UNIVERSITY OF ZAGREB

FACULTY OF ECONOMICS AND BUSINESS

MULTIPLE RETAILERS' POSITIONING

Multivariate Statistical Analysis, PhD

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1. INTRODUCTION

Multiple retailers operate in saturated markets characterized by continuous struggle over market share and increasing expectations of modern consumers. In order to retain and attract potential consumers, retail companies need to understand their motives and the decisionmaking process better than the competition and create a differential value proposition. The above is achieved by effective brand positioning. Effective positioning is expected to shape preferences and lead to higher loyalty and customer-driven brand equity, reduce competitive rivalry and increase profitability. To successfully position a brand, companies need to identify the attributes that influence consumer's choiceand determine how they are perceived in relation to the most relevant positioning dimensions.

1.1. RESEARCH CONTEXT

In their research of image attribute measurement, Urbanavičius and Ivanauskas (2005) presented a methodology for establishing multiple retailers positions. The methodology is based on the evaluation of image attributes importance for consumers. Additionally, they propose factor analysis as a method to identify general latent factors that can be used to evaluate retailers positions in a perceptual space. This approach isapplied in the paper.

1.2. REASEARCH GOALS

The goal of the research was to identify the key attributes that determine customers` choice of a particular multiple retailer in Croatia and detect the underlying factors on the basis of which a comprehensive evaluation of multiple retailers' positioningcould be possible. For this, we first evaluated image attributes and their

importance for consumers of multiple retailers. Secondly, factor analysis was conducted in order to reduce the number of attributes into few key dimensions.

1.3. RESEARCH METHODOLOGY

The empirical research consisted of two phases. In the first phase, a series of 20 in – depth interviews were performed in order to identify attributes that determine the choice of a particular multiple retailer in Croatia and that will later be evaluated in the quantitative part of the research. The qualitative analysis revealed the following attributes as the most influential: (1) product quality, (2) quality of services, (3) all in one place, (4) fast checkout, (5) private labels, (6) frequent shoppers programs, (7) product prices, (8) price discounts and special offers, (9) store layout and atmosphere, (10) local products, (11) location of the store, (12) assortment, (13) good value for money, (14) working hours, (15) parking facilities and (16) products of famous manufacturers. Quantitative survey was then performed on a sample of 220 respondents. The questionnaire was distributed and collected via e-mail.

Figure 1. Sample characteristics
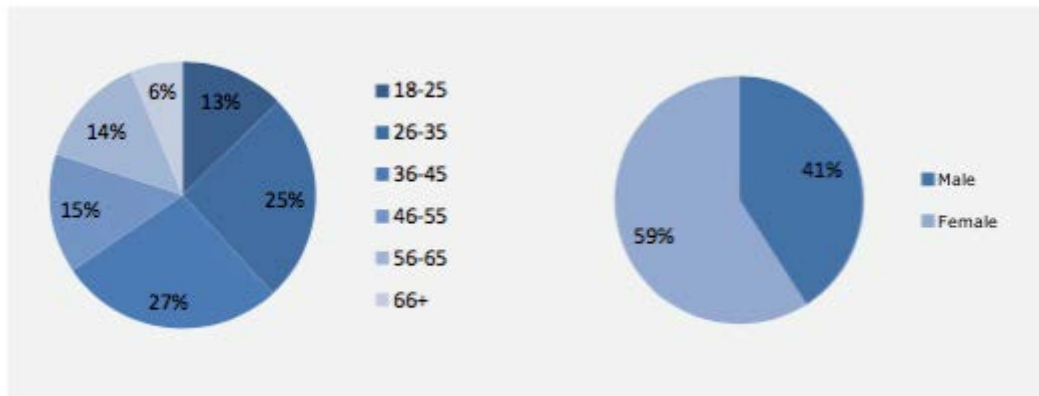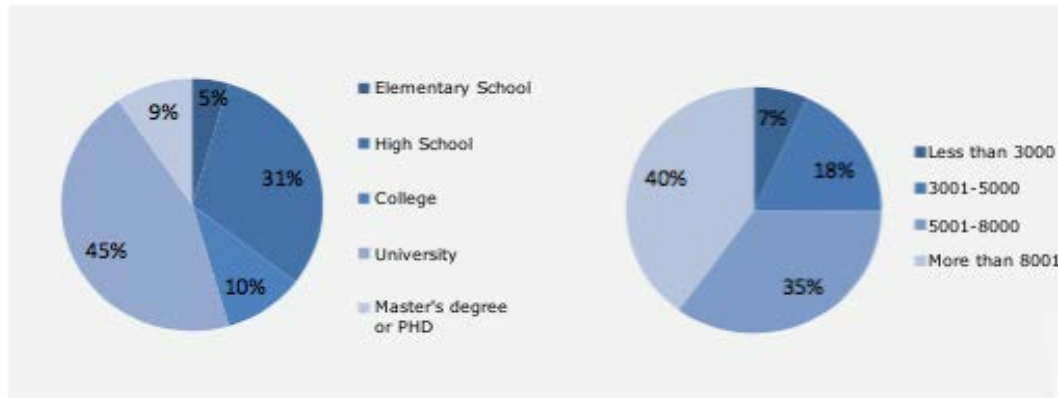
Sources: Author's calculations, an extract from software package Excel

The respondents were asked to asses the importance of the 16 image attributes on a Likert scale from 1 – 5.

The data was analysed using:

1.3.1. R for Windows,

1.3.2. SPSS for Windows statistical data analysis program and

1.3.3. Microsoft Excel data analysis tool.

Procedures included calculation of descriptive statistics and factor analysis.Initial step in analysis was importingthe date in R program.

Figure 2. Input dana

```
library(corrgram)
## Warning: package 'corrgram' was built under R version 3.2.5
library(psych)
## Warning: package 'psych' was built under R version 3.2.5
library(blockmodeling)
## Warning: package 'blockmodeling' was built under R version 3.2.5
library(GPArotation)
## Warning: package 'GPArotation' was built under R version 3.2.3
    poodaci <-read.csv("D:/IvanaDK/IvanaFA/poodaci.csv", sep=";",
                           dec=",")
```
Sources: Author's calculations, an extract from software package R

2. MAIN FINDINGS

Figure 3. Eveluation of image attributes importance for consumers

Attribute	Average
Product quality	4,71
Good value for money	4,64
Assortment	4,46
Fast checkout	4,44
All in one place	4,42
Location of store	4,39
Working hours	4,33
Quality of services	4,29
Local products	4,18
Parking facilities	4,04
Products of famousmanufacturers	3,91
Store layout and atmosphere	3,82
Product prices	3,81
Price discounts and specialoffers	3,64
Frequent shoppers programs	2,98
Private labels	2,89

Sources: Author's calculations, an extract from software package

3. FACTOR ANALYSIS

Explorative factor analysis was performed in order to discover latent factors related to specific image attributes. Factor analysis of attributes of multiple retailers included:

1. Evaluation of internal correlation and data fit for factor analysis.
2. Evaluation of minimal number of factors that will explain the internal correlation of variables.
3. Factor rotation and interpretation.

3.1.1. *Evaluation of internal correlation and data fit for factor analysis*

Evaluation of correlations among image attributes revealed that all variables have at least one coefficient of correlation above 0,3. Keiser – Mayer – Olkin (KMO) coefficient equaled 0,754 which surpassed the suggested minimum of 0,6 (Keiser, 1970, according to Pallant, 2011). Bartlet Test of Sphericitycriteria was lower than significance level,meaning that image attributes are not independent (Bartlett, 1954, according to Pallant, 2011).

Internal correlation of variables was further tested through Cronbach Alpha (0,771) and passed the minimal suggested value of 0,7 (Nunally, 1974.) demonstrating the fit of correlation matrix for factor analysis.

