

<b>Ljung-Box test for white noise</b>  <b>H0:</b> <b>Logreturns are uncorrelated upto lag 12</b>		
Chi-Square	df	P-Value
0.000	1	0.999
28.327	2	0.000
29.690	3	0.000
30.814	4	0.000
39.735	5	0.000
47.079	6	0.000
47.080	7	0.000
48.357	8	0.000
48.541	9	0.000
66.085	10	0.000
67.145	11	0.000
72.446	12	0.000

<b>Breusch-Godfrey test for serial correlation</b> <b>H0:</b> <b>there is no serial correlation of any order up to 12</b>		
<b>Chi-Square</b>	<b>df</b>	<b>P-value</b>
1448.975	12	0.000

## von Neuman Rank Test

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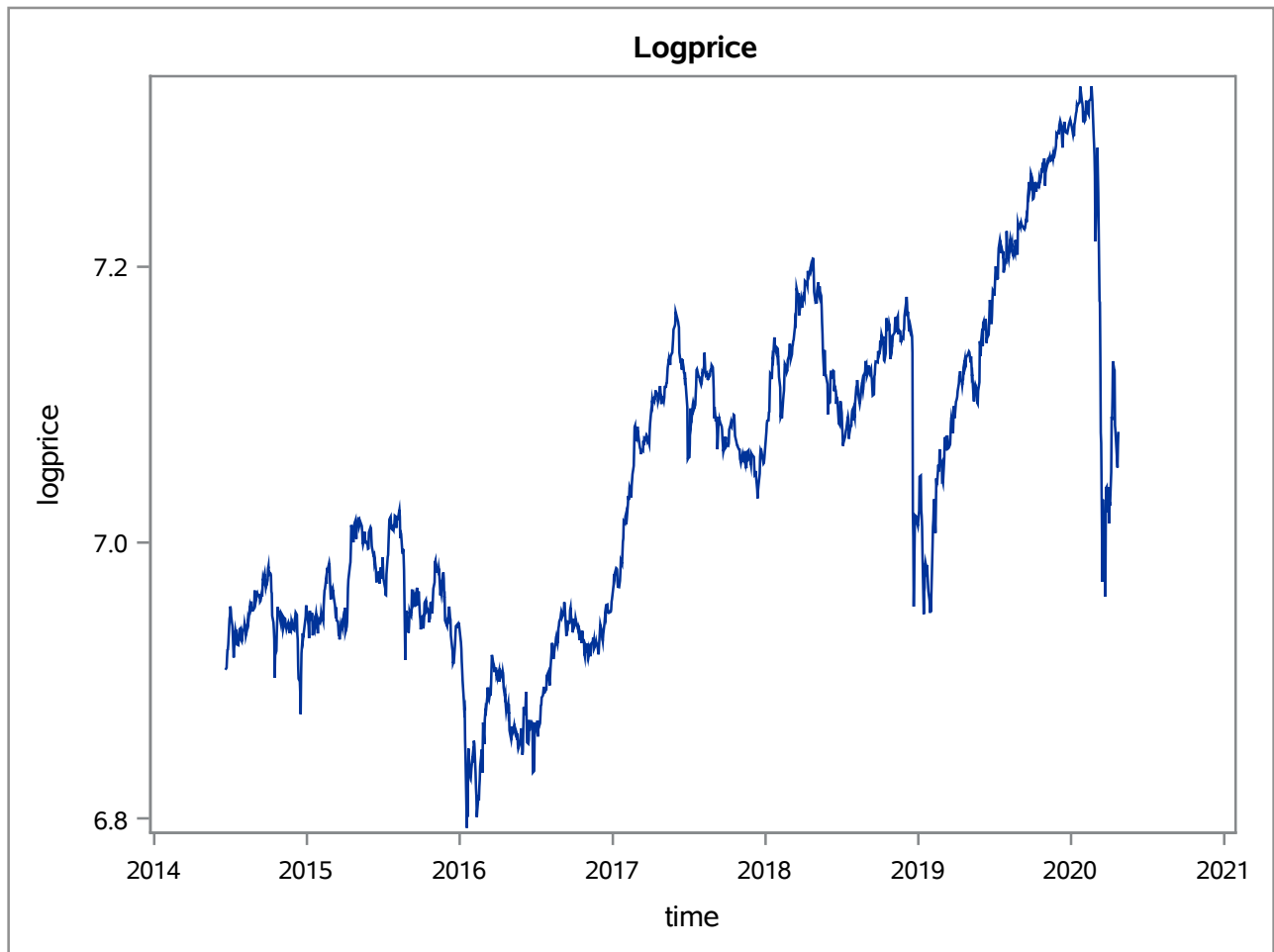
von Neuman rank statistic	Test statistic Z	p-value A	p-value B	p-value C
1.82505	-3.34471	0.000824	0.999588	0.000412

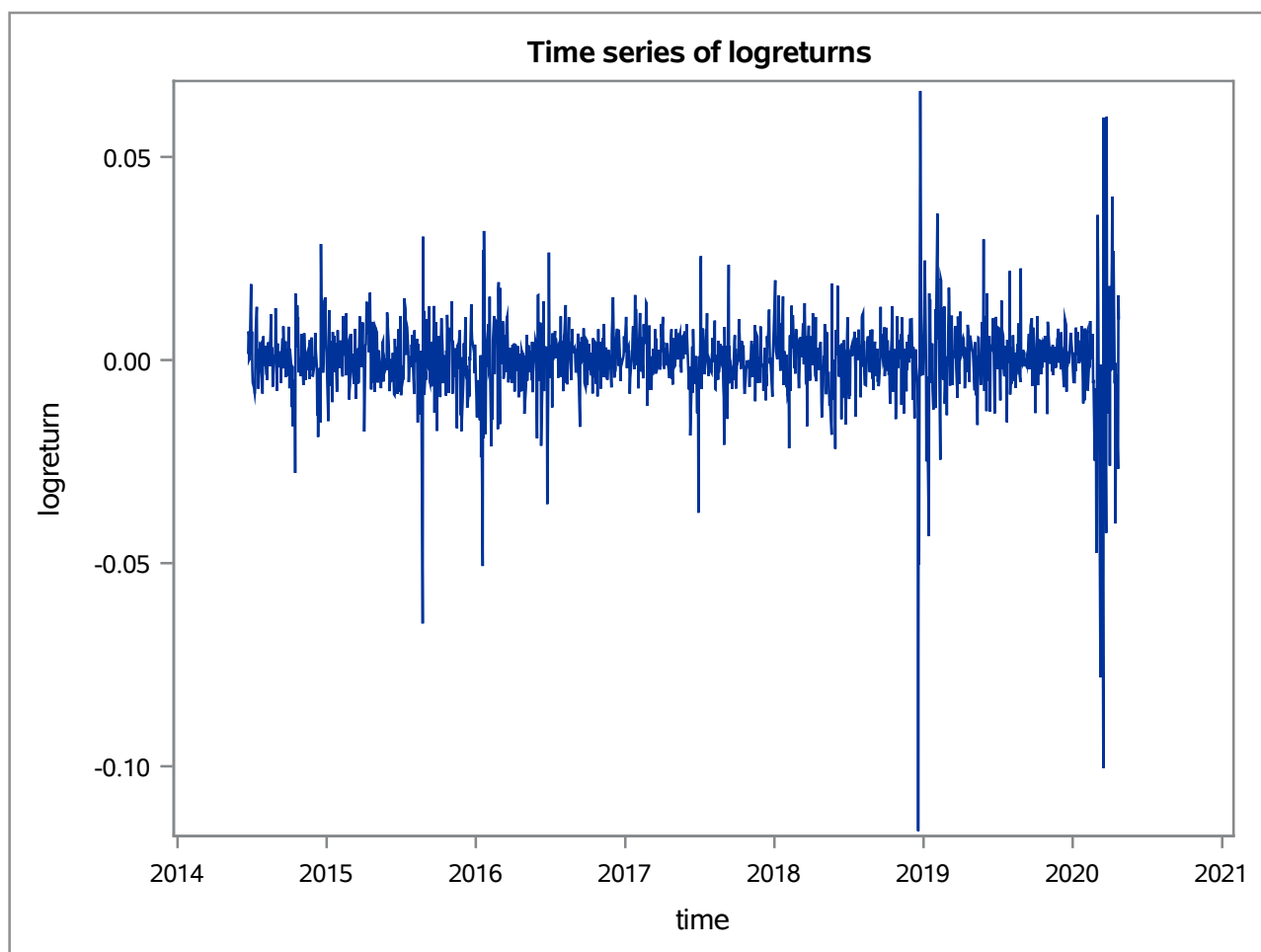
# Wald-Wolfowitz Test for Randomness

## H0: The data are random

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Wald-Wolfowitz Z	Pr >  Z
-2.55611	0.0106





