The following file contains results that are not displayed in the main document to save space but are available for readers. Table A.1 presents the correlation matrix of the variables used in the study.

Table A.2 and Table A.3 expose the results of the Unit root tests (ADF +PP) for the same variables used in the study.

Table A.4 shows the results of GJR-GARCH(1,1) with constant and AR(1) of the TUNINDEX stock market volatility.

**Table A.1** Pairwise correlation matrix (02/01/2020-30/12/2022)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Covariance Analysis: Ordinary |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Date: 12/26/23 Time: 15:05 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sample: 3/23/2020 12/30/2022 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Included observations: 654 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Balanced sample (listwise missing value deletion) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Correlation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Probability | CONDVAR\_TUN  | CASES\_RATE  | DEATH\_RATE  | DSTRINGENCYINDEX  | DS1  | DS2  | DS3  | DS4  | DS5  | DS6  | DS7  | DS8  | DS9  | DCONTAINMENTHEALTHINDEX  | DECONOMICSUPPORTINDEX  | DGOVERNMENTRESPONSEINDEX  | CONDVAR\_WTI  |
| CONDVAR\_TUN  | 1.000000 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | -----  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CASES\_RATE  | 0.641684 | 1.000000 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 0.0000 | -----  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DEATH\_RATE  | 0.531238 | 0.702107 | 1.000000 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 0.0000 | 0.0000 | -----  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DSTRINGENCYINDEX  | 0.253544 | 0.235240 | 0.469472 | 1.000000 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 0.0000 | 0.0000 | 0.0000 | -----  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS1  | -0.001310 | 0.015518 | 0.050847 | 0.317825 | 1.000000 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 0.9733 | 0.6920 | 0.1940 | 0.0000 | -----  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS2  | 0.085401 | 0.098285 | 0.088481 | 0.622050 | 0.055570 | 1.000000 |  |  |  |  |  |  |  |  |  |  |  |
|  | 0.0290 | 0.0119 | 0.0236 | 0.0000 | 0.1558 | -----  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS3  | 0.085401 | 0.098285 | 0.088481 | 0.622050 | 0.055570 | 1.000000 | 1.000000 |  |  |  |  |  |  |  |  |  |  |
|  | 0.0290 | 0.0119 | 0.0236 | 0.0000 | 0.1558 | 0.0000 | -----  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS4  | 0.322770 | 0.262660 | 0.493970 | 0.749258 | -0.053961 | 0.653357 | 0.653357 | 1.000000 |  |  |  |  |  |  |  |  |  |
|  | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1681 | 0.0000 | 0.0000 | -----  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS5  | 0.138473 | 0.109170 | 0.257526 | 0.376878 | -0.068059 | 0.204124 | 0.204124 | 0.400098 | 1.000000 |  |  |  |  |  |  |  |  |
|  | 0.0004 | 0.0052 | 0.0000 | 0.0000 | 0.0820 | 0.0000 | 0.0000 | 0.0000 | -----  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS6  | 0.254143 | 0.142544 | 0.324790 | 0.569724 | 0.215221 | 0.129099 | 0.129099 | 0.379566 | 0.237171 | 1.000000 |  |  |  |  |  |  |  |
|  | 0.0000 | 0.0003 | 0.0000 | 0.0000 | 0.0000 | 0.0009 | 0.0009 | 0.0000 | 0.0000 | -----  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS7  | 0.112594 | 0.145647 | 0.340032 | 0.605458 | 0.188761 | 0.169842 | 0.169842 | 0.221934 | 0.208013 | 0.263117 | 1.000000 |  |  |  |  |  |  |
|  | 0.0039 | 0.0002 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | -----  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS8  | -0.001727 | 0.015988 | 0.005142 | 0.103252 | -0.001021 | 0.083418 | 0.083418 | 0.001000 | 0.000000 | 0.000000 | -0.113343 | 1.000000 |  |  |  |  |  |
|  | 0.9648 | 0.6832 | 0.8956 | 0.0082 | 0.9792 | 0.0329 | 0.0329 | 0.9796 | 1.0000 | 1.0000 | 0.0037 | -----  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DS9  | 0.018344 | 0.015166 | 0.010140 | 0.102838 | -0.000884 | 1.25E-19 | 1.25E-19 | 0.000866 | 0.000000 | 0.000000 | 1.70E-19 | 0.287422 | 1.000000 |  |  |  |  |
|  | 0.6396 | 0.6987 | 0.7958 | 0.0085 | 0.9820 | 1.0000 | 1.0000 | 0.9824 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | -----  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DCONTAINMENTHEALTHINDEX  | 0.247155 | 0.239503 | 0.480352 | 0.966442 | 0.284465 | 0.561828 | 0.561828 | 0.756711 | 0.430487 | 0.562210 | 0.547830 | 0.127180 | 0.086460 | 1.000000 |  |  |  |
|  | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0011 | 0.0270 | -----  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DECONOMICSUPPORTINDEX  | 0.314156 | 0.230082 | 0.556719 | 0.363384 | -0.049042 | -8.28E-20 | -8.28E-20 | 0.437816 | 0.182658 | 0.231046 | 0.303961 | 0.001370 | 0.001186 | 0.358285 | 1.000000 |  |  |
|  | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.2104 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.9721 | 0.9759 | 0.0000 | -----  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DGOVERNMENTRESPONSEINDEX  | 0.288383 | 0.264404 | 0.549608 | 0.952510 | 0.248843 | 0.510873 | 0.510873 | 0.776793 | 0.428548 | 0.558133 | 0.559835 | 0.115908 | 0.078869 | 0.981980 | 0.528264 | 1.000000 |  |
|  | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0030 | 0.0438 | 0.0000 | 0.0000 | -----  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CONDVAR\_WTI  | 0.504872 | 0.461038 | 0.373197 | 0.115029 | 0.003756 | 0.001056 | 0.001056 | 0.129824 | 0.082393 | 0.098683 | 0.089358 | 0.007011 | 0.009324 | 0.122565 | 0.174915 | 0.146867 | 1.000000 |
|  | 0.0000 | 0.0000 | 0.0000 | 0.0032 | 0.9236 | 0.9785 | 0.9785 | 0.0009 | 0.0352 | 0.0116 | 0.0223 | 0.8580 | 0.8119 | 0.0017 | 0.0000 | 0.0002 | -----  |