Figure 4. KMO and Bartlett's Test and extraction factors according attributes

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,754
Bartlett's Test of Sphericity	Approx. Chi-Square	839,614
	df	120
	Sig.	,000

Sources: Author's calculations, an extract from software package SPSS

Figure 5. KMO and Bartlett's Test

```
cortest.bartlett(C)

## Warning in cortest.bartlett(C): n not specified, 100 used

## $chisq
## [1] 520.4755
##
## $p.value
## [1] 2.260886e-24
##
## $df
## [1] 231

KMO(r=C)

## Kaiser-Meyer-Olkin factor adequacy
## Call: KMO(r = C)
## Overall MSA =  0.7
## MSA for each item =
##                                Age                         Gender
##                               0.62                           0.51
##                          Education                         Income
##                               0.71                           0.62
##                    Buying.decision                         Kupnja
##                               0.64                           0.50
##        Store.layout.and.atmosphere                       Location
##                               0.76                           0.41
##                     Fast.checkout             Product.assortment
##                               0.69                           0.80
##                Long.working.hours            Parking.facilities
##                               0.64                           0.64
##               Quality.of.services   Frequent.shopper.programs
##                               0.70                           0.72
## Price.discounts.and.special.offers            Product.prices
##                               0.71                           0.73
##    Products.of.famous.manufacturers            Product.quality
##                               0.76                           0.75
##               Private.label.products         Assortment.variety
##                               0.79                           0.69
##                Good.value.for.money            Local.products
##                               0.72                           0.77
```

Sources: Author's calculations, an extract from software package R

Figure 6. KMO and Bartlett's Test with special funcion

```
par(xpd=FALSE)
scree(C,factors =FALSE)
```

Sources: Author's calculations, an extract from software package R

Figure7. Communalities

	Initial	Extraction
Location	1,000	,746
Fast checkout	1,000	,618
Assortment	1,000	,453
Work time	1,000	,540
Availability and the possibility of parking	1,000	,602
Friendly and attentive staff	1,000	,622
Product quality	1,000	,663
Possibility to buy everything on one spot	1,000	,533
Good price-quality ratio	1,000	,671
Products of domestic manufactors	1,000	,356
Promotions and discounts	1,000	,815
Loyalty programs	1,000	,643
Generally low level of price	1,000	,635
Known or famous brands	1,000	,533
Ambience and appearance	1,000	,512
Private brands	1,000	,566

Sources: Author's calculations, an extract from software package SPSS

Figure 8. Evaluation of correlations

```
C<-cor(poodaci)

alpha(C,keys=NULL,cumulative=FALSE, title=NULL, max=10,na.rm =TRUE,
check.keys=TRUE,n.iter=1,delete=TRUE)

## Warning in alpha(C, keys = NULL, cumulative = FALSE, title = NULL, max =
 10, : Some items were negatively correlated with total scale and were auto
matically reversed.
##  This is indicated by a negative sign for the variable name.

##
## Reliability analysis
## Call: alpha(x = C, keys = NULL, cumulative = FALSE, title = NULL, max =
10,
##    na.rm = TRUE, check.keys = TRUE, n.iter = 1, delete = TRUE)
```

```
##
##    raw_alpha std.alpha G6(smc) average_r S/N
##       0.75      0.75     0.82        0.12 3.1
##
##   Reliability if an item is dropped:
##                                    raw_alpha std.alpha G6(smc) average_r
## Age                                     0.75      0.75    0.82      0.13
## Gender                                  0.76      0.76    0.82      0.13
## Education-                              0.74      0.74    0.81      0.12
## Income-                                 0.75      0.75    0.81      0.12
## Buying.decision-                        0.76      0.76    0.82      0.13
## Kupnja-                                 0.76      0.76    0.82      0.13
## Store.layout.and.atmosphere             0.74      0.74    0.81      0.12
## Location                                0.76      0.76    0.82      0.13
## Fast.checkout                           0.74      0.74    0.80      0.12
## Product.assortment                      0.74      0.74    0.81      0.12
## Long.working.hours                      0.75      0.75    0.81      0.12
## Parking.facilities                      0.74      0.74    0.81      0.12
## Quality.of.services                     0.73      0.73    0.80      0.12
## Frequent.shopper.programs               0.74      0.74    0.80      0.12
## Price.discounts.and.special.offers      0.73      0.73    0.80      0.12
## Product.prices                          0.74      0.74    0.81      0.12
## Products.of.famous.manufacturers        0.75      0.75    0.81      0.12
## Product.quality                         0.74      0.74    0.80      0.12
## Private.label.products                  0.74      0.74    0.81      0.12
## Assortment.variety                      0.75      0.75    0.81      0.12
## Good.value.for.money                    0.74      0.74    0.81      0.12
## Local.products                          0.74      0.74    0.80      0.12
##                                    S/N
## Age                                3.1
## Gender                             3.1
## Education-                         2.9
## Income-                            3.0
## Buying.decision-                   3.1
## Kupnja-                            3.2
## Store.layout.and.atmosphere        2.8
## Location                           3.1
## Fast.checkout                      2.8
## Product.assortment                 2.9
## Long.working.hours                 3.0
## Parking.facilities                 2.9
## Quality.of.services                2.8
## Frequent.shopper.programs          2.8
## Price.discounts.and.special.offers 2.8
## Product.prices                     2.9
## Products.of.famous.manufacturers   3.0
## Product.quality                    2.8
## Private.label.products             2.9
## Assortment.variety                 3.0
## Good.value.for.money               2.9
## Local.products                     2.8
##
##   Item statistics
##                                       r r.cor r.drop
## Age                                0.27  0.22  0.159
## Gender                             0.26  0.19  0.155
## Education-                         0.41  0.39  0.307
## Income-                            0.34  0.30  0.233
## Buying.decision-                   0.26  0.18  0.154
```

```
## Kupnja-                               0.20  0.12  0.088
## Store.layout.and.atmosphere          0.51  0.49  0.424
## Location                             0.22  0.16  0.114
## Fast.checkout                        0.49  0.46  0.393
## Product.assortment                   0.45  0.41  0.352
## Long.working.hours                   0.36  0.30  0.258
## Parking.facilities                   0.43  0.40  0.337
## Quality.of.services                  0.55  0.54  0.465
## Frequent.shopper.programs            0.53  0.52  0.438
## Price.discounts.and.special.offers 0.54  0.55  0.455
## Product.prices                       0.42  0.40  0.325
## Products.of.famous.manufacturers   0.38  0.32  0.272
## Product.quality                      0.49  0.47  0.396
## Private.label.products               0.42  0.38  0.324
## Assortment.variety                   0.36  0.31  0.251
## Good.value.for.money                 0.43  0.40  0.336
## Local.products                       0.52  0.50  0.434
```

Sources: Author's calculations, an extract from software package R

Figure 9. Correlogram
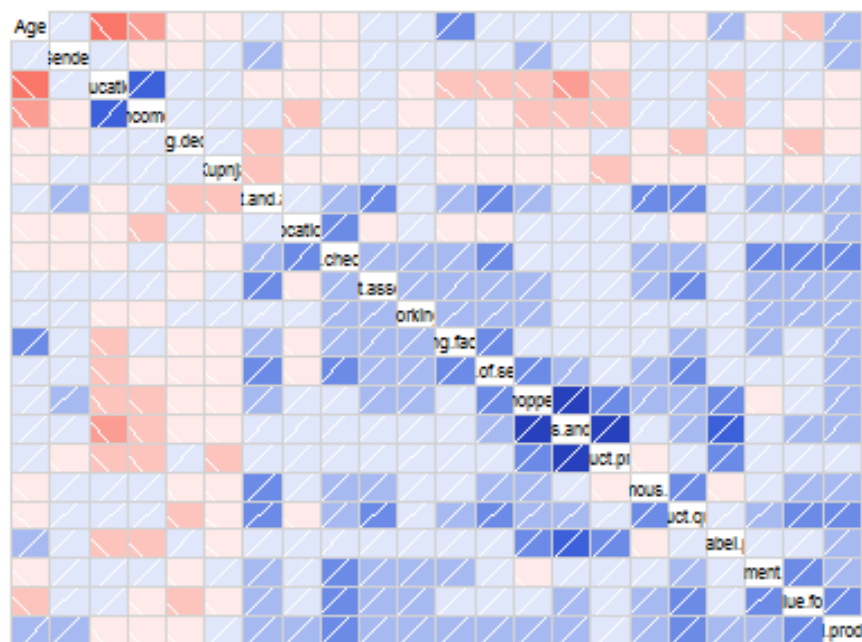
Sources: Author's calculations, an extract from software package R

