Proposal of a Customer Satisfaction Index Model
(Part of the Antecedents) Adopted to the Algerian Context

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ABSTRACT

Measuring customer satisfaction is an efficient method for evaluating organisational performance of firms, especially in today's competitive environment. In the Algerian context, where the industry is developing rapidly and the customer satisfaction and its antecedents have an importance for the most of the Algerian companies, it becomes crucial to explore the factors influencing customer satisfaction in the industrial sector. Therefore, the main objective of this study is to develop a specific model for a customer satisfaction index in the Algerian industrial environment. The inexistence of this type of models in the Algerian context has provided difficulties to companies in detecting what affects the satisfaction of their customers; this research can help them to find out what are the factors that impact on the customer satisfaction and improve it. To achieve this, we have examined previous studies conducted in other countries to identify the antecedents of customer satisfaction. The research methodology employed in this study follows a quantitative approach. We conducted a questionnaire survey among a sample of 203 customers of the BCR brand, which specialises in faucet production. The questionnaire was designed to measure various factors, including corporate image, customer expectations, perceived quality, perceived value, price, and handling of complaints. The collected data was analysed using SPSS software, and the model will be constructed using Smart-PLS software. The findings of the study confirmed that three variables significantly impact customer satisfaction in the studied context: perceived value, price, and perceived quality, specifically focusing on the sustainability dimension. Based on these results, we have developed a customer satisfaction index model, specifically focusing on the antecedents' part, which incorporates these three variables.

KEYWORDS: *complaint handling, customer satisfaction, customer satisfaction index/barometer, customer expectations, perceived quality, perceived value, price.*

JEL CLASSIFICATION: *M31; M310; L12.*

1. INTRODUCTION

In today's highly competitive industrial and commercial environment, customer satisfaction plays a critical role and serves as a key indicator of long-term sustainability for companies across various sectors. It encompasses how customers perceive and evaluate a company's ability to meet their needs and expectations through their interactions with its products, services, or overall experience. To develop effective strategies that enhance customer loyalty and, ultimately, improve market position, companies need a comprehensive understanding of the factors that impact customer satisfaction. In Algeria, it is essential to understand the factors that

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influence customer satisfaction in the industrial sector. Algerian companies face particular challenges such as government procedures, supply chain constraints, and geographical differences that can reduce customer satisfaction. In the Algerian business context, firms do not really attach much importance to the concept of customer satisfaction, but they know that it is necessary for them to improve it and know what its antecedents are. This research project aims to examine the concept of customer satisfaction, with a specific focus on the Algerian industrial sector. The study will shed light on the variables that influence customer satisfaction and their implications on organisational success, while considering the unique characteristics of Algerian companies.

Researchers in the fields of marketing and management have extensively debated and analysed the concept of customer satisfaction. Kotler states that satisfaction is a customer's judgment of a consumption or use experience resulting from a comparison between his or her expectations of the product and its perceived performance (Kotler et al., 2003) In addition, Zeithaml and Binter confirmed that perceived quality influences satisfaction (Lorena et al., 2019). They argued that customer satisfaction is a function of how well a product or service performs in relation to customer expectations.

Due to the nature of the products and associated services, customer satisfaction in the industrial sector has particular dimensions. Festge and Schwaiger have highlighted the importance of customer satisfaction in industrial markets given their special features and characteristics (Festge & Schwaiger, 2015).

In all sectors, customer satisfaction is essential to an organisation's success and competitiveness. Companies need to understand the idea of customer satisfaction and the factors that affect it, in order to create tactics that will increase customer loyalty and retention. In the industrial sector, variables such as product quality, sustainability, perceived value, value for money and customer relationship management influence customer satisfaction (Biesok & Wyród-Wróbel, 2018). In order to better understand customer satisfaction from a broader perspective, this research intends to delve deeper into these issues and propose relevant recommendations for improving it in the Algerian industrial sector.

Many countries around the world have developed customer satisfaction index models to measure customer satisfaction and identify the factors that influence it, citing Sweden, the USA, Norway, and many others as examples. This is linked to the important role satisfaction plays in firms' performance, growth, and competitiveness. In Algeria, the non-existence of this type of model and of studies in this field constitutes a shortcoming for the country's industrial and economic sector. Our study has come to give importance to this type of study, and in order to guarantee the achievement of our objectives, and starting from the context presented above, we pose the following question as a question of our research: "What factors influence customer satisfaction in the specific industrial context of Algeria?"

1.1 Study objective

The main objective of this study is to develop a customer satisfaction index model relevant to the Algerian industry. Taking into account the particularities of the industrial sector, the model will help to measure the level of customer satisfaction in the industrial sector. To achieve this, the research will focus on an approach based on a number of sub-objectives:
- Assessment of factors impacting on customer satisfaction BCR cases.
- Determine the antecedents of customer satisfaction in the context studied.
- Model the factors influencing customer satisfaction for the BCR case.
- Try to generalise the proposed model to the future for the Algerian context.

1.2 Research epistemology:

In this research, we have adopted the post-positivist posture, and we have opted for the deductive approach, given that our starting point is theory, from which we have developed hypotheses that will be presented in the theoretical framework and tested in the empirical part of our work. For the empirical part of our work, we opted for a quantitative approach, using a questionnaire survey. A questionnaire has been distributed to the customers of the BCR company in order to collect the necessary data for the study. The data collected have been analysed and treated using the appropriate methods in order to find the elements that affect the customer satisfaction and build a model for the Algerian context.

2. LITERATURE REVIEW

In the business world, increasing customer satisfaction has become a key activity for companies to focus on through the progressive improvement of the products and services which they provide, especially in a competitive environment characterised by high level of competition (Kabare & Kibera, 2014). According to (Fornell, 1992) the concept of customer satisfaction is the overall evaluation that is based on the total purchase or consumption experience of a product or service over time. Customer satisfaction has become the ultimate concern of most companies no matter what type of products or services they provide and their field of activity; therefore, the question of how to satisfy customers has become an important issue for firms in the current market-oriented economic environment (Ngo, 2015). Customer satisfaction is a very important aspect for both big and even small brands (Otto et al., 2019). Several researchers have demonstrated in their research that satisfaction is a central element in the marketing strategies of companies, because it can drive improved business performance and profitability (Eren, 2021). According to (Dossi & Patelli, 2010), customer satisfaction can be considered as a vital goal for any company, since satisfied customers are more likely to maintain their relationship with the firm, which in turn, reduces costs for the company (Eklof et al., 2018). Repeated purchases from satisfied consumers will create positive word of mouth about the company and its products with which customers interact, and that gives it a competitive advantage, and explains the importance of focusing on achieving customer satisfaction (Biesok & Wyród-Wróbel, 2018).

