

How do I perform a Durbin-Watson test in SPSS?

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July 8, 2024

RECOMMENDED CITATION

stats writer (2024). *How do I perform a Durbin-Watson test in SPSS?*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=127043>

The Durbin-Watson test is a statistical test used to assess the presence of autocorrelation in a dataset. In SPSS, the Durbin-Watson test can be performed by following a few simple steps. First, open the dataset in SPSS and navigate to the "Analyze" tab. From there, select "Regression" and then "Linear". In the dialogue box that appears, select the dependent and independent variables for your analysis. Next, click on the "Statistics" button and check the box for "Durbin-Watson test" under the "Autocorrelation" section. Finally, click "OK" to run the test and obtain the results. The output will include the Durbin-Watson statistic and a significance value, which can be used to determine the presence of autocorrelation in your dataset. This test can help researchers identify potential issues with their data and make appropriate adjustments to their analysis.

Perform a Durbin-Watson Test in SPSS

One of the is that there is no correlation between the , e.g. the residuals are independent.

One way to determine if this assumption is met is to perform a , which is used to detect the presence of autocorrelation in the residuals of a regression model.

This test uses the following hypotheses:

H0: There is no correlation among the residuals. HA: The residuals are autocorrelated.

The test statistic for this test is approximately equal to $2 \cdot (1 - r)$ where r is the sample autocorrelation of the residuals.

Thus, the test statistic will always be between 0 and 4

where:

A test statistic of 2 indicates no serial correlation. The closer the test statistics is to 0, the more evidence of positive serial correlation. The closer the test statistics is to 4, the more evidence of negative serial correlation.

As a rule of thumb, test statistic values between the range of 1.5 and 2.5 are considered normal.

However, values outside of this range could indicate that autocorrelation is a problem.

The following example shows how to perform a Durbin-Watson test for a regression model in SPSS.

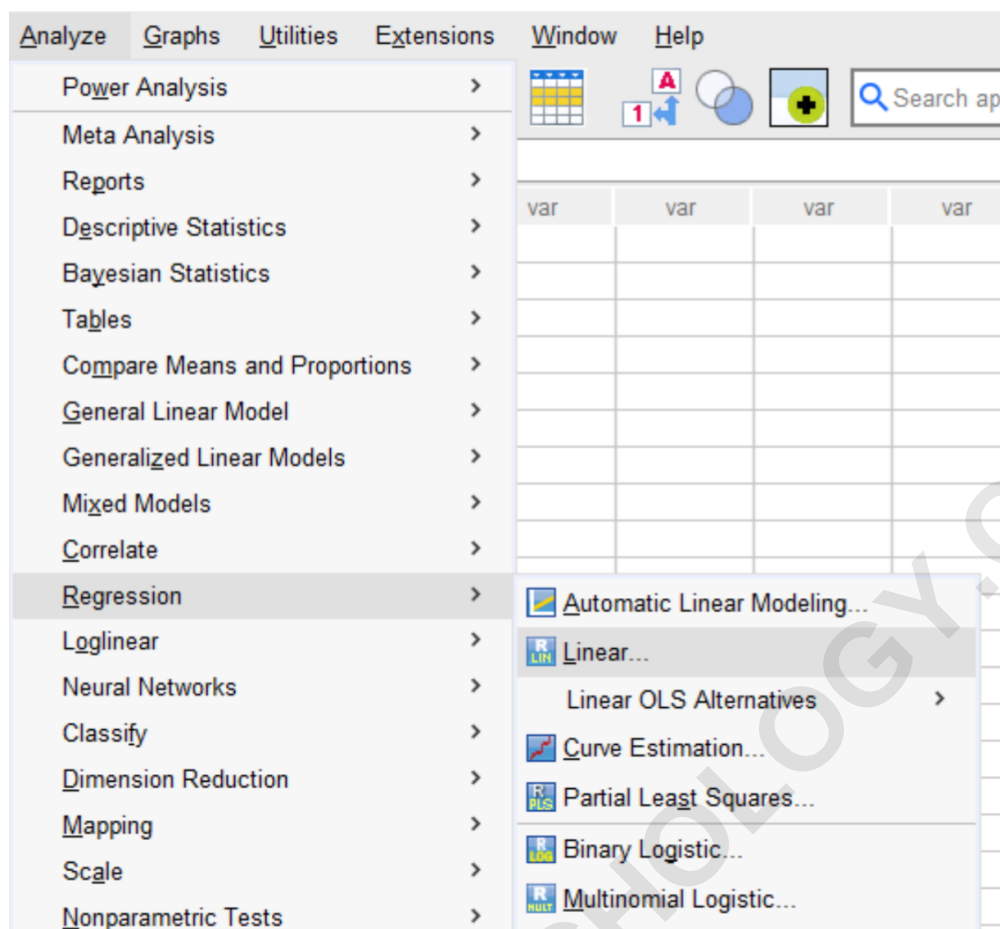
Example: How to Perform a Durbin-Watson Test in SPSS