Figure 10. Correlation matrix
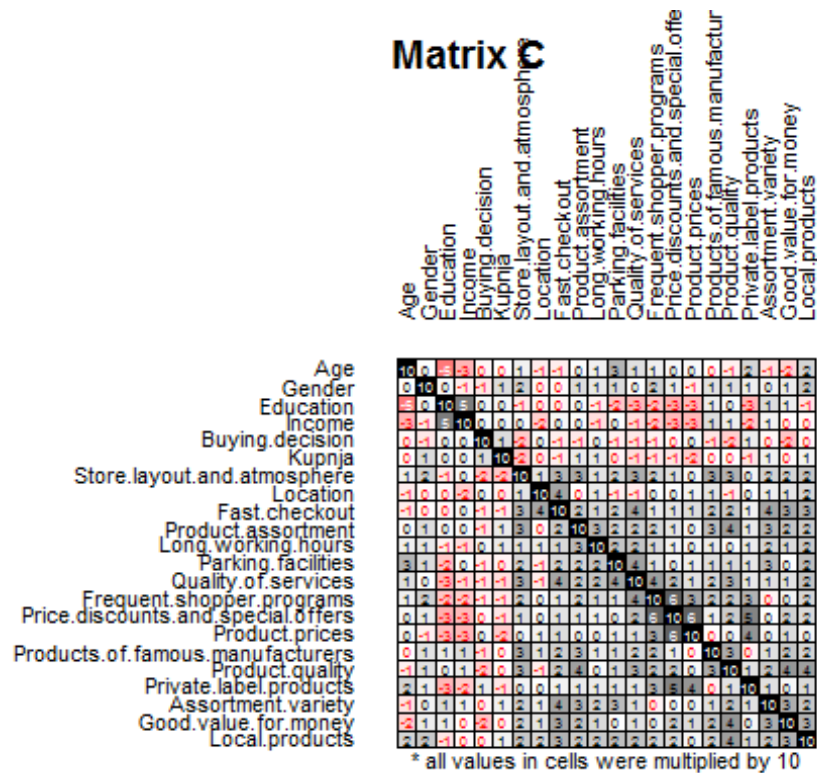
Sources: Author's calculations, an extract from software package R

3.1.2. *Evaluation of minimal number of factors that will explain the internal correlation of variables*

Principal components analysis (PCA) revealed five latent variables with initial eigenvalues greater than one. The five factors explained 60% of variation among all image attributes.

Figure 11. Eigenvalues and Eigen vectors of Correlation matrix

```
e<-eigen(C)
values<-e$values
values

##  [1] 3.8994618 2.6484980 1.7055727 1.4526962 1.3708538 1.1953492 1.08057
16
##  [8] 0.9561270 0.9293998 0.8780225 0.7634966 0.7475589 0.6354978 0.58553
20
## [15] 0.5654102 0.4923645 0.4781986 0.4078474 0.3480790 0.3351851 0.28322
97
## [22] 0.2410475
```

```
vectors<-e$vectors
```

Sources: Author's calculations, an extract from software package R

Figure12. Total Variance Explained

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3,794	23,714	23,714	3,794	23,714	23,714	2,672
2	2,164	13,525	37,239	2,164	13,525	37,239	2,575
3	1,364	8,522	45,761	1,364	8,522	45,761	2,549
4	1,162	7,260	53,021	1,162	7,260	53,021	2,126
5	1,026	6,413	59,434	1,026	6,413	59,434	1,485
6	,939	5,871	65,306				
7	,861	5,383	70,688				
8	,759	4,746	75,434				
9	,706	4,414	79,848				
10	,604	3,774	83,623				
11	,573	3,582	87,205				
12	,548	3,426	90,631				
13	,482	3,014	93,645				
14	,402	2,514	96,160				
15	,367	2,295	98,455				
16	,247	1,545	100,000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Sources: Author's calculations, an extract from software package SPSS

Figure 13. Scree Plot

Scree plot
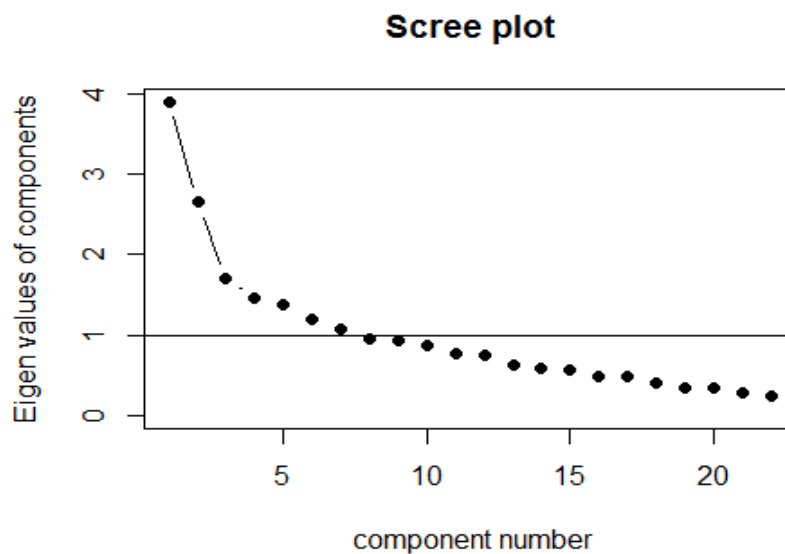
Sources: Author's calculations, an extract from software package R

3.1.3. *Factor rotation and interpretation*

Unrotated factor matrix showed that all image attributes are linked to only one of the five factors. After applying Promax rotation, the first factor was related to four attributes, the second to two attributes, the third – four attributes, the fourth – two attributes and the fifth – four attributes. Factor loading for each factor was above 0,5, which showed significance of factors in the analysis (Hackett and Foxall, 1994, according to Newman and Patel, 2004). The SPSS software package sometimes use a Kaiser normalization before rotating, and then denormalizing them after rotation. Therefore, we conducted the analysis in R software package, among maximum likelihood factor analysis and promax rotation.