2.1 Barometers and indices of customer satisfaction:

Customer satisfaction index or barometer, is a tool that helps in improving decision making and is considered as a key factor in presenting a reliable picture of the company's economic performance (Rajendran & Arun, 2020). This type of indices/barometers are used by some countries as a measure of satisfaction not only for individual companies, but also for institutions, organisations, and industries across the country (Pezeshki et al., 2020) many indexes to measure customer satisfaction have evolved successively such as Swedish barometer (Fornell, 1992) German barometer and Swiss index (Bruhn & Grund, 2000), American index (Jhonson et al., 2001), Norwegian index (Veljković & Marinković, 2010). In the end of the 1980s, the first barometer to measure customer satisfaction was introduced by Fornell, followed by the German barometer in 1992, then researchers in Norway introduced the Norwegian Customer Satisfaction Index in 1996 and the interest in satisfaction indexes continued to the creation of a European satisfaction index in 1999 (Kabare & Kibera, 2014)

2.1.1 The Swedish Customer Satisfaction Barometer (SCSB):

The Swedish customer satisfaction barometer was first introduced in Sweden in 1989 and it was presented in 1992 by (Fornell, 1992). Its construction is based mainly on studies done by

Hirschman in 1970 and Oliver in 1980 (Pandey et al., 2020). In this model the four antecedents of satisfaction represented in the perceived performance and expectations of customers and they are the elements that can affect satisfaction, also the model includes the consequences of satisfaction that are derived from Hirschman's "Exit-Voice" theory and which are customer loyalty and complaints (Turkyılmaz, 2013).
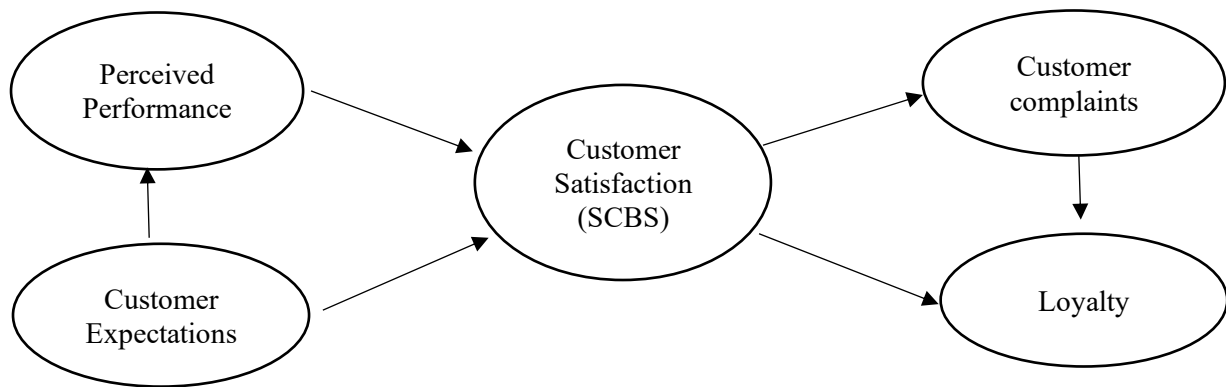

Figure 1. **The Swedish SCSB customer satisfaction barometer**
Source: Jhonson et al. (2001, pp. 217-245)

2.1.2 The German Customer Satisfaction Barometer (GCSB)

In 1992, sponsored by the German Post Office, the German Marketing Association launched a barometer to measure the performance of firms through satisfaction and quality. The main objective of this barometer was to measure the satisfaction of adult individuals (over 16 years old) with the different products provided by different firms in the country (Bruhn & Grund, 2000). The purpose of the barometer was to provide industries and individual suppliers with data that would allow them to determine their position and gaps in the market, from the customer's point of view (Grigoroudis & Siskos, 2004).

Unlike the Swedish barometer, the German barometer is not based on the cause-effect relationship between its components, and it is not based on a structural model, its study is mainly based on a simple questionnaire that focuses on three important points: the overall customer satisfaction, the satisfaction rate of the quality of the products and, the intention of repurchase and recommendation (Grigoroudis et al., 2008). The data collected during the surveys conducted include customer expectations as well as how these expectations are changing, the process of this barometer also involves the continuous monitoring of customer satisfaction and the development and strengthening of the customer orientation philosophy of German companies, organisations and institutions (Grigoroudis & Siskos, 2004). The test of this barometer covered about 52 industries in Germany whose model could confirm its reliability, and the results were published by Meyer and Dornach (Turkyılmaz & Ozkan, 2007).

2.1.3 The American Customer Satisfaction Index (ACSI)

The American customer satisfaction index was introduced two years after the creation of the previous model (Fornell et al., 1996). This measurement model is essentially based on customer satisfaction and was developed from the Swedish customer satisfaction barometer (Grigoroudis & Siskos, 2004). However, it differs from the latter by including two new variables, namely perceived quality and perceived value (Pandey et al., 2020). This model was first introduced in the United States in 1994 as a result of research conducted by Anderson, Fornell, and their colleagues at the National Center for Quality Research at the University of Michigan Business School (Eklof et al., 2018).

The model suggests that customer satisfaction is directly influenced by perceived quality and perceived value of the buying experience, as well as customer expectations; customer loyalty is then considered as the immediate consequences of customer satisfaction (Hult et al., 2019).

