

CHAPTER IV

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This study develops and tests an integrated, systematic model of quality of service and customer satisfaction. From a statistical perspective, examining relationships among complex multiple variables in a set of constructs is more important than examining simple bivariate relationships. The methodology employed, the structural equation analysis, allows for the simultaneous examination of systematic relationships among expected service quality, perceived service quality as the mediating variable, customer awareness, demographic variables as moderating variables, and customer satisfaction. This approach provides for the integration of the cross-sectional data and for the consideration of multiple dependent variables.

This chapter shows the research methodology used in this study to empirically test the research hypotheses. The first section begins with a discussion of the research questions, research framework, and 14 research hypotheses to be tested. The second section describes the research design and survey instrument, in particular, the research population, sampling, and the data collection method, data screening, remedy for the missing data, outlier detection, normality test, exploratory factor analysis, unidimensionality test, reliability and validity analyses, statistical method (structural equation modeling), and the SPSS program that have been applied in this study.

4.2 RESEARCH STRATEGY

One of the critical steps in doing research is to find a suitable research strategy for the subject being investigated and the success of the research depends on the style in which primary data are collected, produced and analyzed.

However, there are a lot of research strategies that can be used for the primary data research. Any strategy has a different way of collecting and analyzing the data and each strategy has its own logic and its own advantages and disadvantages (Yin, 2003).

Saunders et al. (2007) listed seven different kinds of research strategies. These are: Survey, experiment, case study, ground theory, action research, ethnography and archival research. Yin (2003) also named five kinds of strategies which the researcher can use as shown in Table 4.2. He stated that there are three conditions that should be considered when determining the appropriate research strategy. These are:

- i. The types of the research question(s) posed.
- ii. The extent of control the researcher has over behavioural events.
- iii. The focus on contemporary events.

Table 4.1: Relevant Situations for Different Research Strategies

Strategy	Form of research question	Required control over behaviour	Focus on contemporary event
Survey	Who, What, When, How many. How much	No	Yes
Experiment	How, Why	Yes	Yes
Case study	How , Why	No	Yes
History	How, Why	No	No
Archival Analysis	Who, What, Where, How many, How much	No	Yes, No

Source: Yin (2003).

Identifying the research questions is probably the most important steps to be taken in a research study. Nevertheless, the form of the question can provide an important clue regarding the appropriate research strategy that is to be used (Yin, 2003). Robson (2002) said that there is a sense in which surveys are more like a research strategy than a specific method. It is an overall approach to doing social research. Conducting surveys is now a booming business, and being on the receiving end of a survey is often a component of modern life.

Zikmund (2002) defines a survey as: *"A research technique in which information is gathered from a sample of people by using of a questionnaire or interview; a method of data collection based on communication with a representative sample of individuals"*.

Saunders et al. (2007) stated that the survey strategy is a popular and common strategy in management research and business and is most frequently used to answer "what" questions. It tends thereby, to be used for exploratory and descriptive research. A survey allows the researcher to generate findings that are representative of the whole population at a lower cost.

In this study, the survey has been chosen as a research strategy. As a "what" question has been asked, the survey strategy is the best technique suited to these types of questions. There are some reasons and rationales for using this technique in this research:

- The researcher is seeking to investigate some of the relationships between the expected service qualities, perceived service quality as the mediating variable, customer awareness, demographic variables as moderating variables, and customer satisfaction, thus a survey strategy allows the researcher to collect quantitative data which can be analyzed quantitatively to find these relationships.
- Using a survey strategy gives the researcher more control over the research process (Saunders, 2007).
- Since a PhD program has a limited amount of time, the survey strategy has been considered as the most suitable because it takes less time to undertake than other research methods.

4.3 DISCUSSION OF THE RESEARCH QUESTIONS

This study identifies customer satisfaction in Libyan banks that operate under the Islamic window system. It also examines the awareness level of Libyan customers of products and services provided by Islamic window banks. The study has seven research questions. The first research question is an examination of customer awareness of Islamic products and services that are provided by Islamic window banking.

The second research question determines the dimensions of the expected quality of customer services in Islamic windows in commercial banks. On the other hand, the third research question explores into the dimensions of the perceived quality of customer services in Islamic windows in commercial banks. The differences between expected service quality and perceived service quality are tested in Research Question No. 4.

An examination on window Islamic bank operation is performed. The relationship between perceived service quality and customer satisfaction moderated by demographic variables such as gender and marital status in Islamic windows in commercial banks is performed. This is done in Research Question No. 5. In addition, the sixth research question identifies the relationships between customer awareness and customer satisfaction moderated by demographic variables such as gender and marital status in Islamic windows in commercial banks. The seventh research question identifies the relationship between expected service quality and customer satisfaction mediated by the perceived service quality in Islamic windows in commercial banks.