Figure14. Pattern and structure Coefficients

	Pattern Coefficients					Structure Coefficients				
	Component					Component				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Location	-,046	-,009	,026	-,112	**,880**	,026	,129	-,013	,032	**,855**
Fast checkout	,052	,146	,184	,228	**,596**	,2121	,373	,314	,426	**,668**
Assortment	-,060	**,524**	,199	,187	-,157	,062	**,594**	,387	,342	-,033
Work time	-,021	,153	-,157	**,718**	-,058	,065	,289	,090	**,709**	,157
Availability and the possibility of parking	-,075	,006	,082	**,764**	-,058	,065	,204	,284	**,768**	,063
Friendly and attentive staff	,142	-,204	,475	**,380**	,056	,351	,083	,567	**,528**	,100
Product quality	,055	**,592**	,422	-,102	-,247	,192	**,650**	,580	,139	-,145
Possibility to buy everything on one spot	-,039	,394	-,155	**,629**	,045	,030	,414	,105	**,664**	,206

Good price-quality ratio	,108	**,777**	-,028	-,169	,204	,167	**,775**	,182	,071	,330
Products of domestic manufactors	,093	**,386**	,142	,197	,099	,211	**,505**	,339	,029	,128
Promotions and discounts	**,884**	,043	,070	-,154	,060	**,889**	,121	,289	,029	,128
Loyalty programs	**,622**	-,152	,392	-,017	-,063	**,709**	,006	,518	,147	-,031
Generally low level of price	**,822**	,035	-,193	-,060	,072	**,768**	,056	,033	,036	,145
Knowing or famous brands	-,170	,213	**,707**	-,232	,037	,017	,351	**,653**	,006	,029
Ambience and appearance	-,114	,021	**,713**	,045	,090	,105	,246	**,700**	,254	,097
Private brands	**,751**	,118	-,267	,148	-,148	**,696**	,123	,021	,196	-,033
Extraction Metjod: Principal Component Analysis										
Rotation Method: Promax with Kaiser Normalization										
a.Rotation converged in 8 iterations										

Sources: Author's calculations, an extract from software package SPSS

Figure 15. KaiserNormalization

```
kaiser(Fa, rotate ="oblimin")

##
## Call: NULL
## Standardized loadings (pattern matrix) based upon correlation matrix
##                                ML2   ML1   ML3   ML4   ML5    h2
## Age                          -0.07 -0.06  0.05  0.75  0.08 0.551
## Gender                        0.06 -0.12  0.33  0.03  0.11 0.117
## Education                    -0.21 -0.08  0.10 -0.73  0.04 0.657
## Income                       -0.25 -0.01  0.16 -0.47  0.11 0.348
## Buying.decision               0.02 -0.01 -0.23 -0.02 -0.01 0.054
## Store.layout.and.atmosphere   0.02  0.17  0.41  0.04 -0.07 0.255
## Location                      0.02 -0.09 -0.05  0.04 -0.55 0.291
## Fast.checkout                -0.01  0.27  0.22 -0.05 -0.60 0.605
## Product.assortment            0.02  0.02  0.53 -0.02 -0.02 0.289
## Long.working.hours           -0.02  0.14  0.19  0.11 -0.10 0.102
```

```
## Parking.facilities                       -0.10   0.22   0.28   0.30   0.02 0.254
## Quality.of.services                        0.01   0.95   0.15   0.10   0.16 0.995
## Frequent.shopper.programs                  0.58   0.21   0.19   0.00   0.21 0.483
## Price.discounts.and.special.offers  0.95   0.03   0.11  -0.04   0.08 0.912
## Product.prices                             0.66  -0.01  -0.07   0.03  -0.14 0.473
## Products.of.famous.manufacturers     0.00   0.02   0.46  -0.08  -0.02 0.220
## Product.quality                            0.11   0.09   0.65  -0.12   0.08 0.462
## Private.label.products                     0.49  -0.09   0.08   0.17  -0.03 0.301
## Assortment.variety                        -0.06   0.03   0.36  -0.10  -0.31 0.268
## Good.value.for.money                       0.14  -0.03   0.44  -0.18  -0.28 0.348
## Local.products                             0.04   0.01   0.50   0.16  -0.17 0.340
##                                                 u2
## Age                                       0.449
## Gender                                    0.883
## Education                                 0.343
## Income                                    0.652
## Buying.decision                           0.946
## Kupnja                                    0.958
## Store.layout.and.atmosphere               0.745
## Location                                  0.709
## Fast.checkout                             0.395
## Product.assortment                        0.711
## Long.working.hours                        0.898
## Parking.facilities                        0.746
## Quality.of.services                       0.005
## Frequent.shopper.programs                 0.517
## Price.discounts.and.special.offers 0.088
## Product.prices                            0.527
## Products.of.famous.manufacturers     0.780
## Product.quality                           0.538
## Private.label.products                    0.699
## Assortment.variety                        0.732
## Good.value.for.money                      0.652
## Local.products                            0.660
##
##                           ML2  ML1  ML3  ML4  ML5
## SS loadings              2.16 1.32 2.24 1.60 1.04
## Proportion Var           0.10 0.06 0.10 0.07 0.05
## Cumulative Var           0.10 0.16 0.26 0.33 0.38
## Proportion Explained     0.26 0.16 0.27 0.19 0.12
## Cumulative Proportion 0.26 0.42 0.68 0.88 1.00
##        ML2    ML1    ML3  ML4    ML5
## ML2  1.00   0.19   0.06 0.18 -0.10
## ML1  0.19   1.00   0.21 0.14 -0.19
## ML3  0.06   0.21   1.00 0.05 -0.13
## ML4  0.18   0.14   0.05 1.00  0.03
## ML5 -0.10 -0.19 -0.13 0.03  1.00
```

Figure 16. Unrotated factor matrix using maximum likelihood method

```
Fa<-fa(poodaci,nfactors =5,rotate ="none", scores=TRUE,fm="ml",use="complet
e",residuals =TRUE)
Fa

## Factor Analysis using method =  ml
## Call: fa(r = poodaci, nfactors = 5, rotate = "none", scores = TRUE,
##     residuals = TRUE, fm = "ml", use = "complete")
## Standardized loadings (pattern matrix) based upon correlation matrix
##                                  ML2   ML1   ML3   ML4   ML5   h2
## Age                             0.06  0.13 -0.52  0.48  0.18 0.551
## Gender                          0.09  0.01  0.13  0.14  0.27 0.117
## Education                      -0.32 -0.28  0.55 -0.42  0.05 0.657
## Income                         -0.31 -0.13  0.38 -0.25  0.15 0.348
## Buying.decision                 0.00 -0.09 -0.12 -0.12 -0.12 0.054
## Store.layout.and.atmosphere     0.05  0.33  0.26  0.25  0.11 0.255
## Location                        0.06 -0.07  0.17  0.27 -0.43 0.291
## Fast.checkout                   0.03  0.35  0.43  0.34 -0.42 0.605
## Product.assortment              0.07  0.20  0.35  0.26  0.24 0.289
## Long.working.hours              0.01  0.23  0.09  0.20  0.00 0.102
## Parking.facilities             -0.03  0.37 -0.03  0.31  0.14 0.254
## Quality.of.services            -0.02  1.00  0.00 -0.01  0.00 0.995
## Frequent.shopper.programs       0.55  0.39  0.03 -0.06  0.15 0.483
## Price.discounts.and.special.offers  0.91  0.26  0.04 -0.09  0.01 0.912
## Product.prices                  0.64  0.13 -0.03  0.00 -0.20 0.473
## Products.of.famous.manufacturers  0.03  0.16  0.35  0.18  0.20 0.220
## Product.quality                 0.13  0.30  0.44  0.19  0.34 0.462
## Private.label.products          0.52  0.10 -0.07  0.14  0.00 0.301
## Assortment.variety             -0.03  0.13  0.42  0.26 -0.07 0.268
## Good.value.for.money            0.16  0.12  0.51  0.22 -0.02 0.348
## Local.products                  0.12  0.24  0.27  0.43  0.12 0.340
##                                   u2 com
## Age                            0.449 2.4
## Gender                         0.883 2.3
## Education                      0.343 3.1
## Income                         0.652 3.4
## Buying.decision                0.946 3.8
## Store.layout.and.atmosphere    0.745 3.2
## Location                       0.709 2.1
## Fast.checkout                  0.395 3.8
## Product.assortment             0.711 3.5
## Long.working.hours             0.898 2.3
## Parking.facilities             0.746 2.3
## Quality.of.services            0.005 1.0
## Frequent.shopper.programs      0.517 2.0
## Price.discounts.and.special.offers 0.088 1.2
## Product.prices                 0.527 1.3
## Products.of.famous.manufacturers  0.780 2.7
## Product.quality                0.538 3.4
## Private.label.products         0.699 1.3
## Assortment.variety             0.732 1.9
## Good.value.for.money           0.652 1.8
## Local.products                 0.660 2.8
##
##                         ML2  ML1  ML3  ML4  ML5
## SS loadings            2.11 2.04 1.99 1.36 0.86
## Proportion Var         0.10 0.09 0.09 0.06 0.04
## Cumulative Var         0.10 0.19 0.28 0.34 0.38
```

```
## Proportion Explained  0.25 0.24 0.24 0.16 0.10
## Cumulative Proportion 0.25 0.50 0.73 0.90 1.00
##
## Mean item complexity =  2.5
## Test of the hypothesis that 5 factors are sufficient.
##
## The degrees of freedom for the null model are  231  and the objective fu
nction was  5.73 with Chi Square of  1208.08
## The degrees of freedom for the model are 131  and the objective function
 was  1.12
##
## The root mean square of the residuals (RMSR) is  0.05
## The df corrected root mean square of the residuals is  0.07
##
## The harmonic number of observations is  220 with the empirical chi squar
e 244.39  with prob <  7.2e-09
## The total number of observations was  220  with MLE Chi Square =  232.67
  with prob <  1.1e-07
##
## Tucker Lewis Index of factoring reliability =  0.813
## RMSEA index =  0.063  and the 90 % confidence intervals are  0.047 0.072
## BIC =  -473.89
## Fit based upon off diagonal values = 0.93
## Measures of factor score adequacy
##                                                ML2  ML1  ML3  ML4  ML5
## Correlation of scores with factors            0.96 1.00 0.89 0.85 0.77
## Multiple R square of scores with factors      0.92 1.00 0.79 0.72 0.60
## Minimum correlation of possible factor scores 0.85 0.99 0.58 0.44 0.20
```

