The SAS System

The AUTOREG Procedure

Model	garch_1_1
Dependent Variable	return

The SAS System

The AUTOREG Procedure

Ordinary Least Squares Estimates			
SSE	0.64642471	**DFE**	1510
MSE	0.0004281	**Root MSE**	0.02069
SBC	-7426.6125	**AIC**	-7426.6125
MAE	0.01447432	**AICC**	-7426.6125
MAPE	115.633513	**HQC**	-7426.6125
Durbin-Watson	2.2169	**Total R-Square**	0.0000
NOTE: No intercept term is used. R-squares are redefined.			

Algorithm converged.

The SAS System

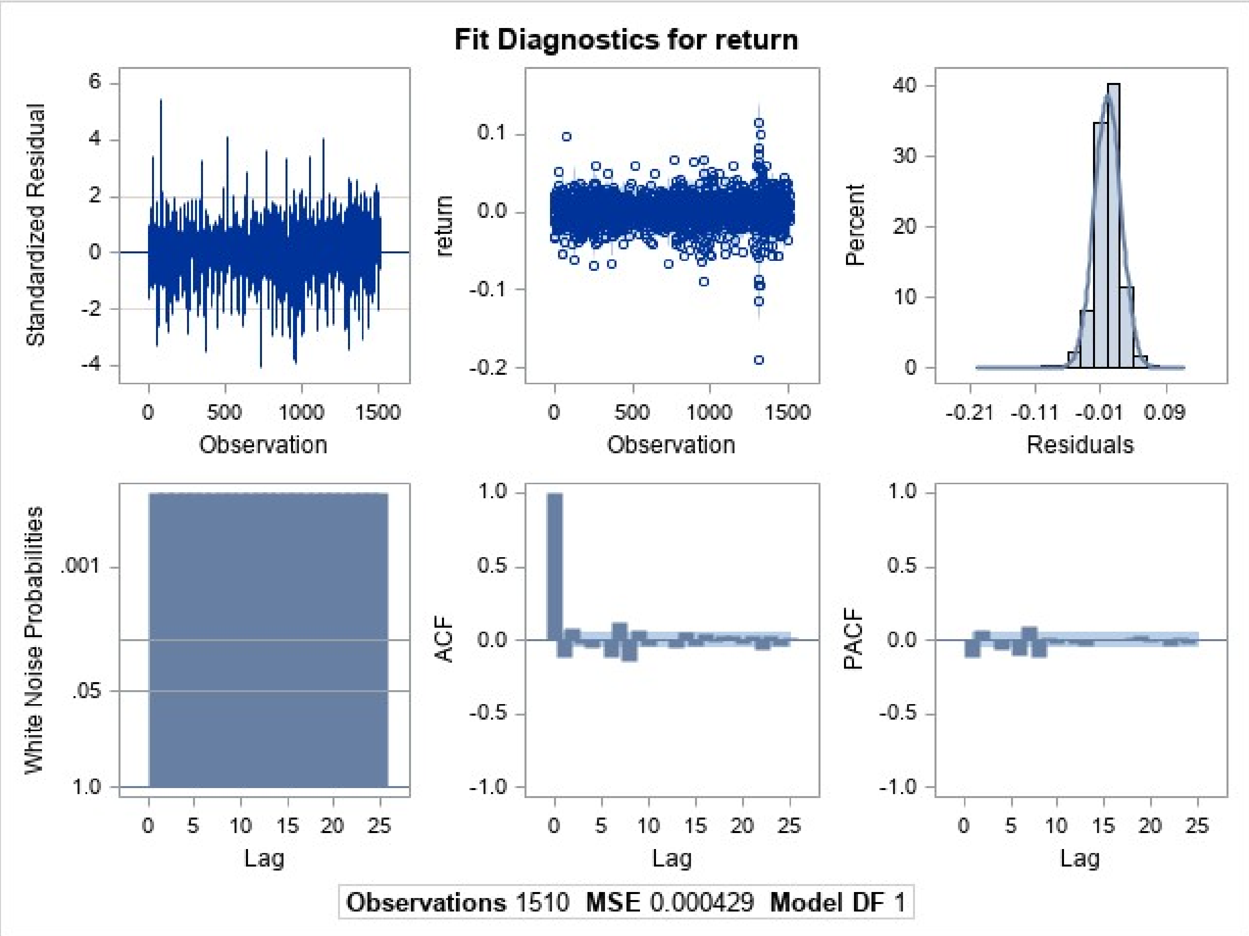
The AUTOREG Procedure

GARCH Estimates			
SSE	0.64642471	**Observations**	1510
MSE	0.0004281	**Uncond Var**	0.0003824
Log Likelihood	3872.06895	**Total R-Square**	0.0000
SBC	-7722.1783	**AIC**	-7738.1379
MAE	0.01452935	**AICC**	-7738.122
MAPE	100	**HQC**	-7732.1944
		Normality Test	210.1467
		Pr > ChiSq	<.0001
NOTE: No intercept term is used. R-squares are redefined.			