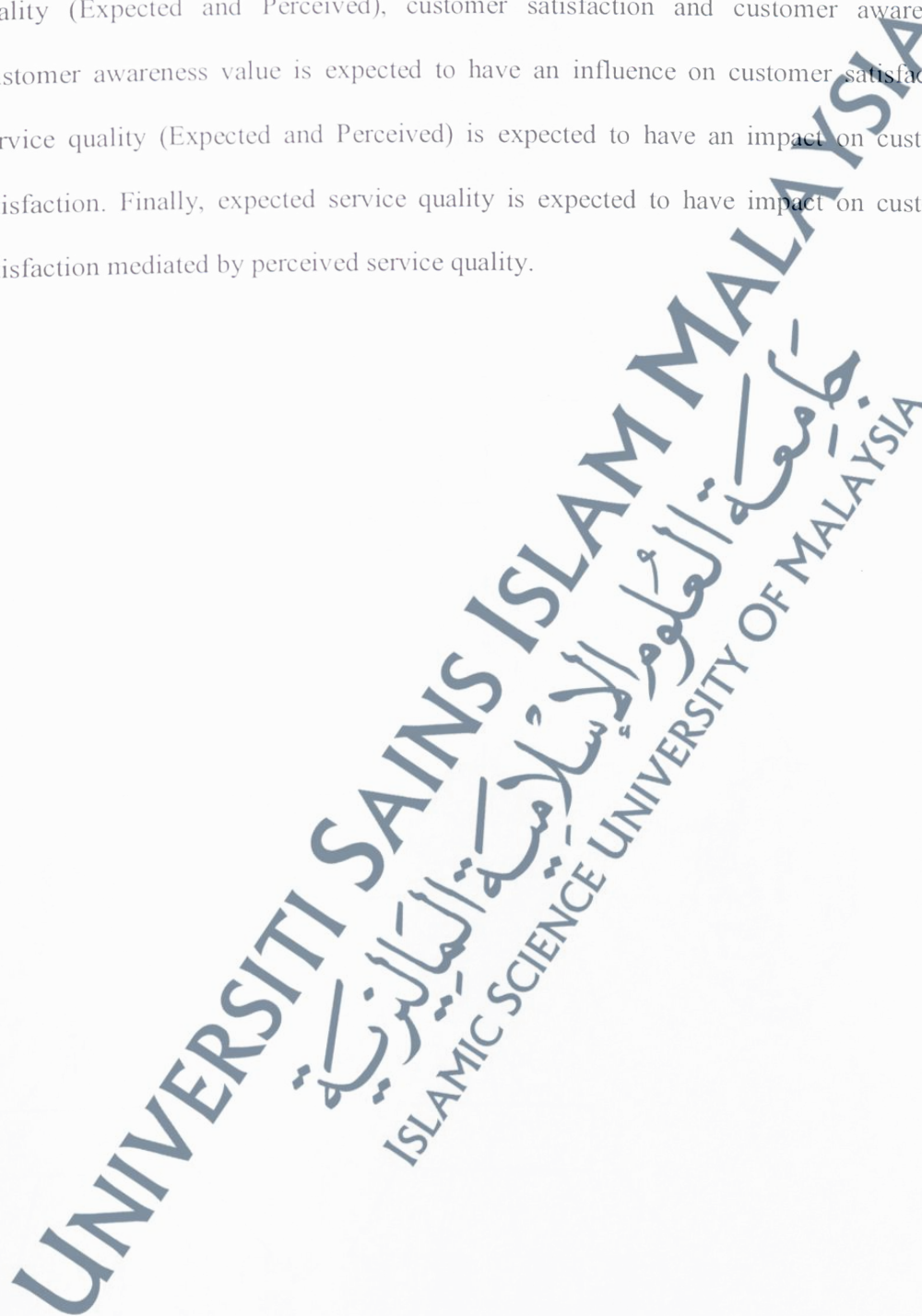
To achieve the objectives of the study, an extensive review of the existing relevant literature has been performed using the SERVQUAL model. This study extends previous research on the measurement of customer satisfaction by adding demographic variables into the analysis. Another variable added is customer awareness of products and services provided by Islamic window banks. As shown in Figure 3.1, the constructs in the study include expected service quality, perceived service quality, customer awareness, and customer satisfaction. However, the previous studies do not provide an integrated approach to examine the relationships among the constructs mentioned. The theoretical framework for the study is as follows:

4.4 MODEL DEVELOPMENT

The conceptual research model (See Figure 4.1) was developed using a multidimensional variables based on the SERVQUAL model (1985), and the expectancy disconfirmation paradigm (Oliver, 1997). The conceptual research model suggests that the Libyan banking customers are seeking to evaluate customer satisfaction, service quality and customer awareness at seven orders; four first orders, two second order and only one third orders.

Figure 4.1 shows that the first order establishes for four variables (Customer satisfaction, customer awareness, expected service quality and perceived service quality). Meanwhile, the second order is established for two variables (expected service quality and perceived service quality), and only one third-order for the perceived service quality.

The model also illustrates the potential relationships that may exist between service quality (Expected and Perceived), customer satisfaction and customer awareness. Customer awareness value is expected to have an influence on customer satisfaction. Service quality (Expected and Perceived) is expected to have an impact on customer satisfaction. Finally, expected service quality is expected to have impact on customer satisfaction mediated by perceived service quality.



