CUSTOMER SATISFACTION MEASUREMENT IN THE PRIVATE BANK SECTOR

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Abstract

Customer satisfaction represents a modern approach for quality in enterprises and organisations and serves the development of a truly customer-focused management and culture. Measuring customer satisfaction offers an immediate, meaningful and objective feedback about clients' preferences and expectations. In this way, company's performance may be evaluated in relation to a set of satisfaction dimensions that indicate the strong and the weak points of a business organisation. This paper presents an original customer satisfaction survey in the private bank sector. The implemented methodology is based on the principles of multicriteria analysis and preference disaggregation modelling. The most important results are focused on the determination of the critical service dimensions and the segmentation to customer clusters with distinctive preferences and expectations.

Key words: Multicriteria analysis, preference disaggregation, ordinal regression, customer satisfaction analysis

1. INTRODUCTION

Modern management science's philosophy considers customer satisfaction as a baseline standard of performance and a possible standard of excellence for any business organisation (Gerson, 1993). Moreover, customer satisfaction measurement provides a sense of achievement and accomplishment for all employees involved in any stage of the customer service process. In this way, satisfaction measurement motivates people to perform and achieve higher levels of productivity (Hill, 1996; Wild, 1977; Wild, 1980).

To reinforce customer orientation on a day-to-day basis, a growing number of companies choose customer satisfaction as their main performance indicator. It is almost impossible, however, to keep an entire company permanently motivated by a notion as abstract and intangible as customer satisfaction. Therefore, customer satisfaction must be translated into a number of measurable parameters directly linked to people's job -in other words factors that people can understand and influence (Deschamps and Nayak, 1995).

The aim of this paper is to present an original customer satisfaction survey conducted in the Greek private bank sector. The methodological approach is based on the principles of multicriteria modelling, while a preference disaggregation method is used for data analysis and interpretation. The survey took place in different branches of the Commercial Bank of Greece, in order to illustrate benchmarking capabilities within a business organisation.

The objectives of the customer satisfaction survey are focused on the assessment of the critical satisfaction dimensions and the determination of customer groups with distinctive preferences and expectations. In particular, the purpose of this application consists of a set of the most important queries expressed by the managers of the Commercial Bank of Greece:

- Which are the satisfaction parameters and which is their impact to customer behaviour?
- Which is the importance of these factors?
- How many customers are satisfied or dissatisfied?
- Which is the satisfaction level according to the characteristics of provided service?
- Which is the average global satisfaction level according to customers' preference and expectations?
- Which are the weak and the strong points of the bank?
- Which are the satisfaction dimensions that should be improved and how this improvement can be achieved?

This paper is organised into 5 sections. Section 2 presents briefly the basic principles of the multicriteria preference disaggregation approach, as well as the implemented methodological frame. Preliminary client behavioural analysis and customer satisfaction survey design are described in section 3, while the main results of the application are presented in section 4. Section 5 summarises some concluding remarks, as well as the basic advantages of a permanent customer satisfaction measurement approach. Finally, a detailed presentation of the used preference disaggregation MUSA model (MUlticriteria Satisfaction Analysis) is given in Appendix A, while a form of the questionnaire used in the survey is presented in Appendix B.

2. PREFERENCE DISAGGREGATION APPROACH

2.1 Basic principles

The main objective of the MUSA model is the aggregation of individual judgements into a collective value function assuming that client's global satisfaction depends on a set of criteria or variables representing service characteristic dimensions (Figure 1).

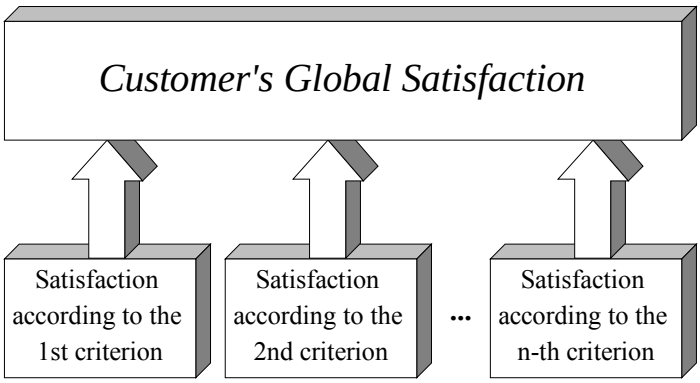

Figure 1: Aggregation of customer's preferences

The preference disaggregation methodology is an ordinal regression based approach (Jacquet-Lagrèze and Siskos, 1982; Siskos, 1985; Siskos and Yannacopoulos, 1985) in the field of multicriteria analysis used for the assessment of a set of marginal satisfaction functions in such

a way that the global satisfaction criterion becomes as consistent as possible with customer's judgements.

According to the model, each customer is asked to express his/her judgements, namely his/her global satisfaction and his/her satisfaction with regard to the set of discrete criteria (see Siskos *et al*., 1998 and Grigoroudis *et al*., 1998 for further details).

A more detailed presentation of the mathematical development of the model is presented in Appendix A.

2.2 Satisfaction analysis results

The main results from the aforementioned preference disaggregation approach are focused on global and partial explanatory analysis. Global explanatory analysis lays emphasis on customers' global satisfaction and its primary dimensions, as indicated in Figure 1, while partial explanatory analysis focuses on each criterion and their relevant parameters separately.

Satisfaction analysis results, in more detail, consist of:

1. **Global satisfaction index**: this average index shows in a range of 0-100% the level of global satisfaction of the customers; it may be considered as the basic average performance indicator for the business organisation.
2. **Added value curve**: this curve shows the real value (0-100) that customers give for each level of the global ordinal satisfaction scale; the form of the curve indicates if customers are demanding.
3. **"Fragile" customers**: the % of customers receiving satisfaction value less than a particular level can be calculated, using the global added value; this curve represents the probability distribution function of the added value curve. In this way, if a particular level of the added value curve is believed to be critical, the percentage of "fragile" customers can be calculated.
4. **Criteria/Subcriteria satisfaction indices**: these indices show in a range of 0-100% the level of partial satisfaction of the customers according to the specific criterion/subcriterion, similarly to the global satisfaction index.
5. **Weights of criteria/subcriteria**: they show the relative importance within a set of criteria or subcriteria.

