Autocorrelation Test Report

Dependent / ordered variable: G3
Valid ordered cases: 649
Residual predictors: G1, G2, absences, studytime, failures
Series used: Regression residual series from target predicted by available numeric predictors.

H0: ordered values/residuals are not autocorrelated across the tested lags.
H1: ordered values/residuals show serial dependence at one or more tested lags.

Main test summary:

test	statistic	df	p_value	decision_alpha_0_05	interpretation_note
Durbin-Watson first-order autocorrelation context	1.857347	NaN	NaN	Near 2: little first-order autocorrelation signal	Durbin-Watson is interpreted around 2; values below 2 suggest positive autocorrelation and values above 2 suggest negative autocorrelation.
Lag 1 Pearson autocorrelation	0.070685	647.0	0.071938	No significant lag 1 autocorrelation	This directly correlates the ordered series with its one-case lag.
Ljung-Box portmanteau test through lag 10	45.069974	10.0	0.000002	Evidence of autocorrelation by Ljung-Box at selected lag	Ljung-Box tests whether several autocorrelations are jointly zero.
Approximate AR(1) coefficient from Durbin-Watson	0.071326	NaN	NaN	Report as direction/size context, not a p-value decision	Dependent variable: G3; predictors used for residuals: G1, G2, absences, studytime, failures; Regression residual series from target predicted by available numeric predictors.

Lag table:

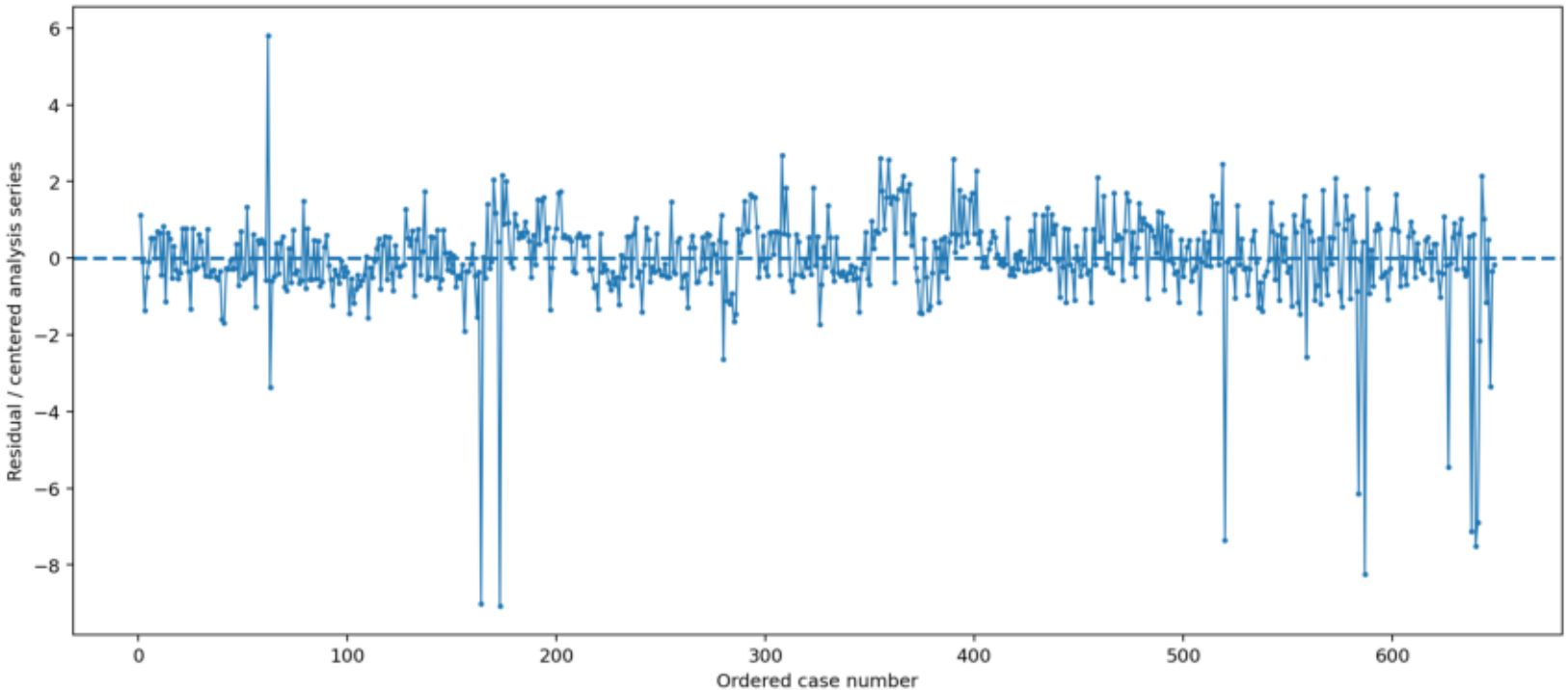
lag	autocorrelation	standard_error_approx	lower_approx_95_limit	upper_approx_95_limit	ljung_box_q_cumulative	ljung_box_df	ljung_box_p_value	decision_alpha_0_05
1	0.070685	0.039253	-0.076937	0.076937	3.257641	1	7.109132e-02	No evidence up to this lag
2	0.132566	0.039253	-0.076937	0.076937	14.733509	2	6.319156e-04	Evidence of autocorrelation up to this lag
3	0.101061	0.039253	-0.076937	0.076937	21.413245	3	8.639230e-05	Evidence of autocorrelation up to this lag
4	0.078412	0.039253	-0.076937	0.076937	25.440752	4	4.101823e-05	Evidence of autocorrelation up to this lag
5	0.061318	0.039253	-0.076937	0.076937	27.907431	5	3.794713e-05	Evidence of autocorrelation up to this lag
6	-0.001886	0.039253	-0.076937	0.076937	27.909767	6	9.771126e-05	Evidence of autocorrelation up to this lag
7	0.096457	0.039253	-0.076937	0.076937	34.032647	7	1.698400e-05	Evidence of autocorrelation up to this lag
8	0.026807	0.039253	-0.076937	0.076937	34.506292	8	3.288141e-05	Evidence of autocorrelation up to this lag
9	0.126225	0.039253	-0.076937	0.076937	45.024330	9	9.131514e-07	Evidence of autocorrelation up to this lag
10	-0.008309	0.039253	-0.076937	0.076937	45.069974	10	2.112416e-06	Evidence of autocorrelation up to this lag
11	0.053616	0.039253	-0.076937	0.076937	46.973671	11	2.173771e-06	Evidence of autocorrelation up to this lag
12	0.021002	0.039253	-0.076937	0.076937	47.266229	12	4.191877e-06	Evidence of autocorrelation up to this lag
13	0.025628	0.039253	-0.076937	0.076937	47.702553	13	7.349081e-06	Evidence of autocorrelation up to this lag
14	0.010752	0.039253	-0.076937	0.076937	47.779477	14	1.429742e-05	Evidence of autocorrelation up to this lag
15	0.021376	0.039253	-0.076937	0.076937	48.083986	15	2.464932e-05	Evidence of autocorrelation up to this lag
16	-0.029317	0.039253	-0.076937	0.076937	48.657657	16	3.742447e-05	Evidence of autocorrelation up to this lag

