APPENDIX: MICROFIT 4.0 RESULTS

Unit root tests for variable LAUS\(^1\)
The Dickey-Fuller regressions include an intercept but not a trend

**2495 observations used in the estimation of all ADF regressions.**
Sample period from 6 to 2500

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>-1.9821</td>
<td>10507.0</td>
<td>10505.0</td>
<td>10499.1</td>
</tr>
<tr>
<td>ADF(1)</td>
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<td>10508.0</td>
<td>10505.0</td>
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<tr>
<td>ADF(2)</td>
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<tr>
<td>ADF(3)</td>
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<td>10510.4</td>
<td>10505.4</td>
<td>10490.8</td>
</tr>
<tr>
<td>ADF(4)</td>
<td>-1.9805</td>
<td>10511.8</td>
<td>10505.8</td>
<td>10488.3</td>
</tr>
</tbody>
</table>

95% critical value for the augmented Dickey-Fuller statistic = -2.8632
LL = Maximized log-likelihood      AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion

Unit root tests for variable LAUS
The Dickey-Fuller regressions include an intercept and a linear trend

**2495 observations used in the estimation of all ADF regressions.**
Sample period from 6 to 2500

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
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<td>ADF(2)</td>
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<td>10495.1</td>
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<td>10509.7</td>
<td>10489.4</td>
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</tbody>
</table>

95% critical value for the augmented Dickey-Fuller statistic = -3.4142
LL = Maximized log-likelihood      AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion

\(^1\) Here LAUS stands for the logged value for the stock market index of Australia.
Unit root tests for variable LBRZ

The Dickey-Fuller regressions include an intercept but not a trend

2495 observations used in the estimation of all ADF regressions.
Sample period from 6 to 2500

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
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</thead>
<tbody>
<tr>
<td>DF</td>
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<td>5324.4</td>
<td>5307.0</td>
</tr>
</tbody>
</table>

95% critical value for the augmented Dickey-Fuller statistic = -2.8632
LL = Maximized log-likelihood  AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion  HQC = Hannan-Quinn Criterion

Unit root tests for variable LBRZ

The Dickey-Fuller regressions include an intercept and a linear trend

2495 observations used in the estimation of all ADF regressions.
Sample period from 6 to 2500

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
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<td>5323.5</td>
<td>5314.8</td>
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<tr>
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95% critical value for the augmented Dickey-Fuller statistic = -3.4142
LL = Maximized log-likelihood  AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion  HQC = Hannan-Quinn Criterion

2 Here LBRZ Stands For The Logged Value For The Stock Market Index Of Brazil
Unit root tests for variable LGER

The Dickey-Fuller regressions include an intercept but not a trend

2495 observations used in the estimation of all ADF regressions.
Sample period from 6 to 2500

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
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</thead>
<tbody>
<tr>
<td>DF</td>
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<td>9226.8</td>
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<tr>
<td>ADF(1)</td>
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<td>9217.8</td>
</tr>
<tr>
<td>ADF(2)</td>
<td>-1.8141</td>
<td>9232.7</td>
<td>9228.7</td>
<td>9217.1</td>
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<td>9228.2</td>
<td>9210.7</td>
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95% critical value for the augmented Dickey-Fuller statistic = -2.8632
LL = Maximized log-likelihood  AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion  HQC = Hannan-Quinn Criterion

Unit root tests for variable LGER

The Dickey-Fuller regressions include an intercept and a linear trend

2495 observations used in the estimation of all ADF regressions.
Sample period from 6 to 2500

<table>
<thead>
<tr>
<th>Test Statistic</th>
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<th>SBC</th>
<th>HQC</th>
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</thead>
<tbody>
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<td>9217.7</td>
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<td>.41238</td>
<td>9233.8</td>
<td>9227.8</td>
<td>9210.3</td>
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3 Here LGER Stands For The Logged Value For The Stock Market Index Of Germany
ADF(4)      .30114        9234.8        9227.8        9207.5        9220.4
*****************************************************************************
95% critical value for the augmented Dickey-Fuller statistic =  -3.4142
LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
Unit root tests for variable LHKG
The Dickey-Fuller regressions include an intercept but not a trend
*****************************************************************************
2495 observations used in the estimation of all ADF regressions.
Sample period from 6 to 2500
*****************************************************************************
Test Statistic      LL           AIC           SBC           HQC
DF         -2.8161        8552.6        8550.6        8544.8        8548.5
ADF(1)     -2.8370        8553.4        8550.4        8541.7        8547.3
ADF(2)     -2.8074        8555.0        8551.0        8539.3        8546.7
ADF(3)     -2.8842        8565.4        8560.4        8545.9        8555.1
ADF(4)     -2.8575        8566.3        8560.3        8542.8        8553.9
*****************************************************************************
95% critical value for the augmented Dickey-Fuller statistic =  -2.8632
LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
Unit root tests for variable LHKG
The Dickey-Fuller regressions include an intercept and a linear trend

