

Host

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_analysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=["if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output""].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.05

Host

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_analysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=["if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav""].
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.05

Host

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_analysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=["if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\spv" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\spv""].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.07

Host

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_analysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=["if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\pdf" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\pdf""].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.05

Host

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_analysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['del /Q "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav*.sav" 2>nul'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.05

D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_analysis_data.sav

D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_predictions_with_residuals.sav

Host

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_analysis_data. sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['del /Q "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ spv*.spv" 2>nul'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.05

Host

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_analysis_data. sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['del /Q "D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ pdf*.pdf" 2>nul'].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.05

Ridge Regression

Dataset Name

Notes

Output Created		12-JUL-2026 13:14:31
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\dataset.csv
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		DATASET NAME RidgeRegressionData WINDOW=FRONT.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Warnings

The active dataset will replace the existing dataset named
RidgeRegressionData.

Ridge Regression

Ridge Regression

Descriptive statistics and correlations

Descriptives

Notes

Output Created		12-JUL-2026 13:14:32
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_analysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=G3 G1 G2 studytime failures absences age Medu Fedu /STATISTICS=MEAN STDDEV MIN MAX SKEWNESS KURTOSIS.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.00

[RidgeRegressionData] D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_analysis_data.sav

Ridge Regression
Descriptive statistics and correlations

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic
Final grade outcome	649	.00	19.00	11.9060	3.23066	-.913
First period grade predictor	649	.00	19.00	11.3991	2.74527	-.003
Second period grade predictor	649	.00	19.00	11.5701	2.91364	-.360
Weekly study time predictor	649	1.00	4.00	1.9307	.82951	.700
Past class failures predictor	649	.00	3.00	.2219	.59324	3.093
School absences predictor	649	.00	32.00	3.6595	4.64076	2.021
Student age predictor	649	15.00	22.00	16.7442	1.21814	.417
Mother education predictor	649	.00	4.00	2.5146	1.13455	-.030
Father education predictor	649	.00	4.00	2.3066	1.09993	.215
Valid N (listwise)	649					

Ridge Regression
Descriptive statistics and correlations

Descriptive Statistics

	Skewness	Kurtosis	
	Std. Error	Statistic	Std. Error
Final grade outcome	.096	2.712	.192
First period grade predictor	.096	.037	.192
Second period grade predictor	.096	1.662	.192
Weekly study time predictor	.096	.038	.192
Past class failures predictor	.096	9.824	.192
School absences predictor	.096	5.781	.192
Student age predictor	.096	.072	.192
Mother education predictor	.096	-1.261	.192
Father education predictor	.096	-1.109	.192
Valid N (listwise)			

Correlations

Ridge Regression
Descriptive statistics and correlations

Notes

Output Created		12-JUL-2026 13:14:32
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_anal ysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.
Syntax		CORRELATIONS /VARIABLES=G3 G1 G2 studytime failures absences age Medu Fedu /PRINT=TWOTAIL SIG /MISSING=PAIRWISE.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.03

Ridge Regression
Descriptive statistics and correlations

Correlations

		Final grade outcome	First period grade predictor	Second period grade predictor
Final grade outcome	Pearson Correlation	1	.826	.919
	Sig. (2-tailed)		.000	.000
	N	649	649	649
First period grade predictor	Pearson Correlation	.826	1	.865
	Sig. (2-tailed)	.000		.000
	N	649	649	649
Second period grade predictor	Pearson Correlation	.919	.865	1
	Sig. (2-tailed)	.000	.000	
	N	649	649	649
Weekly study time predictor	Pearson Correlation	.250	.261	.240
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Past class failures predictor	Pearson Correlation	-.393	-.384	-.386
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
School absences predictor	Pearson Correlation	-.091	-.147	-.125
	Sig. (2-tailed)	.020	.000	.001
	N	649	649	649
Student age predictor	Pearson Correlation	-.107	-.174	-.107
	Sig. (2-tailed)	.007	.000	.006
	N	649	649	649
Mother education predictor	Pearson Correlation	.240	.260	.264
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Father education predictor	Pearson Correlation	.212	.218	.225
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649

Ridge Regression
Descriptive statistics and correlations

Correlations

		Weekly study time predictor	Past class failures predictor	School absences predictor
Final grade outcome	Pearson Correlation	.250	-.393	-.091
	Sig. (2-tailed)	.000	.000	.020
	N	649	649	649
First period grade predictor	Pearson Correlation	.261	-.384	-.147
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Second period grade predictor	Pearson Correlation	.240	-.386	-.125
	Sig. (2-tailed)	.000	.000	.001
	N	649	649	649
Weekly study time predictor	Pearson Correlation	1	-.147	-.118
	Sig. (2-tailed)		.000	.003
	N	649	649	649
Past class failures predictor	Pearson Correlation	-.147	1	.123
	Sig. (2-tailed)	.000		.002
	N	649	649	649
School absences predictor	Pearson Correlation	-.118	.123	1
	Sig. (2-tailed)	.003	.002	
	N	649	649	649
Student age predictor	Pearson Correlation	-.008	.320	.150
	Sig. (2-tailed)	.831	.000	.000
	N	649	649	649
Mother education predictor	Pearson Correlation	.097	-.172	-.009
	Sig. (2-tailed)	.013	.000	.827
	N	649	649	649
Father education predictor	Pearson Correlation	.050	-.166	.030
	Sig. (2-tailed)	.200	.000	.448
	N	649	649	649

Ridge Regression
Descriptive statistics and correlations

Correlations

		Student age predictor	Mother education predictor	Father education predictor
Final grade outcome	Pearson Correlation	-.107	.240	.212
	Sig. (2-tailed)	.007	.000	.000
	N	649	649	649
First period grade predictor	Pearson Correlation	-.174	.260	.218
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Second period grade predictor	Pearson Correlation	-.107	.264	.225
	Sig. (2-tailed)	.006	.000	.000
	N	649	649	649
Weekly study time predictor	Pearson Correlation	-.008	.097	.050
	Sig. (2-tailed)	.831	.013	.200
	N	649	649	649
Past class failures predictor	Pearson Correlation	.320	-.172	-.166
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
School absences predictor	Pearson Correlation	.150	-.009	.030
	Sig. (2-tailed)	.000	.827	.448
	N	649	649	649
Student age predictor	Pearson Correlation	1	-.108	-.121
	Sig. (2-tailed)		.006	.002
	N	649	649	649
Mother education predictor	Pearson Correlation	-.108	1	.647
	Sig. (2-tailed)	.006		.000
	N	649	649	649
Father education predictor	Pearson Correlation	-.121	.647	1
	Sig. (2-tailed)	.002	.000	
	N	649	649	649

Ridge Regression

Ridge Regression
Ordinary least-squares comparison model

Regression

Notes

Output Created		12-JUL-2026 13:14:32
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_anal ysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE CI(95) COLLIN TOL /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT G3 /METHOD=ENTER G1 G2 studytime failures absences age Medu Fedu /SAVE PRED(ols_pred) ...
Resources	Processor Time	00:00:00.06
	Elapsed Time	00:00:00.04

Ridge Regression
Ordinary least-squares comparison model

Notes

	Memory Required	8400 bytes
	Additional Memory Required for Residual Plots	0 bytes
Variables Created or Modified	ols_pred	Unstandardized Predicted Value
	ols_resid	Unstandardized Residual

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Father education predictor, School absences predictor, Weekly study time predictor, Student age predictor, Second period grade predictor, Past class failures predictor, Mother education predictor, First period grade predictor ^b	.	Enter

a. Dependent Variable: Final grade outcome

b. All requested variables entered.

Ridge Regression
Ordinary least-squares comparison model

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.922 ^a	.851	.849	1.25576	.851	456.111	8

Model Summary^b

Model	Change Statistics	
	df2	Sig. F Change
1	640	.000

a. Predictors: (Constant), Father education predictor, School absences predictor, Weekly study time predictor, Student age predictor, Second period grade predictor, Past class failures predictor, Mother education predictor, First period grade predictor

b. Dependent Variable: Final grade outcome

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5754.033	8	719.254	456.111	.000 ^b
	Residual	1009.234	640	1.577		
	Total	6763.267	648			

a. Dependent Variable: Final grade outcome

b. Predictors: (Constant), Father education predictor, School absences predictor, Weekly study time predictor, Student age predictor, Second period grade predictor, Past class failures predictor, Mother education predictor, First period grade predictor

Ridge Regression
Ordinary least-squares comparison model

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.501	.774		-.648	.518
	First period grade predictor	.143	.037	.122	3.910	.000
	Second period grade predictor	.885	.034	.798	25.744	.000
	Weekly study time predictor	.097	.062	.025	1.556	.120
	Past class failures predictor	-.235	.095	-.043	-2.471	.014
	School absences predictor	.023	.011	.033	2.085	.038
	Student age predictor	.023	.044	.009	.520	.604
	Mother education predictor	-.045	.058	-.016	-.776	.438
	Father education predictor	.022	.059	.007	.371	.711

Ridge Regression
Ordinary least-squares comparison model

Coefficients^a

Model		95.0% Confidence Interval for B		Collinearity Statistics	
		Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-2.021	1.019		
	First period grade predictor	.071	.215	.240	4.165
	Second period grade predictor	.817	.952	.243	4.121
	Weekly study time predictor	-.025	.219	.917	1.090
	Past class failures predictor	-.422	-.048	.762	1.312
	School absences predictor	.001	.044	.948	1.055
	Student age predictor	-.063	.108	.860	1.163
	Mother education predictor	-.159	.069	.563	1.776
	Father education predictor	-.094	.139	.572	1.749

a. Dependent Variable: Final grade outcome

Ridge Regression
Ordinary least-squares comparison model

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	(Constant)	Variance Proportions	
					First period grade predictor	Second period grade predictor
1	1	7.051	1.000	.00	.00	.00
	2	.945	2.731	.00	.00	.00
	3	.570	3.518	.00	.00	.00
	4	.211	5.777	.00	.00	.00
	5	.108	8.064	.00	.01	.01
	6	.062	10.680	.00	.00	.00
	7	.043	12.869	.02	.06	.08
	8	.008	30.135	.00	.87	.88
	9	.002	56.814	.97	.06	.02

