

## Article

# BIM and BEM Methodologies Integration in Energy-Efficient Buildings Using Experimental Design

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## 1. Linear Regression and ANOVA Results via Minitab for Armação dos Búzios, Brazil.

*General Factorial Regression: EUI versus A, B, C*

**Table S1.** Factor Information for Armação dos Búzios.

Factor	Levels	Values
A	3	1, 2, 3
B	2	1, 2
C	7	1, 2, 3, 4, 5, 6, 7

**Table S2.** Analysis of Variance for Armação dos Búzios.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	29	28221.7	973.16	5244.58	0.000
Linear	9	28048.6	3116.52	16795.60	0.000
A	2	4375.6	2187.81	11790.59	0.000
B	1	3456.2	3456.21	18626.30	0.000
C	6	20216.8	3369.47	18158.81	0.000
2-Way Interactions	20	173.0	8.65	46.63	0.000
A*B	2	100.0	50.00	269.46	0.000
A*C	12	45.9	3.83	20.63	0.000
B*C	6	27.1	4.52	24.34	0.000
Error	12	2.2	0.19	-	-
Total	41	28223.9	-	-	-

**Table S3.** Model Summary for Armação dos Búzios.

S	R-sq	R-sq(adj)	R-sq(pred)
0.430762	99.99%	99.97%	99.90%

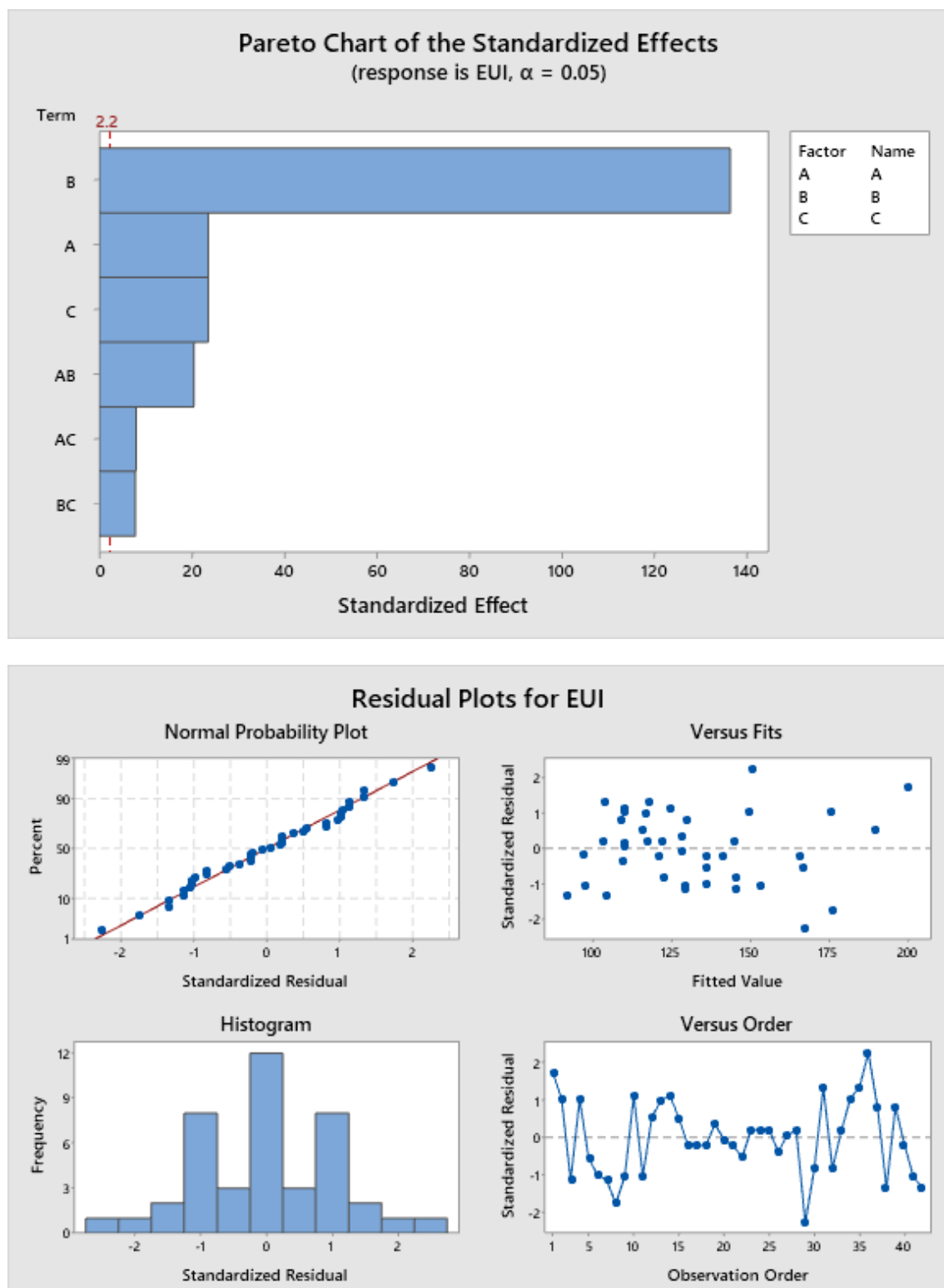
**Table S4.** Coefficients for Armação dos Búzios.

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	131.833	0.066	1983.41	0.000	-
1	10.9524	0.0940	116.51	0.000	1.33

2	2.6667	0.0940	28.37	0.000	1.33
B					
1	9.0714	0.0665	136.48	0.000	1.00
C					
1	43.500	0.163	267.18	0.000	1.71
2	20.667	0.163	126.94	0.000	1.71
3	−7.667	0.163	−47.09	0.000	1.71
4	−3.000	0.163	−18.43	0.000	1.71
5	−15.867	0.163	−97.45	0.000	1.71
6	−15.467	0.163	−95.00	0.000	1.71
A*B					
1 1	1.4286	0.0940	15.20	0.000	1.33
2 1	0.7143	0.0940	7.60	0.000	1.33
A*C					
1 1	2.214	0.230	9.62	0.000	2.29
1 2	1.048	0.230	4.55	0.001	2.29
1 3	−0.119	0.230	−0.52	0.615	2.29
1 4	−0.286	0.230	−1.24	0.238	2.29
1 5	−0.919	0.230	−3.99	0.002	2.29
1 6	−0.819	0.230	−3.56	0.004	2.29
2 1	0.500	0.230	2.17	0.051	2.29
2 2	0.333	0.230	1.45	0.173	2.29
2 3	−0.333	0.230	−1.45	0.173	2.29
2 4	−0.000	0.230	−0.00	1.000	2.29
2 5	−0.133	0.230	−0.58	0.573	2.29
2 6	−0.033	0.230	−0.14	0.887	2.29
B*C					
1 1	1.595	0.163	9.80	0.000	1.71
1 2	0.762	0.163	4.68	0.001	1.71
1 3	−0.238	0.163	−1.46	0.169	1.71
1 4	−0.238	0.163	−1.46	0.169	1.71
1 5	−0.371	0.163	−2.28	0.042	1.71
1 6	−0.771	0.163	−4.74	0.000	1.71

Table S5. Regression Equation for Armação dos Búzios.

