

Example of regression model output from RegressIt

Analysis specifications of the linear price-demand model for beer sales:

The screenshot displays the Microsoft Excel interface with the 'RegressIt' ribbon active. The 'Select Variables for Regression Analysis' dialog box is open, showing the following configuration:

- Model name: Linear price-demand model
- Confidence level: 0.95
- Dependent variable: CASES_18PK
- Independent variables: PRICE_18PK (checked), CASES_12PK, CASES_18PK, CASES_30PK, PRICE_12PK, PRICE_30PK, Week.
- Additional output options: Time series statistics (checked), Forecasts for missing or additional values (unchecked), Save residual table to model sheet (checked), Save residuals and predictions to data sheet (unchecked).
- More diagnostic tools: Normal quantile plot (checked), Correlation matrix of coefficient estimates (unchecked), Residual vs. independent variable plots (unchecked).

The background spreadsheet shows the following data:

Week	PRICE 12PK	PRICE 18PK	PRICE 30PK	CASES 12PK	CASES 18PK	CASES 30PK
1	19.98	14.10	15.19	223.5	439.0	55.00
2	19.98	18.65	15.19	215.0	98.0	66.75
3	19.98	18.65	13.87	227.5	70.0	242.00

See the following pages for the output that is produced.

This is an example of a *bad* regression model, not a good one, as the output indicates. The Excel file that contains it, along with some better models and a discussion, can be found on the RegressIt.com web site.

The title of very table and chart on a regression output worksheet contains the model name, dependent variable name, sample size, and number of variables . This may look redundant, but it helps the user to remain aware of which model's output is being viewed when scrolling up and down and flipping back and forth among many worksheets in the same file, and it also preserves the audit trail when tables or charts are copied individually to other applications or used in presentations. Custom model names can be entered at the time the analysis is run. The bitmapped date/time/user/model name stamp at the top of the worksheet also contributes to the audit trail. Numbers in tables are formatted to show enough decimal places but not way-too-many according to their magnitudes, with decimal points lined up to the greatest extent possible, and point sizes on charts are adjusted between 4 and 8 points according to the sample size. Output includes the Durbin-Watson statistic and a residual autocorrelation table if the time series statistics box has been checked. Confidence limits in tables and editable charts are interactively computed with live formulas that are linked to the confidence level cell in the upper right. Many other stats are also computed with live formulas for educational purposes.

Model: Linear price-demand model
Dependent Variable: CASES_18PK
Independent Variables: PRICE_18PK

May 28, 2015 10:25 AM RegressIt 2.2.2 Linear price-demand model

Equation:
 Predicted CASES_18PK = 1,812 - 93.007*PRICE_18PK

Regression Statistics: Linear price-demand model for CASES 18PK (1 variable, n=52)

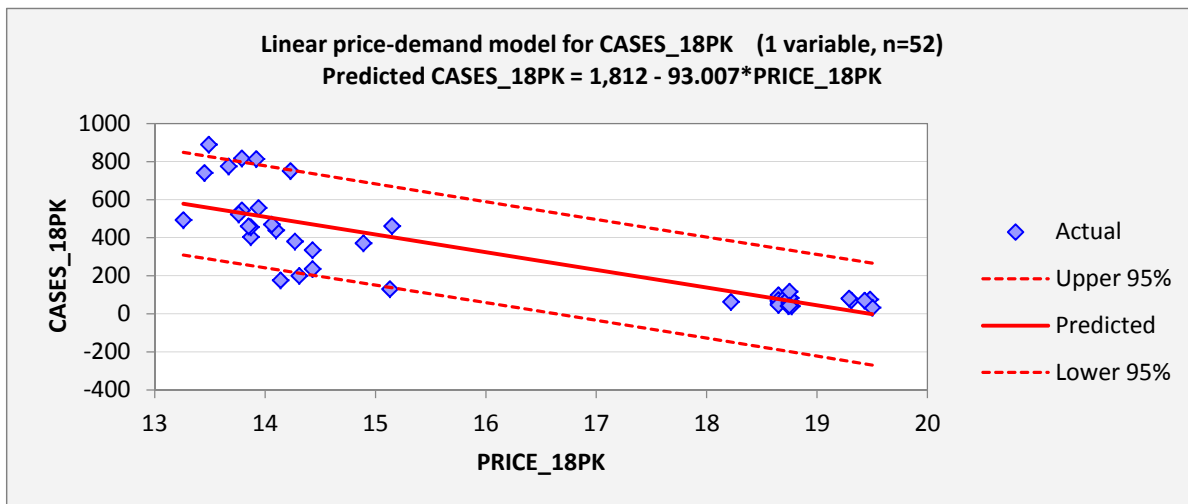
R-Squared	Adj.R-Sqr.	Std.Err.Reg.	Std. Dev.	# Cases	# Missing	t(2.50%,50)	Conf. level
0.751	0.746	130.529	258.825	52	0	2.009	95.0%