Suppose we have the following dataset in SPSS that contains information about various basketball players:

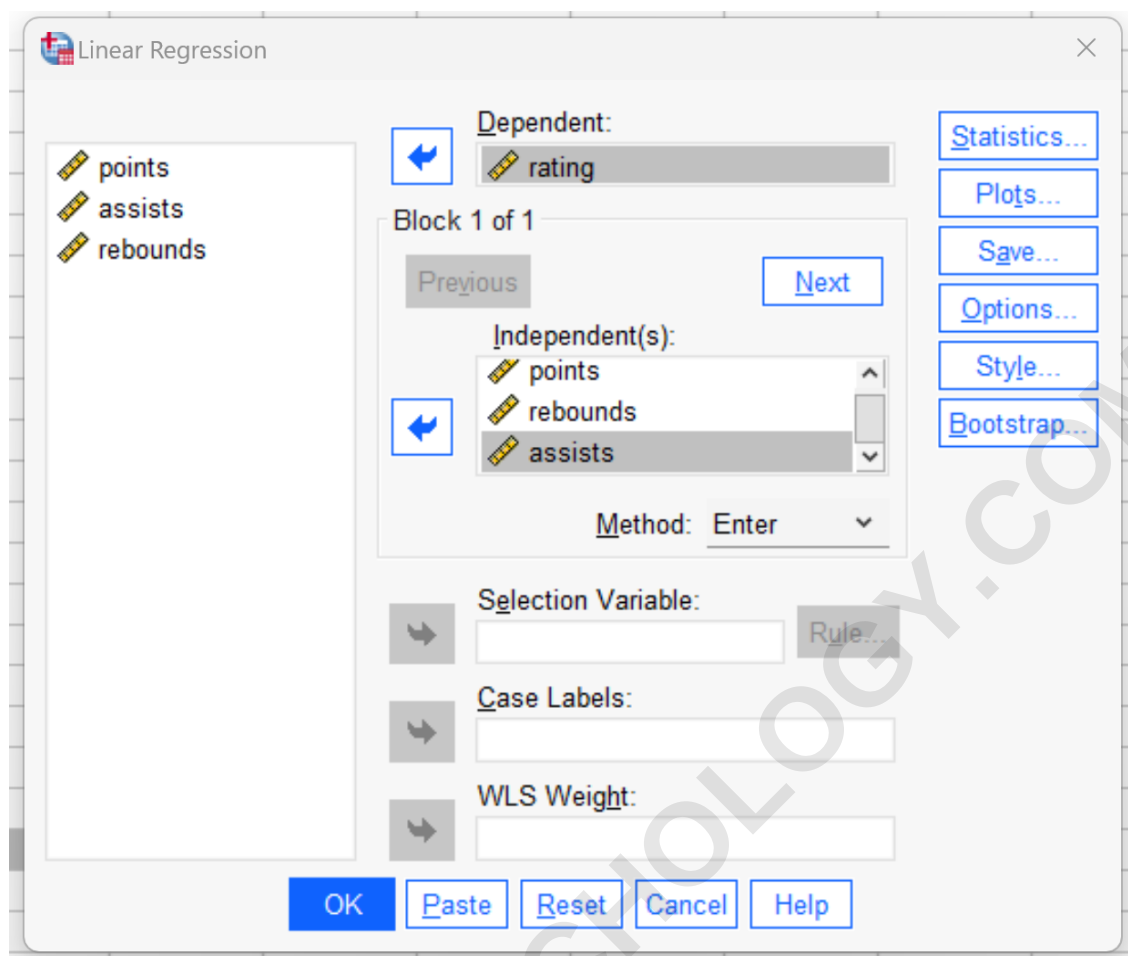
	rating	points	assists	rebounds	var	
1	90	25	5	11		
2	85	20	7	8		
3	82	14	7	10		
4	88	16	8	6		
5	94	27	5	6		
6	90	20	7	9		
7	76	12	6	6		
8	75	15	9	10		
9	87	14	9	10		
10	86	19	5	7		
11						
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Suppose that we would like to fit a multiple linear regression model using points, assists and rebounds as predictor variables and rating as the response variable.

