

Ljung-Box test for white noise H0: Logreturns are uncorrelated upto lag 12		
Chi-Square	df	P-Value
0.082	1	0.775
32.017	2	0.000
33.344	3	0.000
33.612	4	0.000
44.914	5	0.000
52.815	6	0.000
52.842	7	0.000
54.169	8	0.000
54.183	9	0.000
70.219	10	0.000
71.578	11	0.000
77.588	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
1382.560	12	0.000

von Neuman Rank Test

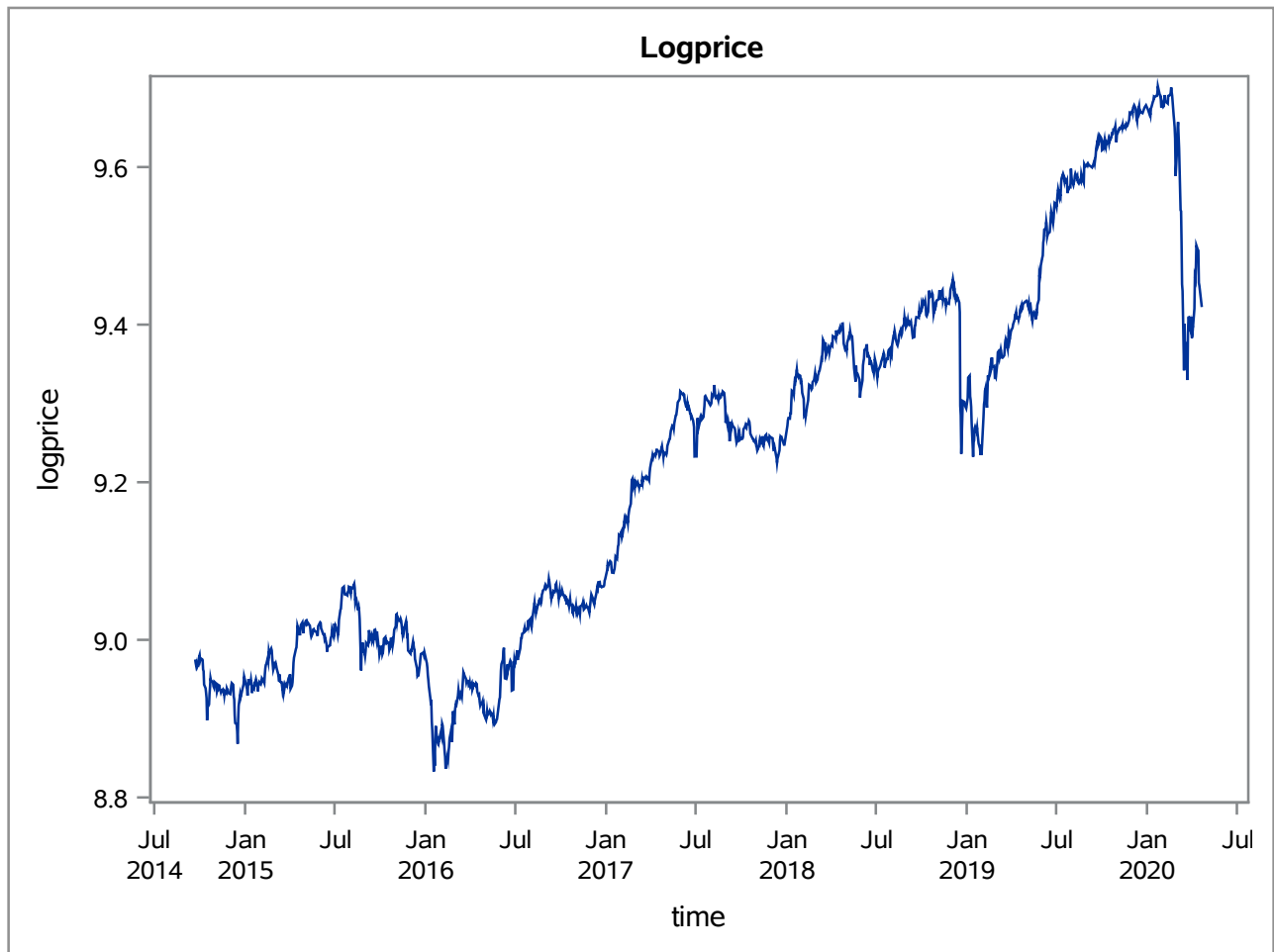
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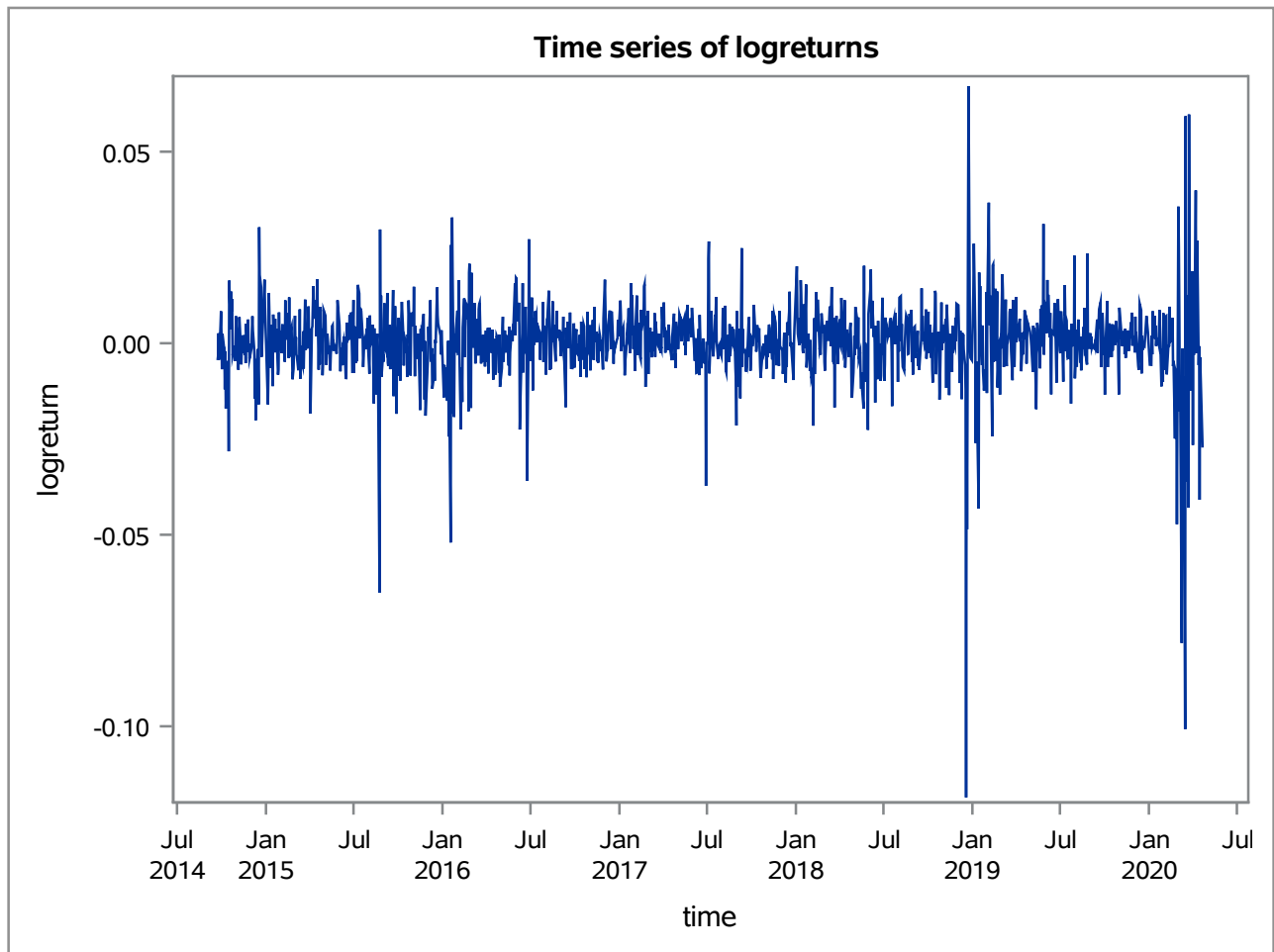
von Neuman rank statistic	Test statistic Z	p-value A	p-value B	p-value C
1.80600	-3.62427	0.000290	0.999855	0.000145