Here LHKG Stands For The Logged Value For The Stock Market Index Of Hong Kong
2495 observations used in the estimation of all ADF regressions.
Sample period from 6 to 2500

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
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<td>8541.0</td>
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<td>8537.9</td>
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<tr>
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<td>8555.0</td>
<td>8550.0</td>
<td>8535.5</td>
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<td>8565.6</td>
<td>8559.6</td>
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<tr>
<td>ADF(4)</td>
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<td>8559.4</td>
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</table>

95% critical value for the augmented Dickey-Fuller statistic = -3.4142

LL = Maximized log-likelihood  
AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion  
HQC = Hannan-Quinn Criterion

Unit root tests for variable LUSA⁵
The Dickey-Fuller regressions include an intercept but not a trend

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
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<td>9921.6</td>
<td>9919.6</td>
<td>9913.8</td>
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<tr>
<td>ADF(1)</td>
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<td>9918.8</td>
<td>9910.0</td>
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<tr>
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<td>ADF(3)</td>
<td>-1.5970</td>
<td>9925.9</td>
<td>9920.9</td>
<td>9906.4</td>
</tr>
</tbody>
</table>

⁵ Here LUSA Stands For The Logged Value For The Stock Market Index Of USA
ADF(4)     -1.5986        9926.0        9920.0        9902.5        9913.6
*****************************************************************************
* 95% critical value for the augmented Dickey-Fuller statistic = -2.8632  
LL  = Maximized log-likelihood      AIC = Akaike Information Criterion  
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion  
*****************************************************************************
* 2495 observations used in the estimation of all ADF regressions. 
Sample period from    6 to 2500  
*****************************************************************************
*   Test Statistic  LL          AIC          SBC          HQC 
  DF         .54126        9922.4        9919.4        9910.7        9916.3 
  ADF(1)     .50565        9922.6        9918.6        9906.9        9914.3 
  ADF(2)     .63117        9924.3        9919.3        9904.7        9914.0 
  ADF(3)     .79862        9927.2        9921.2        9903.7        9914.8 
  ADF(4)     .82444        9927.3        9920.3        9899.9        9912.9 
*****************************************************************************
* 95% critical value for the augmented Dickey-Fuller statistic = -3.4142  
LL  = Maximized log-likelihood      AIC = Akaike Information Criterion  
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion  
*****************************************************************************
*
Unit root tests for variable LUSA  
The Dickey-Fuller regressions include an intercept and a linear trend  
*****************************************************************************
* 6 Here DA, DG and DU Stands for the Differenced Value for the Stock Market Return of Australia, Germany and USA Respectively.
The Dickey-Fuller regressions include an intercept but not a trend

2493 observations used in the estimation of all ADF regressions.
Sample period from 8 to 2500

Test Statistic      LL           AIC           SBC           HQC
DF        -82.7576        7897.4        7895.4        7889.6        7893.3
ADF(1)    -62.3213        8071.0        8068.0        8059.2        8064.8
ADF(2)    -48.7560        8133.4        8129.4        8117.7        8125.2
ADF(3)    -42.5793        8182.9        8177.9        8163.4        8172.6
ADF(4)    -37.1496        8206.4        8200.4        8182.9        8194.0

95% critical value for the augmented Dickey-Fuller statistic = -2.8632
LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion

Unit root tests for variable DA
The Dickey-Fuller regressions include an intercept and a linear trend

2493 observations used in the estimation of all ADF regressions.
Sample period from 8 to 2500

Test Statistic      LL           AIC           SBC           HQC
DF        -82.7410        7897.4        7894.4        7885.7        7891.3
ADF(1)    -62.3088        8071.0        8067.0        8055.3        8062.7
ADF(2)    -48.7462        8133.4        8128.4        8113.8        8123.1
ADF(3)    -42.5708        8182.9        8176.9        8159.4        8170.6
ADF(4)    -37.1421        8206.4        8199.4        8179.0        8192.0

95% critical value for the augmented Dickey-Fuller statistic = -3.4142
LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
Unit root tests for variable DG

The Dickey-Fuller regressions include an intercept but not a trend

*****************************************************************************
* 2493 observations used in the estimation of all ADF regressions. Sample period from 8 to 2500
*****************************************************************************
*
<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>-82.3523</td>
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<td>6606.6</td>
<td>6600.8</td>
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<td>6865.3</td>
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<td>6940.2</td>
<td>6934.2</td>
<td>6916.8</td>
</tr>
</tbody>
</table>
*****************************************************************************
*
95% critical value for the augmented Dickey-Fuller statistic = -2.8632
LL = Maximized log-likelihood    AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion

Unit root tests for variable DG

The Dickey-Fuller regressions include an intercept and a linear trend

*****************************************************************************
* 2493 observations used in the estimation of all ADF regressions. Sample period from 8 to 2500
*****************************************************************************
*
<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
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<td>6605.7</td>
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<td>6746.7</td>
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<td>6864.3</td>
<td>6849.7</td>
</tr>
<tr>
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<td>6913.5</td>
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<td>6933.2</td>
<td>6912.9</td>
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</table>
*****************************************************************************
*
95% critical value for the augmented Dickey-Fuller statistic = -3.4142
LL = Maximized log-likelihood    AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
Unit root tests for variable DU
The Dickey-Fuller regressions include an intercept but not a trend
*****************************************************************************
* 2493 observations used in the estimation of all ADF regressions.
Sample period from 8 to 2500
*****************************************************************************
*  
<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
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</thead>
<tbody>
<tr>
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<td>ADF(4)</td>
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<td>7612.3</td>
<td>7606.3</td>
<td>7588.8</td>
</tr>
</tbody>
</table>
*****************************************************************************
* 95% critical value for the augmented Dickey-Fuller statistic = -2.8632
LL = Maximized log-likelihood    AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion

Unit root tests for variable DU
The Dickey-Fuller regressions include an intercept and a linear trend
*****************************************************************************
* 2493 observations used in the estimation of all ADF regressions.
Sample period from 8 to 2500
*****************************************************************************
*  
<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>LL</th>
<th>AIC</th>
<th>SBC</th>
<th>HQC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
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<td>7302.7</td>
<td>7294.0</td>
</tr>
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<td>7433.4</td>
<td>7420.8</td>
</tr>
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<td>7532.3</td>
<td>7527.3</td>
<td>7512.7</td>
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</table>
ADF(3)  -42.9798  7579.7  7573.7  7556.3  7567.4
ADF(4)  -38.2512  7612.3  7605.3  7584.9  7597.9

*****************************************************************************
95% critical value for the augmented Dickey-Fuller statistic = -3.4142
LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
*****************************************************************************

TESTING FOR ARCH EFFECTS IN THE RETURN SERIES OF THE VARIABLES
Ordinary Least Squares Estimation
*****************************************************************************
Dependent variable is AUS
2498 observations used for estimation from 3 to 2500
*****************************************************************************

Regressor              Coefficient       Standard Error         T-Ratio[Prob]
CONSTANT                 .2598E-3           .1656E-3
1.5691 [.117]
AUS(-1)                   .029667            .020005
1.4830 [.138]
*****************************************************************************
R-Squared                   .8804E-3   R-Bar-Squared                 .4801E-3
S.E. of Regression          .0082722   F-stat.    F(  1,2496)
Mean of Dependent Variable  .2679E-3   S.D. of Dependent Variable
Residual Sum of Squares       .17080   Equation Log-likelihood 8434.0
Akaike Info. Criterion        8432.0   Schwarz Bayesian Criterion 8426.2
DW-statistic                  1.9979   Durbin's h-statistic 3.0256[.002]

*****************************************************************************

Diagnostic Tests
*****************************************************************************

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

*                     *                          *
* A:Serial Correlation*CHSQ(  1)=  2.2311[.135]*F(  1,2495)= 2.2305[.135]
*                     *                          *
* B:Functional Form   *CHSQ(  1)=  37.1992[.000]*F(  1,2495)= 37.7161[.000]
*                     *                          *
* C:Normality         *CHSQ(  2)=   2442.0[.000]*       Not applicable
*                     *                          *
* D:Heteroscedasticity*CHSQ(  1)=  83.4620[.000]*F(  1,2496)= 86.2778[.000]
*****************************************************************************

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

Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)
*****************************************************************************

* Dependent variable is AUS
List of the variables in the regression:
CONSTANT        AUS(-1)
2498 observations used for estimation from    3 to 2500
*****************************************************************************

* Lagrange Multiplier Statistic       CHSQ(  1)= 270.3689[.000]
F Statistic                    F(  1,2495)= 302.8196[.000]
*****************************************************************************

Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)
*****************************************************************************

* Dependent variable is AUS
List of the variables in the regression:
CONSTANT        AUS(-1)
2498 observations used for estimation from    3 to 2500
*****************************************************************************


Lagrange Multiplier Statistic  CHSQ( 2) = 270.7294 [.000]
F Statistic  F(  2,2494) = 151.5755 [.000]

* *

Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)
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* Dependent variable is AUS
List of the variables in the regression:
CONSTANT    AUS(-1)
2498 observations used for estimation from 3 to 2500
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* Lagrange Multiplier Statistic  CHSQ( 3) = 303.6546 [.000]
F Statistic  F(  3,2493) = 114.9942 [.000]
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* Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)
*****************************************************************************
* Dependent variable is AUS
List of the variables in the regression:
CONSTANT    AUS(-1)
2498 observations used for estimation from 3 to 2500
*****************************************************************************
* Lagrange Multiplier Statistic  CHSQ( 4) = 304.5221 [.000]
F Statistic  F(  4,2492) =  86.4915 [.000]
*****************************************************************************