To do so, click the **Analyze** tab, then click **Regression**, then click **Linear**:

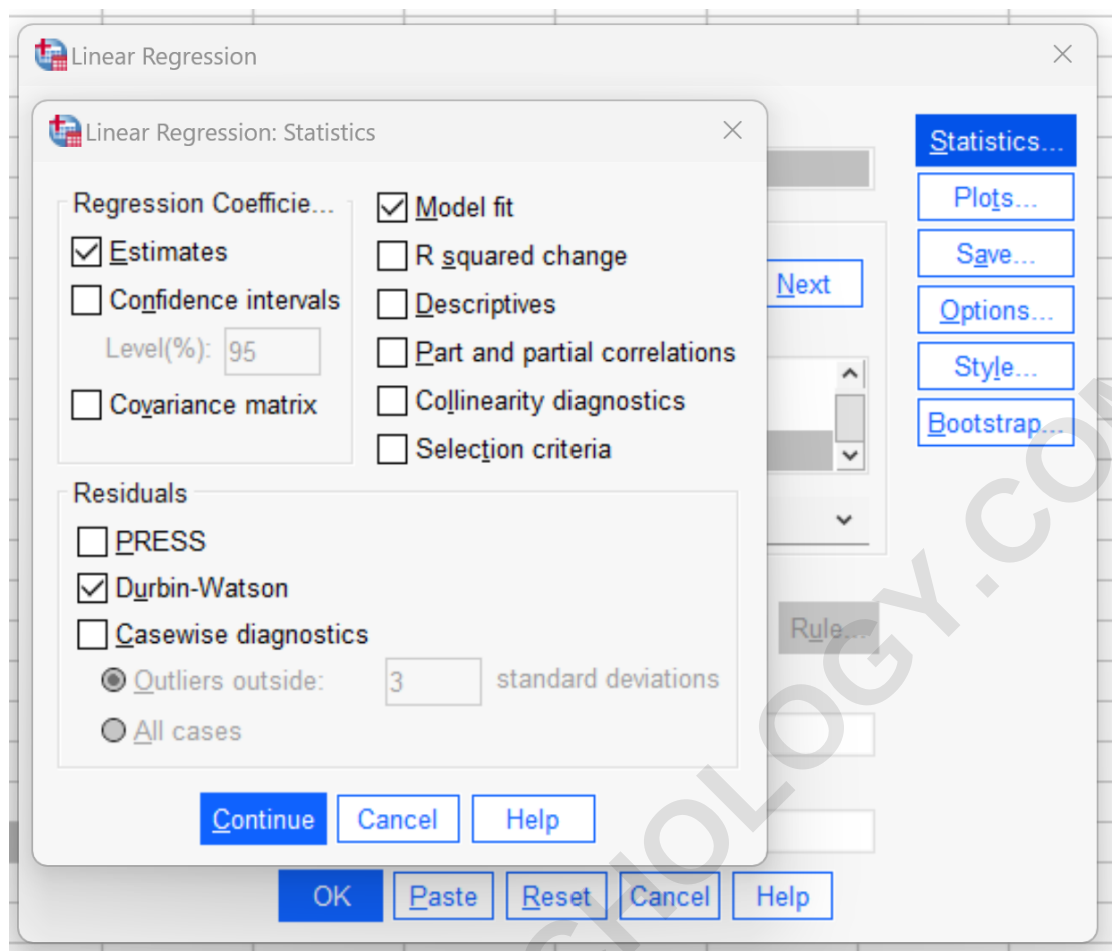


In the new window that appears, drag rating to the Dependent panel and then drag points, assists and rebounds to the Independent panel:



Then click the Statistics button.

In the new window that appears, check the box next to Durbin-Watson under Residuals:



Then click Continue. Then click OK.

The following results will be shown:

➔ Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	assists, rebounds, points ^b	.	Enter

a. Dependent Variable: rating

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.789 ^a	.623	.434	4.584	2.392

a. Predictors: (Constant), assists, rebounds, points

b. Dependent Variable: rating

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	207.997	3	69.332	3.299	.099 ^b
	Residual	126.103	6	21.017		
	Total	334.100	9			

a. Dependent Variable: rating

b. Predictors: (Constant), assists, rebounds, points

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	62.472	14.588		4.282	.005
	points	1.119	.411	.907	2.724	.034
	rebounds	-.428	.851	-.137	-.503	.633
	assists	.883	1.381	.225	.640	.546

a. Dependent Variable: rating

The test statistic for the Durbin-Watson test will be shown in the Model Summary table.

We can see that the test statistic turns out to be 2.392.

Since this value is within the range of 1.5 to 2.5, we would not consider autocorrelation to be a problem in this regression model.

How to Handle Autocorrelation

If you reject the null hypothesis and conclude that autocorrelation is present in the residuals, then you may consider the following options to correct this problem if you deem it to be serious enough:

For positive serial correlation, consider adding lags of the dependent and/or independent variable to the model. For negative serial correlation, check to make sure that none of your variables are overdifferentenced. For seasonal correlation, consider adding seasonal dummy variables to the model.

The following tutorials explain how to perform other common tasks in SPSS: