

Ljung-Box test for white noise H0: Logreturns are uncorrelated upto lag 12		
Chi-Square	df	P-Value
23.074	1	0.000
23.844	2	0.000
27.283	3	0.000
29.566	4	0.000
32.908	5	0.000
39.642	6	0.000
43.286	7	0.000
43.485	8	0.000
44.848	9	0.000
45.236	10	0.000
56.094	11	0.000
56.175	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
3351.028	12	0.000

von Neuman Rank Test

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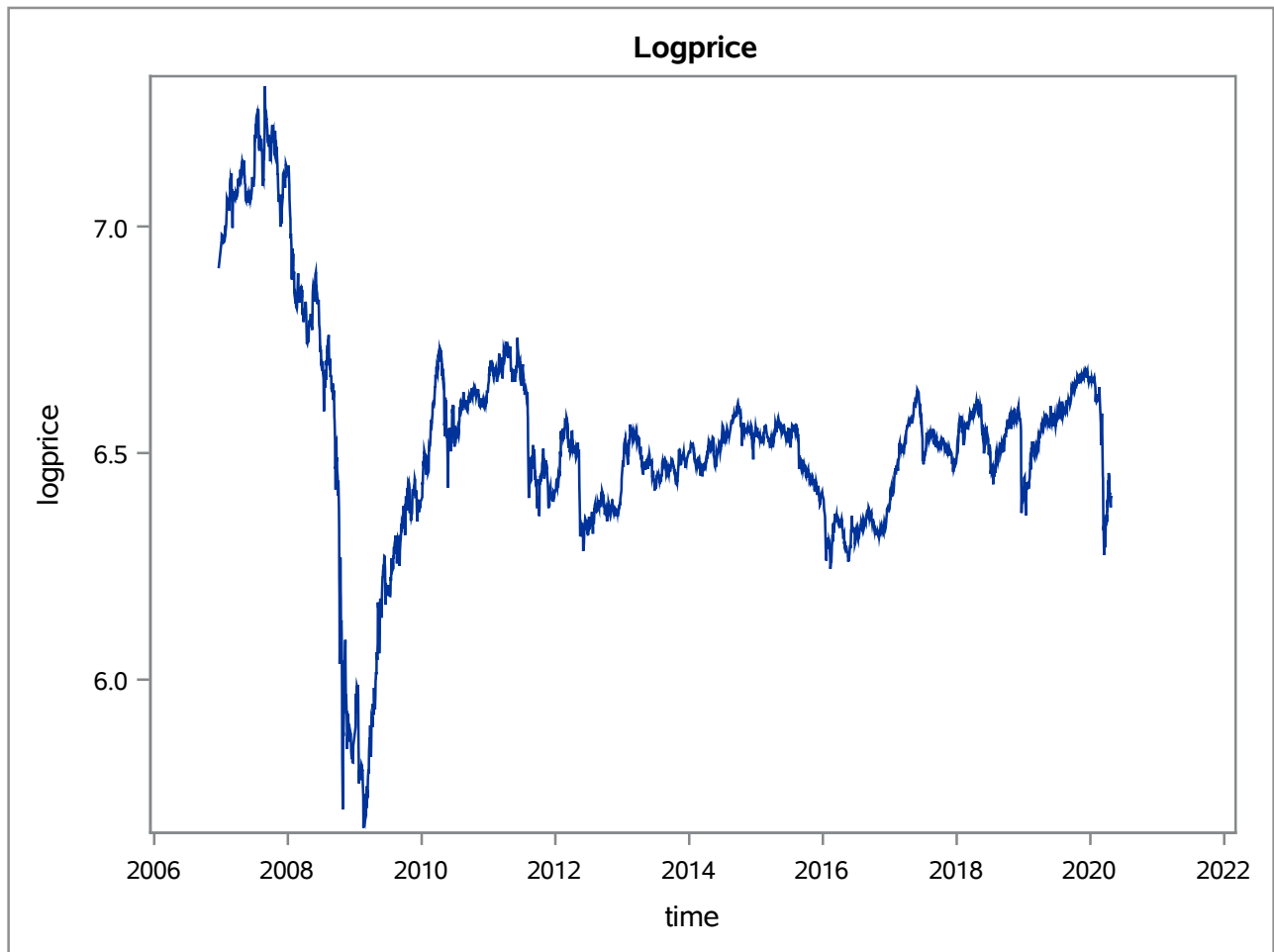
von Neuman rank statistic	Test statistic Z	p-value A	p-value B	p-value C
1.93646	-1.84267	0.065377	0.967312	0.032688

