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Identifying Factors Influencing Selection of Banks by Customers in Rwanda: Principal Components Analysis Approach

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Abstract

Nowadays, with the presence of the many financial institutions, customers have the chance of choosing among variety of products and services and they are concerned towards the value of money. Although many studies on the selection of bank have been conducted in many countries and in different segments but the findings of such studies cannot be applicable to all countries of the world due to the difference in cultural, political, economic and legal atmosphere. The aim of this study is to identify the most important factors that influencing customers' choice in respect of selecting a bank by customers in Rwanda. The study population is consisted of all the active customers of the ten licensed commercial banks existed at the end of 2014. This study relied on 40 selection factors extracted from relevant literature, personal experience, and the responses from some bank officials and customers given in the pilot test. A convenience (non-probability) sample of 400 customers has been selected to collect the primary data through a structured questionnaire designed in the scales of 5 point Likert-type ranging from 1 'strongly disagree' to 5 'strongly agree' and 325 respondents(which represents 8 observations per variable) have correctly completed the questionnaire. Principal components analysis approach and SPSS statistical software version 20 for Windows have been used to analyze the data and hence identify the factors that influence mostly customers to select banks to patronize.

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The findings for the total sample indicate that the bank selection decision is based primarily on twelve selection criteria following this order: The Appearance of the building, social influences, financial benefits, and availability of the bank in many places, Customer care, Time for delivering services, Convenience- Location, Assurance, variety of products, professionalism, brand name and lastly Recommendation of employer. Theoretically, this study fills the important gap in literature and practically, Exploring this question will help all competitors in banking sector small and large to prepare some appropriate banking marketing strategies to invite new customers, to maintain their customers and to retain the existing customers.

Keywords: bank selection; Rwanda; principal components; Availability of ATM.

1. Introduction

The service industry importance is gradually increasing in the world economy, Reference [1] shows that its value added is about 68% of world GDP. One of the most important participants in financial system is banking industry.

Many financial institution decision-makers are finding it essential to obtain information from consumers concerning the degree to which various product characteristics are important and how they influence choice decisions. Consequently, those in banking industry are becoming more marketing oriented, and marketing of financial services has emerged as an important topic in the bank selection literature. The banking industry plays an essential role in the economy in terms of resource mobilization and allocation and, is by far, the most important part of the financial system in developing economies, accounting for the bulk of the financial transactions and assets. In addition, banks have recently expanded in other activities such as securities markets, fund management, insurance, among others, blurring the distinction between banks and other financial markets. According to [2], it is expected that through reforms (increased competition), banks can potentially be the main source of financial innovation and efficiency or, in a worst case scenario, as a source of systemic risk to the financial structure through contagion, thus engendering macroeconomic instability and diminished investment and growth. Reference [3] showed that at the end of 2013 Rwanda's financial system is dominated by the banking sector. In this way banks have become very effective partners in the process of economic development. Reference [3] highlighted that even though Rwanda's financial sector has made remarkable achievement, it still faces major challenges that need addressing to enable the financial sector to contribute meaningfully to the overall performance of the country's economy because28% of the Rwandan population have no access to finance. By trying to find the solution, the government suggests that foreign banking institutions entrance into the banking sector is one opportunity**.**

The expansion of foreign banks in Rwanda is aggressively increasing a competition in banking sector. Due to the increase in competition in banking industry and similarity of the offered services, it has become imperative for the banks to identify the factors that influence customer's choice in selection of a bank. According to [4,5,6] most retail banking institutions do not achieve remarkable growth due to failure to identify and effectively manage factors that determine customers' choice of bank selection, therefore banks need to offer services which customers are in real need of in order to sustain the ever increasing market competition. To be successful in

financial services marketing is the ability to implement marketing strategies based on consumer needs and preferences. To attract prospective clients, the banks need to be aware of the factors driving clients to choose a particular bank. These studies on bank selection criteria provide the basis from which banks can formulate their acquisition and marketing strategies and in doing so, expand their existing client base.

Many studies have been conducted to investigate factors that determine customers' bank selection criteria. These studies demonstrate the importance of consistent review of factors that influence customers' choice of bank selection for retail banking service provision. Reference [8] shows that most of such studies were conducted mainly in USA and some studies were conducted in Europe but quite rare studies were conducted in the countries other than USA and Europe and up to now there is no such study investigated in Rwanda as far as I know. The literature shows that some studies focus on certain segments as it can be seen in [9;10;11;12;13;14;15;16;17] or mostly target general population as in [18;19;20;21;22;23;24].

