

Ljung-Box test for white noise H0: Logreturns are uncorrelated upto lag 12		
Chi-Square	df	P-Value
57.907	1	0.000
64.847	2	0.000
65.690	3	0.000
69.042	4	0.000
86.224	5	0.000
87.086	6	0.000
88.038	7	0.000
94.307	8	0.000
95.197	9	0.000
95.586	10	0.000
104.814	11	0.000
105.409	12	0.000

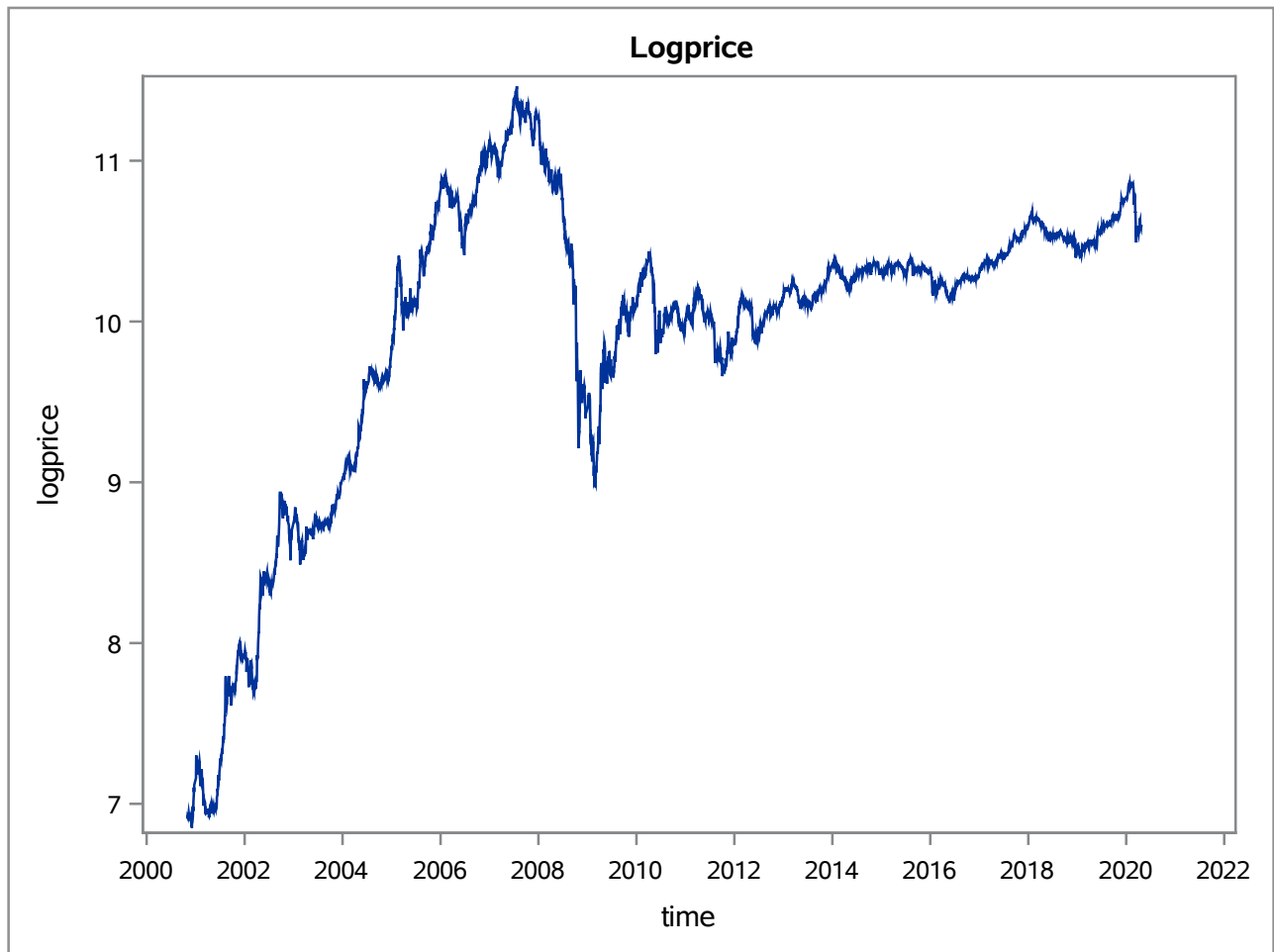
Breusch-Godfrey test for serial correlation H0: there is no serial correlation of any order up to 12		
Chi-Square	df	P-value
4845.234	12	0.000

