CHAPTER 4. RESEARCH METHODOLOGY

4.1. Overview

This chapter reviews the research methodology used for this study in order to empirically test the hypotheses developed in the chapter three. It includes a discussion on research strategy, research context, data collection method, sampling, questionnaire, pilot study and an overview of the statistical techniques used.

4.2. Research Strategy

There are four principal research strategies for understanding the social world: experiments, surveys, field research and use of available data (Singleton & Straits, 2005). The purpose of this study was to examine the relationship between various factors and store brand proneness, which implied analysis of quantitative data. Therefore, collection of numerical descriptions of the socio-demographic, perceptual, psychographic and behavioral characteristics of the study population was necessary. Survey was chosen as the appropriate research strategy for this study due to the benefits of survey research design. Among all the approaches of social science research, surveys are the most effective means of social description. Surveys are found useful in addressing research questions
related to social background information, reports of past behaviour, attitudes, beliefs and values, behavioral intentions and sensitive questions (Fowler, 1993; Singleton & Straits, 2005). Surveys are also considered as a very efficient data gathering technique. While experimentation usually addresses only one research hypotheses, numerous research questions can be addressed through a single large-scale survey. Additionally, strength of survey design lies in simple administration of questionnaire, enhanced reliability of data because of fixed response questions, reduced complexity of data coding, analysis and interpretation (Malhotra & Dash, 2009; Schuman & Kalton, 1985; Singleton & Straits, 2005).

In contrast to these advantages, surveys are susceptible to reactivity, leading to systematic measurement error in data. Another key weakness of this approach is reliance on respondents reporting of behaviour than observation. This may lead to measurement error in cases of respondents' lack of truthfulness, misunderstanding of questions, inability to recall past events, instability in their opinions and attitudes (Malhotra & Dash, 2009; Singleton & Straits, 2005)

4.3. Research Context

The study took place in Ahmedabad and Vadodara cities of Gujarat. While Ahmedabad is known as the commercial capital of the state, Vadodara is popularly known as the cultural capital of Gujarat. Ahmedabad ranks seventh and Vadodara ranks fifteenth in the list of India's top urban agglomerations on the
basis of population and literacy rates (Datta, 2006). The average monthly spending on FMCG products in Ahmedabad and Vadodara are Rs 2,869 and Rs 2,816 respectively and these two cities have appeared in the top ten list of FMCG Havens (Bijapurkar, 2006). The RK Swamy BBDO\(^7\) ranking of 784 towns on the basis of market potential value places Ahmedabad at seventh and Vadodara at fifteenth position and classify them in 'AA' and 'A' category of towns respectively.

Ahmedabad and Vadodara can therefore be considered as relatively developed market for organised retailing in India. Vadodara also features at the third position in the list of towns prepared based on ownership of durables priced over Rs. 6000 (Bijapurkar, 2006).

Private brands in India are now found across a spectrum of product categories within the product class of F&G and non-food household consumption items. While Pantaloon retail chain has over 300 SKUs in the food, non food, dairy in FMCG areas, Spencer's Retail has more than 150 Stock Keeping Units (SKUs) under its private label and Aditya Birla Retail has 310 SKUs across 14 in-house store brands (Anonymous, 2009).

We consulted with the store managers of selected retail chains in Vadodara city to identify products, which had wide availability of store brands across the key retail chains in the city. The managers identified the thirty product categories

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\(^7\) The RK Swamy BBDO Guide to Urban Markets provided a rigorous explanatory framework of indexing market potential across different towns. It postulates that market potential value of a town is a function of the number of consumers a town has, the means these consumers have, the consumption behaviour in these towns, the awareness levels – a composite of exposure to media and extent of female literacy and the extent of market supporting infrastructure that exists.
from the monthly household consumption basket across the broad categories of food and non-food products. An observation survey of retail chains in Vadodara city confirmed the availability of store brand counterparts for the twenty-four out of thirty products identified by the managers (See Table 4-1).

