

What kind of gamer are you ?

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SEGUY

ENAC

May 20, 2015

- 1 Introduction
- 2 Variables
- 3 Model
- 4 Model Analysis
- 5 Conclusion

Introduction

Purpose

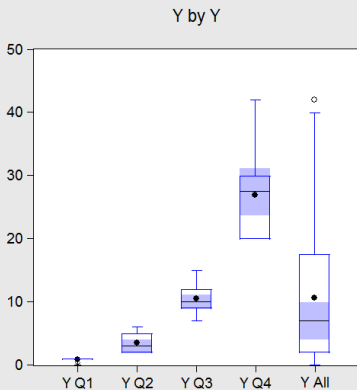
- Estimate the weekly time spent to play video games
- Establish a model for this activity

Database

- Use of a Google Form
- $n = 72$ answers
- Poll realized on a majority of students (92%)

Results

Boxplot



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Variables

Variable	Expected Effect	Real Effect	Significant
Man	+	+	No
Student	+	-	No
Age	-	-	No
Height	?	No effect	No
Weight	+	No effect	No
In couple	-	-	No
Children	-	-	No
Income	-	No tendency	-
Sport frequency	-	+	Yes
Type : PC	?	+	No
Type : Home console	+	+	Yes
Type : Handheld console	+	+	Yes
Type : Smartphone	?	+	No
Number of screens	+	+	No

Variables (2)

Variable	Expected Effect	Real Effect	Significant
Game : Action	?	+	Yes
Game : Adventure	?	+	No
Game : Sport	?	+	No
Game : Reflexion	?	+	No
Game : Strategy	?	+	Yes
Game : Simulation	?	+	No
Game : RPG	+	+	Yes
Alone	?	-	No
Online	+	+	Yes
Phase : Morning	+	+	Yes
Phase : Afternoon	?	+	No
Phase : Evening	?	+	No
Phase : Night	+	+	Yes
Budget	+	+	Yes
Event	+	+	Yes

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First Model

E-Views Results

Dependent Variable: Y
Method: Least Squares
Date: 05/14/15 Time: 17:59
Sample: 172
Included observations: 72

	Coefficient	Std. Error	t-Statistic	Prob.
C	44.07271	46.54085	0.946968	0.3491
AGE	-0.572020	0.597420	-0.957484	0.3438
B010	-6.778322	3.473133	-1.951645	0.0577
COUPLE	2.188556	3.301246	0.662949	0.5110
ECRANS	0.261899	0.578593	0.452649	0.6531
ENFANTS	6.613534	9.525314	0.694311	0.4913
ETUDIAN	-6.657926	6.545450	-1.017184	0.3149
EVENT	-2.920631	4.032605	-0.724254	0.4729
HSPORT	0.964523	0.611911	1.576247	0.1225
JACTION	-3.715376	3.669808	-1.012417	0.3171
JAVENTUR	1.494251	3.870451	0.386066	0.7014
JREFLEX	0.625880	2.898069	0.215965	0.8301
JROLE	1.155739	3.361366	0.343830	0.7327
JSIMU	0.795536	2.940049	0.270586	0.7880
JSPORT	-1.910180	3.411476	-0.559928	0.5785
JSTRAT	-0.618466	2.915108	-0.212159	0.8330

MMATINEE	7.669966	4.372659	1.754074	0.0867
MAPREM	-0.457657	4.040668	-0.113263	0.9104
MSOIREE	6.030124	4.311960	1.398465	0.1693
MNUIT	7.995717	3.377128	2.367609	0.0226
OFFLINE	3.227561	3.935844	0.820043	0.4168
POIDS	0.043564	0.153465	0.283869	0.7779
PPC	4.689890	5.757305	0.814598	0.4199
PSPORTAB	-2.004187	3.445410	-0.581698	0.5639
PSALON	3.839217	3.360090	1.142594	0.2597
PTEL	2.661626	3.368383	0.790179	0.4339
S05K	-2.096655	2.926950	-0.716328	0.4778
SEUL	0.800013	3.555968	0.224978	0.8231
SEXE	7.601143	4.524466	1.680009	0.1004
TAILLE	-0.232492	0.273742	-0.849312	0.4005