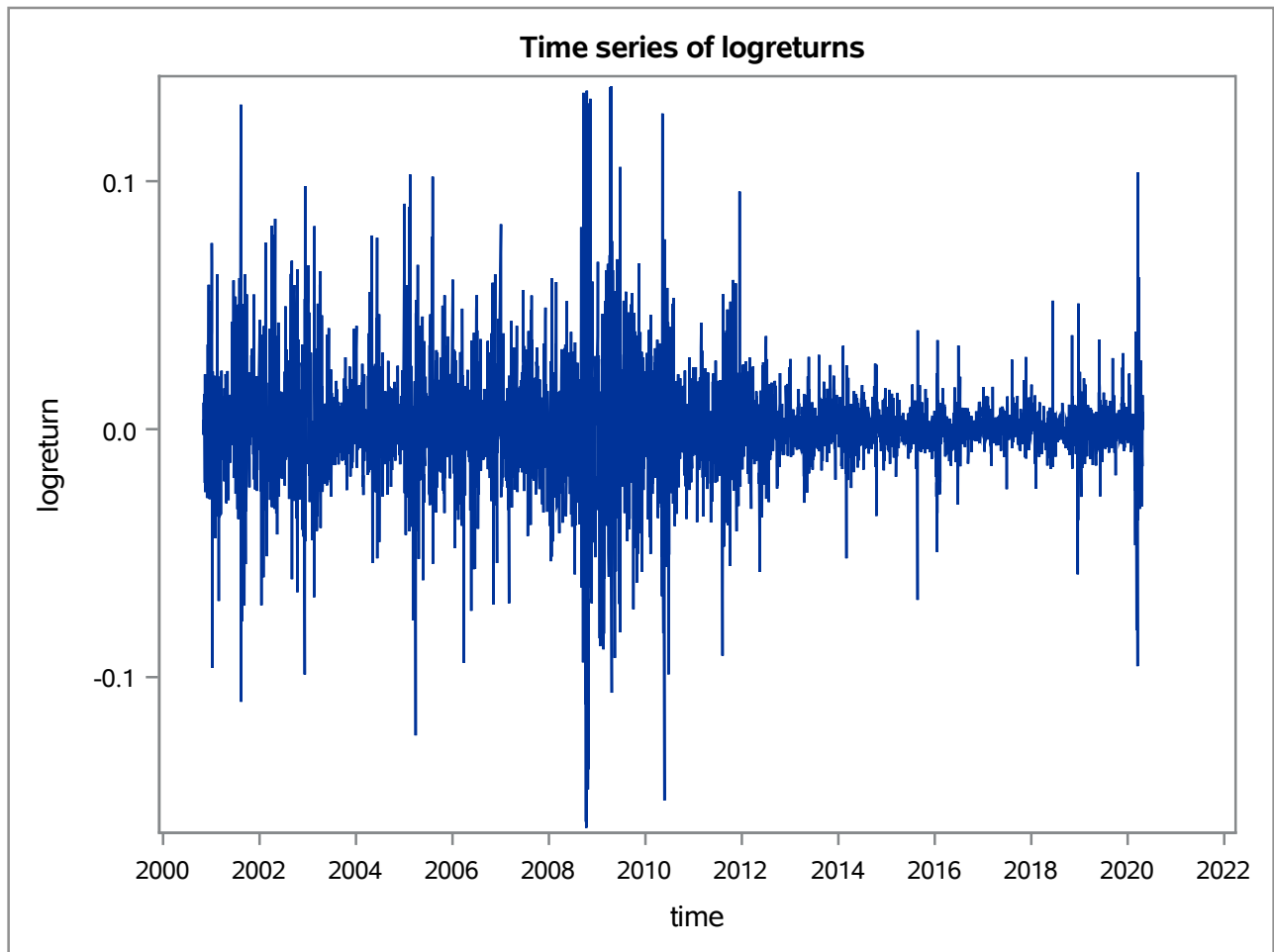
von Neuman rank statistic	Test statistic Z	p-value A	p-value B	p-value C
1.78013	-7.66403	<.000001	1.000000	<.000001