With coverage of 200 firms in 41 industries (1/3 of the nation's economy) this model is the only standardised index for measuring customer satisfaction in the United States and its survey results are published quarterly in the media and on the ACSI website (www.theacsi.org) confirming its reliability (Yadav & Urvashi, 2011).
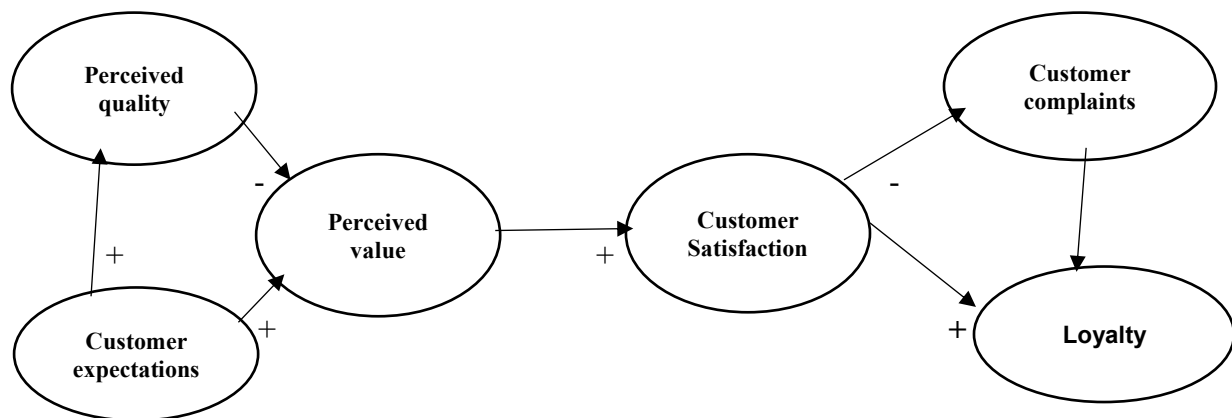

Figure 2. **The ACSI American Customer Satisfaction Index**
Source: Fornell et al. (1996, pp. 7-18)

2.1.4 The Norwegian Customer Satisfaction Barometer (NCSB)

In Norway, researchers drew on previous experiences in Sweden and the United States to develop a customer satisfaction index model specific to their countries (Slongo & Vieira, 2007). The proposed model was built based mainly on the American Customer Satisfaction Index (ACSI), with the addition of two new variables in the antecedent part, namely the corporate image and the price index considered as an antecedent of satisfaction and loyalty, thus the model experienced the deletion of the variable 'perceived value' (Rajendran & Arun, 2020).

Subsequently, with the evolution of marketing from a transactional orientation to a relational orientation that focuses on the relationship with customers (Slongo & Vieira, 2007), the Norwegian model has been modified and evolved to include a new variable that is 'relational commitment'. The new NCSB is represented in three antecedents of satisfaction which are: price index, and perceived quality, which is represented in the model by quality drivers, and complaints handling; the model also includes the consequences of satisfaction which are: loyalty, company image, relational commitment.

After testing this model through surveys conducted in Norway, the reliability of the model was confirmed where its components were successfully isolated (Jhonson et al., 2001).
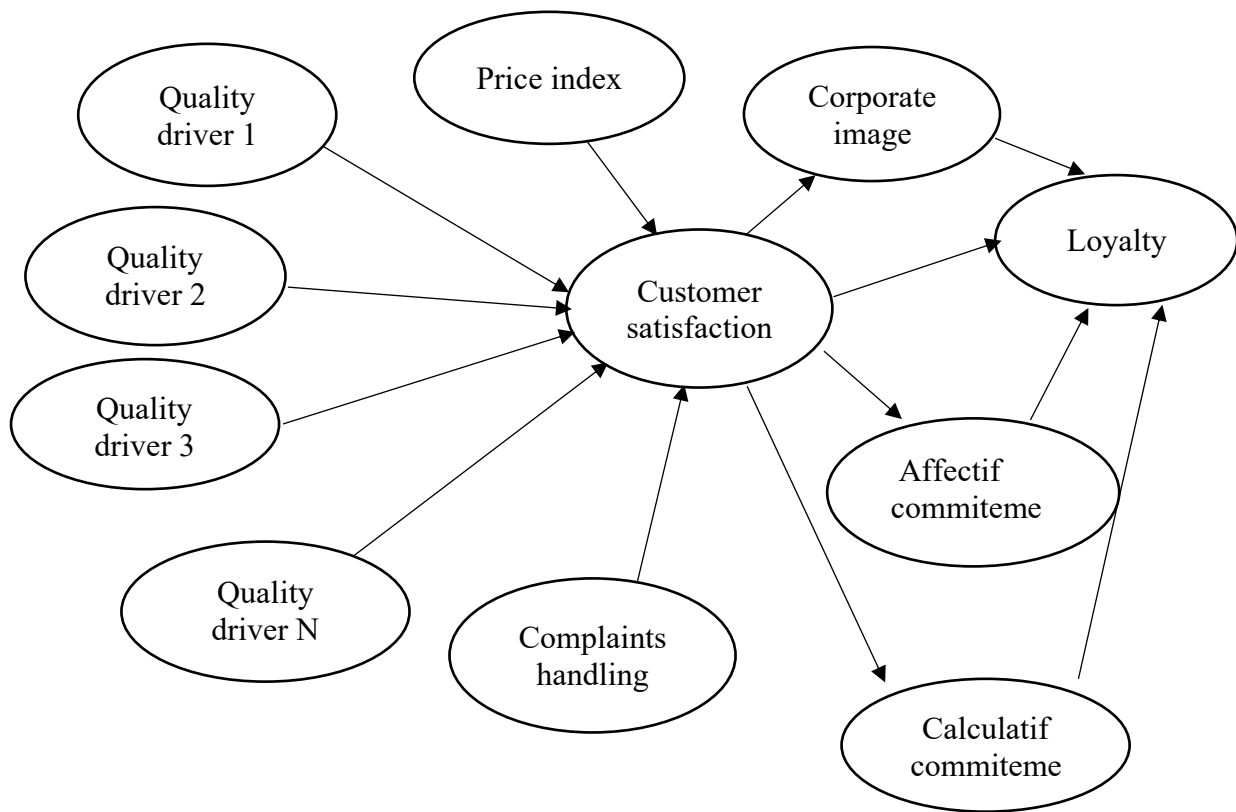
Figure 3. The Norwegian NCSB customer satisfaction barometer
Source: Jhonson et al. (2001, pp. 217-245)