Parameter Estimates					
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**
ARCH0	1	0.0000384	7.1333E-6	5.38	<.0001
ARCH1	1	0.1298	0.0184	7.05	<.0001
GARCH1	1	0.7699	0.0320	24.06	<.0001

The SAS System

The AUTOREG Procedure



The SAS System

The AUTOREG Procedure

Model	egarch_1_1
Dependent Variable	return

The SAS System

The AUTOREG Procedure

Ordinary Least Squares Estimates			
SSE	0.64642471	**DFE**	1510
MSE	0.0004281	**Root MSE**	0.02069
SBC	-7426.6125	**AIC**	-7426.6125
MAE	0.01447432	**AICC**	-7426.6125
MAPE	115.633513	**HQC**	-7426.6125
Durbin-Watson	2.2169	**Total R-Square**	0.0000
NOTE: No intercept term is used. R-squares are redefined.			

Algorithm converged.

The SAS System

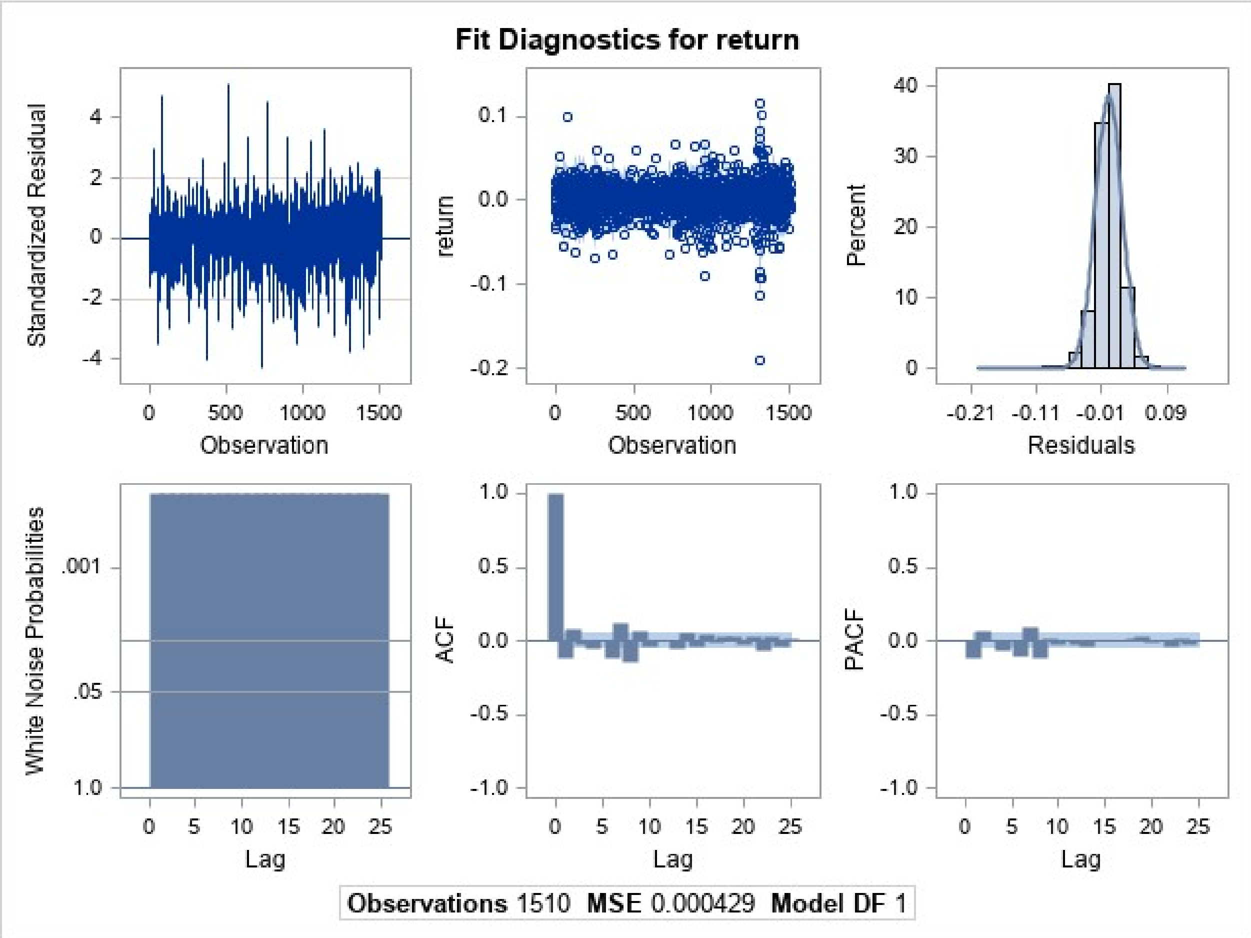
The AUTOREG Procedure

Exponential GARCH Estimates			
SSE	0.64642471	**Observations**	1510
MSE	0.0004281	**Uncond Var**	.
Log Likelihood	3886.24378	**Total R-Square**	0.0000
SBC	-7743.2081	**AIC**	-7764.4876
MAE	0.01452935	**AICC**	-7764.461
MAPE	100	**HQC**	-7756.5628
		Normality Test	251.6127
		Pr > ChiSq	<.0001
NOTE: No intercept term is used. R-squares are redefined.			