Reference [9] shows that although these studies have been playing a vital role in bank selection criteria but the findings of the studies cannot be applicable to all countries of the world due to the difference in cultural, political, economic and legal atmosphere. Amongst some, the major factors explored to be demonstrating high influence on customers' bank selection criteria include secured electronic banking, ATM security, effective handling of customers' queries and complains, reliable service provision, functional ATMs, availability of innovative financial products, bank networking, nearness to home, school or workplace, account maintenance, service fees and related transactional costs.

The aim of this study is to identify the criteria that commercial bank customers prioritize in selection of bank in Rwandans. It will demonstrate how much influence that each consistent factor or criterion has on customers' choice of a bank to patronize. Exploring this question will help all competitors in banking sector small and large to prepare some appropriate banking marketing strategies to invite new customers, to maintain their customers and to retain the existing customers and for effective management of them.

2. Principal components analysis

2.1 Definition

Reference [25] Principal Component Analysis (PCA) is a technique of multivariate analysis which transforms a set of correlated variables (observed variables) to a new set of uncorrelated variables (not observed directly) called principal components without losing too much information. The goal of PCA is to reproduce as much of the information in the measured variables with as few principal components as possible. Thus these new uncorrelated variables are linear combinations of the original variables and the principal component analysis seeks to maximize the variance of a linear combination of the measured variables. It is also one of the oldest, and has been rediscovered many times in many fields, so it is also known as the Karhunen-Loève transformation, the Hotelling transformation, the method of empirical orthogonal functions, and singular value decomposition. Its general objectives are (1) data reduction and (2) interpretation.

An analysis of principal components seeks to maximize the variance of a linear combination of the variables and

often reveals relationships that were not previously suspected and thereby allows interpretations that would not ordinarily result. Algebraically PCA reduces the data set of n individual observations $y_1, y_2, \ldots, y_n$ and p observed variables $Z_1, Z_2, \ldots, Z_p$ to a smaller number data set of n observations $y_1, y_2, \ldots, y_n$ and k new uncorrelated variables $X_1, X_2, \ldots, X_k$ which account for most of the variance of the observed variables. The information on the measured variables is summarized in a $p \times p$ correlation matrix which is symmetric and positive definite.

The eigenvalues of a positive definite matrix are all positive and customary listed in descending order: $\lambda_1 > \lambda_2 > \ldots > \lambda_p$ The eigenvectors $x_1, x_2, \ldots, x_p$ are listed in the same order; x_1 corresponds to λ_1, x_2 corresponds to λ_2, and so on. If all elements of the positive definite matrix A are positive, then all elements of the first eigenvector are positive.(The first eigenvector is the one associated with the first eigenvalue, λ_1.). The first principal component is the linear combination with maximum variance. In other words, let the random vector $Z' = (z_1, z_2, \ldots, z_p)$ have the covariance matrix S with eigenvalues $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_p \geq 0$ and a_i as the eigenvector corresponding to the eigenvalue λ_i .

Consider the linear combinations

$$X_1 = a_1' Z = a_{11} z_1 + a_{12} z_2 + \cdots + a_{1p} z_p$$

$$X_2 = a_2' Z = a_{21} z_1 + a_{22} z_2 + \cdots + a_{2p} z_p$$

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. **(2.1)**

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$$X_p = a_p' Z = a_{p1} z_1 + a_{p2} z_2 + \cdots + a_{pp} z_p$$

Then $$Var(X_i) = a_i' S a_i \qquad i = 1, 2, \ldots, p \qquad \textbf{(2.2)}$$

$$Cov(X_i, X_k) = a_i' S a_k \qquad i, k = 1, 2, \ldots, p \qquad \textbf{(2.3)}$$

The principal components are those uncorrelated linear combinations $X_1, X_2, \ldots, X_p$ whose variances are as large as possible. The first principal component is the linear combination with maximum variance. That is, it maximizes $Var(X_1) = a'_1 S a_1$

$$The\ first\ principal\ component = linear\ combination\ a_1' Z\ that\ maximizes\ Var(a_1' Z)$$

$$subject\ to\ a_1' a_1 = 1 \quad (2.4)$$

$$The\ second\ principal\ component = linear\ combination\ a_1' Z\ that\ maximizes\ Var(a_2' Z)$$

$$subject\ to\ a_2' a_2 = 1\ and\ Cov(a_1' Z, a_2' Z) = 0 \quad (2.5)$$

At the ith step

$$The\ ith\ principal\ component = linear\ combination\ a'.Z\ that\ maximizes\ Var(a'.Z)$$

$$subject\ to\ a_i' a_i = 1\ and\ Cov(a_i' Z, a'.Z) = 0\ for\ k < i \quad (2.6)$$

Therefore the ith principal component is given by

$$X_i = a_i' Z = a_{i1} z_1 + a_{i2} z_2 + \cdots + a_{ip} z_p \quad (2.7)$$

where a_i is the eigenvector corresponding to the eigenvalue λ_i of the covariance matrix S with these choices.