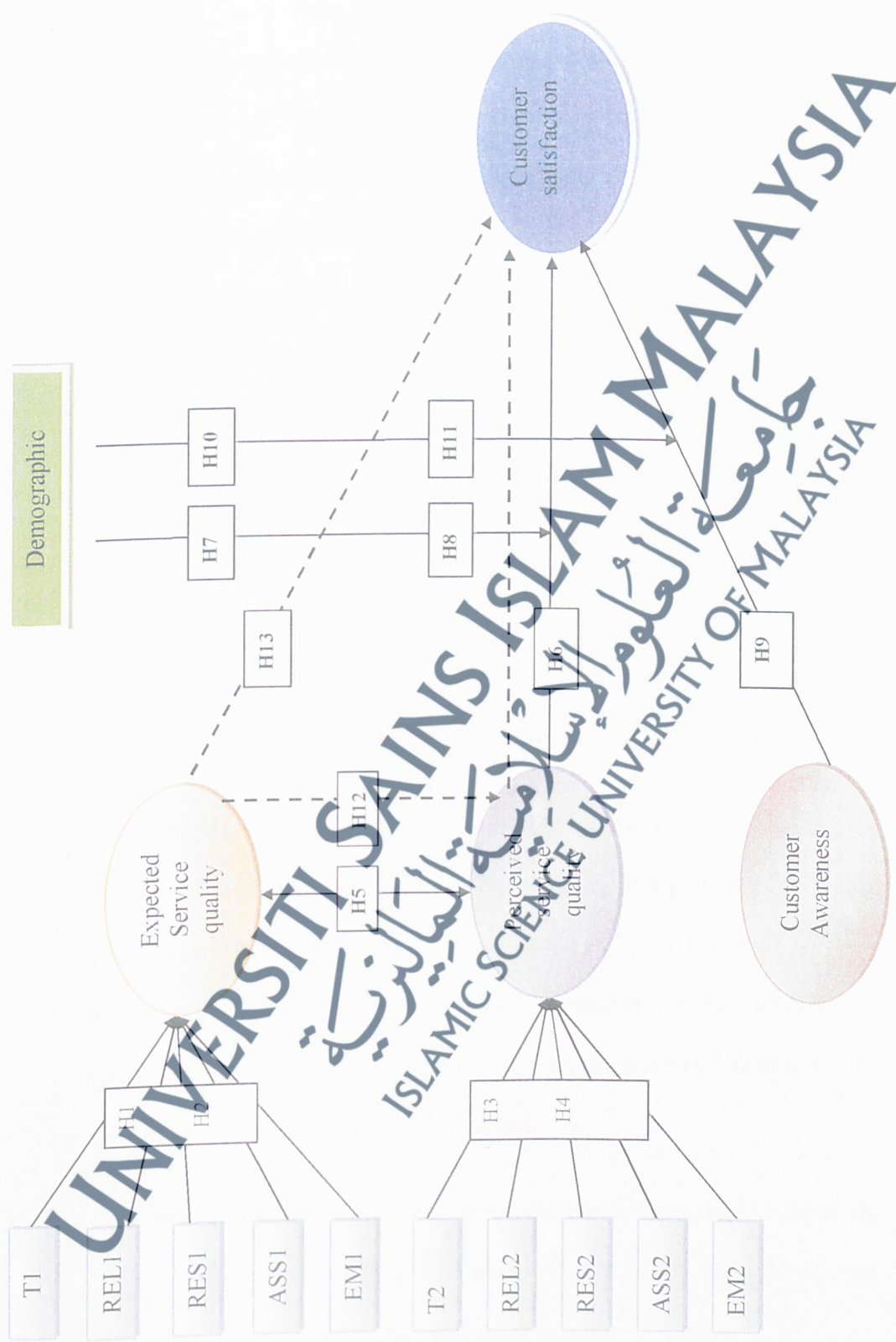


Figure 4.1: Model of the Study

H1_A (alternative): A significant positive relationship exists between the five sub-dimensions of expected quality (ET, EREL, ERES, EASS, and EEM) and the expected quality primary dimension.

H2₀ (null): No significant difference exists in the contribution of the expected aspects (TAN, REL, RES, ASS, and EM) toward service quality.

H2_A (alternative): A significant difference exists in the contribution of the expected aspects (TAN, REL, RES, ASS, and EM) toward service quality.

H3₀ (null): No significant positive relationship exists between the sub-dimensions of perceived quality (PT, PREL, PRES, PASS, and PEM) and the perceived quality primary dimension.

H3_A (alternative): A significant positive relationship exists between the sub-dimensions of perceived quality (PT, PREL, PRES, PASS and PEM) and the perceived quality primary dimension.

H4₀ (null): No significant difference exists in the contribution of the perceived aspects (TAN, REL, RES, ASS, and EM) toward service quality.

H4_A (alternative): A significant difference exists in the contribution of the perceived aspects (TAN, REL, RES, ASS, and EM) toward service quality

H5₀ (null): No difference exists between expected service quality and perceived service quality by customers.

H5_A (alternative): A difference exists between expected service quality and perceived service quality by the customers.

H6₀ (null): No significant positive relationship exists between perceived service quality and customer satisfaction.

H6_A (alternative): A significant positive relationship exists between perceived service quality and customer satisfaction.

H7₀ (null): No significant positive relationship exists between perceived service quality and customer satisfaction moderated by the gender of the customer.

H7_A (alternative): A significant positive relationship exists between perceived service quality and customer satisfaction moderated by the gender of the customer.

H8₀ (null): No significant positive relationship exists between perceived service quality and customer satisfaction moderated by the marital status of the customer.

H8_A (alternative): A significant positive relationship exists between perceived service quality and customer satisfaction moderated by the marital status of the customer.

H9₀ (null): No significant positive relationship exists between customer awareness and customer satisfaction.

H9_A (alternative): A significant positive relationship exists between customer awareness and customer satisfaction.

H10₀ (null): No significant positive relationship exists between customer awareness and customer satisfaction moderated by the gender of the customer.

H10_A (alternative): A significant positive relationship exists between customer awareness and customer satisfaction moderated by the gender of the customer.

