# The Future of Retail Chains in the E-commerce Era in Saudi Arabia

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*Abstract:* Retail has always been one of the biggest industries worldwide, with different kinds of products, because people buy in retail every day. Since Amazon started drawing the first outline of e-commerce, online shopping kept growing more and more, and many bigger retailers considered the competition of e-commerce versus the one of physical stores. Retailers are constantly monitoring the change of customers' preferences in shopping to predict the behavior of upcoming generations, to know where and how the new competition will be. When COVID-19 hit in 2020, this rate of growth increased aggressively, especially in some products categories like food delivery, as online shopping was the only way to do shopping with all the movement restrictions at that time. The aims of this study are (1) to find out the frequency of buying online, (2) to know if COVID-19 influenced buying behaviors, (3) to forecast the market size of e-commerce in 2030. For data gathering required by the researcher, a questionnaire was prepared by himself as an effective tool. The questionnaire was distributed to the study sample through Google Drive to their emails. The social package SPSS was used for data analysis to obtain the results of this study. As results, the category with the highest buying frequency was food and the one with the lowest was automobile spare parts. Moreover, in all categories, Covid-19 had a significant effect on customers' buying frequency online from lower to higher frequency rate. By analyzing the historical data, the predicted market size of Saudi would reach up to 45B SAR, which is around 10% of the market size. More improvements can be done to the categories with high buying frequency and many investments can be initiated to the low-buying frequency categories as it will also grow one day online.

*Keywords*: Retail Chains, E-commerce, Saudi Arabia

## I. INTRODUCTION

In a fast-developing world, uncertainty became the only certain fact in business; the most famous brands have been forgotten. After they were out of the market, the internet of Things, fund-tech and E-commerce have changed the way companies should plan. Retailers especially must take online shopping into consideration when planning. Now, the main question that comes to all managers' minds in the retail industry is: will retail chains disappear and be substituted with E-commerce? E-commerce has known a massive and continuous growth since 1999, starting with Amazon's rise which led to the concern of many retailers about which channels to invest in and with which model. Since the competition in e-commerce has different criteria and preferences based on customers, which requires different strategies, not many studies have been conducted about the Saudi Market. However, the Communication and Information Technology Commission started a study in Saudi Arabia in 2017 [1] to determine whether customers prefer to buy online or in-store. This research is still going on and will dig deeper to try and predict the future of retail chains in Saudi Arabia with the presence of E-commerce. It will do so by finding the consumers' preferences and the effects of COVID-19 on customers' behaviors. Saudi Arabia is one of the fastest growing countries in using the Internet, which resulted in fast growth for e-commerce, for which both Amazon and Noon were launched in 2019 to compete and bring more small competitors to the online retailing. We will classify retailing by the following categories:

- Food from restaurant
- Perfumes, makeup and personal care products
- Books and stationery
- Apparel, clothing, and accessories
- Luxury goods
- Groceries, and beverages
- Automobile parts and accessories
- Furniture and home furnishing
- Electronics (phones, PCs, washing machines, TVs, fridge, etc.)
- Games, music, movies, TV series, etc.
- Travel and events tickets (air tickets, tour packages, hotels, etc.)
- Taxi services/ground transport
- Insurance schemes/policies

The situation of retail chains in Saudi Arabia should be reviewed to identify what has kept being active with time, and what has not been capable of surviving. With the dominance of e-commerce due to COVID-19, the retail chains in Saudi Arabia have been affected. The following questions are to try and find out what the future holds for retail chains in Saudi Arabia:

(1) What is the frequency of buying online for each category of products in Saudi Arabia?
(2) What is the impact of COVID-19 on the growth of e-commerce?
(3) What will be the e-commerce market size in Saudi in 2030?

The following are the main objectives of this research:

- Measure consumers' frequency of buying online or offline based on each category of products.
- Forecast the growth of e-commerce based on historical data.
- Measure the effects of COVID-19 on the frequency of buying products online.

Many medium and small retailers do not have enough funding for such research about the future of retail channels; however, it is necessary as it answers their biggest concern regarding the direction to take for their investments. Each of online and offline retail channels has different strategies, operations, competitive edges, etc. Moreover, all logistics and involved parties should be ready for the future of retailing such as the last mile steps in logistics, fulfillment centers and all infrastructures and networks of delivery. Furthermore, the government would benefit from such paper by knowing better how to regulate this field and take the necessary actions to smooth all the changes that will take place in the near future. COVID-19 changed the world for ever, especially when it comes to technology: a big boost to all e-businesses was given by the pandemic, in particular for e-commerce which boomed in a huge way. Therefore, measuring the effect on the growth rate of e-commerce will help to know more about the near future of e-commerce and traditional retail in Saudi Arabia.

## II. LITERATURE REVIEW

The swift progress of the international e-commerce sector is supported and affected by the following drivers [2].