Combining weights and satisfaction indices, a series of "Perform/Importance" diagrams can be developed (Figure 2). These diagrams are also mentioned as action, decision, and strategic or perceptual maps (Customers Satisfaction Council, 1995; Dutka, 1994; Naumann and Giel, 1995). Each of these maps is divided into quadrants according to performance (high/low), and importance (high/low), that may be used to classify actions:

- Status quo (low performance and low importance): Generally, no action is required.
- Leverage opportunity (high performance/high importance): These areas can be used as advantage against competition.
- Transfer resources (high performance/low importance): Company's resources may be better used elsewhere.
- Action opportunity (low performance/high importance): These are the criteria/subcriteria that need attention.

This grid can be used in order to identify priorities for improvement. The bottom right quadrant is obviously the first priority, for the attributes are important to customers but company's performance is rated moderately low. The second priority may be given to the satisfaction

criteria/subcriteria in the top right quadrant, especially if there is room for improvement. The third priority issues are indicated in the bottom left quadrant; although these issues are not terribly pertinent at the time of the analysis, they may be more important in the future, and company's performance is certainly not good. Finally, last priority for improvement can be given to the criteria/subcriteria in the top left quadrant because this category is the least important and company's performance is relatively good. Apparently, priorities for improvement can vary among different companies, depending on the potential capabilities of improving the particular category.

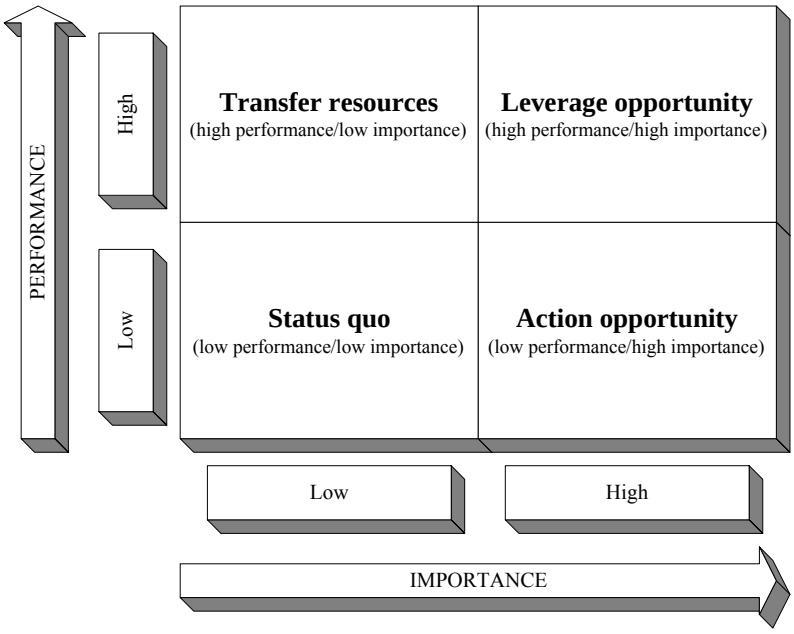

Figure 2: Performance/Importance diagram

2.3 Methodological frame

The main stages of the customer satisfaction survey were based on the methodology presented in Figure 3. This research process consists of the steps below (Hayes, 1992):

1. **Preliminary analysis**: customer satisfaction research objectives should be specified in this stage; preliminary market and customer behavioural analysis should be conducted in order to assess satisfaction dimensions (customers' consistent family of criteria).
2. **Questionnaire design and conducting survey**: using results from the previous step, this stage refers to the development of the questionnaire, the determination of survey parameters (sample size, collection data form, etc.) and the survey conduction.
3. **Analysis**: the implementation of the model is included in this stage providing several results as described in the previous paragraph. Analysis is performed into the total set of customers, as well as into distinctive customer segments. Provided results involve basic descriptive statistical models, as well as the multicriteria preference disaggregation MUSA model.
4. **Results**: using the results from the analysis stage, final proposals for company's improvement strategy can be formulated; a reliability testing process for the results of the model is also included in this stage.