Partial autocorrelation table:

lag	partial_autocorrelation
1	0.070687
2	0.128220
3	0.086701
4	0.052808
5	0.032632
6	-0.032540
7	0.078320
8	0.011167
9	0.117002
10	-0.033743
11	0.019614
12	-0.004230
13	0.014096
14	-0.009508
15	0.023963
16	-0.065518

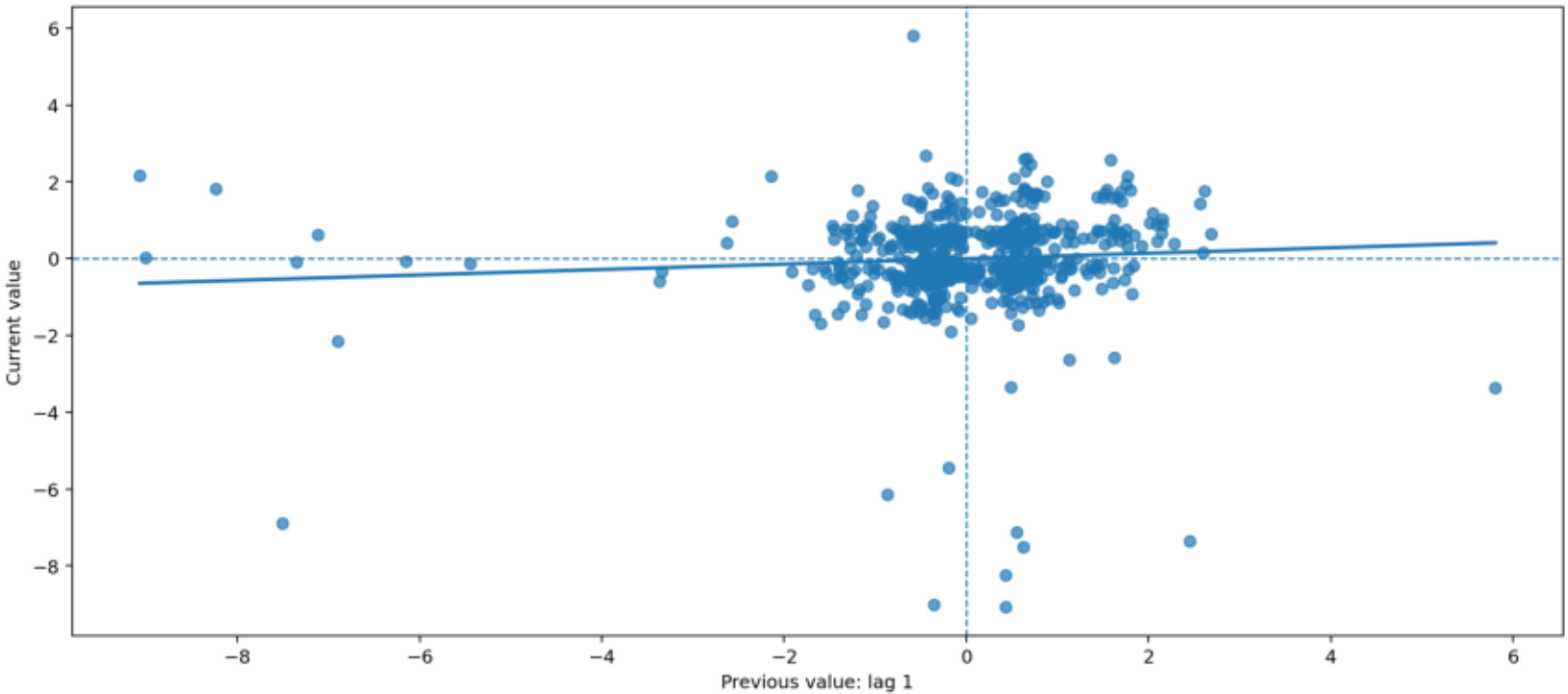
Autocorrelation Test: Ordered Series Plot

The G3 series is inspected in its current row order before lag tests are reported.



