify the reasons of deviations from normality in portfolios, may separately include individual non-normal stocks to normal portfolios and investigate their effects on normality. The normality of stocks from different sectors can also be investigated to analyze sectoral effects.

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7 APPENDIX

A Normal Probability Plots for ISE Indices

Figure 2: Normal Probability Plots for Daily Data
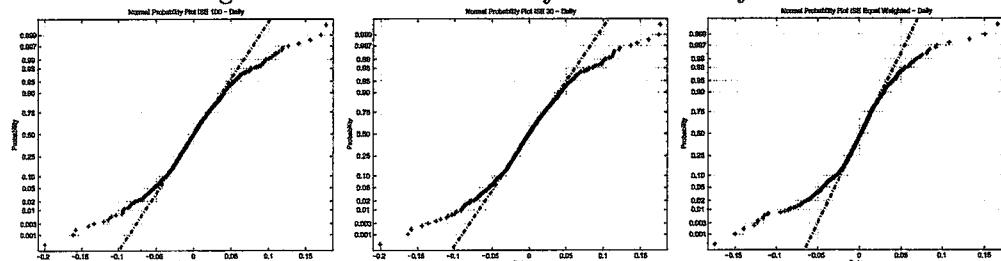
Figure 3: Normal Probability Plots for Weekly Data
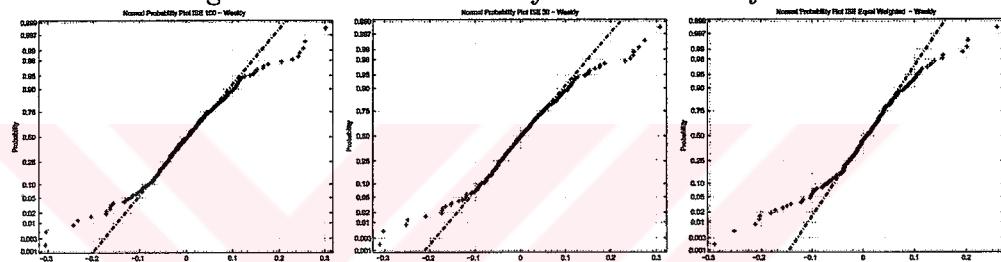
Figure 4: Normal Probability Plots for Monthly Data
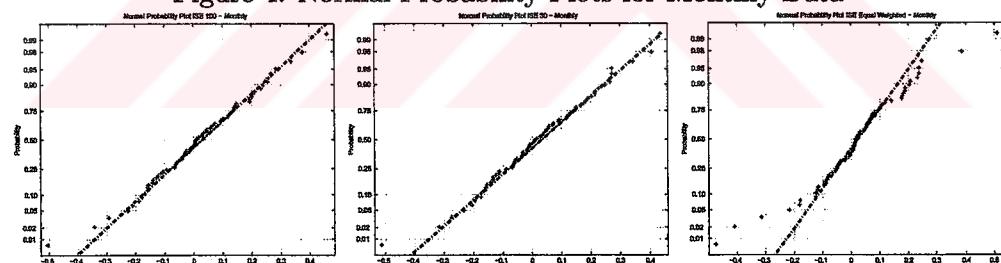
B   Tables of Test Statistics for Individual ISE Stocks

B.1   Jarque-Bera Statistics

Table 7: Jarque-Bera Statistics for Individual ISE Stocks

	Daily data		Weekly data		Monthly Data	
	P-value	JB statistic	P-value	JB statistic	P-value	JB statistic
ABANA	6.66E-16	69.79633	1.30E-09	40.91521	0.515186	1.326453
ACIBD	0	309.8708	0.003871	11.10845	0.721431	0.653037
ADANA	0	948.4643	0	97.54618	0.003418	11.35713
ADBGR	0	965.4756	0	186.0177	0.163453	3.62246
ADEL	0	1657.909	0	1288.817	8.51E-06	23.34965
ADNAC	0	709.0618	0	107.8423	0.099954	4.606098
AEFES	0	1305.154	8.54E-08	32.55132	0.151553	3.773642
AFYON	0	560.4446	0	241.1525	0.12913	4.093864
AGIDA	0	436.9334	1.11E-08	36.62541	0.366737	2.006218
AGYO	9.06E-11	46.24907	0	108.7427	0.29406	2.447943
AKALT	0	341.5651	1.67E-15	68.06617	0.03819	6.530378
AKBNK	0	448.5353	2.08E-07	30.76726	0.28469	2.512711
AKCNS	0	366.0754	2.01E-13	58.46663	0.036947	6.596534
AKENR	0	513.7349	0	151.2557	0.56107	1.155819
AKGRT	0	392.5021	0	75.15955	3.07E-06	25.38519
AKIPD	0	598.2219	0	99.75899	0.3009	2.401954
AKSA	0	434.8718	1.88E-13	58.60374	0.800565	0.444874
AKSUE	0	1621.27	0	6935.136	0.389044	1.888128
AKYO	0	657.1537	0	233.8489	0.032033	6.881956
ALARK	0	272.3232	2.19E-08	35.27081	0.004315	10.89121
ALCAR	0	513.3182	5.00E-08	33.62083	0.045972	6.159425
ALCTL	0	161.1456	1.85E-08	35.61611	0.161125	3.651145
ALFA	0	1021.696	0	282.359	7.66E-09	37.37515
ALGYO	0	607.6447	1.57E-12	54.35807	0.047766	6.082887
ALKA	0	834.689	0	161.9739	0.000363	15.84089
ALKIM	0	825.5447	0.001814	12.62416	0.580709	1.087012
ALNTF	0	367.8111	0	223.2431	0.267436	2.63775
ALTIN	0	406.7695	1.08E-12	55.11742	0.320625	2.274964
ALYAG	0	452.9549	1.95E-09	40.11095	0.000928	13.96495
ANACM	0	741.5164	4.35E-05	20.08387	0.624665	0.941081
ANHYT	0	209.7491	2.00E-07	30.8497	0.44523	1.61833
ANSGR	0	846.2478	0	170.2907	0.000571	14.93607
ARAT	0	378.2076	0	116.9566	0.147485	3.828057
ARCLK	0	227.7928	1.24E-05	22.59414	0.19859	3.233028
ARENA	0	283.0322	0	278.116	0.000352	15.90565
ARFYO	0	1192.642	0	2389.43	1.10E-06	27.44693
ARSAN	0	364.0888	0	246.8304	1.19E-06	27.28099
ASELS	0	496.5452	0	105.5871	0.736138	0.612675
ASLAN	0	895.066	0	860.3205	0	115.6942
ASUZU	0	393.1301	0	78.23577	0.350186	2.098579
ATAYO	0	702.1251	0	144.3433	0.034612	6.727088
ATEKS	0	304.2614	8.44E-15	64.81387	0.946673	0.109604
ATLAS	0	671.5904	0	157.3966	0.422615	1.722587
ATSYO	0	596.554	0	111.1801	0.141941	3.904687
AVRSY	0	268.4382	0	86.518	1.49E-07	31.43865
AYCES	0	291.9493	0	97.62462	0.666419	0.811674
AYEN	0	949.9915	1.91E-06	26.33378	0.426158	1.705891
AYGAZ	0	423.6516	3.12E-14	62.19596	0.496658	1.399705
BAGFS	0	699.0069	0	87.21656	0.072746	5.241555
BAKAB	0	649.0652	0	161.3276	0.796348	0.455437
BANVT	0	717.7375	0	191.732	0.639958	0.892705
BEKO	0	279.769	0.000392	15.68773	0.171497	3.526379
BERDN	0	354.1056	6.46E-09	37.71437	0.058915	5.663325
BFREN	0	1064.416	0	126.3545	0	100.6193
BISAS	0	180.0947	0	85.01408	0.004653	10.74037
BJKAS	0	246.2776	5.65E-10	42.5895	0.777951	0.502183

Table 7: Jarque-Bera Statistics for Individual ISE Stocks (continued)

	Daily data		Weekly data		Monthly Data	
	P-value	JB statistic	P-value	JB statistic	P-value	JB statistic
BOLUC	0	1289.553	0	520.8266	0.003881	11.10353
BOSSA	0	464.2816	4.44E-16	70.88413	0.633583	0.912727
BRISA	0	521.9548	4.33E-15	66.17124	0.002871	11.70654
BRMEN	0	1144.759	0	584.6551	3.71E-11	48.03678
BROVA	0	518.1419	0	109.8076	8.09E-06	23.45047
BRSAN	0	430.2707	8.14E-14	60.28036	4.66E-05	19.94752
BRYAT	0	581.0182	0	95.6245	0	87.36331
BSOKE	0	599.6381	4.77E-15	65.95567	0.063916	5.500376
BSPRO	0	800.4563	0	87.30015	1.07E-09	41.31739
BTCIM	0	542.1669	1.25E-09	41.00436	1.17E-14	64.16812
BUCIM	0	4236.764	0	1792.894	0.003864	11.1122
BUMYO	0	721.0134	0	164.3731	0.027894	7.158658
BURCE	0	445.7209	8.56E-14	60.17814	2.15E-06	26.10279
BYSAN	0	9508.014	1.44E-15	68.272	0.062064	5.55918
CARSI	0	361.6744	0	89.36726	0.032006	6.883693
CBSBO	0	546.7143	0	376.6092	0.000855	14.12815
CELHA	0	423.8861	3.33E-11	48.25244	0.84965	0.325861
CEMTS	0	539.1147	0	134.8443	0.000108	18.26874
CEYLN	0	516.6295	1.11E-16	73.75269	0.015533	8.329516
CIMSA	0	421.6746	0.009211	9.374689	0.370181	1.987529
CLEBI	0	652.4338	1.05E-13	59.76776	0.08628	4.900321
CMBTN	0	446.6298	1.12E-09	41.21256	0.136067	3.98921
CMENT	0	708.2775	0	92.87451	0.018259	8.006169
CMLOJ	0	36155.53	0	299.8961	0.001531	12.96317
COMUN	0	1181.884	0	237.1555	8.05E-10	41.87919
CUKEL	0	10377.57	0	1407.739	7.59E-14	60.41686
CYTAS	0	126.6784	1.35E-07	31.62889	8.17E-06	23.42998
DARDL	0	19960.49	0	150.5509	8.60E-05	18.72279
DENCM	0	402.0614	8.71E-06	23.3017	0.368364	1.997369
DENTA	0	664.751	0	211.1381	3.43E-14	62.00553
DERIM	0	332.2574	0	75.80682	0.002484	11.99608
DEVA	0	389.7384	4.48E-11	47.65726	0.001211	13.4322
DISBA	0	480.18	6.93E-13	55.99528	0.004189	10.95073
DITAS	0	626.3498	5.88E-15	65.53666	0.663966	0.819048
DMSAS	0	1255.389	0.000129	17.90396	0.033881	6.769811
DNZYO	0	708.7758	0	119.4269	0	166.7352
DOBUR	0	149.7563	0.031932	6.888299	0.234477	2.900792
DOGUB	8.39E-10	41.79811	1.29E-05	22.51043	2.71E-09	39.45599
DOHOL	0	112.4889	1.79E-07	31.07647	0.07421	5.201716
DOKTS	0	552.9376	0.000174	17.3124	0.401266	1.826263
DUROF	0	405.4957	0	336.141	1.51E-05	22.19616
DYHOL	0	95.44312	1.74E-09	40.34367	0.10328	4.540623
DYOBY	0	529.9069	1.67E-10	45.02069	0.055471	5.783783
ECBYO	0	562.5416	0	835.2041	0.1782	3.449695
ECILC	0	314.1091	6.54E-12	51.50482	0.037969	6.541982
ECYAP	0	547.8416	2.83E-10	43.96901	0.907378	0.194392
ECZYT	0	493.989	0	310.0945	2.08E-05	21.56568
EDIP	0	392.454	0	696.6373	3.94E-11	47.91265
EFES	0	298.7977	0	165.233	0.730354	0.628452
EGEEN	0	749.1202	0	262.1414	0.864893	0.290298
EGGUB	0	971.0119	0	335.9489	0.130459	4.073387
EGPRO	0	970.9959	0	120.745	0.031663	6.905191
EGSER	0	443.2195	0	83.3559	0.576687	1.100913
EGYO	0	877.8588	0	86.10791	0.003968	11.05907
EMKEL	0	327.7453	0	81.76866	0.304224	2.37998
EMNIS	0	788.6078	0	288.8258	0.018516	7.978243
ENKAI	8.73E-10	41.71796	0.715045	0.670819	0.575144	1.106269
EPLAS	0	342.0987	0.019399	7.885047	0.814637	0.410024
ERBOS	0	1219.102	0	194.6388	0.103429	4.537733
EREGL	0	326.2595	0.014443	8.475076	0.961193	0.07916
ERSU	0	568.1182	0	79.33673	5.55E-07	28.80826
ESCOM	0	953.7147	1.95E-06	26.29331	0.02457	7.41247

Table 7: Jarque-Bera Statistics for Individual ISE Stocks (continued)