Source: The Author

 **Table A.2** Unit root test results for the main variables (02/01/2020-30/12/2022)

|  |
| --- |
| **UNIT ROOT TEST TABLE (PP)** |
|  | **At Level** |  |  |  |  |  |  |  |  |
|  |  | RETURN\_TUN | WTI\_OIL\_RETURN | CASES\_RATE | DEATH\_RATE | STRINGENCY\_INDEX | CONTAINMENT\_HEALTH\_INDEX | ECONOMIC\_SUPPORT\_INDEX | GOVERNMENT\_RESPONSE\_INDEX |
| With Constant | t-Statistic | -17.9629 | -25.7297 | -22.9927 | -30.5010 | -2.9743 | -3.0827 | -2.7451 | -3.1193 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0379*** | ***0.0283*** | ***0.0670*** | ***0.0256*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\* | \*\* | \* | \*\* |
| With Constant & Trend  | t-Statistic | -17.9605 | -25.7187 | -23.8726 | -31.2349 | -2.9910 | -2.8231 | -3.4774 | -2.9014 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.1354*** | ***0.1894*** | ***0.0426*** | ***0.1626*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | n0 | n0 | \*\* | n0 |
| Without Constant & Trend  | t-Statistic | -17.9588 | -25.7048 | -22.4117 | -30.2296 | -0.9405 | -0.5733 | -1.1239 | -0.5541 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.3091*** | ***0.4688*** | ***0.2376*** | ***0.4770*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | n0 | n0 | n0 | n0 |
|  | **At First Difference** |  |  |  |  |  |  |  |
|  |  | d(RETURN\_TUN) | d(WTI\_OIL\_RETURN) | d(CASES\_RATE) | d(DEATH\_RATE) | d(STRINGENCY\_INDEX) | d(CONTAINMENT\_HEALTH\_INDEX) | d(ECONOMIC\_SUPPORT\_INDEX) | d(GOVERNMENT\_RESPONSE\_INDEX) |
| With Constant | t-Statistic | -169.3500 | -236.2181 | -162.4985 | -136.8774 | -26.7290 | -26.7904 | -26.4779 | -26.5074 |
|  | ***Prob.*** | ***0.0001*** | ***0.0001*** | ***0.0001*** | ***0.0001*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| With Constant & Trend  | t-Statistic | -172.0593 | -235.9024 | -166.8787 | -139.2376 | -26.7121 | -26.7453 | -26.4934 | -26.5297 |
|  | ***Prob.*** | ***0.0001*** | ***0.0001*** | ***0.0001*** | ***0.0001*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| Without Constant & Trend  | t-Statistic | -167.7626 | -236.2979 | -160.7190 | -135.3977 | -26.7437 | -26.8039 | -26.4953 | -26.5187 |
|  | ***Prob.*** | ***0.0001*** | ***0.0001*** | ***0.0001*** | ***0.0001*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| **UNIT ROOT TESt TABLE (ADF)** |
|  |
|  | **At Level** |  |  |  |  |  |  |  |  |
|  |  | RETURN\_TUN | WTI\_OIL\_RETURN | CASES\_RATE | DEATH\_RATE | STRINGENCY\_INDEX | CONTAINMENT\_HEALTH\_INDEX | ECONOMIC\_SUPPORT\_INDEX | GOVERNMENT\_RESPONSE\_INDEX |
| With Constant | t-Statistic | -17.9797 | -25.7401 | -4.1014 | -7.7899 | -2.5128 | -2.8497 | -2.7115 | -2.9252 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0010*** | ***0.0000*** | ***0.1128*** | ***0.0520*** | ***0.0725*** | ***0.0430*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | n0 | \* | \* | \*\* |
| With Constant & Trend  | t-Statistic | -18.0276 | -25.7294 | -5.0681 | -8.0845 | -2.5667 | -2.5136 | -3.4564 | -2.6956 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0002*** | ***0.0000*** | ***0.2959*** | ***0.3214*** | ***0.0450*** | ***0.2387*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | n0 | n0 | \*\* | n0 |
| Without Constant & Trend  | t-Statistic | -17.9751 | -25.7179 | -3.5286 | -7.4023 | -0.6830 | -0.3836 | -1.1228 | -0.3992 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0004*** | ***0.0000*** | ***0.4211*** | ***0.5460*** | ***0.2381*** | ***0.5399*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | n0 | n0 | n0 | n0 |
|  | **At First Difference** |  |  |  |  |  |  |  |
|  |  | d(RETURN\_TUN) | d(WTI\_OIL\_RETURN) | d(CASES\_RATE) | d(DEATH\_RATE) | d(STRINGENCY\_INDEX) | d(CONTAINMENT\_HEALTH\_INDEX) | d(ECONOMIC\_SUPPORT\_INDEX) | d(GOVERNMENT\_RESPONSE\_INDEX) |
| With Constant | t-Statistic | -14.0490 | -16.0559 | -14.5446 | -9.7378 | -16.3350 | -16.3293 | -26.4779 | -16.5312 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| With Constant & Trend  | t-Statistic | -14.0385 | -16.0445 | -14.8146 | -9.8772 | -16.3824 | -16.4021 | -26.4934 | -16.6102 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| Without Constant & Trend  | t-Statistic | -14.0595 | -16.0675 | -14.4511 | -9.6831 | -16.3424 | -16.3292 | -26.4953 | -16.5318 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| \*MacKinnon (1996) one-sided p-values. Source: The Author |

