

APPENDIX A

COMPOSITION OF ISE30 INDEX BETWEEN 1997-2005

97/1	97/2	97/3	97/4	98/1	98/2	98/3	98/4	99/1	99/2	99/3	99/4	2000/1	2000/2	2000/3	2000/4
AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK
AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKCNS	AKGRT
AKTAS	AKTAS	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	ALARK
TELTS	ALCTL	AKTAS	AKTAS	AKTAS	AKTAS	AKTAS	AKTAS	ALARK	ALARK	ALARK	ALARK	ALARK	ALARK	ALARK	ALCTL
ARCLK	ARCLK	ALCTL	ALCTL	ALCTL	ALARK	ALARK	ALARK	ALCTL	ALCTL	ALCTL	ALCTL	ALCTL	ALCTL	ALCTL	ARCLK
AYGAZ	AYGAZ	ARCLK	ARCLK	ARCLK	ALCTL	ALCTL	ALCTL	ARCLK	ARCLK	ARCLK	ARCLK	ARCLK	ARCLK	ARCLK	DOHOL
BRMEN	BRMEN	AYGAZ	AYGAZ	BAGFS	ARCLK	ARCLK	ARCLK	BAGFS	BAGFS	BAGFS	BAGFS	BAGFS	BAGFS	DOHOL	DYHOL
CUKEL	CUKEL	BTCIM	BTCIM	BTCIM	BAGFS	BAGFS	BAGFS	CUKEL	CUKEL	DOHOL	DOHOL	DOHOL	DYHOL	DYHOL	EFES
DOHOL	DOHOL	BEKO	BEKO	CUKEL	CUKEL	CUKEL	CUKEL	DOHOL	DOHOL	DYHOL	DYHOL	DYHOL	EFES	EFES	ENKA
ECILC	ECILC	CUKEL	CUKEL	DOHOL	DOHOL	DOHOL	DOHOL	DYHOL	DYHOL	EFES	EFES	EFES	ENKA	ENKA	EREGL
EREGL	EREGL	DOHOL	DOHOL	EREGL	ENKA	EFES	EFES	EFES	EFES	ENKA	ENKA	ENKA	EREGL	EREGL	GARAN
IHLAS	IHLAS	EREGL	EREGL	OTOSN	EREGL	ENKA	ENKA	ENKA	ENKA	EREGL	EREGL	EREGL	FINBN	GARAN	HURGZ
ISCTR	ISCTR	IHLAS	OTOSN	GARAN	OTOSN	EREGL	EREGL	EREGL	EREGL	OTOSN	OTOSN	GARAN	GARAN	HURGZ	IHLAS
KARTN	KARTN	ISCTR	IHLAS	IHLAS	GARAN	OTOSN	OTOSN	OTOSN	OTOSN	GARAN	GARAN	HURGZ	HURGZ	IHLAS	ISCTR
KCHOL	KCHOL	IZMDC	ISCTR	ISCTR	IHLAS	GARAN	GARAN	GARAN	GARAN	HURGZ	HURGZ	IHLAS	IHLAS	ISCTR	ISGYO
KEPEZ	KEPEZ	KEPEZ	IZMDC	KCHOL	ISCTR	HURGZ	HURGZ	HURGZ	HURGZ	IHLAS	IHLAS	ISCTR	ISCTR	ISGYO	KCHOL
KONYA	KONYA	KCHOL	KEPEZ	MEDYA	KEPEZ	IHLAS	IHLAS	IHLAS	IHLAS	ISCTR	ISCTR	KCHOL	KCHOL	KCHOL	MEDYA
NTHOL	NTHOL	MIGRS	KCHOL	MIGRS	KCHOL	ISCTR	ISCTR	ISCTR	ISCTR	KIPA	KCHOL	MIGRS	MEDYA	MEDYA	MIGRS
OTOSN	OTOSN	NTHOL	MIGRS	NTHOL	MIGRS	KEPEZ	KCHOL	KCHOL	KIPA	KCHOL	MIGRS	NETAS	MIGRS	MIGRS	NETAS
PETKM	PETKM	OTOSN	NTHOL	PETKM	MILYT	KCHOL	MIGRS	MIGRS	KCHOL	MIGRS	NETAS	FROTO	NETAS	NETAS	FROTO
PTOFS	PTOFS	PETKM	PETKM	PTOFS	NTHOL	MIGRS	NTHOL	NTHOL	MIGRS	PETKM	PETKM	PETKM	FROTO	FROTO	PETKM
RAKSE	RAKSE	PTOFS	PTOFS	SAHOL	PETKM	NTHOL	PETKM	PETKM	PETKM	PTOFS	PTOFS	PTOFS	PETKM	PETKM	PTOFS
SARKY	SARKY	SARKY	SARKY	SARKY	PTOFS	PETKM	PTOFS	PTOFS	PTOFS	SAHOL	SAHOL	SAHOL	PTOFS	PTOFS	SAHOL
SISE	SISE	SASA	SASA	SASA	SAHOL	PTOFS	SAHOL	SAHOL	SAHOL	SISE	SISE	SISE	SAHOL	SAHOL	SISE
THYAO	THYAO	SISE	SISE	SISE	SISE	SAHOL	TOASO	TOASO	TOASO	TNSAS	TNSAS	TNSAS	SISE	SISE	TNSAS
TIRE	TIRE	TOASO	TOASO	TOASO	TOASO	TOASO	TUPRS	TUPRS	TUPRS	TOASO	TOASO	TOASO	TNSAS	TNSAS	TOASO
TOASO	TOASO	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	THYAO	THYAO	THYAO	TUPRS	TUPRS	TUPRS	TOASO	TOASO	TCELL
TUPRS	TUPRS	THYAO	THYAO	UZEL	UZEL	UZEL	UZEL	UZEL	UZEL	THYAO	THYAO	THYAO	TUPRS	TUPRS	TUPRS
UCAK	UCAK	UCAK	UCAK	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL
YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK

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06.11.2000	2001/1	19.02.2001	2001/2	2001/3	2001/4	2002/1	2002/2	2002/3	22.07.2002	2002/4	2003/1	2003/2	2003/3	2003/4
AKBNK	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR	AKENR
AKGRT	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK	AKBNK
ALARK	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKSA	AKSA	AKSA	AKSA	AKSA	AKSA	AKSA	AKSA	AKSA
ALCTL	ALARK	ALARK	ALARK	ALARK	ALARK	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT	AKGRT
ARCLK	ALCTL	ALCTL	ALCTL	AEFES	AEFES	ALARK	ALARK	ALARK	ALARK	ALARK	ALARK	ALARK	ALARK	ALARK
DOHOL	ARCLK	AEFES	AEFES	ARCLK	ARCLK	AEFES	AEFES	AEFES	AEFES	AEFES	AEFES	AEFES	ARCLK	ARCLK
DYHOL	DOHOL	ARCLK	ARCLK	DOHOL	DOHOL	ARCLK	ARCLK	ARCLK	ARCLK	ARCLK	ARCLK	ARCLK	DOHOL	DOHOL
EFES	DYHOL	DOHOL	DOHOL	DYHOL	DYHOL	DOHOL	DOHOL	DOHOL	DOHOL	DOHOL	DOHOL	DOHOL	DYHOL	DYHOL
ENKA	ENKA	DYHOL	DYHOL	ENKA	ENKA	DYHOL	DYHOL	DYHOL	DYHOL	DYHOL	DYHOL	DYHOL	ENKAI	ENKAI
EREGL	EREGL	ENKA	ENKA	EREGL	EREGL	ENKA	ENKA	ENKA	ENKAI	ENKAI	ENKAI	ENKAI	EREGL	EREGL
GARAN	FROTO	EREGL	EREGL	FROTO	FROTO	EREGL	EREGL	EREGL	EREGL	EREGL	EREGL	EREGL	FINBN	FINBN
HURGZ	GARAN	FROTO	FROTO	GARAN	GARAN	FROTO	FROTO	FROTO	FROTO	FROTO	FINBN	FINBN	FROTO	FROTO
IHLAS	HURGZ	GARAN	GARAN	HURGZ	HURGZ	GARAN	GARAN	GARAN	GARAN	GARAN	FROTO	FROTO	GARAN	GARAN
ISCTR	IHLAS	HURGZ	HURGZ	ISCTR	ISCTR	HURGZ	HURGZ	HURGZ	HURGZ	HURGZ	GARAN	GARAN	HURGZ	HURGZ
ISGYO	ISCTR	ISCTR	ISCTR	ISGYO	ISGYO	ISCTR	ISCTR	ISCTR	ISCTR	ISCTR	HURGZ	HURGZ	IHLAS	IHLAS
KCHOL	ISGYO	ISGYO	ISGYO	KCHOL	KCHOL	ISGYO	ISGYO	ISGYO	ISGYO	ISGYO	ISCTR	ISCTR	ISCTR	ISCTR
MIGRS	KCHOL	KCHOL	KCHOL	MIGRS	MIGRS	KCHOL	KCHOL	KCHOL	KCHOL	KCHOL	KCHOL	KCHOL	KCHOL	KCHOL
NETAS	MIGRS	MIGRS	MIGRS	NETAS	NETAS	MIGRS	MIGRS	MIGRS	MIGRS	MIGRS	MIGRS	MIGRS	MIGRS	MIGRS
FROTO	NETAS	NETAS	NETAS	PETKM	PETKM	NETAS	NETAS	NETAS	NETAS	NETAS	NETAS	NETAS	NETAS	NETAS
PETKM	PETKM	PETKM	PETKM	PTOFS	PTOFS	PETKM	PETKM	PETKM	PETKM	PETKM	PETKM	PETKM	PETKM	PETKM
PTOFS	PTOFS	PTOFS	PTOFS	SAHOL	SAHOL	PTOFS	PTOFS	PTOFS	PTOFS	PTOFS	PTOFS	PTOFS	PTOFS	PTOFS
SAHOL	SAHOL	SAHOL	SAHOL	SANKO	SANKO	SAHOL	SAHOL	SAHOL	SAHOL	SAHOL	SAHOL	SAHOL	SAHOL	SAHOL
SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE	SISE
TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TNSAS
TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO	TOASO
TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM	TRKCM
TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL	TCELL
TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS	TUPRS
VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL	VESTL
YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YKBNK

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2004/1	2004/2	2004/3	2004/4	2005/1	2005/2
AKENR	AKENR	AKENR	AKENR	AKBNK	AKBNK
AKBNK	AKBNK	AKBNK	AKBNK	AKSA	AKGRT
AKSA	AKSA	AKSA	AKSA	AKGRT	AEFES
AKGRT	AKGRT	AKGRT	AKGRT	ALARK	ARCLK
ALARK	ALARK	ALARK	ALARK	AEFES	DENIZ
ARCLK	ARCLK	ARCLK	AEFES	ARCLK	DOHOL
BEKO	BEKO	BEKO	ARCLK	BEKO	DYHOL
DOHOL	DOHOL	DOHOL	BEKO	DOHOL	ENKAI
DYHOL	DYHOL	DYHOL	DOHOL	DYHOL	EREGL
ENKAI	ENKAI	ENKAI	DYHOL	ENKAI	FINBN
EREGL	EREGL	EREGL	ENKAI	EREGL	FROTO
FINBN	FINBN	FINBN	EREGL	FINBN	GARAN
FROTO	FROTO	FROTO	FINBN	FROTO	HURGZ
GARAN	GARAN	GARAN	FROTO	GARAN	IHLAS
HURGZ	HURGZ	HURGZ	GARAN	HURGZ	ISCTR
IHLAS	IHLAS	IHLAS	HURGZ	IHLAS	ISGYO
ISCTR	ISCTR	ISCTR	IHLAS	ISCTR	KRDMD
KCHOL	KCHOL	KRDMD	ISCTR	ISGYO	KCHOL
MIGRS	MIGRS	KCHOL	KRDMD	KRDMD	MIGRS
NETAS	NETAS	MIGRS	KCHOL	KCHOL	SAHOL
PTOFS	PTOFS	PTOFS	MIGRS	MIGRS	SISE
SAHOL	SAHOL	SAHOL	SAHOL	SAHOL	TNSAS
SISE	SISE	SISE	SISE	SISE	TOASO
TNSAS	TNSAS	TNSAS	TNSAS	TNSAS	TCELL
TOASO	TOASO	TOASO	TOASO	TOASO	TUPRS
TRKCM	TCELL	TCELL	TCELL	TCELL	THYAO
TCELL	TUPRS	TUPRS	TUPRS	TUPRS	ULKER
TUPRS	ULKER	ULKER	ULKER	ULKER	VESTL
VESTL	VESTL	VESTL	VESTL	VESTL	YKBNK
YKBNK	YKBNK	YKBNK	YKBNK	YKBNK	YAZIC

APPENDIX B

BASIC PROPERTIES OF GAMMA FUNCTION

Gamma function is generally encountered in physics problems. In our case, the gamma function is used to calculate the factorial of a real number which is needed due to the fact that the fractional integer parameter d as the name implies is non-integer. If it was integer it would be the well known ARIMA model. Gamma function is an integral and defined as follows:

$$\Gamma(x) = \int_0^{\infty} e^{-t} t^{x-1} dt,$$

An interesting property of the gamma function is shown below:

$$\Gamma(x+1) = x\Gamma(x)$$

This result can be obtained by integrating $\Gamma(x+1)$ by parts. Namely;

$$\Gamma(x+1) = \int_0^{\infty} e^{-t} t^x dt$$

$$\text{let } u = t^x, dv = e^{-t} dt$$

The above integral then becomes

$$\Gamma(x+1) = \int_0^{\infty} u dv$$

we know that, $\int_0^{\infty} u dv = uv - \int_0^{\infty} v du$

then,

$$\Gamma(x+1) = f(x) = \int_0^{\infty} e^{-t} t^x dt = -e^{-t} t^x \Big|_0^{\infty} - \int_0^{\infty} (-e^{-t}) x t^{x-1} dt = 0 - (-)x \int_0^{\infty} e^{-t} t^{x-1} dt = x \Gamma(x)$$

Here the variable x can assume any real value greater than zero. By using the above reasoning for any $x > 0$ and any integer n , $\Gamma(x+n)$ can be written as follows:

$$\Gamma(x+n) = (x+n-1)(x+n-2)\dots\dots(x+1)x\Gamma(x)$$

By using the above property we can also prove that If x is integer then the integral formula for the gamma function becomes equal to $(x-1)!$

Alternatively we can also say that for integer values of x the value of $x!$ is equal to $\Gamma(x+1)$.

To prove this let's evaluate the above integral for $x=1$. Since $\Gamma(x) = f(x-1)$, insert $x=1$ in the above integral, then we get;

$$\Gamma(1) = f(1-1) = f(0) = \int_0^{\infty} e^{-t} t^{1-1} dt = \int_0^{\infty} e^{-t} dt = -e^{-t} \Big|_0^{\infty} = 0 - (-1) = 1$$

Therefore $\Gamma(x) = (x-1)! = (1-1)! = 1$

So $0!$ is found to be equal to 1, as expected. Now let's try to evaluate the gamma function for $x=2$, in other words we will find the value of $\Gamma(2)$.

$\Gamma(2)$ is actually equals to $\Gamma(1+1)$.

We know from just above that $\Gamma(x+1) = x\Gamma(x)$, this means that $\Gamma(2) = 1 \cdot \Gamma(1) = 1 \cdot 1 = 1$.

Therefore $\Gamma(2) = (x-1)! = (2-1)! = 1$

Now let's try for $x=2$, this means that we are trying to find the value of $\Gamma(3)$.

$\Gamma(3)$ can be written as $\Gamma(2+1)$, remembering that $\Gamma(x+1) = x\Gamma(x)$, we obtain

$\Gamma(2+1) = 2\Gamma(2)$.

We have calculated $\Gamma(2)$ to be equal to 1, therefore $\Gamma(3) = 2 \cdot 1 = 2$. Now let's try for $x=3$; then we have

$\Gamma(x+1) = \Gamma(3+1)$

Note that $\Gamma(x+1) = x\Gamma(x)$ which means that,

$\Gamma(3+1) = 3\Gamma(3)$.

We had found the value of $\Gamma(3)$ as 2, thus

$\Gamma(3+1) = 3\Gamma(3) = 3 \cdot 2 = 6$

Repeated application of the above substitution results in

$\Gamma(x+1) = x!$ or $\Gamma(x) = (x-1)!$

APPENDIX C: RESULTS OF STATIONARITY TESTS

Stationarity Test for session close to session close returns.