Sources: Author's calculations, an extract from software package R

Figure 17. Promax rotation

```
Fa1<-fa(poodaci,nfactors =5,rotate ="promax", scores=TRUE,fm="ml",use="comp
lete",residuals =TRUE)
Fa1

## Factor Analysis using method =  ml
## Call: fa(r = poodaci, nfactors = 5, rotate = "promax", scores = TRUE,
##     residuals = TRUE, fm = "ml", use = "complete")
## Standardized loadings (pattern matrix) based upon correlation matrix
##                                ML3   ML2   ML4   ML1   ML5   h2
## Age                           0.07 -0.19 -0.80 -0.07 -0.14 0.551
## Gender                        0.36  0.06 -0.06 -0.14 -0.17 0.117
## Education                     0.12 -0.10  0.75 -0.06 -0.04 0.657
## Income                        0.19 -0.17  0.48  0.01 -0.11 0.348
## Buying.decision              -0.24  0.03  0.03  0.01  0.03 0.054
## Kupnja                        0.11 -0.10 -0.05 -0.15 -0.09 0.042
## Store.layout.and.atmosphere   0.41 -0.01 -0.04  0.12  0.09 0.255
## Location                     -0.10 -0.04 -0.05 -0.15  0.55 0.291
## Fast.checkout                 0.14 -0.06  0.08  0.19  0.69 0.605
## Product.assortment            0.55  0.01 -0.01 -0.03 -0.01 0.289
## Long.working.hours            0.18 -0.05 -0.11  0.11  0.12 0.102
## Parking.facilities            0.27 -0.15 -0.30  0.20  0.01 0.254
## Quality.of.services           0.09  0.00  0.00  0.95  0.08 0.995
## Frequent.shopper.programs     0.19  0.60  0.03  0.19 -0.17 0.483
## Price.discounts.and.special.offers  0.11  0.97  0.06 -0.01 -0.06 0.912
## Product.prices               -0.10  0.65 -0.02 -0.04  0.15 0.473
## Products.of.famous.manufacturers  0.48  0.00  0.06 -0.02 -0.01 0.220
## Product.quality               0.67  0.12  0.10  0.04 -0.10 0.462
## Private.label.products        0.09  0.46 -0.19 -0.12  0.00 0.301
## Assortment.variety            0.35 -0.08  0.09 -0.04  0.30 0.268
## Good.value.for.money          0.44  0.14  0.17 -0.11  0.26 0.348
## Local.products                0.50 -0.02 -0.19 -0.06  0.14 0.340
##                                 u2 com
## Age                           0.449 1.2
## Gender                        0.883 1.9
## Education                     0.343 1.1
## Income                        0.652 1.7
## Buying.decision               0.946 1.1
## Kupnja                        0.958 3.8
## Store.layout.and.atmosphere   0.745 1.3
## Location                      0.709 1.3
## Fast.checkout                 0.395 1.3
## Product.assortment            0.711 1.0
## Long.working.hours            0.898 3.6
## Parking.facilities            0.746 3.3
## Quality.of.services           0.005 1.0
## Frequent.shopper.programs     0.517 1.6
## Price.discounts.and.special.offers 0.088 1.0
## Product.prices                0.527 1.2
## Products.of.famous.manufacturers  0.780 1.0
## Product.quality               0.538 1.2
## Private.label.products        0.699 1.6
## Assortment.variety            0.732 2.3
## Good.value.for.money          0.652 2.4
## Local.products                0.660 1.5
##
##                      ML3  ML2  ML4  ML1  ML5
## SS loadings         2.27 2.09 1.64 1.20 1.16
```

```
## Proportion Var        0.10 0.09 0.07 0.05 0.05
## Cumulative Var        0.10 0.20 0.27 0.33 0.38
## Proportion Explained  0.27 0.25 0.20 0.14 0.14
## Cumulative Proportion 0.27 0.52 0.72 0.86 1.00
##
##  With factor correlations of
##       ML3   ML2   ML4   ML1   ML5
## ML3  1.00  0.11 -0.06  0.32  0.31
## ML2  0.11  1.00 -0.36  0.23  0.21
## ML4 -0.06 -0.36  1.00 -0.31 -0.10
## ML1  0.32  0.23 -0.31  1.00  0.11
## ML5  0.31  0.21 -0.10  0.11  1.00
##
## Mean item complexity =  1.7
## Test of the hypothesis that 5 factors are sufficient.
##
## The degrees of freedom for the null model are  231  and the objective fu
nction was  5.73 with Chi Square of  1208.08
## The degrees of freedom for the model are 131  and the objective function
 was  1.12
##
## The root mean square of the residuals (RMSR) is  0.05
## The df corrected root mean square of the residuals is  0.07
##
## The harmonic number of observations is  220 with the empirical chi squar
e  244.39  with prob <  7.2e-09
## The total number of observations was  220  with MLE Chi Square =  232.67
  with prob <  1.1e-07
##
## Tucker Lewis Index of factoring reliability =  0.813
## RMSEA index =  0.063  and the 90 % confidence intervals are  0.047 0.072
## BIC =  -473.89
## Fit based upon off diagonal values = 0.93
## Measures of factor score adequacy
##                                              ML3  ML2  ML4  ML1  ML5
## Correlation of scores with factors          0.88 0.96 0.89 1.00 0.83
## Multiple R square of scores with factors    0.78 0.92 0.80 0.99 0.69
## Minimum correlation of possible factor scores  0.56 0.85 0.59 0.98 0.38
```

Sources: Author's calculations, an extract from software package R

Figure18. Derivated factors according attributes, factor loading and initial communality

Identified factor	Attributes	Factor loading	Initial communality	Excreted
Factor 1	Quality	0,650	1	0,663
	Good price-quality ratio	0,772	1	0,671
	Assortment	0,594	1	0,453
	Products of domestic manufactors	0,505	1	0,356
Factor 2	Location / proximity of store	0,855	1	0,746
	Fast checkout	0,668	1	0,618
Factor 3	Work time	0,709	1	0,540
	Availability and the possibility of parking	0,768	1	0,602
	Possibility to buy everything on one spot	0,664	1	0,533
	Friendly and attentive staff	0,528	1	0,622
Factor 4	Known or famous brands	0,653	1	0,533
	Ambience and appearance	0,700	1	0,512
Factor 5	Price	0,768	1	0,635
	Promotions and discounts	0,889	1	0,815
	Loyalty programs	0,709	1	0,663
	Private brands	0,696	1	0,566

- Factor 1:

The first factor related to image attributes: Product quality, Value for money ratio, Product assortment and Local products. All attributes are linked with products and the perception of quality. We suggest naming that the first factor **product quality**.