Ordinary Least Squares Estimation
*****************************************************************************
* Dependent variable is GER
2498 observations used for estimation from 3 to 2500
*****************************************************************************
* Regressor  Coefficient  Standard Error  T-Ratio[Prob]
CONSTANT  .3342E-3  .2761E-3  1.2102 [.226]
GER(-1)   .024718  .020022
1.2345 [.217]
*****************************************************************************
* R-Squared  .6102E-3  R-Bar-Squared  .2098E-3
S.E. of Regression .013796  F-stat.  F( 1,2496)  1.5241 [.217]
Mean of Dependent Variable .3428E-3  S.D. of Dependent Variable .013797
Residual Sum of Squares       .47506   Equation Log-likelihood 7156.4  Akaike Info. Criterion 7154.4 Schwarz Bayesian Criterion 7148.5  DW-statistic 1.9950 Durbin's h-statistic *NONE*

Diagnostic Tests

* Test Statistics * LM Version * F Version

A:Serial Correlation*CHSQ( 1)= 7.7303[.005]*F( 1,2495)= 7.7450[.005]
B:Functional Form *CHSQ( 1)= 1.4450[.229]*F( 1,2495)= 1.4441[.230]
C:Normality *CHSQ( 2)= 1279.7[.000] Not applicable
D:Heteroscedasticity*CHSQ( 1)= 14.8694[.000]*F( 1,2496)= 14.9465[.000]

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

Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)

* Dependent variable is GER  
List of the variables in the regression:  
CONSTANT GER(-1)  
2498 observations used for estimation from 3 to 2500

Lagrange Multiplier Statistic *CHSQ( 1)= 105.4285[.000]
F Statistic *F( 1,2495)= 109.9420[.000]
Lagrange Multiplier Statistic \ CHSQ( 2)= 204.4210[.000]  
F Statistic \ F(  2,2494)= 111.1420[.000]  

Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)

Dependent variable is GER  
List of the variables in the regression:  
CONSTANT    GER(-1)
2498 observations used for estimation from    3 to 2500

Lagrange Multiplier Statistic \ CHSQ( 3)= 307.3997[.000]  
F Statistic \ F(  3,2493)= 116.6115[.000]  

Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)

Dependent variable is GER  
List of the variables in the regression:  
CONSTANT    GER(-1)
2498 observations used for estimation from    3 to 2500

Lagrange Multiplier Statistic \ CHSQ( 4)= 341.5369[.000]  
F Statistic \ F(  4,2492)=  98.6697[.000]  

Ordinary Least Squares Estimation

Dependent variable is USA  
2498 observations used for estimation from    3 to 2500

Regressor              Coefficient       Standard Error         T-Ratio[Prob]
CONSTANT                 .2801E-3           .2092E-3
USA(-1)                   .012369            .020048

R-Squared                   .1525E-3   R-Bar-Squared                -.2481E-3  
S.E. of Regression           .010450   F-stat.    F(  1,2496)
Mean of Dependent Variable  .2838E-3   S.D. of Dependent Variable
                            .010449
Residual Sum of Squares       .27258   Equation Log-likelihood
7850.2
Akaike Info. Criterion        7848.2   Schwarz Bayesian Criterion
7842.4
DW-statistic                  1.9957   Durbin's h-statistic
*NONE*
*****************************************************************************
* Diagnostic Tests  
*****************************************************************************
*
Test Statistics   LM Version   F Version
*****************************************************************************
*
A:Serial Correlation
CHSQ(  1)=   2.7633 [.096] F(  1,2495)= 2.7630 [.097]
*
B:Functional Form
CHSQ(  1)=  12.4878 [.000] F(  1,2495)= 12.5354 [.000]
*
C:Normality
CHSQ(  2)=  2159.1 [.000] Not applicable
*
D:Heteroscedasticity
CHSQ(  1)=   .52058 [.471] F(  1,2496)= .52027 [.471]
*****************************************************************************
* A: Lagrange multiplier test of residual serial correlation
B: Ramsey's RESET test using the square of the fitted values
C: Based on a test of skewness and kurtosis of residuals
D: Based on the regression of squared residuals on squared fitted values

Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)
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* Dependent variable is USA
List of the variables in the regression:
CONSTANT        USA(-1)
2498 observations used for estimation from    3 to 2500
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*Lagrange Multiplier Statistic
CHSQ(  1)= 101.9001 [.000]
F Statistic
F(  1,2495)= 106.1061 [.000]
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*
Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)
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* Dependent variable is USA
List of the variables in the regression:
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2498 observations used for estimation from    3 to 2500
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CHSQ(  2)= 142.8360 [.000]
F Statistic
F(  2,2494)=  75.6281 [.000]
Autoregressive Conditional Heteroscedasticity Test of Residuals (OLS Case)