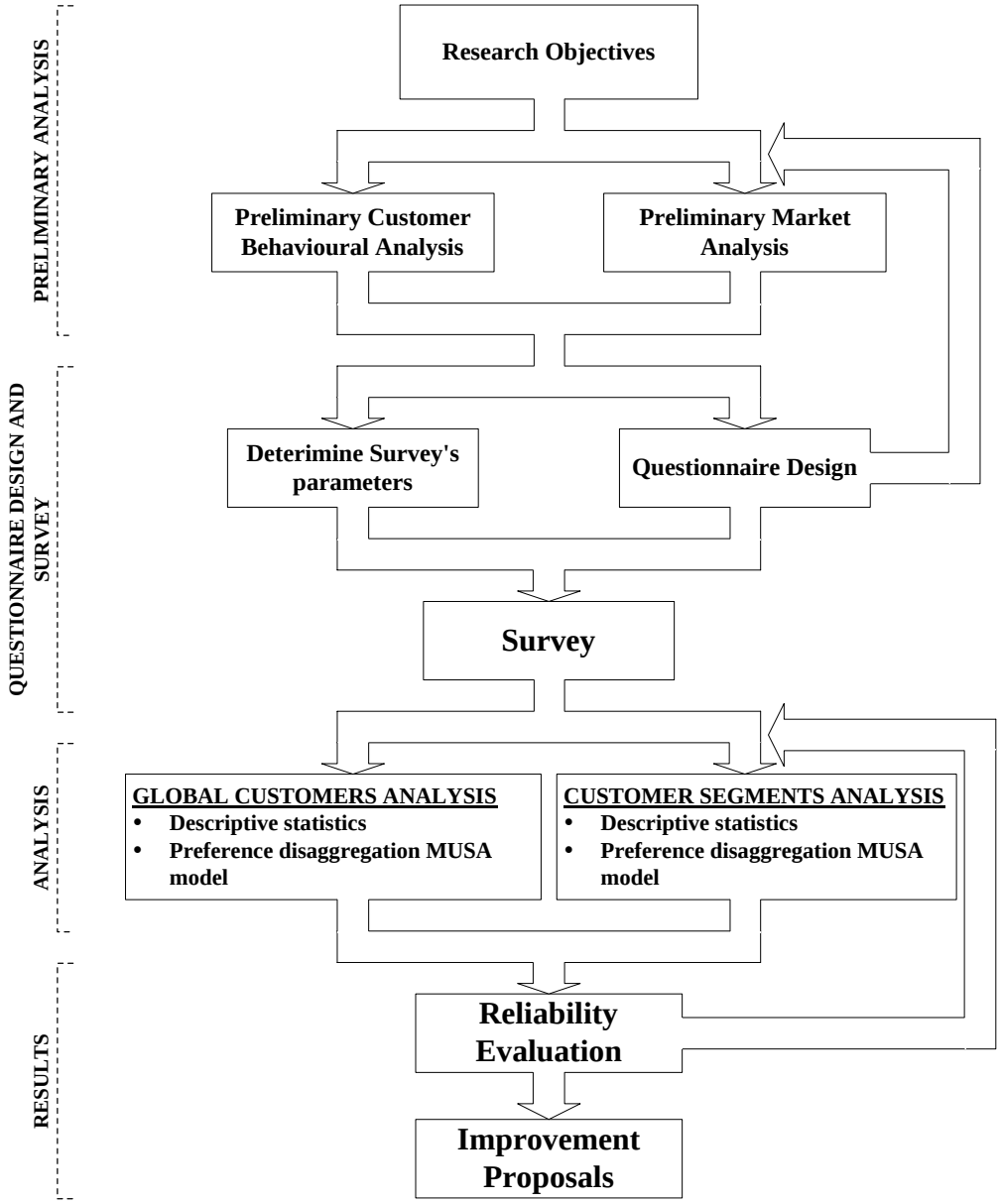

Figure 3: Customer satisfaction survey process

3. CUSTOMER SATISFACTION SURVEY

3.1 Satisfaction criteria

The assessment of a consistent family of criteria representing customers' satisfaction dimensions is one of most important stages of the implemented methodology, as mentioned in the previous section. This assessment can be achieved through an extensive interactive procedure between the analyst and the decision-maker (company). In any case, the reliability of the set of criteria/subcriteria has to be tested in a small indicative set of customers.

The hierarchical structure of customers' satisfaction dimensions is presented in Figure 4 and it indicates the set of criteria and subcriteria used in this survey.

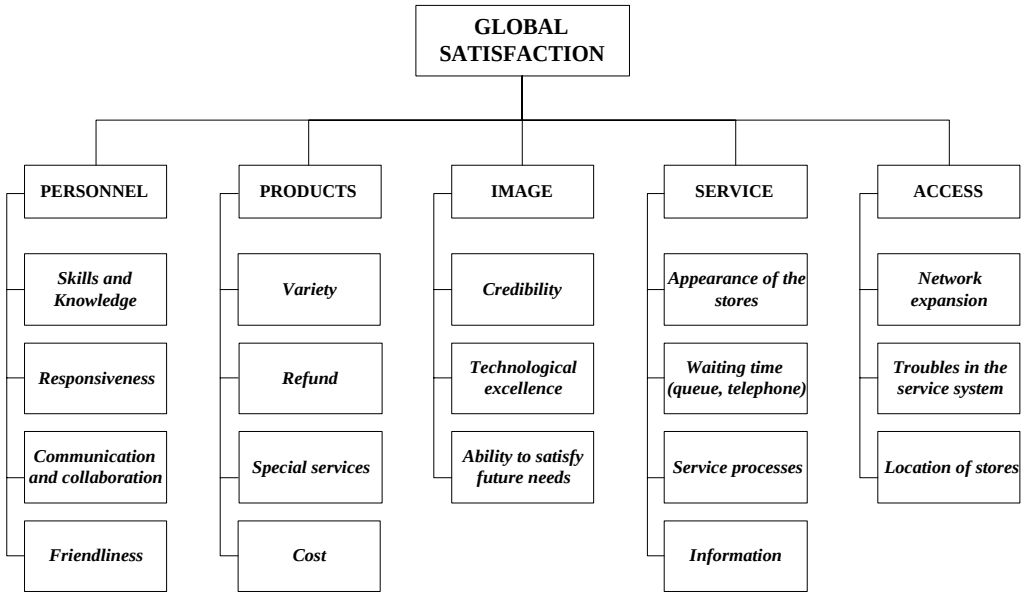

Figure 4: Hierarchical structure of customers' satisfaction dimensions

The main satisfaction criteria consist of:

- **Personnel of the bank**: this criterion includes all the characteristics concerning personnel (skills and knowledge, responsiveness, communication and collaboration with customers, friendliness, etc.).
- **Products**: this criterion refers mainly to the offered products and service (variety, refund, cost, special services, etc.).
- **Image of the bank**: credibility of the bank (name, reputation), technological excellence, as well as ability to satisfy future customers' needs are included in this criterion.
- **Service**: this criterion refers to the service offered to the customers; it includes the appearance of the stores, the waiting time (queue, telephone, etc.), the complexity of service processes and the information provided (informing customers in an understandable way, explaining the service and other relevant factors, informing for new products, etc.).
- **Access**: network expansion of the bank, branches location, as well as observed troubles in the service system (strikes, damaged ATMs, etc.) are included in this criterion.

3.2 Survey conduction

The presented customer satisfaction survey took place in two different branches of the Commercial Bank of Greece in the area of the city of Chania. The survey was conducted within the period July 25th-September 30th, 1998.

Final input data consist of 303 questionnaires: 122 in store A and 181 in store B. Moreover, 160 private customers and 95 companies have been participated in the survey (Figure 5).

A more detailed presentation of the general profile of the sample is presented in Figures 6, 7 and 8:

- Figure 6 presents the profession of the private customers' cluster, while Figure 7 shows the activity sector of the segment of companies. The observed distributions show a well-balanced sample.