2.2 Factor interpretation and respecification

Cross-loading: a variable has two or more factor loadings exceeding the threshold value necessary for inclusion in the factor interpretation process. In the final process of factor interpretation, the researcher evaluates the rotated factor loadings for each variable in order to determine that variable's role and contribution in determining the factor structure. In this evaluative process, the need may arise to respecify the factor model owing, to (1) the deletion of a variable(s) from the analysis, (2) the desire to employ a different rotational method for interpretation, (3) the need to extract a different number of factors, or (4) the desire to change from one extraction method to another. Respecification of a factor model involves returning to the extraction stage, extracting factors, and then beginning the process of interpretation once again.

2.3 The significance of factor loadings

In interpreting factors, a decision must be made regarding the factor loadings worth consideration and attention. The first issue in judging practical and statistical significance is not based on any mathematical proposition but relates more to practical significance by making a preliminary examination of the component matrix in terms of the factor loadings. Because a factor loading is the correlation of the variable and the factor, the squared loading is the amount of the variable's total variance accounted for by the factor. Thus, the larger the absolute size of the factor loading, the more important the loading in interpreting the factor matrix. Using practical significance as the criteria, we can assess the loadings as follows:

- Factor loadings in the range of ± 30 to ± 40 are considered to meet the minimal level for interpretation of structure.
- Loadings ± 50 or greater are considered practically significant.
- Loadings exceeding 0.70 are considered indicative of well-defined structure.

These guidelines are applicable when the sample size is 100 or larger and where the emphasis is on practical, not statistical significance.

3. Materials and Methods

3.1 Research Instrument

To meet the objectives of the research and for further analysis and references, a survey has been conducted to collect the primary data through a structured questionnaire designed in the scales of 5 point Likert-type ranging from 1"strongly disagree" to 5 "strongly agree" and this covering the different attributes that customers perceive as important in the selection of the banks. The questionnaire consisted of 40 initial variables picked from the relevant literature and the results of pilot test.

Table 3.1: Initial variables

Code	Variable	Code	Variable
z_1	Office branch near home	z_{21}	Availability of ATM machines in several locations
z_2	Office branch near my work /institution	z_{22}	Easy to apply for VISA debit and credit cards
z_3	The building looks well externally	z_{23}	Speed of transaction services is high
z_4	The building looks well internally	z_{24}	Affordable interest rate on loans
z_5	Sitting arrangements	z_{25}	Handsome return on deposits
z_6	Parking place nearby	z_{26}	Minimum Service charges
z_7	Family relatives advice	z_{27}	Providing interest on minimum deposit
z_8	Advice of teachers or lecturer lecturers	z_{28}	There are many facilities to obtain loans
z_9	Recommendations of my employer	z_{29}	Bank is open many hours per day
z_{10}	Recommendations of friends	z_{30}	Bank is open many days per week
z_{11}	Recommendations of parents	z_{31}	Competence of the staff
z_{12}	having a friend in the staff	z_{32}	Financial stability
z_{13}	Internet banking	z_{33}	Friendliness of the branch's staff members
z_{14}	Advertisement	z_{34}	Variety of products and services
z_{15}	Loan promotional campaign	z_{35}	Security of customer's bank account
z_{16}	Reception at the bank	z_{36}	Short waiting time in the queue
z_{17}	Class of people who patronize the bank	z_{37}	Flexibility of opening bank accounts
z_{18}	With ATM card you can get your money from another bank	z_{38}	You can get your money in many countries
z_{19}	Phone banking facilities	z_{39}	Exit barrier
z_{20}	Agency banking	z_{40}	Reputation

The questions were organized into two sections as follows: the first section of the questionnaire asked the respondent to complete his/her identification; the second section of the questionnaire asked the respondent to rate the relative importance of the 40 bank attributes when choosing which commercial bank to patronize. To ensure all respondents can understand and answer questions precisely, the questionnaire has been designed in two forms which are similar, one in English and the other second in Kinyarwanda language. The values of these initial variables have been used to reduce their dimensionalities to a new set of small number of uncorrelated variables called principal components. The Table 3.1 presents forty variables drawn from the relevant literature and the codes as they have been used in the analysis.