Collinearity Diagnostics^a

Model	Dimension	Variance Proportions				
		Weekly study time predictor	Past class failures predictor	School absences predictor	Student age predictor	Mother education predictor
1	1	.00	.00	.01	.00	.00
	2	.00	.61	.05	.00	.00
	3	.00	.12	.88	.00	.00
	4	.15	.01	.00	.00	.13
	5	.83	.00	.02	.00	.02
	6	.00	.00	.00	.00	.84
	7	.01	.21	.04	.03	.00
	8	.00	.00	.00	.00	.00
	9	.00	.04	.01	.96	.00

Ridge Regression
Ordinary least-squares comparison model

Collinearity Diagnostics^a

Model	Dimension	Variance ... Father education predictor
1	1	.00
	2	.00
	3	.00
	4	.19
	5	.02
	6	.76
	7	.01
	8	.00
	9	.01

a. Dependent Variable: Final grade outcome

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.2512	19.5507	11.9060	2.97988	649
Residual	-9.05080	5.78244	.00000	1.24798	649
Std. Predicted Value	-3.911	2.565	.000	1.000	649
Std. Residual	-7.207	4.605	.000	.994	649

a. Dependent Variable: Final grade outcome

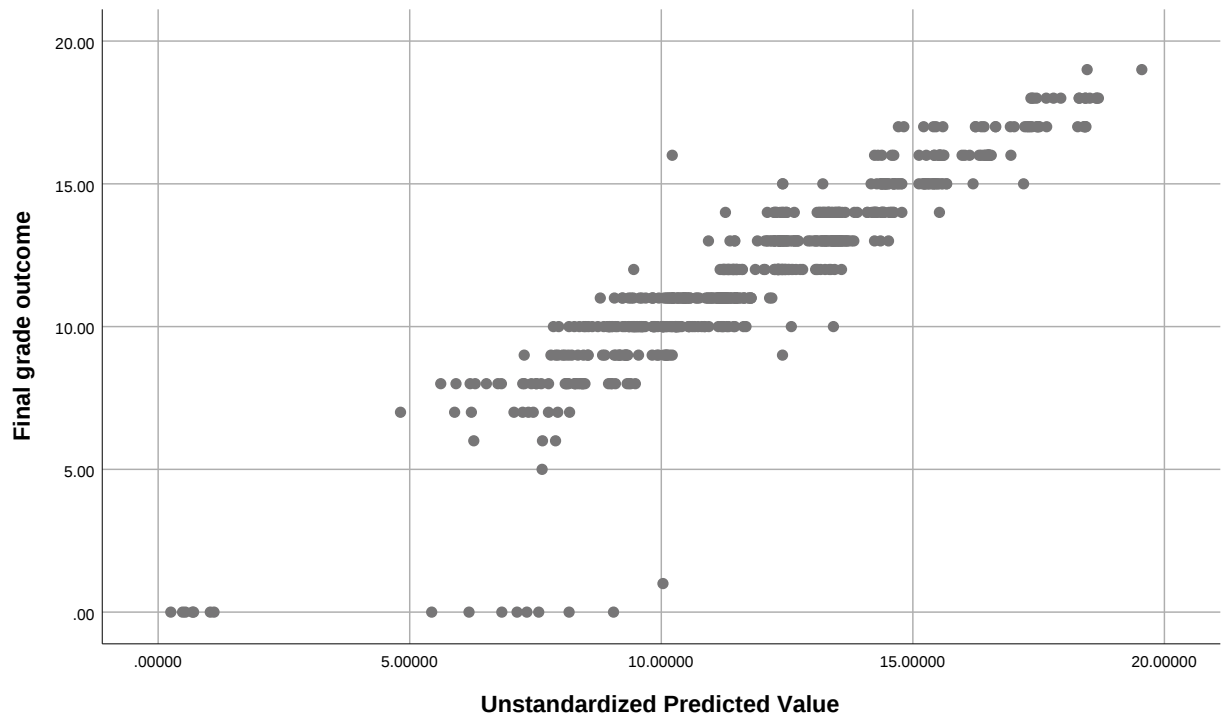
Graph

Ridge Regression
Ordinary least-squares comparison model

Notes

Output Created		12-JUL-2026 13:14:32
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_anal ysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /SCATTERPLOT(BIVAR) =ols_pred WITH G3 /MISSING=LISTWISE.
Resources	Processor Time	00:00:00.44
	Elapsed Time	00:00:00.39