H11₀ (null): No significant positive relationship exists between customer awareness and customer satisfaction moderated by the marital status of the customer.

H11_A (alternative): A significant positive relationship exists between customer awareness and customer satisfaction moderated by the marital status of the customer.

H12₀ (null): No indirect relationship exists between expected service quality and customer satisfaction.

H12_A (alternative): An indirect relationship exists between the expected service quality and customer satisfaction.

H13₀ (null): No significant positive relationship exists between expected service quality (ESQ) and satisfaction (SAT) (without a mediator).

H13_A (alternative): A significant positive relationship exists between ESQ and SAT (without a mediator).

H14₀ (null): Perceived service quality has no full mediation effect on the relationship between ESQ and SAT.

H14_A (alternative): Perceived service quality has a full mediation effect on the relationship between ESQ and SAT.

4.6 QUESTIONNAIRE DESIGN

The questionnaire was divided into five parts (see Appendixes A and B, page, 195). The first part includes personal details such as gender, age, education, occupation, monthly income, marital status, and the name of the bank. The second part includes 22 items designed to measure the service expected by excellent bank customers. The third part includes 22 items designed to measure the level of service quality that the customers actually perceived. The fourth part includes five items designed to measure customers' satisfaction toward the services provided by Islamic window banks. The fifth part includes six items designed to measure customers' awareness toward Islamic products and services. Moreover, all items regarding perceptions of service quality and expected service quality were positively worded in the questionnaire, as recommended by Parasuraman et al. (1985).

All items in parts B, C, and D used a standard five-point Likert-type scale ranging from (1) strongly agree, (2) agree, (3) neutral, and (4) disagree, to (5) strongly disagree. All items in part E ranged from (1) aware and use it and (2) aware and do not use it, to (3) not aware and use it. (See Appendix I)

4.6.1 The Pilot Study (Pre-Test Questionnaire)

Conducting a pretest was necessary before creating the final survey instrument. The pre-test is aimed to improve the face and content validity for the final instrument. The questionnaire consisted of 55 items. A total of 22 items were used to measure expected service quality (4 items to measure Tangibility, 5 items to measure Reliability, 4 items to measure Responsiveness, 4 items to measure Assurance, and 5 items to measure Empathy). Twenty-two other items were used to measure perceived service quality (4 items to measure Tangibility, 5 items to measure Reliability, 4 items to measure Responsiveness, 4 items to measure Assurance, and 5 items to measure Empathy); 6 items were used to measure customer awareness of Islamic products; and 4 items were used to measure customer satisfaction.

Three experts¹ were asked to evaluate the questionnaire and provide comments on its content and understandability. They were also asked to edit and improve the items to enhance their clarity and readability. They were asked about the suitability of paragraphs in relation to the objectives of the study; also they were asked about the validity of the paragraphs in measuring customer satisfaction, service quality (Expected and Perceived), and the awareness of customers of Islamic windows and Islamic services and products. Furthermore, the experts made observations and proposed modification. The experts commented that several scale items were clear and needed no adjustments. Nonetheless, they added one item for measuring customer satisfaction, thus increasing the number of items for customer satisfaction to six.

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The questionnaire was translated into the Arabic language, after which it was corrected by an expert in Arabic language. The researcher subsequently selected a small representative group to review the survey questions. A convenience sample was drawn from 30 customers from Libyan banks who had bank accounts. Respondents to the pre-test were encouraged to comment and provide suggestions on any questions that they thought were ambiguous or difficult to answer. Some of them commented about the large number of items in the questionnaire and that the researcher should reduce their number. The researcher then made minor modifications on the questionnaire, such as clarifying sentences and using more appropriate words.

Table 4.2 below shows demographic variables for the respondents of the pilot study that had been conducted before the main survey study. The pilot study was conducted early 2012 from different cities in Libya which have been using commercial bank services throughout five working days.

Respondents' Demographic Profile: Table 4.2 shows that the majority of respondents have these characteristics- they are Males (20), Aged between 26 to 40 years old (21), have High Diploma or Bachelor (17) degrees as their academic qualifications, also it is found that the majority of the respondents are Government employees (27) and (20) from respondents have income more than 801 L.D and (19) were married. Finally, another finding is that the distribution of respondents across the banks is similar to one another.

Table 4.2: Respondent’s Demographics Details

No	Respondent Characteristics		frequency
1	Gender	Male	20
		Female	10
2	Age	Below 25 years	3
		26 to 40 years	21
		41 to 55 years	5
		Above 56 years	1
3	Qualifications	Without qualification	1
		Secondary school	8
		High Diploma or Bachelor	17
		Master	4
		PhD	-
4	Occupations	Government employees	27
		Private sector employees	3
		Freelancers	3
		Student	-
		Unemployed	-
5	Monthly income	Less than 350 L.D	1
		351 to 500 L.D	1
		501 to 800 L.D	8
		Above 801 L.D	20
6	Marital status	Single	11
		Married	19
		Widowed / divorced	-
7	Name of the bank	Gumbouria Bank	12
		Wahda Bank	8
		Sahara Bank	10

The results of Cronbach's alpha are shown in table 4.3. They are depicted in Table 4.3, showing a value of Cronbach's alpha between 0.918 to 0.869, indicating an acceptable consistency and stability of the questionnaire. This is as recommended by (Nunnally, 1978).