3.2 Sampling and data analysis

Reference [26] states that to date the banking sector in Rwanda is comprised of 10 commercial banks, 4 microfinance banks, one development bank and one cooperative bank. The commercial banks dominate the sector by 81.2% of the total banking sector assets. Given the nature of the study and time constraint, this study used the sample taken from commercial bank customers residing in the districts of Kigali city because all banks settled their branches in Kigali city for a long time than in any other city or district of the country and the concentration of the people. A sample size of 400 (which represents 10:1 ratio of observations to variables or ten observations per variable) is thought to be adequate and a convenience (non-probability) sample of customers from nine different commercial banks has been selected to complete the questionnaires. Self-administered questionnaires were distributed to customers and for the total sample of 400 questionnaires distributed, only 375 questionnaires were returned, out of which 325 were correctly completed and deemed usable (which represents 8:1 ratio of observations to variables or eight observations per variable), thereby yielding a response rate of about 81 percent. Such a response rate was considered high and sufficient for statistical reliability. This relatively high response rate was attributed to the self-administered approach undertaken in distributing questionnaires. All analyses have been conducted using SPSS statistical software version 20 for Windows.

4. Results and Discussion

4.1 Results

4.1.1 Consistency of the questions

Reliability: extent to which a variable or a set of variables is consistent in what it is intended to measure.

Table 4.1: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.893	.894	40

A level of alpha that indicates an acceptable level of reliability has traditionally been 0.70 or higher and in an exploratory research a value of 0.60 or higher is acceptable. In the research discussed in this document, Cronbach's alpha is .893 and its standardized form is .894 and since in this research item standard scores are not summed to form scale scores Standardized alpha is not appropriate, however, Cronbach's alpha has been used to assess the consistency of the questions and a value of 0.8993 indicates that the item are reliable.

4.1.2 Appropriateness of PCA

Table 4.2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.763
Bartlett's Test of Sphericity	Approx. Chi-Square	5.071E3
	Df	780
	Sig.	.000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy

From the table 4.2 above the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .763 which falls in the range of being middling (above 0.70), so we should be confident that the sample selected is adequate and we may proceed with the principal components analysis.

Bartlett's Test of Sphericity

Null hypothesis: H_0 : there is no statistically significant interrelationship between variables affecting the selection of a bank. Alternate hypothesis: H_1: there may be a statistically significant interrelationship between variables affecting the selection of a bank.

Taking a 95% level of Significance, $\alpha = 0.05$ and using the result from the Table 4.2 the p-value (Sig.) of .000 < 0.05, the Bartlett's measure is found to be highly significant as the value $p<0.05$, and we therefore reject the null hypothesis H_0 and accept the alternate hypothesis (H_1) that there may be statistically significant interrelationship between variables. The Bartlett's Test of Sphericity shows that factor analysis (principal components analysis) is appropriate.

The Kaiser-Meyer Olkin (KMO) and Bartlett's Test measure of sampling adequacy all show the appropriateness of Principal Components Analysis. The approximate of Chi-square is 5071 with 780 degrees of freedom, which is significant at 0.05 level of significance.

4.1.3 Number of Extracted principal components

Table 4.3: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.283	20.708	20.708	8.283	20.708	20.708	3.514	8.786	8.786
2	2.756	6.889	27.597	2.756	6.889	27.597	2.867	7.168	15.953
3	2.432	6.079	33.676	2.432	6.079	33.676	2.724	6.810	22.763
4	1.938	4.844	38.521	1.938	4.844	38.521	2.645	6.613	29.376
5	1.816	4.540	43.060	1.816	4.540	43.060	2.489	6.222	35.599
6	1.639	4.097	47.158	1.639	4.097	47.158	1.994	4.985	40.583
7	1.479	3.698	50.855	1.479	3.698	50.855	1.990	4.975	45.559
8	1.392	3.481	54.336	1.392	3.481	54.336	1.807	4.516	50.075
9	1.360	3.399	57.736	1.360	3.399	57.736	1.788	4.470	54.545
10	1.183	2.957	60.693	1.183	2.957	60.693	1.772	4.429	58.974
11	1.153	2.882	63.575	1.153	2.882	63.575	1.632	4.079	63.053
12	1.049	2.623	66.198	1.049	2.623	66.198	1.258	3.145	66.198
13	.969	2.423	68.620						
14	.914	2.286	70.906						
15	.869	2.174	73.079						
16	.808	2.019	75.098						
17	.802	2.005	77.103						
18	.713	1.781	78.885						
19	.669	1.671	80.556						
20	.664	1.659	82.215						
21	.605	1.512	83.727						
22	.577	1.444	85.170						
23	.552	1.381	86.551						
24	.510	1.276	87.827						
25	.477	1.193	89.021						
26	.456	1.139	90.160						
27	.424	1.061	91.220						
28	.391	.977	92.197						
29	.375	.937	93.135						
30	.356	.889	94.024						
31	.340	.850	94.874						
32	.302	.756	95.630						
33	.282	.706	96.336						
34	.269	.674	97.009						
35	.239	.598	97.607						
36	.236	.591	98.198						
37	.220	.549	98.747						
38	.188	.471	99.218						
39	.165	.411	99.630						