ADF Test Statistic	-28.25670	1% Critical Value*	-3.4351
		5% Critical Value	-2.8628
		10% Critical Value	-2.5675

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RET30SEANS)

Method: Least Squares

Date: 09/02/05 Time: 16:24

Sample(adjusted): 7 4014

Included observations: 4008 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RET30SEANS(-1)	-0.927546	0.032826	-28.25670	0.0000
D(RET30SEANS(-1))	0.019679	0.029682	0.662987	0.5074
D(RET30SEANS(-2))	0.021685	0.025698	0.843837	0.3988
D(RET30SEANS(-3))	-0.011984	0.021338	-0.561606	0.5744
D(RET30SEANS(-4))	0.038229	0.015794	2.420565	0.0155
C	0.000690	0.000352	1.957024	0.0504
R-squared	0.457914	Mean dependent var	-2.84E-06	
Adjusted R-squared	0.457237	S.D. dependent var	0.030212	
S.E. of regression	0.022258	Akaike info criterion	-4.770766	
Sum squared resid	1.982604	Schwarz criterion	-4.761340	
Log likelihood	9566.614	F-statistic	676.1186	
Durbin-Watson stat	2.000372	Prob(F-statistic)	0.000000	

Stationary Test for the session to session average returns

ADF Test Statistic	-27.62631	1% Critical Value*	-3.4351
		5% Critical Value	-2.8628
		10% Critical Value	-2.5675

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RET30AVGSEANS)

Method: Least Squares

Included observations: 4008 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RET30AVGSEANS(-1)	-0.711810	0.025766	-27.62631	0.0000
D(RET30AVGSEANS(-1))	0.149949	0.023975	6.254497	0.0000
D(RET30AVGSEANS(-2))	-0.015784	0.021456	-0.735629	0.4620
D(RET30AVGSEANS(-3))	0.019024	0.018111	1.050437	0.2936
D(RET30AVGSEANS(-4))	0.049250	0.015788	3.119494	0.0018
C	0.000529	0.000265	1.991776	0.0465
R-squared	0.330819	Mean dependent var	-1.84E-06	
Adjusted R-squared	0.329983	S.D. dependent var	0.020480	
S.E. of regression	0.016763	Akaike info criterion	-5.337730	
Sum squared resid	1.124622	Schwarz criterion	-5.328305	
Log likelihood	10702.81	F-statistic	395.6888	
Durbin-Watson stat	1.997639	Prob(F-statistic)	0.000000	

APPENDIX C: RESULTS OF STATIONARITY TESTS

Stationary test for the return dispersion

ADF Test Statistic	-16.07899	1% Critical Value*	-3.4351	
		5% Critical Value	-2.8628	
		10% Critical Value	-2.5675	
*MacKinnon critical values for rejection of hypothesis of a unit root.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(RET_DISP)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RET_DISP(-1)	-0.328454	0.020428	-16.07899	0.0000
D(RET_DISP(-1))	-0.451622	0.021984	-20.54305	0.0000
D(RET_DISP(-2))	-0.306977	0.021584	-14.22238	0.0000
D(RET_DISP(-3))	-0.196005	0.019719	-9.939894	0.0000
D(RET_DISP(-4))	-0.104117	0.015700	-6.631556	0.0000
C	0.006474	0.000425	15.23424	0.0000
R-squared	0.381769	Mean dependent var	-2.91E-06	
Adjusted R-squared	0.380997	S.D. dependent var	0.010774	
S.E. of regression	0.008476	Akaike info criterion	-6.701587	
Sum squared resid	0.287607	Schwarz criterion	-6.692163	
Log likelihood	13439.33	F-statistic	494.3858	
Durbin-Watson stat	2.016189	Prob(F-statistic)	0.000000	

Stationarity test for session volume change.

ADF Test Statistic	-35.64887	1% Critical Value*	-3.4351
		5% Critical Value	-2.8628
		10% Critical Value	-2.5675

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(VOL30CHG)

Method: Least Squares

Sample(adjusted): 7 4014

Included observations: 4008 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VOL30CHG(-1)	-1.648284	0.046237	-35.64887	0.0000
D(VOL30CHG(-1))	0.388061	0.040467	9.589560	0.0000
D(VOL30CHG(-2))	0.260423	0.033217	7.840110	0.0000
D(VOL30CHG(-3))	0.135696	0.025284	5.366953	0.0000
D(VOL30CHG(-4))	0.092316	0.015732	5.868097	0.0000
C	-0.004128	0.006942	-0.594746	0.5520
R-squared	0.624369	Mean dependent var	0.000248	
Adjusted R-squared	0.623899	S.D. dependent var	0.716471	
S.E. of regression	0.439391	Akaike info criterion	1.194640	
Sum squared resid	772.6426	Schwarz criterion	1.204065	
Log likelihood	-2388.059	F-statistic	1330.412	
Durbin-Watson stat	2.000481	Prob(F-statistic)	0.000000	

APPENDIX C: RESULTS OF STATIONARITY TESTS

Stationarity test for the variable Ret30vol

ADF Test Statistic	-27.40322	1% Critical Value*	-3.4351
		5% Critical Value	-2.8628
		10% Critical Value	-2.5675

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RET30VOL)

Method: Least Squares

Included observations: 4008 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RET30VOL(-1)	-0.923978	0.033718	-27.40322	0.0000
D(RET30VOL(-1))	-0.043268	0.030637	-1.412250	0.1580
D(RET30VOL(-2))	-0.039448	0.026739	-1.475270	0.1402
D(RET30VOL(-3))	-0.022832	0.021984	-1.038561	0.2991
D(RET30VOL(-4))	0.030286	0.015800	1.916848	0.0553
C	0.003874	0.000672	5.767961	0.0000
R-squared	0.485853	Mean dependent var	-6.31E-06	
Adjusted R-squared	0.485211	S.D. dependent var	0.057937	
S.E. of regression	0.041569	Akaike info criterion	-3.521408	
Sum squared resid	6.915526	Schwarz criterion	-3.511982	
Log likelihood	7062.901	F-statistic	756.3535	
Durbin-Watson stat	2.000637	Prob(F-statistic)	0.000000	

Stationary test for the variable range

ADF Test Statistic	-13.55163	1% Critical Value*	-3.4351
		5% Critical Value	-2.8628
		10% Critical Value	-2.5675

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RANGE)

Method: Least Squares

Included observations: 4009 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RANGE(-1)	-0.221891	0.016374	-13.55163	0.0000
D(RANGE(-1))	-0.506539	0.019914	-25.43646	0.0000
D(RANGE(-2))	-0.284214	0.020340	-13.97287	0.0000
D(RANGE(-3))	-0.211089	0.019229	-10.97791	0.0000
D(RANGE(-4))	-0.080664	0.015755	-5.119788	0.0000
C	0.006431	0.000520	12.37117	0.0000
R-squared	0.353451	Mean dependent var	-1.58E-06	
Adjusted R-squared	0.352644	S.D. dependent var	0.016617	
S.E. of regression	0.013369	Akaike info criterion	-5.790204	
Sum squared resid	0.715498	Schwarz criterion	-5.780780	
Log likelihood	11612.46	F-statistic	437.6671	
Durbin-Watson stat	2.009290	Prob(F-statistic)	0.000000	

APPENDIX C: RESULTS OF STATIONARITY TESTS

PP Test for stationary for session to session returns calculated from the closing values.

PP Test Statistic	-57.86820	1% Critical Value*	-3.4351	
		5% Critical Value	-2.8628	
		10% Critical Value	-2.5675	
*MacKinnon critical values for rejection of hypothesis of a unit root.				
Lag truncation for Bartlett kernel: (Newey-West suggests: 9)				
Residual variance with no correction			0.000497	
Residual variance with correction			0.000489	
Phillips-Perron Test Equation				
Dependent Variable: D(RET30SEANS)				
Method: Least Squares				
Sample(adjusted): 3 4014				
Included observations: 4012 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RET30SEANS(-1)	-0.910957	0.015731	-57.90902	0.0000
C	0.000674	0.000352	1.913730	0.0557
R-squared	0.455419	Mean dependent var	-7.32E-06	
Adjusted R-squared	0.455283	S.D. dependent var	0.030205	
S.E. of regression	0.022293	Akaike info criterion	-4.768584	
Sum squared resid	1.992893	Schwarz criterion	-4.765445	
Log likelihood	9567.779	F-statistic	3353.455	
Durbin-Watson stat	1.999670	Prob(F-statistic)	0.000000	

PP Test for stationary for session to session returns calculated from the averages.

PP Test Statistic	-41.51750	1% Critical Value*	-3.4351	
		5% Critical Value	-2.8628	
		10% Critical Value	-2.5675	
*MacKinnon critical values for rejection of hypothesis of a unit root.				
Lag truncation for Bartlett kernel: (Newey-West suggests: 9)				
Residual variance with no correction			0.000288	
Residual variance with correction			0.000245	
Phillips-Perron Test Equation				
Dependent Variable: D(RET30AVGSEANS)				
Method: Least Squares				
Sample(adjusted): 3 4014				
Included observations: 4012 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RET30AVGSEANS(-1	-0.624820	0.014641	-42.67750	0.0000
C	0.000462	0.000268	1.720303	0.0855
R-squared	0.312340	Mean dependent var		-6.14E-06
Adjusted R-squared	0.312168	S.D. dependent var		0.020476
S.E. of regression	0.016982	Akaike info criterion		-5.312850
Sum squared resid	1.156410	Schwarz criterion		-5.309711
Log likelihood	10659.58	F-statistic		1821.369
Durbin-Watson stat	1.887387	Prob(F-statistic)		0.000000

APPENDIX D: CORRELOGRAMS

Correlogram of ret30seans

Date: 09/02/05 Time: 16:58

Sample: 1 4015

Included observations: 4013

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
*	*	1	0.089	0.089	31.825 0.000
		2	0.009	0.001	32.119 0.000
		3	-0.029	-0.030	35.436 0.000
		4	0.041	0.047	42.234 0.000
		5	-0.030	-0.038	45.927 0.000
		6	-0.018	-0.013	47.175 0.000
		7	0.005	0.011	47.283 0.000
		8	0.038	0.033	53.205 0.000
		9	-0.016	-0.020	54.175 0.000
		10	-0.024	-0.021	56.471 0.000
		11	-0.052	-0.048	67.297 0.000
		12	-0.020	-0.015	68.843 0.000
		13	0.025	0.032	71.283 0.000
		14	0.008	0.002	71.561 0.000
		15	-0.015	-0.016	72.488 0.000
		16	0.034	0.036	77.253 0.000
		17	0.039	0.030	83.344 0.000
		18	0.013	0.008	84.031 0.000
		19	0.017	0.023	85.209 0.000
		20	0.024	0.018	87.542 0.000
		21	-0.006	-0.016	87.697 0.000
		22	-0.010	-0.007	88.088 0.000
		23	-0.022	-0.019	90.056 0.000
		24	0.032	0.035	94.272 0.000
		25	0.018	0.015	95.571 0.000
		26	-0.003	-0.007	95.598 0.000
		27	-0.005	0.001	95.685 0.000
		28	0.011	0.013	96.132 0.000
		29	-0.006	-0.005	96.278 0.000
*	*	30	0.073	0.079	117.60 0.000
		31	-0.015	-0.025	118.53 0.000
		32	0.035	0.031	123.48 0.000
		33	-0.004	-0.010	123.56 0.000
		34	-0.012	-0.020	124.10 0.000
		35	-0.013	0.000	124.84 0.000
		36	0.002	0.002	124.85 0.000

APPENDIX D: CORRELOGRAMS

Correlogram of average session to session returns

Date: 04/25/06 Time: 11:20

Sample: 1 4015

Included observations: 4013

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
***	***	1 0.375	0.375	564.96	0.000
	*	2 0.012	-0.149	565.57	0.000
		3 -0.011	0.047	566.09	0.000
		4 0.018	0.009	567.35	0.000
		5 -0.028	-0.049	570.47	0.000
		6 -0.019	0.018	571.92	0.000
		7 0.007	0.006	572.13	0.000
		8 0.037	0.033	577.52	0.000
		9 -0.014	-0.046	578.33	0.000
		10 -0.032	-0.006	582.49	0.000
*	*	11 -0.071	-0.069	602.64	0.000
		12 -0.034	0.019	607.22	0.000
		13 0.024	0.033	609.62	0.000
		14 0.017	-0.013	610.84	0.000
		15 -0.002	0.002	610.86	0.000
		16 0.039	0.043	616.97	0.000
		17 0.041	0.007	623.74	0.000
		18 0.038	0.031	629.62	0.000
		19 0.025	0.011	632.21	0.000
		20 0.031	0.018	636.10	0.000
		21 -0.015	-0.043	637.04	0.000
		22 -0.009	0.019	637.35	0.000
		23 -0.006	-0.012	637.48	0.000
		24 0.032	0.045	641.74	0.000
		25 0.016	-0.011	642.77	0.000
		26 -0.002	-0.006	642.78	0.000
		27 -0.006	0.005	642.94	0.000
		28 0.010	0.014	643.39	0.000
		29 0.014	0.014	644.15	0.000
		30 0.059	0.061	658.15	0.000
		31 0.023	-0.025	660.26	0.000
		32 0.029	0.033	663.72	0.000
		33 0.005	-0.023	663.83	0.000
		34 -0.014	-0.008	664.60	0.000
		35 -0.021	-0.005	666.36	0.000
		36 -0.011	-0.008	666.89	0.000

APPENDIX D: CORRELOGRAMS

Correlogram of Daily Return Series (Close to Close)

Date: 05/04/06 Time: 16:23

Sample: 1 2015

Included observations: 2013

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.005	0.005	0.0590	0.808
		2 0.041	0.041	3.4254	0.180
		3 -0.036	-0.036	5.9859	0.112
		4 0.023	0.022	7.0245	0.135
		5 -0.054	-0.051	12.834	0.025
		6 -0.034	-0.036	15.103	0.019
		7 0.007	0.013	15.202	0.033
		8 0.033	0.032	17.398	0.026
		9 0.059	0.058	24.495	0.004
		10 0.035	0.032	26.991	0.003
		11 -0.042	-0.050	30.645	0.001
		12 0.029	0.029	32.369	0.001
		13 0.027	0.034	33.863	0.001
		14 -0.007	-0.006	33.963	0.002
		15 0.042	0.052	37.560	0.001
		16 0.025	0.021	38.833	0.001
		17 -0.008	-0.019	38.949	0.002
		18 -0.023	-0.021	40.063	0.002
		19 0.028	0.029	41.637	0.002
		20 -0.039	-0.034	44.743	0.001
		21 -0.001	0.000	44.747	0.002
		22 -0.026	-0.029	46.132	0.002
		23 -0.002	-0.011	46.138	0.003
		24 -0.006	-0.006	46.224	0.004
		25 0.030	0.020	48.051	0.004
		26 0.007	0.010	48.138	0.005
		27 0.032	0.031	50.277	0.004
		28 -0.042	-0.050	53.925	0.002
		29 0.037	0.035	56.679	0.002
		30 -0.025	-0.011	57.992	0.002
		31 0.023	0.017	59.101	0.002
*		32 -0.068	-0.057	68.661	0.000
		33 0.000	-0.004	68.661	0.000
		34 -0.032	-0.031	70.808	0.000
		35 0.004	0.000	70.848	0.000
		36 -0.009	-0.001	71.004	0.000

APPENDIX D: CORRELOGRAMS

Correlogram of series belonging to 2002-2005 period

Date: 05/05/06 Time: 13:27

Sample: 1 830

Included observations: 829

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
. .	. .	1 -0.025	-0.025	0.5327	0.465
. .	. .	2 -0.005	-0.006	0.5568	0.757
. .	. .	3 -0.023	-0.024	1.0149	0.798
. .	. .	4 -0.054	-0.055	3.4455	0.486
. .	. .	5 0.043	0.040	4.9624	0.420
* .	* .	6 -0.071	-0.071	9.2325	0.161
. .	. .	7 0.015	0.010	9.4280	0.223
. .	. .	8 -0.014	-0.016	9.6004	0.294
. *	. *	9 0.070	0.071	13.700	0.133
. *	. *	10 0.078	0.073	18.776	0.043
* .	. .	11 -0.059	-0.048	21.668	0.027
. .	. .	12 0.026	0.022	22.251	0.035
. .	. .	13 0.035	0.050	23.283	0.038
. .	. .	14 0.039	0.040	24.572	0.039
. .	. .	15 -0.034	-0.033	25.561	0.043
. .	. .	16 0.015	0.032	25.748	0.058
. .	. .	17 0.006	0.004	25.775	0.079
. .	. .	18 -0.004	-0.003	25.789	0.105
. .	. .	19 0.042	0.030	27.302	0.098
. .	. .	20 0.022	0.037	27.725	0.116
. .	. .	21 -0.014	-0.013	27.888	0.143
. .	* .	22 -0.051	-0.060	30.135	0.115
. .	. .	23 -0.011	-0.018	30.231	0.143
. .	. .	24 -0.026	-0.025	30.817	0.159
. .	. .	25 -0.035	-0.036	31.875	0.162
. .	. .	26 0.028	0.012	32.566	0.175
. .	. .	27 -0.043	-0.044	34.140	0.162
. .	. .	28 -0.024	-0.042	34.652	0.180
. .	. .	29 -0.005	-0.020	34.674	0.215
. .	. .	30 -0.037	-0.043	35.863	0.213
. .	. .	31 -0.009	-0.011	35.929	0.248
. .	. .	32 -0.046	-0.044	37.771	0.222
. .	. .	33 0.019	0.003	38.067	0.250
. .	. .	34 0.001	0.006	38.069	0.289
. .	. .	35 -0.040	-0.037	39.483	0.276
. .	. .	36 0.012	0.005	39.601	0.312