**Preliminary Statistics**

**Estimated Correlation Matrix of Variables**
### Variable AUS

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<th>Autocorrelation Coefficient</th>
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### Variable BRZ

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Variable GER

Sample from 2 to 2500

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Variable HKG

Sample from 2 to 2500

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<td>13.1477 [.041]</td>
</tr>
<tr>
<td>7</td>
<td>-.025285</td>
<td>.020109</td>
<td>14.7160 [.040]</td>
<td>14.7511 [.039]</td>
</tr>
<tr>
<td>10</td>
<td>.034734</td>
<td>.020122</td>
<td>17.8587 [.057]</td>
<td>17.9089 [.057]</td>
</tr>
<tr>
<td>11</td>
<td>-.046378</td>
<td>.020146</td>
<td>23.2338 [.016]</td>
<td>23.3121 [.016]</td>
</tr>
<tr>
<td>12</td>
<td>.016744</td>
<td>.020189</td>
<td>23.9345 [.021]</td>
<td>24.0166 [.020]</td>
</tr>
<tr>
<td>13</td>
<td>.059457</td>
<td>.020195</td>
<td>32.7688 [.002]</td>
<td>32.9043 [.002]</td>
</tr>
<tr>
<td>14</td>
<td>.0012805</td>
<td>.020265</td>
<td>32.7729 [.003]</td>
<td>32.9084 [.003]</td>
</tr>
<tr>
<td>15</td>
<td>.019589</td>
<td>.020265</td>
<td>33.7318 [.004]</td>
<td>33.8739 [.004]</td>
</tr>
<tr>
<td>16</td>
<td>.0032432</td>
<td>.020272</td>
<td>33.7581 [.006]</td>
<td>33.9004 [.006]</td>
</tr>
<tr>
<td>17</td>
<td>-.019210</td>
<td>.020272</td>
<td>34.6803 [.007]</td>
<td>34.8296 [.007]</td>
</tr>
<tr>
<td>18</td>
<td>-.017575</td>
<td>.020280</td>
<td>35.4523 [.008]</td>
<td>35.6078 [.008]</td>
</tr>
<tr>
<td>19</td>
<td>-.9247E-3</td>
<td>.020286</td>
<td>35.4544 [.012]</td>
<td>35.6099 [.012]</td>
</tr>
<tr>
<td>20</td>
<td>-.010797</td>
<td>.020286</td>
<td>35.7457 [.016]</td>
<td>35.9038 [.016]</td>
</tr>
<tr>
<td>21</td>
<td>.0048073</td>
<td>.020288</td>
<td>35.8034 [.023]</td>
<td>35.9621 [.022]</td>
</tr>
<tr>
<td>22</td>
<td>-.013859</td>
<td>.020289</td>
<td>36.2834 [.028]</td>
<td>36.4467 [.027]</td>
</tr>
<tr>
<td>23</td>
<td>.027383</td>
<td>.020292</td>
<td>38.1572 [.025]</td>
<td>38.3395 [.023]</td>
</tr>
<tr>
<td>24</td>
<td>-.028293</td>
<td>.020307</td>
<td>40.1577 [.021]</td>
<td>40.3609 [.020]</td>
</tr>
</tbody>
</table>

GARCH (1,1) - M RESULTS

TESTS FOR SAVING THE ERROR CORRECTION VARIABLES (RESIDUALS) WHICH ARE USED FOR TESTING VOLATILITY SPILLOVERS

GARCH(1,1) in mean assuming a t distribution converged after 26 iterations

* Dependent variable is DA
2497 observations used for estimation from 4 to 2500

* Regressor Coefficient Standard Error T-Ratio[Prob]
CONSTANT -.1537E-3 .3756E-3 .40928 [.682]
DA(-1)                  -.47027            .018599           -
25.2846[,000]           1.9179            4.4613
.42991[,667]

*****************************************************************************
* R-Squared                     .21788   R-Bar-Squared
.21662
S.E. of Regression           .010204   F-stat.    F(  4,2492)
173.5526[,000]
Mean of Dependent Variable -.2123E-5   S.D. of Dependent Variable
.011529
Residual Sum of Squares       .25949   Equation Log-likelihood
8086.5
Akaike Info. Criterion        8080.5   Schwarz Bayesian Criterion
8063.0
DW-statistic                  2.3304
*****************************************************************************
* Parameters of the Conditional Heteroscedastic Model
Explaining H-SQ, the Conditional Variance of the Error Term
*****************************************************************************
*                          Coefficient       Asymptotic Standard Error
Constant                    .1411E-4              .2385E-5
E-SQ(- 1)                   .17884               .026890
H-SQ(- 1)                   .68209               .023136
D.F. of t-Dist.              13.0845                2.7323
*****************************************************************************