EUI	=	131.833 + 10.9524 A_1 + 2.6667 A_2 − 13.6190 A_3 + 9.0714 B_1 − 9.0714 B_2 + 43.500 C_1
		+ 20.667 C_2 − 7.667 C_3 − 3.000 C_4 − 15.867 C_5 − 15.467 C_6 − 22.167 C_7
		+ 1.4286 A*B_1 1 − 1.4286 A*B_1 2 + 0.7143 A*B_2 1 − 0.7143 A*B_2 2 − 2.1429 A*B_3 1
		+ 2.1429 A*B_3 2 + 2.214 A*C_1 1 + 1.048 A*C_1 2 − 0.119 A*C_1 3 − 0.286 A*C_1 4
		− 0.919 A*C_1 5 − 0.819 A*C_1 6 − 1.119 A*C_1 7 + 0.500 A*C_2 1 + 0.333 A*C_2 2
		− 0.333 A*C_2 3 − 0.000 A*C_2 4 − 0.133 A*C_2 5 − 0.033 A*C_2 6 − 0.333 A*C_2 7
		− 2.714 A*C_3 1 − 1.381 A*C_3 2 + 0.452 A*C_3 3 + 0.286 A*C_3 4 + 1.052 A*C_3 5
		+ 0.852 A*C_3 6 + 1.452 A*C_3 7 + 1.595 B*C_1 1 + 0.762 B*C_1 2 − 0.238 B*C_1 3
		− 0.238 B*C_1 4 − 0.371 B*C_1 5 − 0.771 B*C_1 6 − 0.738 B*C_1 7 − 1.595 B*C_2 1
		− 0.762 B*C_2 2 + 0.238 B*C_2 3 + 0.238 B*C_2 4 + 0.371 B*C_2 5 + 0.771 B*C_2 6
		+ 0.738 B*C_2 7



**Figure S1.** Graphics of Pareto Charts and Residual Plots for Armação dos Búzios, Brazil.

## 2. Linear Regression and ANOVA Results via Minitab for Capri, Italy.

*General Factorial Regression: EUI<sub>Capri</sub> versus A, B, C*

**Table S6.** Factor Information for Capri.

Factor	Levels	Values
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A	3	1, 2, 3
B	2	1, 2
C	7	1, 2, 3, 4, 5, 6, 7

**Table S7.** Analysis of Variance for Capri.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	29	49813.8	1717.72	35773.98	0.000
Linear	9	49771.6	5530.18	115173.98	0.000
A	2	831.8	415.89	8661.44	0.000
B	1	1317.1	1317.12	27430.93	0.000
C	6	47622.7	7937.12	165302.00	0.000
2-Way Interactions	20	42.2	2.11	43.98	0.000
A*B	2	5.0	2.49	51.83	0.000
A*C	12	14.3	1.19	24.84	0.000
B*C	6	22.9	3.82	79.65	0.000
Error	12	0.6	0.05		
Total	41	49814.4			

**Table S8.** Model Summary for Capri.

S	R-sq	R-sq(adj)	R-sq(pred)
0.219125	100.00%	100.00%	99.99%

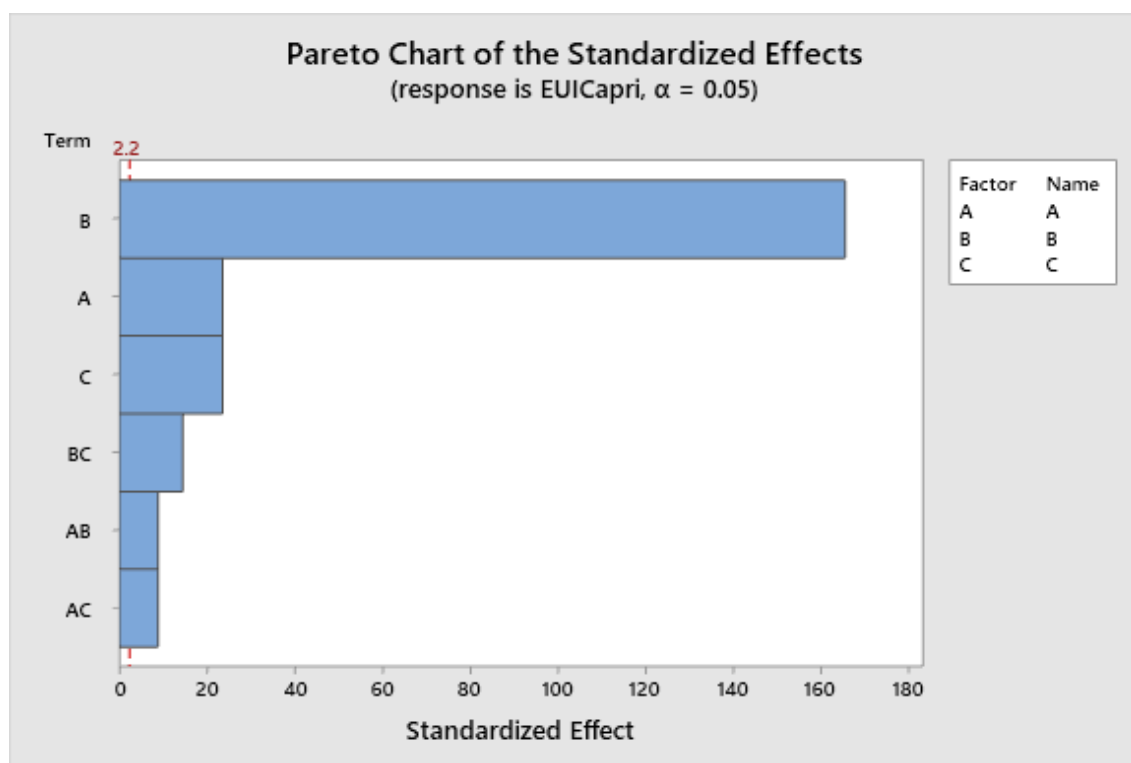
**Table S9.** Coefficients for Capri.