Ridge Regression
Ordinary least-squares comparison model



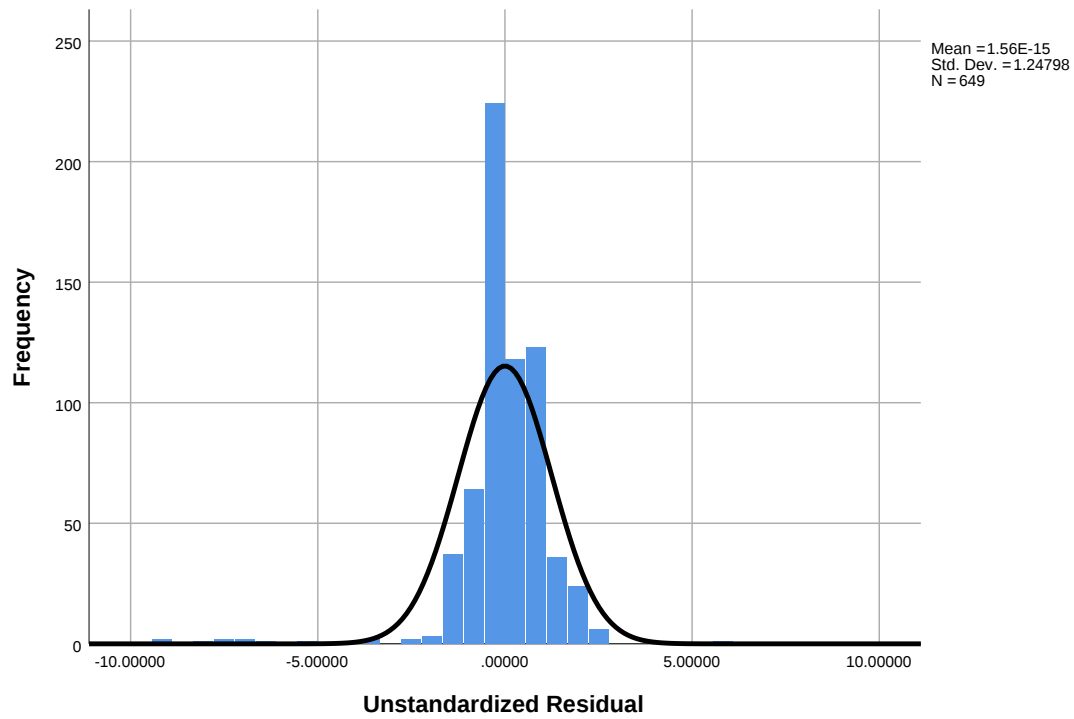
Graph

Ridge Regression
Ordinary least-squares comparison model

Notes

Output Created		12-JUL-2026 13:14:33
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_anal ysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /HISTOGRAM(NORMAL) =ols_resid.
Resources	Processor Time	00:00:00.36
	Elapsed Time	00:00:00.29

Ridge Regression
Ordinary least-squares comparison model



Ridge Regression

Ridge Regression
Standardize variables for the MATRIXridge calculation

Descriptives

Notes

Output Created		12-JUL-2026 13:14:33
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_anal ysis_data.sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=G3 G1 G2 studytime failures absences age Medu Fedu /SAVE.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02
Variables Created or Modified	ZG3	Zscore: Final grade outcome
	ZG1	Zscore: First period grade predictor
	ZG2	Zscore: Second period grade predictor
	Zstudytime	Zscore: Weekly study time predictor
	Zfailures	Zscore: Past class failures predictor
	Zabsences	Zscore: School absences predictor

Ridge Regression
Standardize variables for the MATRIXridge calculation

Notes

Zage	Zscore: Student age predictor
ZMedu	Zscore: Mother education predictor
ZFedu	Zscore: Father education predictor

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Final grade outcome	649	.00	19.00	11.9060	3.23066
First period grade predictor	649	.00	19.00	11.3991	2.74527
Second period grade predictor	649	.00	19.00	11.5701	2.91364
Weekly study time predictor	649	1.00	4.00	1.9307	.82951
Past class failures predictor	649	.00	3.00	.2219	.59324
School absences predictor	649	.00	32.00	3.6595	4.64076
Student age predictor	649	15.00	22.00	16.7442	1.21814
Mother education predictor	649	.00	4.00	2.5146	1.13455
Father education predictor	649	.00	4.00	2.3066	1.09993
Valid N (listwise)	649				

Ridge Regression

Ridge Regression
Ridge coefficient path and worked lambda solution

Matrix

Notes

Output Created		12-JUL-2026 13:14:33
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_analysis_data. sav
	Active Dataset	RidgeRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649

Ridge Regression

Ridge coefficient path and worked lambda solution

Notes

Syntax

```

MATRIX.
GET X
  /VARIABLES=ZG1 ZG2
Zstudytime Zfailures
Zabsences Zage ZMedu
ZFedu
  /MISSING=OMIT.
GET Y
  /VARIABLES=ZG3
  /MISSING=OMIT.

COMPUTE N=NROW(X).
COMPUTE P=NCOL(X).
COMPUTE
PENALTY=IDENT(P).

* Calculate the complete
coefficient path without
MATRIX loops.
COMPUTE B0001=INV(T
(X)*X+.0001*PENALTY)*T
(X)*Y.
COMPUTE B001 =INV(T
(X)*X+.001 *PENALTY)*T
(X)*Y.
COMPUTE B01 =INV(T
(X)*X+.01 *PENALTY)*T
(X)*Y.
COMPUTE B1 =INV(T(X)
*X+.1 *PENALTY)*T(X)
*Y.
COMPUTE B10 =INV(T
(X)*X+1 *PENALTY)*T
(X)*Y.
COMPUTE B100 =INV(T
(X)*X+10 *PENALTY)*T
(X)*Y.
COMPUTE B1000=INV(T
(X)*X+100 *PENALTY)*T
(X)*Y.
COMPUTE B10000=INV
(T(X)*X+1000*PENALTY)
*T(X)*Y.

COMPUTE PATH={.0001,
T(B0001);
.001,T(B001);
.01,T(B01);
.1,T(B1);
1,T(B10);
10,T(B100);
100,T(B1000);
1000,T(B10000)}.

PRINT PATH
  /FORMAT='F12.6'
  /TITLE='Ridge coefficient