<table>
<thead>
<tr>
<th>#</th>
<th>Food</th>
<th>#</th>
<th>Non-Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ketchup/Sauces</td>
<td>13</td>
<td>Floor Cleaners/Phenyls</td>
</tr>
<tr>
<td>2</td>
<td>Jams /Jellies</td>
<td>14</td>
<td>Toilet Cleaners</td>
</tr>
<tr>
<td>3</td>
<td>Instant Noodles</td>
<td>15</td>
<td>Toilet Papers</td>
</tr>
<tr>
<td>4</td>
<td>Instant Soup Mixes</td>
<td>16</td>
<td>Diapers</td>
</tr>
<tr>
<td>5</td>
<td>Packaged Snacks</td>
<td>17</td>
<td>Paper Napkins</td>
</tr>
<tr>
<td>6</td>
<td>Breakfast Cereals</td>
<td>18</td>
<td>Kitchen Paper Towels</td>
</tr>
<tr>
<td>7</td>
<td>Packaged Spices</td>
<td>19</td>
<td>Liquid Hand Wash</td>
</tr>
<tr>
<td>8</td>
<td>Packaged Atta</td>
<td>20</td>
<td>Detergent Powder</td>
</tr>
<tr>
<td>9</td>
<td>Pickles</td>
<td>21</td>
<td>Detergent Liquid</td>
</tr>
<tr>
<td>10</td>
<td>Ghee</td>
<td>22</td>
<td>Detergent Bars</td>
</tr>
<tr>
<td>11</td>
<td>Fruit Drinks</td>
<td>23</td>
<td>Utensil Cleaners</td>
</tr>
<tr>
<td>12</td>
<td>Honey</td>
<td>24</td>
<td>Incensed Sticks</td>
</tr>
</tbody>
</table>

4.4. Data Collection Method

The basic idea of a survey is to measure variables by asking respondents questions and then to examine the relationships among the measures. This leads to major design option of asking the question once or repeat the questions over
time. In this study we chose the cross sectional design, in which data on a sample or "cross section" of respondents chosen to represent a particular target population are gathered at essentially one point in time (Fowler, 1993; Malhotra & Dash, 2009; Singleton & Straits, 2005). Data collection was carried out in the field during the months of September - October 2009.

The second critical aspect of survey research is about deciding on the mode of asking questions: face-to-face interviews, telephone interviews, self administered questionnaires (mail or e-mail surveys) or some combination of these modes. Face-to-face interviewing was used for this study due to the inherent benefits of this technique.

Green, Tull and Albaum (1998) defined face-to-face interviewing as any interviewing, which is conducted between an interviewer and the respondent face-to-face. The key advantage of this interviewing technique is the high response rate resulting in less response error. Reasons for high response rate can probably be due to attractiveness of being interviewed, difficulty in saying 'no' to someone asking for something in person and possibility of conveying the importance and credibility of research by showing identification and credentials (Singleton & Straits, 2005). In addition to this, there are several other advantages of face-to-face interviewing. Malhotra and Dash (2009) have also discussed the advantages of this mode of asking questions with special reference to marketing research. This type of interviewing can be conducted practically anywhere: in home, at a central location, on the street, on public transport or at the respondent's work place. Interviews are able to incorporate show cards;
respondents can be reminded of images they may have seen previously or shown the images. Empirical evidences can be used to classify in respondents, which allows for greater accuracy.

The greatest disadvantage of this method is the cost; Shosteck and Fairweather (1979) compared the cost of mail survey and personal interview and found the data collection cost of face-to-face interview to be 61% higher than the cost of mail survey.

In this study, a combination of central location interviewing and in-home interviewing was followed. A reputed marketing research agency's services were used for the survey. Female shoppers in the sampled organised retail outlets in the study areas were randomly intercepted and requested to participate in the interview. The shoppers agreeing to the request were interviewed briefly through a short recruitment questionnaire. The main survey was conducted in-home with the randomly selected shoppers from the recruitment database.