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	122.581	0.034	3625.39	0.000	-
A					
1	4.3190	0.0478	90.32	0.000	1.33
2	1.8048	0.0478	37.74	0.000	1.33
B					
1	5.6000	0.0338	165.62	0.000	1.00
C					
1	52.2524	0.0828	630.90	0.000	1.71
2	20.4190	0.0828	246.54	0.000	1.71
3	−38.1810	0.0828	−461.00	0.000	1.71
4	7.7524	0.0828	93.60	0.000	1.71
5	4.7524	0.0828	57.38	0.000	1.71
6	9.2524	0.0828	111.71	0.000	1.71
A*B					
1 1	0.2714	0.0478	5.68	0.000	1.33
2 1	0.2143	0.0478	4.48	0.001	1.33
A*C					
1 1	0.848	0.117	7.24	0.000	2.29
1 2	0.181	0.117	1.54	0.148	2.29
1 3	−0.619	0.117	−5.29	0.000	2.29
1 4	0.348	0.117	2.97	0.012	2.29
1 5	0.348	0.117	2.97	0.012	2.29
1 6	−0.152	0.117	−1.30	0.218	2.29
2 1	0.362	0.117	3.09	0.009	2.29

2 2	0.195	0.117	1.67	0.121	2.29
2 3	−0.255	0.117	−2.18	0.050	2.29
2 4	−0.138	0.117	−1.18	0.261	2.29
2 5	−0.138	0.117	−1.18	0.261	2.29
2 6	0.362	0.117	3.09	0.009	2.29
B*C					
1 1	1.2333	0.0828	14.89	0.000	1.71
1 2	0.4000	0.0828	4.83	0.000	1.71
1 3	−0.8000	0.0828	−9.66	0.000	1.71
1 4	0.0667	0.0828	0.80	0.437	1.71
1 5	0.0667	0.0828	0.80	0.437	1.71
1 6	0.2333	0.0828	2.82	0.016	1.71

Table S10. Regression Equation for Capri.

$$\begin{aligned}
 \text{EUI}_{\text{Capri}} = & 122.581 + 4.3190 A_1 + 1.8048 A_2 - 6.1238 A_3 + 5.6000 B_1 - 5.6000 B_2 \\
 & + 52.2524 C_1 + 20.4190 C_2 - 38.1810 C_3 + 7.7524 C_4 + 4.7524 C_5 + 9.2524 C_6 \\
 & - 56.2476 C_7 + 0.2714 A*B_1 - 0.2714 A*B_2 + 0.2143 A*B_3 - 0.2143 A*B_4 \\
 & - 0.4857 A*B_5 + 0.4857 A*B_6 + 0.848 A*C_1 + 0.181 A*C_2 - 0.619 A*C_3 \\
 & + 0.348 A*C_4 + 0.348 A*C_5 - 0.152 A*C_6 - 0.952 A*C_7 + 0.362 A*C_8 \\
 & + 0.195 A*C_9 - 0.255 A*C_{10} - 0.138 A*C_{11} - 0.138 A*C_{12} + 0.362 A*C_{13} \\
 & - 0.388 A*C_{14} - 1.210 A*C_{15} - 0.376 A*C_{16} + 0.874 A*C_{17} - 0.210 A*C_{18} \\
 & - 0.210 A*C_{19} - 0.210 A*C_{20} + 1.340 A*C_{21} + 1.2333 B*C_1 + 0.4000 B*C_2 \\
 & - 0.8000 B*C_3 + 0.0667 B*C_4 + 0.0667 B*C_5 + 0.2333 B*C_6 - 1.2000 B*C_7 \\
 & - 1.2333 B*C_8 - 0.4000 B*C_9 + 0.8000 B*C_{10} - 0.0667 B*C_{11} \\
 & - 0.0667 B*C_{12} - 0.2333 B*C_{13} + 1.2000 B*C_{14}
 \end{aligned}$$



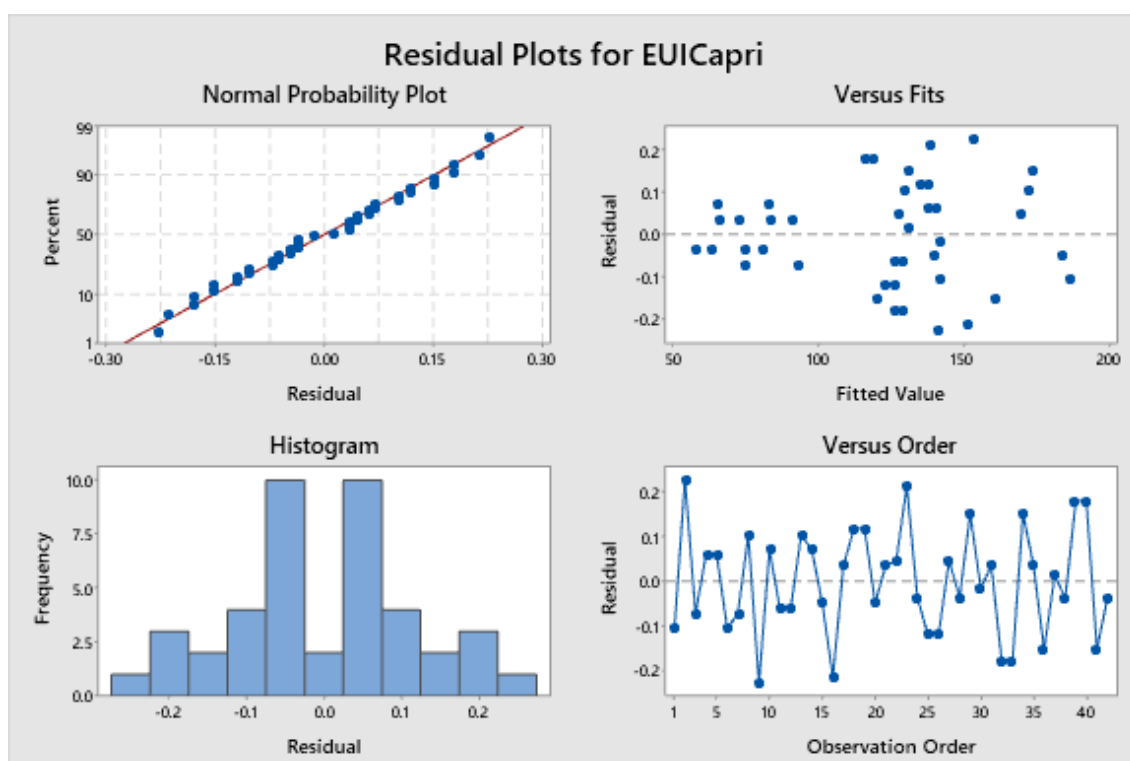


Figure S2. Graphics of Pareto Charts and Residual Plots for Capri, Italy.