Table 4.3: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.283	20.708	20.708	8.283	20.708	20.708	3.514	8.786	8.786
2	2.756	6.889	27.597	2.756	6.889	27.597	2.867	7.168	15.953
3	2.432	6.079	33.676	2.432	6.079	33.676	2.724	6.810	22.763
4	1.938	4.844	38.521	1.938	4.844	38.521	2.645	6.613	29.376
5	1.816	4.540	43.060	1.816	4.540	43.060	2.489	6.222	35.599
6	1.639	4.097	47.158	1.639	4.097	47.158	1.994	4.985	40.583
7	1.479	3.698	50.855	1.479	3.698	50.855	1.990	4.975	45.559
8	1.392	3.481	54.336	1.392	3.481	54.336	1.807	4.516	50.075
9	1.360	3.399	57.736	1.360	3.399	57.736	1.788	4.470	54.545
10	1.183	2.957	60.693	1.183	2.957	60.693	1.772	4.429	58.974
11	1.153	2.882	63.575	1.153	2.882	63.575	1.632	4.079	63.053
12	1.049	2.623	66.198	1.049	2.623	66.198	1.258	3.145	66.198
13	.969	2.423	68.620						
14	.914	2.286	70.906						
15	.869	2.174	73.079						
16	.808	2.019	75.098						
17	.802	2.005	77.103						
18	.713	1.781	78.885						
19	.669	1.671	80.556						
20	.664	1.659	82.215						
21	.605	1.512	83.727						
22	.577	1.444	85.170						
23	.552	1.381	86.551						
24	.510	1.276	87.827						
25	.477	1.193	89.021						
26	.456	1.139	90.160						
27	.424	1.061	91.220						
28	.391	.977	92.197						
29	.375	.937	93.135						
30	.356	.889	94.024						
31	.340	.850	94.874						
32	.302	.756	95.630						
33	.282	.706	96.336						
34	.269	.674	97.009						
35	.239	.598	97.607						
36	.236	.591	98.198						
37	.220	.549	98.747						
38	.188	.471	99.218						
39	.165	.411	99.630						
40	.148	.370	100.000						

Table 4.3: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.283	20.708	20.708	8.283	20.708	20.708	3.514	8.786	8.786
2	2.756	6.889	27.597	2.756	6.889	27.597	2.867	7.168	15.953
3	2.432	6.079	33.676	2.432	6.079	33.676	2.724	6.810	22.763
4	1.938	4.844	38.521	1.938	4.844	38.521	2.645	6.613	29.376
5	1.816	4.540	43.060	1.816	4.540	43.060	2.489	6.222	35.599
6	1.639	4.097	47.158	1.639	4.097	47.158	1.994	4.985	40.583
7	1.479	3.698	50.855	1.479	3.698	50.855	1.990	4.975	45.559
8	1.392	3.481	54.336	1.392	3.481	54.336	1.807	4.516	50.075
9	1.360	3.399	57.736	1.360	3.399	57.736	1.788	4.470	54.545
10	1.183	2.957	60.693	1.183	2.957	60.693	1.772	4.429	58.974
11	1.153	2.882	63.575	1.153	2.882	63.575	1.632	4.079	63.053
12	1.049	2.623	66.198	1.049	2.623	66.198	1.258	3.145	66.198
13	.969	2.423	68.620						
14	.914	2.286	70.906						
15	.869	2.174	73.079						
16	.808	2.019	75.098						
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18	.713	1.781	78.885						
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20	.664	1.659	82.215						
21	.605	1.512	83.727						
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24	.510	1.276	87.827						
25	.477	1.193	89.021						
26	.456	1.139	90.160						
27	.424	1.061	91.220						
28	.391	.977	92.197						
29	.375	.937	93.135						
30	.356	.889	94.024						
31	.340	.850	94.874						
32	.302	.756	95.630						
33	.282	.706	96.336						
34	.269	.674	97.009						
35	.239	.598	97.607						
36	.236	.591	98.198						
37	.220	.549	98.747						
38	.188	.471	99.218						
39	.165	.411	99.630						