2.1.5 The European Customer Satisfaction Index (ECSI)

After the success of the two Swedish and Norwegian barometers of customer satisfaction as well as the American index (Rajendran & Arun, 2020), the model of the European Customer Satisfaction Index was developed through a collaboration between the European Quality Organisation, the European Association of Quality Management and a group of academic experts in the years 1997-1998, inspired by the Swedish barometer and the American index (Eklof & Westlund, 2002). The ECSI model includes six variables, divided into four antecedents: company image, customer expectations, perceived quality (of the product and service (Martensen et al., 2000), with a consequence of satisfaction including customer loyalty. The ECSI differs from the ACSI by adding the latent variable "corporate image" to the antecedents, indicating that it directly influences customer satisfaction and loyalty, and it does not include the variable "complaints" in the consequence part (Turkyılmaz & Ozkan, 2007). These two variables according to (Bayol, 2000) are optional components that do not always influence customer satisfaction and loyalty, and they can be eliminated in some cases.
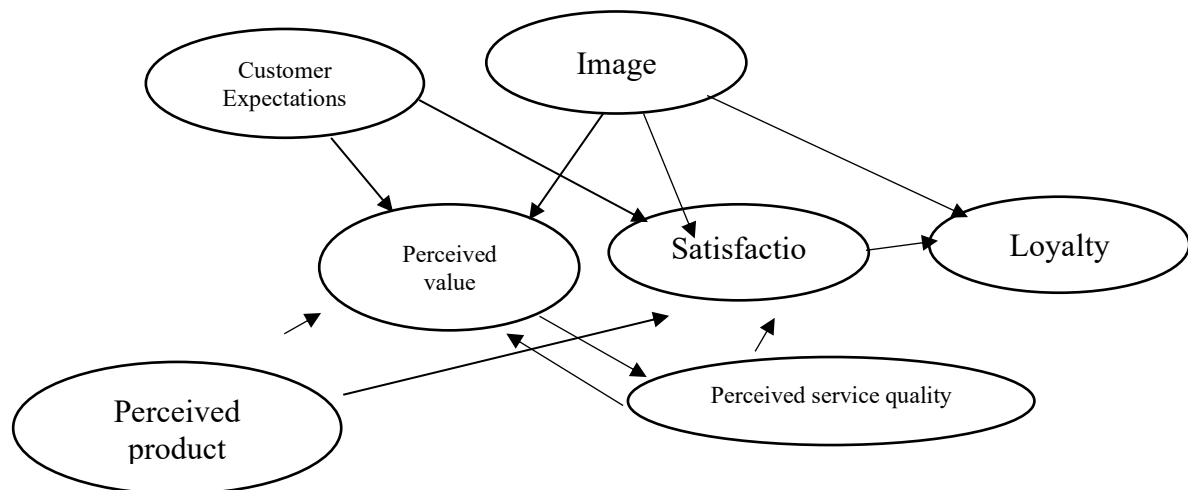
Figure 4. **European customer satisfaction index**
Source: Martensen et al. (2000, pp. S544-S553)

The European model has been modified by several researchers who have proposed changes to the variables and the relationships between its components (Biesok & Wyród-Wróbel, 2018). In 2004 Ball, Machas and Coelho proposed to add the variables communication and trust to the model (Ball et al., 2004), then in 2005 the two researchers Ryglová and Vajčnerová proposed the addition of the variable customer complaints (Ryglová et al., 2005), Magalhães in his research proposed to add two new components including the costs of alternation and the attractiveness of the alternatives (Magalhães, 2009). The last modification was made in 2018 where (Eurico, 2018) proposed to add "employability" or the study was made in a context of higher studies in tourism in Portugal.

2.1.6 The Swiss Customer Satisfaction Index (SWICS)
After the expansion of the culture of measuring firm performance through customer satisfaction barometers around the world, several countries adopted it and decided to build their specific models, adopted to their economies and markets, among these countries was Switzerland (Grigoroudis et al., 2008). Inspired by other customer satisfaction indices, research began in 1996 to develop a Swiss index, Bruhn and Grund, and researchers at the Swiss University developed a specific model for their country in 2000 (Bruhn & Grund, 2000). This model differs from the previous indices by adding a new component which is "the dialogue with the customer", it contains three main components which are: customer satisfaction, dialogue with the customer, and loyalty; each of these three components has three variables to evaluate it (Bruhn & Grund, 2000). Following a survey conducted in Switzerland with 3845 consumers representing about 20 industries belonging to six different sectors, the model was tested and its reliability was confirmed (Rajendran & Arun, 2020).
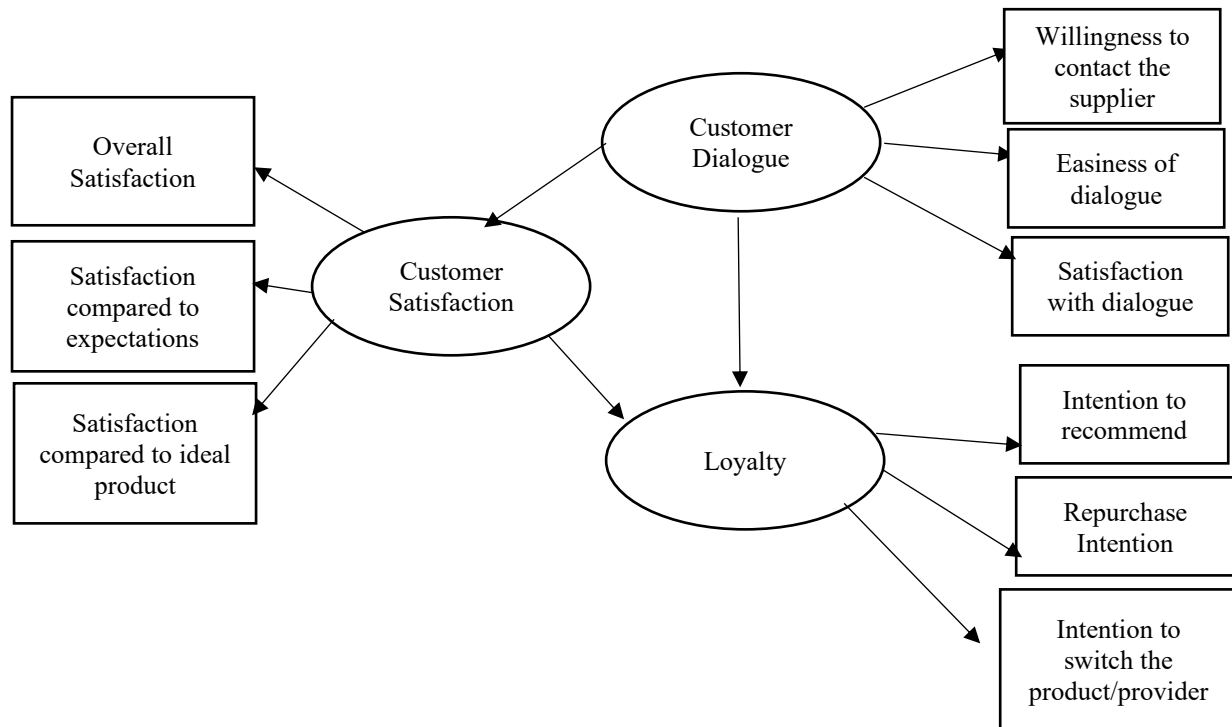
Figure 5. The SWICS Swiss customer satisfaction index
Source: Bruhn & Grund (2000, pp. S1017-S1028)