### 3. Linear Regression and ANOVA Results via Minitab for Punta Cana, Dominican Republic

General Factorial Regression: *EUIPtaCana* versus *A*, *B*, *C*

Table S11. Factor Information for Punta Cana.

Factor	Levels	Values
A	3	1, 2, 3
B	2	1, 2
C	7	1, 2, 3, 4, 5, 6, 7

Table S12. Analysis of Variance for Punta Cana.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	29	29530.3	1018.29	6842.88	0.000
Linear	9	29378.4	3264.27	21935.88	0.000
A	2	3997.0	1998.50	13429.92	0.000
B	1	4736.1	4736.10	31826.56	0.000
C	6	20645.3	3440.89	23122.76	0.000
2-Way Interactions	20	151.9	7.59	51.03	0.000
A*B	2	82.0	41.02	275.68	0.000
A*C	12	31.5	2.63	17.64	0.000
B*C	6	38.3	6.39	42.92	0.000
Error	12	1.8	0.15		
Total	41	29532.1			

Table S13. Model Summary for Punta Cana.

S	R-sq	R-sq(adj)	R-sq(pred)
0.385758	99.99%	99.98%	99.93%

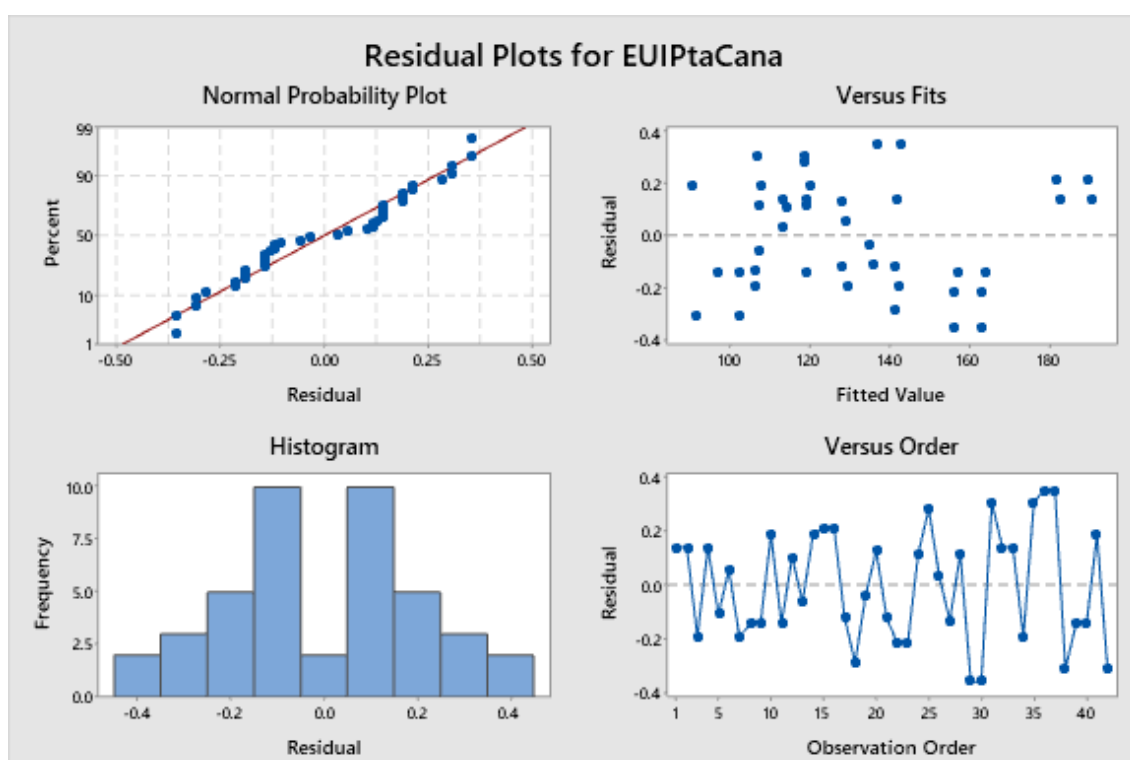
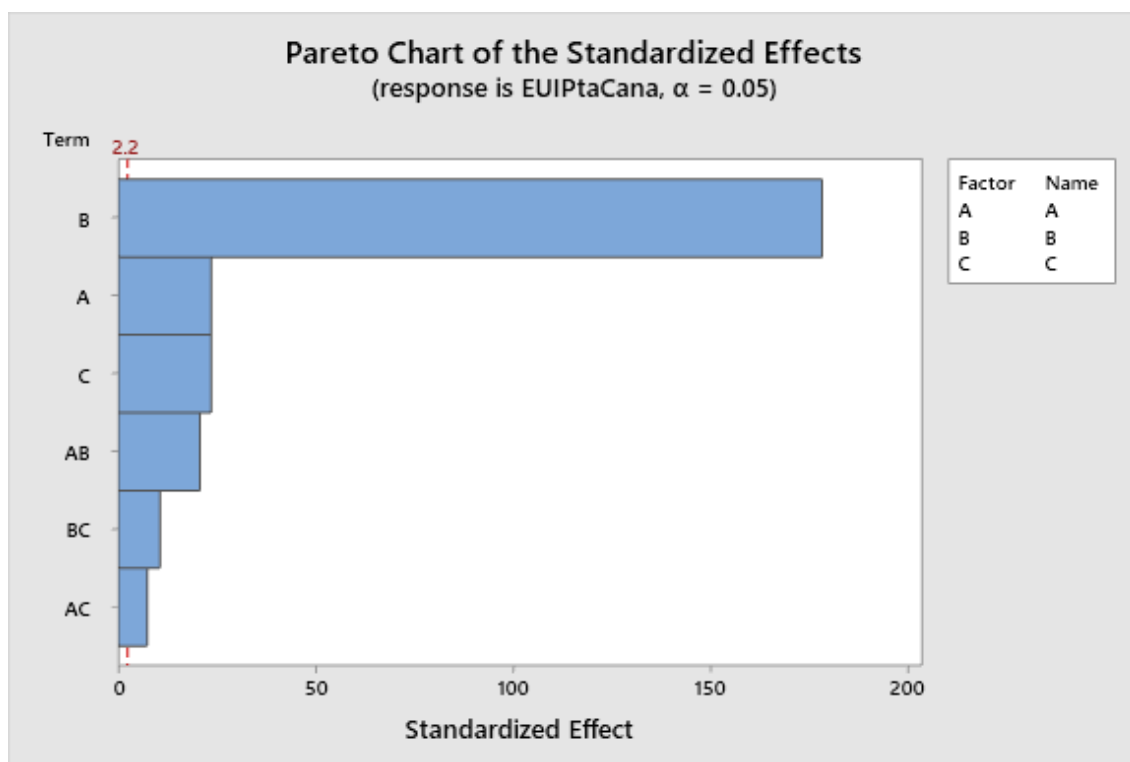
**Table S14.** Coefficients for Punta Cana.