Coefficient Estimates: Linear price-demand model for CASES 18PK (1 variable, n=52)

Variable	Coefficient	Std.Err.	t-Stat.	P-value	Lower95%	Upper95%	Std. Dev.	Std. Coeff.
Constant	1,812	128.070	14.150	0.000	1,555	2,069		
PRICE_18PK	-93.007	7.581	-12.269	0.000	-108.234	-77.781	2.411	-0.866

Analysis of Variance: Linear price-demand model for CASES 18PK (1 variable, n=52)

Line Fit Plot



Residual Distribution Statistics: Linear price-demand model for CASES 18PK (1 variable, n=52)

#Res.>0	#Res.<=0	A-D* Stat.	P-value	MinStdRes	MaxStdRes	Durbin-Watson Stat
21	31	2.591	0.000	-2.460	2.547	2.336

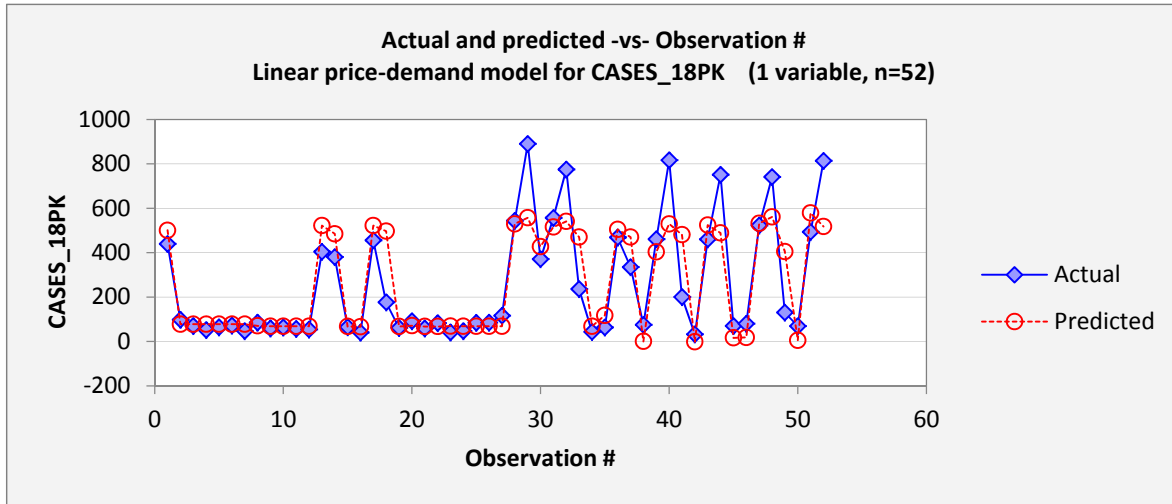
See the residual histogram, normal quantile plot and residual table for more details of the error distribution.

Residual Autocorrelations: Linear price-demand model for CASES 18PK (1 variable, n=52)

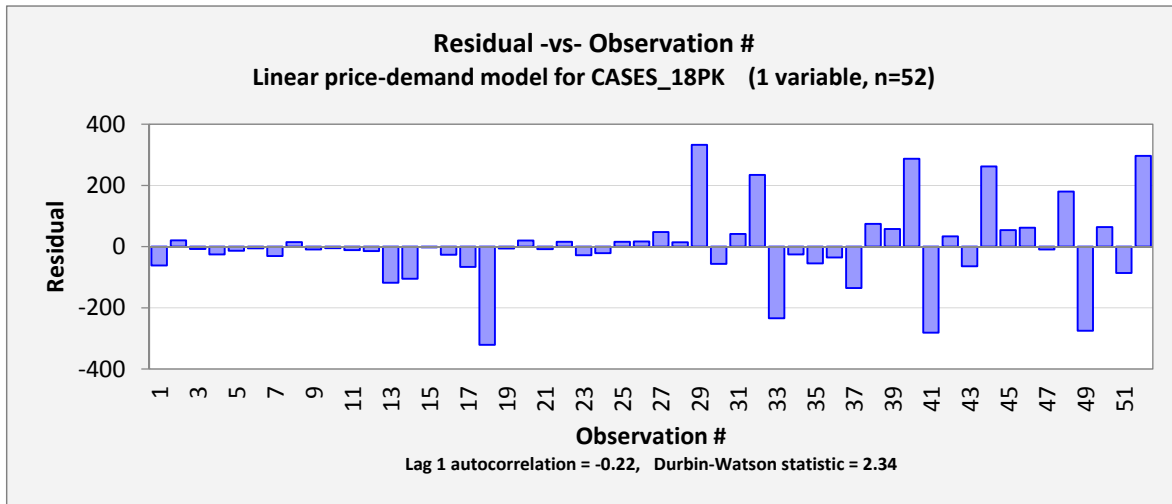
Lag	1	2	3	4	5	6	7	12
Autocorrelation	-0.222	0.167	-0.186	0.196	-0.116	0.114	-0.165	0.096