	Daily data		Weekly data		Monthly Data	
	P-value	JB statistic	P-value	JB statistic	P-value	JB statistic
ESEMS	0	255.8444	0	75.21158	0.002039	12.39049
EVREN	0	526.8234	4.57E-14	61.42934	0.736226	0.612437
FENIS	0	478.9595	2.17E-06	26.08247	0.186412	3.359594
FFKRL	0	1159.852	0	75.47445	0.0007	14.5288
FINBN	0	316.9748	0	77.07492	0.356989	2.060099
FMIZP	0	690.4218	4.65E-10	42.97676	0.021035	7.723157
FNSYO	0	1113.638	3.32E-12	52.86318	0.522377	1.29873
FRIGO	0	567.8434	8.88E-09	37.07935	1.40E-05	22.34898
FROTO	0	266.6318	3.83E-08	34.15655	0.000993	13.82946
FVORI	0	231.2096	1.24E-05	22.59927	0.673864	0.789453
GARAN	0	272.1311	3.44E-15	66.59081	0.086794	4.888433
GARFA	0	585.6659	0	123.1761	0.029244	7.064131
GDKYO	0	832.2506	0	191.899	0.450469	1.594931
GEDIZ	0	253.7293	6.98E-12	51.37516	0.007159	9.878911
GENTS	0	627.1476	0	85.24443	8.97E-07	27.84735
GEREL	0	395.3673	0	227.1252	0.720775	0.654857
GIMA	0	453.6133	0	82.37901	0.594468	1.040178
GLBYO	0	384.5709	0	737.553	1.17E-13	59.5552
GLMDE	0	158.7782	0.001358	13.20421	0.119628	4.246743
GOLDS	0	485.8404	0.088923	4.83997	0.000526	15.09955
GOLTS	0	357.2567	2.11E-08	35.34962	4.65E-07	29.16245
GOODY	0	770.4766	0	227.4107	0.087703	4.867597
GRGYO	0	856.6203	0	124.2599	0.007433	9.803583
GRNYO	0	524.6925	0	396.0515	0.020552	7.769584
GSDHO	0	215.5161	0	78.99057	0.543861	1.218122
GSRAY	0	143.7292	0.001099	13.62666	0.970022	0.060872
GUBRF	0	401.1553	0	487.0949	0.002126	12.30663
GUSGR	0	576.58	0	105.1535	2.22E-11	49.06083
HEKTS	0	463.213	0	117.8226	4.65E-12	52.18705
HURGZ	0	186.8936	0.000843	14.15717	0.000264	16.47625
HZNDR	0	876.3648	0	970.3642	0.120188	4.237395
IDAS	0	382.2682	0	174.5314	0.385617	1.905822
IHEVA	0	205827.7	0	235.5173	4.51E-05	20.01388
IHGYO	0	352197.3	0	1938.766	0.278029	2.560061
IHLAS	0	70294.51	0	822.7592	0.000221	16.83798
INTEM	0	491.0251	0	118.2327	0.145643	3.853198
IPMAT	0	318.7715	0	117.2634	9.35E-09	36.9764
ISAMB	0	583.9995	0	178.76	0.578254	1.095482
ISATR	0	152249.1	0	1119.27	3.87E-12	52.55442
ISBTR	0	943.7407	0	142.0923	2.20E-13	58.29217
ISCTR	0	471.7057	0	154.448	0.84132	0.345567
ISGEN	0	493.2146	0	103.1957	2.81E-10	43.98597
ISGYO	0	352.7307	0	1265.852	0.349823	2.100656
ISKUR	0	154012.1	0	1876.106	1.11E-11	50.45029
ISYAT	0	1284.409	0	446.7494	3.12E-10	43.77561
IZMDC	0	321.2896	1.79E-09	40.282	0.762201	0.543089
IZOCM	0	268.2418	0.000178	17.27272	0.050323	5.978588
KAPLM	0	450.4689	0	83.51479	0.013375	8.628734
KARSN	0	230.8552	3.20E-05	20.69653	0.100103	4.603115
KARTN	0	1779.379	0	103.8785	3.14E-05	20.73507
KAVPA	0	326.9893	0	79.53431	0.004426	10.84058
KCHOL	0	195.3447	0	94.97047	0.93122	0.142521
KENT	0	1702.567	0	604.2447	0.056115	5.760714
KEPEZ	0	7662.095	0	1445.366	2.54E-09	39.58343
KERVT	0	9595.92	0	689.357	1.93E-09	40.12984
KIPA	0	691.5758	1.16E-10	45.75801	0.204709	3.172327
KLBMO	0	499.9438	1.69E-12	54.21559	0.018336	7.997826
KLMSN	0	684.767	5.83E-11	47.13081	0.313216	2.321725
KNFRT	0	449.4868	0	118.2395	0.042145	6.3333
KONYA	0	544.2612	0	78.88849	0.011753	8.887345
KORDS	0	530.4461	0.000153	17.57569	0.337576	2.17193
KOTKS	0	360.4328	0	107.7795	7.09E-09	37.52932

Table 7: Jarque-Bera Statistics for Individual ISE Stocks (continued)

	Daily data		Weekly data		Monthly Data	
	P-value	JB statistic	P-value	JB statistic	P-value	JB statistic
KOZAD	0	543.4805	0.276865	2.568454	0.518929	1.311975
KRDMA	0	400.0015	0	472.4244	0.021603	7.669869
KRDMB	0	423.9097	0	409.9256	9.99E-08	32.23873
KRDMD	0	333.0648	0	330.2871	0.26505	2.655674
KRSTL	0	1290.14	0	963.2132	1.01E-05	23.00506
KRTEK	0	732.0566	0	147.0114	0.837496	0.354678
KUTPO	0	959.5411	0	196.9922	0.000173	17.32262
LINK	0	352.4407	0	91.48341	0.084321	4.946251
LIOYS	0	513.865	0	97.86838	0.000205	16.98878
LOGO	0	767.4807	0	110.5909	0.000784	14.30281
LUKSK	0	669.7586	0	139.1945	0.002866	11.7099
MAALT	0	507.0672	0	121.4126	0.598233	1.027551
MAKTK	0	292.8574	0	78.39606	0.01334	8.633931
MARET	0	509.1287	2.84E-08	34.75549	0.14078	3.921118
MEGES	0	352.1513	0	237.1172	0.029367	7.055784
MEMSA	0	455.8458	0	104.6083	0.000589	14.87496
MERKO	0	765.1896	0	107.0273	0.260652	2.689138
METAS	0	18771.96	0	225.424	0	94.85623
METUR	0	308.9508	0	84.67405	0.002537	11.95361
MIGRS	0	957.6193	0	163.6644	0.47597	1.4848
MILYT	0	196.1346	1.08E-14	64.32823	0.44031	1.640551
MIPAZ	0	248.4533	1.17E-05	22.71838	0.136171	3.987685
MMART	0	470.3766	6.42E-07	28.51697	0.459515	1.555169
MNDRS	0	369.9183	1.80E-08	35.66512	0.367822	2.000314
MRDIN	0	758.3094	0	81.29242	0.208934	3.131475
MRSHL	0	634.5471	0	78.76959	0.017174	8.128741
MTEKS	0	255.8544	0	261.7782	0.042465	6.318138
MUTLU	0	760.0342	2.64E-12	53.32167	0.916551	0.174276
MYZYO	0	871.9303	0	297.8737	0.36568	2.011991
MZHLD	0	273.075	1.01E-08	36.82318	0.066321	5.426487
NETAS	0	364.024	5.82E-10	42.52994	1.66E-07	31.22863
NIGDE	0	731.534	0	77.06934	0.043214	6.283178
NTHOL	0	555.1531	0	83.48315	2.49E-07	30.41349
NTTUR	0	514.9645	8.47E-11	46.38409	0.012272	8.800905
NUGYO	0	676.8444	4.07E-12	52.45285	0.345351	2.126391
NUHCM	0	2052.54	0	96.79219	0.295095	2.440917
OKANT	0	468.5604	0	115.5854	0.192847	3.291719
OLMKS	0	390.6814	8.46E-09	37.17643	0.327505	2.232504
OTKAR	0	546.0898	2.90E-14	62.34253	0.801007	0.443771
OZFIN	0	979.2516	0	174.8962	0.000136	17.80941
PARSN	0	302.8687	0.002372	12.08845	0.552912	1.185114
PASTA	0	985.8672	0	365.4162	7.35E-07	28.2457
PENGD	0	709.3472	6.66E-08	33.04852	0.269956	2.61899
PETKM	0	367.2649	0	155.0602	0.19859	3.233024
PETUN	0	437.5234	4.21E-11	47.78345	0.738335	0.606714
PIMAS	0	669.8266	0	272.3314	0.001359	13.20253
PINSU	0	793.7504	0	89.22689	0.670496	0.799476
PKENT	0	364.618	5.42E-14	61.09141	0.002702	11.82765
PNSUT	0	698.2022	1.73E-10	44.95758	0.006598	10.04208
PRKAB	0	739.8166	0	149.5741	0	108.9988
PRKTE	0	183.6116	0.001167	13.50661	0.002164	12.27138
PRTAS	0	454.2555	0	457.2389	0.023515	7.500273
PTOFS	0	554.53	0	98.60046	0.358112	2.053816
RAKSE	4.61E-05	19.96944	0	132.6573	0.036744	6.607568
RAYSG	0	566.3121	2.22E-12	53.6705	0.009938	9.22285
RKSEV	0.088264	4.854851	0	101.2373	0.328645	2.225557
SAHOL	0	358.2255	4.04E-12	52.46824	0.363071	2.026313
SANKO	0	684.6569	0	146.8122	0.372304	1.976088
SARKY	0	476.8433	5.02E-10	42.82394	4.44E-06	24.64863
SASA	0	918.0897	0.0005	15.20352	0.421088	1.729827
SELGD	0	371.0353	0	102.7178	2.99E-05	20.83621
SERVE	0	542.7766	4.10E-09	38.62569	0.004636	10.74779

Table 7: Jarque-Bera Statistics for Individual ISE Stocks (continued)

	Daily data		Weekly data		Monthly Data	
	P-value	JB statistic	P-value	JB statistic	P-value	JB statistic
SISE	0	240.8665	1.62E-08	35.87555	0.164612	3.608326
SKBNK	0	607.6553	0	779.2965	0.212046	3.101907
SKPLC	0	367.6108	0	88.38814	0.944764	0.11364
SKTAS	0	492.5547	5.19E-10	42.75674	0.149722	3.797947
SNPAM	0	577.9413	0	173.0637	0.005439	10.42847
SODA	0	565.7097	9.67E-05	18.48679	0.823081	0.389402
SONME	0	513.91	1.22E-15	68.7605	0.002505	11.97866
SYBYO	0	355.847	0	308.0788	0.01184	8.872617
TACYO	0	478.0195	0	772.4245	0.892105	0.228343
TATKS	0	366.6654	2.91E-12	53.12869	4.69E-05	19.93553
TBORG	0	690.3193	0	241.0012	0.07649	5.141194
TCELL	0	285.3733	0	81.66776	0.000648	14.68187
TEBNK	0	371.5934	0.148047	3.820456	0.956188	0.089602
TEKFK	0	423.3755	4.19E-11	47.79102	2.27E-05	21.38325
TEKST	0	979.4493	0	176.3177	0.765883	0.533452
TEKTU	0	276.9511	1.17E-06	27.31497	0.944316	0.114588
THYAO	0	209.1921	0	76.49026	0.246996	2.796764
TIRE	0	481.0018	0	95.37244	0.411706	1.774891
TKBNK	0	600.6753	0	1599.568	0	472.7716
TNSAS	0	479.8321	3.16E-11	48.35883	0.975173	0.050281
TOASO	0	414.0657	0.001226	13.40748	0.731773	0.62457
TOPFN	0	609.4514	6.90E-12	51.39967	0.223296	2.998514
TPFAC	0	530.8335	0	205.7235	0.100316	4.598858
TRCAS	0	181.9104	9.24E-08	32.3945	0.000579	14.9087
TRKCM	0	614.8897	0	79.99146	0.049429	6.014454
TRNSK	0	181.5941	0	130.6726	0.000328	16.04735
TSKB	0	388.2232	4.90E-06	24.45395	0.643934	0.880319
TUDDF	0	325.6379	0.000919	13.98477	0.159461	3.671909
TUKAS	0	1096.525	0	723.7605	1.16E-08	36.55132
TUMTK	0	222314.7	0	423.7548	0	86.17994
TUPRS	0	382.1844	0	689.1285	0.033511	6.791761
UCAK	0	2251.311	0	120.0414	0.080827	5.030885
UKIM	0	850.2638	3.07E-11	48.41554	0.122388	4.201112
UNTAR	0	518.3526	2.10E-12	53.78198	0.414872	1.75957
UNYEC	0	1359.636	0	102.8717	0.000122	18.02564
USAK	0	557.4289	0	96.18344	0.008963	9.429274
UZEL	0	380.7749	0	160.0342	0.952785	0.096731
VAKFN	0	443.7909	5.75E-11	47.15738	0.758494	0.55284
VAKKO	0	653.3015	1.68E-07	31.19551	0.083491	4.966035
VANET	0	795.2163	0	332.4008	8.02E-05	18.8616
VARYO	0	240.3073	3.48E-09	38.95286	0.098048	4.644597
VESTL	0	482.5922	0	105.0948	0.130217	4.077107
VKFRS	0	824.8146	0	928.1831	0.19717	3.247374
VKFYT	0	667.8855	0	896.7013	4.32E-12	52.33473
VKGYO	0	614.1263	0	105.4061	0.130789	4.06834
VKING	0	573.7503	0	90.84541	1.81E-05	21.84384
YATAS	0	575.4907	5.45E-08	33.45147	0.692831	0.733937
YAZIC	0	751.4569	2.41E-06	25.87219	0.012425	8.776108
YKBNK	0	238.3691	0	284.5445	2.15E-10	44.51832
YKFIN	0	427.6874	0	1239.746	1.15E-10	45.777
YKGYO	0	668.086	5.70E-08	33.36005	0.717062	0.665187
YKRYO	0	995.9663	0	229.7871	0.411076	1.777956
YKSGR	0	416.1321	1.44E-15	68.30325	0.572122	1.116808
YTFYO	0	1804.926	0	112.485	0.000131	17.87727
YUNSA	0	608.4289	1.54E-13	59.00011	0.190048	3.320955
ZOREN	0	1062.088	4.07E-05	20.21769	0.157764	3.693307

B.2 Modified Kolmogorov-Smirnov Statistics

Table 8: Modified Kolmogorov-Smirnov Statistics for Individual ISE Stocks

	Daily data	Weekly data	Monthly Data
ABANA	8.08992996	2.320381	1.27779
ACIBD	5.32349817	1.976527	0.667231
ADANA	8.11511636	2.495235	1.351178
ADBGR	8.73700744	2.354722	1.752575
ADEL	8.19098562	3.804578	1.354665
ADNAC	8.02652864	2.73341	1.83901
AEFES	4.84667714	1.656929	0.810328
AFYON	8.36491406	2.967772	1.322235
AGIDA	8.5002551	1.827069	1.188527
AGYO	7.3649155	2.085678	1.162755
AKALT	6.62553725	2.626282	1.482065
AKBNK	7.2426565	1.82877	1.148844
AKCNS	7.18301524	2.065195	0.596805
AKENR	6.41806897	2.045693	0.889189
AKGRT	6.32203916	2.722959	1.341265
AKIPD	8.21816909	2.74801	1.153184
AKSA	6.40285496	2.039418	1.190551
AKSUE	6.53610282	4.791191	1.149076
AKYO	7.47508838	3.454225	1.966869
ALARK	7.09170204	2.218676	1.380205
ALCAR	7.26759054	2.119289	1.535329
ALCTL	6.16162229	2.320247	1.324992
ALFA	11.8164403	3.708187	2.949518
ALGYO	7.95950306	2.741007	2.1506
ALKA	5.91497657	2.692741	1.972383
ALKIM	5.62292954	2.047097	1.167541
ALNTF	7.62694024	2.761622	1.548626
ALTIN	6.40412707	2.447393	0.903335
ALYAG	6.04537632	2.143304	1.655931
ANACM	6.60365583	2.20979	1.715922
ANHYT	6.04166188	1.613309	1.270018
ANSGR	7.58451167	2.73298	1.535049
ARAT	7.89499473	4.225108	1.555155
ARCLK	5.42902832	1.533054	0.72536
ARENA	4.17780885	3.502089	1.05372
ARFYO	7.50068903	2.565372	1.550222
ARSAN	6.95312892	2.497053	1.613396
ASELS	6.92702199	2.604142	1.444046
ASLAN	8.66067293	3.761667	2.096206
ASUZU	6.11810838	2.384341	1.409928
ATAYO	9.37680666	3.104525	1.78943
ATEKS	7.50608463	2.494092	0.842238
ATLAS	7.98220056	2.862466	1.442936
ATSYO	7.253477	2.986936	1.790497
AVRSY	8.77896874	3.964896	2.052883
AYCES	7.70050957	2.936638	1.794933
AYEN	5.70764833	2.269381	1.071926
AYGAZ	7.5214847	2.065145	0.964201
BAGFS	7.11889152	2.717678	1.048241
BAKAB	7.09311983	3.239376	1.803751
BANVT	7.6508658	2.577896	1.0491
BEKO	6.53494475	1.984489	1.084298
BERDN	8.61001032	3.045547	1.407569
BFREN	7.41911677	3.411751	1.768085
BISAS	6.79882483	3.304209	1.912643
BJKAS	5.13186362	3.023167	1.363948
BOLUC	8.13239904	2.887831	2.183051
BOSSA	7.01915965	3.062447	1.397788
BRISA	8.34010251	1.983788	1.620191
BRMEN	7.29013453	3.824531	1.706028

