

Singular-value Decomposition

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The analysis is very simple. The Colombo-Morrison estimates of the loyals are used to reduce the diagonals of the trade-in frequencies to just those who are potential switchers and then the switching probabilities p_{ij} are formed. I let distance d_{ij} be $(1-p_{ij})$. I translate distances to scalar products using Torgerson's formula and use singular value decomposition to get scale values for the columns (switch-to probabilities) and the rows (switch-from probabilities). A three-dimensional system (representing 39% of the variance) results.

Looking at the switch-to probabilities we see high pairwise switching represented by the tight clusters of Peugeot and Renault; Ford and GM; Lada, Seat, Fiat, and Rover; and BMW and Mercedes. We also see the draw patterns such as Saab drawing from BMW and Mercedes on one hand, and from Alfa Romeo and Volvo on the other. We see Citroen drawing from Peugeot and Renault on one side and the Lada-Seat-Fiat-Rover cluster on the other side. In the map displaying switch-from probabilities only minor asymmetries are revealed. Citroen is less differentiated from the Peugeot-Renault cluster and BMW is clearly more vulnerable to the lower-priced models than are Mercedes or Saab.

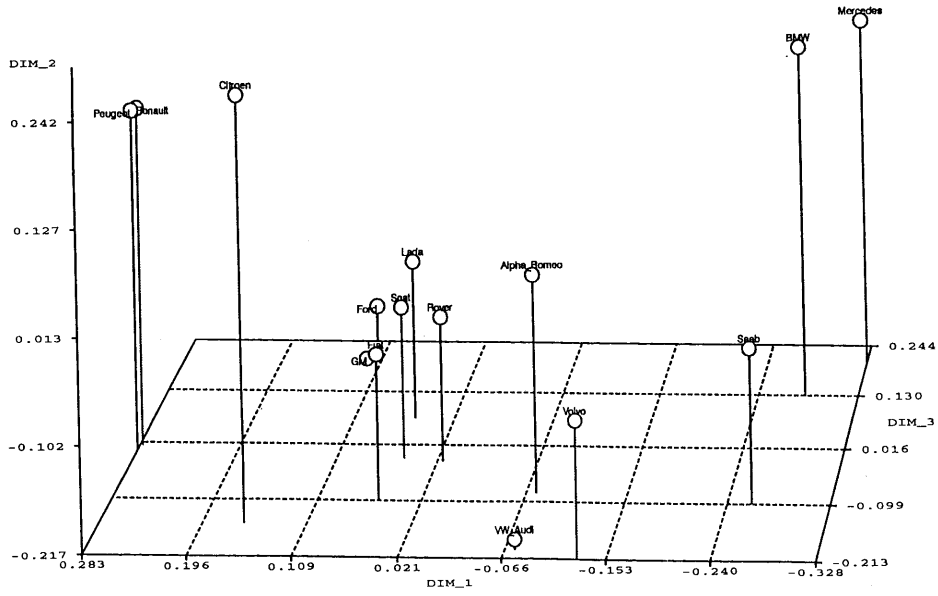
This preliminary interpretation is just to start the process - I think it would be interesting to compare this map to those resulting from other analyses.

Analysis of 1989 French Car Trade-In Data

Variance Explained by Each Dimension

Dimension	Singular Value	First Variance	Percent of Variance	Cumulative Percent
1	0.56	0.15	19.14	19.14
2	0.41	0.01	10.33	29.47
3	0.39	0.04	9.66	39.12
4	0.35	0.00	7.66	46.79
5	0.35	0.01	7.56	54.35
6	0.34	0.01	7.07	61.41
7	0.33	0.01	6.85	68.26
8	0.32	0.01	6.35	74.61
9	0.31	0.02	5.81	80.42
10	0.29	0.01	5.08	85.51
11	0.28	0.02	4.72	90.23
12	0.25	0.01	3.97	94.20
13	0.24	0.05	3.59	97.79
14	0.19	0.19	2.21	100.00
15	0.00		0.00	100.00

Trade-In Data for 15 Cars -- France 1989
 Switch-To Probabilities -- Excluding Loyals



Switch-From Probabilities -- Excluding Loyals

