

```
186 0 OUTPUT ACTIVATE AugmentedDickeyFullerTestOutput.  
186 0 M> OUTPUT ACTIVATE AugmentedDickeyFullerTestOutput.  
187 0 TITLE 'Augmented Dickey Fuller Test'.  
187 0 M> TITLE 'Augmented Dickey Fuller Test'.
```

Augmented Dickey Fuller Test

```
188 0 GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and Fo
recasting\Augmented Dickey Fuller Test\dataset.csv' /E
      NCODING='UTF8' /DELCASE=LINE /DELIMITERS=',' /QUALIFIER='"' /ARRAN
GEMENT=DELIMITED /FIRSTCASE=2
188 0 M> GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and
Forecasting\Augmented Dickey Fuller Test\dataset.csv'
      /ENCODING='UTF8' /DELCASE=LINE /DELIMITERS=',' /QUALIFIER='"'
/ARRANGEMENT=DELIMITED /FIRSTCASE=2
189 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.
189 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.
190 0 DATASET NAME AugmentedDickeyFullerTestData.
190 0 M> DATASET NAME AugmentedDickeyFullerTestData.
191 0 COMPUTE time_index=$CASENUM.
191 0 M> COMPUTE time_index=$CASENUM.
192 0 EXECUTE.
192 0 M> EXECUTE.
193 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
193 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
194 0 COMPUTE dg3=G3-LAG(G3).
194 0 M> COMPUTE dg3=G3-LAG(G3).
195 0 COMPUTE level_l1=LAG(G3).
195 0 M> COMPUTE level_l1=LAG(G3).
196 0 COMPUTE d_l1=LAG(dg3,1).
196 0 M> COMPUTE d_l1=LAG(dg3,1).
197 0 COMPUTE d_l2=LAG(dg3,2).
197 0 M> COMPUTE d_l2=LAG(dg3,2).
198 0 COMPUTE d_l3=LAG(dg3,3).
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198  0 M>  COMPUTE d_l3=LAG(dg3,3) .
199  0  COMPUTE d_l4=LAG(dg3,4) .
199  0 M>  COMPUTE d_l4=LAG(dg3,4) .
200  0  EXECUTE .
200  0 M>  EXECUTE .
201  0  REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT dg3 /METH
OD=ENTER time_index level_l1 d_l1 d_l2 d_l3 d_l4.
201  0 M>  REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT dg3 /M
ETHOD=ENTER time_index level_l1 d_l1 d_l2 d_l3 d_l4.

```

Regression

Notes

Output Created		18-JUL-2026 15:50:28
Comments		
Input	Data	D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Augmented Dickey Fuller Test\dataset. csv
	Active Dataset	AugmentedDickeyFullerTe stData
	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 dg3 /METHOD=ENTER time_index level_l1 d_l1 d_l2 d_l3 d_l4.

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Notes

Resources	Processor Time	00:00:00.06
	Elapsed Time	00:00:00.49
	Memory Required	6992 bytes
	Additional Memory Required for Residual Plots	0 bytes

[AugmentedDickeyFullerTestData]

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	d_l4, time_index, d_l1, d_l3, level_l1, d_l2 ^b	.	Enter

a. Dependent Variable: dg3

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.673 ^a	.453	.448	3.06668

a. Predictors: (Constant), d_l4, time_index, d_l1, d_l3, level_l1, d_l2

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4959.307	6	826.551	87.889	.000 ^b
	Residual	5990.686	637	9.405		
	Total	10949.994	643			

a. Dependent Variable: dg3

b. Predictors: (Constant), d_l4, time_index, d_l1, d_l3, level_l1, d_l2

Augmented Dickey Fuller Test

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.698	.876		7.644	.000
	time_index	-.002	.001	-.073	-2.367	.018
	level_l1	-.519	.065	-.407	-7.967	.000
	d_l1	-.381	.063	-.381	-6.010	.000
	d_l2	-.218	.060	-.218	-3.640	.000
	d_l3	-.135	.053	-.135	-2.556	.011
	d_l4	-.091	.040	-.090	-2.296	.022