See the Residual-vs-Observation # plot for more details of the time pattern in the errors.

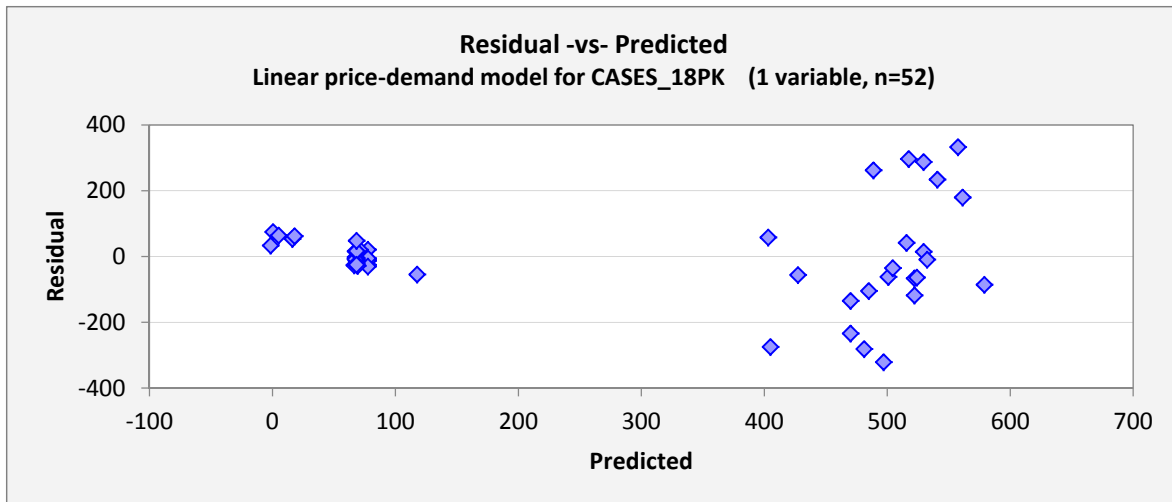
Actual and predicted -vs- Observation #



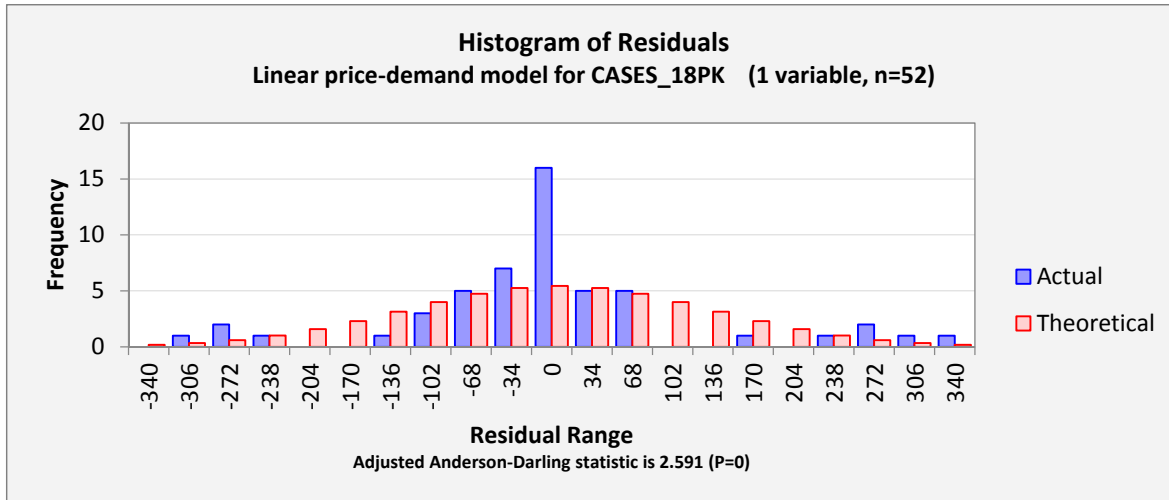
Residual -vs- Observation #



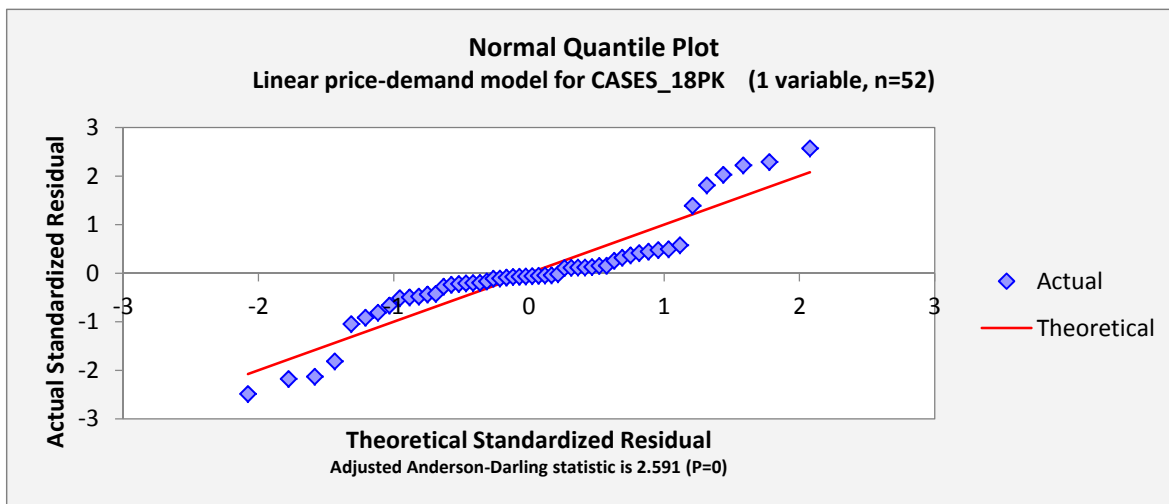
Residual -vs- Predicted



Histogram of Residuals



Normal Quantile Plot



Residuals sorted from largest to smallest by absolute value: Linear price-demand model for CASES_18PK (1 variable, n=52)

Obs#	Actual	Predicted	Residual	Std.Res.
29	890.000	557.516	332.484	2.547
18	176.000	497.061	-321.061	-2.460
52	814.000	517.523	296.477	2.271
40	817.000	529.614	287.386	2.202
41	200.000	481.250	-281.250	-2.155
49	130.000	404.984	-274.984	-2.107
44	751.000	488.690	262.310	2.010
32	775.000	540.775	234.225	1.794
33	236.000	470.089	-234.089	-1.793
48	741.000	561.236	179.764	1.377
37	335.000	470.089	-135.089	-1.035
13	404.000	522.173	-118.173	-0.905
14	380.000	484.970	-104.970	-0.804
51	493.000	578.908	-85.908	-0.658
38	75.000	0.402	74.598	0.572

17	456.000	522.173	-66.173	-0.507
43	460.000	524.033	-64.033	-0.491