APPENDIX D: CORRELOGRAMS

Correlogram of Average Daily Return Series

Date: 05/04/06 Time: 16:26

Sample: 1 2015

Included observations: 2013

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
**	**	1 0.288	0.288	167.39	0.000
	*	2 -0.019	-0.112	168.15	0.000
		3 -0.006	0.035	168.23	0.000
		4 0.018	0.008	168.88	0.000
*	*	5 -0.067	-0.083	177.88	0.000
		6 -0.052	-0.004	183.32	0.000
		7 0.014	0.025	183.71	0.000
		8 0.060	0.048	191.10	0.000
		9 0.056	0.033	197.44	0.000
		10 0.039	0.018	200.59	0.000
		11 -0.012	-0.033	200.88	0.000
		12 0.031	0.052	202.85	0.000
		13 0.019	-0.003	203.59	0.000
		14 -0.005	0.002	203.63	0.000
	*	15 0.051	0.068	208.96	0.000
		16 0.049	0.004	213.80	0.000
		17 -0.019	-0.034	214.50	0.000
		18 -0.028	-0.007	216.13	0.000
		19 0.021	0.027	217.03	0.000
		20 -0.018	-0.037	217.67	0.000
		21 -0.033	-0.005	219.88	0.000
		22 -0.030	-0.029	221.68	0.000
		23 -0.020	-0.019	222.46	0.000
		24 0.003	0.011	222.48	0.000
		25 0.039	0.031	225.54	0.000
		26 0.028	0.011	227.18	0.000
		27 0.005	-0.006	227.23	0.000
		28 -0.013	-0.020	227.56	0.000
		29 0.009	0.021	227.73	0.000
		30 -0.004	-0.003	227.76	0.000
		31 -0.022	-0.018	228.77	0.000
		32 -0.021	-0.004	229.63	0.000
		33 -0.049	-0.050	234.52	0.000
		34 -0.024	-0.003	235.74	0.000
		35 -0.014	-0.012	236.12	0.000
		36 0.015	0.028	236.56	0.000

APPENDIX D: CORRELOGRAMS

Correlogram of residuals of the AR model

Date: 03/14/06 Time: 11:46

Sample: 34 4014

Included observations: 3981

Q-statistic
probabilities
adjusted for 9
ARMA term(s)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.001	0.001	0.0035	
		2 0.002	0.002	0.0203	
		3 -0.028	-0.028	3.2312	
		4 0.000	0.000	3.2318	
		5 0.003	0.003	3.2595	
		6 -0.014	-0.015	4.0622	
		7 0.014	0.014	4.8207	
		8 0.002	0.002	4.8353	
		9 -0.016	-0.017	5.9103	
		10 -0.022	-0.021	7.8054	0.005
		11 0.002	0.002	7.8230	0.020
		12 -0.018	-0.019	9.1579	0.027
		13 0.029	0.028	12.483	0.014
		14 0.006	0.006	12.642	0.027
		15 -0.012	-0.013	13.179	0.040
		16 0.027	0.029	16.179	0.024
		17 0.002	0.003	16.198	0.040
		18 0.004	0.002	16.264	0.062
		19 0.022	0.025	18.255	0.051
		20 0.020	0.020	19.935	0.046
		21 -0.007	-0.009	20.156	0.064
		22 -0.012	-0.010	20.764	0.078
		23 -0.025	-0.023	23.221	0.057
		24 -0.002	-0.004	23.240	0.079
		25 0.018	0.019	24.495	0.079
		26 -0.010	-0.010	24.867	0.098
		27 0.007	0.005	25.047	0.124
		28 0.007	0.011	25.241	0.153
		29 -0.009	-0.010	25.544	0.181
		30 0.000	0.001	25.545	0.224
		31 -0.026	-0.024	28.287	0.166
		32 0.000	-0.004	28.287	0.205
		33 -0.005	-0.008	28.405	0.243
		34 -0.021	-0.022	30.167	0.218
		35 -0.002	-0.003	30.187	0.260
		36 0.002	0.001	30.198	0.305

APPENDIX D: CORRELOGRAMS

Correlogram of Squared Residuals

Date: 03/14/06 Time: 11:51

Sample: 34 4014

Included observations: 3981

Q-statistic
probabilities
adjusted for 9
ARMA term(s)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
*	*	1 0.167	0.167	111.42	
**	**	2 0.238	0.216	337.21	
*		3 0.126	0.063	400.43	
*	*	4 0.161	0.093	503.77	
*	*	5 0.188	0.129	644.16	
*		6 0.131	0.043	712.42	
*		7 0.093	-0.003	747.25	
*		8 0.104	0.033	790.47	
*		9 0.074	0.004	812.59	
*	*	10 0.134	0.067	883.87	0.000
*		11 0.089	0.024	915.39	0.000
*		12 0.090	0.017	947.92	0.000
*		13 0.067	0.004	965.72	0.000
*		14 0.061	0.000	980.65	0.000
*		15 0.084	0.027	1009.1	0.000
*		16 0.082	0.027	1036.1	0.000
*		17 0.085	0.029	1064.9	0.000
		18 0.065	0.007	1081.6	0.000
		19 0.058	0.004	1095.0	0.000
*	*	20 0.122	0.074	1154.4	0.000
		21 0.054	-0.012	1166.1	0.000
*		22 0.104	0.036	1209.6	0.000
		23 0.055	0.002	1221.9	0.000
*		24 0.083	0.022	1249.7	0.000
		25 0.044	-0.022	1257.4	0.000
*		26 0.083	0.029	1285.1	0.000
*		27 0.066	0.014	1302.6	0.000
		28 0.049	-0.014	1312.0	0.000
		29 0.059	0.015	1326.1	0.000
		30 0.063	0.015	1342.1	0.000
*		31 0.066	0.017	1359.7	0.000
*		32 0.081	0.026	1386.2	0.000
		33 0.025	-0.029	1388.7	0.000
*		34 0.077	0.030	1412.7	0.000
		35 0.059	0.019	1426.8	0.000
		36 0.055	-0.005	1439.2	0.000

APPENDIX D: CORRELOGRAMS

Correlogram of ARMA residuals

Date: 04/25/06 Time: 18:47

Sample: 3 4014

Included observations: 4012

Q-statistic
probabilities
adjusted for 3
ARMA term(s)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 -0.001	-0.001	0.0025	
		2 -0.002	-0.002	0.0168	
		3 -0.020	-0.020	1.5627	
		4 0.033	0.033	5.9887	0.014
		5 -0.019	-0.019	7.4092	0.025
		6 -0.030	-0.030	11.057	0.011
		7 0.018	0.019	12.355	0.015
		8 0.025	0.023	14.923	0.011
		9 -0.003	-0.003	14.969	0.020
		10 -0.032	-0.030	19.118	0.008
		11 -0.034	-0.036	23.882	0.002
		12 -0.032	-0.034	27.947	0.001
		13 0.040	0.041	34.416	0.000
		14 -0.006	-0.005	34.578	0.000
		15 -0.006	-0.007	34.715	0.001
		16 0.020	0.020	36.248	0.001
		17 0.049	0.044	45.820	0.000
		18 -0.005	-0.003	45.939	0.000
		19 0.027	0.034	48.968	0.000
		20 0.010	0.009	49.413	0.000
		21 0.005	-0.002	49.531	0.000
		22 -0.020	-0.018	51.090	0.000
		23 -0.012	-0.012	51.686	0.000
		24 0.021	0.020	53.436	0.000
		25 0.028	0.030	56.584	0.000
		26 -0.016	-0.017	57.623	0.000
		27 0.007	0.010	57.798	0.000
		28 0.001	0.003	57.800	0.000
		29 -0.004	-0.002	57.856	0.000
*	*	30 0.066	0.071	75.586	0.000
		31 -0.016	-0.012	76.586	0.000
		32 0.027	0.022	79.644	0.000
		33 0.004	0.003	79.709	0.000
		34 -0.021	-0.028	81.478	0.000
		35 -0.002	0.005	81.494	0.000
		36 -0.006	-0.003	81.625	0.000

APPENDIX D: CORRELOGRAMS

Correlogram of Fractionally Integrated Session to Session Series

Date: 03/27/06 Time: 19:47

Sample: 1 4014

Included observations: 4013

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
*	*	1 0.066	0.066	17.608	0.000
		2 0.055	0.051	29.649	0.000
		3 0.052	0.045	40.486	0.000
		4 -0.029	-0.038	43.856	0.000
		5 0.013	0.012	44.519	0.000
		6 0.023	0.023	46.691	0.000
		7 0.011	0.010	47.168	0.000
		8 -0.001	-0.007	47.170	0.000
		9 -0.002	-0.004	47.180	0.000
		10 -0.028	-0.027	50.405	0.000
		11 -0.012	-0.008	51.010	0.000
		12 0.000	0.004	51.011	0.000
		13 0.017	0.020	52.148	0.000
		14 -0.008	-0.012	52.422	0.000
		15 0.010	0.009	52.806	0.000
		16 0.033	0.034	57.307	0.000
		17 0.008	0.007	57.581	0.000
		18 -0.019	-0.026	59.079	0.000
		19 0.001	-0.001	59.081	0.000
		20 -0.013	-0.010	59.739	0.000
		21 0.002	0.005	59.755	0.000
		22 0.034	0.031	64.314	0.000
		23 -0.006	-0.009	64.464	0.000
		24 -0.003	-0.006	64.495	0.000
		25 0.001	0.001	64.501	0.000
		26 0.005	0.011	64.598	0.000
		27 -0.021	-0.022	66.429	0.000
		28 0.009	0.007	66.748	0.000
		29 0.018	0.017	68.103	0.000
		30 0.004	0.004	68.180	0.000
		31 -0.002	-0.007	68.200	0.000
		32 0.011	0.011	68.729	0.000
		33 0.007	0.008	68.927	0.000
		34 -0.020	-0.021	70.503	0.000
		35 0.000	-0.002	70.504	0.000
		36 -0.007	-0.003	70.687	0.000

APPENDIX D: CORRELOGRAMS

Correlogram of the residuals of the fractionally integrated series

Date: 03/27/06 Time: 19:45

Sample: 5 4013

Included observations: 4009

Q-statistic
probabilities
adjusted for 4
ARMA term(s)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.000	0.000	0.0007	
		2 0.000	0.000	0.0008	
		3 -0.001	-0.001	0.0082	
		4 -0.003	-0.003	0.0429	
		5 0.010	0.010	0.4654	0.495
		6 0.023	0.023	2.5146	0.284
		7 0.013	0.013	3.2417	0.356
		8 -0.002	-0.002	3.2591	0.515
		9 0.000	0.000	3.2601	0.660
		10 -0.029	-0.029	6.6058	0.359
		11 -0.010	-0.011	7.0171	0.427
		12 0.003	0.002	7.0583	0.530
		13 0.018	0.017	8.3562	0.499
		14 -0.014	-0.014	9.1203	0.521
		15 0.008	0.008	9.3544	0.589
		16 0.033	0.035	13.737	0.318
		17 0.009	0.010	14.045	0.371
		18 -0.020	-0.021	15.668	0.334
		19 -0.001	-0.002	15.672	0.404
		20 -0.012	-0.013	16.271	0.434
		21 0.002	0.001	16.293	0.503
		22 0.035	0.034	21.347	0.262
		23 -0.008	-0.008	21.635	0.303
		24 -0.003	-0.003	21.680	0.358
		25 0.002	0.003	21.689	0.418
		26 0.007	0.009	21.869	0.468
		27 -0.023	-0.022	24.087	0.399
		28 0.010	0.006	24.454	0.436
		29 0.019	0.018	25.989	0.408
		30 0.003	0.003	26.028	0.462
		31 -0.005	-0.005	26.117	0.512
		32 0.012	0.012	26.660	0.537
		33 0.008	0.009	26.906	0.577
		34 -0.021	-0.021	28.669	0.535
		35 0.001	0.000	28.675	0.586
		36 -0.003	-0.001	28.719	0.633

APPENDIX D: CORRELOGRAMS

Correlogram of Squared residuals of the ARFIMA model

Date: 03/27/06 Time: 19:52

Sample: 5 4013

Included observations: 4009

Q-statistic
probabilities
adjusted for 4
ARMA term(s)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 -0.010	-0.010	0.4386	
		2 -0.016	-0.016	1.4594	
		3 0.018	0.017	2.7157	
		4 -0.017	-0.017	3.9370	
		5 -0.020	-0.020	5.5569	0.018
		6 0.002	0.000	5.5683	0.062
		7 -0.011	-0.011	6.0873	0.107
		8 0.013	0.013	6.7846	0.148
		9 -0.004	-0.005	6.8580	0.231
		10 -0.011	-0.011	7.3616	0.289
		11 -0.009	-0.011	7.7104	0.359
		12 -0.028	-0.029	10.962	0.204
		13 -0.008	-0.008	11.211	0.262
		14 0.000	-0.002	11.212	0.341
		15 -0.009	-0.009	11.572	0.397
		16 -0.008	-0.010	11.847	0.458
		17 0.000	-0.002	11.847	0.540
		18 -0.023	-0.023	13.923	0.455
		19 0.007	0.006	14.134	0.515
		20 0.014	0.013	14.939	0.529
		21 -0.005	-0.004	15.030	0.593
		22 0.020	0.018	16.623	0.549
		23 -0.004	-0.005	16.679	0.612
		24 0.031	0.032	20.534	0.425
		25 0.004	0.003	20.602	0.483
		26 0.004	0.005	20.651	0.542
		27 0.004	0.003	20.721	0.598
		28 -0.009	-0.009	21.033	0.637
		29 -0.013	-0.012	21.696	0.653
		30 0.003	0.001	21.731	0.703
		31 -0.005	-0.004	21.842	0.745
		32 -0.002	-0.001	21.853	0.788
		33 0.006	0.005	22.011	0.820
		34 -0.024	-0.023	24.282	0.759
		35 -0.014	-0.013	25.026	0.767
		36 -0.012	-0.012	25.571	0.782

APPENDIX D: CORRELOGRAMS

Correlogram of the fractionally integrated average return series

Sample: 1 2014

Included observations: 2013

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
*	*	1	0.074	0.074	11.061 0.001
		2	0.024	0.019	12.257 0.002
		3	0.022	0.019	13.258 0.004
		4	-0.027	-0.031	14.785 0.005
		5	0.002	0.005	14.792 0.011
		6	-0.001	-0.001	14.794 0.022
		7	0.033	0.034	16.951 0.018
		8	0.032	0.026	19.022 0.015
		9	-0.014	-0.019	19.412 0.022
		10	-0.025	-0.026	20.665 0.024
		11	-0.004	0.001	20.701 0.037
		12	-0.017	-0.013	21.261 0.047
		13	0.008	0.011	21.398 0.065
		14	-0.004	-0.007	21.430 0.091
		15	-0.039	-0.040	24.523 0.057
		16	-0.029	-0.024	26.174 0.052
		17	-0.023	-0.015	27.280 0.054
		18	0.000	0.006	27.280 0.074
		19	-0.004	-0.005	27.316 0.098
		20	0.013	0.012	27.637 0.118
		21	-0.023	-0.028	28.740 0.120
		22	-0.014	-0.009	29.156 0.140
		23	-0.051	-0.046	34.469 0.059
		24	-0.008	0.003	34.592 0.075
		25	-0.017	-0.017	35.150 0.086
		26	0.010	0.012	35.337 0.105
		27	0.016	0.010	35.878 0.118
		28	0.034	0.033	38.201 0.095
		29	0.010	0.005	38.399 0.114
		30	-0.012	-0.012	38.704 0.132
		31	-0.010	-0.011	38.910 0.156
		32	-0.012	-0.011	39.196 0.178
		33	-0.036	-0.038	41.897 0.138
		34	0.008	0.011	42.013 0.163
		35	0.012	0.008	42.301 0.185
		36	0.008	0.005	42.433 0.213

APPENDIX E

Vector Autoregression Estimates

Date: 06/11/06 Time: 12:07

Sample(adjusted): 7 4014

Included observations: 4008 after adjusting endpoints

Standard errors in () & t-statistics in []