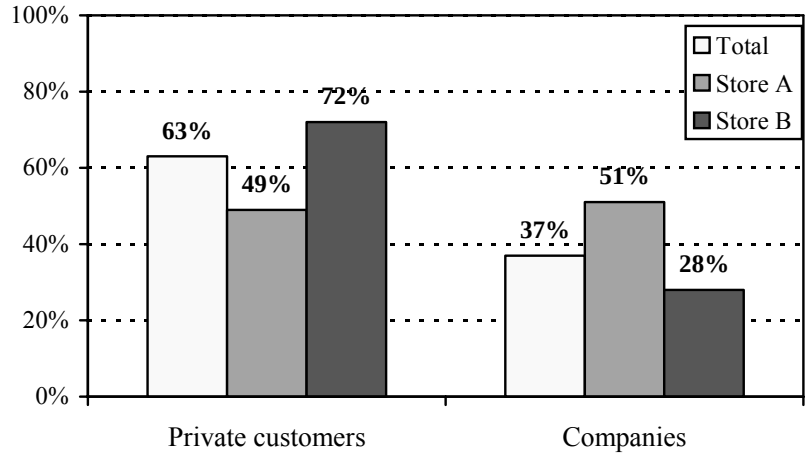

Figure 5: Customer sample per store

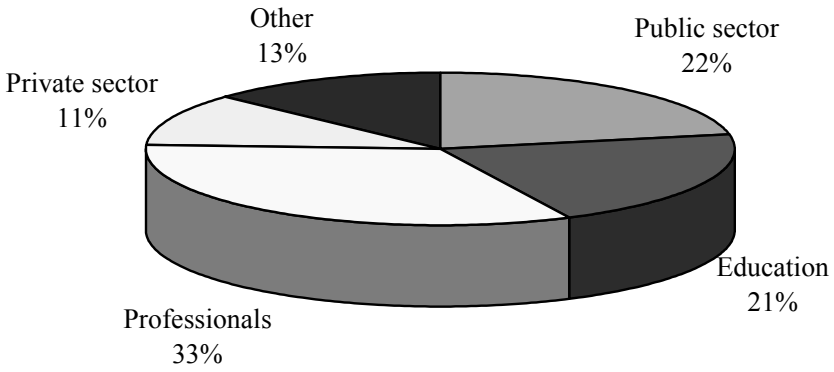

Figure 6: Profession of private customers' sample

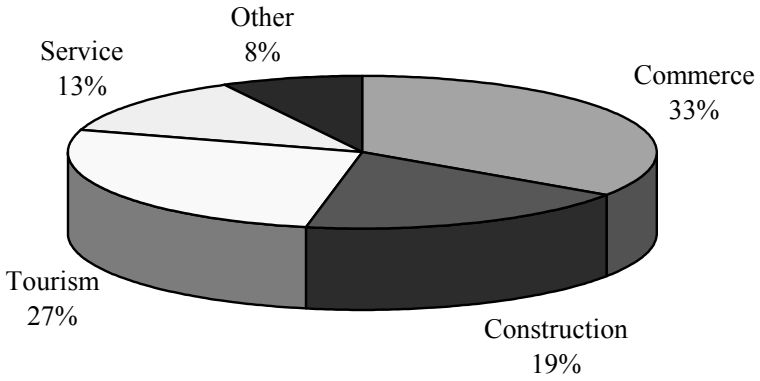

Figure 7: Activity sector of companies' sample

- Figure 8 presents products usage per store; it shows that customers prefer to be served for loans and similar products by Store A.

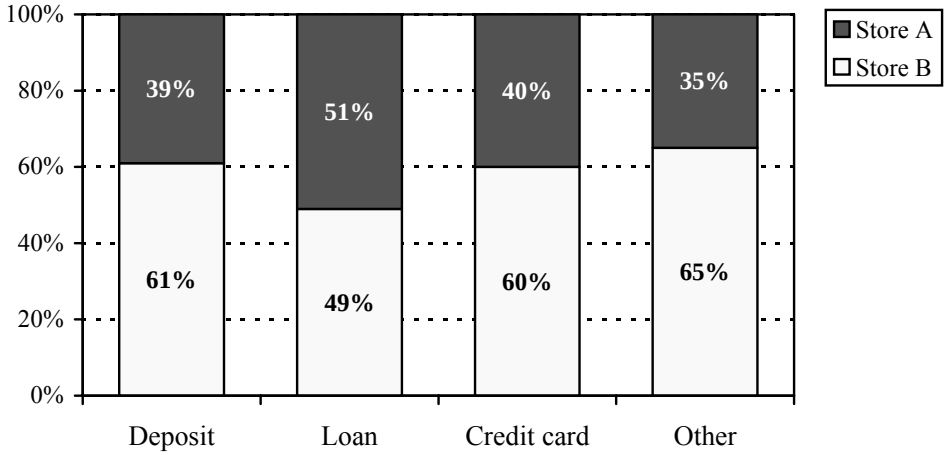

Figure 8: Products usage per store

4. RESULTS

4.1 Global satisfaction analysis

Customers seem to be quite satisfied from the provided service, given that the average global satisfaction index has a very high value (90.1%). Moreover, criteria satisfaction analysis shows that customers are quite satisfied according to the criteria of "Access" and "Personnel", while lower satisfaction indices appear for the rest of the criteria (65%-76%), as Figure 9 displays.

The most important criterion, with a significant importance level, seems to be "Access" (Figure 10). This can justify the high value of the global satisfaction index. Customers are more satisfied according to the most important criterion and less satisfied on the dimensions that seem to play a less important role to their preferences.