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	131.286	0.060	2205.60	0.000	
A					
1	7.3571	0.0842	87.40	0.000	1.33
2	6.4286	0.0842	76.37	0.000	1.33
B					
1	10.6190	0.0595	178.40	0.000	1.00
C					
1	37.714	0.146	258.67	0.000	1.71
2	30.548	0.146	209.51	0.000	1.71
3	−7.452	0.146	−51.11	0.000	1.71
4	−7.619	0.146	−52.26	0.000	1.71
5	−13.369	0.146	−91.69	0.000	1.71
6	−20.202	0.146	−138.56	0.000	1.71
A*B					
1 1	1.0238	0.0842	12.16	0.000	1.33
2 1	0.9524	0.0842	11.31	0.000	1.33
A*C					
1 1	1.143	0.206	5.54	0.000	2.29
1 2	0.810	0.206	3.93	0.002	2.29
1 3	−0.190	0.206	−0.92	0.374	2.29
1 4	−0.524	0.206	−2.54	0.026	2.29
1 5	−0.274	0.206	−1.33	0.209	2.29
1 6	−0.440	0.206	−2.14	0.054	2.29
2 1	1.071	0.206	5.20	0.000	2.29
2 2	0.738	0.206	3.58	0.004	2.29
2 3	−0.262	0.206	−1.27	0.228	2.29
2 4	−0.095	0.206	−0.46	0.652	2.29
2 5	−0.345	0.206	−1.67	0.120	2.29
2 6	−0.512	0.206	−2.48	0.029	2.29
B*C					
1 1	1.714	0.146	11.76	0.000	1.71
1 2	1.214	0.146	8.33	0.000	1.71
1 3	−0.452	0.146	−3.10	0.009	1.71
1 4	−0.286	0.146	−1.96	0.074	1.71
1 5	−0.536	0.146	−3.67	0.003	1.71
1 6	−0.702	0.146	−4.82	0.000	1.71

**Table S15.** Regression Equation for Punta Cana.

EUIPtCana	=	$ \begin{aligned} &131.286 + 7.3571 A_1 + 6.4286 A_2 - 13.7857 A_3 + 10.6190 B_1 - 10.6190 B_2 \\ &+ 37.714 C_1 + 30.548 C_2 - 7.452 C_3 - 7.619 C_4 - 13.369 C_5 - 20.202 C_6 \\ &- 19.619 C_7 + 1.0238 A*B_1 1 - 1.0238 A*B_1 2 + 0.9524 A*B_2 1 - 0.9524 A*B_2 2 \\ &- 1.9762 A*B_3 1 + 1.9762 A*B_3 2 + 1.143 A*C_1 1 + 0.810 A*C_1 2 - 0.190 A*C_1 \\ &3 - 0.524 A*C_1 4 - 0.274 A*C_1 5 - 0.440 A*C_1 6 - 0.524 A*C_1 7 + 1.071 A*C_2 \end{aligned} $
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$$\begin{aligned}
&1 + 0.738 A^*C_{\_2 \ 2} - 0.262 A^*C_{\_2 \ 3} - 0.095 A^*C_{\_2 \ 4} - 0.345 A^*C_{\_2 \ 5} - 0.512 A^*C_{\_2 \ 6} - 0.595 A^*C_{\_2 \ 7} - 2.214 A^*C_{\_3 \ 1} - 1.548 A^*C_{\_3 \ 2} + 0.452 A^*C_{\_3 \ 3} + 0.619 A^*C_{\_3 \ 4} \\
&+ 0.619 A^*C_{\_3 \ 5} + 0.952 A^*C_{\_3 \ 6} + 1.119 A^*C_{\_3 \ 7} + 1.714 B^*C_{\_1 \ 1} + 1.214 B^*C_{\_1 \ 2} - 0.452 B^*C_{\_1 \ 3} - 0.286 B^*C_{\_1 \ 4} - 0.536 B^*C_{\_1 \ 5} - 0.702 B^*C_{\_1 \ 6} - 0.952 B^*C_{\_1 \ 7} \\
&- 1.714 B^*C_{\_2 \ 1} - 1.214 B^*C_{\_2 \ 2} + 0.452 B^*C_{\_2 \ 3} + 0.286 B^*C_{\_2 \ 4} + 0.536 B^*C_{\_2 \ 5} + 0.702 B^*C_{\_2 \ 6} + 0.952 B^*C_{\_2 \ 7}
\end{aligned}$$



**Figure S3.** Graphics of Pareto Charts and Residual Plots for Punta Cana, Dominican Republic.

#### 4. Linear Regression and ANOVA Results via Minitab for Dubai, United Arab Emirates.

General Factorial Regression: EUIDubai versus A, B, C

**Table S16.** Factor Information for Dubai.

Factor	Levels	Values
A	3	1, 2, 3
B	2	1, 2
C	7	1, 2, 3, 4, 5, 6, 7

**Table S17.** Analysis of Variance for Dubai.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	29	43281.0	1492.45	31341.45	0.000
Linear	9	43156.3	4795.15	100698.11	0.000
A	2	5707.2	2853.60	59925.50	0.000
B	1	4651.5	4651.52	97682.00	0.000
C	6	32797.6	5466.27	114791.67	0.000
2-Way Interactions	20	124.7	6.24	130.95	0.000
A*B	2	67.8	33.88	711.50	0.000
A*C	12	29.8	2.48	52.17	0.000
B*C	6	27.1	4.52	95.00	0.000
Error	12	0.6	0.05		
Total	41	43281.6			