Coefficients^a

Model		95.0% Confidence Interval for B	
		Lower Bound	Upper Bound
1	(Constant)	4.977	8.418
	time_index	-.003	.000
	level_l1	-.647	-.391
	d_l1	-.505	-.257
	d_l2	-.335	-.100
	d_l3	-.239	-.031
	d_l4	-.168	-.013

a. Dependent Variable: dg3

```

202 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
202 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
203 0 SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Augmented Dickey Fuller Test\SPSS_Output\sav\augmented-dickey-fuller-test_spss_ready_data.sav' /COMPRESSED.
203 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Augmented Dickey Fuller Test\SPSS_Output\sav\augmented-dickey-fuller-test_spss_ready_data.sav' /COMPRESSED.
204 0 ECHO 'Augmented Dickey Fuller Test'.
204 0 M> ECHO 'Augmented Dickey Fuller Test'.
Augmented Dickey Fuller Test
205 0 ECHO 'Method type: hypothesis_test'.

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Augmented Dickey Fuller Test

```
205 0 M> ECHO 'Method type: hypothesis_test'.
Method type: hypothesis_test
206 0 ECHO 'Design: ADF unit-root test with constant, trend, and AIC-selected augmentation lag.'.
206 0 M> ECHO 'Design: ADF unit-root test with constant, trend, and AIC-selected augmentation lag.'.
Design: ADF unit-root test with constant, trend, and AIC-selected augmentation lag.
207 0 ECHO 'Formula: Delta y_t=a+b*t+gamma*y_(t-1)+sum(delta_i*Delta y_(t-i))+e_t'.
207 0 M> ECHO 'Formula: Delta y_t=a+b*t+gamma*y_(t-1)+sum(delta_i*Delta y_(t-i))+e_t'.
Formula: Delta y_t=a+b*t+gamma*y_(t-1)+sum(delta_i*Delta y_(t-i))+e_t
208 0 ECHO 'Series order: source-row order'.
208 0 M> ECHO 'Series order: source-row order'.
Series order: source-row order
209 0 ECHO 'adf_statistic = -5.534131751785231'.
209 0 M> ECHO 'adf_statistic = -5.534131751785231'.
adf_statistic = -5.534131751785231
210 0 ECHO 'p_value = 1.9722330858411965e-05'.
210 0 M> ECHO 'p_value = 1.9722330858411965e-05'.
p_value = 1.9722330858411965e-05
211 0 ECHO 'used_lag = 10'.
211 0 M> ECHO 'used_lag = 10'.
used_lag = 10
212 0 ECHO 'n_observations = 638'.
212 0 M> ECHO 'n_observations = 638'.
n_observations = 638
213 0 ECHO 'critical_1_percent = -3.973030168616402'.
213 0 M> ECHO 'critical_1_percent = -3.973030168616402'.
critical_1_percent = -3.973030168616402
214 0 ECHO 'critical_5_percent = -3.417393878497465'.
214 0 M> ECHO 'critical_5_percent = -3.417393878497465'.
critical_5_percent = -3.417393878497465
215 0 ECHO 'critical_10_percent = -3.1311123934473177'.
215 0 M> ECHO 'critical_10_percent = -3.1311123934473177'.
critical_10_percent = -3.1311123934473177
216 0 ECHO 'aic_selection_value = 3230.328512040957'.
216 0 M> ECHO 'aic_selection_value = 3230.328512040957'.
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```
aic_selection_value = 3230.328512040957
217 0 ECHO 'Cross-check status: pass'.
217 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
218 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecas
ting\Augmented Dickey Fuller Test\SPSS_Output\spv\augm
ented-dickey-fuller-test_spss_output.spv'.
218 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Fore
casting\Augmented Dickey Fuller Test\SPSS_Output\spv\augm
ented-dickey-fuller-test_spss_output.spv'.
219 0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Time S
eries Tests and Forecasting\Augmented Dickey Fuller Test\SPSS_Outp
ut\pdf\augmented-dickey-fuller-test_spss_output.pdf'.
219 0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Tim
e Series Tests and Forecasting\Augmented Dickey Fuller Test\SPS
S_Output\pdf\augmented-dickey-fuller-test_spss_output.
pdf'.
```