Parameter Estimates					
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**
EARCH0	1	-0.2438	0.0482	-5.05	<.0001
EARCH1	1	0.1126	0.0158	7.14	<.0001
EGARCH1	1	0.9683	0.006089	159.02	<.0001
THETA	1	-0.9152	0.1677	-5.46	<.0001

The SAS System

The AUTOREG Procedure



The SAS System

The AUTOREG Procedure

Model	qgarch_1_1
Dependent Variable	return

The SAS System

The AUTOREG Procedure

Ordinary Least Squares Estimates			
SSE	0.64642471	**DFE**	1510
MSE	0.0004281	**Root MSE**	0.02069
SBC	-7426.6125	**AIC**	-7426.6125
MAE	0.01447432	**AICC**	-7426.6125
MAPE	115.633513	**HQC**	-7426.6125
Durbin-Watson	2.2169	**Total R-Square**	0.0000
NOTE: No intercept term is used. R-squares are redefined.			

Algorithm converged.

The SAS System

The AUTOREG Procedure

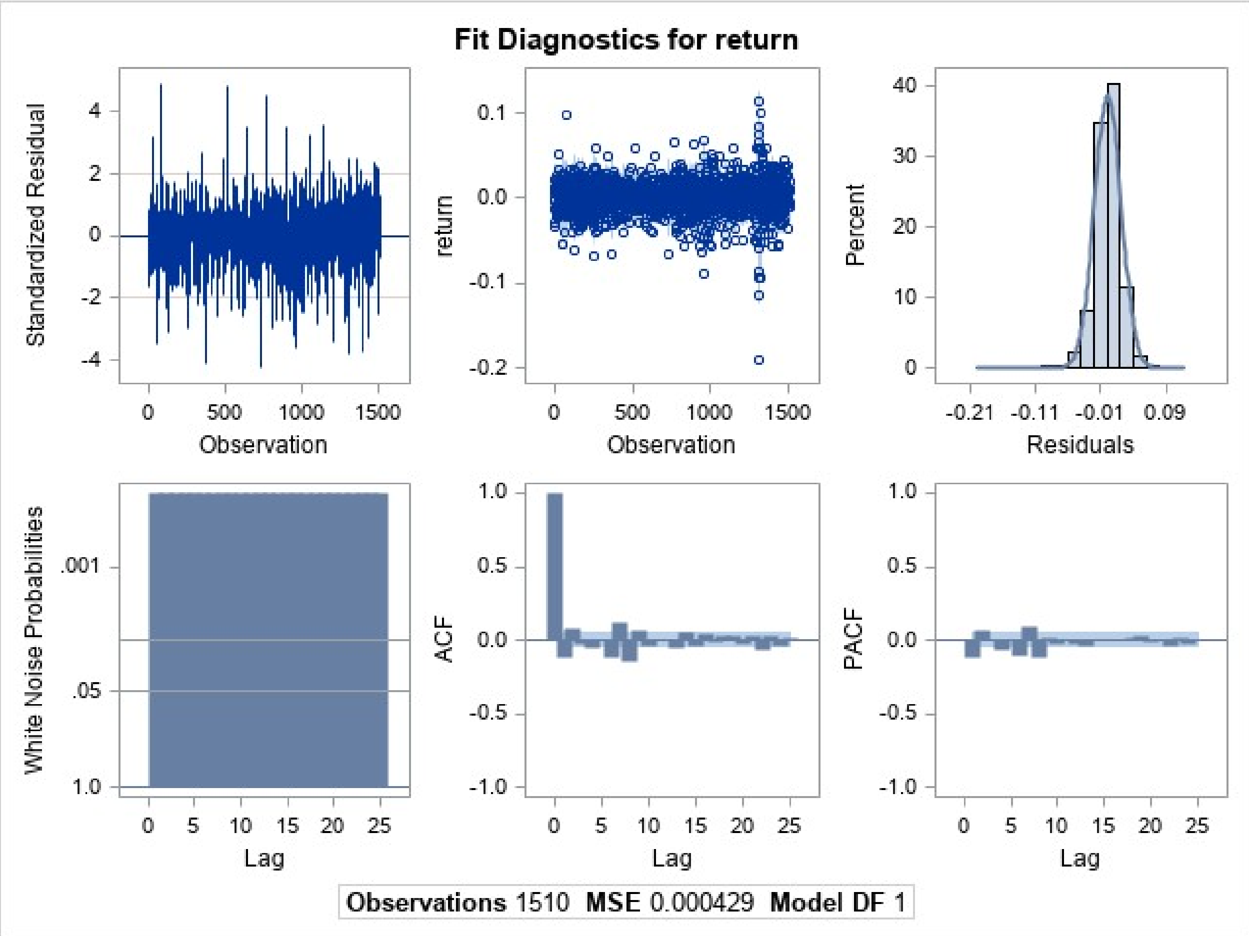
Quadratic GARCH Estimates			
SSE	0.64642471	Observations	1510
MSE	0.0004281	Uncond Var	0.00010735
Log Likelihood	3879.51218	Total R-Square	0.0000
SBC	-7729.7449	AIC	-7751.0244
MAE	0.01452935	AICC	-7750.9978
MAPE	100	HQC	-7743.0996
		Normality Test	265.5403
		Pr > ChiSq	<.0001
NOTE: No intercept term is used. R-squares are redefined.			