4.5. Sampling Plan

According to Malhotra and Dash (2009), the target population is the aggregate of all the elements, sharing some common set of characteristics, which comprises the universe for the research problem. The purpose of this study was to model the household level store brand buying behaviour, the study intended to capture the households that currently purchase their monthly food and non-food items from modern format stores at least once in a month, because store brands are
available only in modern format stores. Therefore, in this study, we defined the target population as the households, which purchase food and non-food items from the modern format stores at least once in a month. In other words, housewives (the primary shopper of the household) who had purchased some household consumption items from organised retail chains during the last one month were included in our target population. While the sampling unit for the main survey was household, the sampling element or the respondent for the study was either the primary shopper of the household (defined as someone who usually chooses the products and brands at home) or the key purchase decision influencer (defined as someone who does not most often choose the exact product and brands consumed at home, but quite often actively participate in the selection of products and brands for the household).

4.5.1. Sampling Frame

Determination of sampling frame is an important consideration in sampling plan. Sampling frame represents the elements of the target population and consists of a set of directions for identifying the target population (Malhotra & Dash, 2009). In the first instance, a sampling frame of modern retail stores from the national retail chains such as, Aditya Birla Retail (More for You Super Market and Hyper Market), Pantaloon Retail (Big Bazaar and Food Bazaar), Spencer’s Retail (Spencer’s Daily and Spencer’s Hyper), D Mart, Trent Retail (Star India Bazaar), Vishal Retail (Vishal Mega Mart and V Mart) present in the two cities was created
with the help of internet search. The list contained store names, retail chain, address and pin code for each of the stores. A two dimensional grid of pin codes and retail chains for each city was generated (See Figure 4-1). From each cell in the grid, a store was randomly selected for the purpose of recruitment interview.

Figure 4-1 Two Dimensional Pin code * Retail Chain Grid: An Illustration

<table>
<thead>
<tr>
<th>Chain</th>
<th>AB Retail</th>
<th>Spencer's Retail</th>
<th>Pantaloons Retail</th>
<th>Vishal Retail</th>
<th>Trent Retail</th>
<th>D Mart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin codes</td>
<td>X_{11}</td>
<td>X_{21}</td>
<td>X_{31}</td>
<td>X_{41}</td>
<td>X_{51}</td>
<td>X_{61}</td>
</tr>
<tr>
<td>Pin code 1</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
</tr>
<tr>
<td>Pin code 2</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
</tr>
<tr>
<td>Pin code 3</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
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<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
</tr>
<tr>
<td>Pin code n</td>
<td>X_{1n}</td>
<td>X_{2n}</td>
<td>X_{3n}</td>
<td>X_{4n}</td>
<td>X_{5n}</td>
<td>X_{6n}</td>
</tr>
</tbody>
</table>

Convenience sampling method attempts to obtain a sample of conveniently available sample elements. Respondents are selected for the study because they are available at the right place and at the right time (Malhotra & Dash, 2009). Therefore, a store-intercept recruitment interview of randomly selected female shoppers, who showed willingness to participate in the main survey, was found appropriate at this stage.

The database created from the recruitment interview served as the sampling frame for the main survey. The database contained the unique record number for the respondent, name, address, role in household level purchase decision-making and the socio-economic class (SEC) of the household. Indian marketers use the socio-economic classification, which uses a combination of the education
and occupation of the chief wage earner of the households to classify them into eight broad categories namely, A1, A2, B1, B2, C, D, E1 and E2; with A1 signifying the highest purchase potential and E2 signifying the lowest (Kotler, et al., 2007).

4.5.2. Sampling Method

Findings of the report on ‘India Shopping Trends’ of KSA Technopak, 2008 (as cited in Pocha, 2009) revealed that 22% of SEC A, 15% of SEC B and 11% of SEC C are regular buyers of food and grocery and non-food household consumption items in cities with population more than one million. Accordingly, a stratified sampling method was chosen for the study. SEC was used as the stratification variable. A proportionate stratified sampling was used: SEC A with 30%, SEC B with 41% and SEC with 30% of the total sample (See Table 4-2)

<table>
<thead>
<tr>
<th>SEC</th>
<th>Estimated Households</th>
<th>% MF Shoppers</th>
<th>Estimated MF Shoppers HH</th>
<th>Required Sampling Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>SEC A</td>
<td>112640</td>
<td></td>
<td>22</td>
<td>24781</td>
</tr>
<tr>
<td>SEC B</td>
<td>225280</td>
<td></td>
<td>15</td>
<td>33792</td>
</tr>
<tr>
<td>SEC C</td>
<td>225280</td>
<td></td>
<td>11</td>
<td>24781</td>
</tr>
<tr>
<td>Total</td>
<td>563200</td>
<td></td>
<td></td>
<td>83354</td>
</tr>
</tbody>
</table>