The customer satisfaction barometer/index models have been criticised by several authors, first, in the methodological side, the variation of the methodological approaches of these indexes constitutes an important drawback in relation to the comparison of satisfaction between countries (Grigoroudis et al., 2008). Thus, both the Swedish and American models use the method of structural models for the estimation of results which implies the possibility of identifying the main drivers of customer satisfaction, but only at a low operational level because these models are based on latent variables that are not directly observable and cannot generate detailed information that behaves with the operational level (Bruhn & Grund, 2000)

Thus, in these models, there are relationships between variables (antecedents and consequences) are considered weak empirically (and/or) conceptually and the effects between some components are not significant in some industrial sectors, as is the case for the ACSI and ECSI (Jhonson et al., 2001).

Regarding the European Customer Satisfaction Index (ECSI) model which has been successful in several countries such as Turkey (Turkyılmaz, 2013), Iran (Askariazad & Babakhani, 2015), Greece (Sarantidou, 2017), Spain (Pastor et al., 2018) and in Poland and Lithuania (Biesok & Wyród-Wróbel, 2018) in measuring firm performance through customer satisfaction.

The models presented above have points of similarity and points of difference. Starting first with the difference in naming the models where we have the Swede, Norwegian, and German researchers who have chosen to name the barometer model while the American and European researchers and the Swiss have chosen to name the index model. Then we move to their variables, beginning with the variable 'perceived value', which has been presented as an antecedent of customer satisfaction, as is the case in the American customer satisfaction index (Fornell et al., 1996), the Norwegian customer satisfaction barometer (Jhonson et al., 2001), and the European customer satisfaction index (Martensen et al., 2000). Thus, the variable 'perceived quality' which was considered antecedent to satisfaction in the Swedish and

Norwegian barometers (Rajendran & C., 2020), and the American and European indices (Ngo, 2015). Then we have the 'price' variable, which was present in the Norwegian barometer only as an independent variable of perceived value (Jhonson et al., 2001). We also have the other variables, namely customer expectations, which exist in the above barometers and indices, and corporate image, which is considered antecedent in the European model, and complaints handling in the Norwegian barometer. The 'company image' variable was included for the first time as an antecedent of satisfaction in the European index (Turkyılmaz & Ozkan, 2007); however, in the case of the Norwegian study, this variable was included as a consequence of satisfaction (Ngo, 2015). Then we have the 'customer expectations' variable, which was present in almost all the customer satisfaction index models presented (Rajendran & C., 2020), and the 'complaints handling' variable, which was present as an antecedent of customer satisfaction in the Norwegian index (Jhonson et al., 2001).

2.2 Development of hypotheses:

Customer satisfaction models and indices differ from one region to another in terms of their components, so these components are gone to be defined in order to be able to carry out this study properly.

2.2.1 Perceived quality

Perceived quality has been always an important element in the studies of the customer satisfaction indexes models around the world, where it can be noticed that the majority of the indexes contains the variable 'Perceived Quality' as an antecedent of customer satisfaction such as the American index (Hult et al., 2019), the Norwegian barometer (Jhonson et al., 2001) and the European index (Rajendran & Arun, 2020). Starting from these examples, the following hypothesis which concerns the variable 'perceived quality has been proposed:
H1: Perceived quality has an impact on the satisfaction of the customers of BCR.

2.2.2 Perceived value

Many authors have insisted on the importance of the perceived value as an antecedent of customer satisfaction, that's why this variable have been integrated in many models of customer satisfaction like the American index, the Norwegian barometer (Jhonson et al., 2001) and the European index (Pandey et al., 2020), taking in consideration the presence of this variable as an antecedent of customer satisfaction, in the present study the following hypothesis have been proposed:
H2: Perceived Value has an impact on the satisfaction of the customers of BCR.

2.2.3 Customer expectations

The variable customer expectations was integrated in all the models of customer satisfaction indexes where it was introduced for the first time at the Swedish barometer as an antecedent of satisfaction (Fornell, 1992), and also at the American index, the Norwegian barometer and the European index too (Rajendran & Arun, 2020). The previous studies have proven the importance of the customer expectations and their impact on the satisfaction, that's why the following hypothesis have been proposed:
H3: Customer expectations have an impact on the satisfaction of the customers of BCR.

2.2.4 Corporate Image

Corporate Image in the studies of the models of customer satisfaction indexes have taken two positions, where in some cases it have been integrated in the part of the antecedents like the case of the European index (Turkyılmaz, 2013), and in some cases it have been integrated in

the consequences part like the case of the Norwegian index (Jhonson et al., 2001), in this study, it will be tested as an antecedent of customer satisfaction since the study focus only on the antecedents part, and the following hypothesis have been proposed:

H4: Corporate image has an impact on the satisfaction of the customers of BCR.

2.2.5 Complaints handling

Complaints handling have been introduced for the first time as an antecedent of customer satisfaction at the Norwegian barometer (Jhonson et al., 2001), where the researchers have proved its importance in making the customers more satisfied, that's why this variable will be tested in this study and the following hypothesis have been proposed:

H5: Complaints Handling has an impact on the satisfaction of the customers of BCR.

2.2.6 Price

The price has always been integrated with the dimensions of the perceived value, but in the Norwegian barometer it has been integrated as an independent variable which can have an impact on customer satisfaction (Rajendran & Arun, 2020); the same procedure will be adopted in the present study, where the variable price will be tested as an independent variable and the following hypothesis have been proposed:

H6: The price has an impact on the satisfaction of the customers of BCR.

3. RESEARCH METHODOLOGY

The methodology section of this paper will introduce the reader to the approach used in gathering data.