```

Ridge Regression
Ridge coefficient path and worked lambda solution

Notes

Resources	Processor Time	00:00:00.08
	Elapsed Time	00:00:00.08

[RidgeRegressionData] D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_analysis_data.sav

Run MATRIX procedure:

Ridge coefficient path on standardized variables

Lambda	G1	G2	studytim	failures	absences
age	Medu	Fedu			
.000100	.121852	.797983	.024811	-.043219	.032697
.008554	-.015786	.007499			
.001000	.121855	.797979	.024811	-.043219	.032697
.008554	-.015786	.007499			
.010000	.121886	.797939	.024812	-.043222	.032696
.008556	-.015784	.007500			
.100000	.122196	.797543	.024815	-.043251	.032688
.008580	-.015765	.007506			
1.000000	.125255	.793624	.024853	-.043544	.032609
.008815	-.015577	.007571			
10.000000	.152270	.758113	.025303	-.046283	.031797
.010840	-.013751	.008186			
100.000000	.260129	.574563	.031775	-.063232	.023612
.016405	.000311	.012866			
1000.000000	.212007	.267414	.044875	-.074869	-.004853
-.003598	.030947	.027709			

Worked SPSS ridge model summary

Complete	649.000000
Predicto	8.000000
Lambda	1.000000
R-square	.850773
RMSE	.386002

Standardized ridge coefficients at lambda 1.0

G1	.125255
----	---------

Ridge Regression
Ridge coefficient path and worked lambda solution

G2	.793624
studytim	.024853
failures	-.043544
absences	.032609
age	.008815
Medu	-.015577
Fedu	.007571

----- END MATRIX -----

Ridge Regression

Ridge Regression
Standardized ridge prediction and residual charts

Dataset Name

Notes

Output Created		12-JUL-2026 13:14:33
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_predictions.sav
	File Label	MATRIX saved file
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		DATASET NAME RidgePredictionData WINDOW=FRONT.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Warnings

The active dataset will replace the existing dataset named
RidgePredictionData.

Descriptives

Ridge Regression
Standardized ridge prediction and residual charts

Notes

Output Created		12-JUL-2026 13:14:33
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_predictions.sav
	Active Dataset	RidgePredictionData
	File Label	MATRIX saved file
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=observed_zg 3 predicted_zg3 residual_zg3 /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

[RidgePredictionData] D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\sav\ridge_regression_standardized_predictions.sav

Ridge Regression
Standardized ridge prediction and residual charts

Descriptive Statistics

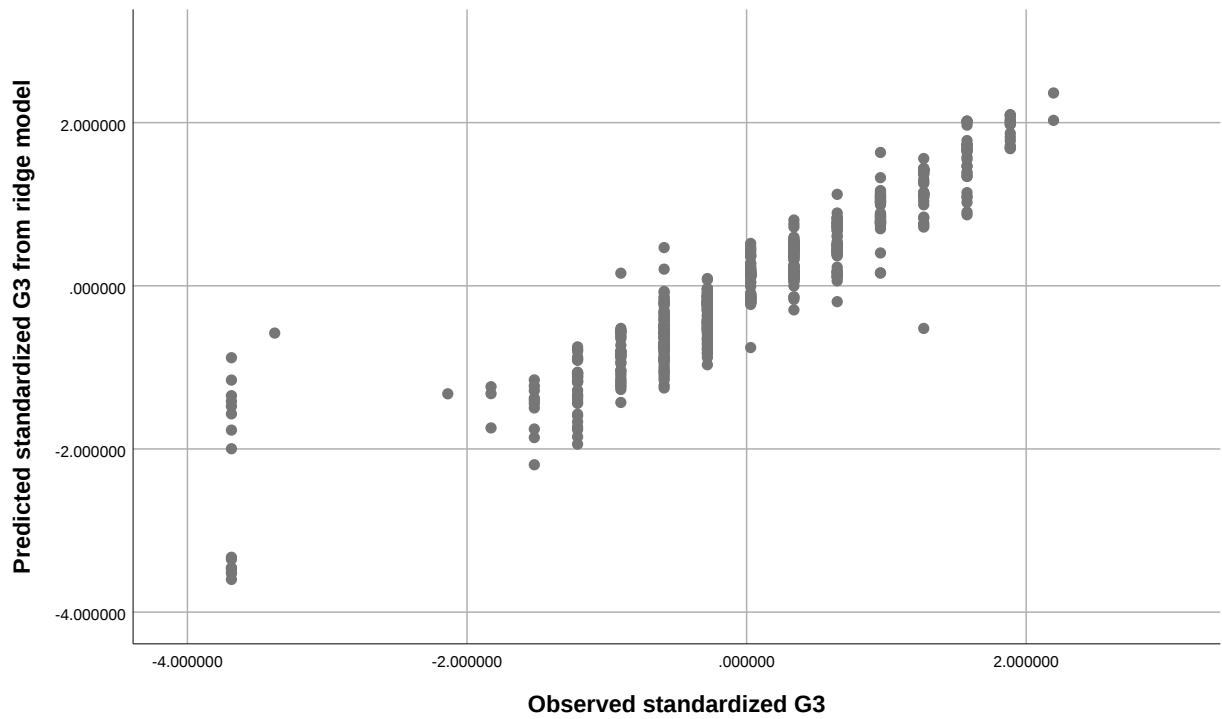
	N	Minimum	Maximum	Mean	Std. Deviation
Observed standardized G3	649	-3.685322	2.195836	.00000000	1.00000000
Predicted standardized G3 from ridge model	649	-3.599485	2.363713	.00000000	.921286035
Standardized ridge residual	649	-2.803837	1.789632	.00000000	.386299707
Valid N (listwise)	649				