Extraction Method: Principal Component

In the Table 4.3 above all the 40 components have not been retained, only the components with eigenvalues greater than 1 have been retained, Eigen values represent the amount of standardized variance that has been captured by each of the components, the initial components are the numbers of the variables used in the Factor Analysis. In the present research only the 12 factors will be extracted by combining the relevant variables. The total column contains the Eigenvalue. The principal component which comes first to explain the selection of the bank is the one with the highest eigenvalue and accounts for 20.708% of the variance. The second principal component or factor which accounts for 6.889% explain much of the left variance as it can and the same will continue till the last(12^{th}) principal component to be retained which accounts for 2.623% . The percentage of variance represents the percent of total variance accounted by each factor or principal component and the cumulative percentage gives the cumulative percentage of variance account by the present and the preceding factors. In the present research the first 12 factors explain 66.198% of the total variance. Note that the components 13 through 40 with eigenvalues less than 1 were eliminated, although together they represent over 30% of the variance explained. However, any one of the components account for very little variance.

4.1.4 Extracted principal components

The component matrix indicates how each item in the analysis correlates with each of the extracted 12 factors. Negative and positive correlations carry the same weight. The factor loadings associated with a variable is the correlation between the factor and the standard score of the variable. Usually, each of the variables is highly loaded in one factor and less loaded towards the other factors. To identify the variables, included in each factor, the variable with the maximum value in each row is selected to be part of the respective factor. The Table 4.4 presents Component Matrix with initial factor loadings and the Table 4.5 presents Rotated Component Matrix with factor loadings greater than 0.35 suppressing the components with factor loadings less than 0.35. Both the Table 4.4 and Table 4.5 present some variables which load on more than one component ,therefore cannot be used for interpretation and a target value of 0.5 or 0.6 is typically more useful. Loadings that are: more than .5 are typically considered strong, between .3 and .5 are acceptable and Less than .3 are typically considered weak. After rotation (varimax with Kaiser normalization) and by suppressing the components with factor loadings less than 0.5, we have the results in the Table 4.6 with no cross- loadings and can be used for interpretation .

Table 4.4: The component matrix

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
z1	.221	.065	.367	.011	.479	-.141	-.102	-.191	-.010	-.245	-.286	-.173
z2	.169	-.041	.432	.075	.468	-.228	.102	-.010	-.056	-.087	.159	.050
z3	.510	.288	-.279	.280	.144	-.335	.147	-.162	-.065	-.059	-.033	-.094
z4	.610	.070	-.394	.256	.053	-.301	-.062	-.171	.031	-.117	-.104	-.012
z5	.637	-.058	-.323	.019	.049	-.308	-.015	-.288	.044	-.109	.120	-.072
z6	.499	.229	-.443	.000	-.140	-.220	-.036	.069	-.290	-.094	-.104	.015