3.1 Research Design

This study is conducted by analysing the factors affecting satisfaction considered in different satisfaction indices/barometers developed by researchers around in the world (Note: dimensions related to the service industry have been excluded). These dimensions were then distributed in the form of a questionnaire to a sample of Algerian consumers of locally manufactured products which is (BCR Algeria) in order to identify the dimensions that influence Algerian consumer satisfaction in the industrial sector.

In order to carry out this study, a quantitative approach was adopted, based on a questionnaire survey of BCR's customers. The data collected are processed using SPSS software for the statistical tests, and the model is built using Smart-PLS software, which is used to find the model of the index and to confirm the results of the statistical tests.

3.2 Quantitative approach

In the present research, it has been opted for the quantitative method through a questionnaire survey to collect the data necessary for our study. This choice is based on the fact that the quantitative method is the best way to generalise the results of a research project.

3.2.1 The questionnaire

The questionnaire of this study consists of four sections, structured as follows:

Eligibility (AD)

- Research questions:

This section contains questions that are mainly related to our research (Corporate image, Customer expectations, perceived quality, perceived value, Price, Complaints handling).

- Source of items:

In this part of the questionnaire, questions expressing the variables that affect satisfaction are cited, based on the conclusions drawn from the satisfaction indicators discussed in the theoretical aspects.

➢ **Corporate image:**

Above is the table that represents the measurement scale used for this variable:

Table 1. Measurement scales for the "Corporate image" variable

Variable	Items	Dimension
Corporate image	1- BCR is a leader in its field. 2- The company offers credible products	General corporate image
	1-BCR is a well-known brand. 2- BCR's products are very popular	Company popularity
	1-BCR has a good reputation. 2-The company always keeps its promises to its customers	Company reputation.

Source: Chen et al. (2015)

➢ **Customer expectations**

Above is the table that represents the measurement scale used for this variable:

Table 2. Measurement scales for the "Customer expectations" variable

Variable	Items	Dimension
Customer expectations	1-Your expectations regarding the quality of BCR products have been reached	General quality expectations
	1-BCR products seem credible to you	Credibility expectations
	1-Your price expectations were confirmed after visiting BCR's store.	Price expectations

Source: Chen et al. (2015)

➢ **Perceived quality:**

Above is the table that represents the measurement scale used for this variable:

Table 3. Measurement scales for the "Perceived quality" variable

Variable	Items	Dimension
Perceived quality	1-BCR products are impeccable 2-BCR products are imperfect 3-BCR products are defective. 4-BCR products are flawless	Absence of defects
	1-BCR products are reliable 2-BCR products are unreliable. 3-BCR products are durable 4-BCR products are not durable	. Durability
	1-BCR products are attractive. 2-BCR products have an elegant appearance.	Physical appearance

Variable	Items	Dimension
	3-BCR products are not attractive. 4-BCR products are gaudy.	
	1-BCR products are distinct. 2-BCR products are ordinary 3-BCR products are innovative 4-BCR products are standard	Distinctivity

Source: Stone-Romero et al. (1997)

➤ **Perceived value:**

Above is the table that represents the measurement scale used for this variable:

Table 4. Measurement scales for the "Perceived value" variable

Variable	Items	Dimension
Perceived value	1-BCR products are well manufactured. 2-The quality level of BCR products is acceptable. 3- BCR products are durable. 4-BCR products perform well	Functional value (Quality/Performance)
	1-BCR brand products are products you enjoy. 2-BCR products make you want to use them. 3-You would feel comfortable using BCR products. 4-BCR products would make you feel good. 5-BCR products would give you pleasure.	Emotional value
	1-BCR products help you feel acceptable. 2-BCR products would improve the way you are perceived. 3-BCR products would make a good impression on other people. 4-BCR products would give its owner social approval.	Social value

Source: Sweeny & Soutar (2001)

➤ **Price:**

Above is the table that represents the measurement scale used for this variable:

Table 5. Measurement scales for the "Price" variable

Variable	Items	Dimension
Price	1-BCR brand products are reasonably priced. 2-BCR products offer good value for money. 3-BCR products are good value for money. 4-BCR products are economical	Functional value (value for money/price)

Source: Sweeny & Soutar (2001)

➤ **Complaints handling:**

Above is the table that represents the measurement scale used for this variable:

Table 6. Measurement scales for the "Complaints handling" variable

Variable	Items	Dimension
Complaints handling	1-The compensation offered by the BCR company is satisfactory. 2-Compensation offered by BCR is unsatisfactory	The compensation offered by the company
	1-BCR employees treat complaints politely. 2-BCR employees treat customer complaints with respect	Employee behaviour during the claim

Source: Jhonson et al. (2001)

Satisfaction questions (SAT): this section contains two questions concerning customer satisfaction.

Respondent's data sheet (FS): this section is dedicated to questions related to the respondent's information.

3.3 Population

The population that has been targeted by this study is the Algerian people who have already used SANIAK-BCR brand products or who have these products in their homes, knowing that BCR is a well-known Algerian brand in the faucet sector and has existed since 1976.

3.4 Sampling method

The sample of this study has been calculated with a non-probability sampling method, and more specifically the non-probability convenience sampling method.

3.4.1 Sample size

To calculate the sample size, we used the 'Survey Monkey' site, which specialises in calculating sample size for questionnaire surveys where we entered the margin of error 6.8 and the confidence interval is 95% and we got our sample size which is estimated at 203.

3.5 Questionnaire administration and study duration

Online by using social media pages of the company in order to share the questionnaire to their customers and face-to-face in the BCR's show-room by asking customers coming there from 03/04/2023 to 28/04/2023. This period is related to the sample size, where we have stopped the survey when the appropriate size has been reached.

3.6 Reliability test

The reliability of the scales used in the study have been calculating by running the Alpha test on SPSS for all the variables. The results of this test are greater than 0.7, which means that the reliability of our scale is situated between acceptable to excellent. The scales used in this study are the same used by researchers in previous studies to develop the models, that's why we have used them in the present research.

4. RESULTS AND DISCUSSION

In this study, the results obtained after analysing the data collected from the assigned survey are going to be discussed. First, the results of the descriptive statistics will be presented, then the results of the multiple linear regression statistical tests, and this part will be concluded with a discussion of these results.