Graph

Notes

Output Created		12-JUL-2026 13:14:34
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_predictions.sav
	Active Dataset	RidgePredictionData
	File Label	MATRIX saved file
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /SCATTERPLOT(BIVAR) =observed_zg3 WITH predicted_zg3 /MISSING=LISTWISE.
Resources	Processor Time	00:00:00.62
	Elapsed Time	00:00:00.46

Ridge Regression
Standardized ridge prediction and residual charts



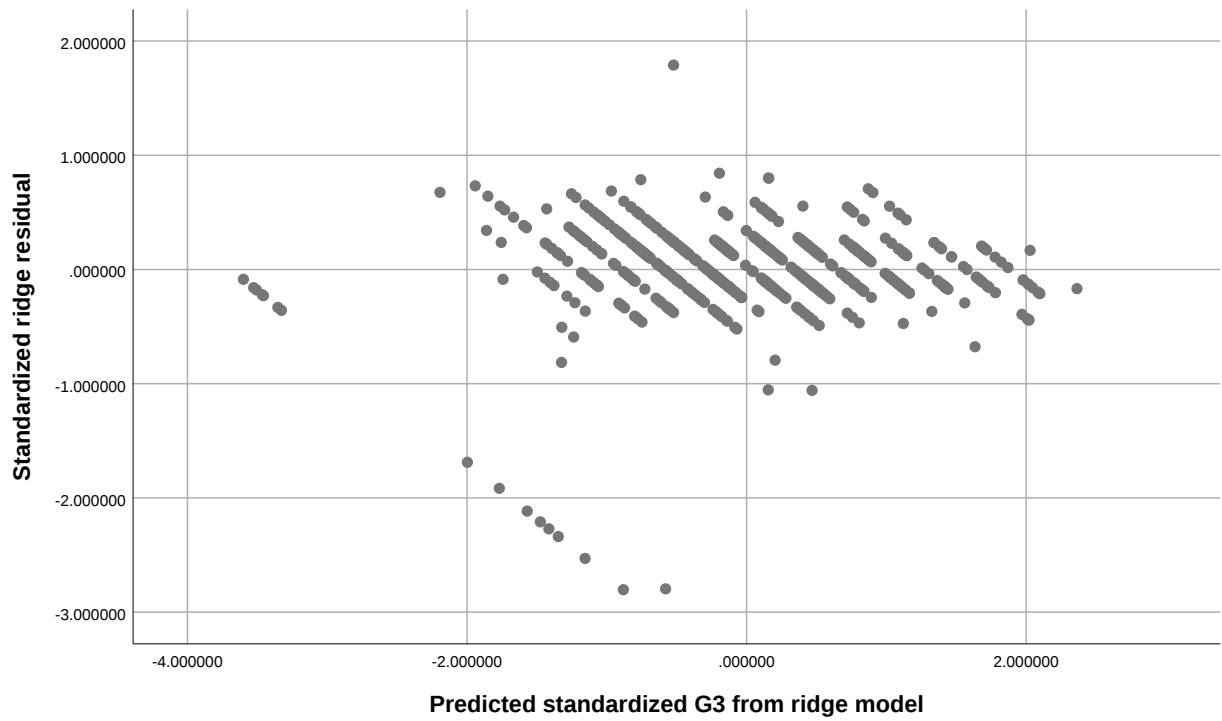
Graph

Ridge Regression
Standardized ridge prediction and residual charts

Notes

Output Created		12-JUL-2026 13:14:35
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_predictions.sav
	Active Dataset	RidgePredictionData
	File Label	MATRIX saved file
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /SCATTERPLOT(BIVAR) =predicted_zg3 WITH residual_zg3 /MISSING=LISTWISE.
Resources	Processor Time	00:00:00.52
	Elapsed Time	00:00:00.43