8 Source: IRS 2005- R1- Hansa Research /MRUC
9 Source: KSA Technopak Study – India Shoppers Trend 2008
Sample Size is a very important issue in the sampling plan after the decision on sampling technique, which in this study was proportionate random sampling. As with all multivariate research designs, the sample size plays a very critical role in the estimation and interpretation of Structural Equation Modeling (SEM) results (Hair, Black, Babin, Anderson, & Tatham, 2008). SEM in general requires a larger sample size relative to other multivariate procedures. According to Hair et al., (2008) five considerations affecting the required sample size for SEM are multivariate distribution of data, estimation technique, model complexity, amount of missing data and amount of average error variance among the reflective indicators.

As data deviate from the normality, ratio of respondents to parameter should be higher. A general heuristic is to maintain a ratio of 15 respondents for each parameter estimated in the model.

The most common estimation procedure in SEM is the maximum likelihood estimation (MLE) procedure. MLE is an iterative approach that makes small sample sizes more likely to produce invalid results.

Simpler models can be tested with smaller samples; however, the complexity of model increases with increase in indicator variables, more constructs, constructs with less than three indicator variables and models requiring multi group analysis. Missing data complicates the testing of SEM models and the use of SEM in general. Recent researches indicate the concept of communality as a more relevant way of approaching the sample size issue. Studies have shown that
occupation grid to arrive at the socio-economic class of the household as provided by the Market Research Society of India (MRSI)\textsuperscript{10} guidelines.

The main survey questionnaire in this research comprised of five major sections (i) questions related to consumer's knowledge about store brands, (ii) questions dealing with comparative assessment of store brands vis-à-vis manufacturer's brands on several product characteristics, (iii) questions related to modern format shopping behaviour with respect to monthly household consumption items, (iv) questions on consumer decision-making styles and (v) questions on demographic characteristics of respondent. For each of the five main constructs of the study, several questions were included in the questionnaire to develop an aggregate measure of the construct, wherever required (See Table 4-3).

The first part of the questionnaire contained questions that intended to assess the knowledge of consumers regarding store brands. In the first question, respondents were asked if they were aware that the retail chains have certain products that carry the store name or any other brand name exclusively created for that chain. Nominal scale was used to measure this variable. Then the aided awareness about the private labels in the consumer packaged goods category of the sampled retail chains was measured though the usage of show cards containing pictures of the store brands.

\textsuperscript{10} Market Research Society of India (MRSI), a unique non-profit autonomous market research body formed by a large fraternity of research suppliers and users spread across India. Established in January 1988, the MRSI is at the forefront of maintaining standards of excellence in the market research industry. The MRSI was also responsible for carrying out the path-breaking Socio Economic Classification (SEC) Study, which provided the basis for classifying urban Indian consumers. The SEC is the cornerstone for consumer classification.
Table 4-3 Measurement of Constructs in the study

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Familiarity</strong></td>
<td>1. I am very familiar with the various store brands available in the retail chains</td>
<td>5-point Likert Scale</td>
</tr>
</tbody>
</table>
| **Perceived Quality Variation** | 1. There is a great deal of difference in the overall quality of Store brands and Manufacturer's brands available in retail chains  
2. There is a great deal of difference between the freshness of Store brands and Manufacturer's brands available in retail chains.  
3. There is a great deal of difference between the ingredients of Store brands and Manufacturer's brands available in retail chains | 5-point Likert Scale |
| **Perceived Value for Money Image** | 1. Store brands offer better value for money than Manufacturer's brands | 5-point Likert Scale |
| **Perceived Variation in Extrinsic Cues** | 1. Store brands are priced more fairly than Manufacturer's brands  
2. Packaging of Store brands are more attractive than that of Manufacturer's brands  
3. Promotional schemes on Store brands offer better value than the promotional schemes available on Manufacturer's brands in retail chains | 5-point Likert Scale |
| **Perceived Variation in Risk** | 1. Usage of Store brands and not the Manufacturer's brands would affect the way others think about me.  
2. Store brands are riskier to consume than Manufacturer's brands because of their inferior quality. | 5-point Likert Scale |