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
QARCHA0	1	2.7139E-6	4.1072E-6	0.66	0.5088
QARCHA1	1	0.0587	0.008614	6.81	<.0001
QARCHB1	1	0.0155	0.002764	5.62	<.0001
QGARCH1	1	0.9005	0.0143	62.97	<.0001

Parameter Estimates

The SAS System

The AUTOREG Procedure



The SAS System

The AUTOREG Procedure

Model	tgarch_1_1
Dependent Variable	return

The SAS System

The AUTOREG Procedure

Ordinary Least Squares Estimates			
SSE	0.64642471	DFE	1510
MSE	0.0004281	Root MSE	0.02069
SBC	-7426.6125	AIC	-7426.6125
MAE	0.01447432	AICC	-7426.6125
MAPE	115.633513	HQC	-7426.6125
Durbin-Watson	2.2169	Total R-Square	0.0000
NOTE: No intercept term is used. R-squares are redefined.			

Algorithm converged.

The SAS System

The AUTOREG Procedure

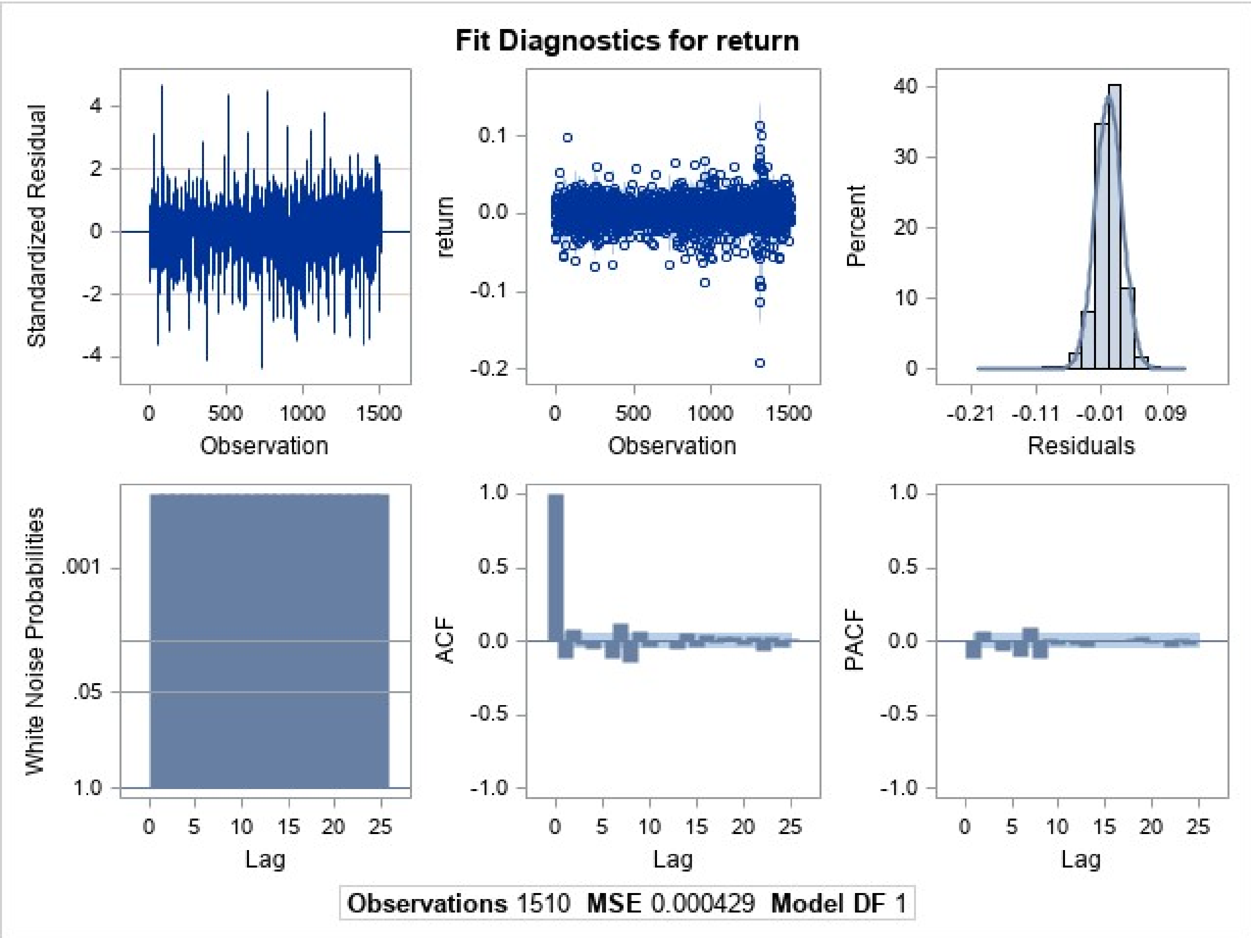
Threshold GARCH Estimates			
SSE	0.64642471	Observations	1510
MSE	0.0004281	Uncond Var	.
Log Likelihood	3882.80296	Total R-Square	0.0000
SBC	-7736.3265	AIC	-7757.6059
MAE	0.01452935	AICC	-7757.5793
MAPE	100	HQC	-7749.6812
		Normality Test	223.1416
		Pr > ChiSq	<.0001
NOTE: No intercept term is used. R-squares are redefined.			

Parameter Estimates

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
TARCHA0	1	0.0000154	2.8828E-6	5.33	<.0001