R-squared	0.559192	Mean dependent var	10.68056
Adjusted R-squared	0.254824	S.D. dependent var	10.80014
S.E. of regression	9.323063	Akaike info criterion	7.597196
Sum squared resid	3650.619	Schwarz criterion	8.545807
Log likelihood	-243.4991	Hannan-Quinn criter.	7.974841
F-statistic	1.837226	Durbin-Watson stat	2.510487
Prob(F-statistic)	0.035206		

Correlation Matrix

	Age	Budget	In coup	Nb of s	Childre	Studen	Event	Sport fr	G : Acti	G : Adv	G : Ref	RPG :	Sim :	Spc :	Str :	Mor P :	Nigl	Online	Weight	Type :	Type :	Type :	Income	Alone	Man	Height	
Age	1.00	0.12	0.25	0.17	0.86	-0.52	-0.06	-0.08	-0.24	-0.26	-0.16	-0.15	0.05	0.14	-0.19	-0.05	-0.02	-0.12	0.33	-0.22	-0.09	-0.16	0.14	-0.24	0.04	0.11	0.11
Budget	0.12	1.00	0.24	-0.02	0.14	-0.03	-0.36	-0.31	-0.35	-0.27	0.02	-0.51	-0.17	-0.09	-0.28	0.00	-0.30	-0.27	0.00	0.04	-0.47	-0.35	0.19	-0.04	-0.12	-0.14	-0.09
In couple	0.25	0.24	1.00	-0.07	0.25	-0.13	-0.11	-0.17	-0.37	-0.10	0.01	-0.29	-0.08	-0.16	0.00	0.12	-0.16	-0.28	-0.14	-0.01	-0.26	-0.15	0.14	-0.07	-0.07	-0.46	-0.23
Nb of screens	0.17	-0.02	-0.07	1.00	0.11	-0.13	-0.13	0.04	0.00	-0.07	-0.18	0.01	0.17	0.23	-0.16	-0.05	-0.08	-0.18	0.01	0.01	0.07	0.16	0.19	0.09	-0.19	-0.01	-0.14
Children	0.86	0.14	0.25	0.11	1.00	-0.43	-0.10	-0.08	-0.26	-0.17	-0.19	-0.22	-0.04	0.12	-0.22	-0.09	-0.13	-0.15	0.23	-0.33	-0.14	-0.21	0.10	-0.16	0.05	0.04	0.10
Student	-0.52	-0.03	-0.13	-0.13	-0.43	1.00	-0.06	-0.01	-0.05	0.15	0.03	0.08	-0.15	-0.04	-0.01	-0.10	0.10	-0.24	-0.46	0.09	0.04	0.07	0.16	0.34	-0.23	-0.04	-0.28
Event	-0.06	-0.36	-0.11	-0.13	-0.10	-0.06	1.00	0.26	0.24	0.16	-0.01	0.39	0.06	0.12	0.32	0.14	0.43	0.18	0.18	0.14	0.34	0.27	0.11	0.03	0.10	0.23	0.14
Sport freq.	-0.08	-0.31	-0.17	0.04	-0.08	-0.01	0.26	1.00	0.09	0.06	-0.14	0.13	0.05	0.24	0.10	-0.07	-0.10	0.26	-0.08	-0.14	0.10	0.19	-0.06	0.10	0.12	0.09	0.04
Game : Action	-0.24	-0.35	-0.37	0.00	-0.26	-0.05	0.24	0.08	1.00	0.48	0.07	0.26	0.12	0.08	0.32	-0.05	0.30	0.26	0.06	-0.09	0.24	0.35	-0.12	-0.02	0.28	0.18	0.22
Game : Adventure	-0.26	-0.27	-0.10	-0.07	-0.17	0.15	0.16	0.06	-0.48	1.00	-0.01	0.40	0.23	-0.14	0.29	-0.07	0.21	-0.06	-0.04	-0.08	0.35	0.38	-0.11	0.00	0.08	-0.10	0.00
Game : Reflexion	-0.16	0.02	0.01	-0.18	-0.19	0.03	-0.01	-0.14	0.07	-0.01	1.00	0.12	0.01	-0.07	0.34	0.25	-0.05	-0.02	-0.06	0.04	0.13	-0.02	0.04	-0.04	0.13	-0.07	-0.14
Game : RPG	-0.15	-0.51	-0.29	0.01	-0.22	0.08	0.39	0.13	0.26	0.40	0.12	1.00	0.24	0.04	0.38	0.03	0.32	0.15	0.14	-0.02	0.48	0.30	-0.01	-0.03	0.00	0.23	0.06