GARCH(1,1) in mean assuming a t distribution converged after 23 iterations
*****************************************************************************
* Dependent variable is DG
2497 observations used for estimation from    4 to 2500
*****************************************************************************
*                          Regressor              Coefficient       Standard Error       T-
Ratio[Prob]                CONSTANT                -.1234E-3           .3559E-3            -
 .34681[,729]               -.49668               .017939              -
DG(-1)                     .75983               1.7423
27.6875[,000]
H-Squared                   .43612[,663]
43612[,663]
*****************************************************************************
* R-Squared                     .21283   R-Bar-Squared
.21157
S.E. of Regression           .017103   F-stat.    F(  4,2492)
168.4442[,000]
Mean of Dependent Variable -.1678E-4   S.D. of Dependent Variable
.019261
Residual Sum of Squares       .72893   Equation Log-likelihood
7018.7
Akaike Info. Criterion        7012.7   Schwarz Bayesian Criterion 6995.3
DW-statistic                  2.2710
*****************************************************************************
* Parameters of the Conditional Heteroscedastic Model
   Explaining H-SQ, the Conditional Variance of the Error Term
*****************************************************************************
*                Coefficient       Asymptotic Standard Error
Constant         .3568E-5              .3266E-5
E-SQ(- 1)        .11705               .019860
H-SQ(- 1)        .87508               .016651
D.F. of t-Dist.  18.4378                6.0274
*****************************************************************************
* H-SQ stands for the conditional variance of the error term.
E-SQ stands for the square of the error term.
   GARCH(1,1) in mean assuming a t distribution
   converged after 26 iterations
*****************************************************************************
* Dependent variable is DU
2497 observations used for estimation from    4 to 2500
*****************************************************************************
*                Regressor              Coefficient       Standard Error         T- Ratio[Prob]
CONSTANT                 .1885E-4           .2309E-3  .081602[.935]
DU(-1)                 -.48483            .018088           -26.8039[.000]
H-Squared                -.33051             2.0282           - .16296[.871]
*****************************************************************************
* R-Squared                     .22628   R-Bar-Squared
.22504
S.E. of Regression       .012920   F-stat.   F(  4,2492)  182.1979[.000]
Mean of Dependent Variable -.1107E-4   S.D. of Dependent Variable
.014676
Residual Sum of Squares   .41596    Equation Log-likelihood
7750.7
Akaike Info. Criterion    7744.7   Schwarz Bayesian Criterion
7727.2
DW-statistic                  2.2850
*****************************************************************************
* Parameters of the Conditional Heteroscedastic Model
   Explaining H-SQ, the Conditional Variance of the Error Term
*****************************************************************************
*                Coefficient       Asymptotic Standard Error
Constant         .1531E-5              .4828E-5
E-SQ(- 1)        .12805               .037552
TESTS FOR MEAN SPILLOVERS

GARCH(1,1) in mean assuming a t distribution converged after 25 iterations

Dependent variable is DU
2497 observations used for estimation from 4 to 2500

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio[Prob]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>.6032E-6</td>
<td>.2322E-3</td>
<td></td>
</tr>
<tr>
<td>.0025973</td>
<td>.998</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DU(-1)</td>
<td>-.49243</td>
<td>.018378</td>
<td>-26.7949[.000]</td>
</tr>
<tr>
<td>DA(-1)</td>
<td>-.083503</td>
<td>.018162</td>
<td>-4.5978[.000]</td>
</tr>
<tr>
<td>DG(-1)</td>
<td>-.024707</td>
<td>.012595</td>
<td>-1.9617[.050]</td>
</tr>
<tr>
<td>H-Squared</td>
<td>-.20583</td>
<td>2.0638</td>
<td></td>
</tr>
<tr>
<td>.099735</td>
<td>.921</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R-Squared                     .23752   R-Bar-Squared
.23568
S.E. of Regression            .012831  F-stat.  F(  6,2490)
129.2771[.000]
Mean of Dependent Variable -.1107E-4  S.D. of Dependent Variable
.014676
Residual Sum of Squares      .40991   Equation Log-likelihood
7766.4
Akaike Info. Criterion       7758.4   Schwarz Bayesian Criterion
7735.1
DW-statistic                  2.2646

Parameters of the Conditional Heteroscedastic Model
Explaining H-SQ, the Conditional Variance of the Error Term

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Asymptotic Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>.1363E-5</td>
</tr>
<tr>
<td>E-SQ(- 1)</td>
<td>.11917</td>
</tr>
<tr>
<td>H-SQ(- 1)</td>
<td>.87970</td>
</tr>
<tr>
<td>D.F. of t-Dist.</td>
<td>12.2133</td>
</tr>
</tbody>
</table>

H-SQ stands for the conditional variance of the error term.
E-SQ stands for the square of the error term.