Table 4.3: Reliability Statistics of the Questionnaire

No	Variables	Cronbach's Alpha	No. of items
1	Expectation of Service quality	0.869	22
2	Perceived of Service quality	0.918	22
3	Customer Satisfaction	0.871	5
4	Customer Awareness	0.904	6
5	Total	0.880	55

4.6.2 Section B: Expected Service Quality

Table 4.4 shows the dimensions of the Expected Service Quality of the questionnaire. Section B included a total of 22 items for measuring Expected Service Quality; it had five sub-dimensions. Four items measured Tangibility, 5 items measured Reliability, 4 items measured Responsiveness, 5 items measured Assurance, and 5 items measured Empathy.

Table 4.4: Dimensions of Expected Service Quality

Service Quality dimensions	Items
Tangibles	Excellent banks must provide equipment and tools to keep up with the modern era.
	The physical facilities at Excellent banks will be visually appealing.
	Employees at Excellent banks will have neat appearance.

	The general appearance of the bank must be compatible with the nature of the service provided.
Reliability	When Excellent banks promise to do something by a certain time, they will do it.
	When the customer has a problem, Excellent banks will show a sincere interest in solving it.
	Excellent banks will perform the right service to customers from the first time.
	Excellent banks provide the service at the time they promise to do so.
	Excellent banks keep error-free records.
Responsiveness	Employees at Excellent banks will tell the customers exactly when the services will be performed.
	Employees at Excellent banks provide prompt services to customers.
	Employees at Excellent banks will always be willing to help customers.
	Employees at Excellent banks are never too busy to respond to customers' requests.
Assurance	The behavior of Employees in Excellent banks will instill confidence in customers.
	Customers at Excellent banks must have a sense of security in transactions.
	Employees at Excellent banks are consistently courteous with customers.
	Employees at Excellent banks have the basic knowledge to answer customers' questions.
	Excellent banks give customers individual attention.
	Excellent banks will have operating hours convenient for all their customers.
	Excellent banks have employees who give

Empathy	customers personal attention.
	Excellent banks have their customers' best interests ahead of their own interests.
	Employees at Excellent banks understand the specific needs of their customers

4.6.3 Section C: Perceived Service Quality

Table 4.5 shows the dimensions of Perceived Service Quality used in this questionnaire. Section C included a total of 22 items for measuring Perceived Service Quality; it had five sub-dimensions. Four items measured Tangibility, 5 items measured Reliability, 4 items measured Responsiveness, 5 items measured Assurance, and 5 items measured Empathy.

Table 4.5: Dimensions of Perceived service quality

Service Quality dimensions	Items
Tangibles	The Bank provides equipment and tools to cope with the modern era.
	The bank has an attractive appearance.
	The employees are presentable and have neat appearance.
	Fit the general appearance of the bank with the nature of the service provided.
Reliability	When my bank promises to do something by a certain time, it will do so.
	When I have a problem, my bank shows a sincere interest in solving it.
	My Bank performs the service right the first time.
	My Bank provides its service at the time it promises to do

	so.
	The bank maintains accurate records.
Responsiveness	Employees determine the time it takes to complete the service.
	The staff provides instant services.
	Staffs at the bank have a constant readiness to help me.
	Staffs at the bank are not too busy to respond to my request.
Assurance	Staffs at the bank are trustworthy.
	I feel safe when dealing with the staffs at the bank.
	The staffs at the bank are characterized are polite towards the customers.
	Employees have the basic information to answer my questions.
Empathy	There is an individual attention to customers by the bank.
	The bank provides hours of work appropriate for my circumstances.
	Staffs at the bank give me personal attention.
	The bank puts my advantage ahead of its interests.
	The staffs understand my specific needs.

4.6.4 Section D: Customer Satisfaction

Table 4.6 shows the measurement of Customer Satisfaction. Section D included a total of five items for measuring Customer Satisfaction.

Table 4.6: Measurement of Customer satisfaction

1	How satisfied are you with the services provided by the bank?
2	Are you satisfied with your financial transactions with the bank?
3	How is your overall satisfaction level with regard to your bank?
4	Banking services offered by the bank that I deal with meet my expectations.
5	Do you recommend your friends/ colleagues at work to deal with this bank?

4.6.5 Section E: Customer Awareness of Islamic Products and Services

Table 4.7 shows the measurement of Customer Awareness. Section D included a total of six items for measuring Customer Awareness. Moreover, all items regarding Customer Awareness were positively worded in the previous studies, as recommended by H. Saduman, O. (2005), Seethalecthunny et al (2011), and Naveed and Kashif (2010).

Table 4.7: Measurement of Customer Awareness

1	I realize (aware) that this bank offers interest-free banking services
2	I realize (aware) that this bank offers Islamic windows system
3	I realize (aware) that this bank offers Mudaraba products
4	I realize (aware) that this bank offers Musharaka products
5	I realize (aware) that this bank offers Murabaha products
6	I realize (aware) that this bank offers Ijara financing products

4.7 RESEARCH DESIGN

4.7.1 Study Population

A population is an entire group of entities such as people, institutions, and organizations that share a common set of characteristics consistent with the purpose of a study. Studying a population enables researchers to draw conclusions and plan to generalize (Zikmund, 1997). This study aims to measure customer satisfaction in commercial banking services in Islamic window banking. Therefore, the population of the study comprises customers who have bank dealings in the form of owning a bank account (Savings or Current), obtaining a financing loan (housing loan, furniture loan or car loan, etc), or conducting money transfers between banks.