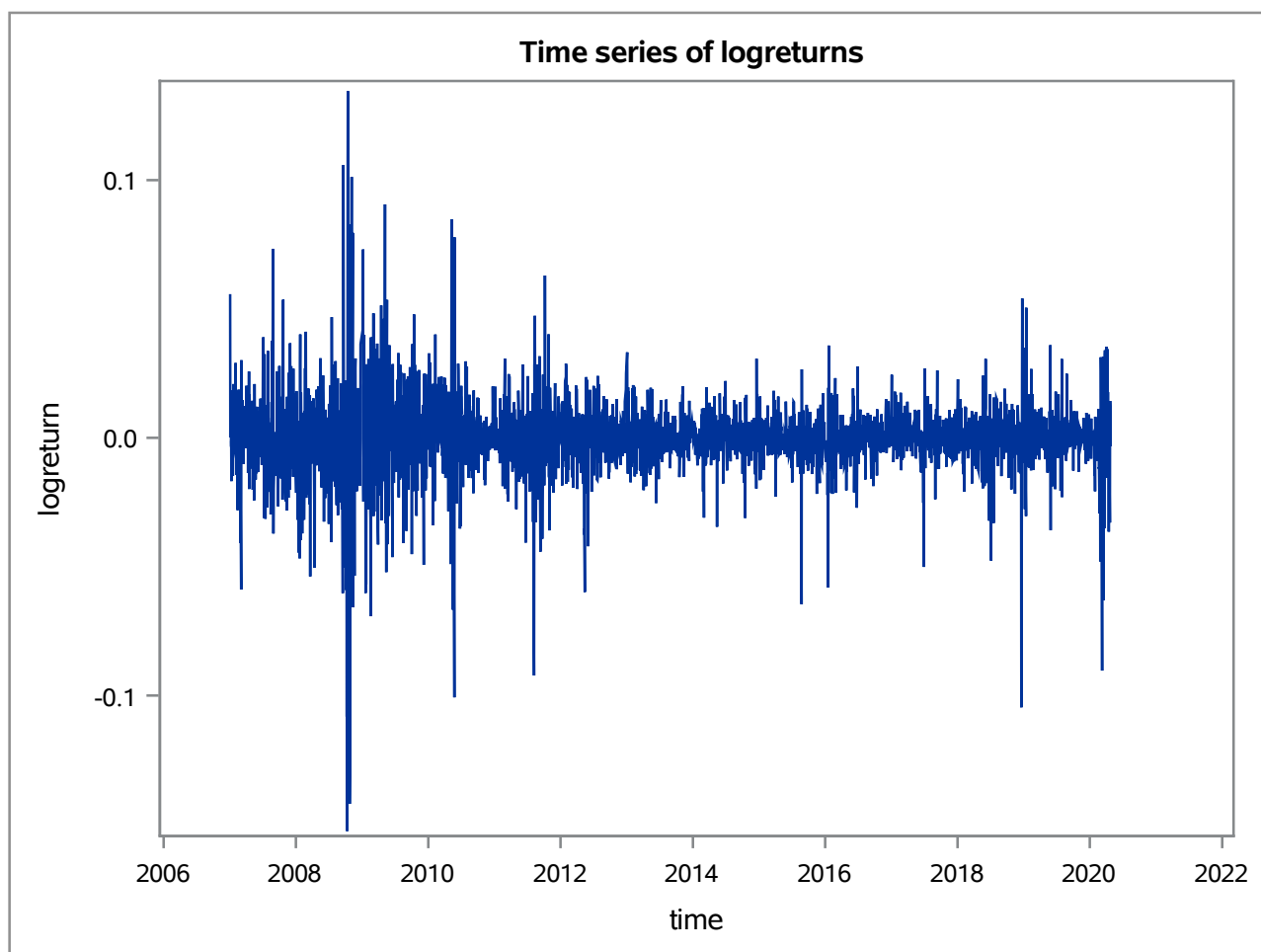
Wald-Wolfowitz Test for Randomness

H0: The data are random

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Wald-Wolfowitz Z	Pr > Z
-0.28538	0.7754





