```
292  0  OUTPUT ACTIVATE BreuschGodfreyTestOutput.
292  0 M>  OUTPUT ACTIVATE BreuschGodfreyTestOutput.
293  0  TITLE 'Breusch Godfrey Test'.
293  0 M>  TITLE 'Breusch Godfrey Test'.
```

```
 294  0  GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and Fo
recasting\Breusch Godfrey Test\dataset.csv' /ENCODING=
            'UTF8' /DELCASE=LINE /DELIMITERS=',' /QUALIFIER='"' /ARRANGEMENT=D
ELIMITED /FIRSTCASE=2
 294  0 M>  GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and
 Forecasting\Breusch Godfrey Test\dataset.csv' /ENCODI
              NG='UTF8' /DELCASE=LINE /DELIMITERS=',' /QUALIFIER='"' /ARRANGE
MENT=DELIMITED /FIRSTCASE=2
 295  0   /VARIABLES=school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A
8 Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16 gua
            rdian A16 traveltime F8.0 studytime F8.0 failures F8.0 schoolsup A
8 famsup A8 paid A8 activities A8 nursery A8 higher A8
             internet A8 romantic A8 famrel F8.0 freetime F8.0 goout F8.0 Dalc
 F8.0 Walc F8.0 health F8.0 absences F8.0 G1 F8.0 G2 F
            8.0 G3 F8.0.
 295  0 M>   /VARIABLES=school A8 sex A8 age F8.0 address A8 famsize A8 Pstatu
s A8 Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16
              guardian A16 traveltime F8.0 studytime F8.0 failures F8.0 schoo
lsup A8 famsup A8 paid A8 activities A8 nursery A8 hig
              her A8 internet A8 romantic A8 famrel F8.0 freetime F8.0 goout
F8.0 Dalc F8.0 Walc F8.0 health F8.0 absences F8.0 G1
              F8.0 G2 F8.0 G3 F8.0.
 296  0  DATASET NAME BreuschGodfreyTestData.
 296  0 M>  DATASET NAME BreuschGodfreyTestData.
 297  0  COMPUTE time_index=$CASENUM.
 297  0 M>  COMPUTE time_index=$CASENUM.
 298  0  EXECUTE.
 298  0 M>  EXECUTE.
 299  0  * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
 299  0 M>  * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
 300  0  REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT G3 /METHO
D=ENTER time_index G1 /SAVE RESID(bg_resid).
 300  0 M>  REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT G3 /ME
THOD=ENTER time_index G1 /SAVE RESID(bg_resid).
```

Regression

Notes

Output Created		18-JUL-2026 15:51:01
Comments		
Input	Data	D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Breusch Godfrey Test\dataset.csv
	Active Dataset	BreuschGodfreyTestData
	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 /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT G3 /METHOD=ENTER time_index G1 /SAVE RESID(bg_resid).
Resources	Processor Time	00:00:00.14
	Elapsed Time	00:00:00.64
	Memory Required	4304 bytes
	Additional Memory Required for Residual Plots	0 bytes
Variables Created or Modified	bg_resid	Unstandardized Residual

[BreuschGodfreyTestData]

Breusch Godfrey Test

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	G1, time_index[b]	.	Enter

a. Dependent Variable: G3

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826[a]	.683	.682	1.822

a. Predictors: (Constant), G1, time_index

b. Dependent Variable: G3

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4619.498	2	2309.749	696.016	.000[b]
	Residual	2143.768	646	3.319		
	Total	6763.267	648			

a. Dependent Variable: G3

b. Predictors: (Constant), G1, time_index

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.727	.363		2.000	.046
	time_index	.000	.000	.011	.478	.633
	G1	.975	.027	.829	36.446	.000

Breusch Godfrey Test

Coefficients[a]

Model		95.0% Confidence Interval for B	
		Lower Bound	Upper Bound
1	(Constant)	.013	1.440
	time_index	-.001	.001
	G1	.923	1.028

a. Dependent Variable: G3

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.73	19.37	11.91	2.670	649
Residual	-11.487	10.273	.000	1.819	649
Std. Predicted Value	-4.187	2.797	.000	1.000	649
Std. Residual	-6.305	5.639	.000	.998	649

a. Dependent Variable: G3

```
 301  0  COMPUTE e_l1=LAG(bg_resid,1).
 301  0 M>  COMPUTE e_l1=LAG(bg_resid,1).
 302  0  COMPUTE e_l2=LAG(bg_resid,2).
 302  0 M>  COMPUTE e_l2=LAG(bg_resid,2).
 303  0  COMPUTE e_l3=LAG(bg_resid,3).
 303  0 M>  COMPUTE e_l3=LAG(bg_resid,3).
 304  0  COMPUTE e_l4=LAG(bg_resid,4).
 304  0 M>  COMPUTE e_l4=LAG(bg_resid,4).
 305  0  COMPUTE e_l5=LAG(bg_resid,5).
 305  0 M>  COMPUTE e_l5=LAG(bg_resid,5).
 306  0  EXECUTE.
 306  0 M>  EXECUTE.
 307  0  REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT bg_resid
/METHOD=ENTER time_index G1 e_l1 e_l2 e_l3 e_l4 e_l5.
 307  0 M>  REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT bg_res
id /METHOD=ENTER time_index G1 e_l1 e_l2 e_l3 e_l4 e_l
               5.
```