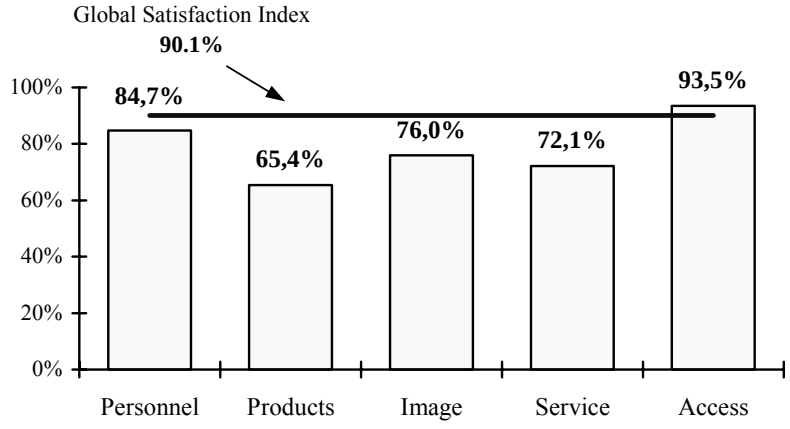

Figure 9: Average satisfaction indices

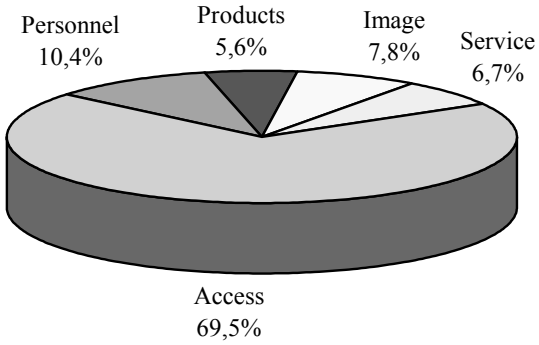

Figure 10: Weights of the criteria

The added value curve for the global set of customers is presented in Figure 11. It shows that they do not seem demanding according to their preferences. The majority of customers has an added value greater than 87%. This added value level seems to be the most critical satisfaction index (Figure 12).

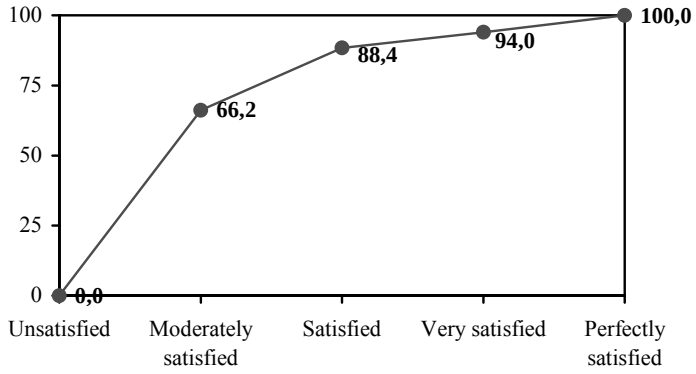

Figure 11: Global satisfaction function (added value curve)

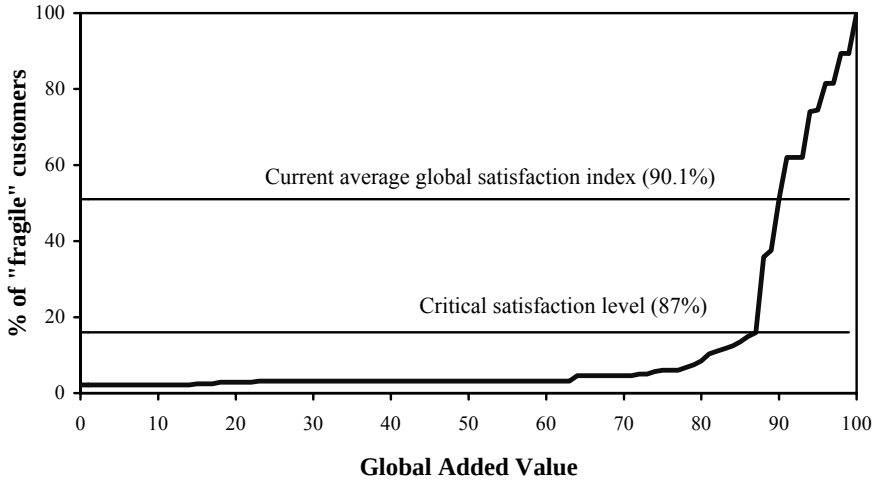

Figure 12: "Fragile" customers curve

The analytical results for the total set of satisfaction dimensions (criteria and subcriteria) are presented in Figure 13. In this figure, the satisfaction indices represent the performance of the Bank according to each satisfaction dimensions, and the weight values indicate their importance level.

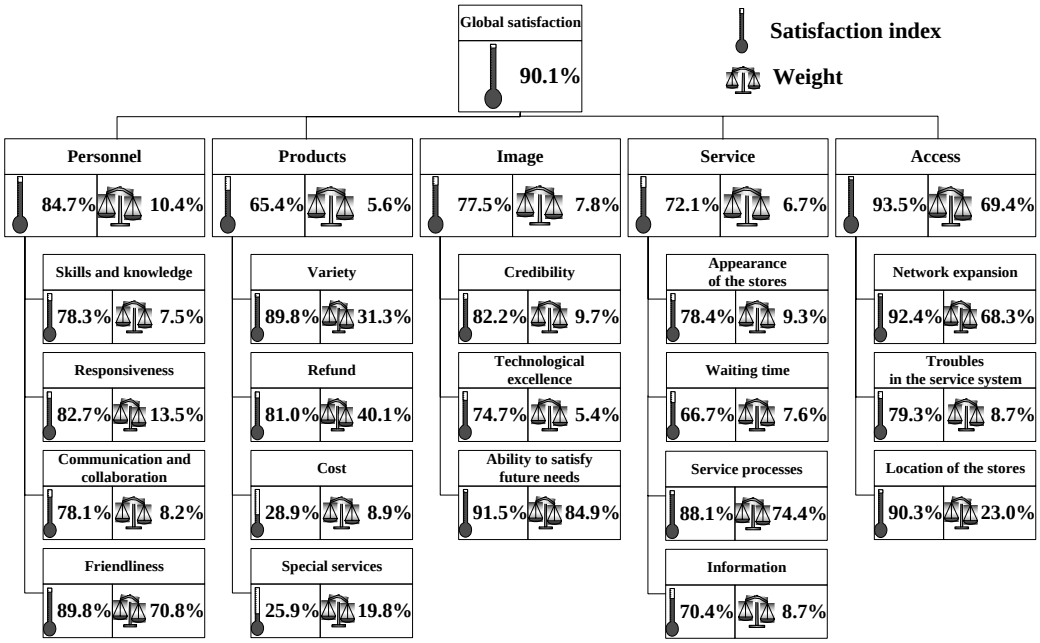

Figure 13: Analytical results for the global set of customers

4.2 Segmentation satisfaction analysis

The main objective of segmentation analysis is to identify particular customers' clusters with distinctive preferences and expectations. This type of analysis is considered necessary, given that the implemented preference disaggregation methodology is based on a multicriteria collective model. The discriminate variables that have been used for identifying special groups of customers are:

- the type of customer (private or company),
- the visiting branch of the bank, and
- the usage of the offered banking products (cards, loans, bank-assurance, etc).

