

**Host**

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## Breusch Pagan Test

Breusch Pagan Test  
Import data

Main regression

Main regression  
Save residuals

## Regression

[BreuschPaganData] D:\DATA ANALYSIS\B Normality and Assumption Tests\Breusch Pagan Test\SPSS\_Output\sav\Breusch-Pagan-Test-data.sav

### Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	failures, absences, studytime, G2, G1 <sup>b</sup>	.	Enter

a. Dependent Variable: G3

b. All requested variables entered.

### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.922 <sup>a</sup>	.851	.849	1.254

a. Predictors: (Constant), failures, absences, studytime, G2, G1

b. Dependent Variable: G3

### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5752.587	5	1150.517	731.966	.000 <sup>b</sup>
	Residual	1010.679	643	1.572		
	Total	6763.267	648			

a. Dependent Variable: G3

b. Predictors: (Constant), failures, absences, studytime, G2, G1

Main regression  
Save residuals

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.155	.259		-.600	.549
	G1	.139	.036	.119	3.849	.000
	G2	.886	.034	.799	26.107	.000
	absences	.023	.011	.034	2.165	.031
	studytime	.097	.062	.025	1.564	.118
	failures	-.218	.091	-.040	-2.402	.017

a. Dependent Variable: G3

**Residuals Statistics<sup>a</sup>**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.28	19.57	11.91	2.980	649
Residual	-9.072	5.807	.000	1.249	649
Std. Predicted Value	-3.902	2.572	.000	1.000	649
Std. Residual	-7.236	4.632	.000	.996	649

a. Dependent Variable: G3

## Residual diagnostics

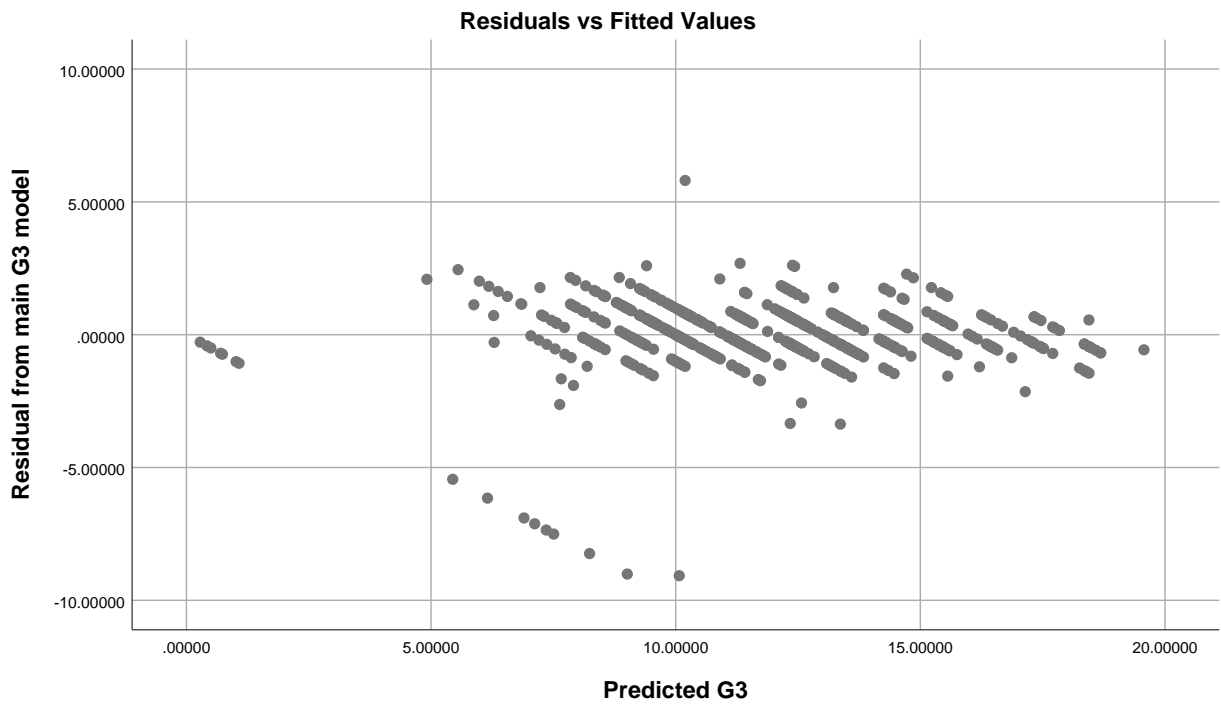
Residual diagnostics  
Descriptive check