z7	.430	.455	-.098	-.091	.235	.103	-.079	.254	.131	.005	.138	-.373
z8	.392	.483	-.059	.256	-.009	.368	-.125	-.014	.181	.088	-.039	-.002
z9	.237	.209	.145	.376	.007	-.075	.105	.022	.338	-.368	.307	.418
z10	.261	.386	-.124	-.124	.324	.355	.372	-.144	-.046	.275	-.236	-.004
z11	.465	.449	.137	.220	-.148	.317	.001	.122	.216	-.086	-.009	-.149
z12	.504	.367	-.118	.111	.114	-.044	.061	.074	.114	.190	-.181	-.065
z13	.341	-.193	.200	.159	-.032	-.020	-.010	-.433	.264	.517	.060	.000
z14	.510	.277	.174	-.146	-.144	-.306	.155	-.013	-.297	.149	.010	.025
z15	.542	-.009	.162	.050	.142	.294	-.284	-.230	.262	-.069	-.139	.070
z16	.609	-.162	.178	.123	.263	.131	.107	-.045	-.216	-.013	-.139	.033
z17	.457	.136	-.147	-.279	.299	-.312	.127	.046	.104	.103	.170	.078
z18	.554	-.097	.107	.105	-.234	-.264	-.018	.267	.061	.268	-.058	.174
z19	.405	-.116	.381	.341	-.172	.012	.035	-.049	-.287	-.163	-.128	-.275
z20	.425	.111	.464	-.092	-.395	-.023	-.072	-.213	.111	.106	-.130	.040
z21	.389	.152	.555	-.063	-.150	-.213	.138	.021	-.239	.078	.009	.005
z22	.378	.170	.475	.066	.168	.121	-.356	.188	-.201	-.085	.290	-.009
z23	.521	-.246	.055	-.045	.245	.099	-.345	-.088	-.021	.103	.303	.059
z24	.596	-.192	-.131	-.247	-.084	.058	.086	.005	.156	-.304	.043	-.028
z25	.436	-.144	.236	-.204	-.389	-.069	.286	.133	.282	-.019	.054	-.242
z26	.354	-.327	.189	-.345	.168	.129	.365	.091	.139	-.205	-.198	.185
z27	.427	-.170	.024	.207	-.194	-.074	.097	.269	.289	-.013	-.248	-.089
z28	.524	-.036	.141	-.533	-.017	-.049	.101	.104	.062	-.117	.020	-.141
z29	.526	-.295	-.032	-.029	-.095	.000	.032	-.354	.129	.009	-.026	.299
z30	.500	-.322	-.091	.197	-.080	.034	-.250	.162	-.270	-.052	-.203	.074
z31	.522	.105	-.075	-.389	.128	.103	-.073	.170	-.133	.335	.141	.153
z32	.307	-.158	.079	.293	.154	-.174	-.051	.549	.150	.144	.062	.140
z33	.578	.059	-.319	-.221	-.003	.165	-.196	.194	-.022	-.062	-.200	.252
z34	.347	-.518	-.103	.050	.219	.207	.062	.151	-.108	-.011	-.255	.068
z35	.329	-.467	-.183	.368	-.082	.232	.184	.084	-.083	.114	.175	-.220
z36	.543	.070	-.184	-.270	-.228	.262	.047	-.139	-.075	-.243	.280	-.078
z37	.450	-.527	-.021	-.042	.135	.101	-.046	-.091	-.092	.091	.176	-.246
z38	.422	.298	.091	.044	-.349	.257	.016	-.109	-.400	-.065	.037	.268
z39	.480	-.210	-.265	-.066	-.206	-.091	-.314	-.034	.063	.049	.094	-.138
z40	.168	-.062	-.165	.340	.064	.232	.600	.008	-.148	.027	.307	.069

Extraction Method: Principal Component Analysis.

a. 12 components extracted.

Table 4.5: Rotated Component Matrix with factor loadings greater than 0.35[a]

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
z4	,812											
z3	,755											
z5	,740											
z6	,694											
z39	,396				,363							
z8		,746										
z11		,742										
z7		,617										
z12	,389	,509										
z10		,495						,443				
z15		,417										
z21			,697									
z38			,657									
z14			,634									
z20			,539						,394			
z25				,772								
z28				,651								
z24				,563								
z26				,557		,498						
z27				,424						,419		
z23					,683							
z37					,551							
z22			,412		,536							
z36				,374	,386							
z34						,712						
z33						,492						
z30						,487						
z16						,483						
z1							,731					
z2							,684					
z31								,620				
z17	,365							,598				
z19			,466					-,497				
z13									,823			
z29									,503			
z32										,749		
z18			,360							,576		
z40											,815	
z35											,603	
z9												,811

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 16 iterations.

Table 4.6: Rotated Component Matrix with factor loadings greater than 0.5[a]

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
z4	,812											
z3	,755											
z5	,740											
z6	,694											
z39												
z8		,746										
z11		,742										
z7		,617										
z12		,509										
z10												
z15												
z21			,697									
z38			,657									
z14			,634									
z20			,539									
z25				,772								
z28				,651								
z24				,563								
z26				,557								
z27												
z23					,683							
z37					,551							
z22					,536							
z36												
z34						,712						
z33												
z30												
z16												
z1							,731					
z2							,684					
z31								,620				
z17								,598				
z19												
z13									,823			
z29									,503			
z32										,749		
z18										,576		
z40											,815	
z35											,603	
z9												,811

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 16 iterations.

4.2 Interpretation of the retained Principal components

From the Table 4.6 above, the Table 4.7 below gives the retained principal components and the names given to each depending on the variables that include into each core factor and the order of importance as given by the bank customers.