4.7.2 Sample Size

The sample of a study consists of any customers who have bank dealings in the form of owning a bank account, obtaining a financing loan, or conducting money transfers between banks. All commercial banks in Libya have a network of branches distributed throughout the country. To guarantee the maximum participation of commercial bank customers, and in view of the large size of the study population, the researcher has chosen three commercial banks in Libya with Islamic window banking services. Convenience samples were taken from Jamahiriya Bank, Wahda Bank, and Sahara Bank. The researcher used the convenience sampling method, following Abdulkarim S. A & Abdulla M. A, (2009), and H. Saduman Okumus (2005), who likewise have used the convenience sampling method. The usage of convenience sampling is unavoidable, in the case of studying the responses of bank customers since the

population list of bank customers is not publicly available. The list of customers is considered as confidential by the banks' management.

The responses from customers are sought in big cities such as Tripoli, the capital city, which represents nearly one-third of Libya; Bangazy, the second city of Libya; Sabha; Zawiya; and Ajayla. A sample size representing at least 200 observations is generally recommended for a structural equation model using the maximum likelihood estimation (Boomsma, 1983; Kelloway, 1998). In addition, according to Parasuraman et al. (1988) and Stevens et al. (1995), a sample size of 200 is commonly used in scale development studies in the marketing area. Sekaran (2003) also states that sample sizes larger than 30 and less than 500 are appropriate for most studies.

A total of 600 questionnaires were distributed, but only 366 questionnaires were usable for analysis. Thus, 61% of the sample sizes were usable for the study. Every customer was in business at the bank during the business hours 0800–1400 from Sunday to Thursday and 0800–1200 on Saturday morning. The questionnaires were distributed in two ways. First of all, the questionnaires were given to bank employees and they were requested to distribute the questionnaires to their customers. Secondly, the interviewers personally met with the potential respondents and distributed the questionnaires to the customers outside the banks through the help of the researcher's friends in other cities. The questionnaire was translated into the Arabic language to ensure clarity, given that all respondents in this study are Libyans whose national language is Arabic.

4.7.3 Data Collection Method

Primary data are collected through an empirical study. The study sample comprises of customers who have bank dealings in the form of owning a bank account, obtaining a financing loan, or conducting money transfers between banks. The questionnaires were filled by the account holders of the different conventional banks with Islamic windows. The data were collected through face-to-face interviews with customers, managers, and employees to prevent the loss of questionnaires. Furthermore, the employees at these banks helped the researcher in collecting questionnaires, and the researcher’s friends in other cities also offered assistance by contributing to the breadth of the study area. And the names of the banks and cities are shown in table 4.8

Table 4.8: Lists of Banks Involved in Data Collection

City	Name of the Banks		
	Jamahiriya	Wahda Bank	Sahara Bank
Tripoli	Tripoli University branch and Ain Zara branch	Main branch and Moroccan branch	Abu Saleem branch and Ben Achour branch
Benghazi	Benghazi University branch	Al maidan branch	Qaminis branch
Sabha	branch um akaranib	Sabha branch	Sabha branch
Zawya	Zawya center and Nasar village	Zawya center	Zawya center
Ajilat	Ajilat center and Aljadedda branch	Ajilat center	No branch

4.8 DATA SCREENING

The collected data were screened to ensure that only valid data were used in the data analysis of this study. The data screening procedures influence the data analysis and statistical outcomes. The regular practice of data screening is worth the time and effort to achieve the most reliable and accurate results, and it is consistent with the best statistical practices (Wilkinson & APA Task force on statistical inference, 1999). Invalid questionnaires, such as highly incomplete questionnaires, were excluded from the data analysis.

4.9 REMEDY FOR MISSING DATA

Missing data under 10% for an individual situation or observation can generally be ignored when the missing data are in a random fashion (Kline, 1998; Hair et al., 2006). Lomax and Schumacker (2004) suggested that the mean substitution is the most viable approach to remedy missing data when the missing data account for a small proportion of the sample data.

4.10 OUTLIER DETECTION

Outliers are cases that have atypical scores either for a single variable or for a combination of variable means that are unusually large or unusually small values in a dataset (Anderson, Sweeney, & Williams, 2009). Outliers generally have a large impact on the solution.

Researchers must decide whether outliers should be deleted or retained, as problematic outliers can distort statistical tests (Pallant, 2007). An outlier can also be deleted when the outlier serves to be an observation that should be excluded from the dataset. An outlier can be deleted when the outlier is a data entry error or a recording mistake.

4.11 NORMALITY TEST

The normality of variables has proven its important role in the multivariate technique and inferential statistics. Normality also refers to the degree to which the distribution of the sample data corresponds to a normal distribution (Hair et al., 2006). The skewness and kurtosis are two indicators of normality. Skewness refers to the symmetry of a distribution compared to a normal distribution, whereas the kurtosis is how observations “cluster around a central point” for a given standard distribution (Norusis, 1990). The values of skewness and kurtosis can be examined to determine whether the observed variables are normally distributed. Kline (2005) suggests that an absolute value of skewness greater than 3 and an absolute value of kurtosis greater than 8 indicate problems with normality.