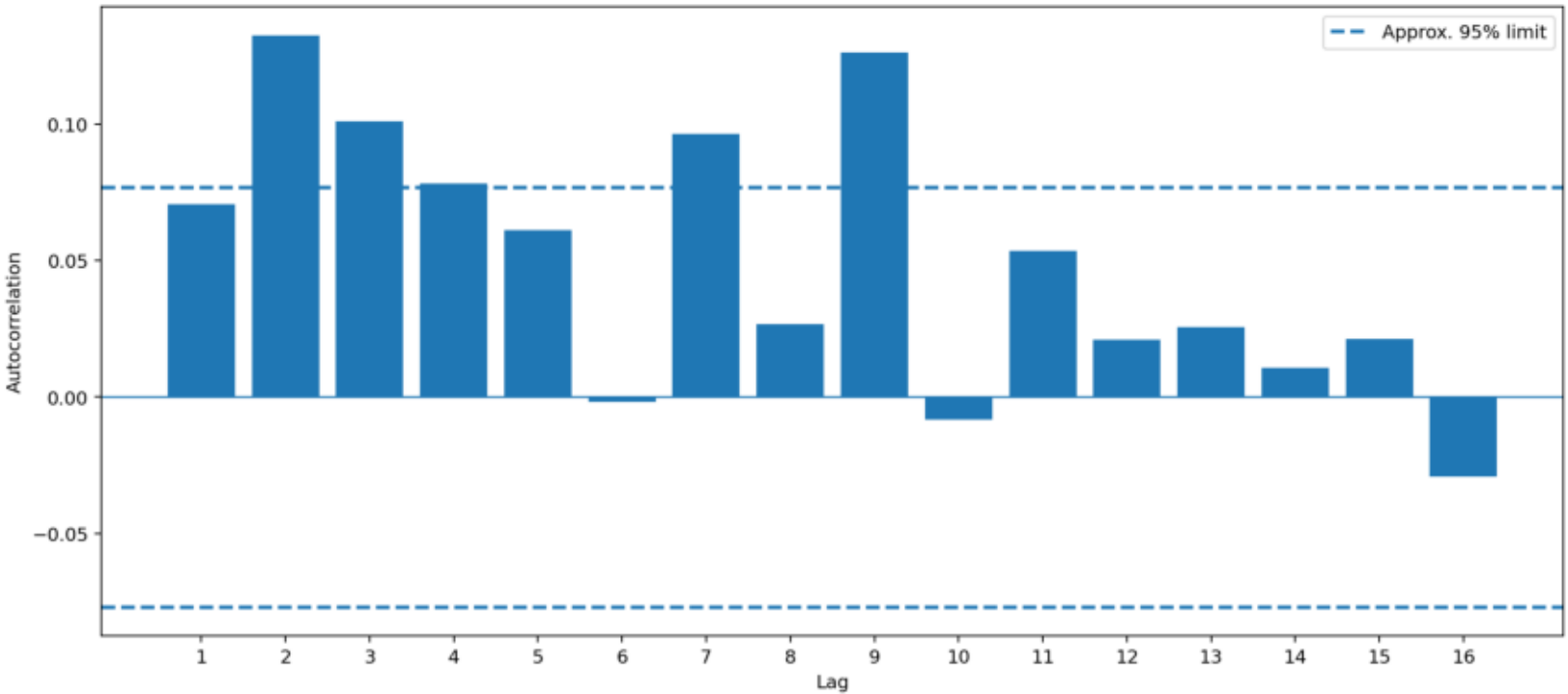
Autocorrelation Test: Lag 1 Scatterplot

A clear upward or downward pattern indicates first-order serial dependence.