**Table S18.** Model Summary for Dubai.

S	R-sq	R-sq(adj)	R-sq(pred)
0.218218	100.00%	100.00%	99.98%

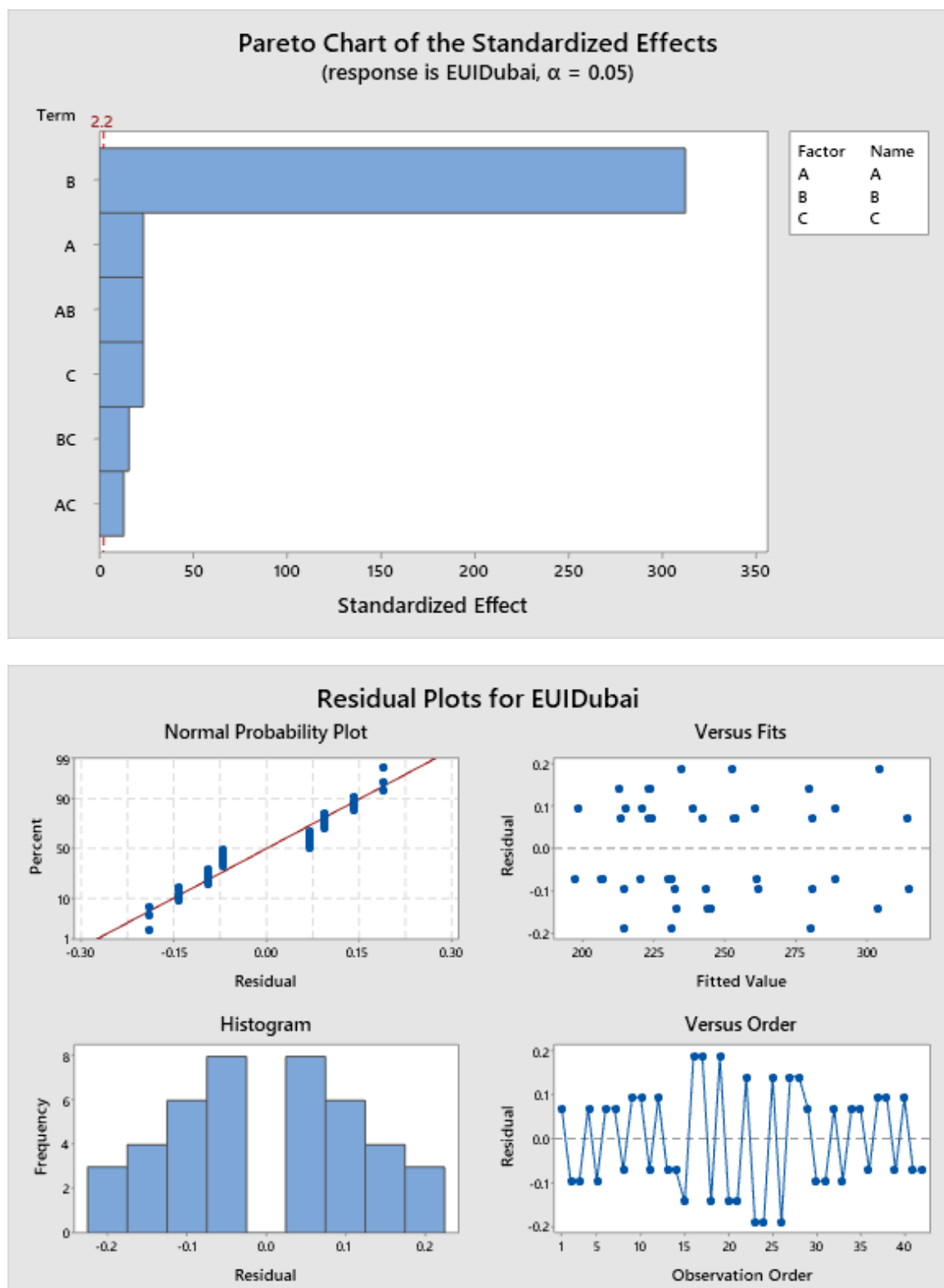
**Table S19.** Coefficients for Dubai.

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	245.238	0.034	7283.20	0.000	
A					
1	12.1190	0.0476	254.50	0.000	1.33
2	3.6190	0.0476	76.00	0.000	1.33
B					
1	10.5238	0.0337	312.54	0.000	1.00
C					
1	43.0952	0.0825	522.50	0.000	1.71
2	43.2619	0.0825	524.52	0.000	1.71
3	−24.4048	0.0825	−295.89	0.000	1.71
4	−15.4048	0.0825	−186.77	0.000	1.71
5	−6.5714	0.0825	−79.67	0.000	1.71
6	−14.4048	0.0825	−174.65	0.000	1.71
A*B					
1 1	1.2619	0.0476	26.50	0.000	1.33
2 1	0.4762	0.0476	10.00	0.000	1.33

A*C					
1 1	1.548	0.117	13.27	0.000	2.29
1 2	1.381	0.117	11.84	0.000	2.29
1 3	-0.952	0.117	-8.16	0.000	2.29
1 4	-0.452	0.117	-3.88	0.002	2.29
1 5	-0.286	0.117	-2.45	0.031	2.29
1 6	-0.452	0.117	-3.88	0.002	2.29
2 1	0.048	0.117	0.41	0.690	2.29
2 2	0.381	0.117	3.27	0.007	2.29
2 3	0.048	0.117	0.41	0.690	2.29
2 4	0.048	0.117	0.41	0.690	2.29
2 5	-0.286	0.117	-2.45	0.031	2.29
2 6	0.048	0.117	0.41	0.690	2.29
B*C					
1 1	1.1429	0.0825	13.86	0.000	1.71
1 2	1.3095	0.0825	15.88	0.000	1.71
1 3	-0.6905	0.0825	-8.37	0.000	1.71
1 4	-0.3571	0.0825	-4.33	0.001	1.71
1 5	-0.1905	0.0825	-2.31	0.040	1.71
1 6	-0.3571	0.0825	-4.33	0.001	1.71

Table S20. Regression Equation for Dubai.