**Table A.3** Unit root test results for stringency sub-indicators (02/01/2020-30/12/2022)

|  |
| --- |
| **UNIT ROOT TEST TABLE (PP)** |
|  | **At Level** |  |  |  |  |  |  |  |  |  |
|  |  | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 |
| With Constant | t-Statistic | -2.9374 | -2.9999 | -2.9368 | -2.7648 | -2.3857 | -2.4164 | -2.8574 | -2.0844 | -3.3819 |
|  | ***Prob.*** | ***0.0417*** | ***0.0354*** | ***0.0417*** | ***0.0639*** | ***0.1462*** | ***0.1375*** | ***0.0510*** | ***0.2512*** | ***0.0119*** |
|  |  | \*\* | \*\* | \*\* | \* | n0 | n0 | \* | n0 | \*\* |
| With Constant & Trend  | t-Statistic | -4.2908 | -2.9352 | -3.2717 | -3.0317 | -2.4878 | -2.7618 | -3.2114 | -3.5266 | -2.6337 |
|  | ***Prob.*** | ***0.0034*** | ***0.1519*** | ***0.0718*** | ***0.1242*** | ***0.3342*** | ***0.2122*** | ***0.0830*** | ***0.0373*** | ***0.2653*** |
|  |  | \*\*\* | n0 | \* | n0 | n0 | n0 | \* | \*\* | n0 |
| Without Constant & Trend  | t-Statistic | -1.9646 | -1.6907 | -0.7570 | -0.6674 | -2.1117 | -1.8343 | -2.3155 | -1.0525 | -0.3018 |
|  | ***Prob.*** | ***0.0474*** | ***0.0861*** | ***0.3883*** | ***0.4279*** | ***0.0335*** | ***0.0635*** | ***0.0200*** | ***0.2643*** | ***0.5769*** |
|  |  | \*\* | \* | n0 | n0 | \*\* | \* | \*\* | n0 | n0 |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | d(S1) | d(S2) | d(S3) | d(S4) | d(S5) | d(S6) | d(S7) | d(S8) | d(S9) |
| With Constant | t-Statistic | -26.6203 | -26.5201 | -26.4872 | -26.4885 | -26.4764 | -26.4796 | -26.4764 | -26.5325 | -26.4890 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| With Constant & Trend  | t-Statistic | -26.6250 | -26.5295 | -26.4799 | -26.4841 | -26.4629 | -26.4734 | -26.4647 | -26.5848 | -26.7642 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| Without Constant & Trend  | t-Statistic | -26.6413 | -26.5401 | -26.4953 | -26.4953 | -26.4953 | -26.4982 | -26.4953 | -26.5502 | -26.4953 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| **UNIT ROOT TEST TABLE (ADF)** |
|  | **At Level** |  |  |  |  |  |  |  |  |  |
|  |  | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 |
| With Constant | t-Statistic | -2.9641 | -3.0665 | -2.9064 | -2.7589 | -2.3506 | -2.3176 | -2.7867 | -1.8966 | -4.0772 |
|  | ***Prob.*** | ***0.0389*** | ***0.0296*** | ***0.0451*** | ***0.0648*** | ***0.1565*** | ***0.1667*** | ***0.0607*** | ***0.3340*** | ***0.0011*** |
|  |  | \*\* | \*\* | \*\* | \* | n0 | n0 | \* | n0 | \*\*\* |
| With Constant & Trend  | t-Statistic | -4.2441 | -2.9834 | -3.1896 | -2.9904 | -2.4532 | -2.6662 | -3.1341 | -3.4214 | -3.6335 |
|  | ***Prob.*** | ***0.0040*** | ***0.1376*** | ***0.0873*** | ***0.1356*** | ***0.3516*** | ***0.2512*** | ***0.0992*** | ***0.0493*** | ***0.0277*** |
|  |  | \*\*\* | n0 | \* | n0 | n0 | n0 | \* | \*\* | \*\* |