Obs	q	nq	VR	z	z_star	z_critic	Decision	lower_homo	upper_homo	lower_hetero	upper_hetero
1	2	3363	1.08149	4.72575	1.63515	2.57583	Reject Homoskedastic RW	1.03707	1.12591	0.95312	1.20986
2	3	3363	1.11917	4.63590	1.60407	2.57583	Reject Homoskedastic RW	1.05296	1.18538	0.92781	1.31053
3	4	3363	1.12148	3.76565	1.30295	2.57583	Reject Homoskedastic RW	1.03838	1.20458	0.88132	1.36164
4	5	3363	1.13372	3.53954	1.22472	2.57583	Reject Homoskedastic RW	1.03641	1.23104	0.85248	1.41497
5	6	3363	1.15269	3.58193	1.23938	2.57583	Reject Homoskedastic RW	1.04289	1.26249	0.83535	1.47003
6	7	3363	1.15372	3.27061	1.13166	2.57583	Reject Homoskedastic RW	1.03265	1.27478	0.80384	1.50359
7	8	3363	1.14622	2.86656	0.99186	2.57583	Reject Homoskedastic RW	1.01483	1.27761	0.76649	1.52594
8	9	3363	1.14208	2.59588	0.89820	2.57583	Reject Homoskedastic RW	1.00110	1.28306	0.73463	1.54952
9	10	3363	1.13507	2.31997	0.80273	2.57583	Cannot Reject RW	0.98510	1.28504	0.70165	1.56850
10	11	3363	1.13144	2.13658	0.73928	2.57583	Cannot Reject RW	0.97298	1.28990	0.67347	1.58940
11	12	3363	1.13788	2.13275	0.73795	2.57583	Cannot Reject RW	0.97136	1.30440	0.65661	1.61915
12	13	3363	1.14451	2.13652	0.73926	2.57583	Cannot Reject RW	0.97029	1.31873	0.64100	1.64802
13	14	3363	1.15392	2.18335	0.75546	2.57583	Cannot Reject RW	0.97233	1.33552	0.62910	1.67874
14	15	3363	1.16481	2.25001	0.77852	2.57583	Cannot Reject RW	0.97613	1.35349	0.61951	1.71011
15	16	3363	1.17730	2.33583	0.80822	2.57583	Cannot Reject RW	0.98178	1.37281	0.61225	1.74234
16	17	3363	1.18948	2.41480	0.83555	2.57583	Cannot Reject RW	0.98736	1.39160	0.60535	1.77361
17	18	3363	1.20141	2.48815	0.86092	2.57583	Cannot Reject RW	0.99290	1.40993	0.59880	1.80403
18	19	3363	1.21455	2.57383	0.89057	2.57583	Cannot Reject RW	0.99983	1.42927	0.59400	1.83511
19	20	3363	1.23074	2.69238	0.93159	2.57583	Reject Homoskedastic RW	1.00999	1.45149	0.59275	1.86873
20	21	3363	1.24183	2.74862	0.95105	2.57583	Reject Homoskedastic RW	1.01520	1.46845	0.58686	1.89679
21	22	3363	1.24783	2.74740	0.95063	2.57583	Reject Homoskedastic RW	1.01548	1.48017	0.57632	1.91933
22	23	3363	1.25292	2.73802	0.94738	2.57583	Reject Homoskedastic RW	1.01498	1.49086	0.56526	1.94058
23	24	3363	1.25766	2.72674	0.94348	2.57583	Reject Homoskedastic RW	1.01426	1.50105	0.55422	1.96110
24	25	3363	1.26128	2.70573	0.93621	2.57583	Reject Homoskedastic RW	1.01254	1.51002	0.54241	1.98016
25	26	3363	1.26170	2.65424	0.91839	2.57583	Reject Homoskedastic RW	1.00773	1.51566	0.52771	1.99568
26	27	3363	1.26269	2.61162	0.90365	2.57583	Reject Homoskedastic RW	1.00360	1.52178	0.51390	2.01148
27	28	3363	1.26485	2.58300	0.89375	2.57583	Reject Homoskedastic RW	1.00074	1.52896	0.50154	2.02816
28	29	3363	1.26928	2.57807	0.89204	2.57583	Reject Homoskedastic RW	1.00023	1.53833	0.49171	2.04685
29	30	3363	1.27603	2.59602	0.89825	2.57583	Reject Homoskedastic RW	1.00215	1.54992	0.48447	2.06759

Obs	q	nq	VR	z	z_star	z_crit	Decision	lower_homo	upper_homo	lower_hetero	upper_hetero
30	31	3363	1.28290	2.61520	0.90488	2.57583	Reject Homoskedastic RW	1.00426	1.56155	0.47759	2.08822
31	32	3363	1.28989	2.63553	0.91192	2.57583	Reject Homoskedastic RW	1.00657	1.57322	0.47106	2.10872