	RET30SEANS	RET30SQR	RET30CUBE	RET30VOL	RETVOLSNS	DIR	ARTAZ	MAXFARK	RANGE	RET30AVGSEA NS
RET30SEANS(-1)	3.227232 (11.6394) [0.27727]	1.140252 (0.59942) [1.90225]	-0.100098 (0.05882) [-1.70165]	2.599804 (21.4428) [0.12124]	157.0432 (378.555) [0.41485]	0.762873 (3.92523) [0.19435]	384.6401 (288.681) [1.33240]	113156.8 (108537.) [1.04257]	-1.056575 (7.10881) [-0.14863]	3.291657 (8.31645) [0.39580]
RET30SEANS(-2)	26.98407 (14.2357) [1.89552]	2.480709 (0.73313) [3.38371]	-0.024131 (0.07195) [-0.33541]	30.50496 (26.2258) [1.16316]	937.0077 (462.997) [2.02379]	14.35994 (4.80080) [2.99115]	693.0113 (353.076) [1.96278]	239192.1 (132748.) [1.80186]	19.56862 (8.69453) [2.25068]	13.37763 (10.1715) [1.31520]
RET30SEANS(-3)	-6.372346 (14.2011) [-0.44872]	2.197273 (0.73135) [3.00441]	-0.153106 (0.07177) [-2.13327]	-37.25893 (26.1620) [-1.42416]	-45.04218 (461.870) [-0.09752]	1.549344 (4.78912) [0.32351]	117.5801 (352.216) [0.33383]	-110902.2 (132424.) [-0.83748]	12.11016 (8.67336) [1.39625]	-7.500269 (10.1468) [-0.73918]
RET30SEANS(-4)	0.279494 (11.5647) [0.02417]	-0.410507 (0.59558) [-0.68926]	0.048800 (0.05845) [0.83495]	33.62976 (21.3052) [1.57847]	7.829128 (376.127) [0.02082]	3.005200 (3.90006) [0.77055]	-68.38990 (286.830) [-0.23843]	-147146.3 (107841.) [-1.36448]	-2.727011 (7.06322) [-0.38609]	-2.535223 (8.26311) [-0.30681]
RET30SEANS(-5)	0.008460 (0.09341) [0.09057]	0.008553 (0.00481) [1.77792]	0.000112 (0.00047) [0.23632]	0.081239 (0.17209) [0.47207]	-1.289155 (3.03810) [-0.42433]	0.011947 (0.03150) [0.37925]	-0.575415 (2.31682) [-0.24836]	216.5973 (871.066) [0.24866]	0.100893 (0.05705) [1.76845]	-0.003237 (0.06674) [-0.04849]
RET30SQR(-1)	2.302850 (0.74819) [3.07788]	0.082936 (0.03853) [2.15240]	0.007315 (0.00378) [1.93460]	7.653770 (1.37836) [5.55280]	66.88944 (24.3339) [2.74881]	0.738113 (0.25232) [2.92533]	43.63150 (18.5568) [2.35125]	35588.07 (6976.87) [5.10086]	0.355067 (0.45696) [0.77702]	1.561471 (0.53459) [2.92087]
RET30SQR(-2)	1.536819 (0.75452) [2.03683]	0.189114 (0.03886) [4.86688]	0.011718 (0.00381) [3.07303]	7.172211 (1.39001) [5.15982]	59.42982 (24.5396) [2.42180]	0.807975 (0.25445) [3.17538]	23.01056 (18.7136) [1.22962]	20591.76 (7035.83) [2.92670]	1.872158 (0.46082) [4.06263]	0.732769 (0.53911) [1.35922]
RET30SQR(-3)	-1.326261 (0.74333) [-1.78421]	-0.009565 (0.03828) [-0.24986]	-0.002112 (0.00376) [-0.56212]	3.270696 (1.36941) [2.38840]	-38.44773 (24.1759) [-1.59033]	-0.648092 (0.25068) [-2.58535]	-18.39053 (18.4362) [-0.99752]	-12121.08 (6931.55) [-1.74868]	-0.972144 (0.45399) [-2.14131]	-0.693435 (0.53112) [-1.30561]
RET30SQR(-4)	0.780428 (0.75812) [1.02942]	-0.186525 (0.03904) [-4.77743]	0.009935 (0.00383) [2.59296]	1.919206 (1.39666) [1.37414]	27.39913 (24.6569) [1.11122]	0.273962 (0.25567) [1.07156]	10.47436 (18.8030) [0.55706]	-1344.195 (7069.46) [-0.19014]	-2.319487 (0.46303) [-5.00940]	0.491508 (0.54168) [0.90737]
RET30SQR(-5)	-0.929020 (0.73403)	0.111713 (0.03780)	-0.009316 (0.00371)	-2.419803 (1.35228)	-17.49947 (23.8734)	-0.724174 (0.24754)	0.498001 (18.2055)	-3922.943 (6844.82)	-0.440804 (0.44831)	-0.210187 (0.52447)

APPENDIX E

	[-1.26564]	[2.95520]	[-2.51117]	[-1.78943]	[-0.73301]	[-2.92545]	[0.02735]	[-0.57313]	[-0.98325]	[-0.40076]
RET30CUBE(-1)	38.71944 (5.94905) [6.50850]	-0.546552 (0.30637) [-1.78394]	0.116533 (0.03007) [3.87595]	78.67538 (10.9597) [7.17862]	1060.367 (193.485) [5.48036]	9.754875 (2.00624) [4.86227]	915.7932 (147.549) [6.20670]	285825.8 (55474.7) [5.15236]	-12.46758 (3.63341) [-3.43137]	28.92165 (4.25065) [6.80405]
RET30CUBE(-2)	-6.872809 (5.95536) [-1.15405]	0.303413 (0.30670) [0.98929]	-0.030466 (0.03010) [-1.01222]	13.47431 (10.9713) [1.22814]	-141.1746 (193.690) [-0.72887]	-0.931019 (2.00837) [-0.46357]	22.29674 (147.706) [0.15095]	143433.1 (55533.6) [2.58282]	3.198804 (3.63727) [0.87945]	-5.940791 (4.25516) [-1.39614]
RET30CUBE(-3)	-4.152645 (5.96452) [-0.69622]	0.116276 (0.30717) [0.37854]	0.013172 (0.03014) [0.43698]	58.32496 (10.9882) [5.30798]	-71.50751 (193.988) [-0.36862]	-0.824354 (2.01145) [-0.40983]	-19.92072 (147.933) [-0.13466]	-104592.0 (55618.9) [-1.88051]	-6.482108 (3.64286) [-1.77940]	-3.335267 (4.26170) [-0.78261]
RET30CUBE(-4)	11.80411 (6.00805) [1.96472]	-0.624601 (0.30941) [-2.01867]	0.152419 (0.03036) [5.01972]	-4.838255 (11.0684) [-0.43712]	411.9187 (195.404) [2.10804]	3.415477 (2.02614) [1.68571]	235.8788 (149.012) [1.58295]	66319.83 (56024.9) [1.18376]	-1.885599 (3.66945) [-0.51386]	8.379621 (4.29281) [1.95201]
RET30CUBE(-5)	-3.357354 (6.03830) [-0.55601]	0.580188 (0.31097) [1.86574]	-0.011284 (0.03052) [-0.36975]	-1.267685 (11.1241) [-0.11396]	-17.52586 (196.388) [-0.08924]	-0.982495 (2.03634) [-0.48248]	-72.94632 (149.763) [-0.48708]	-60097.74 (56307.0) [-1.06732]	0.467875 (3.68792) [0.12687]	-2.312334 (4.31442) [-0.53595]
RET30VOL(-1)	-0.037110 (0.01347) [-2.75492]	-0.000807 (0.00069) [-1.16358]	-0.000242 (6.8E-05) [-3.55539]	-0.170031 (0.02482) [-6.85170]	-1.393150 (0.43811) [-3.17994]	-0.011909 (0.00454) [-2.62147]	-0.304517 (0.33409) [-0.91147]	-134.8851 (125.611) [-1.07383]	0.016798 (0.00823) [2.04177]	-0.025225 (0.00962) [-2.62081]
RET30VOL(-2)	-0.035901 (0.01352) [-2.65478]	0.002193 (0.00070) [3.14845]	-0.000396 (6.8E-05) [-5.79939]	-0.074840 (0.02491) [-3.00402]	-1.472115 (0.43982) [-3.34707]	-0.008553 (0.00456) [-1.87539]	-0.480180 (0.33540) [-1.43165]	-227.8708 (126.103) [-1.80702]	0.020321 (0.00826) [2.46034]	-0.027264 (0.00966) [-2.82163]
RET30VOL(-3)	0.022393 (0.01339) [1.67177]	-0.000814 (0.00069) [-1.17973]	9.07E-05 (6.8E-05) [1.33952]	-0.052421 (0.02468) [-2.12437]	0.393336 (0.43564) [0.90289]	0.011127 (0.00452) [2.46339]	0.291712 (0.33221) [0.87809]	-41.15283 (124.904) [-0.32948]	0.006663 (0.00818) [0.81452]	0.011134 (0.00957) [1.16338]
RET30VOL(-4)	0.046846 (0.01337) [3.50255]	0.000536 (0.00069) [0.77862]	0.000309 (6.8E-05) [4.57390]	0.072578 (0.02464) [2.94554]	0.985659 (0.43500) [2.26590]	0.017811 (0.00451) [3.94881]	0.286052 (0.33172) [0.86232]	241.1434 (124.720) [1.93349]	-0.006467 (0.00817) [-0.79168]	0.029072 (0.00956) [3.04209]
RET30VOL(-5)	-0.002856 (0.01332) [-0.21437]	-0.002434 (0.00069) [-3.54826]	5.74E-05 (6.7E-05) [0.85253]	0.004573 (0.02454) [0.18635]	-0.291796 (0.43327) [-0.67347]	-0.006834 (0.00449) [-1.52118]	-0.102332 (0.33041) [-0.30971]	160.4188 (124.226) [1.29135]	-0.016947 (0.00814) [-2.08282]	0.003892 (0.00952) [0.40886]
RETVOLSNS(-1)	0.011677 (0.00164) [7.13782]	0.000139 (8.4E-05) [1.65127]	4.08E-05 (8.3E-06) [4.93089]	0.019286 (0.00301) [6.39903]	0.371123 (0.05321) [6.97493]	0.002762 (0.00055) [5.00638]	0.216312 (0.04058) [5.33103]	70.57541 (15.2555) [4.62622]	0.001965 (0.00100) [1.96639]	0.008924 (0.00117) [7.63473]
RETVOLSNS(-2)	-0.004376	-0.000238	3.34E-06	-0.007872	-0.091346	-0.001702	-0.129136	-2.467718	-0.001094	-0.002685

APPENDIX E

	(0.00164) [-2.66214]	(8.5E-05) [-2.80970]	(8.3E-06) [0.40212]	(0.00303) [-2.59944]	(0.05346) [-1.70854]	(0.00055) [-3.07088]	(0.04077) [-3.16732]	(15.3290) [-0.16098]	(0.00100) [-1.08999]	(0.00117) [-2.28633]
RETVOLSNS(-3)	1.78E-05 (0.00165) [0.01078]	-2.25E-05 (8.5E-05) [-0.26495]	-2.20E-07 (8.3E-06) [-0.02645]	0.000631 (0.00303) [0.20811]	0.054453 (0.05355) [1.01689]	0.000135 (0.00056) [0.24256]	0.044818 (0.04084) [1.09754]	8.203632 (15.3532) [0.53433]	0.000968 (0.00101) [0.96219]	-0.000118 (0.00118) [-0.10014]
RETVOLSNS(-4)	0.000199 (0.00164) [0.12118]	-0.000149 (8.4E-05) [-1.76096]	3.61E-06 (8.3E-06) [0.43516]	-0.000139 (0.00302) [-0.04602]	0.093905 (0.05334) [1.76036]	-8.24E-05 (0.00055) [-0.14889]	-0.019728 (0.04068) [-0.48495]	-7.748521 (15.2944) [-0.50662]	-0.001138 (0.00100) [-1.13582]	0.000273 (0.00117) [0.23281]
RETVOLSNS(-5)	0.001174 (0.00164) [0.71523]	0.000126 (8.5E-05) [1.49407]	-7.32E-06 (8.3E-06) [-0.88226]	0.001077 (0.00302) [0.35626]	0.095988 (0.05336) [1.79871]	3.88E-05 (0.00055) [0.07011]	0.052004 (0.04070) [1.27789]	5.525270 (15.3004) [0.36112]	0.001201 (0.00100) [1.19875]	0.001142 (0.00117) [0.97445]
DIR(-1)	-3.844548 (11.6293) [-0.33059]	-1.140089 (0.59891) [-1.90362]	0.097922 (0.05877) [1.66611]	-3.250850 (21.4242) [-0.15174]	-174.3018 (378.228) [-0.46084]	-0.957842 (3.92183) [-0.24423]	-399.5051 (288.432) [-1.38509]	-99934.33 (108443.) [-0.92154]	1.021831 (7.10266) [0.14387]	-2.714433 (8.30926) [-0.32668]
DIR(-2)	-22.72889 (11.8493) [-1.91816]	-1.354650 (0.61023) [-2.21989]	-0.072710 (0.05988) [-1.21416]	-26.35452 (21.8295) [-1.20729]	-750.2993 (385.382) [-1.94690]	-13.34065 (3.99602) [-3.33849]	-286.2254 (293.888) [-0.97393]	-120822.9 (110494.) [-1.09348]	-20.80989 (7.23702) [-2.87548]	-9.315329 (8.46644) [-1.10027]
DIR(-3)	32.93157 (11.3492) [2.90166]	0.298678 (0.58448) [0.51101]	0.128073 (0.05736) [2.23289]	67.37536 (20.9082) [3.22244]	969.2029 (369.117) [2.62573]	12.65802 (3.82737) [3.30724]	565.1048 (281.484) [2.00759]	349939.0 (105831.) [3.30658]	7.707316 (6.93158) [1.11191]	20.60664 (8.10911) [2.54117]
DIR(-4)	-6.523085 (11.8095) [-0.55236]	2.600451 (0.60818) [4.27577]	-0.200640 (0.05968) [-3.36173]	-70.49371 (21.7561) [-3.24018]	-49.13767 (384.087) [-0.12793]	-1.383238 (3.98259) [-0.34732]	188.3093 (292.900) [0.64291]	37437.69 (110123.) [0.33996]	14.81970 (7.21270) [2.05467]	-4.909598 (8.43798) [-0.58184]
DIR(-5)	0.352338 (11.5553) [0.03049]	-0.443164 (0.59510) [-0.74469]	0.049370 (0.05840) [0.84539]	32.90430 (21.2879) [1.54568]	10.71157 (375.822) [0.02850]	3.022114 (3.89688) [0.77552]	-65.52521 (286.597) [-0.22863]	-149108.2 (107753.) [-1.38379]	-2.992276 (7.05748) [-0.42399]	-2.481229 (8.25640) [-0.30052]
ARTAZ(-1)	0.012730 (0.00170) [7.47306]	-0.000177 (8.8E-05) [-2.01679]	1.08E-05 (8.6E-06) [1.24878]	0.016691 (0.00314) [5.31846]	0.400966 (0.05540) [7.23718]	0.003522 (0.00057) [6.13022]	0.457074 (0.04225) [10.8183]	188.1738 (15.8850) [11.8460]	-0.002445 (0.00104) [-2.34982]	0.009202 (0.00122) [7.56035]
ARTAZ(-2)	-0.000322 (0.00175) [-0.18394]	0.000155 (9.0E-05) [1.72263]	-4.97E-06 (8.9E-06) [-0.56129]	0.001398 (0.00323) [0.43341]	-0.018713 (0.05696) [-0.32856]	0.000162 (0.00059) [0.27431]	0.012465 (0.04343) [0.28698]	23.08379 (16.3302) [1.41356]	0.001612 (0.00107) [1.50710]	-0.000476 (0.00125) [-0.38076]
ARTAZ(-3)	-0.001705 (0.00175) [-0.97509]	-8.13E-05 (9.0E-05) [-0.90304]	-1.47E-06 (8.8E-06) [-0.16591]	-0.001128 (0.00322) [-0.35026]	-0.036791 (0.05686) [-0.64703]	-0.000367 (0.00059) [-0.62306]	-0.028438 (0.04336) [-0.65583]	-29.10230 (16.3030) [-1.78509]	-0.001973 (0.00107) [-1.84815]	-0.001347 (0.00125) [-1.07791]