Wald-Wolfowitz Test for Randomness

H0: The data are random

Wald-Wolfowitz Z	Pr > Z
-2.32438	0.0201





Obs	q	nq	VR	z	z_star	z_crit	Decision	lower_homo	upper_homo	lower_hetero	upper_hetero
1	2	1395	1.00651	0.24307	0.10264	2.57583	Cannot Reject RW	0.93754	1.07547	0.84319	1.16982
2	3	1395	1.10997	2.75521	1.16347	2.57583	Reject Homoskedastic RW	1.00716	1.21277	0.86651	1.35342
3	4	1395	1.14012	2.79739	1.18128	2.57583	Reject Homoskedastic RW	1.01110	1.26914	0.83458	1.44566
4	5	1395	1.15304	2.60903	1.10174	2.57583	Reject Homoskedastic RW	1.00195	1.30414	0.79523	1.51085
5	6	1395	1.19141	2.89197	1.22122	2.57583	Reject Homoskedastic RW	1.02092	1.36190	0.78768	1.59514
6	7	1395	1.20117	2.75669	1.16410	2.57583	Reject Homoskedastic RW	1.01320	1.38913	0.75604	1.64629
7	8	1395	1.20901	2.63912	1.11445	2.57583	Reject Homoskedastic RW	1.00501	1.41302	0.72592	1.69211
8	9	1395	1.20845	2.45296	1.03584	2.57583	Cannot Reject RW	0.98956	1.42735	0.69009	1.72681
9	10	1395	1.20883	2.31005	0.97549	2.57583	Cannot Reject RW	0.97597	1.44168	0.65741	1.76025
10	11	1395	1.22882	2.39555	1.01159	2.57583	Cannot Reject RW	0.98278	1.47485	0.64618	1.81145
11	12	1395	1.24063	2.39726	1.01232	2.57583	Cannot Reject RW	0.98208	1.49919	0.62835	1.85292
12	13	1395	1.26056	2.48115	1.04774	2.57583	Cannot Reject RW	0.99006	1.53106	0.61998	1.90114
13	14	1395	1.27602	2.52164	1.06484	2.57583	Cannot Reject RW	0.99407	1.55797	0.60833	1.94371
14	15	1395	1.29251	2.57195	1.08608	2.57583	Cannot Reject RW	0.99956	1.58547	0.59877	1.98626
15	16	1395	1.30743	2.60863	1.10157	2.57583	Reject Homoskedastic RW	1.00387	1.61099	0.58856	2.02630
16	17	1395	1.31395	2.57691	1.08818	2.57583	Reject Homoskedastic RW	1.00013	1.62777	0.57080	2.05710
17	18	1395	1.31803	2.53036	1.06852	2.57583	Cannot Reject RW	0.99428	1.64178	0.55137	2.08470
18	19	1395	1.31499	2.43369	1.02770	2.57583	Cannot Reject RW	0.98160	1.64837	0.52550	2.10447
19	20	1395	1.31213	2.34570	0.99054	2.57583	Cannot Reject RW	0.96938	1.65488	0.50046	2.12380
20	21	1395	1.31374	2.29669	0.96985	2.57583	Cannot Reject RW	0.96187	1.66561	0.48048	2.14700
21	22	1395	1.31440	2.24480	0.94793	2.57583	Cannot Reject RW	0.95364	1.67516	0.46008	2.16871
22	23	1395	1.31662	2.20760	0.93222	2.57583	Cannot Reject RW	0.94719	1.68606	0.44176	2.19148
23	24	1395	1.31926	2.17606	0.91891	2.57583	Cannot Reject RW	0.94135	1.69717	0.42433	2.21419
24	25	1395	1.32305	2.15461	0.90985	2.57583	Cannot Reject RW	0.93684	1.70925	0.40848	2.23762
25	26	1395	1.32981	2.15442	0.90977	2.57583	Cannot Reject RW	0.93549	1.72414	0.39602	2.26361
26	27	1395	1.33490	2.14441	0.90554	2.57583	Cannot Reject RW	0.93262	1.73718	0.38227	2.28754
27	28	1395	1.33723	2.11823	0.89449	2.57583	Cannot Reject RW	0.92715	1.74731	0.36612	2.30834
28	29	1395	1.33574	2.07023	0.87422	2.57583	Cannot Reject RW	0.91800	1.75348	0.34650	2.32498
29	30	1395	1.33483	2.02812	0.85643	2.57583	Cannot Reject RW	0.90958	1.76008	0.32779	2.34187
30	31	1395	1.32824	1.95426	0.82524	2.57583	Cannot Reject RW	0.89560	1.76088	0.30370	2.35278
31	32	1395	1.31817	1.86299	0.78670	2.57583	Cannot Reject RW	0.87826	1.75807	0.27642	2.35991