Table 8: Modified Kolmogorov-Smirnov Statistics for Individual ISE Stocks (continued)

	Daily data	Weekly data	Monthly Data
BROVA	7.36728375	3.200779	1.811801
BRSAN	6.93103207	2.408313	1.20072
BRYAT	6.81449681	3.042176	1.904363
BSOKE	5.79688792	2.046366	1.258506
BSPRO	9.14173055	3.538287	2.017599
BTCIM	7.88376473	2.036012	1.962287
BUCIM	13.6110399	4.966982	2.235122
BUMYO	9.05518927	3.086321	1.489498
BURCE	7.88964442	2.830763	1.915094
BYSAN	13.8140787	5.437747	3.148367
CARSI	6.11699875	2.62275	1.598097
CBSBO	7.72420759	2.433419	2.023775
CELHA	6.55751941	2.021339	0.862931
CEMTS	7.45353305	2.803165	2.397383
CEYLN	7.3508836	3.109839	1.459569
CIMSA	6.9281728	2.195294	0.827675
CLEBI	8.39450832	2.37425	2.241427
CMBTN	6.70909672	2.417357	1.250521
CMENT	9.99136359	3.075605	1.912376
CMLOJ	7.27793422	2.936517	1.486106
COMUN	9.34577604	2.854526	2.312517
CUKEL	19.4944299	8.369377	3.809506
CYTAS	6.4320141	3.273576	1.560311
DARDL	9.28856389	2.585509	1.767399
DENCM	8.12250261	2.14785	1.737212
DENTA	6.91641265	2.686885	1.400861
DERIM	6.63520264	3.039558	1.574684
DEVA	6.33781128	3.030769	1.446191
DISBA	7.80749338	2.817933	1.604009
DITAS	6.83676042	2.455928	0.861609
DMSAS	7.2797468	2.283605	1.357545
DNZYO	8.82141612	3.083367	2.048027
DOBUR	6.50019185	1.81198	1.037231
DOGUB	6.24726858	3.391489	2.010993
DOHOL	6.19584534	2.201265	0.756133
DOKTS	6.66327039	1.549105	0.975266
DUROF	6.85422769	3.513137	1.630953
DYHOL	4.91493861	1.725348	0.857668
DYOBY	7.41770538	2.703486	2.101631
ECBYO	6.37874121	3.427348	1.203318
ECILC	6.9275776	2.015652	1.80792
ECYAP	6.74000365	2.181655	1.324113
ECZYT	6.81065806	2.914184	1.610784
EDIP	8.17990143	4.153626	1.827891
EFES	6.03516036	3.03056	1.01768
EGEEN	7.20626582	3.017133	1.050838
EGGUB	7.95399302	2.90589	1.728941
EGPRO	9.5324805	3.615405	1.873528
EGSER	7.71958109	2.663856	1.502334
EGYO	15.0137883	6.135192	3.063589
EMKEL	6.54710202	2.573137	2.036245
EMNIS	8.45649561	2.831696	1.407629
ENKAI	4.03458659	1.008853	1.290103
EPLAS	6.58426606	2.575721	1.145194
ERBOS	8.31999757	2.657331	1.336158
EREGL	6.32320066	1.703037	1.01955
ERSU	5.59193838	2.45834	1.541469
ESCOM	5.358187	2.334703	1.82835
ESEMS	7.16715791	2.73218	1.137929
EVREN	7.04025385	2.835469	1.484528
FENIS	8.3304563	2.261316	1.73708
FFKRL	8.25776589	2.357355	1.246805

Table 8: Modified Kolmogorov-Smirnov Statistics for Individual ISE Stocks
(continued)

	Daily data	Weekly data	Monthly Data
FINBN	6.55394701	1.925901	1.213736
FMIZP	7.3401688	2.538592	1.274119
FNSYO	8.61415838	1.876603	1.20292
FRIGO	6.72343897	2.335305	1.482512
FROTO	6.59512301	2.099618	1.309729
FVORI	6.65060134	2.850199	1.355191
GARAN	6.53456952	2.334971	1.122202
GARFA	9.10715794	3.612681	1.957332
GDKYO	9.20885668	2.88755	1.151167
GEDIZ	7.84933333	3.129714	1.641425
GENTS	7.51927086	2.760468	1.559618
GEREL	4.27512483	2.256507	0.60666
GIMA	8.25755233	2.326602	1.639773
GLBYO	8.62494515	5.114895	1.757229
GLMDE	7.26858114	2.564559	1.121278
GOLDS	6.5543166	1.635813	1.342911
GOLTS	7.30565308	2.395841	1.452786
GOODY	8.47597521	2.869491	1.300777
GRGYO	7.9176518	3.083399	1.64382
GRNYO	8.33741936	3.763228	1.51061
GSDHO	5.18446068	2.522546	1.27315
GSRAY	4.85375058	1.706284	1.215592
GUBRF	5.46459081	2.502458	1.503812
GUSGR	7.36313176	2.913448	1.814027
HEKTS	6.2352536	2.587309	1.161114
HURGZ	5.81638282	1.937123	1.272441
HZNDR	7.30757891	2.94889	1.389305
IDAS	7.58770884	1.941365	1.387457
IHEVA	13.3241427	4.174545	2.512223
IHGYO	11.2804213	5.051469	1.531867
IHLAS	10.9692778	3.395813	2.410011
INTEM	6.57141465	2.025319	0.964082
IPMAT	5.13389868	2.774476	1.693614
ISAMB	7.97457331	3.333873	1.313649
ISATR	27.451973	6.87703	2.224282
ISBTR	8.6326972	3.13353	1.973277
ISCTR	7.23277611	2.75184	0.828644
ISGEN	6.88889372	2.62666	1.410401
ISGYO	6.53517684	3.050826	0.918275
ISKUR	30.6588274	9.787512	3.260852
ISYAT	9.42913319	3.935793	1.645439
IZMDC	6.65303933	2.254641	1.25391
IZOCM	6.4565073	1.920338	1.363743
KAPLM	6.58482035	2.886036	1.751057
KARSN	6.73442473	1.786811	1.549161
KARTN	11.0184844	3.797234	2.159024
KAVPA	5.96918787	3.210342	1.679007
KCHOL	5.889125	2.393035	1.423863
KENT	10.1533534	3.548358	1.653785
KEPEZ	19.7417069	8.750034	3.90691
KERVT	8.14201138	3.156107	1.873794
KIPA	8.15311867	2.382648	1.38501
KLBMO	7.55412239	2.116482	1.204236
KLMSN	7.52410233	2.103599	1.242948
KNFRT	8.26571989	3.110523	1.222244
KONYA	8.73442435	3.29342	1.368152
KORDS	6.04409267	1.906241	0.908267
KOTKS	8.25346602	3.096081	1.855909
KOZAD	4.05905235	1.453699	1.095149
KRDMA	8.08365248	4.314226	1.041102
KRDMB	7.85779664	4.065619	1.54239
KRDMD	7.66727205	3.414098	1.305923

Table 8: Modified Kolmogorov-Smirnov Statistics for Individual ISE Stocks (continued)

	Daily data	Weekly data	Monthly Data
KRSTL	8.97897015	4.356329	1.140802
KRTEK	5.58264723	2.322713	1.14292
KUTPO	6.98389139	2.526899	1.501189
LINK	5.16923492	2.415596	1.167096
LIOYS	6.40688707	2.096854	1.441488
LOGO	6.45605394	2.437547	1.562345
LUKSK	9.05953491	3.391428	2.035242
MAALT	8.1649121	2.984909	1.116804
MAKTK	8.5996629	2.979075	1.279061
MARET	9.64923027	2.222348	1.286446
MEGES	7.73192403	3.680007	1.831262
MEMSA	7.39061264	2.933881	1.801006
MERKO	7.73786591	2.527735	1.017971
METAS	15.4026	6.520178	3.074933
METUR	4.45200099	2.518704	1.876953
MIGRS	7.20823416	2.602228	0.805362
MILYT	6.89385334	2.649474	1.466035
MIPAZ	6.5492734	2.280497	1.233422
MMART	7.48298175	2.91126	1.341297
MNDRS	5.17820664	2.026625	1.282756
MRDIN	8.77270239	2.681154	1.610365
MRSHL	8.37558742	3.063425	1.982835
MTEKS	7.08293562	3.252231	1.488925
MUTLU	6.87852953	2.892595	1.528466
MYZYO	8.32082011	3.626735	1.782413
MZHLD	7.2369167	3.065989	0.995358
NETAS	7.32255012	2.943682	1.683843
NIGDE	7.63149667	2.388764	1.479241
NTHOL	8.27684949	2.360624	2.093846
NTTUR	7.83474952	3.185584	1.771771
NUGYO	6.48057829	2.404883	1.0574
NUHCM	8.38387801	2.266143	1.332574
OKANT	8.28666812	2.930457	2.19806
OLMKS	7.28002572	1.950735	1.221784
OTKAR	7.34859846	2.724374	1.479299
OZFIN	8.18338295	2.799076	2.407164
PARSN	6.76489344	1.945255	0.888069
PASTA	8.60347889	3.360434	1.984911
PENGD	7.88443934	2.45434	0.905418
PETKM	8.16455959	2.809608	1.490537
PETUN	5.1805931	2.314817	0.92383
PIMAS	7.29394254	3.10197	2.032069
PINSU	8.29988773	2.863908	0.87445
PKENT	8.55388151	3.131713	2.126635
PNSUT	7.40015443	2.289211	1.189617
PRKAB	7.93705183	2.043194	1.679254
PRKTE	6.28222301	2.586121	1.067133
PRTAS	7.73840064	2.991604	1.391583
PTOFS	9.09583885	2.379363	1.21749
RAKSE	6.17153798	2.897929	1.966973
RAYSG	7.92565259	2.997058	1.35368
RKSEV	6.92109834	2.780524	1.634704
SAHOL	7.72540877	2.208612	1.082938
SANKO	5.59892425	2.059386	1.038569
SARKY	8.35736555	2.344555	1.829715
SASA	7.34334828	2.028282	1.545984
SELGD	6.50011339	2.043342	1.664919
SERVE	5.48855774	2.448796	1.641564
SISE	6.08894436	2.267977	1.290446
SKBNK	7.28894997	3.864673	1.644023
SKPLC	6.24933368	2.594981	1.146736
SKTAS	7.34722609	2.276488	1.34953

Table 8: Modified Kolmogorov-Smirnov Statistics for Individual ISE Stocks (continued)

	Daily data	Weekly data	Monthly Data
SNPAM	7.48308762	2.98624	2.241105
SODA	5.93524168	1.501419	0.907461
SONME	5.70568149	2.181242	1.070221
SYBYO	5.67294764	2.776908	2.038713
TACYO	7.38272054	4.909435	1.217797
TATKS	6.92365222	2.61387	1.816536
TBORG	8.4383808	2.840234	1.725617
TCELL	4.33844063	2.060436	1.236694
TEBNK	6.67021968	2.004113	0.749253
TEKFK	8.07553904	2.622973	1.693152
TEKST	8.92368292	2.488494	1.280781
TEKTU	5.39007545	2.67596	1.166664
THYAO	6.95530192	2.384143	0.900534
TIRE	7.69686547	2.40204	1.136853
TKBNK	7.65007803	4.283834	1.954184
TNSAS	7.44685484	2.804998	0.870132
TOASO	5.52049063	1.85673	1.183974
TOPFN	7.96665498	2.471943	1.198942
TPFAC	7.81363563	3.055075	1.034839
TRCAS	5.74362791	2.234978	1.451099
TRKCM	6.46403669	1.718172	0.711804
TRNSK	8.9643049	2.841698	1.34135
TSKB	8.74252963	2.322989	1.442663
TUDDF	5.5119435	1.485158	0.973597
TUKAS	7.23910764	3.310231	1.898541
TUMTK	21.4120914	9.82345	4.29612
TUPRS	7.36026077	3.09035	1.087773
UCAK	8.15222262	3.096911	0.896034
UKIM	8.05416789	2.817128	0.76542
UNTAR	7.875234	1.987653	1.112305
UNYEC	8.69611524	2.448154	1.594687
USAK	7.44414565	2.50546	1.339643
UZEL	6.18518906	2.755424	0.928268
VAKFN	7.13144748	2.467744	0.865988
VAKKO	6.29556452	2.299251	1.343182
VANET	7.43845624	3.335141	1.372337
VARYO	8.40380307	2.873703	1.472578
VESTL	5.95378896	2.159054	1.609914
VKFRS	6.95420405	4.441753	1.990556
VKFYT	8.00480622	4.120944	2.384762
VKGYO	6.31470511	3.3395	1.24993
VKING	8.77614513	2.921572	1.153004
YATAS	7.48903942	1.967048	0.86638
YAZIC	4.97885507	1.261738	0.711823
YKBNK	6.53028268	2.677328	1.656039
YKFIN	7.86109839	4.288534	2.154954
YKGYO	7.19060065	2.328512	0.873216
YKRYO	8.43717308	3.108891	1.30067
YKSGR	6.92999666	2.842638	1.05122
YTFYO	7.3461252	2.634458	1.732109
YUNSA	8.03830417	2.755339	1.630066
ZOREN	7.15859354	2.89997	1.052536

C Normality in Sub-periods

Table 9: Statistics for Normality for Sub-periods (Daily Data)

	1998-2000			2000-2003		
	P-value	JB statistic	KS statistic	P-value	JB statistic	KS statistic
ise100	0	189.7763	2.6689	0	569.847	2.9233
ise30	0	152.7038	2.4853	0	491.9284	2.627
iseequal weigthed	0	683.0243	4.3899	0	1877.364	4.4828
ABANA	4.70E-05	19.94086	5.2215	2.10E-13	58.35359	6.173434
ACIBD	5.90E-06	24.09274	2.215704	0	279.9467	5.120491
ADANA	0	258.5577	5.025325	0	894.8447	6.510207
ADBGR	0	250.4441	5.880316	0	971.7847	6.550904
ADEL	0	663.5441	5.777475	0	801.6012	5.781742
ADNAC	0	260.7463	5.645509	0	445.444	5.754206
AEFES	0	77.06198	1.336147	0	1051.977	4.84642
AFYON	0	203.2713	5.913449	0	282.1747	5.872705
AGIDA	0	180.5917	5.992879	0	258.1003	6.022741
AGYO				9.10E-11	46.24907	7.364915
AKALT	0	124.7112	5.090833	0	156.5938	4.269838
AKBNK	0	134.1174	5.83414	0	372.5046	4.473436
AKCNS	0	169.0511	5.198921	0	120.7114	4.983674
AKENR	0	114.2597	2.739772	0	207.2097	5.832068
AKGRT	0	99.86928	4.055121	0	343.688	4.853581
AKIPD	0	283.924	5.962065	0	222.2237	5.675686
AKSA	0	178.7481	4.681098	0	171.0193	5.020863
AKSUE	0	80.16226	4.259974	0	513.7132	4.796306
AKYO	0	107.5722	4.595416	0	637.1177	5.830595
ALARK	4.70E-11	47.57715	5.703873	0	322.7724	4.21784
ALCAR	0	122.6775	4.912014	0	388.7021	5.401581
ALCTL	5.10E-13	56.60042	4.597246	0	111.4557	4.061092
ALFA	0	160.8801	5.75093	0	1076.436	10.57977
ALGYO	0	238.9697	4.843852	0	199.6039	6.382326
ALKA	0.695	0.727676	1.160164	0	998.4747	5.549608
ALKIM	0	112.0799	3.129986	0	812.0502	4.753996
ALNTF	0	154.0388	5.251779	0	190.4407	5.543049
ALTIN	0	177.547	4.850069	0	241.9429	4.195586
ALYAG	3.60E-11	48.07804	2.776416	0	412.474	5.419044
ANACM	0	168.9261	4.583684	0	831.7196	4.826323
ANHYT	2.30E-12	53.57042	3.202051	0	148.7899	5.181338
ANSGR	0	365.6856	5.010003	0	280.1557	5.645573
ARAT	0	108.9586	5.457618	0	321.4684	6.141256
ARCLK	0	83.46311	3.41949	0	129.5743	4.307064
ARENA	0.36716	2.003914	1.091591	0	172.6982	4.271601
ARFYO	0	504.0966	5.533787	0	195.0693	5.151307
ARSAN	0	101.7921	4.83565	0	253.2026	4.983305
ASELS	0	149.608	4.712561	0	399.6134	5.071495
ASLAN	0	350.2292	6.170627	0	393.4854	6.053
ASUZU	0	149.4217	4.732804	0	230.8508	3.943434
ATAYO	0	244.5373	6.778318	0	474.9271	6.481413
ATEKS	0	177.4445	5.550121	0	127.2407	5.071026
ATLAS	0	323.77	5.734879	0	321.2912	5.532713
ATSYO	0	264.3765	4.875379	0	186.8283	5.424488
AVRSY	3.70E-08	34.22271	5.199699	0	460.2701	6.995812
AYCES	1.10E-16	73.66502	5.331707	0	300.3196	5.790997
AYEN	1.90E-14	63.14472	1.961655	0	779.075	5.452951
AYGAZ	0	141.9431	4.867967	0	228.2124	5.688216
BAGFS	0	159.7392	5.756187	0	404.1571	5.11671
BAKAB	0	117.7795	5.154219	0	793.2606	5.69263
BANVT	0	208.7434	6.079271	0	632.7785	4.664612
BEKO	0	93.56813	4.732736	0	135.6987	4.632261
BERDN	0	105.8876	6.261269	0	292.5348	5.948118
BFREN	0	365.7404	5.88489	0	596.6219	5.395299
BISAS	2.30E-12	53.6245	5.847883	0	86.95177	4.09238
BJKAS				0	246.2776	5.131864

Table 9: Statistics for Normality for Sub-periods (Daily Data) (continued)

	1998-2000			2000-2003		
	P-value	JB statistic	KS statistic	P-value	JB statistic	KS statistic
BOLUC	0	515.6053	5.512191	0	681.2336	6.022889
BOSSA	0	124.8186	5.000954	0	402.3577	5.026359
BRISA	0	226.5639	5.7137	0	187.6757	6.145802
BRMEN	0	415.614	5.017537	0	790.6131	5.798038
BROVA	0	139.7059	5.613993	0	499.2467	4.681483
BRSAN	0	148.8058	6.105824	0	237.5584	3.673368
BRYAT	0	196.4406	5.01935	0	362.5159	4.546313
BSOKE	0	153.5368	3.1895	0	347.5673	5.424322
BSPRO	0	211.9709	5.570667	0	766.6916	7.248721
BTCIM	0	120.8892	5.825596	0	759.1017	5.366998
BUCIM	0	973.0782	8.590292	0	5890.622	10.65484
BUMYO	0	409.8746	7.523657	0	101.8571	5.327785
BURCE	0	162.5078	4.92048	0	302.0488	6.256486
BYSAN	0	10107.27	8.390882	0	96.75339	11.24289
CARSI	0	146.4006	4.745586	0	216.5871	3.879297
CBSBO	0	265.8053	5.922069	0	252.7696	5.823327
CELHA	0	89.5228	4.628591	0	497.755	4.70023
CEMTS	0	196.5632	4.656264	0	209.3784	5.951961
CEYLN	0	159.6158	5.126608	0	409.3232	6.065343
CIMSA	0	151.1058	5.030105	0	201.0545	4.827604
CLEBI	0	187.6621	5.970669	0	616.1473	5.925889
CMBTN	0	85.11614	4.727177	0	567.8362	4.978744
CMENT	0	240.681	6.187412	0	508.9529	7.930756
CMLOJ	0	26148.71	5.537997	0	110.0169	5.053037
COMUN	0	417.1032	5.437065	0	865.944	7.782981
CUKEL	0	84.29289	7.479338	0	130721.3	20.3217
CYTAS	0.00132	13.26322	5.156761	0	250.8622	4.622437
DARDL	1.10E-16	73.41363	5.193393	0	41439.34	7.9533
DENCM	0	79.07639	5.332077	0	447.2861	6.162971
DENTA	1.20E-12	54.90235	2.980432	0	352.6831	6.396804
DERIM	0	82.07815	4.66899	0	352.1954	4.739654
DEVA	0	126.1922	4.840932	0	314.7918	4.760578
DISBA	0	128.2727	5.365921	0	411.8036	5.748755
DITAS	0	192.1762	4.576496	0	395.1982	5.146783
DMSAS	0	251.1492	5.257955	0	1639.015	5.112831
DNZYO	0	215.8192	5.828811	0	580.6633	6.695923
DOBUR	0	81.14655	3.07898	0	87.54016	5.597919
DOGUB	9.40E-05	18.54222	3.529371	0.14167	3.908545	5.608394
DOHOL	2.80E-08	34.78015	4.702761	0	86.24682	4.038391
DOKTS	0	179.8126	4.319237	0	366.031	5.207175
DUROF	0	85.14937	5.08937	0	389.7544	5.753214
DYHOL	5.00E-09	38.21984	3.696113	3.10E-09	39.20049	3.275496
DYOBY	0	208.5314	5.457603	0	298.8735	5.290295
ECBYO	0	171.4377	4.457005	0	378.2932	4.595166
ECILC	0	93.60825	4.655607	0	206.455	5.116663
ECYAP	0	90.31583	4.500633	0	889.8598	5.058882
ECZYT	0	121.332	4.876039	0	448.041	4.57183
EDIP	0	121.294	5.985498	0	322.1291	5.629134
EFES	0	100.8983	4.615837	0	104.5178	3.941517
EGEEN	0	271.6576	4.477396	0	349.7683	5.82049
EGGUB	0	221.3588	5.538942	0	849.1931	5.703428
EGPRO	0	355.6826	5.814288	0	617.4398	7.669257
EGSER	0	168.1572	5.86146	0	274.5307	5.028605
EGYO	0	131.1357	4.534663	0	1249.644	16.45783
EMKEL	0	109.5274	4.125706	0	219.7424	5.061643
EMNIS	0	245.0398	5.519226	0	574.9154	6.371913
ENKAI				8.70E-10	41.71796	4.034587
EPLAS	0	177.9599	5.112441	0	158.0055	4.496106
ERBOS	0	481.8998	5.252791	0	595.7486	6.520305
EREGL	0	105.0691	4.665163	0	243.4503	4.293458
ERSU	2.60E-09	39.54007	2.206998	0	536.5274	5.513835
ESCOM	4.40E-16	70.87065	2.575786	0	425.8149	5.226027

Table 9: Statistics for Normality for Sub-periods (Daily Data) (continued)

	1998-2000			2000-2003		
	P-value	JB statistic	KS statistic	P-value	JB statistic	KS statistic
ESEMS	0	192.1335	4.816546	0	79.18081	5.313184
EVREN	0	238.4598	5.018343	0	247.1307	4.906172
FENIS	0	137.8887	7.013586	0	407.068	5.373042
FFKRL	0	469.5722	6.042301	0	712.6256	5.638631
FINBN	0	83.09909	5.095377	0	253.8476	4.171376
FMIZP	0	196.0558	5.295865	0	599.3893	5.195745
FNSYO	0	352.4552	5.934141	0	900.2419	6.360365
FRIGO	0	267.6484	4.417434	0	277.8232	5.435801
FROTO	0	80.93571	4.146769	0	123.88	5.226841
FVORI	0.07776	5.108163	2.683196	0	175.8666	6.473704
GARAN	2.20E-16	72.00806	4.239603	0	245.4602	5.016601
GARFA	0	192.0103	6.765049	0	383.2467	6.132575
GDKYO	0	375.449	6.509047	0	410.1092	6.735893
GEDIZ	0	102.0751	5.218787	0	115.7503	5.817768
GENTS	0	132.0306	5.266548	0	737.8244	5.386929
GEREL				0	395.3673	4.275125
GIMA	0	126.9629	6.125731	0	299.9129	5.342101
GLBYO	0	149.872	5.701777	0	241.6636	6.488949
GLMDE	9.30E-11	46.19016	5.25008	0	105.7557	4.983309
GOLDS	0	87.00762	3.671147	0	177.7594	5.391128
GOLTS	1.10E-16	73.23301	4.815661	0	442.9754	5.637072
GOODY	0	280.4202	6.075992	0	316.0899	5.896379
GRGYO	0	296.0315	6.465979	0	295.8507	4.836109
GRNYO	0	146.8565	5.926181	0	431.8072	7.040584
GSDHO	1.20E-06	27.24329	2.965309	0	147.2085	4.157156
GSRAY				0	143.7292	4.853751
GUBRF	0	135.547	4.206575	0	196.3966	4.354826
GUSGR	0	278.7903	5.343128	0	226.3952	5.06898
HEKTS	0	180.7603	4.611123	0	228.4987	4.6448
HURGZ	1.00E-13	59.85831	4.323945	0	139.3659	3.914059
HZNDR	0	331.4524	5.851816	0	386.0173	4.499308
IDAS	0	101.7198	5.100689	0	317.8481	5.637033
IHEVA	0	177.8668	5.767648	0	406239	13.07953
IHGYO	0	88.64502	3.565104	0	393612.4	11.29085
IHLAS	0	160.8886	4.102565	0	125838.7	12.01743
INTEM	0	93.81147	4.247328	0	644.1747	4.982943
IPMAT	0.00246	12.01576	1.996916	0	330.8535	5.354395
ISAMB	0	344.5566	5.61931	0	244.7946	5.655079
ISATR	0	159477.6	20.39467	0	6623.916	18.40065
ISBTR	0	407.2813	5.277105	0	190.6565	6.879589
ISCTR	0	194.2059	6.353987	0	283.4571	3.832336
ISGEN	1.40E-10	45.42039	3.040924	0	513.9367	6.186334
ISGYO	0	100.3386	3.331615	0	186.5562	5.566026
ISKUR	0	45854.73	22.09487	0	19525.41	21.51662
ISYAT	0	547.3412	6.787115	0	509.2473	6.510504
IZMDC	0	89.83964	4.479706	0	297.4286	4.935778
IZOCM	0	122.1279	4.839765	0	109.2229	4.292175
KAPLM	0	195.7505	4.973392	0	255.1035	4.325507
KARSN	1.20E-13	59.54979	4.393981	0	141.2151	5.297225
KARTN	0	399.2555	6.439621	0	2205.104	9.248844
KAVPA	1.10E-15	68.78005	4.654167	0	353.583	4.156404
KCHOL	6.60E-09	37.67161	4.282693	0	261.1293	4.069767
KENT	0	497.6389	5.798057	0	991.9566	8.656565
KEPEZ	0	109.7046	8.264492	0	76565.28	19.85597
KERVT	0	174.5822	5.76409	0	7169.295	6.637025
KIPA	0	166.6081	5.235007	0	696.1292	6.381674
KLBMO	0	286.5678	4.641081	0	215.6667	6.04897
KLMSN	0	181.8762	5.144022	0	638.6795	5.419828
KNFRT	0	101.8453	3.927814	0	471.0083	7.881807
KONYA	0	159.1539	6.031704	0	463.7792	6.31677
KORDS	0	88.18299	4.110635	0	784.4373	4.359582
KOTKS	0	89.31431	5.206109	0	360.337	6.496602

Table 9: Statistics for Normality for Sub-periods (Daily Data) (continued)

	1998-2000			2000-2003		
	P-value	JB statistic	KS statistic	P-value	JB statistic	KS statistic
KOZAD				0	543.4805	4.059052
KRDMA	0	106.6631	5.225971	0	343.994	6.195913
KRDMB	0	179.8709	5.244217	0	254.5641	6.540225
KRDMD	0	100.0183	5.419731	0	265.8973	5.454881
KRSTL	0	327.5243	5.675538	0	1130.501	7.314555
KRTEK	0	311.4802	4.764957	0	141.0356	3.8781
KUTPO	0	189.9738	4.315697	0	1064.801	5.573102
LINK	0.78798	0.476564	1.330968	0	386.7724	5.068985
LIOYS	0	387.6571	3.5011	0	255.6618	5.402242
LOGO	0	88.10803	3.583804	0	368.7614	5.550086
LUKSK	0	251.7182	5.822839	0	389.3046	6.949857
MAALT	0	121.4952	6.316893	0	572.0427	5.207493
MAKTK	0	262.9569	5.134006	0	77.82616	6.960672
MARET	0	134.6591	6.179111	0	474.0161	7.431759
MEGES	0	117.897	5.714721	0	182.7966	6.050147
MEMSA	0	127.769	6.340187	0	452.0033	4.4253
MERKO	0	233.9359	5.446878	0	629.8989	5.48502
METAS	0	30344.58	12.75532	0	1017.434	9.024868
METUR				0	308.9508	4.452001
MIGRS	0	222.8358	5.430066	0	1106.238	4.88054
MILYT	0	118.5393	5.799789	6.70E-16	69.96569	3.972483
MIPAZ	0	130.1283	4.589691	0	85.31316	4.646118
MMART	0	193.3752	5.610213	0	261.9878	4.959657
MNDRS	0.08203	5.001251	2.05129	0	416.5805	4.553633
MRDIN	0	242.9043	5.851078	0	454.8194	6.583095
MRSHL	0	154.9091	6.4262	0	260.0471	5.633902
MTEKS	4.30E-12	52.34142	4.638035	0	229.4571	5.71724
MUTLU	0	200.613	5.218292	0	740.1848	4.44632
MYZYO	0	202.8714	5.486115	0	754.0277	7.351391
MZHLD	0	91.29561	4.555208	0	198.7951	5.707814
NETAS	0	98.4405	5.58091	0	259.1441	4.605452
NIGDE	0	203.6381	5.01841	0	667.5243	6.418276
NTHOL	0	118.3726	5.076527	0	552.922	6.630545
NTTUR	0	210.6561	5.027674	0	306.7224	6.052939
NUGYO	2.90E-12	53.1388	2.786994	0	680.8334	5.815544
NUHCM	0	470.0595	4.502661	0	1098.699	7.377465
OKANT	0	232.4673	6.042655	0	241.783	5.686672
OLMKS	0	106.5143	5.489021	0	293.5144	4.990147
OTKAR	0	125.4395	4.39085	0	620.4148	5.976734
OZFIN	0	340.1263	4.945152	0	714.2021	6.671901
PARSN	0	104.4725	5.136007	0	246.4872	4.445902
PASTA	0	201.3438	3.545229	0	946.5716	8.619951
PENGD	0	96.42527	5.403932	0	1045.168	5.668252
PETKM	0	110.8918	6.312613	0	283.5697	5.128436
PETUN	9.60E-08	32.3215	2.354281	0	401.4225	4.999317
PIMAS	0	256.8485	5.271339	0	391.7578	5.083035
PINSU	0	266.3404	5.751691	0	590.7305	5.99685
PKENT	0	107.3852	5.49949	0	126.8855	6.593524
PNSUT	0	220.3723	4.818511	0	550.1117	5.633646
PRKAB	0	209.6651	5.715347	0	673.3716	5.475969
PRKTE	1.40E-09	40.79509	5.250738	0	231.6375	4.354423
PRTAS	0	163.2983	6.153318	0	269.4779	4.714373
PTOFS	1.70E-15	68.05595	5.708154	0	1127.648	7.105003
RAKSE	0.00758	9.763758	3.621076	0.15357	3.74715	5.060437
RAYSG	0	195.231	5.646295	0	400.908	5.531521
RKSEV	0.19998	3.219057	4.577129	0.55117	1.191432	5.233013
SAHOL	0	85.70744	5.544066	0	321.2834	5.385016
SANKO	3.50E-08	34.34071	2.943287	0	615.1352	5.037172
SARKY	0	177.083	5.000706	0	106.1345	6.832241
SASA	0	173.5245	5.671401	0	1191.551	4.833968
SELGD	0	89.81529	4.019983	0	316.9474	5.153839
SERVE	0	161.6507	3.566655	0	377.2194	4.337545

Table 9: Statistics for Normality for Sub-periods (Daily Data) (continued)

	1998-2000			2000-2003		
	P-value	JB statistic	KS statistic	P-value	JB statistic	KS statistic
SISE	5.30E-09	38.10855	4.054006	0	348.8512	4.540546
SKBNK	0	203.4487	4.616579	0	426.1225	5.689043
SKPLC	0	246.7868	3.892274	0	216.7371	5.114973
SKTAS	0	143.2426	4.785446	0	387.8789	5.615005
SNPAM	0	184.453	5.216455	0	212.9113	5.420497
SODA	0	207.4211	2.815176	0	135.0747	5.402087
SONME	0	265.7027	4.109236	0	105.5291	3.979127
SYBYO				0	355.847	5.672948
TACYO	0	113.3143	5.518671	0	323.4933	5.013151
TATKS	3.30E-16	71.31201	5.003543	0	382.0307	4.908159
TBORG	0	214.2925	5.420621	0	551.5092	6.537688
TCELL	7.50E-08	32.82466	2.056929	0	244.4738	4.02247
TEBNK	0	123.3077	3.88183	0	189.4159	5.532778
TEKFK	0	213.4351	5.750012	0	204.0072	5.67793
TEKST	0	584.5208	5.869831	0	317.7363	6.694571
TEKTU	0.0768	5.133087	1.756081	0	341.1598	5.2353
THYAO	6.70E-16	69.81805	5.382058	0	156.2195	4.391622
TIRE	0	295.4605	5.671196	0	117.9066	5.203327
TKBNK	0	166.3876	5.474082	0	115.5175	5.24281
TNSAS	0	172.693	5.794872	0	329.1934	4.657684
TOASO	0	105.2733	3.833771	0	344.7719	4.086601
TOPFN	0	175.8041	5.590797	0	300.0558	5.618452
TPFAC	0	393.8215	5.428007	0	151.0045	5.500125
TRCAS	0	78.3185	3.258025	0	91.10255	4.754638
TRKCM	0	135.5174	4.970077	0	672.6285	4.274788
TRNSK	0	132.3729	5.050355	7.90E-14	60.32793	7.615294
TSKB	0	181.5632	6.268092	0	145.3551	6.122471
TUDDF	1.90E-14	63.24094	4.000717	0	404.9921	3.842731
TUKAS	0	356.9542	4.513103	0	556.1145	5.881861
TUMTK	0	525177.6	17.07204	0	260.3685	13.173
TUPRS	0	123.8834	5.566161	0	159.5017	4.841706
UCAK	0	1047.225	5.883591	0	1199.207	5.6695
UKIM	0	203.4902	5.425146	0	868.0408	5.975217
UNTAR	0	150.3952	5.103615	0	379.8166	5.869997
UNYEC	0	459.4	5.697158	0	998.688	6.541173
USAK	0	183.458	5.174983	0	377.1426	5.32542
UZEL	0	135.9734	4.46401	0	256.9003	4.545898
VAKFN	0	149.9392	5.272082	0	279.9045	4.8869
VAKKO	0	140.9495	4.381277	0	736.9309	4.636802
VANET	0	227.3005	4.635011	0	654.9382	5.805177
VARYO	0	102.2667	5.445075	0	122.3736	6.445522
VESTL	0	175.3704	3.973328	0	178.9939	4.421069
VKFRS	0.00723	9.85933	3.219638	0	955.4758	5.65721
VKFYT	0	228.8121	6.088674	0	356.9037	5.790606
VKGYO	0	164.6587	4.085002	0	454.578	5.30765
VKING	0	215.0701	6.276839	0	370.2303	6.068964
YATAS	0	216.7046	5.755626	0	353.2768	4.826549
YAZIC	0	167.8118	2.466974	0	409.6831	4.458065
YKBNK	6.90E-10	42.19725	4.563494	0	284.834	4.644296
YKFIN	0	86.89891	4.948224	0	495.6889	6.163838
YKGYO	0	192.1522	4.444561	0	535.5161	5.689371
YKRYO	0	489.8957	6.297548	0	477.2686	5.627765
YKSGR	0	119.0716	5.215871	0	359.5056	4.75621
YTFYO	0	566.038	4.689195	0	1084.817	6.27785
YUNSA	0	180.1988	5.44095	0	332.7199	6.02038
ZOREN	0	188.4228	3.537417	0	406.9522	6.358183

D   Estimates for Autocorrelation Coefficients for ISE Stocks

Table 10: Estimates for Autocorrelation Coefficients for ISE Stocks

	Order							
	1	2	3	4	5	6	7	8
ABANA	0.037	0.036	-0.025	0.016	0.012	-0.022	-0.028	0.063
ACIBD	-0.028	0.056	0.016	0.001	0.057	-0.017	-0.018	0.034
ADANA	-0.04	0.094	-0.018	0.044	-0.006	-0.019	0.066	0.053
ADBGR	-0.087	0.068	-0.021	0.09	-0.011	0.01	0.008	0.033
ADEL	0.012	0.074	0.025	-0.012	-0.025	-0.053	-0.057	-0.01
ADNAC	-0.03	0.083	-0.035	0.044	-0.042	-0.009	0.044	0.025
AEFES	0.02	0.022	-0.106	-0.048	-0.009	0.014	0.021	-0.001
AFYON	-0.08	0.01	-0.033	0.035	-0.022	-0.05	0.011	-0.032
AGIDA	-0.014	-0.004	-0.029	0.02	0.014	-0.063	0.028	0.037
AGYO	-0.103	0.06	-0.036	-0.001	0.068	0.017	-0.009	0.012
AKALT	-0.012	0.053	-0.013	0.043	-0.012	0.037	0.006	0.007
AKBNK	-0.039	0.059	-0.025	0	-0.074	-0.007	0.011	0.005
AKCNS	0.017	0.042	-0.012	0.008	-0.041	-0.014	0.03	-0.007
AKENR	0.011	-0.006	-0.025	-0.018	0.018	-0.007	0.044	0.035
AKGRT	0.018	0.026	-0.029	0.027	-0.062	-0.039	-0.018	0.067
AKIPD	-0.02	0.09	-0.031	0.002	-0.034	-0.001	0.006	0.009
AKSA	-0.01	0.056	-0.006	0.037	-0.018	-0.005	0.026	0.051
AKSUE	0.174	0.095	0.108	0.077	0.052	0.053	0.028	-0.003
AKYO	0.041	0.08	-0.046	0.018	0.013	-0.007	0.028	0.017
ALARK	-0.034	0.057	-0.017	0.106	-0.025	-0.02	0.04	0.006
ALCAR	-0.062	0.015	-0.007	0.069	-0.007	-0.032	0.049	0.028
ALCTL	0.012	0.016	0.028	0.016	0.01	-0.032	0.024	0.075
ALFA	-0.029	0.107	0.068	0.037	0.032	0.002	0.04	0.003
ALGYO	-0.063	0.059	-0.008	0.029	-0.061	-0.001	0.062	0.002
ALKA	0.101	0.071	0.023	0.08	0.008	-0.039	-0.039	0.022
ALKIM	-0.018	0.053	0.006	-0.029	0.018	-0.074	-0.016	0.067
ALNTF	-0.005	0.053	-0.031	0.06	-0.047	0.029	0.011	0.035
ALTIN	-0.001	0.02	0.028	0.003	0.036	-0.067	0.014	0.001
ALYAG	0.053	-0.055	-0.011	-0.001	0.064	0.003	0.054	0.048
ANACM	-0.001	0.004	0.01	0.074	-0.014	-0.028	0.019	0.052
ANHYT	-0.03	-0.005	-0.007	0.011	0.002	0.013	0.003	0.012
ANSGR	-0.049	0.068	-0.035	0.045	-0.01	-0.02	0.039	0.011
ARAT	0.105	0.033	0.048	0.005	-0.012	-0.048	0.015	0.017
ARCLK	0.009	0.051	-0.008	0.023	-0.034	-0.003	-0.055	0.021
ARENA	0.061	0.023	0.027	0.122	0	-0.053	0.01	0.058
ARFYO	0.06	0.039	0.042	0.086	0.025	-0.024	0.001	-0.008
ARSAN	0.082	0.081	0.042	0.047	0.053	0.02	0.021	0.022
ASELS	0.028	0.018	0.027	-0.017	-0.007	0.019	0.046	0.032
ASLAN	0.129	0.028	0.035	0.033	0.025	-0.04	0.058	0.025
ASUZU	0.027	0.05	-0.005	0.012	-0.004	0.026	-0.008	0.042
ATAYO	-0.01	-0.048	-0.015	-0.059	-0.005	0	0.027	-0.001
ATEKS	0.02	0.068	0.004	0.075	0.034	-0.02	0.01	0.063
ATLAS	0.012	0.046	0.014	0.052	0.006	0.005	0.005	0.109
ATSYO	-0.118	0.039	0.002	0.025	0.033	0.001	0.021	-0.002
AVRSY	-0.024	0.021	-0.006	0.003	0.004	0.049	0.012	0.062
AYCES	-0.051	0.001	0.014	0.012	0.016	0.027	-0.013	0.068
AYEN	0.004	0.055	-0.016	0.06	-0.073	-0.003	0.041	0.034
AYGAZ	-0.085	0.059	-0.04	0.05	-0.024	0.003	0.033	0.025
BAGFS	0.029	0.031	-0.029	0.044	-0.048	-0.054	0.001	0.056
BAKAB	0.055	0.063	0.008	0.057	-0.03	0.012	-0.043	0.008
BANVT	0.059	-0.006	-0.062	0.053	0.047	-0.044	0.003	-0.049
BEKO	-0.062	0.037	-0.012	0.045	0.03	-0.023	0.013	0.036
BERDN	0.039	-0.021	-0.016	0.036	0.005	0.008	0.018	-0.029
BFREN	0	0.057	-0.081	0.015	0.013	0.006	0.035	-0.014
BISAS	0.092	0.078	0.01	0.032	0.028	0.041	0.058	0.018
BJKAS	0.001	-0.048	0.098	0.017	0.055	-0.048	-0.023	0.046
BOLUC	0.038	-0.006	0.027	0.084	-0.019	-0.011	0.007	0.048

Table 10: Estimates for Autocorrelation Coefficients for ISE Stocks (continued)

	Order							
	1	2	3	4	5	6	7	8
BOSSA	-0.032	0.056	0.001	-0.013	-0.014	0.001	-0.038	0.035
BRISA	0.009	0.028	-0.031	-0.015	-0.001	-0.021	0.025	0.039
BRMEN	-0.037	-0.05	-0.019	-0.004	0.004	-0.012	-0.029	-0.024
BROVA	0.04	0.048	0.004	0.037	0.031	0.011	0.033	0.005
BRSAN	0.05	0.028	0.017	-0.023	-0.024	-0.017	0.037	0.017
BRYAT	0.062	0	0.009	0.033	0.01	-0.016	0.035	0.052
BSOKE	-0.014	-0.021	-0.034	0.094	0.04	-0.04	0.036	0.074
BSPRO	0.061	0.047	-0.025	-0.014	-0.036	-0.036	-0.017	-0.028
BTCIM	-0.038	0.061	-0.009	0.009	0.015	-0.048	0.035	0.006
BUCIM	-0.015	0.017	-0.001	0.018	-0.083	-0.035	0.038	0.018
BUMYO	-0.072	0	-0.024	0.012	-0.034	0.028	-0.008	0.035
BURCE	-0.054	-0.02	0.034	0.055	-0.037	-0.064	0.013	0.012
BYSAN	0.157	0.063	0.042	0.003	-0.011	0.074	0.026	0.023
CARSI	0.073	0.038	0.041	0.001	0.05	-0.036	0.02	0.02
CBSBO	0.073	0.03	0.035	-0.006	-0.036	0.027	0.066	0
CELHA	0.011	0.044	-0.033	0.035	-0.024	-0.107	-0.01	0.042
CEMTS	0.053	0.037	0.055	0.072	0.03	0.033	0.028	0.042
CEYLN	0.136	-0.015	-0.062	-0.002	-0.023	0.039	-0.01	0.026
CIMSA	-0.045	0.025	-0.019	0.056	-0.041	0.014	0.026	0.002
CLEBI	0.042	-0.002	0.038	0.043	0.021	0.003	-0.023	0.053
CMBTN	0.039	0.029	0.018	0.053	-0.033	-0.017	0.058	-0.044
CMENT	-0.11	0.032	0.034	0.032	-0.009	-0.01	-0.017	-0.019
CMLOJ	0.095	0.002	-0.005	-0.066	-0.031	-0.05	-0.044	-0.005
COMUN	-0.032	0.004	-0.015	-0.015	-0.045	-0.006	0.047	0.06
CUKEL	0.108	0.076	0.041	-0.003	-0.054	0.003	-0.017	-0.023
CYTAS	0.097	0.077	0.026	-0.004	-0.017	0.007	0.052	0.017
DARDL	0.079	-0.042	-0.037	-0.023	0.005	-0.012	0.024	0.004
DENCM	0.006	0.019	0.001	0.037	0.023	0.016	0.039	0.005
DENTA	0.033	-0.034	0.009	0.039	0.016	-0.014	0.002	0.02
DERIM	0.063	0.053	-0.01	0.064	-0.032	0	-0.002	-0.008
DEVA	-0.024	0.07	-0.007	0.023	-0.029	0.012	0.034	-0.019
DISBA	-0.055	0.007	0.01	0.097	-0.03	-0.021	0.05	0.029
DITAS	0.042	0.033	0.027	0.041	0.054	-0.003	0.01	0.013
DMSAS	-0.051	0.07	0.009	0.014	0.031	-0.052	0.055	0.026
DNZYO	0.053	-0.02	-0.031	0	0	-0.045	0.014	0.006
DOBUR	0.007	0.039	0.034	0.044	0.088	-0.005	-0.024	0.03
DOGUB	0.144	0.102	0.064	0.03	0.018	0.023	-0.014	-0.026
DOHOL	-0.011	0.06	-0.007	0.043	-0.019	-0.001	0.012	0.041
DOKTS	-0.012	0.062	-0.031	0.031	0.031	0.027	0.086	-0.016
DUROF	0.099	0.048	0.012	0.03	0	-0.049	-0.015	-0.029
DYHOL	0.037	0.016	0.008	0.066	-0.038	-0.005	0.009	0.075
DYOBY	0.057	0.033	-0.001	0.088	-0.033	-0.019	0.007	0.036
ECBYO	0.1	0.084	-0.026	0.007	0.033	0.008	0	0.002
ECILC	-0.037	0.082	0.014	0.029	-0.008	0.021	0.033	0.012
ECYAP	-0.017	0.036	-0.014	0.05	-0.044	0.01	0.015	0.04
ECZYT	0.048	0.105	-0.004	0.044	-0.024	-0.009	0.01	0.019
EDIP	0.016	0.035	-0.034	0.034	0.01	-0.052	-0.028	0.036
EFES	-0.007	0.049	-0.021	0.05	-0.03	-0.012	0.006	0.039
EGEEN	0.026	0.037	0	0.036	-0.021	-0.038	0.002	0.005
EGGUB	0.047	0.042	0.028	-0.036	-0.064	-0.045	-0.007	-0.02
EGPRO	-0.088	0.05	0.001	0.026	-0.027	0.029	-0.007	-0.01
EGSER	0.056	0.046	-0.028	0.052	-0.037	0.007	0.039	0.018
EGYO	0.011	0.021	-0.002	0.058	-0.004	-0.027	0.059	0.019
EMKEL	0.132	0.015	-0.038	-0.018	0.011	-0.038	-0.001	0.039
EMNIS	-0.001	0.035	-0.012	0.022	-0.006	0	0.015	0.056
ENKAI	0.035	-0.002	-0.048	-0.122	-0.076	-0.033	0.045	0.063
EPLAS	0.028	0.021	-0.038	0.007	-0.004	0.006	-0.017	0.014
ERBOS	-0.068	-0.004	-0.051	0.084	-0.048	0.033	-0.007	-0.04
EREGL	-0.058	0.041	-0.008	0.012	-0.027	0.004	0.054	0.024
ERSU	0.268	0.145	0.026	0.044	0.08	0.011	0.051	0.087
ESCOM	-0.021	-0.005	0.028	0.058	-0.008	-0.042	-0.017	-0.012
ESEMS	-0.034	0.017	0.009	0.013	-0.039	-0.02	0.046	0.002