APPENDIX E

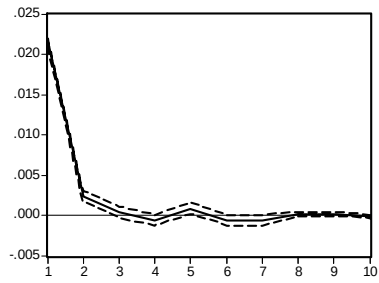
ARTAZ(-4)	0.001276 (0.00174) [0.73166]	-3.46E-06 (9.0E-05) [-0.03850]	1.39E-06 (8.8E-06) [0.15728]	-0.002316 (0.00321) [-0.72097]	0.020507 (0.05671) [0.36164]	0.000429 (0.00059) [0.72890]	0.076333 (0.04324) [1.76519]	-5.527596 (16.2584) [-0.33998]	0.000323 (0.00106) [0.30352]	0.000850 (0.00125) [0.68259]
ARTAZ(-5)	-0.000296 (0.00173) [-0.17096]	-4.08E-05 (8.9E-05) [-0.45767]	1.22E-05 (8.8E-06) [1.39558]	0.004221 (0.00319) [1.32312]	-0.027895 (0.05632) [-0.49533]	9.75E-05 (0.00058) [0.16697]	-0.057430 (0.04295) [-1.33725]	-4.497142 (16.1468) [-0.27852]	-0.001431 (0.00106) [-1.35336]	-0.000395 (0.00124) [-0.31898]
MAXFARK(-1)	-9.62E-06 (2.7E-06) [-3.61855]	2.78E-07 (1.4E-07) [2.03081]	-4.57E-08 (1.3E-08) [-3.39771]	-1.03E-05 (4.9E-06) [-2.11058]	-0.000301 (8.7E-05) [-3.47674]	-2.69E-06 (9.0E-07) [-3.00161]	-0.000158 (6.6E-05) [-2.39659]	0.156103 (0.02480) [6.29413]	1.83E-06 (1.6E-06) [1.12944]	-6.92E-06 (1.9E-06) [-3.64231]
MAXFARK(-2)	5.17E-06 (2.7E-06) [1.91493]	3.76E-08 (1.4E-07) [0.27005]	3.22E-08 (1.4E-08) [2.35533]	6.04E-06 (5.0E-06) [1.21414]	0.000174 (8.8E-05) [1.98274]	2.29E-06 (9.1E-07) [2.50903]	-5.26E-06 (6.7E-05) [-0.07845]	0.005045 (0.02519) [0.20031]	-7.94E-07 (1.6E-06) [-0.48104]	2.88E-06 (1.9E-06) [1.49247]
MAXFARK(-3)	-2.69E-07 (2.7E-06) [-0.09980]	1.90E-07 (1.4E-07) [1.36854]	-1.70E-08 (1.4E-08) [-1.24405]	-1.44E-06 (5.0E-06) [-0.29023]	-6.72E-05 (8.8E-05) [-0.76547]	-4.83E-07 (9.1E-07) [-0.53105]	2.27E-05 (6.7E-05) [0.33876]	-0.055241 (0.02517) [-2.19499]	3.36E-06 (1.6E-06) [2.03580]	2.35E-07 (1.9E-06) [0.12207]
MAXFARK(-4)	1.85E-06 (2.7E-06) [0.68638]	-4.07E-08 (1.4E-07) [-0.29305]	3.61E-08 (1.4E-08) [2.65380]	2.38E-06 (5.0E-06) [0.47975]	3.09E-05 (8.8E-05) [0.35309]	8.40E-07 (9.1E-07) [0.92380]	-7.60E-05 (6.7E-05) [-1.13682]	0.131770 (0.02513) [5.24393]	1.09E-06 (1.6E-06) [0.66415]	1.01E-06 (1.9E-06) [0.52612]
MAXFARK(-5)	-5.46E-06 (2.3E-06) [-2.35242]	1.61E-07 (1.2E-07) [1.34833]	-3.02E-08 (1.2E-08) [-2.57766]	-1.24E-05 (4.3E-06) [-2.90137]	-0.000201 (7.5E-05) [-2.67068]	-1.46E-06 (7.8E-07) [-1.86457]	-7.99E-05 (5.8E-05) [-1.38913]	-0.115960 (0.02163) [-5.36079]	-1.08E-07 (1.4E-06) [-0.07631]	-3.99E-06 (1.7E-06) [-2.40827]
RANGE(-1)	0.077751 (0.04583) [1.69633]	0.005603 (0.00236) [2.37350]	1.17E-06 (0.00023) [0.00507]	-0.171308 (0.08444) [-2.02876]	2.772034 (1.49071) [1.85953]	0.028890 (0.01546) [1.86902]	1.987436 (1.13680) [1.74827]	-5910.799 (427.408) [-13.8294]	0.205843 (0.02799) [7.35315]	0.049085 (0.03275) [1.49882]
RANGE(-2)	-0.131635 (0.04994) [-2.63601]	0.003126 (0.00257) [1.21539]	-0.000881 (0.00025) [-3.49084]	-0.378406 (0.09200) [-4.11326]	-4.400145 (1.62413) [-2.70923]	-0.051661 (0.01684) [-3.06767]	-0.931323 (1.23854) [-0.75195]	1327.079 (465.661) [2.84988]	0.185424 (0.03050) [6.07964]	-0.079877 (0.03568) [-2.23869]
RANGE(-3)	-0.012890 (0.05033) [-0.25608]	0.002080 (0.00259) [0.80237]	-5.93E-05 (0.00025) [-0.23292]	-0.196436 (0.09273) [-2.11839]	0.140932 (1.63705) [0.08609]	0.019629 (0.01697) [1.15636]	-1.464228 (1.24840) [-1.17289]	342.3394 (469.366) [0.72937]	0.103965 (0.03074) [3.38188]	-0.032478 (0.03596) [-0.90307]
RANGE(-4)	-0.112543 (0.05003) [-2.24940]	0.009708 (0.00258) [3.76777]	-0.000519 (0.00025) [-2.05160]	-0.024435 (0.09217) [-0.26510]	-4.176686 (1.62723) [-2.56674]	-0.064823 (0.01687) [-3.84189]	-1.732799 (1.24091) [-1.39640]	-740.1358 (466.550) [-1.58640]	0.227156 (0.03056) [7.43373]	-0.047364 (0.03575) [-1.32492]
RANGE(-5)	0.133025 (0.04572) [2.90981]	0.001604 (0.00235) [0.68116]	0.000847 (0.00023) [3.66792]	0.371566 (0.08422) [4.41181]	4.261204 (1.48685) [2.86593]	0.064670 (0.01542) [4.19466]	0.910685 (1.13385) [0.80318]	2496.617 (426.301) [5.85647]	0.121371 (0.02792) [4.34688]	0.068507 (0.03266) [2.09728]

APPENDIX E

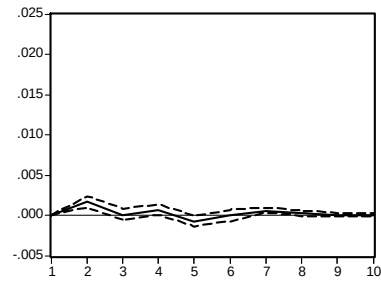
RET30AVGSEANS(-1)	-3.722219 (11.6402) [-0.31977]	-1.138862 (0.59947) [-1.89979]	0.099402 (0.05883) [1.68970]	-3.361190 (21.4443) [-0.15674]	-171.5897 (378.582) [-0.45324]	-0.869375 (3.92551) [-0.22147]	-400.3612 (288.702) [-1.38676]	-122355.4 (108545.) [-1.12723]	1.026500 (7.10933) [0.14439]	-3.680170 (8.31705) [-0.44248]
RET30AVGSEANS(-2)	-26.87837 (14.2371) [-1.88791]	-2.481397 (0.73320) [-3.38432]	0.024118 (0.07195) [0.33519]	-30.43729 (26.2283) [-1.16047]	-934.2959 (463.041) [-2.01774]	-14.35284 (4.80126) [-2.98939]	-689.1884 (353.109) [-1.95177]	-239174.9 (132760.) [-1.80156]	-19.56054 (8.69536) [-2.24954]	-13.27888 (10.1725) [-1.30537]
RET30AVGSEANS(-3)	6.467015 (14.2016) [0.45537]	-2.203026 (0.73137) [-3.01217]	0.153166 (0.07177) [2.13403]	37.29143 (26.1629) [1.42535]	47.11579 (461.886) [0.10201]	-1.518477 (4.78928) [-0.31706]	-117.5919 (352.228) [-0.33385]	112366.8 (132429.) [0.84851]	-12.23886 (8.67367) [-1.41104]	7.563790 (10.1471) [0.74541]
RET30AVGSEANS(-4)	-0.533587 (11.5648) [-0.04614]	0.421005 (0.59558) [0.70688]	-0.050613 (0.05845) [-0.86596]	-33.74445 (21.3053) [-1.58385]	-16.89980 (376.129) [-0.04493]	-3.098841 (3.90007) [-0.79456]	65.39714 (286.831) [0.22800]	145383.4 (107841.) [1.34812]	2.819833 (7.06325) [0.39923]	2.375206 (8.26314) [0.28745]
RET30AVGSEANS(-5)	0.037306 (0.06220) [0.59976]	-0.006103 (0.00320) [-1.90519]	5.80E-07 (0.00031) [0.00184]	0.051181 (0.11459) [0.44663]	2.673635 (2.02305) [1.32158]	0.017543 (0.02098) [0.83632]	1.464499 (1.54275) [0.94928]	1007.394 (580.037) [1.73678]	-0.048143 (0.03799) [-1.26723]	0.019529 (0.04444) [0.43941]
C	0.000245 (0.00128) [0.19115]	-0.000189 (6.6E-05) [-2.86744]	3.46E-06 (6.5E-06) [0.53571]	0.007071 (0.00236) [2.99963]	0.066874 (0.04162) [1.60689]	0.000729 (0.00043) [1.68913]	0.002402 (0.03174) [0.07568]	41.63370 (11.9321) [3.48921]	0.005132 (0.00078) [6.56706]	-0.000489 (0.00091) [-0.53476]
R-squared	0.087048	0.160296	0.079145	0.105063	0.086116	0.082963	0.074078	0.410794	0.398725	0.304263
Adj. R-squared	0.075512	0.149686	0.067509	0.093755	0.074569	0.071375	0.062379	0.403349	0.391127	0.295471
Sum sq. resids	1.832756	0.004861	4.68E-05	6.220210	1938.664	0.208437	1127.410	1.59E+08	0.683657	0.935665
S.E. equation	0.021521	0.001108	0.000109	0.039648	0.699952	0.007258	0.533775	200.6858	0.013144	0.015377
F-statistic	7.545846	15.10755	6.801860	9.290812	7.457455	7.159635	6.331601	55.17633	52.48029	34.60983
Log likelihood	9724.109	21612.56	30916.81	7275.255	-4231.613	14080.69	-3145.293	-26910.82	11700.29	11071.44
Akaike AIC	-4.826901	-10.75926	-15.40210	-3.604918	2.137033	-7.000841	1.594956	13.45400	-5.813020	-5.499220
Schwarz SC	-4.746786	-10.67915	-15.32199	-3.524804	2.217147	-6.920727	1.675071	13.53412	-5.732906	-5.419105
Mean dependent	0.000744	0.000501	-2.20E-06	0.004194	0.116471	0.000872	0.002087	7.321277	0.029008	0.000744
S.D. dependent	0.022383	0.001202	0.000113	0.041648	0.727606	0.007532	0.551244	259.8103	0.016845	0.018320
Determinant Residual Covariance		3.52E-38								
Log Likelihood (d.f. adjusted)		115952.7								
Akaike Information Criteria		-57.60616								
Schwarz Criteria		-56.80501								

Response to Cholesky One S.D. Innovations ± 2 S.E.

