

TOPIC: STAGE 3: DESIGNING A FACTOR ANALYSIS

TABLE 3.4 provides a correlation matrix among the 13 variables under investigation. The goal is to identify variables that are statistically significant through a matrix so that all combinations can be analyzed on a single table. For example, x15 (New Products) clearly shows a low level of correlation among the 13 variables. The interpretation is that New Products have little influence over the other metric variables.

TABLE 3.4[illegible]

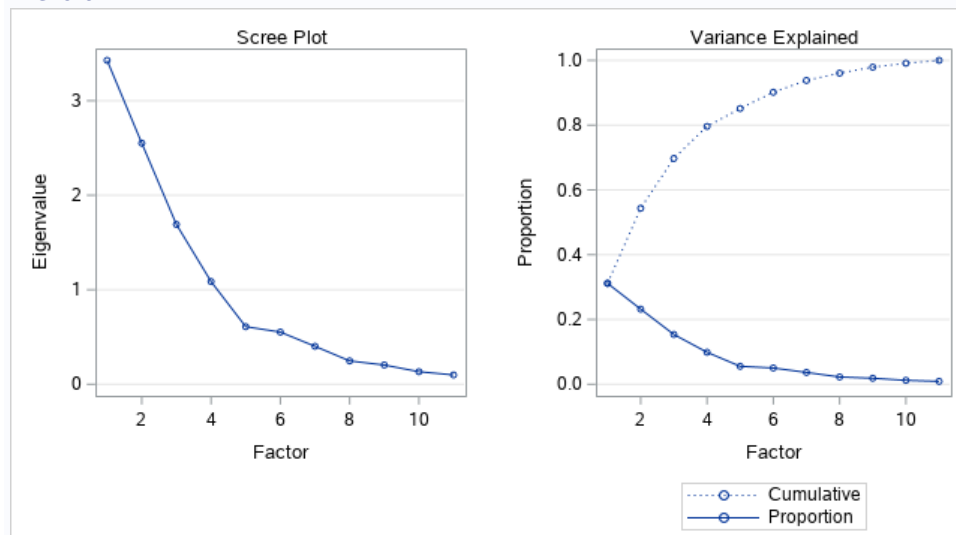
TOPIC: STAGE 4: DERIVING FACTORS AND ASSESSING OVERALL FIT

Table 3.6 and FIG 3.9 examine the relationship between eigenvalues and component factors. FIG 3.9 suggests that the researcher should use between three to five factors of the eleven under investigation. This is determined by the eigenvalue y-axis being equal to 1.0. The table shows the 1.0 y-axis threshold appearing between eigenvalue four and five.

TABLE 3.6

Eigenvalues of the Correlation Matrix: Total = 11 Average = 1				
	Eigenvalue	Difference	Proportion	Cumulative
1	3.42697133	0.87607462	0.3115	0.3115
2	2.55089671	0.85992024	0.2319	0.5434
3	1.69097648	0.60442042	0.1537	0.6972
4	1.08655606	0.47713196	0.0988	0.7959
5	0.60942409	0.05754032	0.0554	0.8513
6	0.55188378	0.15036563	0.0502	0.9015
7	0.40151815	0.15456660	0.0365	0.9380
8	0.24695154	0.04339828	0.0225	0.9605
9	0.20355327	0.07071169	0.0185	0.9790
10	0.13284158	0.03441456	0.0121	0.9911
11	0.09842702		0.0089	1.0000

FIG 3.9



TOPIC: STAGE 5: INTERPRETING THE FACTORS

Factor loadings represent the degree of correlation of each variable with each factor, which creates a matrix. Both tables displayed are unrotated factor analysis for the variables under investigation. The communality displayed in both variables is significant in the sense that it represents how well each variable is explained by the four factor components. As noted previously, eigenvalue at x equal one is the closest to four factor components, which is why only four factor are being represented in the matrices.

TABLE 3.7

TABLE 3A

Factor Pattern										
		Factor1	Factor2	Factor3	Factor4					
x6	x6	0.24767	-0.50070	-0.08098	0.67039					
x7	x7	0.30721	0.71314	0.30591	0.28392					
x8	x8	0.29192	-0.36889	0.79447	-0.20159					
x9	x9	0.87133	0.03105	-0.27354	-0.21506					
x10	x10	0.34013	0.58083	0.11456	0.33137					
x11	x11	0.71598	-0.45484	-0.15121	0.21150					
x12	x12	0.37703	0.75177	0.31384	0.23159					
x13	x13	-0.28081	0.66035	-0.06898	-0.34768					
x14	x14	0.39418	-0.30613	0.77836	-0.19316					
x16	x16	0.80938	0.04216	-0.21967	-0.24689					
x18	x18	0.87579	0.11667	-0.30250	-0.20569					
Variance Explained by Each Factor										
Factor1		Factor2		Factor3		Factor4				
3.4269713		2.5508967		1.6909765		1.0865561				
Final Communality Estimates: Total = 8.755401										
x6	x7	x8	x9	x10	x11	x12	x13	x14	x16	x18
0.7680 2937	0.7771 4736	0.8931 1235	0.8812 6008	0.5759 7858	0.7871 0502	0.8594 4643	0.6405 5781	0.8922 4653	0.7660 8666	0.9144 3037