At the end of this section, an item was included to assess the consumer's overall familiarity with store brands. Participants used the 5-point Likert Scale to indicate how strongly they agreed or disagreed with the statement related to perceived
familiarity with the store brand (See Table 4-3). The statement used was taken from the previous study on store brand proneness by Richardson et al. (1996). The second section of the questionnaire comprised of questions that requested respondents to make comparative assessment of store brands vis-à-vis manufacturer's brands on several product characteristics. The comparative assessment was done using 5-point Likert questions, where respondents were asked to indicate their agreement/disagreement with the statement. There were three statements regarding overall quality, freshness and ingredient quality to measure the perceived quality variation between the store brands and manufacturer's brands (See Table 4-3). There was one statement to measure if respondents perceived store brands to be more value for money than manufacturer's brands (See Table 4-3). In a study on association between extrinsic cues and store brand proneness (Dick, et al., 1997), price was found to be most strongly associated with store brand proneness followed by brand name, advertising and packaging. Since in India, store brands is a recent phenomenon and there is hardly any mass media advertisement of these brands, three statements on pricing, packaging and promotional activities were included to assess the consumers' perception variation between store brands and manufacturer's brands on extrinsic cues. Perceived risk associated with brand usage measured in this study included two items related to functional risk and social risk (See Table 4-3).

Part three of the questionnaire had questions that inquired respondents about the salience of modern format stores in their monthly fast moving consumers' goods
(FMCG) basket purchase. Respondents were asked to indicate the proportion of their monthly FMCG purchases from modern format stores, number of shopping trips to modern format stores in a month for their household food and non-food purchases and how loyal they are towards a single modern retail store.

The fourth section of the questionnaire used the three-item short form of the scale (24 items) to use Consumer Style Inventory (CSI) as developed and validated by Sproles and Kendall (1986). These twenty-four items were intended to measure CDMS of the respondents.

The final section of the questionnaire comprised of measures that examined the demographic characteristics of respondents: age, number of family members and ownership of eight durables such as four wheelers, music system with DVD, frost-free fridge, fully automatic washing machine, laptop/personal computers, air conditioner, microwave and video camera.

4.7. Pilot Study

A pilot study was conducted with a convenience sample of housewives in Ellorapark and Alkapuri areas of Vadodara City. The chosen localities have good presence of national retail chains like Aditya Birla Retail, Spencer's Retail, and Food Bazaar. These areas also have a good mix of population across the SEC A, B and C. The study allowed for reframing of questions to reduce ambiguity and achieve more clarity. The study also allowed for an initial indication of reliability of measurement scales.
4.8. Data Analysis Methods

The statistical package for social science (SPSS) 17.0 and AMOS 18.0 were used for the data analysis procedures. The statistical tools used in this research included: (i) descriptive statistics, (ii) inferential statistics and (iii) structural equation modeling. Application of these statistical tools used in this study is explained in subsequent sections.

4.8.1. Descriptive Statistics

Descriptive statistics are collection of methods that involve summarization and presentation of data in a form that is easy for the end-user to understand. Such summaries of data may be tabular, graphical, or numerical (D. R. Anderson, Sweeney, & Williams, 2001). By applying the descriptive statistics, several measures of central tendency and dispersion could be derived depending upon the scale of measurement. On the other hand, graphical summary of interval data can also be used to check for the assumption of normal distribution. In brief, descriptive statistics would also be used in this study to analyse, summarize and present the descriptive information in the data set.

4.8.2. Inferential Statistics

Univariate Analysis of Variance was the chosen technique for the inferential statistics procedure. This was helpful in identifying the factors that affect store brand proneness. A univariate comparison of means was carried out using this
technique across the groups of buyers classified based on their store brand proneness level.