Game : Simu	0.05	-0.17	-0.08	0.17	-0.04	-0.15	0.06	0.05	0.12	0.23	0.01	0.24	1.00	0.08	0.18	-0.17	0.14	0.12	0.20	0.08	0.14	0.14	0.04	0.06	-0.08	-0.14	-0.01
Game : Sport	0.14	-0.09	-0.16	0.23	0.12	-0.04	0.12	0.24	0.08	-0.14	-0.07	0.04	0.08	1.00	0.04	0.01	-0.06	0.06	0.10	-0.11	-0.06	0.25	0.06	0.21	0.04	0.34	0.07
Game : Strategy	-0.19	-0.28	0.00	-0.16	-0.22	-0.01	0.32	0.10	0.32	0.29	0.34	0.38	0.18	0.04	1.00	0.18	0.15	0.15	0.03	-0.02	0.24	0.19	-0.01	0.03	0.06	0.05	0.07
Phase : Morning	-0.05	0.00	0.12	-0.05	-0.08	-0.10	0.14	-0.07	-0.05	-0.07	0.25	0.03	-0.17	0.01	1.00	0.08	0.05	-0.22	0.12	0.07	-0.04	0.06	0.03	0.12	-0.14	-0.23	
Phase : Night	-0.02	-0.30	-0.16	-0.08	-0.13	0.10	0.43	-0.10	0.30	0.21	-0.05	0.32	0.14	-0.06	0.15	0.08	1.00	0.17	0.19	0.21	0.32	0.24	0.02	0.01	0.01	0.09	0.03
Online	-0.12	-0.27	-0.28	-0.18	-0.15	-0.24	0.18	0.26	0.26	-0.06	-0.02	0.15	0.12	0.06	0.15	0.05	0.17	1.00	0.14	-0.02	0.06	0.00	-0.15	-0.10	0.55	0.18	0.27
Weight	0.33	0.00	-0.14	0.01	0.23	-0.46	0.18	-0.08	0.06	-0.04	-0.06	0.14	0.20	0.10	0.03	-0.22	0.19	0.14	1.00	0.00	0.11	0.20	0.03	-0.27	-0.03	0.33	0.63
Type : PC	-0.22	0.04	-0.01	0.01	-0.33	0.09	0.14	-0.14	-0.09	-0.08	0.04	-0.02	0.08	-0.11	-0.02	0.12	0.21	-0.02	0.00	1.00	0.20	-0.03	0.12	0.02	-0.13	-0.08	0.05
Type : HH Console	-0.09	-0.47	-0.26	0.07	-0.14	0.04	0.34	0.10	0.24	0.35	0.13	0.48	0.14	-0.06	0.24	0.07	0.32	0.06	0.11	0.20	1.00	0.38	0.11	-0.06	-0.02	0.23	0.13
Type : Home Console	-0.16	-0.35	-0.15	0.16	-0.21	0.07	0.27	0.19	-0.35	0.38	-0.02	0.30	0.14	0.25	0.19	-0.04	0.24	0.00	0.20	-0.03	0.38	1.00	0.11	0.24	-0.04	0.27	0.26
Type : Smartphone	0.14	0.19	0.14	0.19	0.10	0.16	0.11	-0.06	-0.12	-0.11	0.04	-0.01	0.04	0.06	-0.01	0.06	0.02	-0.15	0.03	0.12	0.11	0.11	1.00	0.02	-0.21	-0.04	-0.10
Income	-0.24	-0.04	-0.07	0.09	-0.16	0.34	0.03	0.10	-0.02	0.00	-0.04	-0.03	-0.06	0.21	0.03	0.03	0.01	-0.10	-0.27	0.02	-0.06	0.24	0.02	1.00	-0.13	0.06	-0.13
Alone	0.04	-0.12	-0.07	-0.19	0.05	-0.23	0.10	0.12	0.28	0.08	0.13	0.00	-0.08	0.04	0.06	0.12	0.01	0.55	-0.03	-0.13	-0.02	-0.04	-0.21	1.00	0.02	0.04	
Man	0.11	-0.14	-0.46	-0.01	0.04	-0.04	0.23	0.09	0.18	-0.10	-0.07	0.23	-0.14	0.34	0.05	-0.14	0.09	0.18	0.33	-0.08	0.23	0.27	-0.04	0.06	0.02	1.00	0.63
Height	0.11	-0.09	-0.23	-0.14	0.10	-0.28	0.14	0.04	0.22	0.00	-0.14	0.06	-0.01	0.07	0.07	-0.23	0.03	0.27	0.63	0.05	0.13	0.26	-0.10	-0.13	0.04	0.63	1.00

Correlation Matrix

High correlation between the following :

- Children and Age : 0.86
- Age and Student : -0.52
- Height and Weight : 0.63

There are many other cases of correlated variables. For each case, we only keep one in order to improve the model.