The most important distinctive results relate to the segmentation according to the type of customers. The other groups of customers have not shown a significant variation.

Analytical results for private customers and for companies are presented in Figures 14-15, where the satisfaction indices with a significant low value are specially marked. These figures show that:

- Both types of customers are not satisfied regarding the cost of the offered products and services.
- Waiting time has a low satisfaction index for all customers.

- Special services (leasing, factoring, bank-assurance, etc.) and information offered to private customers should be improved.

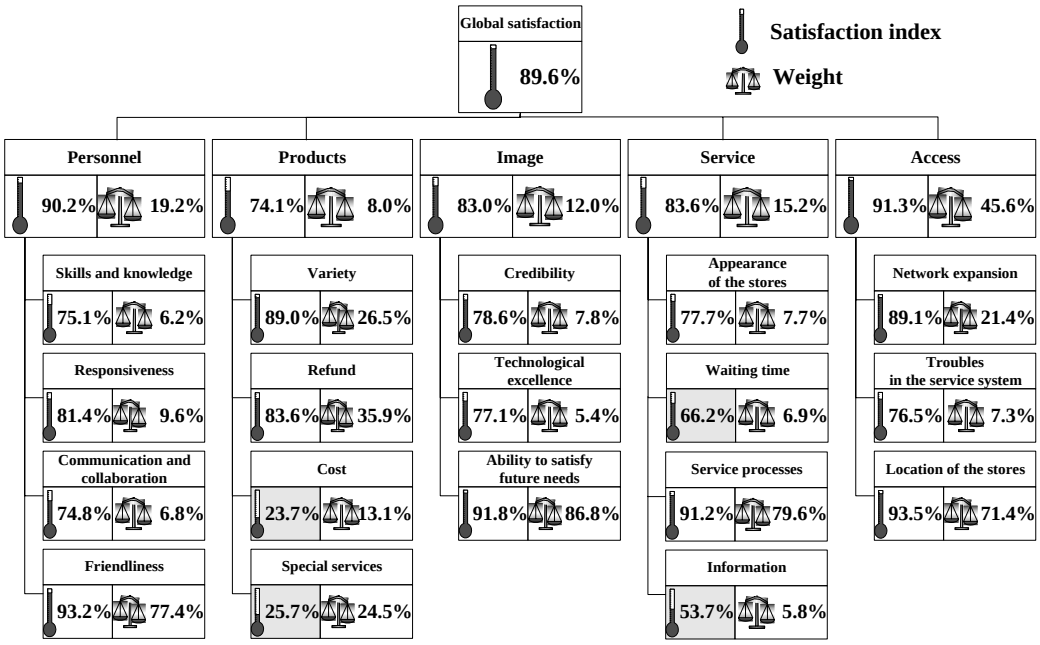

Figure 14: Analytical results for private customers

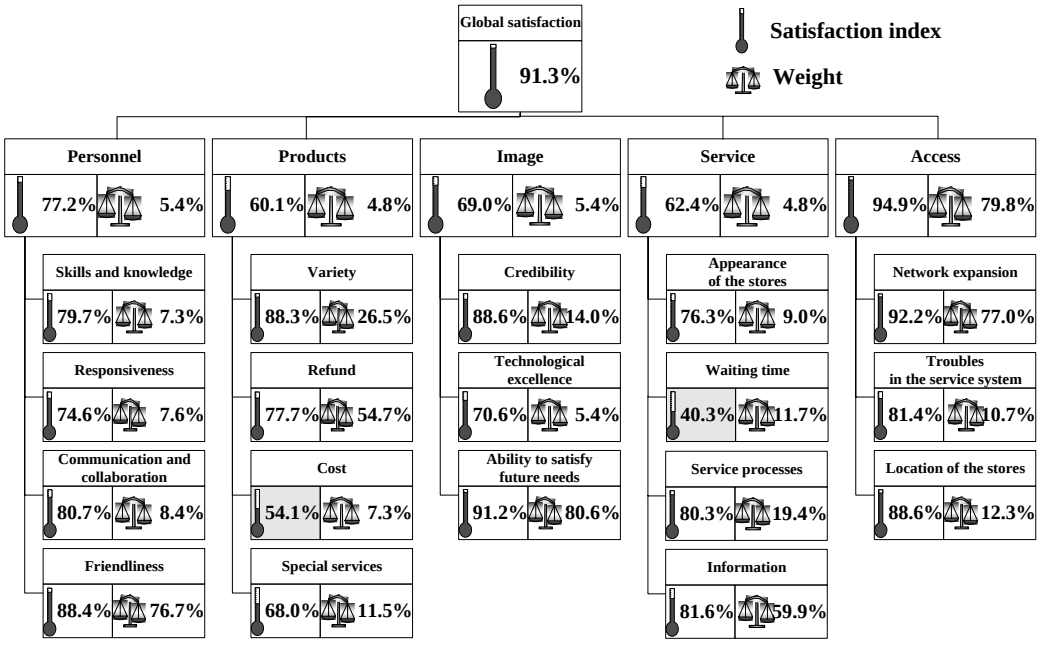

Figure 15: Analytical results for companies

Performance-Importance diagrams indicate current and potentially critical satisfaction dimensions (Figure 16-17):

1. Private customers are not satisfied by the offered special services, although this subcriterion is very important to them. Taken into account that provided information has not a high satisfaction value, it may be concluded that the customers should be informed in a more understandable way. This conclusion poses a more general problem for the bank sector.
2. On the other hand, companies are usually well informed for the bank's products and services, and this is the reason why urgently critical satisfaction dimensions are not observed. Nevertheless, waiting time could be a potential critical factor in the future, given that companies are quite demanding in this particular issue.