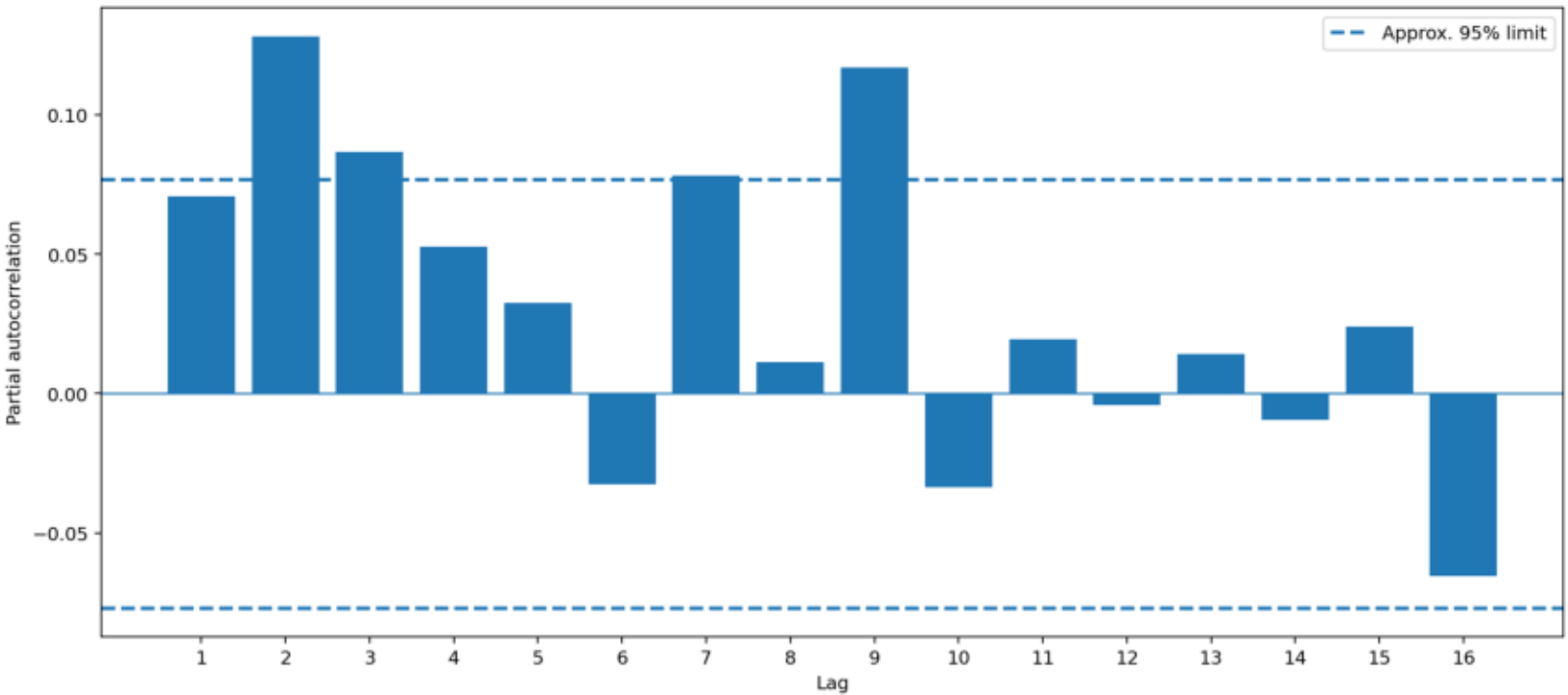
Autocorrelation Function

Bars outside the approximate limits indicate notable lag correlation.