Second Model

Parameters

$k = 15$

$R^2 = 0.49$

Adjusted $R^2 = 0.35$

E-Views Results

Dependent Variable: Y
 Method: Least Squares
 Date: 05/19/15 Time: 16:46
 Sample: 1 72
 Included observations: 72

	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.396499	8.553675	-0.163263	0.8709
B010	-5.990049	2.695213	-2.222477	0.0303
COUPLE	2.020500	2.574051	0.784950	0.4358
ECRANS	0.404949	0.470997	0.859771	0.3936
HSPORT	0.496774	0.470272	1.056356	0.2953
JREFLEX	0.718394	2.216955	0.324045	0.7471
JSIMU	1.570726	2.450992	0.640853	0.5242
MMATINEE	7.356703	3.055304	2.407846	0.0194
MNUIT	6.098782	2.433354	2.506328	0.0151
OFFLINE	4.435912	2.491939	1.780104	0.0805
POIDS	-0.014926	0.097140	-0.153659	0.8784
PPC	2.851656	4.261946	0.669097	0.5062
PSALON	2.546024	2.545282	1.000292	0.3215
PTEL	0.697415	2.667651	0.261434	0.7947
S05K	-1.306008	2.376387	-0.549577	0.5848
SEXE	3.382081	2.765960	1.222751	0.2265

R-squared	0.486399	Mean dependent var	10.68056
Adjusted R-squared	0.348827	S.D. dependent var	10.80014
S.E. of regression	8.715201	Akaike info criterion	7.361145
Sum squared resid	4253.465	Schwarz criterion	7.887070
Log likelihood	-249.0012	Hannan-Quinn criter.	7.562555
F-statistic	3.535604	Durbin-Watson stat	2.457799
Prob(F-statistic)	0.000287		

Third Model

Parameters

$$k = 4$$

$$R^2 = 0.42$$

$$\text{Adjusted } R^2 = 0.38$$

E-Views Results

Dependent Variable: Y
 Method: Least Squares
 Date: 05/19/15 Time: 16:54
 Sample: 1 72
 Included observations: 72

	Coefficient	Std. Error	t-Statistic	Prob.
C	9.492188	2.623531	3.618096	0.0006
B010	-7.767683	2.276699	-3.411818	0.0011
MMATINEE	6.764084	2.684581	2.519605	0.0141
MNUIT	6.244986	2.132947	2.927868	0.0047
OFFLINE	4.421262	2.163520	2.043551	0.0449
R-squared	0.421857	Mean dependent var		10.68056
Adjusted R-squared	0.387341	S.D. dependent var		10.80014
S.E. of regression	8.453545	Akaike info criterion		7.173964
Sum squared resid	4787.982	Schwarz criterion		7.332066
Log likelihood	-253.2627	Hannan-Quinn criter.		7.236905
F-statistic	12.22206	Durbin-Watson stat		2.416556
Prob(F-statistic)	0.000000			

Model Equation

Model :

$$\begin{aligned} \ln(Y+1) = & \beta_1 + \beta_2 HOMECONSOLE + \beta_3 ONLINE + \beta_4 MORNING \\ & + \beta_5 NIGHT + \beta_6 BUDGET (< 10) + \beta_7 \ln(WEIGHT) + \beta_8 \ln(WEIGHT)^2 \\ & + \beta_9 \ln(SPORTFREQ + 1) + \beta_{10} \ln(SPORTFREQ + 1)^2 + u \quad (1) \end{aligned}$$

Model Equation

Model :

$$\ln(\widehat{Y} + 1) = -69.91 + 0.34HOMECONSOLE + 0.56ONLINE + 0.75MORNING + 0.77NIGHT - 0.47(BUDGET < 10) + 33.31\ln(WEIGHT) - 3.86\ln(WEIGHT)^2 - 0.77\ln(SPORTFREQ + 1) + 0.31\ln(SPORTFREQ + 1)^2 \quad (2)$$

Wald Tests

Low p-values so we reject the null hypothesis for each β_i .