50	69.000	5.053	63.947	0.490
46	80.000	18.074	61.926	0.474
1	439.000	500.781	-61.781	-0.473
39	461.000	403.124	57.876	0.443
30	371.000	427.306	-56.306	-0.431
35	63.000	117.591	-54.591	-0.418
45	70.000	16.214	53.786	0.412
27	116.000	68.298	47.702	0.365
31	557.000	515.663	41.337	0.317
36	469.000	504.502	-35.502	-0.272
42	32.000	-1.458	33.458	0.256
7	47.000	77.598	-30.598	-0.234
23	41.000	69.228	-28.228	-0.216
16	40.000	66.437	-26.437	-0.203
4	52.000	77.598	-25.598	-0.196
34	43.000	68.298	-25.298	-0.194
24	47.000	68.298	-21.298	-0.163
2	98.000	77.598	20.402	0.156
20	91.000	71.088	19.912	0.153
26	85.000	68.298	16.702	0.128
25	84.000	68.298	15.702	0.120
22	83.000	67.368	15.632	0.120
8	85.000	70.158	14.842	0.114
28	544.000	529.614	14.386	0.110
12	54.000	68.298	-14.298	-0.110
5	64.000	77.598	-13.598	-0.104
11	57.000	68.298	-11.298	-0.087
47	523.000	532.404	-9.404	-0.072
9	59.000	68.298	-9.298	-0.071
21	59.000	67.368	-8.368	-0.064
3	70.000	77.598	-7.598	-0.058
19	61.000	67.368	-6.368	-0.049
6	72.000	77.598	-5.598	-0.043
10	63.000	68.298	-5.298	-0.041
15	65.000	67.368	-2.368	-0.018