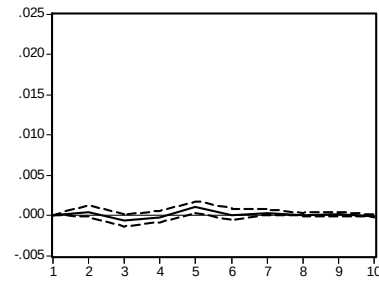
Response of RET30SEANS to RET30SEANS



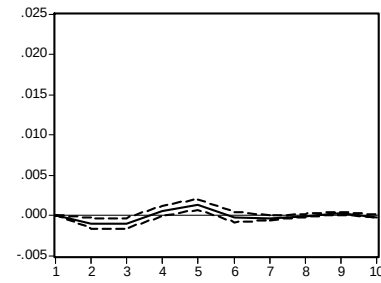
Response of RET30SEANS to RET30SQR



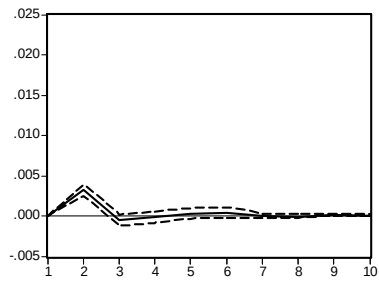
Response of RET30SEANS to RET30CUBE



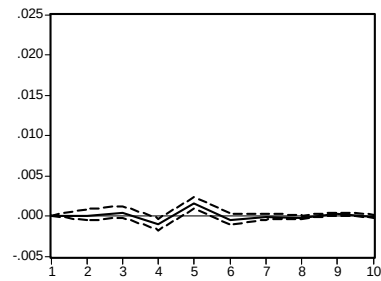
Response of RET30SEANS to RET30VOL



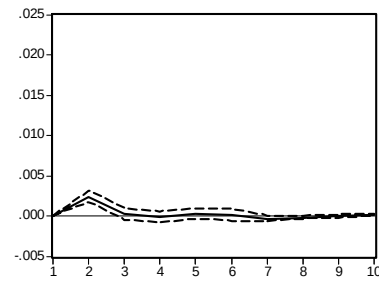
Response of RET30SEANS to RETVOLSNS



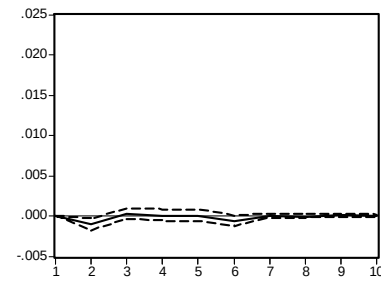
Response of RET30SEANS to DIR



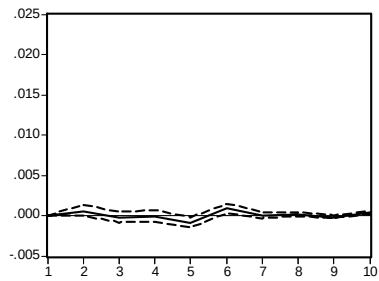
Response of RET30SEANS to ARTAZ



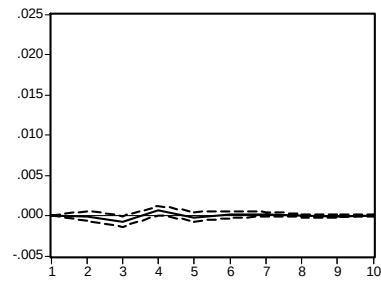
Response of RET30SEANS to MAXFARK

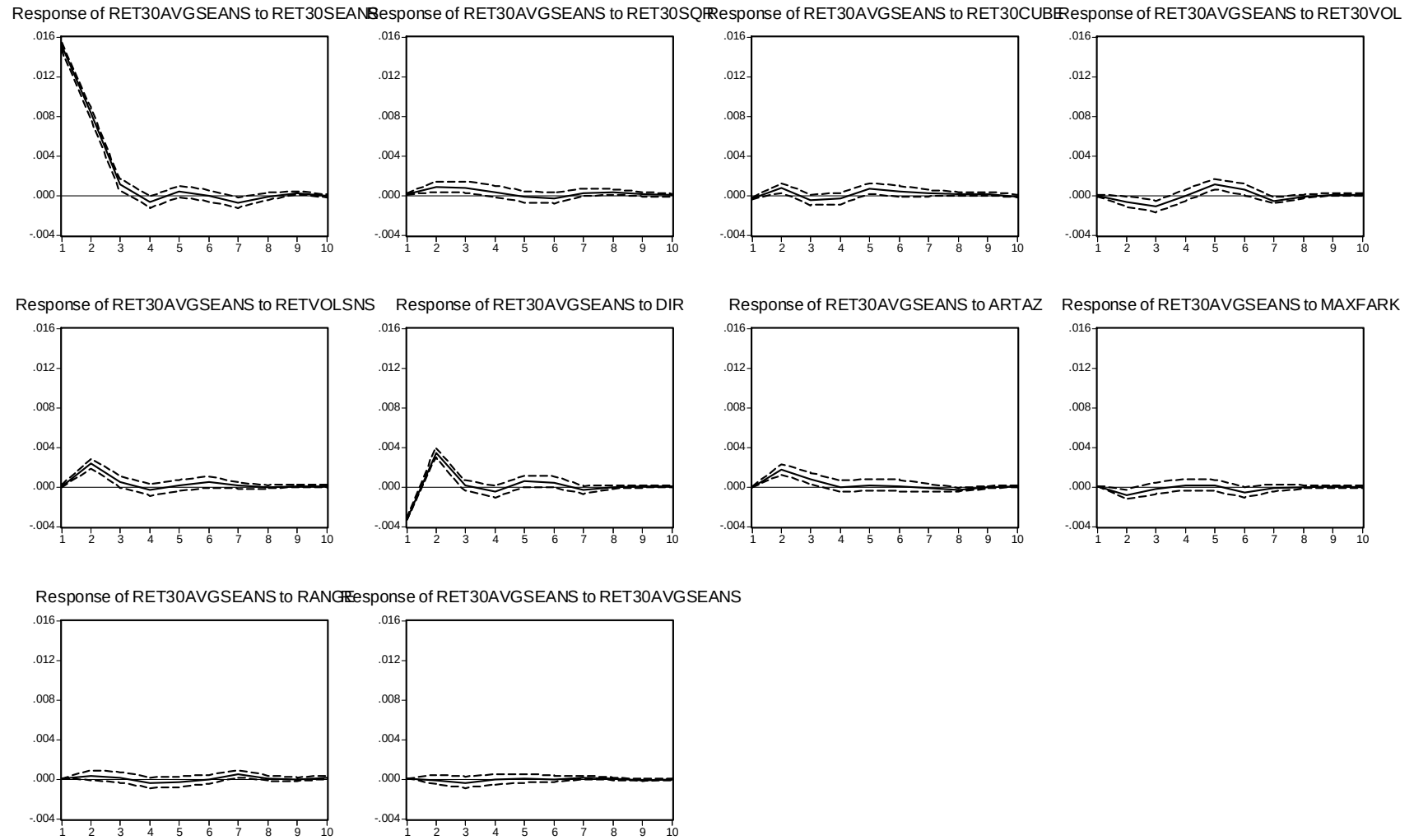


Response of RET30SEANS to RANGE



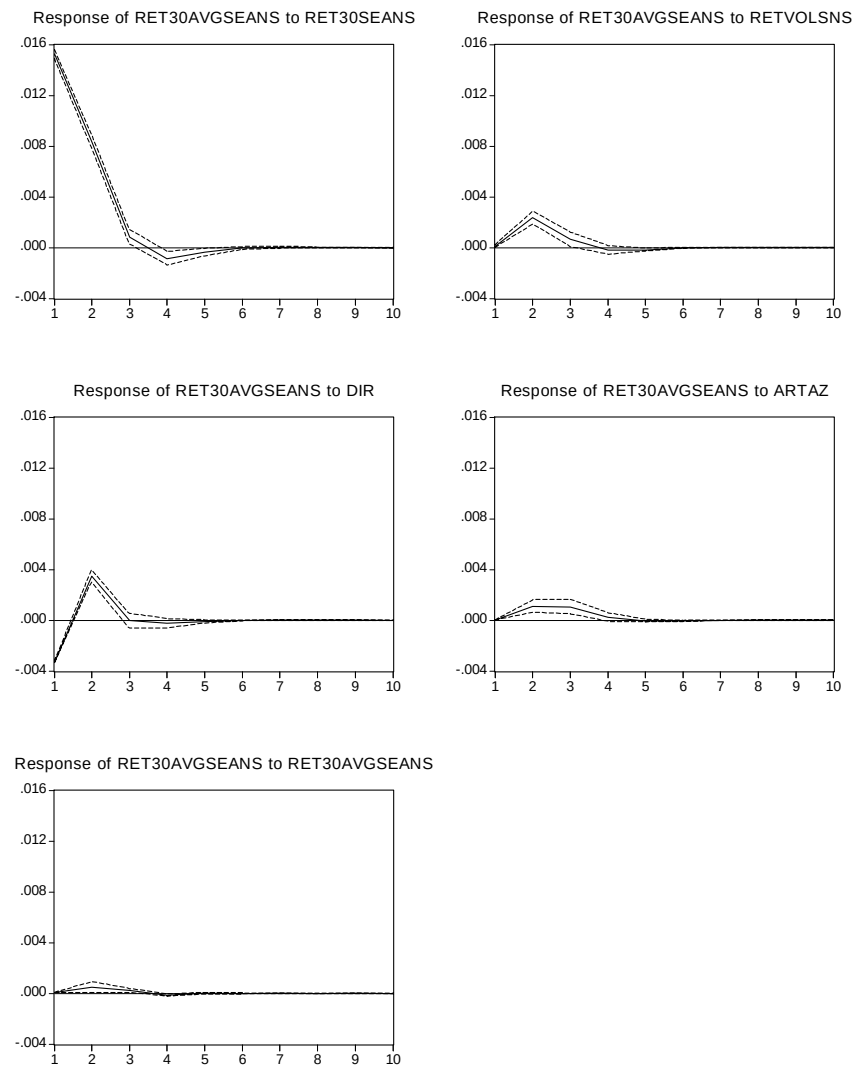
Response of RET30SEANS to RET30AVGSEANS



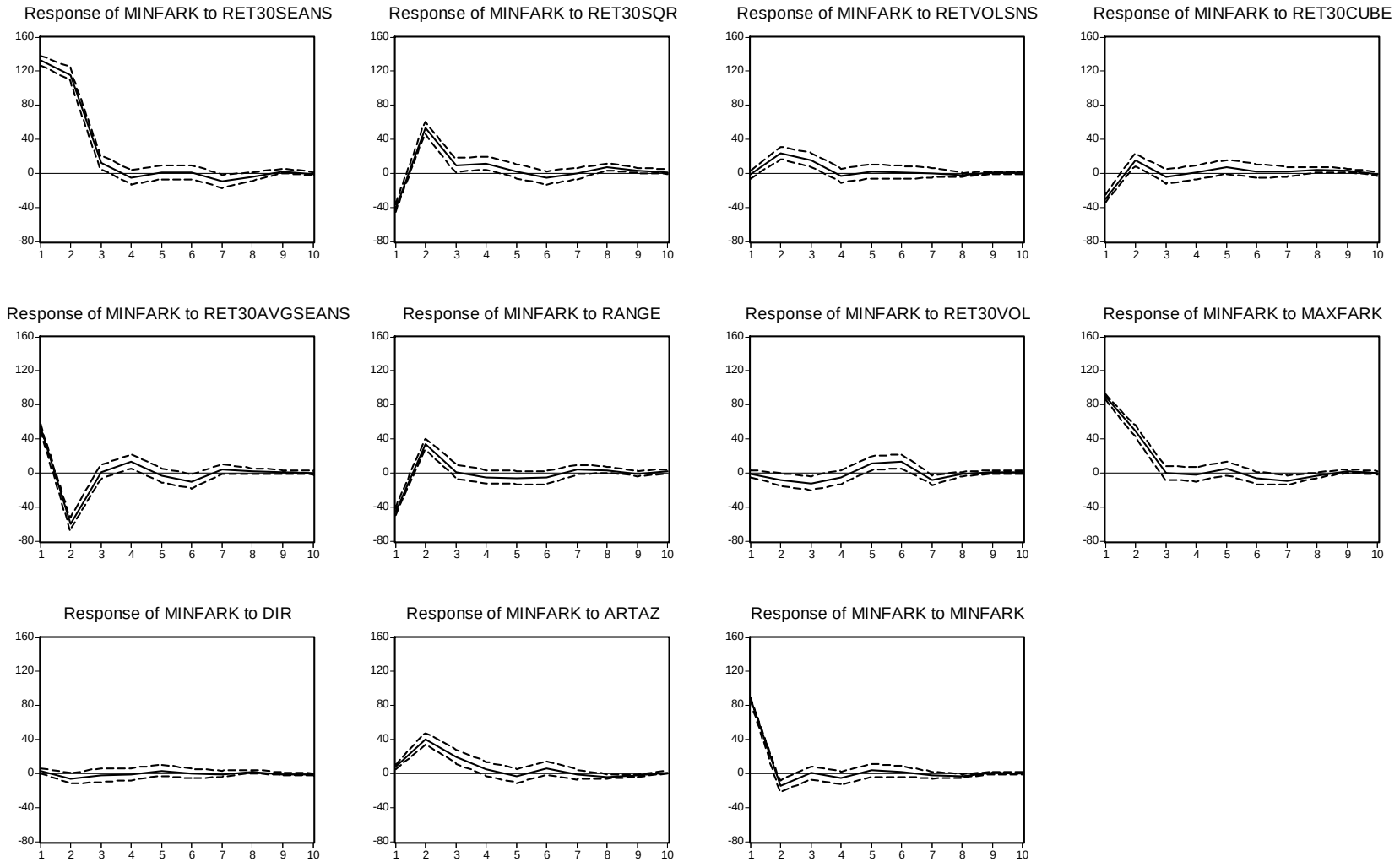
Response to Cholesky One S.D. Innovations ± 2 S.E.

APPENDIX H

Response to Cholesky One S.D. Innovations ± 2 S.E.

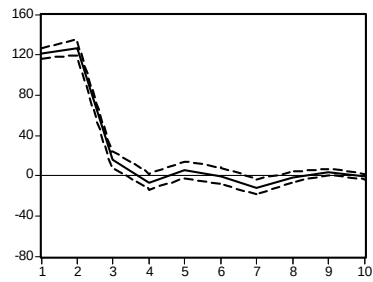


Response to Cholesky One S.D. Innovations ± 2 S.E.

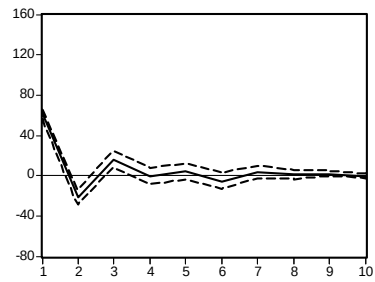


Response to Cholesky One S.D. Innovations ± 2 S.E.

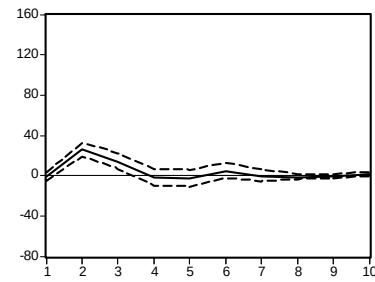
Response of MAXFARK to RET30SEANS



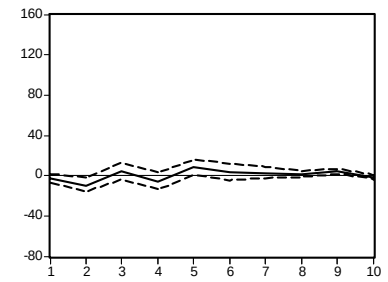
Response of MAXFARK to RET30SQR



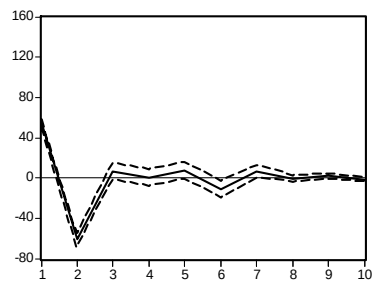
Response of MAXFARK to RETVOLSNS



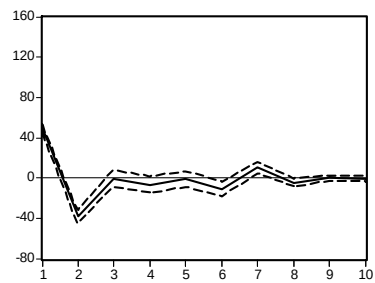
Response of MAXFARK to RET30CUBE



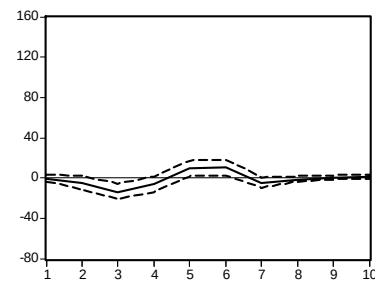
Response of MAXFARK to RET30AVGSEANS



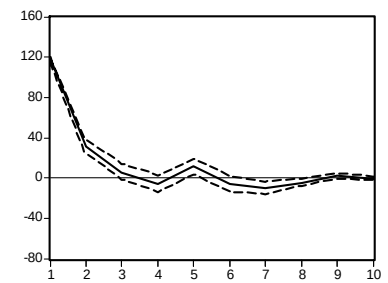
Response of MAXFARK to RANGE



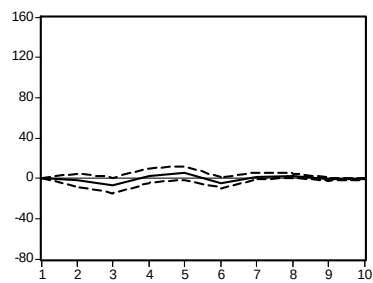
Response of MAXFARK to RET30VOL



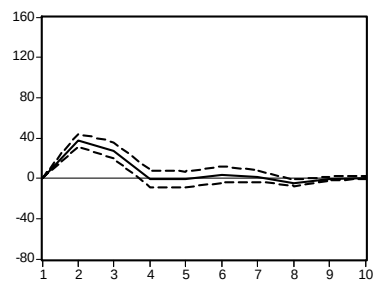
Response of MAXFARK to MAXFARK



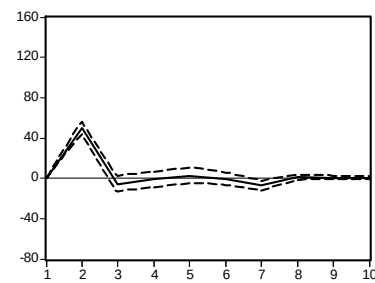
Response of MAXFARK to DIR



Response of MAXFARK to ARTAZ



Response of MAXFARK to MINFARK



APPENDIX J:

Vector Autoregression Estimates

Date: 06/11/06 Time: 15:15

Sample(adjusted): 7 2014

Included observations: 1945

Excluded observations: 63 after adjusting endpoints

Standard errors in () & t-statistics in []

	RET30	RET30SQR	RET30CUBE	RET30VOL	MAXFARK	DIR	ARTAZ	RET30AVGD	NETVOLCHG	VOLDISP
RET30(-1)	1.029407 (5.20126) [0.19791]	-0.188285 (0.39072) [-0.48190]	0.107206 (0.05738) [1.86851]	-3.934366 (2.41326) [-1.63031]	73477.36 (48713.5) [1.50836]	2.623949 (2.23919) [1.17183]	-1.905186 (99.1392) [-0.01922]	-0.838583 (3.54176) [-0.23677]	-41.37564 (49.3358) [-0.83865]	-53.24235 (29.7049) [-1.79237]
RET30(-2)	5.275926 (6.05715) [0.87102]	1.004183 (0.45501) [2.20695]	0.163780 (0.06682) [2.45121]	-1.169999 (2.81036) [-0.41632]	94821.03 (56729.5) [1.67146]	6.846463 (2.60765) [2.62553]	89.09325 (115.453) [0.77168]	-0.874743 (4.12456) [-0.21208]	-185.6673 (57.4541) [-3.23158]	-29.82639 (34.5930) [-0.86221]
RET30(-3)	-7.117590 (6.00285) [-1.18570]	0.087502 (0.45093) [0.19405]	-0.136217 (0.06622) [-2.05713]	-3.247102 (2.78517) [-1.16585]	72497.01 (56220.9) [1.28950]	-0.587077 (2.58428) [-0.22717]	-14.63684 (114.418) [-0.12792]	-6.168035 (4.08759) [-1.50897]	-202.8711 (56.9391) [-3.56295]	15.14860 (34.2829) [0.44187]
RET30(-4)	-17.21620 (4.97896) [-3.45779]	-0.727441 (0.37402) [-1.94494]	-0.330243 (0.05492) [-6.01287]	-1.955089 (2.31011) [-0.84632]	-10877.59 (46631.4) [-0.23327]	-4.898173 (2.14348) [-2.28515]	-88.44776 (94.9019) [-0.93199]	-12.15198 (3.39038) [-3.58426]	-109.3734 (47.2271) [-2.31590]	-26.28618 (28.4353) [-0.92442]
RET30(-5)	0.102403 (0.10276) [0.99648]	0.008555 (0.00772) [1.10823]	0.001673 (0.00113) [1.47606]	0.023167 (0.04768) [0.48589]	1341.653 (962.466) [1.39397]	0.016111 (0.04424) [0.36415]	1.486742 (1.95876) [0.75902]	0.086183 (0.06998) [1.23160]	0.349660 (0.97476) [0.35871]	-0.915051 (0.58690) [-1.55913]
RET30SQR(-1)	0.708526 (0.44686) [1.58557]	0.190391 (0.03357) [5.67181]	0.028523 (0.00493) [5.78643]	-0.533720 (0.20733) [-2.57423]	-5970.384 (4185.16) [-1.42656]	0.318068 (0.19238) [1.65336]	3.485344 (8.51742) [0.40920]	0.395351 (0.30429) [1.29928]	6.714121 (4.23862) [1.58403]	-0.860486 (2.55206) [-0.33717]
RET30SQR(-2)	-0.425910 (0.45119) [-0.94397]	0.236064 (0.03389) [6.96492]	-0.021221 (0.00498) [-4.26371]	0.418787 (0.20934) [2.00050]	-3006.058 (4225.72) [-0.71137]	-0.003220 (0.19424) [-0.01658]	2.530396 (8.59997) [0.29423]	-0.408181 (0.30723) [-1.32856]	17.04214 (4.27970) [3.98209]	2.093682 (2.57680) [0.81251]
RET30SQR(-3)	-0.148962 (0.46198) [-0.32244]	-0.061106 (0.03470) [-1.76080]	-0.007215 (0.00510) [-1.41575]	-0.338777 (0.21435) [-1.58050]	-573.4528 (4326.78) [-0.13254]	0.020607 (0.19889) [0.10361]	-2.115720 (8.80564) [-0.24027]	-0.189998 (0.31458) [-0.60397]	1.379251 (4.38205) [0.31475]	1.320606 (2.63842) [0.50053]
RET30SQR(-4)	0.337245 (0.46343) [0.72772]	-0.024474 (0.03481) [-0.70303]	-0.002828 (0.00511) [-0.55327]	0.296748 (0.21502) [1.38010]	-3219.891 (4340.32) [-0.74186]	0.108032 (0.19951) [0.54149]	12.96325 (8.83320) [1.46756]	0.211617 (0.31557) [0.67059]	-6.244141 (4.39576) [-1.42049]	-2.988478 (2.64668) [-1.12914]
RET30SQR(-5)	-0.224947 (0.45918)	0.138780 (0.03449)	0.006720 (0.00507)	0.322316 (0.21305)	-1394.305 (4300.51)	-0.119921 (0.19768)	-10.48023 (8.75217)	-0.114771 (0.31267)	-5.205558 (4.35544)	-0.464462 (2.62240)

APPENDIX J:

	[-0.48989]	[4.02341]	[1.32670]	[1.51289]	[-0.32422]	[-0.60664]	[-1.19744]	[-0.36707]	[-1.19519]	[-0.17711]
RET30CUBE(-1)	-3.290730 (3.38042) [-0.97347]	0.947217 (0.25394) [3.73015]	0.130551 (0.03729) [3.50103]	-8.655076 (1.56843) [-5.51830]	54394.76 (31660.1) [1.71809]	-1.382068 (1.45530) [-0.94968]	39.28666 (64.4329) [0.60973]	-1.780815 (2.30187) [-0.77364]	-35.40733 (32.0645) [-1.10425]	-15.43351 (19.3059) [-0.79942]
RET30CUBE(-2)	3.487728 (3.53109) [0.98772]	-0.278895 (0.26525) [-1.05143]	0.165088 (0.03895) [4.23830]	-0.413732 (1.63834) [-0.25253]	54554.28 (33071.2) [1.64960]	-0.575459 (1.52017) [-0.37855]	14.82657 (67.3048) [0.22029]	4.097612 (2.40447) [1.70417]	-50.20839 (33.4936) [-1.49904]	8.604694 (20.1664) [0.42668]
RET30CUBE(-3)	2.023645 (3.59107) [0.56352]	-0.832719 (0.26976) [-3.08690]	0.016032 (0.03961) [0.40471]	-0.778874 (1.66617) [-0.46746]	-73054.34 (33632.9) [-2.17211]	4.886688 (1.54599) [3.16089]	60.18335 (68.4479) [0.87926]	-2.908155 (2.44531) [-1.18928]	-96.16687 (34.0625) [-2.82325]	-8.084245 (20.5089) [-0.39418]
RET30CUBE(-4)	4.109020 (3.54116) [1.16036]	0.503571 (0.26601) [1.89305]	-0.007075 (0.03906) [-0.18112]	-0.327889 (1.64301) [-0.19957]	24779.50 (33165.5) [0.74715]	2.133592 (1.52450) [1.39954]	85.03469 (67.4966) [1.25984]	1.926292 (2.41132) [0.79885]	57.71061 (33.5891) [1.71814]	4.536076 (20.2239) [0.22429]
RET30CUBE(-5)	-9.533585 (3.48972) [-2.73190]	0.335329 (0.26215) [1.27917]	-0.073253 (0.03850) [-1.90292]	1.549322 (1.61914) [0.95688]	-46166.53 (32683.7) [-1.41252]	-3.623641 (1.50236) [-2.41197]	-179.2795 (66.5162) [-2.69528]	-5.953726 (2.37629) [-2.50547]	54.48367 (33.1012) [1.64597]	36.70039 (19.9301) [1.84145]
RET30VOL(-1)	0.125153 (0.05950) [2.10344]	-0.002537 (0.00447) [-0.56768]	0.001341 (0.00066) [2.04296]	0.096449 (0.02761) [3.49374]	1307.833 (557.255) [2.34692]	0.050748 (0.02562) [1.98118]	1.895834 (1.13410) [1.67167]	0.074152 (0.04052) [1.83021]	-0.713988 (0.56437) [-1.26510]	0.232322 (0.33981) [0.68369]
RET30VOL(-2)	0.238774 (0.05966) [4.00211]	-0.012083 (0.00448) [-2.69605]	0.003747 (0.00066) [5.69391]	-0.044187 (0.02768) [-1.59626]	773.0705 (558.778) [1.38350]	0.090784 (0.02569) [3.53449]	3.235986 (1.13720) [2.84558]	0.147123 (0.04063) [3.62135]	0.936144 (0.56592) [1.65421]	0.068183 (0.34074) [0.20010]
RET30VOL(-3)	0.079245 (0.06028) [1.31459]	0.011819 (0.00453) [2.61012]	0.000416 (0.00066) [0.62540]	0.006901 (0.02797) [0.24675]	128.9155 (564.571) [0.22834]	0.030243 (0.02595) [1.16537]	1.862006 (1.14899) [1.62056]	0.049387 (0.04105) [1.20316]	0.456302 (0.57178) [0.79803]	-0.351259 (0.34427) [-1.02031]
RET30VOL(-4)	-0.080616 (0.06048) [-1.33301]	0.011446 (0.00454) [2.51957]	-0.000998 (0.00067) [-1.49573]	0.001683 (0.02806) [0.05998]	-216.7952 (566.411) [-0.38275]	-0.043788 (0.02604) [-1.68185]	-1.380792 (1.15273) [-1.19785]	-0.035846 (0.04118) [-0.87044]	0.842658 (0.57365) [1.46895]	0.460574 (0.34539) [1.33349]
RET30VOL(-5)	-0.120438 (0.05872) [-2.05090]	-0.000455 (0.00441) [-0.10308]	-0.001801 (0.00065) [-2.78046]	-0.004801 (0.02725) [-0.17621]	-773.7501 (549.995) [-1.40683]	-0.042987 (0.02528) [-1.70034]	-1.334442 (1.11932) [-1.19219]	-0.076939 (0.03999) [-1.92405]	0.102436 (0.55702) [0.18390]	0.659128 (0.33538) [1.96531]
MAXFARK(-1)	-5.91E-08 (3.4E-06) [-0.01758]	-6.40E-08 (2.5E-07) [-0.25347]	-5.46E-09 (3.7E-08) [-0.14733]	-2.08E-06 (1.6E-06) [-1.33222]	-0.023493 (0.03146) [-0.74666]	9.37E-07 (1.4E-06) [0.64762]	-4.38E-05 (6.4E-05) [-0.68432]	-1.02E-06 (2.3E-06) [-0.44544]	-0.000178 (3.2E-05) [-5.58716]	6.62E-07 (1.9E-05) [0.03448]
MAXFARK(-2)	-3.11E-06	6.41E-07	9.89E-08	4.10E-06	0.016664	-1.42E-06	-0.000124	-1.62E-06	0.000227	5.48E-05

APPENDIX J:

	(3.4E-06) [-0.92427]	(2.5E-07) [2.53569]	(3.7E-08) [2.66412]	(1.6E-06) [2.62867]	(0.03151) [0.52877]	(1.4E-06) [-0.98268]	(6.4E-05) [-1.92768]	(2.3E-06) [-0.70894]	(3.2E-05) [7.11246]	(1.9E-05) [2.85100]
MAXFARK(-3)	-4.46E-06 (3.4E-06) [-1.29951]	4.65E-07 (2.6E-07) [1.80223]	-5.26E-08 (3.8E-08) [-1.38868]	3.03E-06 (1.6E-06) [1.90269]	-0.045838 (0.03214) [-1.42614]	-1.56E-06 (1.5E-06) [-1.05544]	-4.94E-05 (6.5E-05) [-0.75449]	-2.86E-06 (2.3E-06) [-1.22293]	-7.89E-05 (3.3E-05) [-2.42348]	1.58E-05 (2.0E-05) [0.80695]
MAXFARK(-4)	-4.84E-06 (3.4E-06) [-1.40809]	-5.61E-07 (2.6E-07) [-2.17462]	-5.96E-08 (3.8E-08) [-1.57248]	-4.83E-08 (1.6E-06) [-0.03032]	-0.009761 (0.03216) [-0.30349]	-5.80E-07 (1.5E-06) [-0.39202]	-2.41E-05 (6.5E-05) [-0.36750]	-4.28E-06 (2.3E-06) [-1.83105]	-1.23E-05 (3.3E-05) [-0.37623]	1.24E-05 (2.0E-05) [0.63033]
MAXFARK(-5)	-2.10E-08 (3.2E-06) [-0.00647]	-2.42E-07 (2.4E-07) [-0.99371]	7.00E-08 (3.6E-08) [1.95320]	-5.69E-07 (1.5E-06) [-0.37748]	-0.055616 (0.03041) [-1.82862]	-2.31E-07 (1.4E-06) [-0.16501]	-8.82E-05 (6.2E-05) [-1.42556]	1.85E-07 (2.2E-06) [0.08377]	3.24E-05 (3.1E-05) [1.05202]	-1.50E-05 (1.9E-05) [-0.80693]
DIR(-1)	-1.218151 (5.20434) [-0.23406]	0.179243 (0.39095) [0.45848]	-0.110628 (0.05741) [-1.92701]	3.956844 (2.41468) [1.63866]	-65782.48 (48742.4) [-1.34960]	-2.746098 (2.24052) [-1.22565]	-2.657887 (99.1979) [-0.02679]	1.769936 (3.54385) [0.49944]	41.94847 (49.3650) [0.84976]	52.73481 (29.7225) [1.77424]
DIR(-2)	-4.001525 (5.15477) [-0.77628]	-1.175670 (0.38722) [-3.03615]	-0.055415 (0.05686) [-0.97456]	-2.745800 (2.39169) [-1.14806]	-20593.15 (48278.1) [-0.42655]	-4.060539 (2.21918) [-1.82975]	-83.90805 (98.2531) [-0.85400]	0.121334 (3.51010) [0.03457]	144.1338 (48.8948) [2.94784]	-25.28965 (29.4394) [-0.85904]
DIR(-3)	12.24053 (5.06812) [2.41520]	0.902989 (0.38071) [2.37183]	0.298240 (0.05591) [5.33463]	2.029498 (2.35148) [0.86307]	23359.22 (47466.5) [0.49212]	7.292753 (2.18187) [3.34244]	102.3624 (96.6014) [1.05964]	5.280681 (3.45109) [1.53015]	18.01567 (48.0728) [0.37476]	-44.98008 (28.9445) [-1.55401]
DIR(-4)	10.03276 (5.21253) [1.92474]	0.788420 (0.39156) [2.01352]	0.193149 (0.05750) [3.35915]	-1.286772 (2.41848) [-0.53206]	82370.21 (48819.0) [1.68726]	4.320469 (2.24404) [1.92531]	73.71863 (99.3540) [0.74198]	5.907657 (3.54943) [1.66440]	-93.33739 (49.4426) [-1.88779]	40.66859 (29.7693) [1.36613]
DIR(-5)	-17.20033 (4.98081) [-3.45332]	-0.723227 (0.37416) [-1.93296]	-0.332988 (0.05494) [-6.06059]	-2.133229 (2.31097) [-0.92309]	-12288.00 (46648.8) [-0.26342]	-4.811580 (2.14428) [-2.24391]	-84.90598 (94.9372) [-0.89434]	-12.22196 (3.39164) [-3.60356]	-107.5204 (47.2447) [-2.27582]	-25.02988 (28.4459) [-0.87991]
ARTAZ(-1)	0.009232 (0.00306) [3.01529]	0.000462 (0.00023) [2.01000]	0.000111 (3.4E-05) [3.29332]	0.002523 (0.00142) [1.77636]	239.5575 (28.6745) [8.35438]	0.002077 (0.00132) [1.57572]	0.218840 (0.05836) [3.75004]	0.007230 (0.00208) [3.46790]	-0.006945 (0.02904) [-0.23916]	-0.039040 (0.01749) [-2.23272]
ARTAZ(-2)	0.000440 (0.00313) [0.14051]	-8.20E-05 (0.00024) [-0.34810]	5.73E-05 (3.5E-05) [1.65768]	0.001142 (0.00145) [0.78508]	41.90776 (29.3535) [1.42769]	-0.001892 (0.00135) [-1.40187]	-0.019998 (0.05974) [-0.33477]	0.002355 (0.00213) [1.10344]	0.082349 (0.02973) [2.77003]	0.031384 (0.01790) [1.75333]
ARTAZ(-3)	0.004169 (0.00313) [1.33206]	-0.000204 (0.00024) [-0.86706]	3.18E-05 (3.5E-05) [0.91987]	0.000335 (0.00145) [0.23083]	-21.10721 (29.3097) [-0.72014]	0.002649 (0.00135) [1.96622]	0.052070 (0.05965) [0.87292]	0.001498 (0.00213) [0.70299]	0.019876 (0.02968) [0.66959]	-0.011451 (0.01787) [-0.64067]

APPENDIX J:

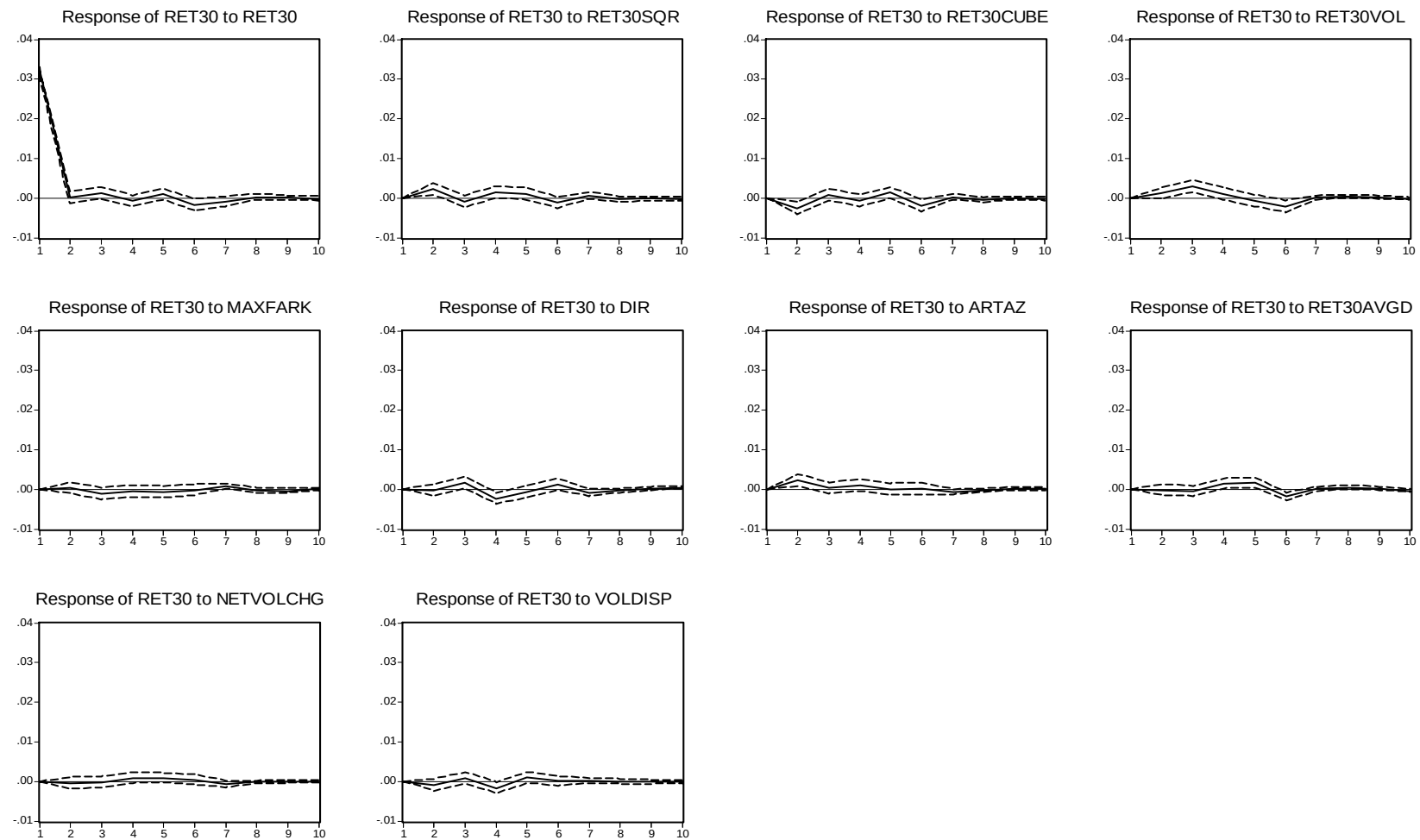
ARTAZ(-4)	8.72E-05 (0.00311) [0.02800]	0.000273 (0.00023) [1.16512]	-5.05E-06 (3.4E-05) [-0.14694]	-0.004327 (0.00145) [-2.99380]	-1.820663 (29.1731) [-0.06241]	0.000842 (0.00134) [0.62761]	0.013092 (0.05937) [0.22050]	-0.000762 (0.00212) [-0.35907]	0.052838 (0.02955) [1.78834]	0.032380 (0.01779) [1.82019]
ARTAZ(-5)	0.000348 (0.00310) [0.11238]	-0.000102 (0.00023) [-0.43827]	2.96E-05 (3.4E-05) [0.86584]	0.000888 (0.00144) [0.61793]	-11.78377 (28.9941) [-0.40642]	-0.000434 (0.00133) [-0.32540]	-0.054919 (0.05901) [-0.93071]	0.000767 (0.00211) [0.36383]	-0.032114 (0.02936) [-1.09363]	0.025659 (0.01768) [1.45129]
RET30AVGD(-1)	-1.163729 (5.20571) [-0.22355]	0.169027 (0.39105) [0.43224]	-0.109738 (0.05742) [-1.91101]	3.935485 (2.41532) [1.62939]	-75063.66 (48755.2) [-1.53960]	-2.690499 (2.24110) [-1.20052]	-2.435250 (99.2240) [-0.02454]	0.768383 (3.54478) [0.21676]	43.71270 (49.3780) [0.88527]	54.10074 (29.7303) [1.81972]
RET30AVGD(-2)	-5.360078 (6.06557) [-0.88369]	-1.010332 (0.45564) [-2.21738]	-0.167199 (0.06691) [-2.49890]	1.124072 (2.81427) [0.39942]	-95914.29 (56808.4) [-1.68838]	-6.851577 (2.61128) [-2.62384]	-88.93381 (115.613) [-0.76923]	0.794073 (4.13030) [0.19226]	186.4604 (57.5340) [3.24087]	29.20691 (34.6411) [0.84313]
RET30AVGD(-3)	7.148484 (6.01404) [1.18863]	-0.081394 (0.45177) [-0.18017]	0.136525 (0.06634) [2.05794]	3.252323 (2.79037) [1.16555]	-71263.27 (56325.8) [-1.26520]	0.547431 (2.58910) [0.21144]	14.45325 (114.631) [0.12608]	6.239162 (4.09521) [1.52353]	203.7523 (57.0453) [3.57177]	-15.03827 (34.3468) [-0.43784]
RET30AVGD(-4)	17.31010 (4.98717) [3.47093]	0.717216 (0.37463) [1.91445]	0.332033 (0.05501) [6.03549]	2.050845 (2.31392) [0.88631]	11371.18 (46708.4) [0.24345]	4.870901 (2.14702) [2.26868]	88.76856 (95.0585) [0.93383]	12.27313 (3.39597) [3.61403]	108.7007 (47.3050) [2.29787]	25.44030 (28.4822) [0.89320]
RET30AVGD(-5)	-0.124072 (0.07042) [-1.76183]	-0.001616 (0.00529) [-0.30549]	-0.003023 (0.00078) [-3.89122]	-0.034018 (0.03267) [-1.04112]	-462.2357 (659.554) [-0.70083]	-0.031300 (0.03032) [-1.03241]	-0.427349 (1.34229) [-0.31837]	-0.092021 (0.04795) [-1.91896]	-0.633333 (0.66798) [-0.94813]	0.505381 (0.40219) [1.25658]
NETVOLCHG(-1)	-0.001716 (0.00239) [-0.71808]	0.000223 (0.00018) [1.24047]	8.90E-06 (2.6E-05) [0.33757]	7.49E-05 (0.00111) [0.06754]	5.111304 (22.3860) [0.22833]	-0.000907 (0.00103) [-0.88138]	-0.043359 (0.04556) [-0.95171]	-0.000802 (0.00163) [-0.49273]	-0.505765 (0.02267) [-22.3079]	0.002648 (0.01365) [0.19395]
NETVOLCHG(-2)	-0.001569 (0.00259) [-0.60499]	0.000212 (0.00019) [1.08695]	4.60E-06 (2.9E-05) [0.16093]	8.30E-05 (0.00120) [0.06900]	2.354883 (24.2926) [0.09694]	-0.000207 (0.00112) [-0.18527]	-0.047228 (0.04944) [-0.95527]	-0.001358 (0.00177) [-0.76882]	-0.441781 (0.02460) [-17.9565]	-0.003449 (0.01481) [-0.23284]
NETVOLCHG(-3)	0.001886 (0.00267) [0.70541]	5.54E-05 (0.00020) [0.27575]	2.39E-05 (2.9E-05) [0.81016]	0.001160 (0.00124) [0.93519]	27.38519 (25.0398) [1.09367]	0.001126 (0.00115) [0.97864]	0.030308 (0.05096) [0.59474]	0.000757 (0.00182) [0.41580]	-0.265092 (0.02536) [-10.4533]	-0.017099 (0.01527) [-1.11983]
NETVOLCHG(-4)	0.003383 (0.00240) [1.40910]	0.000238 (0.00018) [1.31910]	1.99E-05 (2.6E-05) [0.75235]	0.002032 (0.00111) [1.82434]	26.18314 (22.4828) [1.16459]	0.001717 (0.00103) [1.66096]	0.044574 (0.04576) [0.97417]	0.001669 (0.00163) [1.02108]	-0.198184 (0.02277) [-8.70376]	-0.014009 (0.01371) [-1.02185]
NETVOLCHG(-5)	0.002774 (0.00214) [1.29394]	2.21E-05 (0.00016) [0.13737]	3.32E-05 (2.4E-05) [1.40282]	0.000651 (0.00099) [0.65440]	5.119011 (20.0787) [0.25495]	0.001496 (0.00092) [1.62057]	0.050146 (0.04086) [1.22717]	0.001286 (0.00146) [0.88073]	-0.120410 (0.02034) [-5.92128]	-0.022491 (0.01224) [-1.83693]