Wald-Wolfowitz Test for Randomness

H0: The data are random

Wald-Wolfowitz Z	Pr > Z
-5.16399	<.0001





Obs	q	nq	VR	z	z_star	z_crit	Decision	lower_homo	upper_homo	lower_hetero	upper_hetero
1	2	4859	1.10954	7.63540	3.47683	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.07258	1.14649	1.02839	1.19069
2	3	4859	1.17159	8.02381	3.65370	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.11651	1.22668	1.05062	1.29257
3	4	4859	1.20944	7.80369	3.55346	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.14031	1.27857	1.05762	1.36126
4	5	4859	1.24291	7.72865	3.51930	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.16195	1.32387	1.06512	1.42071
5	6	4859	1.28526	8.04375	3.66278	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.19391	1.37661	1.08465	1.48587
6	7	4859	1.31181	7.97464	3.63131	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.21109	1.41253	1.09063	1.53299
7	8	4859	1.33538	7.90331	3.59883	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.22607	1.44469	1.09534	1.57543
8	9	4859	1.36182	7.94624	3.61838	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.24453	1.47910	1.10425	1.61939
9	10	4859	1.38584	7.96587	3.62731	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.26108	1.51061	1.11185	1.65984
10	11	4859	1.40729	7.95805	3.62375	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.27546	1.53912	1.11778	1.69679
11	12	4859	1.43252	8.04193	3.66195	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.29399	1.57106	1.12828	1.73676
12	13	4859	1.45571	8.09875	3.68783	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.31077	1.60065	1.13741	1.77401
13	14	4859	1.47953	8.17616	3.72307	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.32846	1.63061	1.14777	1.81130
14	15	4859	1.50476	8.28305	3.77175	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.34779	1.66173	1.16005	1.84948
15	16	4859	1.53140	8.41544	3.83203	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.36875	1.69406	1.17420	1.88860
16	17	4859	1.55938	8.56913	3.90201	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.39124	1.72753	1.19012	1.92865
17	18	4859	1.58936	8.75136	3.98499	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.41589	1.76283	1.20841	1.97031
18	19	4859	1.61752	8.90449	4.05472	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.43889	1.79615	1.22523	2.00981
19	20	4859	1.64449	9.03949	4.11620	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.46084	1.82814	1.24118	2.04780
20	21	4859	1.66737	9.11781	4.15186	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.47884	1.85591	1.25333	2.08141
21	22	4859	1.68828	9.17170	4.17640	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.49498	1.88158	1.26378	2.11278
22	23	4859	1.70835	9.21752	4.19726	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.51040	1.90630	1.27364	2.14306
23	24	4859	1.72735	9.25241	4.21315	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.52486	1.92984	1.28266	2.17203
24	25	4859	1.74575	9.28277	4.22697	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.53881	1.95268	1.29130	2.20019
25	26	4859	1.76258	9.29687	4.23340	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.55130	1.97387	1.29859	2.22658
26	27	4859	1.77909	9.31035	4.23953	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.56355	1.99464	1.30574	2.25245
27	28	4859	1.79350	9.30206	4.23576	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.57377	2.01322	1.31096	2.27603

Obs	q	nq	VR	z	z_star	z_crit	Decision	lower_homo	upper_homo	lower_hetero	upper_hetero
28	29	4859	1.80803	9.29884	4.23429	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.58420	2.03186	1.31648	2.29957
29	30	4859	1.82241	9.29695	4.23343	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.59455	2.05026	1.32201	2.32280
30	31	4859	1.83577	9.28664	4.22874	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.60395	2.06758	1.32668	2.34485
31	32	4859	1.84859	9.27339	4.22270	2.57583	Reject Homoskedastic and Heteroskedastic RW	1.61288	2.08429	1.33095	2.36622