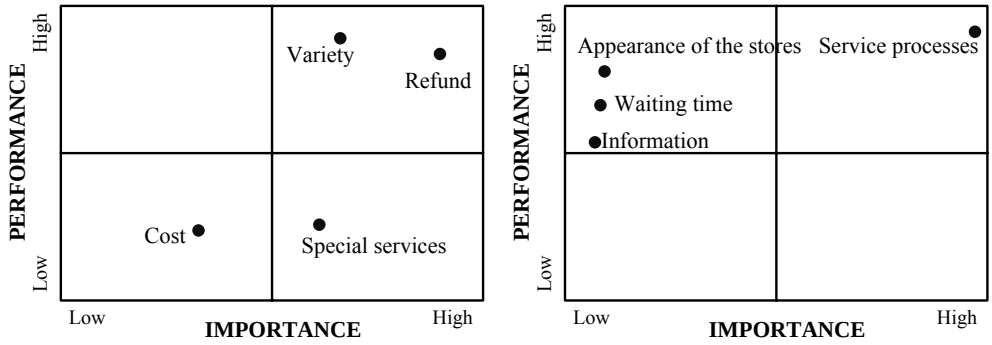

Figure 16: Performance/Importance diagrams for private customers

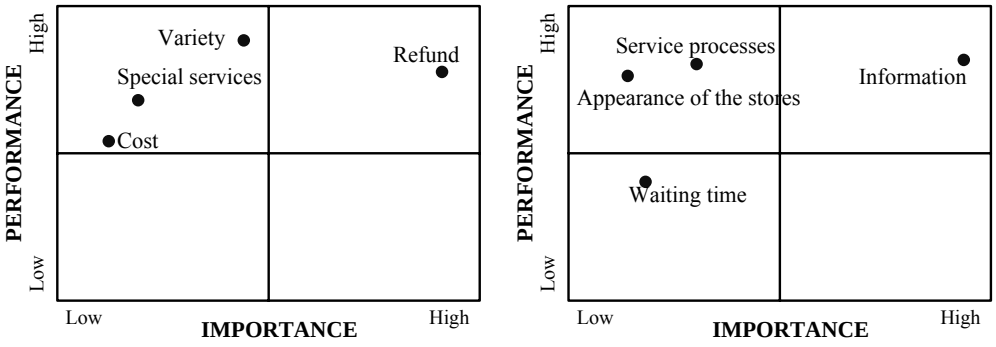

Figure 17: Performance/Importance diagrams for companies

5. CONCLUDING REMARKS

The original application presented in this paper illustrates the implementation of a preference disaggregation methodology in the private bank sector. The most important results include:

- the determination of the weak and the strong points of the bank,
- the performance evaluation of the bank (globally and per criteria/subcriteria), and
- the identification of distinctive critical groups of customers.

It should be noted that customer satisfaction is a dynamic parameter of the business organisation. Changes in the current market can affect customers' preferences and expectations. For example, some satisfaction dimensions may become critical in the near future if customers

give more importance to them. For this reason, the installation of a permanent customer satisfaction barometer is considered necessary, given that this particular application was basically a pilot survey. The main advantages of a permanent customer satisfaction measurement system are:

- The Commercial Bank of Greece will have the ability to analyse customers' behaviour for different regions in the country, taking into account special regional characteristics.
- An interior benchmarking system can be established, based on customer satisfaction evaluation in each branch. In this way, the most "weak" stores of the bank may be identified and improved.
- Competition analysis will be performed for different regions of the country.
- The effectiveness of marketing plans will be evaluated through customer satisfaction measurement.
- The establishment of a motivating system for employees may be directly related to customer satisfaction measurement. In this way, productivity may be improved and efficiently measured.

A permanent customer satisfaction barometer can assist Total Quality Management and Continuous Improvement concepts in every business organisation (Edosomwan, 1993). Moreover, the focus on total customer satisfaction should be integrated into the accepted management process and the enterprise's culture.

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APPENDIX

Appendix A: The MUSA method

The preference disaggregation model MUSA (MUlticriteria Satisfaction Analysis) assesses global and partial satisfaction functions Y^* and X_i^* respectively, given customers' judgements Y and X_i. Following the principles of ordinal regression analysis under constraints using linear programming techniques, the ordinal regression analysis equation has as follows:

$$\begin{cases} \widetilde{Y}^* = \sum_{i=1}^{n} b_i X_i^* - \sigma^+ + \sigma^- \\ \sum_{i=1}^{n} b_i = 1 \end{cases} \quad (1)$$

where $\widetilde{Y}^*$ is the estimation of the global satisfaction function Y^*, X_i^* are the partial satisfaction functions, σ^+ and σ^- are the overestimation and the underestimation error, respectively, and b_i is the weight of the i-th criterion.

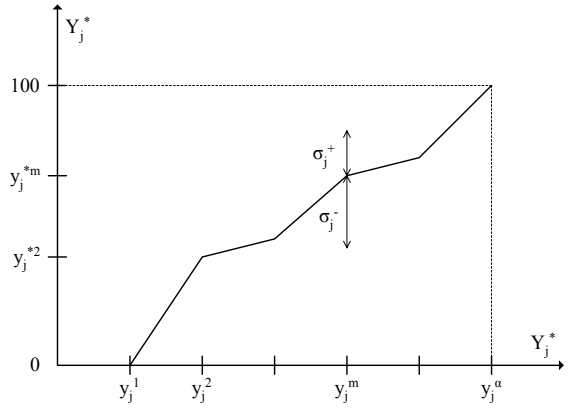

Figure 18: Satisfaction function and error variables for the j-th customer

It should be noted that Y^* and X_i^* are monotonic functions normalised between 0 and 100 (see Figure 18). Also, in order to reduce the number of the mathematical constraints the following transformation equations are used:

$$\begin{cases} z_m = y^{m+1} - y^m & \text{for m} = 1, 2, ..., \alpha - 1 \\ w_{ik} = b_i x_i^{*k+1} - b_i x_i^{*k} & \text{for k} = 1, 2, ..., \alpha_i - 1 \text{ and i} = 1, 2, ..., \text{n} \end{cases} \tag{2}$$

