CAS Problem-12 24-04-2024

The owner of Pizza Corner, Varanasi collected data on six variables such as no. of delivery boys (X_1), cost of advertisements in rupees (X_2), number of outlets (X_3), varieties of pizzas (X_4), competitor's activities index (X_5) from past 15 months.

X1	X2	X3	X4	X5	X6
15	20	35	17	4	70
10	12	10	13	4	43
7	11	14	14	3	31
2	6	9	13	3	10
4	10	11	12	4	17
1	5	6	12	5	8
4	14	15	15	2	39
7	12	16	16	3	40
5	10	18	15	4	30
3	5	8	13	2	16
13	17	20	14	2	30
2	9	10	12	3	20
5	12	15	12	3	25
12	18	30	15	4	50
1	5	6	12	5	20

By using factor analysis to reduce these six variables into factors.

Solution:

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.707
Bartlett's Test of Sphericity	Approx. Chi-Square	76.451
	df	15
	Sig.	.000

Communalities

	Initial	Extraction
X1	1.000	.852
X2	1.000	.907
X3	1.000	.910
X4	1.000	.744
X5	1.000	.998
X6	1.000	.911

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.302	71.708	71.708	4.302	71.708	71.708	4.278	71.300	71.300
2	1.018	16.974	88.682	1.018	16.974	88.682	1.043	17.382	88.682
3	.386	6.434	95.116						
4	.147	2.453	97.569						
5	.105	1.755	99.324						
6	.041	.676	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component	
	1	2
X1	.923	.028
X2	.951	-.056
X3	.949	.096
X4	.859	-.074
X5	-.138	.989
X6	.943	.145

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
X1	.922	-.052
X2	.942	-.138
X3	.954	.014
X4	.850	-.148
X5	-.052	.998
X6	.952	.063

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Component Transformation Matrix

Component	1	2
1	.996	-.086
2	.086	.996

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Conclusion: - KMO and Bartletts test .707>0.05 so it is good for factor analysis there are two factor percentage of variance exist.