Regression

Notes

Output Created		18-JUL-2026 15:51:02
Comments		
Input	Data	D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Breusch Godfrey Test\dataset.csv
	Active Dataset	BreuschGodfreyTestData
	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 /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT bg_resid /METHOD=ENTER time_index G1 e_l1 e_l2 e_l3 e_l4 e_l5.
Resources	Processor Time	00:00:00.13
	Elapsed Time	00:00:00.62
	Memory Required	7776 bytes
	Additional Memory Required for Residual Plots	0 bytes

Breusch Godfrey Test

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	e_l5, time_index, e_l1, e_l3, e_l2, e_l4, G1[b]	.	Enter

a. Dependent Variable: Unstandardized Residual

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.196[a]	.038	.028	1.75325745

a. Predictors: (Constant), e_l5, time_index, e_l1, e_l3, e_l2, e_l4, G1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.030	7	11.147	3.626	.001[b]
	Residual	1955.008	636	3.074		
	Total	2033.038	643			

a. Dependent Variable: Unstandardized Residual

b. Predictors: (Constant), e_l5, time_index, e_l1, e_l3, e_l2, e_l4, G1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.303	.362		-.836	.403
	time_index	.000	.000	.021	.519	.604
	G1	.020	.027	.030	.736	.462
	e_l1	.106	.040	.106	2.666	.008
	e_l2	.050	.040	.050	1.256	.210
	e_l3	.113	.040	.113	2.834	.005
	e_l4	.018	.040	.018	.441	.659
	e_l5	.039	.039	.040	1.013	.312

Coefficients[a]

Model		95.0% Confidence Interval for B	
		Lower Bound	Upper Bound
1	(Constant)	-1.015	.409
	time_index	-.001	.001
	G1	-.033	.072
	e_l1	.028	.183
	e_l2	-.028	.128
	e_l3	.035	.191
	e_l4	-.061	.096
	e_l5	-.037	.115

a. Dependent Variable: Unstandardized Residual

```
 308  0  * END METHOD-SPECIFIC SPSS WORKFLOW.
 308  0 M>  * END METHOD-SPECIFIC SPSS WORKFLOW.
 309  0  SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Br
eusch Godfrey Test\SPSS_Output\sav\breusch-godfrey-tes
           t_spss_ready_data.sav' /COMPRESSED.
 309  0 M>  SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting
\Breusch Godfrey Test\SPSS_Output\sav\breusch-godfrey-
              test_spss_ready_data.sav' /COMPRESSED.
 310  0  ECHO 'Breusch Godfrey Test'.
 310  0 M>  ECHO 'Breusch Godfrey Test'.
```

```
Breusch Godfrey Test
 311  0  ECHO 'Method type: hypothesis_test'.
 311  0 M>  ECHO 'Method type: hypothesis_test'.
Method type: hypothesis_test
 312  0  ECHO 'Design: Breusch-Godfrey LM test with five residual lags after a
 trend-and-G1 regression for G3.'.
 312  0 M>  ECHO 'Design: Breusch-Godfrey LM test with five residual lags afte
r a trend-and-G1 regression for G3.'.
Design: Breusch-Godfrey LM test with five residual lags after a trend-and-G1 r
egression for G3.
 313  0  ECHO 'Formula: LM=n*R_aux^2 ~ chi-square(q), q=5'.
 313  0 M>  ECHO 'Formula: LM=n*R_aux^2 ~ chi-square(q), q=5'.
Formula: LM=n*R_aux^2 ~ chi-square(q), q=5
 314  0  ECHO 'Series order: source-row order'.
 314  0 M>  ECHO 'Series order: source-row order'.
Series order: source-row order
 315  0  ECHO 'bg_lm = 23.093450417840945'.
 315  0 M>  ECHO 'bg_lm = 23.093450417840945'.
bg_lm = 23.093450417840945
 316  0  ECHO 'df = 5'.
 316  0 M>  ECHO 'df = 5'.
df = 5
 317  0  ECHO 'lm_p_value = 0.00032395848856939783'.
 317  0 M>  ECHO 'lm_p_value = 0.00032395848856939783'.
lm_p_value = 0.00032395848856939783
 318  0  ECHO 'f_statistic = 4.7300676842951095'.
 318  0 M>  ECHO 'f_statistic = 4.7300676842951095'.
f_statistic = 4.7300676842951095
 319  0  ECHO 'f_p_value = 0.000298576963058267'.
 319  0 M>  ECHO 'f_p_value = 0.000298576963058267'.
f_p_value = 0.000298576963058267
 320  0  ECHO 'n_residuals = 649'.
 320  0 M>  ECHO 'n_residuals = 649'.
n_residuals = 649
 321  0  ECHO 'Cross-check status: pass'.
 321  0 M>  ECHO 'Cross-check status: pass'.
Cross-check status: pass
 322  0  OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecas
ting\Breusch Godfrey Test\SPSS_Output\spv\breusch-godf
```

```
            rey-test_spss_output.spv'.
 322  0 M>  OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Fore
casting\Breusch Godfrey Test\SPSS_Output\spv\breusch-g
               odfrey-test_spss_output.spv'.
 323  0  OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Time S
            eries Tests and Forecasting\Breusch Godfrey Test\SPSS_Output\pdf\b
reusch-godfrey-test_spss_output.pdf'.
 323  0 M>  OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Tim
               e Series Tests and Forecasting\Breusch Godfrey Test\SPSS_Output
\pdf\breusch-godfrey-test_spss_output.pdf'.
```