GARCH(1,1) in mean assuming a t distribution converged after 40 iterations
Dependent variable is DA
2497 observations used for estimation from 4 to 2500

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio[Prob]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>0.1515E-3</td>
<td>0.4217E-3</td>
<td></td>
</tr>
<tr>
<td>DU(-1)</td>
<td>18.5065</td>
<td>0.013553</td>
<td>18.5065[.000]</td>
</tr>
<tr>
<td>DA(-1)</td>
<td>-4.2817</td>
<td>0.017392</td>
<td>-24.6182[.000]</td>
</tr>
<tr>
<td>DG(-1)</td>
<td>6.5245</td>
<td>0.010073</td>
<td>6.5245[.000]</td>
</tr>
</tbody>
</table>

H-Squared = -2.2416, R-Squared = 0.38023, R-Bar-Squared = 0.37874
S.E. of Regression = 0.0090873, F-stat = 254.6063[.000]
Mean of Dependent Variable = -0.2123E-5, S.D. of Dependent Variable = 0.011529
Residual Sum of Squares = 0.20562, Equation Log-likelihood = 8320.5
Akaike Info. Criterion = 8312.5, Schwarz Bayesian Criterion = 8289.2
DW-statistic = 2.4153

Parameters of the Conditional Heteroscedastic Model
Explaining H-SQ, the Conditional Variance of the Error Term

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Asymptotic Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.1546E-4</td>
</tr>
<tr>
<td>E-SQ(-1)</td>
<td>0.16517</td>
</tr>
<tr>
<td>H-SQ(-1)</td>
<td>-0.64330</td>
</tr>
<tr>
<td>D.F. of t-Dist.</td>
<td>13.5278</td>
</tr>
</tbody>
</table>

GARCH(1,1) in mean assuming a t distribution converged after 25 iterations

Dependent variable is DG
2497 observations used for estimation from 4 to 2500

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio[Prob]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>-0.3855E-4</td>
<td>0.3183E-3</td>
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</tr>
</tbody>
</table>
### Parameters of the Conditional Heteroscedastic Model

Explaining H-SQ, the Conditional Variance of the Error Term

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Asymptotic Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>.1847E-5</td>
</tr>
<tr>
<td>E-SQ(- 1)</td>
<td>.10035</td>
</tr>
<tr>
<td>H-SQ(- 1)</td>
<td>.89746</td>
</tr>
<tr>
<td>D.F. of t-Dist.</td>
<td>15.8141</td>
</tr>
</tbody>
</table>

### TESTS FOR VOLATILITY SPILLOVERS

**GARCH(1,1) in mean assuming a t distribution converged after 34 iterations**

* \( \text{Dependent variable is DA} \)

2496 observations used for estimation from 5 to 2500

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio[Prob]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>-.1414E-3</td>
<td>.4650E-3</td>
<td>.-</td>
</tr>
<tr>
<td>EUS(^{-1})</td>
<td>.27555</td>
<td>.014498</td>
<td></td>
</tr>
</tbody>
</table>

7 Here EUS, EGER and EAUS are the past squared innovations which are used as proxies for past volatility shocks during day \( t-1 \); and are taken as the residuals from running the regression of a variable on its one period lagged variable.
EAUS(-1)       -.65148    .018267    -
35.6643[.000]  
EGER(-1)       .058683    .011121    
5.2766[.000]   
H-Squared      1.7413      7.5262     
.23137[.817]   
*****************************************************************************
*                              R-Squared                     .46728   R-Bar-Squared  .46600
*                              S.E. of Regression          .0084224   F-stat.    F(  6,2489) 363.8761[.000]
*                              Mean of Dependent Variable  .5256E-5   S.D. of Dependent Variable .011526
*                              Residual Sum of Squares       .17656   Equation Log-likelihood 8487.7
*                              Akaike Info. Criterion        8479.7   Schwarz Bayesian Criterion 8456.4
*                              DW-statistic                  2.1719  
*****************************************************************************
*
Parameters of the Conditional Heteroscedastic Model
Explaining H-SQ, the Conditional Variance of the Error Term
*****************************************************************************
*                              Coefficient Asymptotic Standard Error
Constant            .7223E-5              .2910E-5
E-SQ(- 1)             .10540               .024139
H-SQ(- 1)             .79071               .022535
D.F. of t-Dist.      12.5577                2.7026  
*****************************************************************************
*
GARCH(1,1) in mean model assuming a t distribution converged after 23
iterations
*****************************************************************************
*                              Dependent variable is DG 2496 observations used for estimation from 5 to 2500
*****************************************************************************
*                              Regressor              Coefficient       Standard Error         T-Ratio[Prob]
CONSTANT                -.3612E-4           .2110E-3            - .17121[.864]
EUS(-1)                .43946               .041914
.4848[.000]                  .014631            .033136            - .44154[.659]
EGER(-1)           -.75323               .023960            - 31.4365[.000]
*****************************************************************************
*                              R-Squared                     .37111   R-Bar-Squared  .36984
*                              S.E. of Regression          .015291   F-stat.    F(  5,2490) 293.8656[.000]
Mean of Dependent Variable -.1026E-4 S.D. of Dependent Variable 0.019262
Residual Sum of Squares .58220 Equation Log-likelihood 7312.2
Akaike Info. Criterion 7305.2 Schwarz Bayesian Criterion 7284.8
DW-statistic 2.1818