$$\begin{aligned}
 \text{EUIDubai} = & 245.238 + 12.1190 A\_1 + 3.6190 A\_2 - 15.7381 A\_3 + 10.5238 B\_1 - 10.5238 B\_2 \\
 & + 43.0952 C\_1 + 43.2619 C\_2 - 24.4048 C\_3 - 15.4048 C\_4 - 6.5714 C\_5 - 14.4048 C\_6 \\
 & - 25.5714 C\_7 + 1.2619 A*B\_1\ 1 - 1.2619 A*B\_1\ 2 + 0.4762 A*B\_2\ 1 - 0.4762 A*B\_2\ 2 \\
 & - 1.7381 A*B\_3\ 1 + 1.7381 A*B\_3\ 2 + 1.548 A*C\_1\ 1 + 1.381 A*C\_1\ 2 - 0.952 A*C\_1\ 3 \\
 & - 0.452 A*C\_1\ 4 - 0.286 A*C\_1\ 5 - 0.452 A*C\_1\ 6 - 0.786 A*C\_1\ 7 + 0.048 A*C\_2\ 1 \\
 & + 0.381 A*C\_2\ 2 + 0.048 A*C\_2\ 3 + 0.048 A*C\_2\ 4 - 0.286 A*C\_2\ 5 + 0.048 A*C\_2\ 6 \\
 & - 0.286 A*C\_2\ 7 - 1.595 A*C\_3\ 1 - 1.762 A*C\_3\ 2 + 0.905 A*C\_3\ 3 + 0.405 A*C\_3\ 4 \\
 & + 0.571 A*C\_3\ 5 + 0.405 A*C\_3\ 6 + 1.071 A*C\_3\ 7 + 1.1429 B*C\_1\ 1 + 1.3095 B*C\_1\ 2 \\
 & - 0.6905 B*C\_1\ 3 - 0.3571 B*C\_1\ 4 - 0.1905 B*C\_1\ 5 - 0.3571 B*C\_1\ 6 - 0.8571 B*C\_1\ 7 \\
 & - 1.1429 B*C\_2\ 1 - 1.3095 B*C\_2\ 2 + 0.6905 B*C\_2\ 3 + 0.3571 B*C\_2\ 4 \\
 & + 0.1905 B*C\_2\ 5 + 0.3571 B*C\_2\ 6 + 0.8571 B*C\_2\ 7
 \end{aligned}$$



**Figure S4.** Graphics of Pareto Charts and Residual Plots for Dubai, United Arab Emirates.

## 5. Linear Regression and ANOVA Results via Minitab for Sydney, Australia.

*General Factorial Regression: EUISydney versus A, B, C*

**Table S21.** Factor Information for Sydney.

Factor	Levels	Values
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A	3	1, 2, 3
B	2	1, 2
C	7	1, 2, 3, 4, 5, 6, 7

**Table S22.** Analysis of Variance for Sydney.

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	29	60720.5	2093.81	6434.64	0.000
Linear	9	60579.1	6731.01	20685.55	0.000
A	2	5156.3	2578.17	7923.15	0.000
B	1	2640.2	2640.21	8113.83	0.000
C	6	52782.6	8797.10	27034.98	0.000
2-Way Interactions	20	141.4	7.07	21.72	0.000
A*B	2	72.4	36.21	111.29	0.000
A*C	12	44.0	3.67	11.27	0.000
B*C	6	25.0	4.16	12.78	0.000
Error	12	3.9	0.33		
Total	41	60724.4			

**Table S23.** Model Summary for Sydney.

S	R-sq	R-sq(adj)	R-sq(pred)
0.570436	99.99%	99.98%	99.92%

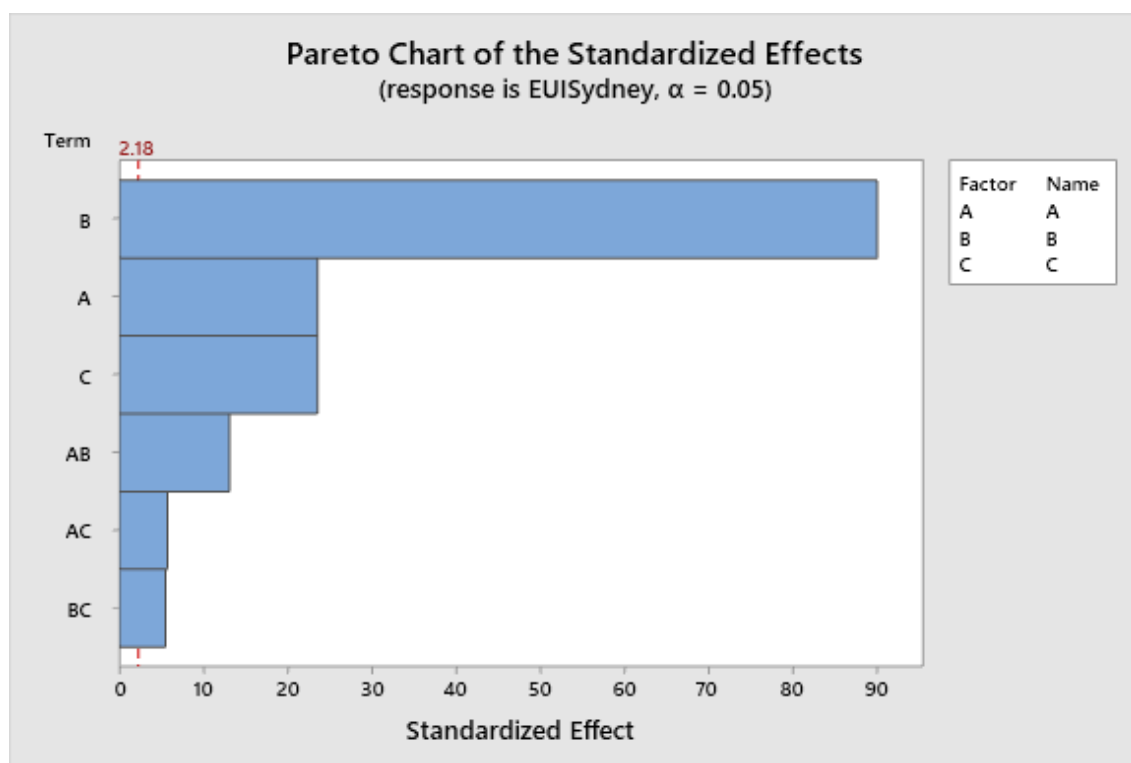
**Table S24.** Coefficients for Sydney.