Optimized Model

Parameters

$k = 9$

$R^2 = 0.63$

Adjusted $R^2 = 0.57$

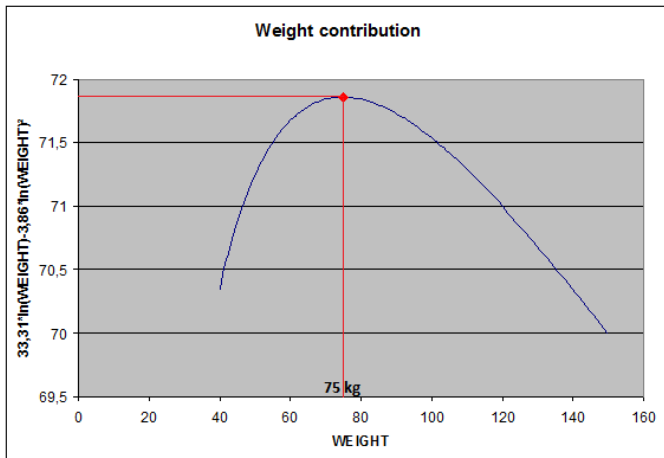
E-Views Results

Dependent Variable: LNY
 Method: Least Squares
 Date: 05/14/15 Time: 14:55
 Sample: 1 72
 Included observations: 72

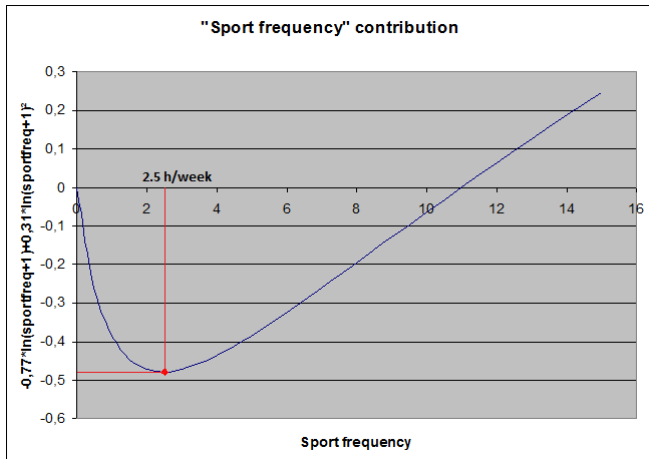
	Coefficient	Std. Error	t-Statistic	Prob.
C	-69.91406	32.97057	-2.120499	0.0380
PSALON	0.342171	0.180507	1.895613	0.0627
OFFLINE	0.558424	0.183265	3.047084	0.0034
MMATINEE	0.750866	0.225928	3.323476	0.0015
MNUIT	0.771254	0.181017	4.260680	0.0001
B010	-0.465758	0.203339	-2.290552	0.0254
LOG(POIDS)	33.30817	15.54865	2.142190	0.0361
LOG(POIDS)^2	-3.864341	1.827806	-2.114197	0.0385
LNHSP	-0.765431	0.428314	-1.787081	0.0788
LNHSP^2	0.311312	0.177402	1.754841	0.0842
R-squared	0.626648	Mean dependent var	1.993001	
Adjusted R-squared	0.572452	S.D. dependent var	1.027459	
S.E. of regression	0.671826	Akaike info criterion	2.170612	
Sum squared resid	27.98374	Schwarz criterion	2.486816	
Log likelihood	-68.14204	Hannan-Quinn criter.	2.296494	
F-statistic	11.56258	Durbin-Watson stat	2.256125	
Prob(F-statistic)	0.000000			

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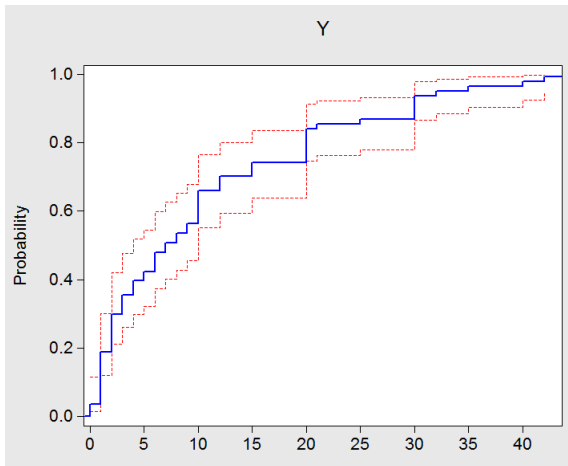
Weight Contribution