Parameters of the Conditional Heteroscedastic Model
Explaining H-SQ, the Conditional Variance of the Error Term

Coefficient Asymptotic Standard Error
Constant .1398E-5 .4470E-4
E-SQ(- 1) .091503 .24623
H-SQ(- 1) .90713 .20961
D.F. of t-Dist. 12.2740 16.0772

SINCE WE EXPERIENCED PROBLEMS IN RUNNING THE EQUATION FOR USA ON OTHER VARIABLES TESTS WHERE RUN INDEPENDENTLY TO SHOW THE RESULTS

GARCH(1,1) in mean assuming a t distribution converged after 25 iterations

Dependent variable is EDU
2494 observations used for estimation from 7 to 2500

Regressor Coefficient Standard Error T-Ratio[Prob]
CONSTANT -.4157E-4 .2317E-3 - .17942 [.858]
EDU(-1) -.13966 .020321 - 6.8730 [.000]
H-Squared .46440 2.0570

R-Squared .020786 R-Bar-Squared .019213
S.E. of Regression .012791 F-stat. F( 4,2489) 13.2088 [.000]
Mean of Dependent Variable .3185E-4 S.D. of Dependent Variable .012916
Residual Sum of Squares .40724 Equation Log-likelihood 7763.3
Akaike Info. Criterion 7757.3 Schwarz Bayesian Criterion 7739.8
DW-statistic 2.1100

Parameters of the Conditional Heteroscedastic Model
Explaining H-SQ, the Conditional Variance of the Error Term
Coefficient       Asymptotic Standard Error

Constant            .1440E-5              .5381E-5
E-SQ(- 1)             .12356               .040562
H-SQ(- 1)             .87525               .033120
D.F. of t-Dist.      12.1379                3.0142

H-SQ stands for the conditional variance of the error term.
E-SQ stands for the square of the error term.

GARCH(1,1) in mean assuming a t distribution converged after 25 iterations

Dependent variable is EDU
2494 observations used for estimation from    7 to 2500

Coefficient       Asymptotic Standard Error

Constant            .1358E-5              .7478E-5
E-SQ(- 1)             .11751               .043298
H-SQ(- 1)             .88125               .034546
D.F. of t-Dist.      11.6186                3.0147

H-SQ stands for the conditional variance of the error term.
E-SQ stands for the square of the error term.
GARCH(1,1) in mean assuming a t distribution converged after 24 iterations

Dependent variable is EDU
2494 observations used for estimation from 7 to 2500

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Ratio[Prob]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>-.3230E-4</td>
<td>.2317E-3</td>
<td>-</td>
</tr>
<tr>
<td>.13939[.889]</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>EDG(-1)</td>
<td>-.088727</td>
<td>.014172</td>
<td>-</td>
</tr>
<tr>
<td>6.2608[.000]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-Squared</td>
<td>.36569</td>
<td>2.0524</td>
<td></td>
</tr>
<tr>
<td>.17817[.859]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R-Squared                    .015995   R-Bar-Squared .014414
S.E. of Regression           .012823   F-stat.    F( 4,2489) 10.1146[.000]
Mean of Dependent Variable   .3185E-4   S.D. of Dependent Variable .012916
Residual Sum of Squares      .40924     Equation Log-likelihood 7759.7
Akaike Info. Criterion       7753.7     Schwarz Bayesian Criterion 7736.2
DW-statistic                 2.2490

Parameters of the Conditional Heteroscedastic Model Explaining H-SQ, the Conditional Variance of the Error Term

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Asymptotic Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>.1400E-5</td>
</tr>
<tr>
<td>E-SQ(- 1)</td>
<td>.12183</td>
</tr>
<tr>
<td>H-SQ(- 1)</td>
<td>.87699</td>
</tr>
<tr>
<td>D.F. of t-Dist.</td>
<td>12.8171</td>
</tr>
</tbody>
</table>

H-SQ stands for the conditional variance of the error term.
E-SQ stands for the square of the error term.