

Homework 3

BAX 442: Advanced Statistics for Business Analytics

Team C

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1 Principal Components

We retain 4 principal components out of the 17. The number of principal components to retain is obtained using the EGO rule. We further remove the effect of any attribute from the retained principal components whose absolute value is less than 0.3

<i>Product Attribute</i>	<i>Z1</i>	<i>Z2</i>	<i>Z3</i>	<i>Z4</i>
Attractive	0.3263	0.0000	0.0000	0.0000
Quiet	0.3174	0.0000	0.0000	0.0000
Unreliable	0.0000	0.4011	0.0000	0.0000
Poorly Built	-0.3319	0.0000	0.0000	0.0000
Interesting	0.0000	0.0000	-0.4291	0.0000
Sporty	0.0000	-0.4288	0.0000	0.0000
Uncomfortable	0.0000	0.0000	0.0000	0.0000
Roomy	0.0000	0.3789	0.0000	0.0000
Easy Service	0.0000	-0.4280	0.0000	0.0000
Prestige	0.3323	0.0000	0.0000	0.0000
Common	0.0000	0.0000	0.0000	-0.4663
Economical	0.0000	0.0000	0.6642	0.0000
Successful	0.3155	0.0000	0.0000	0.0000
AvantGarde	0.0000	0.0000	0.0000	0.6686
Poor Value	0.0000	0.0000	-0.4711	0.0000

Table 1: Principle Components as per the EGO Rule

1.1 Names of the Benefit Space

<i>Benefit Space</i>	<i>Product Attribute</i>	<i>Name</i>
Z1	Attractive, Quiet, Not Poorly Built, Prestigious, Successful	Sleek Design
Z2	Unreliable, Roomy, Not Easy Service	Not user friendly
Z3	Not interesting, Economical, Not Poor value	Everyday Usage
Z4	Not Common, Avant Garde	Uniqueness

2 Brand Map

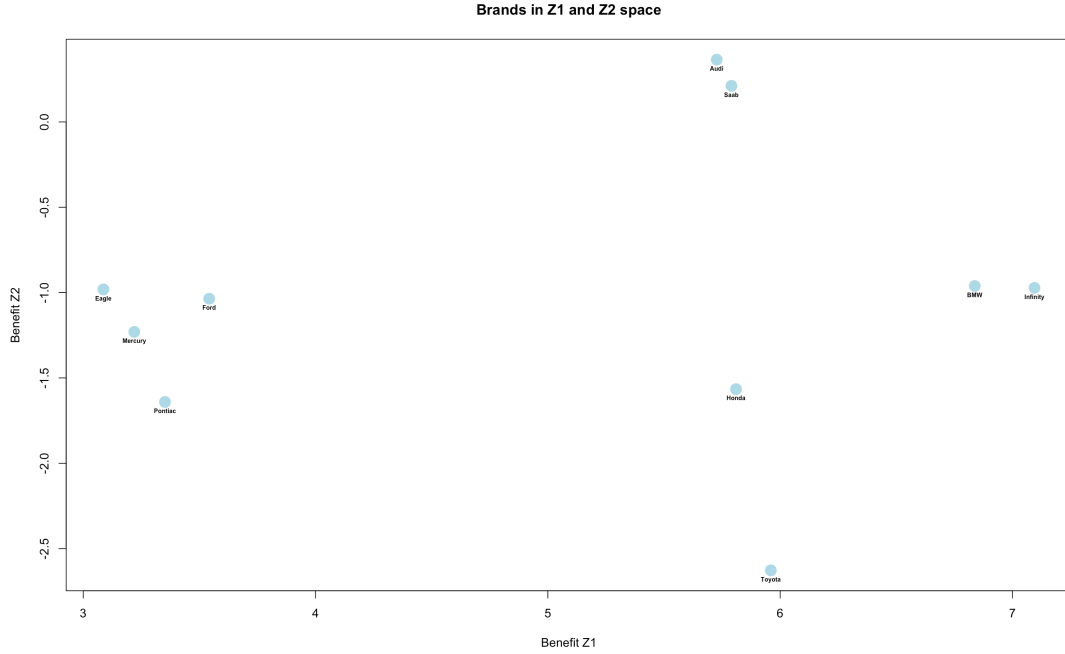


Figure 1: Perceptual Map of Brands in Z1 and Z2 space

3 Iso Preference Line & Ideal Vectors

3.1 Iso Preference Line

Iso-preference line is the line on the perceptual map where all the brands falling on it are perceived equally preferential along the line. It is a downward sloping line where brands to the left of the iso-preference line are less preferred to the brands on the right. The slope of the iso-preference line is $-b_1/b_2$ where b_1 corresponds to the β estimate of the benefit on the X-axis and b_2 corresponds to the β estimate of the benefit on the Y-axis.

The iso-preference lines differs from the regression line in the sense that it represents where all brands are equally preferential across a set of two benefit space where as the regression line is a fit of the overall preferences across all benefit factors.

3.2 Ideal Vectors

Ideal vector is a line defined on the perceptual map that denotes the direction of which benefit space would be most appealing to work on for a particular brand to distinguish itself from its competitors. The range of angle of interest is 90° . If the angle of the ideal vector is less than

45°, then we infer that increasing the benefit factor on the X-axis will be more beneficial in increasing the brand preference where as if the angle is more than 45°, then increasing the benefit factor along the Y-axis will be more beneficial. Thus giving an implication on which attributes hold more preference over the other, leading to a better product design.

The slope of ideal vector is given by b_2/b_1 where b_2 corresponds to the β estimate of the benefit on the Y-axis and b_1 corresponds to the β estimate of the benefit on the X-axis.

3.3 Confidence Interval

The iso-preference line has the angle -56.21° where as the ideal vector has angle 33.79°

	Estimate	Lower Bound	Upper Bound
Iso Preference Line	-56.21°	-76.18°	22.41°
Ideal Vector	33.79°	-4.36°	66.92°

Table 2: 95% Confidence Intervals for Iso Preference Line and Ideal Vector

4 Recommendations

Based on the perceptual map in the Z1 and Z2 space, we can observe that the brand Infinity lies on the extreme right of all brands. This is a good indication in a sense that along the iso-preference line passing through Infinity, all the brands lie on the left which means that Infinity has established itself well in this space. The closest competitor to Infinity would be BMW. If at all the brand needs to do an intervention to improve its overall preference, then Inifinity should go along the benefit space Z1 i.e. it should focus on creating more attractive well built products, as indicated by the direction of the ideal vector.