4.12 EXPLORATORY FACTOR ANALYSIS

The Exploratory factor analysis (EFA) is designed for a situation where connections between the observed and latent variables are unknown or uncertain. The analysis thus proceeds in an exploratory mode to determine how, and to what extent, the observed

variables are linked with their underlying factors. The researcher typically wishes to identify the minimal number of factors that underlie co-variation among the observed variables (Barbara, M.B., 2010). Thus, the common exploratory factor analysis aims to explain the interrelationships between the original variables. Conversely, the target of the component factor analysis is to select the components that explain as much of the variance in a sample as possible (Hutcheson & Sofroniou, 1999). A number of researchers suggested that no difference exists between the common factor analysis and component factor analysis, or that the latter is preferable to common factor analysis (Steiger, 1990; Schonemann, 1990; Velicer & Jackson, 1990; Quadagno & Velicer, 1988).

According to Kline (2005), it is not entirely appropriate to run the exploratory factor analysis and confirmatory factor analysis using the same data as using confirmatory factor analysis to specify a model based on the results of exploratory factor analysis will compound the problem of capitalization of chance variation. The sample size in this study comprised of 366 respondents and we had performed the moderator variables. For the aforementioned reasons, the researcher deemed it inappropriate to run the exploratory factor analysis and confirmatory factor analysis using the same data set in this study, following Kline (2005).

4.13 UNIDIMENSIONALITY ANALYSIS

Unidimensionality refers to the existence of a single construct mean that ensures that the measurement scales are unidimensional. A measurement scale is unidimensional when a single factor underlies all the variables and all variables (items) load on that

single factor (Bernard, 2000). Prior to estimating the overall measurement model, the unidimensionality of each construct was individually assessed (Sethi & King, 1994) because the items that were highly loaded on more than one factor were eliminated, as suggested by Hair et al. (2006), to ensure that the unidimensionality in the present study is adequate.

4.14 RELIABILITY AND VALIDITY

Cronbach's alpha is one of the most commonly used reliability coefficients (Kline, 2005), which is based on the "internal consistency" of a test. It is based on the average correlation of items within a test if the items are standardized to a standard deviation of 1, or on the average covariance among items on a scale if the items are not standardized. We assume that the items on a scale are positively correlated with each other because they are measuring, to a certain extent, a common entity. The average correlation of an item with all other items in the scale conveys the extent of the commonly entity. If items are not positively correlated with each other, we have no reason to believe that they are correlated with other possible items we may select. In this case, we do not expect to see a positive relationship between their test and other similar tests (Lord, F. & Novick, M., 1968). Stromgren, O. (2007) stated that reliability investigation through Cronbach's alpha is frequently used for assessing the consistency of an entire scale. Given its heavy usage, Cronbach's alpha that exceeds 0.70 or higher is generally acceptable (Nunnally & Bernstein, 1994). In the current study, coefficient alphas were calculated for each construct in the model (Expected Service Quality, Perceived Service Quality, Customer Awareness, and Customer

Satisfaction). For Expected Service Quality and Perceived Service Quality, we calculated for each of the identified SERVQUAL dimensions.

Validity refers to the degree to which a scale measures what it should measure. Content validity is a form of validity (Pallant, 2005). Several different types of validity are important, including face validity and construct validity (Nunnally and Bernstein, 1994; Bollen, 1989).

Face validity is the agreement among professionals that a scale measures what it is supposed to measure. In this study, the researcher sent his questionnaire to three professionals to examine it and give him the feedback for revision. The questionnaire was then given to his colleagues in the same facility to check for the readability of a question and the time to complete the questionnaire. The questionnaire was subsequently translated into the Arabic language to ensure clarity, given that all respondents in this study are Libyans whose national language is Arabic.

The study examines the construct validity through two aspects, convergent and discriminant validity. Convergent validity means that the items belonging to the same construct are highly correlated with each other (converge to the dimension). We can use the solutions proposed to determine the convergent validity such as size of factor loading, the average variance extracted (AVE), and construct reliability. The AVE is defined as “the mean variance extracted for the items loading on a construct” (Hair et al., 2006). Hair et al. (2006) explained that scholars suggested that the AVE value should be 0.5 or higher to provide evidence of convergent validity.

Discriminant validity relates to how a certain construct is different from other constructs. According to Hair et al. (2010), correlations between latent constructs of

more than 0.90 indicate a lack of discriminant validity. Thus, the correlations between variables should be less than 0.90.

4.15 STRUCTURAL EQUATION MODELING

The structural equation modeling is a statistical methodology that adopts a confirmatory (i.e., hypothesis testing) approach to the analysis of a structural theory bearing on a certain phenomenon (Byrne, 2010). Meanwhile, Hoyle (1995) defines a structural model as a hypothetical model that prescribes relationships among latent constructs and observed variables that are not indicators of latent constructs. Thus, Anderson and Gerbing (1988) observed that the estimation of the measurement models provides an estimate of convergent and discriminant validity, and that the estimation of the structural equation model provides an assessment of the predictive validity. The structural model also provides a meaningful and parsimonious explanation for the observed relationships within a set of measured variables (MacCallum, 1995). The model enables explanations of direct, indirect, and total structural effects of the exogenous (independent variables) latent constructs on the endogenous (dependent variables) constructs. In the present study, the structural equation model was designed to examine the relationships between the latent variables (Expected Service Quality, Perceived Service Quality, Customer Awareness, Customer Satisfaction) and other demographic variables as the moderating variables.

4.16 MEASUREMENT MODELS

Measurement models are used to identify the relationships among the observed variables (indicators) and a latent construct (Byrne, 1998). Measurement models also enable researchers to assess how well the observed indicators work as measurement instruments for the latent variables by investigating the reliabilities and the validities of the observed or indicator variables (Jöreskog & Sörbom, 1989). Thus, the confirmatory factor analysis models represented the measurement models that were assessed in the current study.

