

```
105 0 OUTPUT ACTIVATE LjungBoxTestOutput.  
105 0 M> OUTPUT ACTIVATE LjungBoxTestOutput.  
106 0 TITLE 'Ljung Box Test'.  
106 0 M> TITLE 'Ljung Box Test'.
```

Ljung Box Test

```
107 0 GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and Fo
recasting\Ljung Box Test\dataset.csv' /ENCODING='UTF8'
      /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /ARRANGEMENT=DELIMIT
ED /FIRSTCASE=2
107 0 M> GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and
Forecasting\Ljung Box Test\dataset.csv' /ENCODING='UT
      F8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /ARRANGEMENT=D
ELIMITED /FIRSTCASE=2
108 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.
108 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.
109 0 DATASET NAME LjungBoxTestData.
109 0 M> DATASET NAME LjungBoxTestData.
110 0 COMPUTE time_index=$CASENUM.
110 0 M> COMPUTE time_index=$CASENUM.
111 0 EXECUTE.
111 0 M> EXECUTE.
112 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
112 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
113 0 ACF VARIABLES=G3 /NOLOG /MXAUTO 10 /SERROR=IND.
113 0 M> ACF VARIABLES=G3 /NOLOG /MXAUTO 10 /SERROR=IND.
```

ACF

Ljung Box Test

Notes

Output Created		18-JUL-2026 16:01:06
Comments		
Input	Data	D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Ljung Box Test\dataset.csv
	Active Dataset	LjungBoxTestData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
	Date	<none>
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	For a given time series variable, cases with missing values are not used in the analysis. Also, cases with negative or zero values are not used, if the log transform is requested.
Syntax		ACF VARIABLES=G3 /NOLOG /MXAUTO 10 /ERROR=IND.
Resources	Processor Time	00:00:01.86
	Elapsed Time	00:00:00.78
Use	From	First observation
	To	Last observation
Time Series Settings (TSET)	Amount of Output	PRINT = DEFAULT
	Saving New Variables	NEWVAR = CURRENT
	Maximum Number of Lags in Autocorrelation or Partial Autocorrelation Plots	MXAUTO = 16
	Maximum Number of Lags Per Cross-Correlation Plots	MXCROSS = 7

Ljung Box Test

Notes

Maximum Number of New Variables Generated Per Procedure	MXNEWVAR = 60
Maximum Number of New Cases Per Procedure	MPREDICT = 1000
Treatment of User-Missing Values	MISSING = EXCLUDE
Confidence Interval Percentage Value	CIN = 95
Tolerance for Entering Variables in Regression Equations	TOLER = .0001
Maximum Iterative Parameter Change	CNVERGE = .001
Method of Calculating Std. Errors for Autocorrelations	ACFSE = IND
Length of Seasonal Period	Unspecified
Variable Whose Values Label Observations in Plots	Unspecified
Equations Include	CONSTANT

[LjungBoxTestData]

Model Description

Model Name	MOD_3
Series Name	1
Transformation	None
Non-Seasonal Differencing	0
Seasonal Differencing	0
Length of Seasonal Period	No periodicity
Maximum Number of Lags	10
Process Assumed for Calculating the Standard Errors of the Autocorrelations	Independence(white noise)
Display and Plot	All lags

Applying the model specifications from MOD_3

Ljung Box Test

Case Processing Summary

G3		
Series Length		649
Number of Missing Values	User-Missing	0
	System-Missing	0
Number of Valid Values		649
Number of Computable First Lags		648