4.1 Descriptive statistics

Table 7. **Respondent profiles**

Variable	Response mode	Frequency	Percentage
Gender	Men	164	80.8%
	Female	39	19.2%
Profession	Plumber	24	12.4%
	Civil servant	28	13.8%
	Plumbing supplies salesman	36	17.8%
	Other professions	88	56%

Source: Compiled from SPSS software

In the table above contains information on the respondents' profiles; It is noticed from the results that the majority of respondents are men 80,8%, and this is due to the nature of the product concerned as it is purchased in most cases by men.

Concerning the profession of the respondents, there was a wide variety of professions, with a superiority of three of them, namely 'plumbers (12.4%)', 'public officials (13.8%)' and 'sellers of plumbing articles (17.8%) ', this may be due to the sharing of the questionnaire in the sanitary plumbing social network groups.

4.2 Test of Hypothesis

After checking the conditions, we have proceeded to the 'step-by-step' multiple linear regression test, which will enable us to extract the variables impacting on satisfaction and find the most reliable model.

Table 8. **Results of the multiple linear regression statistical tests**

Model	R	R-two	Adjusted R-two	Standard error of estimate	Variation in R-two	Variation in F	Sig
1	0,677	0,458	0,455	0,73797965	0,458	169,905	<0.01
2	0,702	0,492	0,487	0,71620529	0,034	13,408	<0.01
3	0,711	0,511	0,506	0,70857649	0,019	5,330	0.022

Source: Compiled from SPSS software

As the table shows, after testing, three models were proposed, of which the third is the most reliable. For the first model, the value of R is 0.67, which means that there is an average relationship between the dependent variable and the perceived value, which is the only independent variable left in this model. Its reliability is equal to 0.45, which means that this first model is moderately reliable. For the second model, the same thing can be noticed, with an increase in the value of R equal to 0.7, which indicates the existence of a strong relationship between the variables in this model, including perceived value, price and satisfaction, and its adjusted R-two is 0.48, meaning that it is therefore moderately reliable. In the third model, the R-value is 0.71, indicating that there is a strong positive relationship between the dependent variable satisfaction and the independent variables remaining after the test, namely, the durability dimension of the perceived quality variable, perceived value and price.

The R-two is equal to 0.511, indicating that the variance of the dependent variable explains 51.5% of the variance of the independent variables. The adjusted R-two is equal to 0.506, which means that the model is reliable and valid. This is why it is opted for this model, which is considered to be the most reliable of the three models resulting from the multiple linear regression test. The sig of the chosen model is 0.02, which is lower than the sig of significance 0.05, confirming the validity of the model.

Table 9. **ANOVA table**

	Model	Model Sum of squares	Ddl	Mean square	F	Sig.
3	Regression	102,086	3	34,029	67,775	<0,001
	Student's	99,914	199	0,502		
	Total	202,000	202			

Source: Compiled from SPSS software

As the table shows, the Sig of the model is less than 0.001, which means that it is significant as it is below the 0.05 significance level, indicating the existence of a significant positive effect between

the dependent variable 'customer satisfaction' and the independent variables perceived quality (durability), perceived value, and price.

In the following table, the results of the multiple linear regression are presented; where it can be observed that for the third model, the sig is less than 0.01, significance below the 0.05 significance level, which indicates that there is a positive effect on the part of the independent variables (Perceived quality 'durability', Perceived value, Price) towards the dependent variable, which in this case is customer satisfaction.

The Beta coefficient of the 'perceived value' variable is 0.54, which explains its strong impact on customer satisfaction. The Beta coefficient of the second variable, 'price', is 0.26, meaning that it has a moderate impact on customer satisfaction. For the third variable, which is perceived quality represented by the 'durability' dimension, its Beta coefficient is equal to 0.124, meaning that the more durable the tap, the greater the increase in satisfaction.

Table 10. **Multiple linear regression (summary)**

	Model	Non-standardised coefficients		Standardised coefficients	t	Sig
		B	Standard error	Bêta		
3	(Constant)	-2,840	0,343		-8,279	<0,001
	Perceived value	0,736	0,089	0,549	8,253	<0,001
	Price	0,252	0,063	0,264	3,993	<0,001
	Durability	0,250	0,108	0,124	2,309	0,022

Source: Compiled from SPSS software

4.3 Discussion of results

The results of this study conducted on a sample of 203 BCR brand customers, the majority of whom were male respondents, as the product under study is primarily of interest to men. As for the professions, the study sample included individuals working in various occupations, with a notable number of plumbing supply sellers and plumbers, who can be considered as the primary users of the product under study.

The results revealed the background of satisfaction in the studied context. In this section, these results will be discussed. The descriptive analysis showed that BCR brand customers agree that the company has a good image, as well as good complaint handling service. They also agreed on the perceived value variable, indicating that BCR faucets provide them with the value they expect. However, the results for the variables 'customer expectations,' 'perceived quality,' and 'price' were neutral, while the standard deviation values indicated an inconsistency between the average and the reality. Respondents evaluated these three variables as 'disagree,' meaning that they did not agree with these three variables. Regarding the question about satisfaction evaluation, the average indicates that customers are on the satisfied side.

After applying the multiple linear regression test, the results showed that customer satisfaction in the studied case is influenced by three variables: 'perceived value,' 'price,' and 'perceived quality (durability).' The rest of the tested variables, namely 'company image,' 'customer expectations,' and 'perceived quality (absence of defects, physical appearance, and distinctiveness),' did not have an impact on customer satisfaction and are not factors of customer satisfaction. The three variables 'perceived quality (durability),' 'perceived value,' and 'price' are

the components that impact satisfaction in the industrial sector in Algeria, specifically in the case of BCR company. This allows us to designate them as the three antecedents of customer satisfaction in the proposed model.

The model obtained after the test and analysis includes the variable 'perceived value' as an antecedent of customer satisfaction because it has a positive impact on satisfaction, as seen in the American Customer Satisfaction Index (Fornell et al., 1996), the Norwegian Customer Satisfaction Barometer (Jhonson et al., 2001), and the European Customer Satisfaction Index (Martensen et al., 2000). Thus, the model derived from this study includes the variable 'perceived quality' as an antecedent of satisfaction, as seen in the Swedish and Norwegian barometers (Rajendran & Arun, 2020), as well as the American and European indices (Ngo, 2015). However, in our case, this variable only impacts satisfaction through the durability dimension because customers seek durable products, and the more durable the product, the higher the satisfaction. The model also includes the variable 'price' as an antecedent of satisfaction. This variable was only present in the Norwegian barometer as an independent variable of perceived value (Jhonson et al., 2001). Similarly, in our study, this variable has a positive impact on customer satisfaction, as customers are always looking for affordable and reasonable-priced products.