APPENDIX J:

VOLDISP(-1)	-0.005071 (0.00407) [-1.24632]	-0.000300 (0.00031) [-0.98291]	-8.30E-06 (4.5E-05) [-0.18494]	-0.005248 (0.00189) [-2.77986]	10.83404 (38.1050) [0.28432]	-0.003324 (0.00175) [-1.89792]	-0.073496 (0.07755) [-0.94773]	-0.001765 (0.00277) [-0.63698]	0.016262 (0.03859) [0.42137]	0.374426 (0.02324) [16.1141]
VOLDISP(-2)	0.006819 (0.00431) [1.58055]	-0.000152 (0.00032) [-0.46793]	-3.97E-05 (4.8E-05) [-0.83513]	0.002994 (0.00200) [1.49548]	12.21434 (40.4066) [0.30229]	0.001292 (0.00186) [0.69576]	0.209446 (0.08223) [2.54697]	0.005535 (0.00294) [1.88394]	0.156889 (0.04092) [3.83378]	0.155204 (0.02464) [6.29901]
VOLDISP(-3)	-0.009762 (0.00437) [-2.23510]	6.11E-06 (0.00033) [0.01863]	-6.10E-05 (4.8E-05) [-1.26612]	-0.000247 (0.00203) [-0.12206]	-27.95971 (40.9055) [-0.68352]	-0.002726 (0.00188) [-1.45005]	-0.174624 (0.08325) [-2.09761]	-0.007062 (0.00297) [-2.37450]	-0.069829 (0.04143) [-1.68556]	0.127646 (0.02494) [5.11736]
VOLDISP(-4)	0.008202 (0.00431) [1.90186]	0.000208 (0.00032) [0.64072]	5.13E-05 (4.8E-05) [1.07914]	0.002833 (0.00200) [1.41582]	49.39639 (40.3922) [1.22292]	0.002069 (0.00186) [1.11430]	0.140452 (0.08220) [1.70858]	0.006146 (0.00294) [2.09273]	-0.024753 (0.04091) [-0.60510]	0.070831 (0.02463) [2.87571]
VOLDISP(-5)	-0.002488 (0.00404) [-0.61648]	-0.000490 (0.00030) [-1.61766]	-2.09E-05 (4.5E-05) [-0.47041]	-0.003411 (0.00187) [-1.82159]	-59.05570 (37.8024) [-1.56222]	-0.000116 (0.00174) [-0.06654]	-0.000799 (0.07693) [-0.01039]	-0.002400 (0.00275) [-0.87307]	-0.048574 (0.03829) [-1.26873]	0.071089 (0.02305) [3.08392]
C	0.003504 (0.00458) [0.76523]	0.001440 (0.00034) [4.18514]	9.91E-05 (5.1E-05) [1.96141]	0.007597 (0.00212) [3.57551]	33.06073 (42.8890) [0.77084]	0.004356 (0.00197) [2.20949]	-0.142569 (0.08729) [-1.63336]	-0.000761 (0.00312) [-0.24417]	-0.061730 (0.04344) [-1.42113]	0.229147 (0.02615) [8.76172]
R-squared	0.078089	0.163178	0.143852	0.076637	0.375338	0.085960	0.049172	0.374613	0.411404	0.465933
Adj. R-squared	0.053751	0.141086	0.121251	0.052261	0.358848	0.061830	0.024071	0.358103	0.395866	0.451834
Sum sq. resids	1.952570	0.011018	0.000238	0.420335	1.71E+08	0.361885	709.3818	0.905370	175.6761	63.68629
S.E. equation	0.032108	0.002412	0.000354	0.014897	300.7143	0.013823	0.611998	0.021864	0.304555	0.183372
F-statistic	3.208543	7.386483	6.364694	3.143970	22.76080	3.562379	1.958970	22.69049	26.47657	33.04748
Log likelihood	3954.179	8989.153	12720.39	5447.793	-13832.48	5593.401	-1778.949	4701.602	-421.5804	565.1888
Akaike AIC	-4.013551	-9.190902	-13.02765	-5.549401	14.27607	-5.699127	1.881696	-4.782110	0.485944	-0.528729
Schwarz SC	-3.867421	-9.044772	-12.88152	-5.403271	14.42220	-5.552996	2.027826	-4.635979	0.632074	-0.382598
Mean dependent	0.001504	0.001091	6.29E-06	0.004295	15.71815	0.001571	-0.005021	0.001587	0.001971	1.140442
S.D. dependent	0.033007	0.002603	0.000378	0.015303	375.5548	0.014271	0.619500	0.027289	0.391832	0.247672
Determinant Residual Covariance		6.51E-31								
Log Likelihood (d.f. adjusted)		39996.36								
Akaike Information Criteria		-40.60294								
Schwarz Criteria		-39.14164								

APPENDIX K:

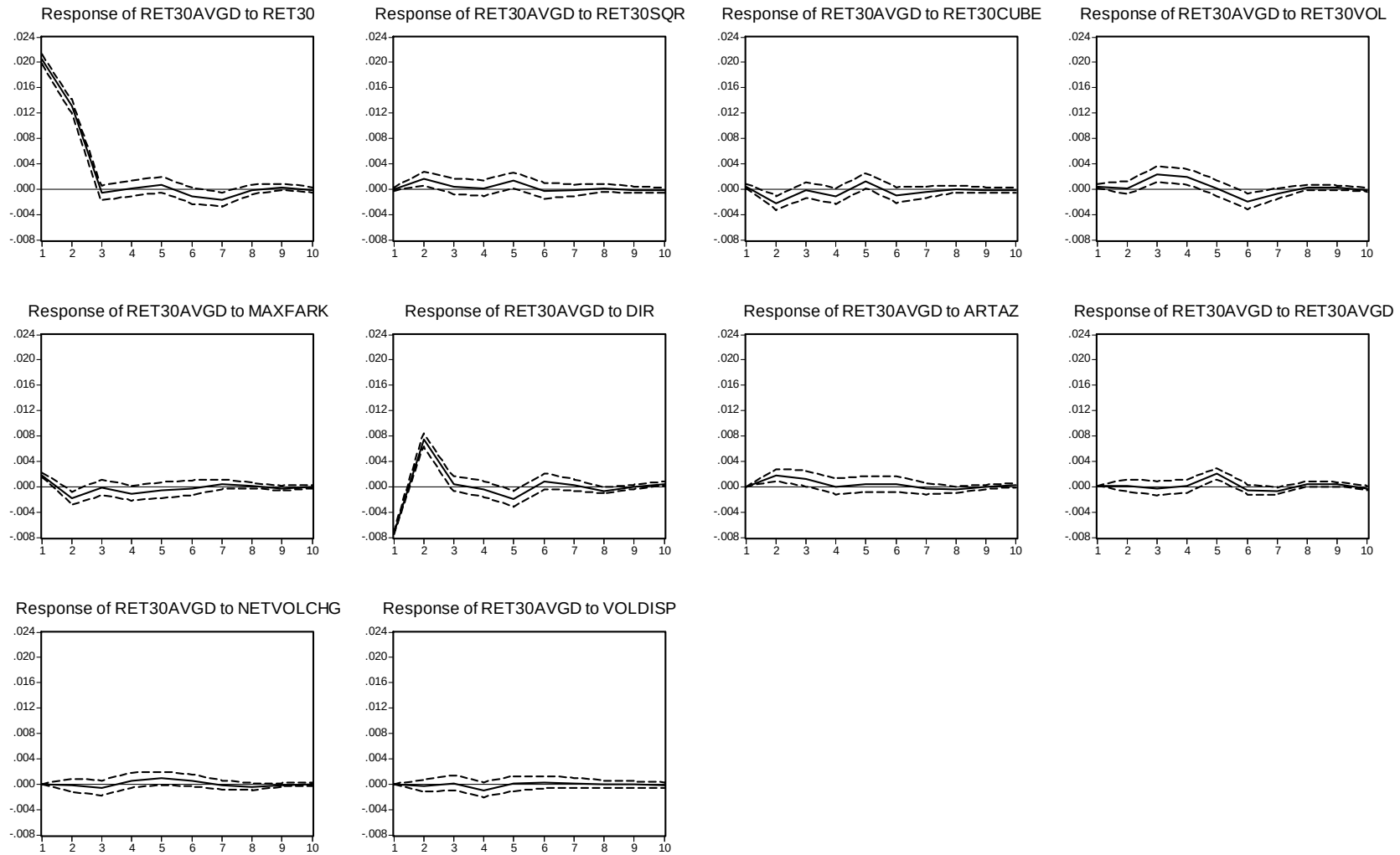
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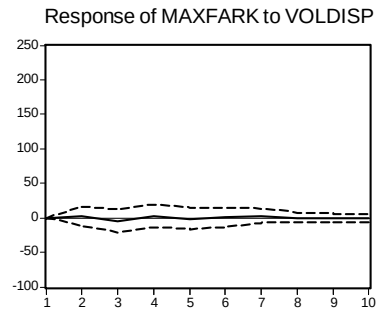
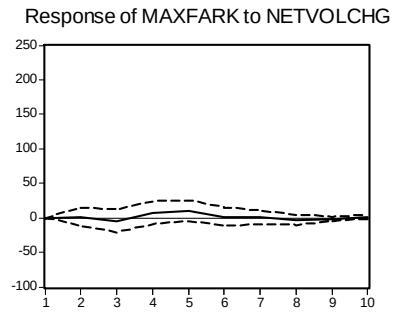
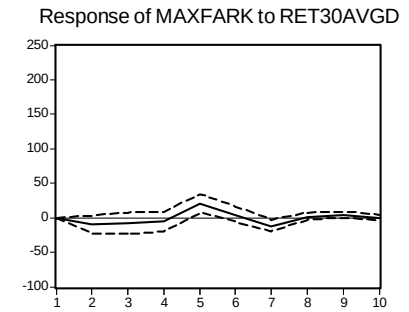
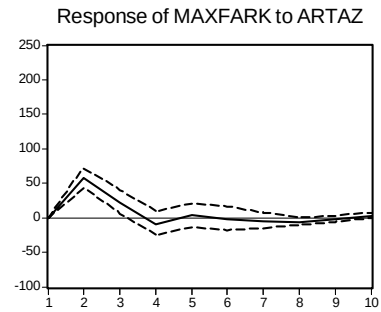
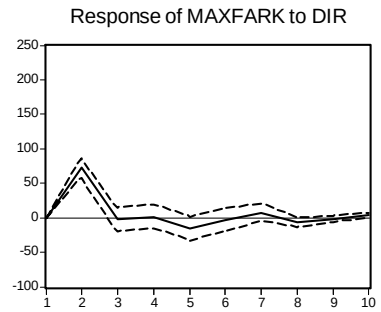
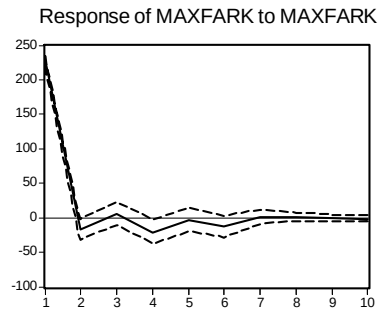
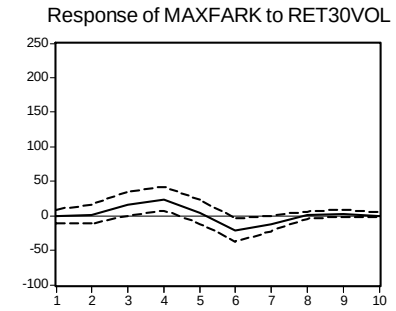
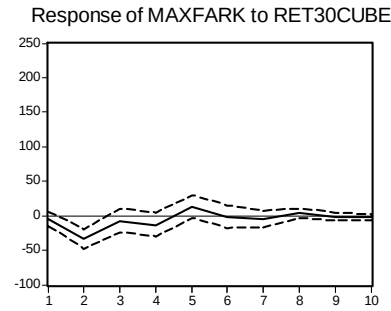
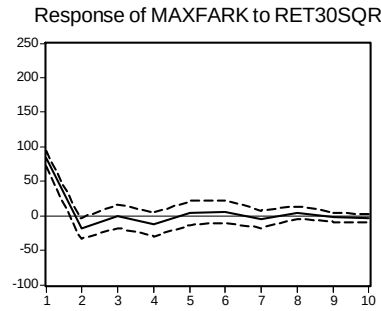
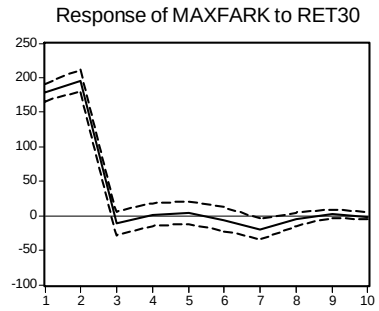


APPENDIX K:

APPENDIX L:

Response to Cholesky One S.D. Innovations ± 2 S.E.



Response to Cholesky One S.D. Innovations ± 2 S.E.

Response to Cholesky One S.D. Innovations ± 2 S.E.