G3

Autocorrelations

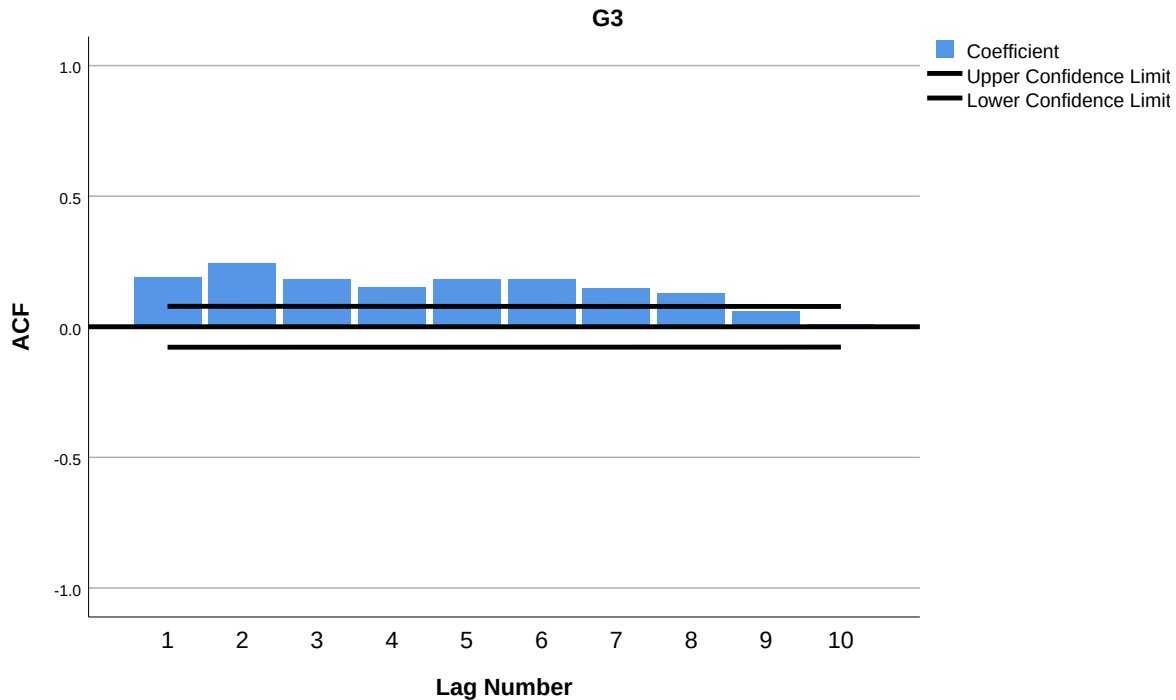
Series: G3

Lag	Autocorrelation	Std. Error ^a	Box-Ljung Statistic		
			Value	df	Sig. ^b
1	.190	.039	23.516	1	.000
2	.241	.039	61.573	2	.000
3	.183	.039	83.558	3	.000
4	.152	.039	98.645	4	.000
5	.180	.039	119.940	5	.000
6	.180	.039	141.271	6	.000
7	.149	.039	155.848	7	.000
8	.128	.039	166.660	8	.000
9	.060	.039	169.060	9	.000
10	.009	.039	169.112	10	.000

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

Ljung Box Test



```
114 0 ECHO 'SPSS ACF reports the finite-sample Ljung-Box sequence through l
ag ten'.
```

```
114 0 M> ECHO 'SPSS ACF reports the finite-sample Ljung-Box sequence throug
h lag ten'.
```

```
SPSS ACF reports the finite-sample Ljung-Box sequence through lag ten
```

```
115 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
```

```
115 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
```

```
116 0 SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Lj
ung Box Test\SPSS_Output\sav\ljung-box-test_spss_ready
_data.sav' /COMPRESSED.
```

```
116 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting
\Ljung Box Test\SPSS_Output\sav\ljung-box-test_spss_re
ady_data.sav' /COMPRESSED.
```

```
117 0 ECHO 'Ljung Box Test'.
```

```
117 0 M> ECHO 'Ljung Box Test'.
```

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Ljung Box Test
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```
118 0 ECHO 'Method type: hypothesis_test'.
```

```
118 0 M> ECHO 'Method type: hypothesis_test'.
```

```
Method type: hypothesis_test
```

Ljung Box Test

```
119 0 ECHO 'Design: Ljung-Box finite-sample portmanteau test through lag 10
for centered G3.'.
119 0 M> ECHO 'Design: Ljung-Box finite-sample portmanteau test through lag
10 for centered G3.'.
Design: Ljung-Box finite-sample portmanteau test through lag 10 for centered G
3.
120 0 ECHO 'Formula:  $Q_{LB}=n(n+2)*\sum(\rho_k^2/(n-k))$ ,  $k=1..10$ '.
120 0 M> ECHO 'Formula:  $Q_{LB}=n(n+2)*\sum(\rho_k^2/(n-k))$ ,  $k=1..10$ '.
Formula:  $Q_{LB}=n(n+2)*\sum(\rho_k^2/(n-k))$ ,  $k=1..10$ 
121 0 ECHO 'Series order: source-row order'.
121 0 M> ECHO 'Series order: source-row order'.
Series order: source-row order
122 0 ECHO 'ljung_box_q = 169.1121750199782'.
122 0 M> ECHO 'ljung_box_q = 169.1121750199782'.
ljung_box_q = 169.1121750199782
123 0 ECHO 'df = 10'.
123 0 M> ECHO 'df = 10'.
df = 10
124 0 ECHO 'p_value = 4.23556803781009e-31'.
124 0 M> ECHO 'p_value = 4.23556803781009e-31'.
p_value = 4.23556803781009e-31
125 0 ECHO 'n_series = 649'.
125 0 M> ECHO 'n_series = 649'.
n_series = 649
126 0 ECHO 'lag_tested = 10'.
126 0 M> ECHO 'lag_tested = 10'.
lag_tested = 10
127 0 ECHO 'lag_1_q = 23.51630995608801'.
127 0 M> ECHO 'lag_1_q = 23.51630995608801'.
lag_1_q = 23.51630995608801
128 0 ECHO 'Cross-check status: pass'.
128 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
129 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecas
ting\Ljung Box Test\SPSS_Output\spv\ljung-box-test_sps
s_output.spv'.
129 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Fore
casting\Ljung Box Test\SPSS_Output\spv\ljung-box-test_
spss_output.spv'.
```

Ljung Box Test

```
130 0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Time S
eries Tests and Forecasting\Ljung Box Test\SPSS_Output\pdf\ljung-b
ox-test_spss_output.pdf'.
130 0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Tim
e Series Tests and Forecasting\Ljung Box Test\SPSS_Output\pdf\l
jung-box-test_spss_output.pdf'.
```