The other variables, such as customer expectations, which exist in the aforementioned barometers and indices, and company image, which is considered an antecedent in the European model and complaint handling in the Norwegian barometer, did not exist.

According to the results of the linear regression test presented above, the variable 'perceived value' was found to have the greatest impact on BCR customer satisfaction, followed by the variable 'perceived quality' with the dimension of durability, which had a moderate impact on satisfaction, and finally, the variable 'price', which had a low impact on customer satisfaction. These results helped to explain the impact of these variables on customer satisfaction with the BCR brand, and subsequently helped to confirm three of the hypotheses proposed in the conceptual framework:

Table 11. **Summary of assumptions**

N°	Hypothesis		Status
H1	Perceived quality has an impact on customer satisfaction.	No defects	Not validated
		Durability	Validated
		Physical appearance	Not validated
		Distinctiveness	Not validated
H2	Perceived value has an impact on customer satisfaction.	Functional value (performance/quality)	Validated
		Emotional value	Validated
		Social value	Validated
H3	Customer expectations have an impact on customer satisfaction.		Not validated
H4	Corporate image has an impact on customer satisfaction.		Not validated
H5	Complaints handling has an impact on customer satisfaction.		Not validated
H6	Price has an impact on customer satisfaction.		Validated

Source: Developed through perceived results

The results gave rise to the following model equation (see Equation 1)

$$y = 0.549x_1 + 0.264x_2 + 0.124x_3 \qquad (1)$$

The results of our study lead to propose a model which is made up of three variables which have an impact on satisfaction and which are presented in the following model which summarises the results of our study:
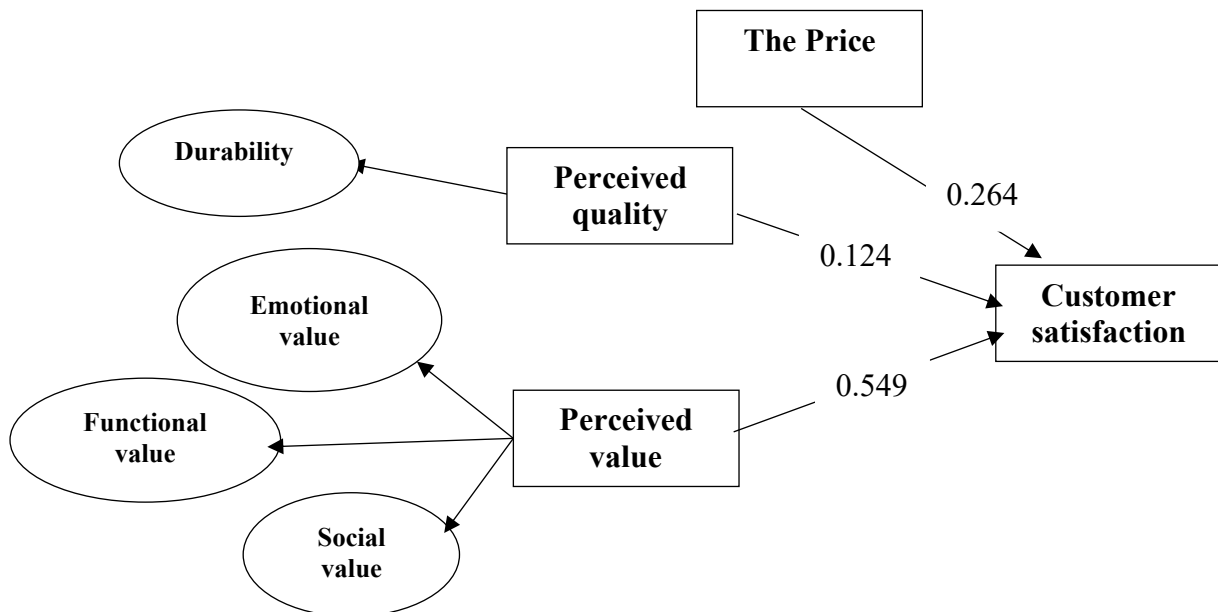
Figure 6. **The Algerian Customer Satisfaction Index for industry (ALCSI)**
Source : Compiled from SmartPLS software

5. CONCLUSIONS

The primary aim of this research is to identify the factors that influence customer satisfaction in the Algerian industrial sector, specifically focusing on the case of BCR brand faucet products. Our objectives included developing a customer satisfaction index model inspired by models from other countries. Due to time constraints, our study focused solely on determining the antecedents of satisfaction and did not explore the consequences of satisfaction.

This study followed a quantitative approach, employing a questionnaire survey primarily targeted at BCR brand customers. The questionnaire was distributed using two methods: online distribution through social networks and plumbing groups, and direct distribution at the BCR store in Setif, where face-to-face interviews were conducted with customers.

The findings of this study identified three key factors that impact customer satisfaction in the studied context:
- Perceived quality (specifically durability)
- Perceived value
- Price

In summary, the questionnaire results confirm the significance of perceived product quality, perceived value, and price as crucial drivers of customer satisfaction. These findings emphasise the importance for BCR to prioritise these elements in order to enhance customer satisfaction and foster long-term customer loyalty, particularly by focusing on the aspect of perceived value. Recognising the importance of customer satisfaction, companies can cultivate strong and enduring relationships that are vital for long-term success in today's competitive market.

The model developed through this study's results can be further refined, expanded, and applied to various contexts in Algeria, considering its significance in the business realm. Such models are widely adopted by major nations to assess corporate performance.

The model developed through the results of this study can be studied in order to be improved, completed, and generalised for several contexts in Algeria, taking into account its importance in the corporate world, as this type of model is adopted by major nations to evaluate corporate performance.

However, this research has its limitations, despite the results obtained. Among these was the time constraint, where the period of the research can be considered insufficient for studies of this kind. The study of a single case for this type of model, which requires a study of a large number of companies or several sectors. In addition, the sample size of 203 is a limit for the case studied, as it cannot be truly representative when compared to the sample sizes studied in other countries.

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