4.8.3. Structural Equation Modeling

One of the primary advantages of multivariate analysis techniques is to obtain a more complete and detailed description of the phenomenon under investigation and to expand the researcher's explanatory ability and statistical efficiency (Garson, 2009b; Hair, et al., 2008; Meyers, Gamst, & Guarino, 2006). Though, the traditional multivariate techniques like multiple regression, logistic regression, discriminant analysis, multivariate analysis of variance all address a wide range of theoretical and managerial questions, they share a common limitation of being able to examine only a single relationship at a time (Hair, et al., 2008). Researchers are many times faced with a set of interrelated questions. In such cases, none of the multivariate techniques enables researcher to address all the questions with one comprehensive technique. In this study, too we were faced with a set of interrelated questions. For example, what variables determine the store brand proneness of a consumer? How does the product knowledge combine with other variables and affect buying behavior? Do consumers' risk perception associated with store brand usage affect directly store brand proneness or via some other consumer related variables? As none of the techniques enables us to address the series of questions, we made the use of
SEM to address our research questions and hypotheses as presented in chapter three.

SEM is a statistical methodology that takes a confirmatory or hypothesis-testing approach to the analysis of a structural theory bearing on some phenomenon (Bentler & Chou, 1987). The term structural equation modeling conveys two important aspects of the procedure: (i) that the causal processes under study are represented by a series of structural or regression equations and (ii) that these structural relations can be modeled pictorially to enable a clearer conceptualization of the theory under the study. Apart from the ability to estimate multiple interrelated dependence relationship, SEM is also unique in the way that it incorporates both observed and unobserved variables in the estimation procedure and defines a model to explain the entire set of relationships (Byrne, 2001; Garson, 2009b; Hair, et al., 2008). Unobserved variable is also known as latent variable, which is defined as the abstract hypothesized concept that cannot be measured directly and can be approximated or represented by one or many indicator or manifest or observed variables. Observed variables are the observation or measured value for a specific item or question obtained through various data collection methods, i.e. surveys and observations.

The general SEM model can be decomposed into two sub models: a measurement model and a structural model. The measurement model defines relations between the observed and unobserved variables and thus it provides the link between scores on a measuring instrument and the underlying constructs they are designed to be measured. The measurement model follows the
confirmatory factor analysis (CFA) approach specifying the pattern by which each measure loads on a particular factor. The structural model defines relationship for specification of regression structures among the variables under investigation. There are four basic configurations in a SEM model, each representing an important component of the entire analytic process. These are (i) path coefficient for regression of an observed variable onto an unobserved or another observed variable (ii) path coefficient for regression of one factor onto another, (iii) measurement error associated with an observed variable and (iv) residual error in the prediction of an unobserved variable.

The proposed model for our research presents the factors that lead consumers' propensity of buying store brands. We use the technique of SEM to build and test our hypothesized model. In order to use the technique effectively, we follow a stepwise approach;

1. Defining the constructs
2. Developing the sub models: measurement model and structural model
3. Testing for the factorial validity of scores from the measuring instrument as specified in the measurement model
4. Testing for the validity of a structural relationship as specified in the structural model

In short, the data analysis took place in four phases: (i) descriptive analysis of data (ii) examination of group differences using statistical inference procedure,
(iii) first-order CFA model analysis and (iv) full structural equation model analysis.

4.9. Summary

The chapter presented the methodology used to test the model and associated hypotheses, developed in chapter 3. The chosen research strategy was a survey design. Twenty-four product categories from household F&G and non-food consumption items were selected to measure the store brand proneness of the household. The survey was carried out in two phases. In the initial phase, store intercept interview of shoppers at the randomly selected organised retail chains in the study areas was done to recruit the respondents for the main survey. The database prepared from the recruitment survey served as the sampling frame for the sample selection in the main survey. A proportionate stratified sampling method was used to sample 500 subjects for the study. In-home interviews were conducted to carry out the main survey. Data coding and cleaning was done using the SPSS 17.0. Structural Equation Modeling technique was used to translate the conceptual framework into an empirically testable model. SEM was performed using the AMOS 18.0 software. The hypotheses were tested using the SEM technique. The analysis and results of the study are presented in the following chapter five.