Obs	q	nq	VR	z	z_star	z_crit	Decision	lower_homo	upper_homo	lower_hetero	upper_hetero
1	2	1461	1.00102	0.03888	0.01552	2.57583	Cannot Reject RW	0.93363	1.06841	0.83220	1.16983
2	3	1461	1.09374	2.40360	0.95950	2.57583	Cannot Reject RW	0.99328	1.19420	0.84209	1.34539
3	4	1461	1.12658	2.58621	1.03240	2.57583	Reject Homoskedastic RW	1.00051	1.25266	0.81076	1.44240
4	5	1461	1.13581	2.36931	0.94581	2.57583	Cannot Reject RW	0.98816	1.28345	0.76595	1.50566
5	6	1461	1.16633	2.57179	1.02664	2.57583	Cannot Reject RW	0.99974	1.33292	0.74901	1.58365
6	7	1461	1.16811	2.35761	0.94114	2.57583	Cannot Reject RW	0.98444	1.35179	0.70800	1.62822
7	8	1461	1.16834	2.17522	0.86834	2.57583	Cannot Reject RW	0.96900	1.36768	0.66898	1.66770
8	9	1461	1.16372	1.97168	0.78708	2.57583	Cannot Reject RW	0.94983	1.37762	0.62791	1.69953
9	10	1461	1.16259	1.84066	0.73478	2.57583	Cannot Reject RW	0.93506	1.39013	0.59261	1.73257
10	11	1461	1.18214	1.95149	0.77902	2.57583	Cannot Reject RW	0.94173	1.42256	0.57989	1.78439
11	12	1461	1.19411	1.97899	0.79000	2.57583	Cannot Reject RW	0.94146	1.44676	0.56121	1.82700
12	13	1461	1.21310	2.07663	0.82898	2.57583	Cannot Reject RW	0.94877	1.47742	0.55095	1.87524
13	14	1461	1.22860	2.13726	0.85318	2.57583	Cannot Reject RW	0.95309	1.50411	0.53844	1.91876
14	15	1461	1.24564	2.21035	0.88236	2.57583	Cannot Reject RW	0.95938	1.53191	0.52854	1.96275
15	16	1461	1.26279	2.28202	0.91097	2.57583	Cannot Reject RW	0.96616	1.55942	0.51972	2.00586
16	17	1461	1.27024	2.27002	0.90618	2.57583	Cannot Reject RW	0.96359	1.57689	0.50208	2.03841
17	18	1461	1.27475	2.23711	0.89304	2.57583	Cannot Reject RW	0.95840	1.59110	0.48228	2.06723
18	19	1461	1.27461	2.17131	0.86677	2.57583	Cannot Reject RW	0.94884	1.60037	0.45854	2.09067
19	20	1461	1.27568	2.12024	0.84639	2.57583	Cannot Reject RW	0.94076	1.61060	0.43669	2.11467
20	21	1461	1.27700	2.07518	0.82840	2.57583	Cannot Reject RW	0.93317	1.62083	0.41569	2.13831
21	22	1461	1.27263	1.99210	0.79523	2.57583	Cannot Reject RW	0.92011	1.62515	0.38956	2.15570
22	23	1461	1.27290	1.94723	0.77732	2.57583	Cannot Reject RW	0.91190	1.63389	0.36859	2.17721
23	24	1461	1.27250	1.90076	0.75877	2.57583	Cannot Reject RW	0.90322	1.64178	0.34744	2.19756
24	25	1461	1.27431	1.87230	0.74741	2.57583	Cannot Reject RW	0.89693	1.65169	0.32895	2.21967
25	26	1461	1.27896	1.86483	0.74443	2.57583	Cannot Reject RW	0.89364	1.66427	0.31373	2.24419
26	27	1461	1.27893	1.82778	0.72964	2.57583	Cannot Reject RW	0.88584	1.67202	0.29423	2.26363
27	28	1461	1.28094	1.80591	0.72091	2.57583	Cannot Reject RW	0.88023	1.68165	0.27714	2.28474
28	29	1461	1.28028	1.76867	0.70604	2.57583	Cannot Reject RW	0.87209	1.68847	0.25774	2.30282
29	30	1461	1.27880	1.72822	0.68990	2.57583	Cannot Reject RW	0.86326	1.69434	0.23786	2.31974
30	31	1461	1.27490	1.67494	0.66863	2.57583	Cannot Reject RW	0.85214	1.69766	0.21587	2.33393
31	32	1461	1.26875	1.61046	0.64288	2.57583	Cannot Reject RW	0.83890	1.69861	0.19194	2.34556