Ridge Regression
Standardized ridge prediction and residual charts



Graph

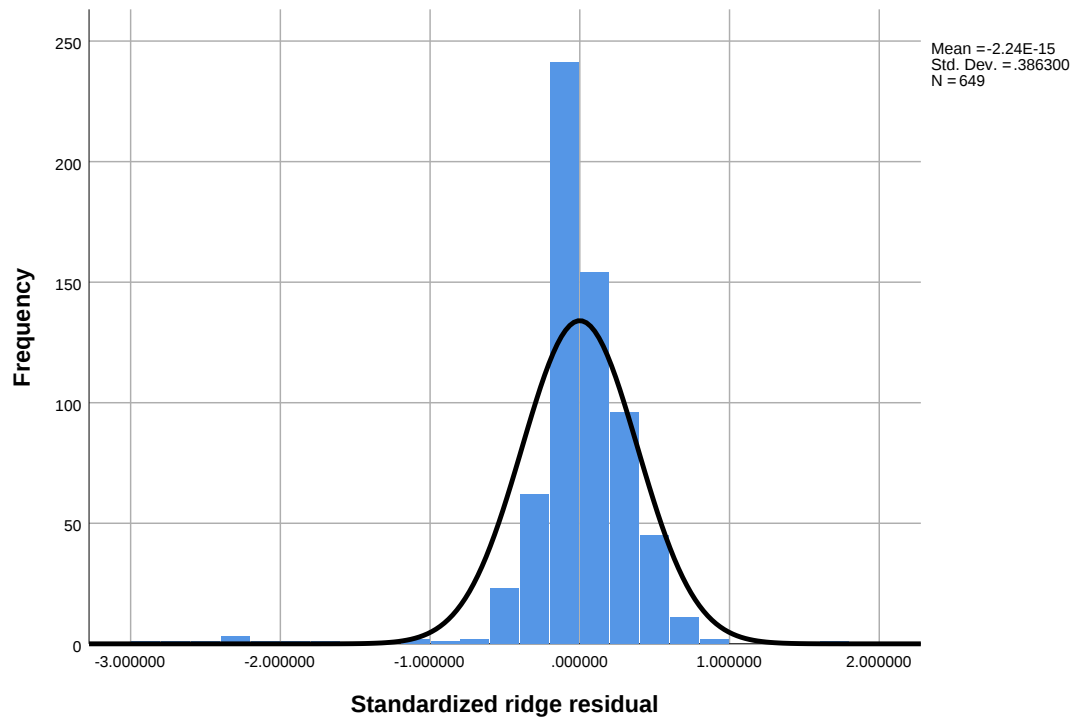
Ridge Regression
Standardized ridge prediction and residual charts

Notes

Output Created		12-JUL-2026 13:14:35
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_predictions.sav
	Active Dataset	RidgePredictionData
	File Label	MATRIX saved file
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /HISTOGRAM(NORMAL) =residual_zg3.
Resources	Processor Time	00:00:00.41
	Elapsed Time	00:00:00.36

Ridge Regression

Standardized ridge prediction and residual charts



Explore

Ridge Regression
Standardized ridge prediction and residual charts

Notes

Output Created		12-JUL-2026 13:14:35
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Ridge Regression\SPSS_Output\ sav\ridge_regression_stan dardized_predictions.sav
	Active Dataset	RidgePredictionData
	File Label	MATRIX saved file
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values for dependent variables are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any dependent variable or factor used.
Syntax		EXAMINE VARIABLES=residual_zg3 /PLOT BOXPLOT HISTOGRAM NPLOT /COMPARE GROUPS /STATISTICS DESCRIPTIVES EXTREME /INTERVAL 95 /MISSING LISTWISE /NOTOTAL.
Resources	Processor Time	00:00:01.28
	Elapsed Time	00:00:01.09

Ridge Regression
Standardized ridge prediction and residual charts

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Standardized ridge residual	649	100.0%	0	0.0%	649	100.0%

Descriptives

		Statistic	Std. Error
Standardized ridge residual	Mean	.00000000	.015163590
	95% Confidence Interval for Mean	Lower Bound	-.02977570
		Upper Bound	.02977570
	5% Trimmed Mean	.02144615	
	Median	-.01885041	
	Variance	.149	
	Std. Deviation	.386299707	
	Minimum	-2.803837	
	Maximum	1.789632	
	Range	4.593469	
	Interquartile Range	.336682	
	Skewness	-2.850	.096
	Kurtosis	18.557	.192

Ridge Regression
Standardized ridge prediction and residual charts

Extreme Values

			Case Number	Value
Standardized ridge residual	Highest	1	62	1.789632
		2	308	.842815
		3	359	.800816
		4	355	.799322
		5	390	.786287
	Lowest	1	164	-2.803837
		2	173	-2.796255
		3	587	-2.529797
		4	640	-2.338337
		5	520	-2.270754