Table 10: Estimates for Autocorrelation Coefficients for ISE Stocks (continued)

	Order							
	1	2	3	4	5	6	7	8
EVREN	0.009	0.049	-0.007	0.075	-0.002	-0.011	0.034	0.029
FENIS	0.013	0.005	-0.027	0.045	0.006	-0.019	-0.012	0.036
FFKRL	0.011	-0.019	0.018	0.067	0.01	0.014	0.073	0.03
FINBN	0.055	0.061	0.002	0.029	-0.016	-0.005	-0.014	0.025
FMIZP	-0.024	0.005	0.008	-0.002	-0.006	0.025	0.03	0.027
FNSYO	-0.065	0.051	0.021	0.053	-0.012	0.012	0.057	0.052
FRIGO	0.039	0	0.014	0.058	-0.023	-0.042	0.038	0.058
FROTO	-0.022	0.021	-0.022	0.044	-0.014	-0.011	0.028	0.044
FVORI	0.201	0.052	-0.028	0.004	-0.005	0.004	0.053	0.017
GARAN	0.021	0.005	0.016	0.036	-0.079	0.032	0.028	0.043
GARFA	0.008	-0.007	0.017	-0.015	0.034	0.003	0.017	0.035
GDKYO	-0.201	-0.035	-0.034	0.052	0.008	-0.045	0.028	0.038
GEDIZ	0.033	0.042	-0.02	-0.001	-0.003	0.023	0.015	0.034
GENTS	-0.074	0.035	0.029	0.046	-0.021	-0.008	0.054	-0.014
GEREL	0.148	0.343	0.03	0.096	0.025	0.099	0.01	-0.018
GIMA	0.005	0.071	-0.028	0.064	-0.01	-0.008	0.038	0.039
GLBYO	0.091	0.063	-0.004	0.024	-0.014	-0.011	0.01	-0.008
GLMDE	0.069	0.038	-0.034	0.063	0.007	0.002	0.018	0.028
GOLDS	0.036	-0.004	-0.027	0.068	-0.011	-0.001	-0.016	0.019
GOLTS	0.017	0.049	-0.042	0.078	0.006	-0.053	0.039	0.028
GOODY	0.025	-0.017	-0.001	0.029	-0.036	-0.003	0.023	0.02
GRGYO	0.031	0.032	0.001	0.08	-0.021	0	-0.049	0.032
GRNYO	-0.033	0.018	0.01	0.041	-0.009	-0.024	0.003	0.027
GSDHO	0.135	0.043	0.052	0.064	-0.007	-0.023	0.058	0.036
GSRAY	-0.078	-0.061	0.054	-0.061	-0.032	-0.04	0.055	0.023
GUBRF	0.065	-0.012	0.026	-0.013	-0.012	0.008	0.01	0.044
GUSGR	0.042	0.023	0.043	0.075	-0.025	-0.006	-0.027	0.008
HEKTS	-0.009	0.052	0.012	0.016	0.006	0.008	-0.025	0.016
HURGZ	0.02	0.014	0.029	0.055	-0.084	-0.004	-0.004	0.001
HZNDR	0.015	-0.011	-0.019	0.013	0.017	-0.039	-0.04	-0.055
IDAS	0.007	0.015	0.01	0.024	-0.014	-0.029	-0.013	0.003
IHEVA	0.138	0.018	0.008	0.043	-0.008	-0.003	0.001	0.013
IHGYO	0.082	-0.017	-0.025	-0.086	-0.034	-0.046	-0.023	0.035
IHLAS	0.058	0.002	0.004	0.005	-0.007	0.018	0.068	0.034
INTEM	0.03	0.032	0.038	-0.005	-0.024	-0.009	0.041	0.083
IPMAT	0.112	0.037	0.024	0.043	0.002	0.048	0.088	0.031
ISAMB	0.133	0.023	0.015	0.072	0.019	-0.022	0.05	-0.009
ISATR	0.01	-0.007	0.041	0.019	0.001	-0.034	0.013	0.03
ISBTR	-0.052	-0.01	-0.016	0.046	-0.001	-0.023	0.071	-0.008
ISCTR	-0.018	0.04	-0.022	-0.021	-0.021	-0.019	-0.005	0.008
ISGEN	0.014	0.059	0.008	0.021	0.089	0.001	0.017	0.058
ISGYO	0	0.028	-0.041	0.019	-0.01	0.007	0.031	0.07
ISKUR	-0.067	-0.07	-0.092	0.035	-0.021	-0.09	-0.014	-0.006
ISYAT	0.033	0.033	-0.048	0.033	0.021	-0.021	0.051	-0.003
IZMDC	-0.052	0.079	-0.011	0.005	0.043	-0.018	0.022	0.038
IZOCM	-0.05	0.034	-0.004	0.03	0.012	-0.004	0.021	0.022
KAPLM	0.056	0.036	-0.022	0.074	-0.026	-0.061	0	0.01
KARSN	0	-0.022	0.028	0.021	-0.014	-0.013	0.006	0.009
KARTN	-0.122	-0.002	0.021	0.012	-0.005	-0.026	0.032	0.053
KAVPA	-0.005	0.07	-0.009	0.087	-0.034	0.036	0.027	0.05
KCHOL	0	0.067	0.003	0.019	-0.071	0.04	0.003	0.035
KENT	0.006	0.029	-0.036	-0.005	0.036	-0.018	0	0.03
KEPEZ	0.106	0.057	0.008	0.004	-0.009	-0.036	0.034	-0.041
KERVT	0.061	0.096	-0.043	-0.072	0.018	0.029	0.082	0.029
KIPA	-0.022	0.052	0.053	0.024	-0.054	0.01	0.055	0.004
KLBMO	-0.073	0.065	0.041	0.063	-0.047	-0.053	-0.019	0.037
KLMSN	0.018	0.023	-0.025	-0.007	0.04	-0.005	0.056	0.001
KNFRT	-0.027	-0.008	0.023	0.011	0.039	-0.074	0.004	-0.008
KONYA	-0.107	0.001	-0.04	0.047	0.031	0.015	0.01	0.022
KORDS	0.002	0.033	-0.047	0.038	-0.019	0.025	-0.007	0.036
KOTKS	0.038	0.135	-0.006	0.044	0.03	-0.026	0.04	0.02
KOZAD	-0.123	-0.064	0.001	-0.103	0.185	-0.109	0.052	-0.184

Table 10: Estimates for Autocorrelation Coefficients for ISE Stocks (continued)

	Order							
	1	2	3	4	5	6	7	8
KRDMA	0.137	-0.003	0.009	0.009	0.021	-0.029	-0.036	-0.017
KRDMB	0.124	0.026	0.013	0.002	0.05	-0.001	-0.01	0.021
KRDMD	0.109	-0.045	0.003	0.007	0.019	-0.045	-0.036	0.029
KRSTL	0.163	0.073	0.043	-0.008	-0.021	0.006	0.006	0.031
KRTEK	0.046	0.039	-0.02	0.064	-0.016	-0.043	-0.033	0.004
KUTPO	-0.002	0.02	-0.023	0.049	-0.001	0.013	0.028	-0.001
LINK	0.109	0.115	0.032	0.013	-0.028	-0.039	0.011	-0.014
LIOYS	-0.037	0.001	-0.03	0.016	0.047	0.015	0.006	0.044
LOGO	0.034	-0.015	0.046	0.039	-0.031	-0.101	0.059	0.046
LUKSK	0.045	0.012	-0.019	0.033	0.026	0.009	0.09	0.054
MAALT	-0.009	0.02	-0.011	0.025	-0.014	-0.044	0.043	0.029
MAKTK	0.068	0.069	-0.022	0.059	-0.066	0.009	-0.042	0.012
MARET	0.044	0.023	-0.017	0.009	0.018	-0.023	0.046	0.094
MEGES	0.021	0.014	-0.015	0.029	-0.005	-0.079	-0.032	-0.048
MEMSA	0.006	0.025	-0.09	0.061	0.008	-0.035	-0.006	-0.036
MERKO	-0.038	-0.035	-0.005	0.022	0.022	-0.029	0.038	0.026
METAS	0.169	0.034	-0.018	-0.058	-0.093	-0.081	-0.008	0.01
METUR	0.14	0.245	0.102	0.074	-0.021	0.029	-0.003	-0.073
MIGRS	-0.013	0.041	-0.039	0	-0.019	-0.062	0.001	0.023
MILYT	0.048	0.024	-0.009	0.058	-0.05	-0.009	0.04	0.028
MIPAZ	0.037	0.031	0.017	0.081	-0.006	0.007	0.038	0.056
MMART	0.051	0.022	-0.025	0.024	-0.006	0	0.011	0.033
MNDRS	0.178	0.051	0.028	-0.065	-0.033	-0.026	0.006	0.051
MRDIN	-0.035	0.093	0.01	0.008	-0.003	0.01	0.017	0.04
MRSHL	-0.045	-0.035	0.003	0.02	-0.026	0.019	0.024	0.015
MTEKS	0.097	0.001	0.01	0.001	0.022	-0.013	0.036	0.044
MUTLU	0.064	0.052	-0.002	0.05	0.064	0.048	0.007	-0.012
MYZYO	-0.044	0.004	0.009	0.005	0.02	-0.067	0.012	0.041
MZHLD	0.044	0	0.008	0.02	-0.004	-0.006	0.03	0.002
NETAS	0.017	0.052	-0.025	0.018	0.009	-0.012	0.066	0.062
NIGDE	-0.069	0.057	-0.001	0.046	0.077	-0.049	0.045	0.032
NTHOL	0.089	0.059	-0.005	0.091	0.023	0.036	0.013	0.053
NTTUR	0.105	0.06	0.013	0.067	-0.013	0.042	0.005	0.015
NUGYO	0.023	-0.048	-0.008	0.106	0.029	-0.037	-0.014	0.01
NUHCM	-0.079	0	0.003	-0.011	0.004	-0.038	0.054	0.025
OKANT	0.074	0.04	-0.045	-0.006	0.035	0.005	-0.006	0.008
OLMKS	0.009	-0.008	-0.012	0	-0.012	0.002	0.012	0.061
OTKAR	0	0.047	0.011	0.011	-0.003	-0.032	-0.007	0.03
OZFIN	-0.027	-0.075	-0.022	0.064	0.008	0.003	-0.009	0.014
PARSN	0.079	0.073	0.001	0.025	-0.03	-0.02	-0.004	-0.043
PASTA	0.039	0.001	-0.028	0.084	-0.038	-0.044	0.06	0.088
PENGD	0.066	0.054	-0.008	0.046	0.022	-0.066	-0.007	0.011
PETKM	-0.003	0.076	0.026	0.02	-0.033	-0.026	-0.013	0.014
PETUN	-0.053	0	-0.005	0.01	-0.007	-0.011	0.061	-0.015
PIMAS	0.036	0.015	-0.054	-0.01	0.003	-0.003	0.077	-0.004
PINSU	0.022	0.002	-0.029	0.029	-0.016	-0.042	0.026	0.017
PKENT	-0.077	-0.021	-0.024	0.025	-0.032	0.026	-0.061	0.005
PNSUT	0.039	0.036	0.022	0.042	-0.004	-0.042	0.017	0.018
PRKAB	-0.072	0.012	0.01	0	0.013	-0.06	0.032	0.032
PRKTE	0.154	0.022	0.027	0.003	-0.012	-0.021	0.036	0.025
PRTAS	0.054	0.045	0.004	0.012	-0.001	0.008	0.011	0.057
PTOFS	0.01	0.016	-0.064	0.041	-0.006	-0.014	0.011	-0.007
RAKSE	0.207	0.06	-0.013	-0.001	-0.053	-0.031	0.017	0.056
RAYSG	0.038	0.015	0.014	0.044	0.001	0.025	0.003	0.064
RKSEV	0.093	0.027	-0.048	-0.034	-0.073	-0.056	-0.002	0.067
SAHOL	-0.061	0.076	-0.036	0.057	-0.062	-0.032	0.016	0.037
SANKO	0.023	0.037	0.034	0.01	0.008	-0.055	0.012	0.014
SARKY	-0.031	0.045	-0.04	0.058	-0.005	0	0.066	0.04
SASA	-0.043	0.066	-0.036	0.002	0.05	-0.029	0.063	0.047
SELGD	0.042	0.025	0.005	0.03	-0.018	-0.025	0.014	0.042
SERVE	0.04	0	-0.048	0.018	0.017	0.015	0.032	0.082
SISE	-0.011	0.033	-0.016	0.058	-0.031	-0.023	-0.003	0.067

Table 10: Estimates for Autocorrelation Coefficients for ISE Stocks (continued)

	Order							
	1	2	3	4	5	6	7	8
SKBNK	-0.004	-0.015	0.005	-0.017	0.017	-0.014	0.04	-0.004
SKPLC	0.178	-0.009	0.045	0.048	0.009	-0.023	0.016	0.018
SKTAS	-0.165	0.068	-0.055	0.018	0.013	0.001	-0.012	0.029
SNPAM	0.036	0.043	-0.051	0.021	0.009	0.032	-0.023	-0.003
SODA	-0.075	-0.018	0.004	0.03	0.041	-0.051	0.068	0.049
SONME	0.012	0.029	0.006	0.03	0.001	-0.005	0.003	-0.018
SYBYO	-0.167	-0.112	0.018	0.026	0.06	-0.014	0.052	-0.09
TACYO	0.067	0.009	-0.035	-0.034	0.034	-0.012	-0.057	0.012
TATKS	-0.055	0.079	0	0.054	-0.027	-0.022	0.041	0.049
TBORG	0.042	0.034	0.005	0.037	-0.013	-0.04	-0.013	0.018
TCELL	0.022	-0.016	-0.019	0.061	-0.058	-0.016	0.014	0.042
TEBNK	-0.027	-0.023	0.068	-0.009	0.005	-0.031	-0.045	0.028
TEKFK	-0.049	0.034	0.015	0.074	0.021	-0.016	0.014	0.028
TEKST	-0.051	0.053	0.014	0.028	-0.027	-0.032	0.002	0.019
TEKTU	0.161	0.069	-0.003	-0.003	0.04	0.034	0.019	0.042
THYAO	-0.034	0.075	0.017	-0.012	0.007	-0.036	0.002	0.042
TIRE	0.013	-0.002	0.015	0.064	-0.02	-0.004	0.017	0.026
TKBNK	0.113	0.077	-0.025	0.039	-0.058	0	-0.036	-0.025
TNSAS	0.058	0.058	0.001	0.053	-0.015	0.001	0.032	0.041
TOASO	0.004	0.047	-0.044	0.03	-0.015	-0.006	0.019	0.032
TOPFN	-0.033	-0.068	-0.019	0.031	-0.032	-0.01	0.031	0.028
TPFAC	0.079	0.02	0.033	0.061	0.028	0.001	-0.037	0.032
TRCAS	0.011	0.058	0.025	0.05	0.008	-0.02	-0.083	0.064
TRKCM	0.022	0.04	-0.026	0.045	-0.048	-0.006	0.046	0.067
TRNSK	0.063	0.016	0.014	0.03	-0.014	-0.04	0.04	0.033
TSKB	-0.052	0.05	-0.009	0.043	0	-0.04	0.016	0.001
TUDDF	-0.064	0.053	0.018	0.054	0.013	-0.002	0.036	0.03
TUKAS	0.014	0.035	0.011	0.082	-0.018	-0.03	0.01	-0.005
TUMTK	0.171	0.123	0.008	-0.021	-0.042	0.011	-0.01	0.032
TUPRS	-0.055	0.029	0	0.005	0.028	-0.064	0.006	0.04
UCAK	0.012	0.05	-0.028	0.029	0.005	-0.019	0.021	0.034
UKIM	-0.028	-0.029	-0.009	0.046	-0.039	-0.018	-0.04	0.031
UNTAR	0.046	0.03	0.025	0.065	-0.023	0	0.074	0.042
UNYEC	-0.002	0.052	0.01	0.059	0.003	0.028	0.071	0.015
USAK	0.036	-0.005	-0.043	-0.005	-0.004	-0.026	0.038	-0.015
UZEL	-0.002	0.002	-0.024	0.007	0.002	-0.036	-0.008	0.019
VAKFN	0.028	-0.028	-0.043	0.071	0.014	0.004	0.02	0.029
VAKKO	-0.002	0.029	-0.008	0.041	-0.025	-0.008	0.008	0.045
VANET	0.024	0.012	-0.032	0.013	-0.027	-0.023	-0.002	0.052
VARYO	0.021	-0.035	-0.071	-0.002	-0.04	-0.012	0.036	0.062
VESTL	0.007	0.033	-0.025	0.035	-0.028	0.006	0.02	-0.005
VKFRS	0.204	0.091	0.076	0.055	-0.008	-0.019	-0.044	-0.011
VKFYT	0.048	0.021	-0.019	0.004	0	-0.008	-0.062	-0.012
VKGYO	0.088	-0.002	-0.011	0.056	-0.035	-0.069	-0.03	0.017
VKING	0.123	-0.013	0.017	0.088	0.003	-0.011	-0.026	-0.002
YATAS	-0.031	0.001	-0.003	0.024	0.012	0.004	0.031	0.033
YAZIC	-0.026	-0.028	0.02	0.087	-0.005	-0.042	0.075	0.076
YKBNK	0.063	0.048	-0.055	0.018	-0.036	0.008	0.007	0.04
YKFIN	-0.146	0.07	-0.035	-0.003	-0.001	0.031	-0.024	0.025
YKGYO	-0.011	0.059	-0.019	0.057	-0.014	-0.054	0.015	0.044
YKRYO	0.012	0.045	0.006	0.043	0.028	-0.03	0.031	0.007
YKSGR	-0.05	0.03	0.024	0.018	0.027	-0.033	0.019	0.067
YTFYO	-0.251	-0.084	0.067	0.045	-0.069	0.047	0.045	0.004
YUNSA	-0.048	-0.029	0	0.02	-0.028	-0.001	0.027	0.029
ZOREN	0.003	0.013	-0.039	0.071	0.003	-0.019	-0.005	0.005

E Characteristic Exponent Estimates for ISE Stocks

Table 11: Characteristic Exponent Estimates for ISE Indices for $m/T = 0.05$

	Pickands Estimator		Hill Estimator		deHaan-Resnick Estimator
	α	P-value	α	P-value	α
ABANA	-0.56356	0.002459	4.664337	0	5.559102
ACIBD	-0.64654	0.01293	2.85407	0.002553	3.75101
ADANA	-0.64333	0.001867	3.17029	2.87E-07	3.802964
ADBGR	-0.52993	0.002756	2.875647	9.17E-05	4.496302
ADEL	-0.6491	0.001829	3.123411	7.96E-07	4.180835
ADNAC	-0.56454	0.002451	2.43909	0.030342	3.925212
AEFES	-0.46518	0.020117	2.641947	0.018756	2.610667
AFYON	-0.61518	0.002059	3.001182	9.47E-06	3.825962
AGIDA	-0.55836	0.002503	3.268156	3.02E-08	4.016597
AGYO	-0.4786	0.06347	3.102629	0.004096	3.408445
AKALT	-0.61117	0.002088	2.615061	0.0043	4.346434
AKBNK	-0.52132	0.002837	2.911027	4.97E-05	4.184071
AKCNS	-0.54327	0.002635	2.883595	8.01E-05	3.755731
AKENR	-0.52178	0.017933	2.825443	0.003739	2.905115
AKGRT	-0.56028	0.002487	3.753021	3.47E-14	4.603637
AKIPD	-0.51671	0.002882	2.954647	2.27E-05	3.866962
AKSA	-0.62338	0.002001	3.142517	5.28E-07	3.894047
AKSUE	-0.63622	0.008908	1.964514	0.549422	3.186177
AKYO	-0.63135	0.00573	2.677882	0.0056	3.864079
ALARK	-0.60032	0.002168	4.123785	0	4.8721
ALCAR	-0.60578	0.002127	3.307289	1.17E-08	4.289166
ALCTL	-0.60405	0.00214	3.463895	2.00E-10	4.384826
ALFA	-0.60715	0.003702	2.704844	0.002406	4.184737
ALGYO	-0.53615	0.002699	3.093128	1.51E-06	3.751302
ALKA	-0.53747	0.022299	3.367911	1.24E-05	3.96679
ALKIM	-0.70199	0.008692	2.796838	0.003153	3.682454
ALNTF	-0.74771	0.001288	3.084053	1.82E-06	4.542756
ALTIN	-0.64713	0.001842	2.94056	2.93E-05	4.558588
ALYAG	-0.77252	0.009104	2.275561	0.180376	4.351127
ANACM	-0.55828	0.002504	3.241026	5.74E-08	3.926424
ANHYT	-0.57085	0.011817	3.724541	1.70E-09	3.776406
ANSGR	-0.57312	0.00238	3.071973	2.33E-06	4.367757
ARAT	-0.83208	0.000945	3.195295	1.64E-07	5.893883
ARCLK	-0.61623	0.002052	3.359646	3.15E-09	4.116108
ARENA	-0.64715	0.018074	2.824801	0.005508	3.20435
ARFYO	-0.68566	0.001608	2.817013	0.000241	3.964576
ARSAN	-0.6549	0.002633	3.461813	1.10E-09	5.91976
ASELS	-0.63411	0.001928	3.218736	9.62E-08	5.096719
ASLAN	-0.80131	0.001059	2.591463	0.005757	4.462497
ASUZU	-0.47495	0.003312	2.888973	7.30E-05	4.612919
ATAYO	-0.87494	0.000805	3.046762	3.88E-06	4.747502
ATEKS	-0.75988	0.001232	3.608047	3.22E-12	5.150881
ATLAS	-0.7945	0.001086	2.822828	0.00022	4.961829
ATSYO	-0.71754	0.001435	3.571861	9.40E-12	4.020844
AVRSY	-0.66464	0.001732	3.500923	7.18E-11	6.890951
AYCES	-0.57262	0.002384	3.142571	5.28E-07	5.825338
AYEN	-0.47675	0.018518	2.997168	0.000539	2.930011
AYGAZ	-0.53755	0.002686	3.645927	1.02E-12	3.802897
BAGFS	-0.61463	0.002063	2.627168	0.003689	4.093274
BAKAB	-0.65201	0.002493	3.089226	3.54E-06	4.146421
BANVT	-0.64511	0.001855	2.753881	0.00064	3.996143
BEKO	-0.58161	0.002312	3.194005	1.69E-07	4.497774
BERDN	-0.80039	0.001063	3.050249	3.62E-06	5.342201
BFREN	-0.62208	0.00201	2.556676	0.008701	3.573804
BISAS	-0.55887	0.002499	4.540689	0	5.706781
BJKAS	-0.83611	0.043814	2.150067	0.362443	3.007702
BOLUC	-0.78636	0.001119	2.248721	0.143996	3.50229
BOSSA	-0.57041	0.002402	2.928955	3.62E-05	4.152828
BRISA	-0.52219	0.002829	3.113519	9.83E-07	4.00116

Table 11: Characteristic Exponent Estimates for ISE Indices for $m/T = 0.05$
(continued)

	Pickands Estimator		Hill Estimator		deHaan-Resnick Estimator
	α	P-value	α	P-value	α
BRMEN	-0.63916	0.001894	2.25543	0.137593	3.850244
BROVA	-0.60769	0.002113	2.877734	8.85E-05	4.433518
BRSAN	-0.68431	0.001616	3.022887	6.22E-06	4.252181
BRYAT	-0.81827	0.000995	2.801048	0.000311	4.555942
BSOKE	-0.55398	0.01391	2.824628	0.002838	3.379165
BSPRO	-0.64842	0.001834	2.462413	0.02411	3.904307
BTCIM	-0.52572	0.002796	2.647252	0.002846	3.821829
BUCIM	-0.69465	0.001557	2.072498	0.378391	2.955316
BUMYO	-0.82423	0.000973	3.127621	7.28E-07	4.116108
BURCE	-0.987	0.000525	3.592726	5.08E-12	5.154845
BYSAN	-0.44106	0.003704	5.418968	0	2.322689
CARSI	-0.58192	0.002309	3.182456	2.19E-07	4.635746
CBSBO	-1.42934	8.42E-05	3.181731	2.23E-07	5.867786
CELHA	-0.63339	0.001933	3.421719	6.25E-10	5.211855
CEMTS	-0.64583	0.00185	3.03662	4.75E-06	3.892843
CEYLN	-0.71451	0.001451	3.674438	4.24E-13	5.764175
CIMSA	-0.55264	0.002552	3.454772	2.57E-10	3.711691
CLEBI	-0.72863	0.001379	3.439312	3.90E-10	4.680293
CMBTN	-0.65083	0.001818	3.348377	4.20E-09	4.956337
CMENT	-0.54862	0.002587	2.896989	6.36E-05	4.177241
CMLOJ	-0.49831	0.003065	4.36274	0	4.603138
COMUN	-0.81854	0.000994	2.614672	0.004321	4.348505
CUKEL	-0.56469	0.00245	3.025863	5.87E-06	2.344609
CYTAS	-0.48423	0.003212	3.812064	4.88E-15	5.840936
DARDL	-0.71514	0.001448	2.530403	0.011729	2.093477
DENCM	-0.64409	0.001862	3.024944	5.97E-06	4.242859
DENTA	-0.51275	0.016172	2.997306	0.00047	3.048817
DERIM	-0.70871	0.001481	3.33438	5.97E-09	5.566958
DEVA	-0.53572	0.002703	2.841316	0.000163	4.518116
DISBA	-0.55839	0.002503	3.2623	3.47E-08	4.725058
DITAS	-0.89389	0.00075	3.710422	1.37E-13	4.494397
DMSAS	-0.52568	0.002796	3.280654	2.24E-08	3.82967
DNZYO	-0.74311	0.001309	2.58363	0.006329	5.086091
DOBUR	-0.83196	0.006827	4.797076	0	6.597699
DOGUB	-0.42558	0.003896	8.050144	0	5.285264
DOHOL	-0.66628	0.001722	4.015589	0	6.070986
DOKTS	-0.62684	0.001977	2.704297	0.001312	3.867001
DUROF	-0.74281	0.001311	3.168429	3.00E-07	6.011722
DYHOL	-0.6132	0.003206	3.604813	3.54E-11	5.380553
DYOBY	-0.66348	0.001739	2.619052	0.004089	4.534609
ECBYO	-0.83451	0.002408	2.4366	0.045424	4.346494
ECILC	-0.61844	0.002036	3.360583	3.08E-09	4.389268
ECYAP	-0.63394	0.001929	3.271736	2.77E-08	4.574254
ECZYT	-0.58446	0.002289	2.77994	0.000431	4.060815
EDIP	-0.70157	0.00152	3.109521	1.07E-06	4.898733
EFES	-0.5974	0.002476	3.076979	2.85E-06	4.565965
EGEEN	-0.57978	0.002326	2.747681	0.000701	4.210449
EGGUB	-0.58918	0.002252	2.484636	0.019209	3.984999
EGPRO	-0.54999	0.002575	2.733228	0.000867	3.167002
EGSER	-0.63916	0.001894	3.217411	9.92E-08	4.578779
EGYO	-0.75681	0.00153	2.703162	0.001633	3.578664
EMKEL	-0.67164	0.002189	3.090206	2.98E-06	4.660131
EMNIS	-0.80756	0.001035	3.124478	7.79E-07	4.383987
ENKAI	-0.67625	0.078267	5.105472	7.66E-11	3.827365
EPLAS	-0.6981	0.001538	3.219272	9.51E-08	4.445591
ERBOS	-0.59931	0.002175	2.810023	0.00027	3.217925
EREGL	-0.55312	0.002548	2.774036	0.000472	3.921937
ERSU	-0.85381	0.006473	3.059097	0.000164	5.378993
ESCOM	-0.74656	0.011142	2.678708	0.01393	3.9698
ESEMS	-0.73662	0.00134	3.286129	1.96E-08	4.853583
EVREN	-0.64282	0.00187	2.794191	0.000346	4.645604

