

Quantile Regression

Test name: Quantile Regression

Dataset: D:/DATA ANALYSIS/H Regression Tests and Models/Quantile Regression/dataset.csv

Rows in original dataset: 649

Rows used in quantile regression: 649

Outcome variable: G3

Quantiles fitted: 0.25, 0.5, 0.75

Numeric predictors: G1, G2, studytime, failures, absences, age

Categorical predictors: school, sex, address

Formula: $G3 \sim G1 + G2 + \text{studytime} + \text{failures} + \text{absences} + \text{age} + \text{school} + \text{sex} + \text{address}$

Design matrix columns including intercept: 10

OLS comparison R squared: 0.8522

Median quantile pseudo R squared: 0.6852

Method: base-R optimization minimizes the quantile pinball loss function for each tau.

Interpretation: coefficients estimate the effect on the selected conditional quantile.

Decision guide: compare coefficients across tau values to see whether effects differ across the distribution.

Reporting guide: report tau, coefficient, reference standard error, confidence interval, pseudo R squared, and pinball loss.

Charts generated: 10

Quantile regression fit statistics

	model	quantile_tau	n	predictor_columns	pinball_loss	null_pinball_loss	pseudo_r_squared
	Quantile regression tau=0.25	0.25	649	9	195.4467	620.25	0.6848904
	Quantile regression tau=0.50	0.50	649	9	245.0682	778.50	0.6852047
	Quantile regression tau=0.75	0.75	649	9	178.8733	617.75	0.7104439
	OLS comparison	NA	649	9	NA	NA	0.8522223
convergence_code	iterations	method					
0	394	Base-R optim pinball-loss minimization					
0	141	Base-R optim pinball-loss minimization					
0	444	Base-R optim pinball-loss minimization					
NA	NA	stats::lm comparison					

Quantile regression coefficients

quantile	term	coefficient	standard_error_reference	t_value_reference	p_value_reference
0.25	(Intercept)	-0.1709176192	0.77785161	-0.219730368	8.261513e-01
0.25	G1	0.0114780985	0.03676954	0.312163273	7.550183e-01
0.25	G2	0.9881575434	0.03415079	28.935133428	2.712359e-118
0.25	studytime	0.0044018846	0.06323454	0.069612031	9.445242e-01
0.25	failures	-0.0979233139	0.09473929	-1.033608287	3.017103e-01
0.25	absences	0.0006080098	0.01116008	0.054480768	9.565692e-01
0.25	age	0.0097015655	0.04353728	0.222833540	8.237363e-01
0.25	schoolMS	-0.0010789531	0.11806919	-0.009138313	9.927116e-01
0.25	sexM	-0.0031159227	0.10341493	-0.030130298	9.759725e-01
0.25	addressU	0.0065679310	0.11449572	0.057363985	9.542732e-01
0.50	(Intercept)	-0.7750002676	0.77785161	-0.996334342	3.194649e-01
0.50	G1	0.1599771722	0.03676954	4.350807544	1.578726e-05

ci95_lower_reference	ci95_upper_reference	decision_alpha_0_05
-1.69837189	1.35653665	Not statistically significant or not estimated
-0.06072563	0.08368182	Not statistically significant or not estimated
0.92109621	1.05521887	Statistically significant
-0.11977073	0.12857450	Not statistically significant or not estimated
-0.28396128	0.08811465	Not statistically significant or not estimated
-0.02130686	0.02252287	Not statistically significant or not estimated
-0.07579186	0.09519499	Not statistically significant or not estimated
-0.23292945	0.23077155	Not statistically significant or not estimated
-0.20619010	0.19995826	Not statistically significant or not estimated
-0.21826542	0.23140128	Not statistically significant or not estimated
-2.30245454	0.75245400	Not statistically significant or not estimated
0.08777345	0.23218090	Statistically significant



