TABLE 3.8

Rotated Factor Pattern					
		Factor1	Factor2	Factor3	Factor4
Values less than 0.5 are not printed.					
x18	x18	0.93821	.	.	.
x9	x9	0.92583	.	.	.
x16	x16	0.86378	.	.	.
x12	x12	.	0.90045	.	.
x7	x7	.	0.87056	.	.

Rotated Factor Pattern					
		Factor1	Factor2	Factor3	Factor4
x10	x10	.	0.74151	.	.
x8	x8	.	.	0.93919	.
x14	x14	.	.	0.93097	.
x6	x6	.	.	.	0.87566
x11	x11	0.59124	.	.	0.64200
x13	x13	.	.	.	-0.72259

Variance Explained by Each Factor			
Factor1	Factor2	Factor3	Factor4
2.8928210	2.2335531	1.8554249	1.7736015

Final Community Estimates: Total = 8.755401										
x6	x7	x8	x9	x10	x11	x12	x13	x14	x16	x18
0.7680 2937	0.7771 4736	0.8931 1235	0.8812 6008	0.5759 7858	0.7871 0502	0.8594 4643	0.6405 5781	0.8922 4653	0.7660 8666	0.9144 3037

Rotated Factor Pattern					
		Factor1	Factor2	Factor3	Factor4
Values less than 0.5 are not printed.					
x9	x9	0.93253	.	.	.
x18	x18	0.93075	.	.	.
x16	x16	0.88561	.	.	.
x12	x12	.	0.89815	.	.
x7	x7	.	0.86848	.	.
x10	x10	.	0.74258	.	.
x8	x8	.	.	0.93988	.
x14	x14	.	.	0.93305	.
x6	x6	.	.	.	0.89244
x13	x13	.	.	.	-0.73016

Variance Explained by Each Factor			
Factor1	Factor2	Factor3	Factor4
2.5893189	2.2160590	1.8456968	1.4060836

Final Community Estimates: Total = 8.057158									
x6	x7	x8	x9	x10	x12	x13	x14	x16	x18
0.79798 110	0.77967 853	0.89373 001	0.88955 210	0.58483 848	0.85956 702	0.66091 567	0.89078 408	0.80604 375	0.89406 760

TOPIC: STAGE 6: VALIDATION OF FACTOR ANALYSIS

In efforts to validate, or assess, the factor analysis, two samples of 50 cases were split into two separate variables. VARIMAX, a factor rotation used to simplify rows, was performed for the two-factor models. The notable difference between the two tables occurs in x13 where it is placed in both Factor2 and Factor4. The interpretation of TABLE 3.10 is that the results are stable within the sample.

TABLE 3.10

		Factor1	Factor2	Factor3	Factor4
Values less than 0.5 are not printed.					
x9	x9	0.924	.	.	.
x18	x18	0.907	.	.	.
x16	x16	0.901	.	.	.
x12	x12	.	0.885	.	.
x7	x7	.	0.834	.	.
x10	x10	.	0.812	.	.
x8	x8	.	.	0.927	.
x14	x14	.	.	0.876	.
x6	x6	.	.	.	0.884
x13	x13	.	0.445	.	-0.709

		Factor1	Factor2	Factor3	Factor4
Values less than 0.5 are not printed.					
x9	x9	0.943	.	.	.
x18	x18	0.935	.	.	.
x16	x16	0.876	.	.	.
x12	x12	.	0.902	.	.
x7	x7	.	0.890	.	.
x10	x10	.	0.711	.	.
x8	x8	.	.	0.958	.
x14	x14	.	.	0.951	.
x6	x6	.	.	.	0.888
x13	x13	.	.	.	-0.720

Final Communality Estimates: Total = 8.057158									
x6	x7	x8	x9	x10	x12	x13	x14	x16	x18
0.79798 110	0.77967 853	0.89373 001	0.88955 210	0.58483 848	0.85956 702	0.66091 567	0.89078 408	0.80604 375	0.89406 760