Table 11: Characteristic Exponent Estimates for ISE Indices for $m/T = 0.05$
(continued)

	Pickands Estimator		Hill Estimator		deHaan-Resnick Estimator
	α	P-value	α	P-value	α
FENIS	-0.55747	0.002511	2.836205	0.000177	4.778824
FFKRL	-0.57139	0.002394	2.574984	0.007018	3.794327
FINBN	-0.65077	0.001819	3.790404	1.01E-14	4.609197
FMIZP	-0.70922	0.001479	2.810105	0.000269	4.207776
FNSYO	-0.61475	0.002062	2.780668	0.000426	3.799831
FRIGO	-0.59024	0.002244	3.292965	1.66E-08	4.591723
FROTO	-0.57563	0.00236	3.35065	3.96E-09	4.756236
FVORI	-0.78181	0.011095	2.594812	0.028434	5.283844
GARAN	-0.55516	0.00253	2.995181	1.06E-05	4.99009
GARFA	-0.58487	0.002286	2.466915	0.02304	3.957485
GDKYO	-0.48473	0.008005	2.522116	0.024365	3.329399
GEDIZ	-0.60659	0.002121	2.832498	0.000188	4.734708
GENTS	-0.63691	0.001909	2.948246	2.55E-05	4.647224
GEREL	-0.56099	0.192149	2.333587	0.3295	1.980931
GIMA	-0.52987	0.002757	3.513688	5.02E-11	3.800118
GLBYO	-0.80068	0.001061	3.048541	3.74E-06	5.14213
GLMDE	-0.58375	0.002295	4.365313	0	6.273865
GOLDS	-0.63644	0.008903	3.047768	0.000123	3.435003
GOLTS	-0.59964	0.002173	3.399573	1.12E-09	4.502211
GOODY	-0.54654	0.002606	2.46565	0.023336	3.567822
GRGYO	-0.73454	0.001654	2.723271	0.00124	4.204551
GRNYO	-0.76642	0.001203	3.387128	1.55E-09	4.949687
GSDHO	-0.79114	0.005636	2.587784	0.018849	4.898762
GSRAY	-0.89727	0.040503	5.765039	0	4.90666
GUBRF	-0.65611	0.001785	3.100654	1.29E-06	4.717904
GUSGR	-0.69019	0.001582	3.019607	6.63E-06	4.131344
HEKTS	-0.59868	0.00218	2.759652	0.000587	4.035374
HURGZ	-0.56802	0.002422	3.845218	1.55E-15	5.173537
HZNDR	-0.80555	0.001043	2.799096	0.00032	4.870317
IDAS	-0.74856	0.001934	2.767867	0.000837	5.159734
IHEVA	-0.98408	0.000531	3.165819	3.17E-07	1.895964
IHGYO	-0.80984	0.005777	1.967124	0.545804	1.551597
IHLAS	-0.65488	0.001793	2.366185	0.058869	1.871896
INTEM	-0.56735	0.002427	2.971261	1.67E-05	4.001503
IPMAT	-0.93974	0.006658	3.8268	1.05E-09	5.547183
ISAMB	-0.7774	0.001156	2.95786	2.14E-05	5.002657
ISATR	2.460017	0.306898	3.819514	3.89E-15	5.276863
ISBTR	-0.89832	0.000737	2.913925	4.73E-05	3.900617
ISCTR	-0.66446	0.001733	2.685528	0.001703	3.995575
ISGEN	-0.61528	0.011378	2.404817	0.084907	3.523232
ISGYO	-0.59098	0.009936	3.154953	2.65E-05	3.786925
ISKUR	0	0.014114	0.813786	1	1.43557
ISYAT	-0.49966	0.003051	2.20413	0.191592	3.773265
IZMDC	-0.62151	0.002014	2.753444	0.000644	4.216143
IZOCM	-0.60101	0.002162	2.972206	1.64E-05	4.050904
KAPLM	-0.71769	0.001434	2.833552	0.000185	4.797972
KARSN	-0.66587	0.009471	2.594184	0.020837	3.512572
KARTN	-0.70302	0.001512	2.417587	0.037217	3.18857
KAVPA	-0.53959	0.002668	3.230984	7.25E-08	4.984983
KCHOL	-0.5462	0.002609	3.091318	1.56E-06	4.58065
KENT	-0.71193	0.001464	2.364091	0.059926	4.131403
KEPEZ	-0.7149	0.001449	2.838226	0.000171	2.462999
KERVT	-0.62292	0.002004	2.388546	0.048471	2.190239
KIPA	-0.58864	0.002257	2.941919	2.86E-05	3.943053
KLBMO	-0.64884	0.001831	2.401218	0.043264	4.192228
KLMSN	-0.82418	0.000973	2.885821	7.71E-05	4.618036
KNFRT	-0.59823	0.002183	2.630782	0.003523	4.377307
KONYA	-0.47491	0.003313	2.656698	0.002513	3.83795
KORDS	-0.54313	0.002636	3.001066	9.49E-06	3.737419
KOTKS	-0.84448	0.000903	3.513165	5.09E-11	6.064088
KOZAD	-0.40483	0.164422	1.7299	0.665334	1.77178

Table 11: Characteristic Exponent Estimates for ISE Indices for $m/T = 0.05$ (continued)

	Pickands Estimator		Hill Estimator		deHaan-Resnick Estimator
	α	P-value	α	P-value	α
KRDMA	-0.91732	0.001264	2.900426	0.000142	6.057001
KRDMB	-1.0032	0.000939	3.10776	3.99E-06	6.068146
KRDMD	-0.7881	0.001578	2.742961	0.001095	5.862617
KRSTL	-0.70813	0.001484	2.414949	0.038142	4.81928
KRTEK	-0.51755	0.002874	2.768779	0.000511	3.976656
KUTPO	-0.62209	0.00201	3.028026	5.62E-06	4.187089
LINK	-0.60649	0.018308	2.825845	0.004959	4.106775
LIOYS	-0.55427	0.012274	2.837082	0.002056	3.279729
LOGO	-0.66642	0.010819	2.054279	0.427769	3.258127
LUKSK	-0.81428	0.00101	2.793886	0.000348	5.547561
MAALT	-0.54085	0.002656	2.573737	0.007123	4.018556
MAKTK	-0.63411	0.001928	2.893954	6.70E-05	4.445726
MARET	-0.50981	0.002949	3.231137	7.23E-08	4.212282
MEGES	-0.84031	0.000917	3.400814	1.09E-09	6.028039
MEMSA	-0.77388	0.001171	2.9936	1.09E-05	5.228052
MERKO	-0.64157	0.001878	3.235147	6.58E-08	4.130588
METAS	-0.48669	0.003186	5.192727	0	2.824653
METUR	-0.61398	0.083201	2.82159	0.045156	3.274441
MIGRS	-0.49856	0.003062	2.698355	0.001425	3.624752
MILYT	-0.68611	0.001605	3.102683	1.23E-06	5.360994
MIPAZ	-0.65198	0.001811	3.421972	6.21E-10	5.109677
MMART	-0.63489	0.001922	3.005671	8.69E-06	4.824069
MNDRS	-1.17754	0.004095	3.090883	0.000204	3.88515
MRDIN	-0.52427	0.002809	2.748675	0.000691	3.535305
MRSHL	-0.49105	0.00314	2.473219	0.021609	3.95518
MTEKS	-0.73744	0.002149	3.104467	3.62E-06	5.618735
MUTLU	-0.59903	0.002177	2.78524	0.000397	3.958744
MYZYO	-0.56659	0.002434	2.241915	0.150694	3.879258
MZHLD	-0.67543	0.001667	3.486487	1.07E-10	4.733889
NETAS	-0.55061	0.00257	2.96057	2.03E-05	4.637986
NIGDE	-0.52901	0.002765	3.128894	7.08E-07	4.07061
NTHOL	-0.60321	0.002146	2.413269	0.038741	4.37786
NTTUR	-0.80532	0.001043	2.410028	0.039918	4.473704
NUGYO	-0.46819	0.013264	2.891466	0.000904	3.74463
NUHCM	-0.55094	0.013159	2.041097	0.44458	2.679659
OKANT	-0.78599	0.00112	2.631753	0.003479	5.393907
OLMKS	-0.56572	0.002441	3.485314	1.11E-10	4.307076
OTKAR	-0.9046	0.00072	2.953123	2.33E-05	4.652008
OZFIN	-0.73578	0.001344	2.609864	0.004589	3.984862
PARSN	-0.60165	0.002158	3.810494	5.22E-15	5.170197
PASTA	-0.6417	0.00242	3.010368	1.36E-05	3.818741
PENGD	-0.71506	0.001891	3.499226	2.38E-10	4.559823
PETKM	-0.70774	0.001486	3.279029	2.33E-08	4.783755
PETUN	-0.60804	0.016007	2.230143	0.230617	3.529331
PIMAS	-0.654	0.001798	2.489146	0.018325	4.072322
PINSU	-0.64979	0.001825	2.675927	0.001941	4.085064
PKENT	-0.7167	0.00144	3.097764	1.37E-06	4.156155
PNSUT	-0.55511	0.002531	2.64415	0.002963	3.787552
PRKAB	-0.67206	0.001687	3.204362	1.34E-07	4.678749
PRKTE	-0.80734	0.001036	4.287891	0	6.786949
PRTAS	-0.88728	0.000769	2.98335	1.33E-05	5.599617
PTOFS	-0.71769	0.001434	2.991005	1.15E-05	4.403567
RAKSE	-0.45028	0.003593	8.716337	0	7.036605
RAYSG	-0.6289	0.001963	3.218301	9.72E-08	4.697269
RKSEV	-0.35461	0.004896	5.726461	0	6.790403
SAHOL	-0.5346	0.002713	2.995578	1.05E-05	4.370971
SANKO	-0.52777	0.021336	2.562319	0.039558	3.489386
SARKY	-0.52195	0.002831	2.925553	3.84E-05	3.573328
SASA	-0.56325	0.002462	3.29643	1.53E-08	3.927035
SELGD	-0.7506	0.001921	3.1637	9.55E-07	5.181656
SERVE	-0.56883	0.003916	2.304868	0.109543	4.061404

Table 11: Characteristic Exponent Estimates for ISE Indices for $m/T = 0.05$
(continued)

	Pickands Estimator		Hill Estimator		deHaan-Resnick Estimator
	α	P-value	α	P-value	α
SISE	-0.53408	0.002718	3.351963	3.83E-09	4.40646
SKBNK	-0.81144	0.00102	2.488298	0.018489	3.826638
SKPLC	-0.83773	0.006246	2.671757	0.010649	4.426658
SKTAS	-0.67744	0.001655	2.658635	0.002449	4.804765
SNPAM	-0.69762	0.001541	3.070452	2.40E-06	4.101311
SODA	-0.72055	0.009557	2.568819	0.028204	3.105921
SONME	-0.95599	0.000592	3.669545	4.93E-13	3.977489
SYBYO	-0.62195	0.043024	2.599081	0.063335	3.599876
TACYO	-0.67563	0.001666	3.089974	1.61E-06	5.548595
TATKS	-0.58369	0.002295	2.695498	0.001483	4.095114
TBORG	-0.76879	0.001193	3.061988	2.86E-06	4.069106
TCELL	-0.6002	0.015244	2.470624	0.06363	3.907045
TEBNK	-0.61018	0.010791	3.407537	7.01E-07	3.591392
TEKFK	-0.71331	0.001457	2.802188	0.000305	4.277212
TEKST	-0.56018	0.002487	2.851733	0.000137	4.166978
TEKTU	-0.84106	0.009751	2.922975	0.001564	5.049604
THYAO	-0.71327	0.001457	3.139973	5.58E-07	5.480372
TIRE	-0.50603	0.002987	3.565779	1.12E-11	3.802109
TKBNK	-0.65156	0.001814	2.598098	0.005308	4.947896
TNSAS	-0.60747	0.002115	2.75636	0.000616	4.251999
TOASO	-0.54246	0.002642	2.652111	0.00267	3.72299
TOPFN	-0.83548	0.000933	3.227434	7.87E-08	3.675349
TPFAC	-0.96137	0.00058	3.335747	5.77E-09	4.481851
TRCAS	-0.83498	0.004667	3.508664	3.58E-08	3.916164
TRKCM	-0.56264	0.002467	2.956169	2.21E-05	4.065163
TRNSK	-0.6132	0.002073	3.548734	1.84E-11	4.621684
TSKB	-0.96782	0.000565	3.447079	3.17E-10	4.419684
TUDDF	-0.54096	0.002655	3.14412	5.10E-07	4.870231
TUKAS	-0.68469	0.001614	2.663324	0.0023	3.379842
TUMTK	-0.5588	0.002499	3.641032	1.19E-12	1.866976
TUPRS	-0.54381	0.00263	3.344053	4.68E-09	4.246221
UCAK	-0.63158	0.001945	2.453695	0.0263	3.053155
UKIM	-0.64477	0.001857	2.874116	9.41E-05	4.108572
UNTAR	-0.65872	0.001768	3.186192	2.02E-07	4.747348
UNYEC	-0.60916	0.002102	2.436479	0.031116	3.310451
USAK	-0.98572	0.000527	2.788371	0.000379	4.886797
UZEL	-0.69439	0.001559	3.027389	5.69E-06	4.213434
VAKFN	-0.77726	0.001156	2.547317	0.00969	4.870317
VAKKO	-0.54089	0.00317	2.524674	0.014087	4.033854
VANET	-1.03454	0.000657	2.854419	0.000213	4.588588
VARYO	-0.63583	0.002801	3.85185	1.74E-14	5.335301
VESTL	-0.5359	0.002701	2.616882	0.004203	3.791775
VKFRS	-0.89986	0.007311	1.932293	0.58784	4.098361
VKFYT	-1.00911	0.000481	3.008442	8.23E-06	5.305151
VKGYO	-0.99755	0.000504	2.648763	0.00279	4.865772
VKING	-0.61221	0.00208	2.821184	0.000226	4.556657
YATAS	-0.61994	0.002025	3.065575	2.66E-06	4.445591
YAZIC	-0.71294	0.008468	3.180245	2.61E-05	3.566126
YKBNK	-0.63683	0.00191	3.691569	2.48E-13	6.189626
YKFIN	-0.60466	0.002135	2.983727	1.32E-05	4.973489
YKGYO	-0.58931	0.003057	3.147518	1.12E-06	3.751389
YKRYO	-0.6233	0.002002	2.483523	0.019433	3.829168
YKSGR	-0.77983	0.001146	3.08342	1.84E-06	5.002111
YTFYO	-0.56477	0.008781	3.310411	1.15E-06	2.599315
YUNSA	-0.69326	0.001565	2.732884	0.000871	4.001599
ZOREN	-0.607	0.013196	2.584517	0.026274	3.10588