Table 4.7: Names of the twelve core principal components

Principal component	Variables Included	Component loading	Name of the Factor	% of variance
X_1	Z_4:The building looks well internally Z_5: There are sitting arrangements at the branch office Z_3:The building looks well externally Z_6: There is a parking place nearby	0.812 0.755 0.740 0.694	Appearance	8.786
X_2	Z_8: My teacher/lecturer advised me to join it Z_{11}: Influenced by parents Z_7: The family relatives advised me Z_{12}: having a friend in the staff	0.746 0.742 0.617 0.509	Social influences	7.168
X_3	Z_{21}: ATM machines are available in several locations Z_{38}: You can get your money in many places of the world Z_{14}: I heard it in advertisement Z_{20}: It has agents in several locations	0.697 0.657 0.634 0.539	Availability in many places	6.810
X_4	Z_{25}: Handsome return on deposits Z_{28}: There is many facilities to obtain loans Z_{24}: Affordable interest rates on loans Z_{26}: Minimum service charges	0.772 0.651 0.563 0.557	Financial benefits	6.613
X_5	Z_{23}: The speed of transaction is high Z_{37}: Flexibility of opening bank accounts Z_{22}: To apply for VISA debit and credit cards is easy	0.683 0.551 0.536	Customer care	6.222
X_6	Z_{34}: There is a variety of products and services	0.712	Variety of products	4.985
X_7	Z_1: The office branch is near home Z_2: The office branch is near my work/institution	0.731 0.684	Convenience-Location	4.975
X_8	Z_{31}: The staff is competent Z_{17}: Class of people who patronized the bank	0.620 0.598	Professionalism	4.516
X_9	Z_{13}: The bank uses internet banking Z_{29}:bank is open many hours per day	0.823 0.503	Time for delivering services	4.470
X_{10}	Z_{32}: Financial stability of the bank Z_{18}: With ATM you can get your money using another bank	0.749 0.576	Assurance	4.429
X_{11}	Z_{40}: It has a good reputation Z_{35}: There is security of customer's bank account	0.815 0.576	Brand name	4.079
X_{12}	Z_9: My employer recommended me this bank	0.811	Recommendation of employer	3.145

5. Conclusion and recommendations

5.1 Conclusion

The banking industry in Rwanda is operating under a more competitive financial atmosphere and offering a wider variety of financial services. The aim of this study was to identify the main factors that influence the customers in the selection of banks in Rwanda. Forty bank attributes taken from the relevant literature and customers have used to collect the data through the structured questionnaire and the principal component analysis approach has been used to summarize the collected information. Nevertheless, the principal component analysis approach of the data collected from the respondents revealed that twelve factors influence the

customers in the selection of bank in Rwanda. The factor identified and coming at the first rank is the '**Appearance of the building';** The second factor in rank is **'social influences'**;The third factor identified is 'financial benefits' ;The factor which comes to the fourth position is Availability in many places and others follow in this manner: Customer care; Variety of products; Convenience- Location; Assurance; Time for delivering services; professionalism; brand name and lastly Recommendation of employer.

The value of this study is that it has identified the most important factors influencing the bank selection by customers in Rwanda and is the first of its kind in Rwanda. Theoretically, it fills the important gap in literature and this is especially relevant given the competitive nature for banking clientele in Rwanda. Therefore, the inclusion of the findings of this study in the existing literature can serve as the starting point for future studies. Practically, this study will help the management of the commercial banks to capture the market of the future and existed customers, and to enhance the market size by offering desired services to attract potential customers.

5.2 Recommendations

In this study much emphasis was given to identify the main factors influencing the bank selection by considering only customers of commercial banks and by using principal components analysis approach; however some areas and approaches remain uncovered. The limitations of this study were: the non-probability sampling in the selection of respondents (customers from different commercial banks) due to lack of information about their identification, the results of this study are based on the responses within Kigali city. To overcome these limitations further studies need to be conducted to verify whether or not the bank selection criteria obtained by using either a different method of sampling or any other approach like exploratory factor analysis or confirmatory analysis approach are consistent with this findings.

Therefore, the results and ideas presented in here is by no means conclusive. Although the sample used to collect the data in the study were conveniently selected, the majority of the respondents doubted the purpose of the questionnaire and was not familial in completing it. This may be seen as a limitation to the study, but with explanations given to them and necessity of leaving some questions of part A not answered, have permitted us to reach the sample size needed to represent the study population.

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