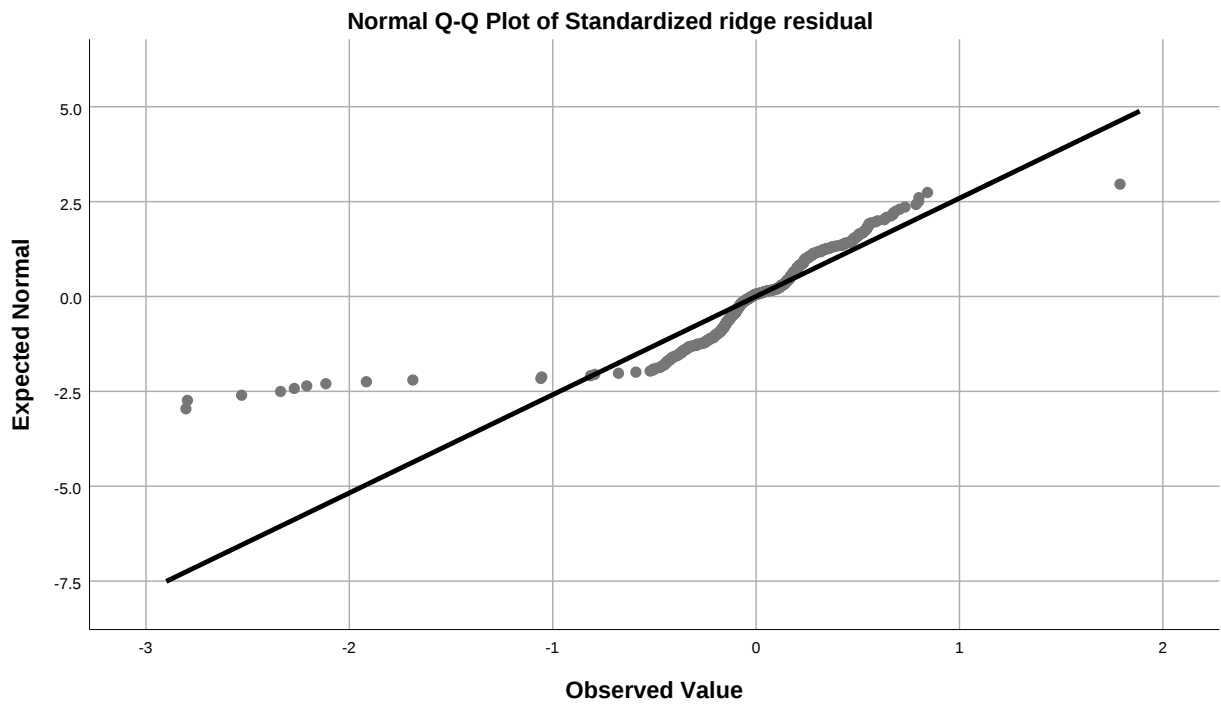
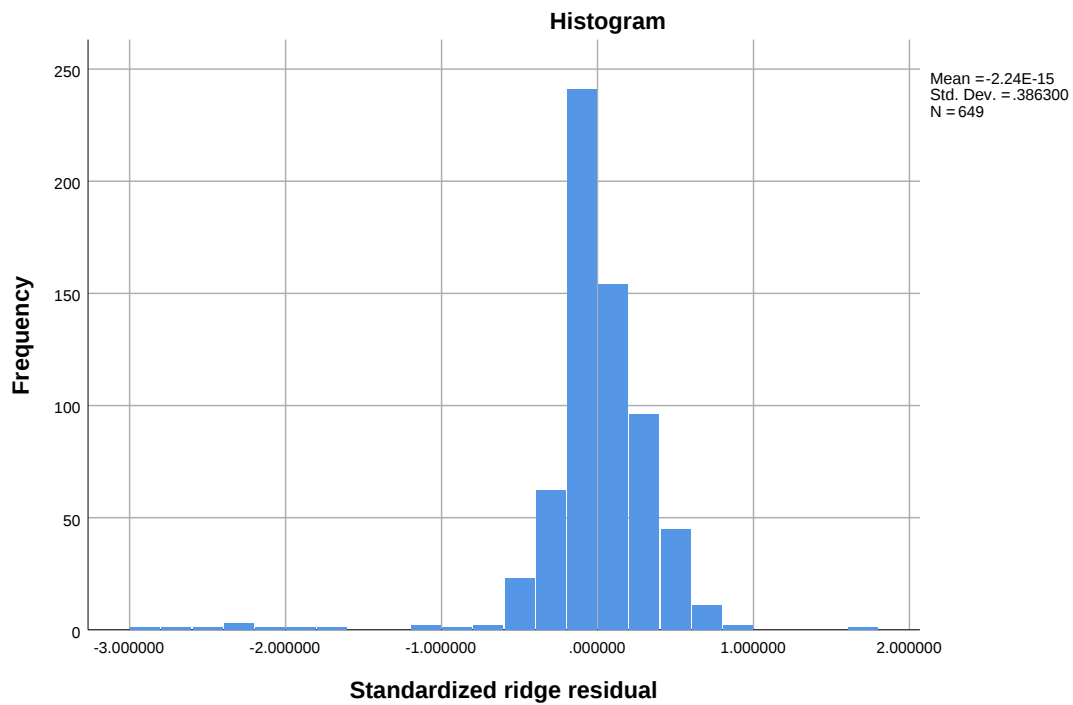
Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized ridge residual	.156	649	.000	.757	649	.000

a. Lilliefors Significance Correction

Standardized ridge residual

Ridge Regression
Standardized ridge prediction and residual charts



Ridge Regression

Standardized ridge prediction and residual charts