TARCHA1	1	-0.004222	0.009150	-0.46	0.6445
TARCHB1	1	0.1218	0.0178	6.84	<.0001
TGARCH1	1	0.9032	0.0139	64.87	<.0001

The SAS System

The AUTOREG Procedure



The SAS System

The AUTOREG Procedure

Model	garchm_1_1
Dependent Variable	return

The SAS System

The AUTOREG Procedure

Ordinary Least Squares Estimates			
SSE	0.64642471	DFE	1510
MSE	0.0004281	Root MSE	0.02069
SBC	-7426.6125	AIC	-7426.6125
MAE	0.01447432	AICC	-7426.6125
MAPE	115.633513	HQC	-7426.6125
Durbin-Watson	2.2169	Total R-Square	0.0000
NOTE: No intercept term is used. R-squares are redefined.			

Algorithm converged.

The SAS System

The AUTOREG Procedure

GARCH Estimates			
SSE	0.64506348	**Observations**	1510
MSE	0.0004272	**Uncond Var**	.
Log Likelihood	3874.68129	**Total R-Square**	0.0021
SBC	-7720.0831	**AIC**	-7741.3626
MAE	0.01447558	**AICC**	-7741.336
MAPE	115.659658	**HQC**	-7733.4379
		Normality Test	232.6127
		Pr > ChiSq	<.0001
NOTE: No intercept term is used. R-squares are redefined.			

Parameter Estimates					
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**
ARCH0	1	0.0000373	7.0088E-6	5.32	<.0001
ARCH1	1	0.1273	0.0183	6.94	<.0001
GARCH1	1	0.7749	0.0318	24.38	<.0001
DELTA	1	-0.000125	0.0000558	-2.24	0.0251

The SAS System

The AUTOREG Procedure