- Factor 2:

The second factor related to image attributes: Location of store and fast checkout. Thereby, we suggest naming that factor**convenience**.

- Factor 3:

The third factor related to image attributes: longer working hours, the possibility to buy all in one place, parking facilities and service quality. We suggest naming the factor **additional value**.

- Factor 4:

The fourth factor related to image attributes: Store layout and atmosphere and Product of famous manufacturers. We suggest naming the factor **store familiarity**.

- Factor 5:

The fifth factor related to image attributes: Product prices, Price discounts and special offers, Frequent shoppers programs and Private labels. All attributes are linked with the perception of product prices and special offers. We suggest naming the factor **price.**

The factors product quality and convenience are related to image attributes which were evaluated as most important in the decision making process. The factor related to price perception attributes was evaluated as less important.

4. CONCLUSION AND IMPLICATION FOR FURTHER RESEARCH

Consumers take into consideration a relatively large number of image attributes when choosing between multiple retailers. Some are more important than others, such as product quality, assortment, good value for money and fast checkout. Nevertheless, to conduct a comprehensive analysis of retailerspositioning in the perceptual space it is important to reduce the number of attributes into fever key dimensions. This can be achieved thorough factor analysis.

In this research, five latent factors that integrate multiple retailers' image attributes and explain interrelationships among them were derived. The factors are: (1) **product quality, (2) convenience, (3) additional value, (4) store familiarity and (5) price perception.** These factors aggregate numerous attributes of multiple retailers, thus allowingthe assessment and comparison of positions of retailers.

To increase their market performance, multiple retailers should position themselves in accordance to the most important dimensions. In this case, the suggested dimensions are **product quality** and **convenience**.

Implications for further research include linking the identified dimensions for positioning with the perception of leading multiple retailers in Croatia. This will give a perspective on weather the most successfull multiple retailers are using the strategy of clear and relevant positioning. Secondly, further analysis could be conducted in order to reduce the number of factors into three or less dimensions. The above allowed Urbanavičius and Ivanauskas (2005) to simultaneously compare multiple retailers' positions in the perceptual space. Finally, the sampling method used in this research was non-probabilistic. Accordingly, generalisation is not possible and further research with random sampling methods is advised.

5. LITERATURE

1. Urbonavičius, S., Ivanauskas, R. (2005). SEGMENTATION OF MULTIPLE RETAILERS' CLIENTS ON THE BASIS OF SHOPPING OCCASIONS
2. Newman, A. J., Patel, D. (2004). THE MARKETING DIRECTIONS OF TWO FASHION RETAILERS

ANNEX I –SOURCE CODE R

```
library(corrgram)

## Warning: package 'corrgram' was built under R version 3.2.5

library(psych)

## Warning: package 'psych' was built under R version 3.2.5

library(blockmodeling)

## Warning: package 'blockmodeling' was built under R version 3.2.5

library(GPArotation)

## Warning: package 'GPArotation' was built under R version 3.2.3

poodaci <-read.csv("D:/IvanaDK/IvanaFA/poodaci.csv", sep=";", dec=",")

C<-cor(poodaci)

alpha(C,keys=NULL,cumulative=FALSE, title=NULL, max=10,na.rm =TRUE,
check.keys=TRUE,n.iter=1,delete=TRUE)

## Warning in alpha(C, keys = NULL, cumulative = FALSE, title = NULL, max =
##  10, : Some items were negatively correlated with total scale and were auto
matically reversed.
##   This is indicated by a negative sign for the variable name.

##
## Reliability analysis
## Call: alpha(x = C, keys = NULL, cumulative = FALSE, title = NULL, max =
10,
##      na.rm = TRUE, check.keys = TRUE, n.iter = 1, delete = TRUE)
##
##    raw_alpha std.alpha G6(smc) average_r S/N
##       0.75      0.75    0.82       0.12 3.1
##
##   Reliability if an item is dropped:
##                                     raw_alpha std.alpha G6(smc) average_r
## Age                                      0.75      0.75    0.82      0.13
## Gender                                   0.76      0.76    0.82      0.13
## Education-                               0.74      0.74    0.81      0.12
## Income-                                  0.75      0.75    0.81      0.12
## Buying.decision-                         0.76      0.76    0.82      0.13
## Kupnja-                                  0.76      0.76    0.82      0.13
## Store.layout.and.atmosphere              0.74      0.74    0.81      0.12
## Location                                 0.76      0.76    0.82      0.13
## Fast.checkout                            0.74      0.74    0.80      0.12
## Product.assortment                       0.74      0.74    0.81      0.12
## Long.working.hours                       0.75      0.75    0.81      0.12
## Parking.facilities                       0.74      0.74    0.81      0.12
## Quality.of.services                      0.73      0.73    0.80      0.12
## Frequent.shopper.programs                0.74      0.74    0.80      0.12
## Price.discounts.and.special.offers       0.73      0.73    0.80      0.12
## Product.prices                           0.74      0.74    0.81      0.12
## Products.of.famous.manufacturers         0.75      0.75    0.81      0.12
## Product.quality                          0.74      0.74    0.80      0.12
## Private.label.products                   0.74      0.74    0.81      0.12
## Assortment.variety                       0.75      0.75    0.81      0.12
```

```
## Good.value.for.money                        0.74     0.74    0.81     0.12
## Local.products                              0.74     0.74    0.80     0.12
##                              S/N
## Age                          3.1
## Gender                       3.1
## Education-                   2.9
## Income-                      3.0
## Buying.decision-             3.1
## Kupnja-                      3.2
## Store.layout.and.atmosphere  2.8
## Location                     3.1
## Fast.checkout                2.8
## Product.assortment           2.9
## Long.working.hours           3.0
## Parking.facilities           2.9
## Quality.of.services          2.8
## Frequent.shopper.programs    2.8
## Price.discounts.and.special.offers 2.8
## Product.prices               2.9
## Products.of.famous.manufacturers   3.0
## Product.quality              2.8
## Private.label.products       2.9
## Assortment.variety           3.0
## Good.value.for.money         2.9
## Local.products               2.8
##
##   Item statistics
##                                 r r.cor r.drop
## Age                          0.27  0.22  0.159
## Gender                       0.26  0.19  0.155
## Education-                   0.41  0.39  0.307
## Income-                      0.34  0.30  0.233
## Buying.decision-             0.26  0.18  0.154
## Kupnja-                      0.20  0.12  0.088
## Store.layout.and.atmosphere  0.51  0.49  0.424
## Location                     0.22  0.16  0.114
## Fast.checkout                0.49  0.46  0.393
## Product.assortment           0.45  0.41  0.352
## Long.working.hours           0.36  0.30  0.258
## Parking.facilities           0.43  0.40  0.337
## Quality.of.services          0.55  0.54  0.465
## Frequent.shopper.programs    0.53  0.52  0.438
## Price.discounts.and.special.offers 0.54  0.55  0.455
## Product.prices               0.42  0.40  0.325
## Products.of.famous.manufacturers   0.38  0.32  0.272
## Product.quality              0.49  0.47  0.396
## Private.label.products       0.42  0.38  0.324
## Assortment.variety           0.36  0.31  0.251
## Good.value.for.money         0.43  0.40  0.336
## Local.products               0.52  0.50  0.434
```

```
corrgram(C)

plot.mat(C)

e<-eigen(C)
values<-e$values
values
```

```
##   [1] 3.8994618 2.6484980 1.7055727 1.4526962 1.3708538 1.1953492 1.08057
16
##   [8] 0.9561270 0.9293998 0.8780225 0.7634966 0.7475589 0.6354978 0.58553
20
## [15] 0.5654102 0.4923645 0.4781986 0.4078474 0.3480790 0.3351851 0.28322
97
## [22] 0.2410475
```

```
vectors<-e$vectors
```

```
cortest.bartlett(C)
```

```
## Warning in cortest.bartlett(C): n not specified, 100 used
```

```
## $chisq
## [1] 520.4755
##
## $p.value
## [1] 2.260886e-24
##
## $df
## [1] 231
```

```
KMO(r=C)
```

```
## Kaiser-Meyer-Olkin factor adequacy
## Call: KMO(r = C)
## Overall MSA =  0.7
## MSA for each item =
##                                 Age                         Gender
##                                0.62                           0.51
##                           Education                         Income
##                                0.71                           0.62
##                     Buying.decision                         Kupnja
##                                0.64                           0.50
##          Store.layout.and.atmosphere                     Location
##                                0.76                           0.41
##                       Fast.checkout            Product.assortment
##                                0.69                           0.80
##                  Long.working.hours            Parking.facilities
##                                0.64                           0.64
##                 Quality.of.services    Frequent.shopper.programs
##                                0.70                           0.72
## Price.discounts.and.special.offers               Product.prices
##                                0.71                           0.73
##    Products.of.famous.manufacturers              Product.quality
##                                0.76                           0.75
##               Private.label.products            Assortment.variety
##                                0.79                           0.69
##               Good.value.for.money                Local.products
##                                0.72                           0.77
```

```
par(xpd=FALSE)
scree(C,factors =FALSE)
```

```
Fa<-fa(poodaci,nfactors =5,rotate ="none", scores=TRUE,fm="ml",use="complet
e",residuals =TRUE)
Fa
```

```
## Factor Analysis using method =  ml
## Call: fa(r = poodaci, nfactors = 5, rotate = "none", scores = TRUE,
```

```
##     residuals = TRUE, fm = "ml", use = "complete")
## Standardized loadings (pattern matrix) based upon correlation matrix
##                                    ML2   ML1   ML3   ML4   ML5   h2
## Age                                0.06  0.13 -0.52  0.48  0.18 0.551
## Gender                             0.09  0.01  0.13  0.14  0.27 0.117
## Education                         -0.32 -0.28  0.55 -0.42  0.05 0.657
## Income                            -0.31 -0.13  0.38 -0.25  0.15 0.348
## Buying.decision                    0.00 -0.09 -0.12 -0.12 -0.12 0.054
## Kupnja                            -0.08 -0.13  0.02  0.06  0.12 0.042
## Store.layout.and.atmosphere        0.05  0.33  0.26  0.25  0.11 0.255
## Location                           0.06 -0.07  0.17  0.27 -0.43 0.291
## Fast.checkout                      0.03  0.35  0.43  0.34 -0.42 0.605
## Product.assortment                 0.07  0.20  0.35  0.26  0.24 0.289
## Long.working.hours                 0.01  0.23  0.09  0.20  0.00 0.102
## Parking.facilities                -0.03  0.37 -0.03  0.31  0.14 0.254
## Quality.of.services               -0.02  1.00  0.00 -0.01  0.00 0.995
## Frequent.shopper.programs          0.55  0.39  0.03 -0.06  0.15 0.483
## Price.discounts.and.special.offers 0.91  0.26  0.04 -0.09  0.01 0.912
## Product.prices                     0.64  0.13 -0.03  0.00 -0.20 0.473
## Products.of.famous.manufacturers   0.03  0.16  0.35  0.18  0.20 0.220
## Product.quality                    0.13  0.30  0.44  0.19  0.34 0.462
## Private.label.products             0.52  0.10 -0.07  0.14  0.00 0.301
## Assortment.variety                -0.03  0.13  0.42  0.26 -0.07 0.268
## Good.value.for.money               0.16  0.12  0.51  0.22 -0.02 0.348
## Local.products                     0.12  0.24  0.27  0.43  0.12 0.340
##                                     u2  com
## Age                                0.449 2.4
## Gender                             0.883 2.3
## Education                          0.343 3.1
## Income                             0.652 3.4
## Buying.decision                    0.946 3.8
## Kupnja                             0.958 3.1
## Store.layout.and.atmosphere        0.745 3.2
## Location                           0.709 2.1
## Fast.checkout                      0.395 3.8
## Product.assortment                 0.711 3.5
## Long.working.hours                 0.898 2.3
## Parking.facilities                 0.746 2.3
## Quality.of.services                0.005 1.0
## Frequent.shopper.programs          0.517 2.0
## Price.discounts.and.special.offers 0.088 1.2
## Product.prices                     0.527 1.3
## Products.of.famous.manufacturers   0.780 2.7
## Product.quality                    0.538 3.4
## Private.label.products             0.699 1.3
## Assortment.variety                 0.732 1.9
## Good.value.for.money               0.652 1.8
## Local.products                     0.660 2.8
##
##                       ML2  ML1  ML3  ML4  ML5
## SS loadings          2.11 2.04 1.99 1.36 0.86
## Proportion Var       0.10 0.09 0.09 0.06 0.04
## Cumulative Var       0.10 0.19 0.28 0.34 0.38
## Proportion Explained 0.25 0.24 0.24 0.16 0.10
## Cumulative Proportion 0.25 0.50 0.73 0.90 1.00
##
## Mean item complexity =  2.5
## Test of the hypothesis that 5 factors are sufficient.
##
```

```
## The degrees of freedom for the null model are  231  and the objective fu
nction was  5.73 with Chi Square of  1208.08
## The degrees of freedom for the model are 131  and the objective function
 was  1.12
##
## The root mean square of the residuals (RMSR) is  0.05
## The df corrected root mean square of the residuals is  0.07
##
## The harmonic number of observations is  220 with the empirical chi squar
e  244.39  with prob <  7.2e-09
## The total number of observations was  220  with MLE Chi Square =  232.67
  with prob <  1.1e-07
##
## Tucker Lewis Index of factoring reliability =  0.813
## RMSEA index =  0.063  and the 90 % confidence intervals are  0.047 0.072
## BIC =  -473.89
## Fit based upon off diagonal values = 0.93
## Measures of factor score adequacy
##                                                 ML2  ML1  ML3  ML4  ML5
## Correlation of scores with factors             0.96 1.00 0.89 0.85 0.77
## Multiple R square of scores with factors       0.92 1.00 0.79 0.72 0.60
## Minimum correlation of possible factor scores  0.85 0.99 0.58 0.44 0.20
```