4.16.1 Confirmatory Factor Analysis

The Confirmatory factor analysis (CFA) is different from the exploratory factor analysis. The CFA aims to convey to researchers how well their specification of the factors matches the actual data. Thus, according to Byrne (2010), the CFA is suitable when the researcher has some knowledge of the underlying latent variable structure. Depending on the knowledge of the theory, empirical research, or both, he postulates the relationship between the observed measures and the underlying factors a priori and then statistically tests this hypothesized structure. The first-order CFA model aims to test the correspondence among the first-order latent factors and observed indicators. The second-order CFA model aims to evaluate whether or not the second-order latent variable is a multidimensional construct comprising multiple first-order factors explained by their corresponding observed (indicators). Five measurement models have been developed and estimated in this research, namely, four first-order CFA models for measuring Expected Service Quality, Perceived Service Quality, Customer

Satisfaction, and Customer Awareness, and two second-order CFA models for measuring Expected Service Quality, Perceived Service Quality, and one third-order CFA model for measuring Perceived Service Quality.

4.16.1.1 Model Fit Indices

Three types of overall model fit measures are typically used, namely, components of incremental fit measures (IFM), absolute fit measures (AFM), and parsimonious fit measures (PFM) (Hair et al., 1998; Byrne, 1998; Hu & Bentler, 1995). An incremental fit index evaluates the proportionate fit by comparing a target model with a more restricted, nested baseline model, and an absolute fit index is used to directly assess how well a priori theoretical model fits the sample data. A parsimonious fit measure is used to diagnose whether the model fit has been achieved by over-fitting the data with too many coefficients.

Firstly, the incremental fit measures can be assessed to compare the proposed model to a certain baseline model. The common indices of the fit indices are the goodness-of-fit index (GFI), normed fit index (NFI), and comparative fit index (CFI).

The GFI represents the weight proportion of variance in the sample covariance accounted for by the estimated population covariance matrix. Kline (2005) suggested that a GFI greater than 0.90 is generally acceptable for a good fit model. According to Hair et al. (2006), the NFI is a measure that quantifies the differences in the X^2 value for the fitted model and an independent model divided by the X^2 value for the independent model. Kelloway (1998) suggested that an NFI greater than 0.90 is generally acceptable with a good model fit. The CFI, according to Kline (2005), is a

measure that quantifies the relative improvement in the model fit compared to an independent model. Hu and Bentler (1999) and Kline (2005) suggested that a CFI greater than 0.90 is generally acceptable for a good model fit.

The model that obtains a value greater than, or equal to, 0.90 larger values indicates a higher level of GFI. Secondly, the chi-square test, root mean square error of approximation (RMSEA), and root mean square residual (RSMR) are the absolute fit indices that are commonly used to assess the model. The chi-square (X^2) is a measure that quantifies the differences between the observed and estimated covariance matrices. The degree of freedom (df) is the amount of mathematical information available to estimate model parameters. The normed chi-square (X^2/df) is a ratio of X^2 to the degree of freedom of a model. Thus, X^2/df less than 3.0 is generally acceptable for a good model fit (Kline, 2005; Carmines & Mclver, 1981). The RMSEA represents how well a model fits a population (Hair et al., 2006). A lower value for the RMSEA indicates a better model fit. An RMSEA less than 0.08 is generally acceptable for model fit (Brown & Cudeck, 1993). The standardized root mean residual (SRMR) represents the average difference between the predicted and observed variances and covariance in the model. Kline (2005) suggested further that an SRMR smaller than 0.10 is generally considered favorable. Thirdly, the parsimonious fit measure (PFM) is used to diagnose whether or not model fit has been achieved by over-fitting the data with numerous coefficients based on the parsimonious goodness-of-fit index (PGFI) and the parsimonious normed fit index (PNFI). The PGFI explains the complexity of the hypothesized model in the evaluation of the overall fit. Generally, a PGFI larger than 0.50 is acceptable for a good model fit (Byrne, 1998). The PNFI accounts for the

number of degrees of freedom used to investigate a level of fit. Thus, a higher value of PNFI is better. Table 4.9 shows the types of indices used in the SEM in this study.

Table 4.9 Shows Types of Indices used in SEM

Goodness-of-Fit Indices	Recommended Thresholds
Normed Chi-square (χ^2/DF)	Less than 3.0
Adjusted goodness-of-fit index (AGFI)	0.9 or larger
Goodness-of-fit index (GFI)	0.9 or larger
Comparative Fit Index (CFI)	0.9 or larger
Normed Fit Index (NFI)	0.9 or larger
Standardized Root Mean Residual (SRMR)	0.10 or less
Root Mean Square Error of Approximation (RMSEA)	0.08 or less

Source: Kline, 2005& Hair et al, 2006

4.17 CHAPTER SUMMARY

This chapter has been devoted to presenting the research methodology used in this study. The chapter contains discussion on the research strategy applied in this research, followed by the discussion on research questions as well as the model development. The explanations on the hypothesis development are also offered. Then, the research design and questionnaire design which include results from the pilot study (Pre-test Questionnaire) were specified. Research population, sampling, and data collection method employed in the study are also discussed in this chapter.

Further processes of data screening, treatment for missing data, outlier detection, normality test, exploratory factor analysis, unidimensionality analysis and the reliability and validity are reported. Finally, the Structural Equation Modeling (SEM) that is used to analyse the data is briefly discussed at the end of the chapter.