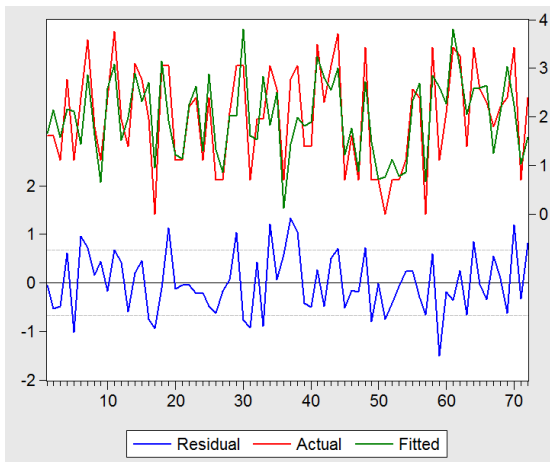
Sport Contribution



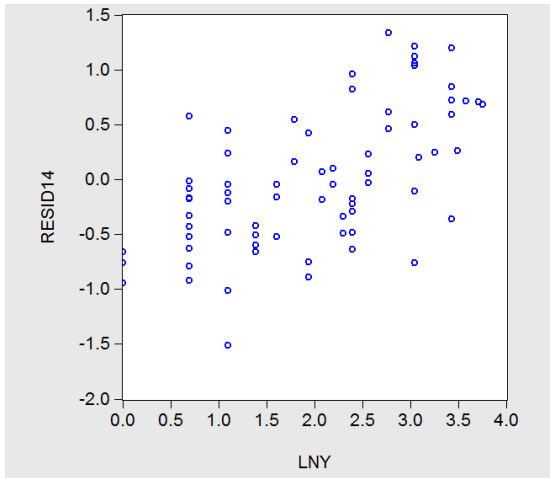
Probability Density Function



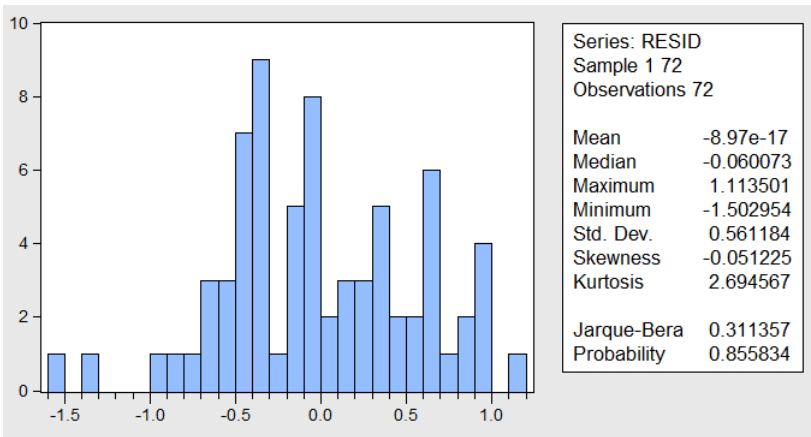
Residuals



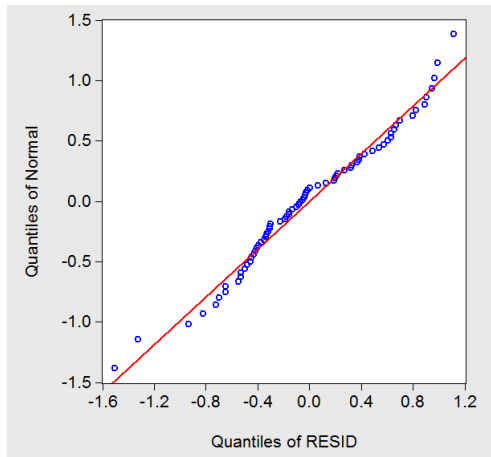
Residuals



Normality of the Residuals



Normality of the Residuals (2)



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Conclusion

Main points

- Strong influence of the periods of the day.
- Validity of the model for : a weight from 45 to 115 kg
sport frequency from 0 to 15 h
- Surprising results : Complexity of the effect of the weight and sport frequency