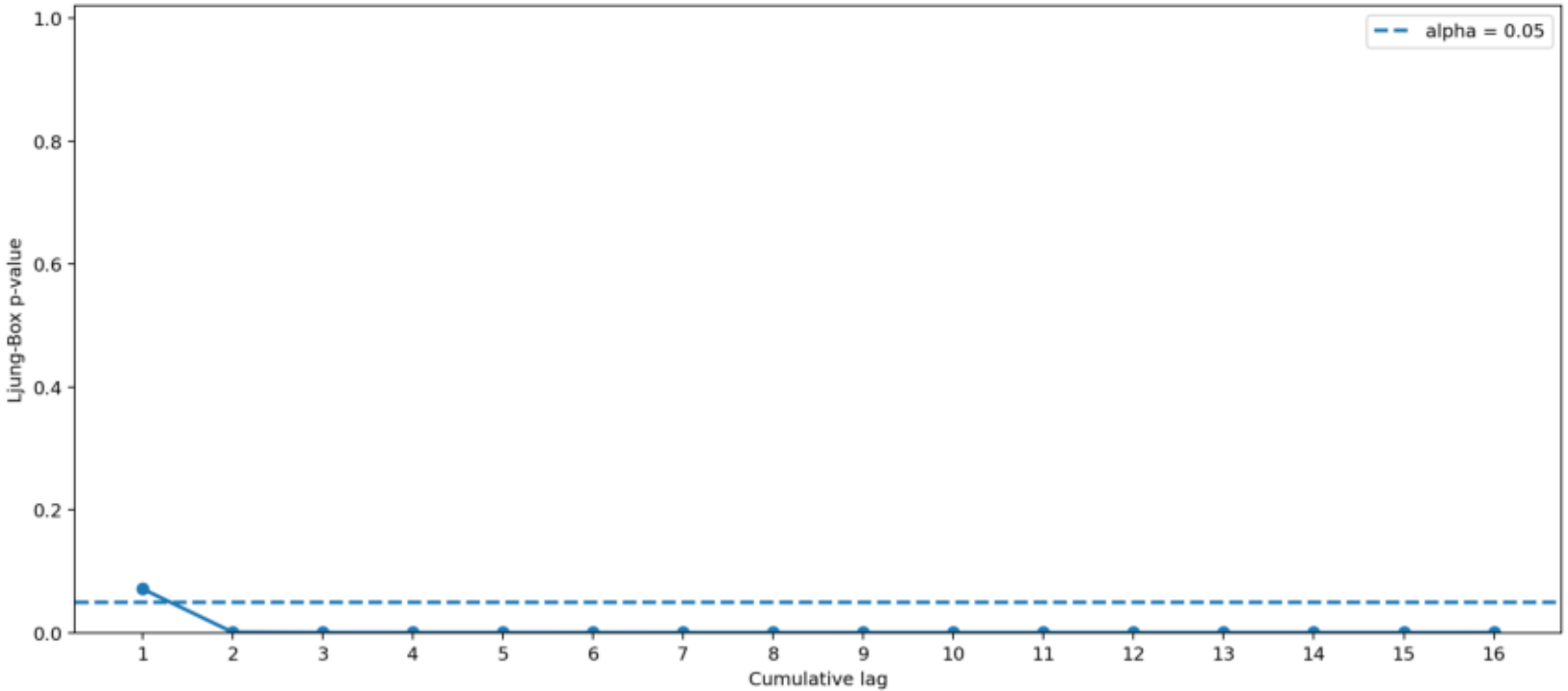
Partial Autocorrelation Context

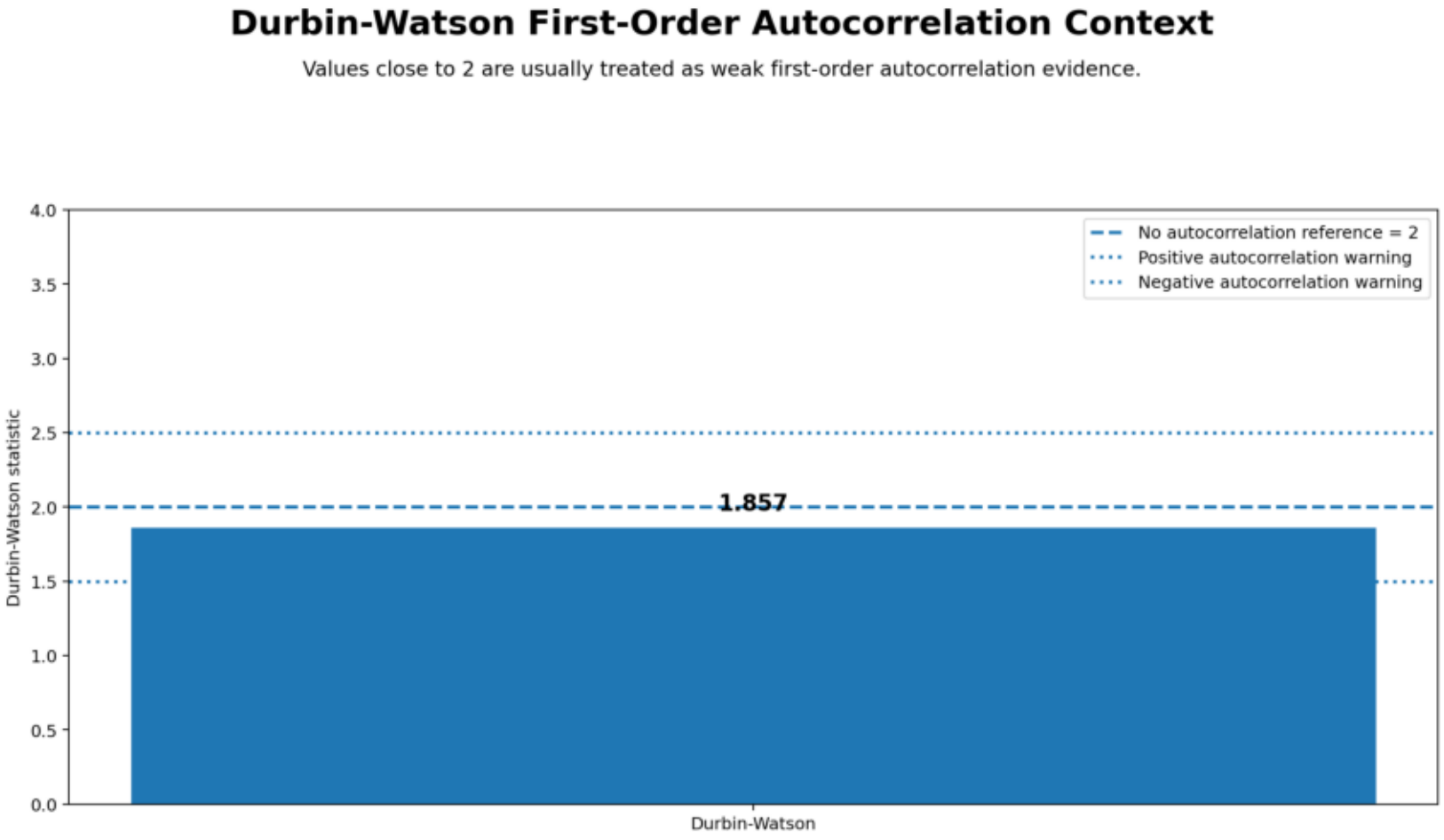
PACF isolates each lag after controlling for earlier lags.



Ljung-Box Autocorrelation Decision

P-values below alpha indicate that autocorrelations are jointly different from zero.




Durbin-Watson First-Order Autocorrelation Context
Values close to 2 are usually treated as weak first-order autocorrelation evidence.
No autocorrelation reference = 2
Positive autocorrelation warning
Negative autocorrelation warning
Durbin-Watson statistic
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.857
Durbin-Watson