kaiser(Fa, rotate ="oblimin")

```
##
## Call: NULL
## Standardized loadings (pattern matrix) based upon correlation matrix
##                                  ML2   ML1   ML3   ML4   ML5    h2
## Age                            -0.07 -0.06  0.05  0.75  0.08 0.551
## Gender                          0.06 -0.12  0.33  0.03  0.11 0.117
## Education                      -0.21 -0.08  0.10 -0.73  0.04 0.657
## Income                         -0.25 -0.01  0.16 -0.47  0.11 0.348
## Buying.decision                 0.02 -0.01 -0.23 -0.02 -0.01 0.054
## Kupnja                         -0.10 -0.15  0.09  0.02  0.04 0.042
## Store.layout.and.atmosphere     0.02  0.17  0.41  0.04 -0.07 0.255
## Location                        0.02 -0.09 -0.05  0.04 -0.55 0.291
## Fast.checkout                  -0.01  0.27  0.22 -0.05 -0.60 0.605
## Product.assortment              0.02  0.02  0.53 -0.02 -0.02 0.289
## Long.working.hours             -0.02  0.14  0.19  0.11 -0.10 0.102
## Parking.facilities             -0.10  0.22  0.28  0.30  0.02 0.254
## Quality.of.services             0.01  0.95  0.15  0.10  0.16 0.995
## Frequent.shopper.programs       0.58  0.21  0.19  0.00  0.21 0.483
## Price.discounts.and.special.offers  0.95  0.03  0.11 -0.04  0.08 0.912
## Product.prices                  0.66 -0.01 -0.07  0.03 -0.14 0.473
## Products.of.famous.manufacturers  0.00  0.02  0.46 -0.08 -0.02 0.220
## Product.quality                 0.11  0.09  0.65 -0.12  0.08 0.462
## Private.label.products          0.49 -0.09  0.08  0.17 -0.03 0.301
## Assortment.variety             -0.06  0.03  0.36 -0.10 -0.31 0.268
## Good.value.for.money            0.14 -0.03  0.44 -0.18 -0.28 0.348
## Local.products                  0.04  0.01  0.50  0.16 -0.17 0.340
##                                  u2
## Age                            0.449
## Gender                         0.883
## Education                      0.343
## Income                         0.652
## Buying.decision                0.946
## Kupnja                         0.958
## Store.layout.and.atmosphere    0.745
## Location                       0.709
```

```
## Fast.checkout                      0.395
## Product.assortment                 0.711
## Long.working.hours                 0.898
## Parking.facilities                 0.746
## Quality.of.services                0.005
## Frequent.shopper.programs          0.517
## Price.discounts.and.special.offers 0.088
## Product.prices                     0.527
## Products.of.famous.manufacturers   0.780
## Product.quality                    0.538
## Private.label.products             0.699
## Assortment.variety                 0.732
## Good.value.for.money               0.652
## Local.products                     0.660
##
##                         ML2  ML1  ML3  ML4  ML5
## SS loadings            2.16 1.32 2.24 1.60 1.04
## Proportion Var         0.10 0.06 0.10 0.07 0.05
## Cumulative Var         0.10 0.16 0.26 0.33 0.38
## Proportion Explained   0.26 0.16 0.27 0.19 0.12
## Cumulative Proportion  0.26 0.42 0.68 0.88 1.00
##        ML2   ML1   ML3  ML4   ML5
## ML2  1.00  0.19  0.06 0.18 -0.10
## ML1  0.19  1.00  0.21 0.14 -0.19
## ML3  0.06  0.21  1.00 0.05 -0.13
## ML4  0.18  0.14  0.05 1.00  0.03
## ML5 -0.10 -0.19 -0.13 0.03  1.00
```

```r
Fa1<-fa(poodaci,nfactors =5,rotate ="promax", scores=TRUE,fm="ml",use="comp
lete",residuals =TRUE)
Fa1
```

```
## Factor Analysis using method =  ml
## Call: fa(r = poodaci, nfactors = 5, rotate = "promax", scores = TRUE,
##     residuals = TRUE, fm = "ml", use = "complete")
## Standardized loadings (pattern matrix) based upon correlation matrix
##                                      ML3   ML2   ML4   ML1   ML5   h2
## Age                                 0.07 -0.19 -0.80 -0.07 -0.14 0.551
## Gender                              0.36  0.06 -0.06 -0.14 -0.17 0.117
## Education                           0.12 -0.10  0.75 -0.06 -0.04 0.657
## Income                              0.19 -0.17  0.48  0.01 -0.11 0.348
## Buying.decision                    -0.24  0.03  0.03  0.01  0.03 0.054
## Kupnja                              0.11 -0.10 -0.05 -0.15 -0.09 0.042
## Store.layout.and.atmosphere         0.41 -0.01 -0.04  0.12  0.09 0.255
## Location                           -0.10 -0.04 -0.05 -0.15  0.55 0.291
## Fast.checkout                       0.14 -0.06  0.08  0.19  0.69 0.605
## Product.assortment                  0.55  0.01 -0.01 -0.03 -0.01 0.289
## Long.working.hours                  0.18 -0.05 -0.11  0.11  0.12 0.102
## Parking.facilities                  0.27 -0.15 -0.30  0.20  0.01 0.254
## Quality.of.services                 0.09  0.00  0.00  0.95  0.08 0.995
## Frequent.shopper.programs           0.19  0.60  0.03  0.19 -0.17 0.483
## Price.discounts.and.special.offers  0.11  0.97  0.06 -0.01 -0.06 0.912
## Product.prices                     -0.10  0.65 -0.02 -0.04  0.15 0.473
## Products.of.famous.manufacturers    0.48  0.00  0.06 -0.02 -0.01 0.220
## Product.quality                     0.67  0.12  0.10  0.04 -0.10 0.462
## Private.label.products              0.09  0.46 -0.19 -0.12  0.00 0.301
## Assortment.variety                  0.35 -0.08  0.09 -0.04  0.30 0.268
## Good.value.for.money                0.44  0.14  0.17 -0.11  0.26 0.348
## Local.products                      0.50 -0.02 -0.19 -0.06  0.14 0.340
##                                     u2 com
```

```
## Age                              0.449 1.2
## Gender                           0.883 1.9
## Education                        0.343 1.1
## Income                           0.652 1.7
## Buying.decision                  0.946 1.1
## Kupnja                           0.958 3.8
## Store.layout.and.atmosphere      0.745 1.3
## Location                         0.709 1.3
## Fast.checkout                    0.395 1.3
## Product.assortment               0.711 1.0
## Long.working.hours               0.898 3.6
## Parking.facilities               0.746 3.3
## Quality.of.services              0.005 1.0
## Frequent.shopper.programs        0.517 1.6
## Price.discounts.and.special.offers 0.088 1.0
## Product.prices                   0.527 1.2
## Products.of.famous.manufacturers  0.780 1.0
## Product.quality                  0.538 1.2
## Private.label.products           0.699 1.6
## Assortment.variety               0.732 2.3
## Good.value.for.money             0.652 2.4
## Local.products                   0.660 1.5
##
##                         ML3  ML2  ML4  ML1  ML5
## SS loadings            2.27 2.09 1.64 1.20 1.16
## Proportion Var         0.10 0.09 0.07 0.05 0.05
## Cumulative Var         0.10 0.20 0.27 0.33 0.38
## Proportion Explained   0.27 0.25 0.20 0.14 0.14
## Cumulative Proportion  0.27 0.52 0.72 0.86 1.00
##
##   With factor correlations of
##        ML3   ML2   ML4   ML1   ML5
## ML3  1.00  0.11 -0.06  0.32  0.31
## ML2  0.11  1.00 -0.36  0.23  0.21
## ML4 -0.06 -0.36  1.00 -0.31 -0.10
## ML1  0.32  0.23 -0.31  1.00  0.11
## ML5  0.31  0.21 -0.10  0.11  1.00
##
## Mean item complexity =  1.7
## Test of the hypothesis that 5 factors are sufficient.
##
## The degrees of freedom for the null model are  231  and the objective fu
nction was  5.73 with Chi Square of  1208.08
## The degrees of freedom for the model are 131  and the objective function
 was  1.12
##
## The root mean square of the residuals (RMSR) is  0.05
## The df corrected root mean square of the residuals is  0.07
##
## The harmonic number of observations is  220 with the empirical chi squar
e  244.39  with prob <  7.2e-09
## The total number of observations was  220  with MLE Chi Square =  232.67
  with prob <  1.1e-07
##
## Tucker Lewis Index of factoring reliability =  0.813
## RMSEA index =  0.063  and the 90 % confidence intervals are  0.047 0.072
## BIC =  -473.89
## Fit based upon off diagonal values = 0.93
## Measures of factor score adequacy
```

```
##                                           ML3  ML2  ML4  ML1  ML5
## Correlation of scores with factors        0.88 0.96 0.89 1.00 0.83
## Multiple R square of scores with factors  0.78 0.92 0.80 0.99 0.69
## Minimum correlation of possible factor scores  0.56 0.85 0.59 0.98 0.38
```