According to the aforementioned definitions and the assumptions mentioned in paragraph 2.1, the basic estimation model can be written in a linear program formulation, as it follows:

$$\begin{cases} [\min] F = \sum_{j=1}^{M} \sigma_j^+ + \sigma_j^- \\ \text{under the constraints} \\ \sum_{i=1}^{n} \sum_{k=1}^{x_i^j - 1} w_{ik} - \sum_{m=1}^{y^j - 1} z_m - \sigma_j^+ + \sigma_j^- = 0 \quad \text{for j} = 1, 2, ..., \text{M} \\ \sum_{m=1}^{\alpha - 1} z_m = 100 \\ \sum_{i=1}^{n} \sum_{k=1}^{\alpha_i - 1} w_{ik} = 100 \\ z_m \geq 0, w_{ik} \geq 0 \quad \forall \text{ m, i and k} \\ \sigma_j^+ \geq 0, \sigma_j^- \geq 0 \quad \text{for j} = 1, 2, ..., \text{M} \end{cases} \tag{3}$$

where M is the number of customers, n is the number of criteria, and x_i^{*j}, y^{*j} are the j-th level on which variables X_i and Y are estimated.

The preference disaggregation methodology consists also of a post optimality analysis stage in order to face the problem of model stability. The final solution is obtained by exploring the polyhedron of near optimal solutions, which is generated by the constraints of the above linear program. This solution is calculated by n linear programs (equal to the number of criteria) of the following form:

$$\begin{cases} [\max] \text{F}' = \sum_{k=1}^{\alpha_i - 1} w_{ik} \quad \text{for i} = 1, 2, ..., \text{n} \\ \text{under the constraints} \\ \text{F} \leq \text{F}^* + \varepsilon \\ \text{all the constraints of LP (3)} \end{cases} \tag{3}$$

where ε is a small percentage of F^*. The average of the solutions given by the n LPs (3) may be taken as the final solution. In case of non-stability this average solution is less representative.

The assessment of a performance norm may be very useful in customer satisfaction analysis. The average global and partial satisfaction indices are used for this purpose and can be assessed according to the following equations:

$$S = \sum_{m=1}^{\alpha} p^m y^{*m} \text{ and } s_i = \sum_{k=1}^{\alpha_i} p_i^k x_i^{*k} \tag{4}$$

where S and s_i are the average global and partial satisfaction indices, and p^m and p_i^k are the frequencies of customers belonging to the y^m and x_i^k satisfaction level, respectively.

Appendix B: Questionnaire of the survey

1. PERSONNEL

- What do you think about the knowledge and the skills of the personnel?
  - perfect ☐
  - good ☐
  - should be improved ☐
- What do you think about the responsiveness of the personnel?
  - very satisfied ☐
  - satisfied ☐
  - moderately satisfied ☐
- What do you think about your relationship with the personnel of the Bank?
  - very friendly ☐
  - fiendly ☐
  - typical ☐
- How often the personnel can understand and satisfy your needs?
  - always ☐
  - often ☐
  - some times ☐

Globally, which is your satisfaction level from the personnel?

- Very satisfied ☐ ☺
- Satisfied ☐ 😐
- Moderately satisfied ☐ ☹

2. PRODUCTS

- Which is your opinion about the variety of the offered products and services?
  - large ☐
  - typical ☐
  - small ☐
  - don't know ☐
- Which is your satisfaction level from the provided interest rates?
  - very satisfied ☐
  - satisfied ☐
  - moderately satisfied ☐
- Which is your satisfaction level from the cost (charges of the provided products and services)?
  - very satisfied ☐
  - satisfied ☐
  - moderately satisfied ☐
- What do you think about bank's special products (leasing, factoring, bank-assurance, etc.)?
  - very satisfied ☐
  - satisfied ☐
  - moderately satisfied ☐

Globally, which is your satisfaction level from the products and services of the Commercial Bank of Greece?

- Very satisfied ☐ ☺
- Satisfied ☐ 😐
- Satisfied ☐ ☹

3. IMAGE

- Which is your opinion about the credibility of the Commercial Bank of Greece?
  - very satisfied ☐
  - satisfied ☐
  - moderately satisfied ☐
- Do you believe in the technological excellence of the Commercial Bank of Greece?
  - yes ☐
  - no ☐
- Do you believe that the Commercial Bank of Greece can satisfy your future needs?
  - completely ☐
  - sufficiently ☐
  - not completely ☐

Globally, which is your opinion about the image of the Commercial Bank of Greece?

- Very good ☐ ☺
- Good ☐ 😐
- Moderate ☐ ☹

4. SERVICE

- What do you think about the appearance of the stores?
  - attractive and functional ☐
  - typical ☐
  - should be improved ☐
- Which is the average waiting time?
  - less than 5 min ☐
  - 5-15 min ☐
  - more than 15 min ☐
- Which is your opinion about the service processes?
  - functional ☐
  - typical ☐
  - bureaucratic ☐
- The information you receive from the bank (new products, account statements, etc.) is:
  - complete ☐
  - sufficient ☐
  - should be improved ☐

Globally, which is your satisfaction level from the service of the Commercial Bank of Greece?

- Very satisfied ☐ ☺
- Satisfied ☐ 😐
- Moderately satisfied ☐ ☹

5. ACCESS

- Which is your opinion about bank's network (branches, ATMs, etc.)?
  - very expanded ☐
  - expanded ☐
  - not so expanded ☐
- How often the service system appears troubles (strikes, damaged ATMs, etc.)?
  - rarely ☐
  - some times ☐
  - often ☐
- Which is your opinion about the location of the stores?
  - very convenient ☐
  - convenient ☐
  - not so convenient ☐

Globally, which is your satisfaction level from the provided ability to access the Commercial Bank of Greece?

- Completely satisfied ☐ ☺
- Very satisfied ☐
- Satisfied ☐ 😐
- Moderately satisfied ☐
- Dissatisfied ☐ ☹

GLOBAL SATISFACTION

Globally, taking into account all your previous answers, which is your satisfaction level from the collaboration with the Commercial Bank of Greece?

- Completely satisfied ☐ ☺
- Very satisfied ☐
- Satisfied ☐ 😐
- Moderately satisfied ☐
- Dissatisfied ☐ ☹