### Descriptives

#### Descriptive Statistics

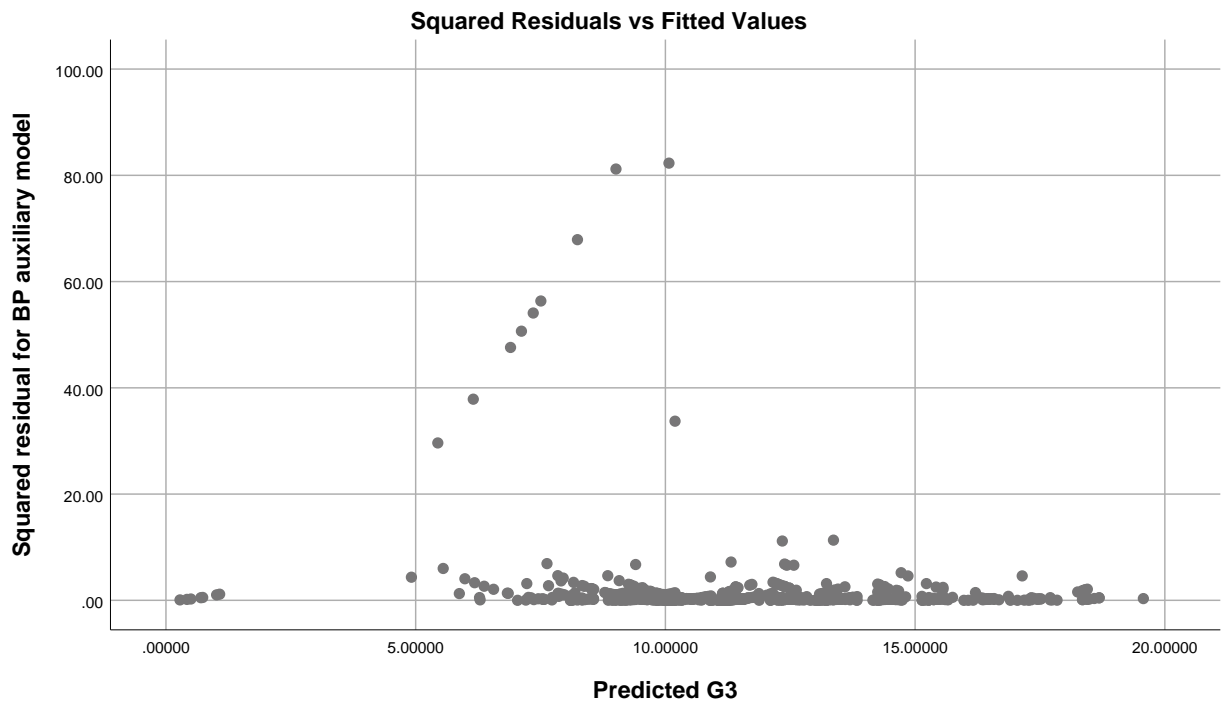
	N	Minimum	Maximum	Mean	Std. Deviation
PRED_G3	649	.28105	19.57031	11.9060092	2.97950491
RESID_G3	649	-9.07158	5.80683	.0000000	1.24887559
RESID_SQ_G3	649	.00	82.29	1.5573	7.03797
ABS_RESID_G3	649	.00	9.07	.7830	.97245
Valid N (listwise)	649				

### Graph



### Graph

Residual diagnostics  
Descriptive check



## Auxiliary regression

Auxiliary regression  
Squared residuals

## Regression

### Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	failures, absences, studytime, G2, G1 <sup>b</sup>	.	Enter

a. Dependent Variable: RESID\_SQ\_G3

b. All requested variables entered.

### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.215 <sup>a</sup>	.046	.039	6.89933

a. Predictors: (Constant), failures, absences, studytime, G2, G1

b. Dependent Variable: RESID\_SQ\_G3

### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1490.081	5	298.016	6.261	.000 <sup>b</sup>
	Residual	30607.288	643	47.601		
	Total	32097.369	648			

a. Dependent Variable: RESID\_SQ\_G3

b. Predictors: (Constant), failures, absences, studytime, G2, G1

Auxiliary regression  
Squared residuals

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.836	1.423		4.803	.000
	G1	-.098	.199	-.038	-.491	.624
	G2	-.254	.187	-.105	-1.362	.174
	absences	-.182	.059	-.120	-3.064	.002
	studytime	-.390	.340	-.046	-1.148	.251
	failures	.901	.500	.076	1.802	.072

a. Dependent Variable: RESID\_SQ\_G3

**Residuals Statistics<sup>a</sup>**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-4.4459	7.9756	1.5573	1.51641	649
Residual	-7.72660	78.85978	.00000	6.87266	649
Std. Predicted Value	-3.959	4.233	.000	1.000	649
Std. Residual	-1.120	11.430	.000	.996	649

a. Dependent Variable: RESID\_SQ\_G3

Breusch Pagan result

Breusch Pagan result  
Manual SPSS calculation

**List**

Breusch Pagan result  
Manual SPSS calculation

N_BP	BP_R2	BP_LM	BP_DF	BP_P_VALUE	BP_REJECT_05
649	.04642	30.12902	5.00	.00001	1.00

Number of cases read: 1      Number of cases listed: 1

Group residual variance

Group residual variance  
By sex

**Means**

**Case Processing Summary**

	Included		Cases Excluded		Total	
	N	Percent	N	Percent	N	Percent
	RESID_G3 * sex	649	100.0%	0	0.0%	649
RESID_SQ_G3 * sex	649	100.0%	0	0.0%	649	100.0%
ABS_RESID_G3 * sex	649	100.0%	0	0.0%	649	100.0%

**Report**

sex		RESID_G3	RESID_SQ_G3	ABS_RESID_G3
F	N	383	383	383
	Mean	.0707426	1.1900	.7473
	Std. Deviation	1.08999022	4.68471	.79571
	Variance	1.188	21.946	.633
M	N	266	266	266
	Mean	-.1018587	2.0862	.8344
	Std. Deviation	1.44347156	9.43453	1.18120
	Variance	2.084	89.010	1.395
Total	N	649	649	649
	Mean	.0000000	1.5573	.7830
	Std. Deviation	1.24887559	7.03797	.97245
	Variance	1.560	49.533	.946