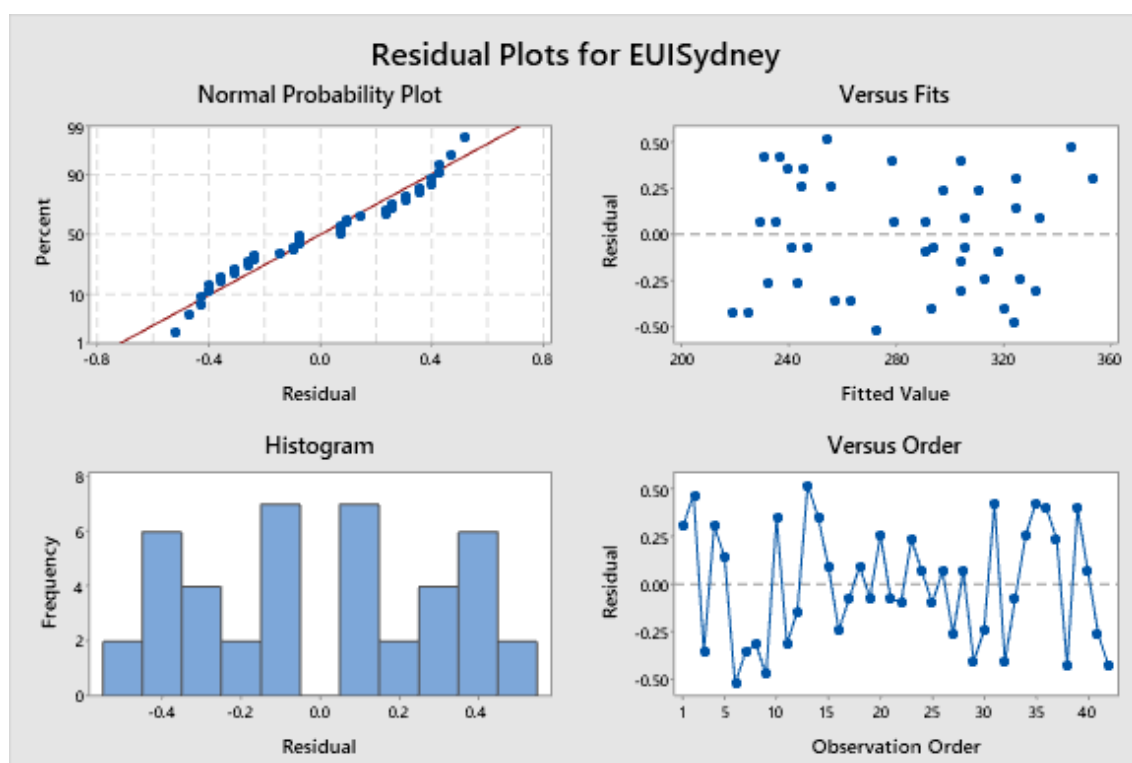
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	282.119	0.088	3205.17	0.000	
A					
1	14.095	0.124	113.23	0.000	1.33
2	−1.119	0.124	−8.99	0.000	1.33
B					
1	7.9286	0.0880	90.08	0.000	1.00
C					
1	45.048	0.216	208.94	0.000	1.71
2	37.548	0.216	174.15	0.000	1.71
3	−40.119	0.216	−186.08	0.000	1.71
4	17.548	0.216	81.39	0.000	1.71
5	17.714	0.216	82.16	0.000	1.71
6	−31.619	0.216	−146.65	0.000	1.71
A*B					
1 1	1.857	0.124	14.92	0.000	1.33
2 1	−0.929	0.124	−7.46	0.000	1.33
A*C					
1 1	1.738	0.305	5.70	0.000	2.29
1 2	1.238	0.305	4.06	0.002	2.29
1 3	−1.595	0.305	−5.23	0.000	2.29
1 4	0.738	0.305	2.42	0.032	2.29
1 5	0.571	0.305	1.87	0.085	2.29
1 6	−1.095	0.305	−3.59	0.004	2.29
2 1	−0.048	0.305	−0.16	0.878	2.29

2 2	−0.048	0.305	−0.16	0.878	2.29
2 3	0.119	0.305	0.39	0.703	2.29
2 4	−0.048	0.305	−0.16	0.878	2.29
2 5	−0.214	0.305	−0.70	0.496	2.29
2 6	0.119	0.305	0.39	0.703	2.29
B*C					
1 1	0.905	0.216	4.20	0.001	1.71
1 2	0.738	0.216	3.42	0.005	1.71
1 3	−0.929	0.216	−4.31	0.001	1.71
1 4	0.405	0.216	1.88	0.085	1.71
1 5	0.571	0.216	2.65	0.021	1.71
1 6	−0.762	0.216	−3.53	0.004	1.71

Table S25. Regression Equation for Sydney.

$$\begin{aligned}
 \text{EUISydney} = & 282.119 + 14.095 A_1 - 1.119 A_2 - 12.976 A_3 + 7.9286 B_1 - 7.9286 B_2 \\
 & + 45.048 C_1 + 37.548 C_2 - 40.119 C_3 + 17.548 C_4 + 17.714 C_5 - 31.619 C_6 \\
 & - 46.119 C_7 + 1.857 A*B_1 - 1.857 A*B_2 - 0.929 A*B_3 + 0.929 A*B_4 \\
 & - 0.929 A*B_5 + 0.929 A*B_6 + 1.738 A*C_1 + 1.238 A*C_2 - 1.595 A*C_3 \\
 & + 0.738 A*C_4 + 0.571 A*C_5 - 1.095 A*C_6 - 1.595 A*C_7 - 0.048 A*C_8 \\
 & - 0.048 A*C_9 + 0.119 A*C_{10} - 0.048 A*C_{11} - 0.214 A*C_{12} + 0.119 A*C_{13} \\
 & + 0.119 A*C_{14} - 1.690 A*C_{15} - 1.190 A*C_{16} + 1.476 A*C_{17} - 0.690 A*C_{18} \\
 & - 0.357 A*C_{19} + 0.976 A*C_{20} + 1.476 A*C_{21} + 0.905 B*C_1 + 0.738 B*C_2 \\
 & - 0.929 B*C_3 + 0.405 B*C_4 + 0.571 B*C_5 - 0.762 B*C_6 - 0.929 B*C_7 \\
 & - 0.905 B*C_8 - 0.738 B*C_9 + 0.929 B*C_{10} - 0.405 B*C_{11} - 0.571 B*C_{12} \\
 & + 0.762 B*C_{13} + 0.929 B*C_{14}
 \end{aligned}$$





**Figure S5.** Graphics of Pareto Charts and Residual Plots for Sydney, Australia.