| Without Constant & Trend  | t-Statistic | -2.0718 | -1.7527 | -0.7560 | -0.6658 | -2.0929 | -1.7755 | -2.2833 | -0.9697 | -0.5273 |
|  | ***Prob.*** | ***0.0368*** | ***0.0756*** | ***0.3887*** | ***0.4286*** | ***0.0350*** | ***0.0721*** | ***0.0217*** | ***0.2972*** | ***0.4883*** |
|  |  | \*\* | \* | n0 | n0 | \*\* | \* | \*\* | n0 | n0 |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | d(S1) | d(S2) | d(S3) | d(S4) | d(S5) | d(S6) | d(S7) | d(S8) | d(S9) |
| With Constant | t-Statistic | -26.4764 | -26.4764 | -26.4872 | -26.4885 | -26.4764 | -26.4764 | -26.4764 | -26.4764 | -5.8586 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| With Constant & Trend  | t-Statistic | -26.4710 | -26.4823 | -26.4799 | -26.4841 | -26.4629 | -26.4724 | -26.4647 | -26.5468 | -6.2265 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| Without Constant & Trend  | t-Statistic | -26.4953 | -26.4953 | -26.4953 | -26.4953 | -26.4953 | -26.4953 | -26.4953 | -26.4953 | -5.8481 |
|  | ***Prob.*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** | ***0.0000*** |
|  |  | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
| \*MacKinnon (1996) one-sided p-values. Source: The Author |

**Table A.4** TGARCH(1,1) for TUNINDEX stock market volatility (02/01/2020-30/12/2022)

|  |  |
| --- | --- |
| Dependent Variable: RETURN\_TUN |  |
| Method: ML - ARCH |  |  |
| Date: 12/26/23 Time: 10:14 |  |  |
| Sample (adjusted): 1/03/2020 12/30/2022 |  |
| Included observations: 754 after adjustments |  |
| Convergence achieved after 23 iterations |  |
| Coefficient covariance computed using outer product of gradients |
| Presample variance: backcast (parameter = 0.7) |
| GARCH = C(3) + C(4)\*RESID(-1)^2 + C(5)\*RESID(-1)^2\*(RESID(-1)<0) + |
|         C(6)\*GARCH(-1) |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | z-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.000331 | 0.000167 | 1.980416 | 0.0477 |
| AR(1) | 0.238238 | 0.042029 | 5.668372 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
|  | Variance Equation |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 1.95E-06 | 2.58E-07 | 7.576788 | 0.0000 |
| RESID(-1)^2 | 0.267931 | 0.062204 | 4.307297 | 0.0000 |
| RESID(-1)^2\*(RESID(-1)<0) | -0.061734 | 0.067649 | -0.912560 | 0.3615 |
| GARCH(-1) | 0.648287 | 0.030173 | 21.48562 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.116555 |     Mean dependent var | 0.000188 |
| Adjusted R-squared | 0.115380 |     S.D. dependent var | 0.004686 |
| S.E. of regression | 0.004408 |     Akaike info criterion | -8.374358 |
| Sum squared resid | 0.014609 |     Schwarz criterion | -8.337551 |
| Log likelihood | 3163.133 |     Hannan-Quinn criter. | -8.360179 |
| Durbin-Watson stat | 1.733961 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Inverted AR Roots |       .24 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

 Source: The Author