- Swift Increase in Internet Penetration
- Growing in the Use of Smartphones
- Better Personalization of Services
- Growth in E-Commerce Investment
- Payments Interruption
- Developments in Logistics and Delivery

Saudi Arabia's Vision 2030 states that: "*The Vision 2030 targets to avail employment chances for an extra million citizens in the year 2020 in an emerging retail sector that fascinates recent, national, regional, and global trademarks thru the entire regions of the Kingdom. It similarly targets to maximize the support of up-to-date trade and ecommerce to 80% of the retail sector through the year 2020.*" Saudi Arabia's Vision 2030 is the Kingdom's vision for the future [3]. It is an ambitious plan of strong objectives and predictions. The government is determined to keep an eye on official and private collaborations, sustain to simplicity the shift of private projects and rise the attraction of the Saudi Arabia economy. Legal institutions have been included to investigate the current instructions to ultimately develop the trade environment. The 'blooming economy' characteristics of the plan is basically reliant on Saudis' capability to develop its economy and reduce its reliance on oil. The change of the economy possibly will have varied effects on the info and communication technology sector, including the evaluation of the governing charter, better call for advanced predictions for information technology focused businesses, i.e., online buying, e-commerce, and others.

Alternatively, the Vision has documented that traditional retailing controls about 5 percent of the Saudi market paralleled to 20 percent in GCC countries. The government aims to increase the contribution of cutting-edge trade and e-commerce to 8 percent in the retail sector through the year 2030. This is projected to be achieved through engaging the international and national retail stakeholders together, combining finance of small retail companies to motivate their growth and spreading out and through minimizing constrains on proprietorship and overseas investment (Khwaja, 2017).

Saudi e-commerce environment has changed consistently with the international model. It comprises demand side, equally customer and enterprise purchasers, supply side, comprising the providers of pure-performance e-commerce, conventional retailers, small-medium-enterprises as well as consumer-to-consumer (C2C) suppliers, along with diverse enablers, comprising regime and governing entities, providers of networking and technology, providers of services and payment outlet, and logistics corporations. At present, Saudi's e-commerce is experiencing an intense move since the whole stakeholders are being gradually dynamic in keeping the e-commerce market's evolution organized and boosting for improvement [4]. This market is increasingly growing and is perceived through numerous innovative publications, achievements, and regime efforts along with the disturbing growth of the conventional retail market in cross sellers. Those are considerably increasing their position through constant addition of innovative capabilities. Every one of the system's players has its distinctive features and a crucial role to carry out.

Retail business has developed intensely, and this development has been reliant on public's requirements and level of income, the interruption in technology, and some external happenings such as the pandemic we are living in currently. Technology has a key role in the retail atmosphere. Nevertheless, innovative commerce models are similarly having a deep effect through the retail value chain. Retailers have to be accessible everywhere and anywhere, from any smart equipment, any place, at any time.

Several innovative tools and technologies were established to help retailers restructure operations, cut costs, and provide major goods and services to their consumers. Almost the whole improvement will be derived from utilizing artificial intelligence (AI), analyzing data, machine education, along with smart assistants. These technologies and tools will prevail in substituting routine jobs, automating as far as conceivable. They should similarly collect several data on the purchasing behavior consumers and, in contrast, support with predicting demand, check up on inventory, and following logistics. As a result, this will aid to cut costs and expand services through the entire circumstances of retail [5]. With the pandemic of COVID-19 making changes in consumers, transport, sanitation standards, and above,

retailers will be required to capitalize in renewing their commerce and in innovative technology with the intention to continue into the subsequent coming years. Prior to the pandemic, a lot of technology and software corporations were evolving and examining goods to develop the retail commerce, however for an additional away prospect. There is a number of retailers previously testing these technologies, and even though, at the present time they need a huge investment, in the long-run, they possibly will be what permits retailers to be successful.

The environment of physical retailing is shifting continually, particularly with the growth of internet-based retailers and confidence in transfer and internet-based transactions growing. The space of online retailing, altogether, is turning to be overloaded. This, nevertheless, does not reflect that the physical practice of shopping will vanish. People are naturally social beings and nothing can take away the feeling they experience while visiting the store for shopping, moving the goods and sharing the know-hows with workmates and household when purchasing different products. From the study, it appears that the retailing future will be a combination of offline and online experiences. There would be technologies that would be combined to cover the essential shopping requirements of customers, nevertheless there will be others that tell further about the general know-how.

AI would support with appraising goods the security of our private houses and permit us online shopping. Physical retailers will be minor, empirical stores with lesser amounts of goods, stands, and greater quality capabilities [6]. Goods would be transported straight from the store, and several times the wholesaler will be excluded, which will result in dropping the prices of the goods. Numerous retailers have previously started to incorporate these different innovative technologies to regulate to the firsthand customer conduct, requirements and desires and have been successful in this. The following is a discussion on the future of the physical in-store practices for retailers, the best way into which the internet-based online shopping will be modified and the different empirical technologies which are streaming into the retail segment.

## III. ADOPTED METHODOLOGY

The research methodology is essential since it is the roadmap which may be applied to gather the whole necessary information and data to realize the research objectives successfully.

The research design is mainly a method of describing the accessible methodologies relevant to the research accompanied by varied existing approaches and frameworks, clarifying rationally and justifying the selected approaches, methods of data collection in addition to frameworks relevant to the study for offering reliability to the study (Patton & Cochran, 2002). The acquired data will then consequently be matched with the results from the literature review and expressive conclusions will be found with the assistance of the formulated study questions (Flowers, 2009).

A quantitative method (survey questionnaire) has been adopted to deeply study the elements which can impact the future of retail chains in the Saudi market. This method was selected because it is the most appropriate option for the general objectives of the present study. The survey questionnaire was prepared dependent on earlier literature to gather data in order to know the factors which influence the retail chains' future.

The researcher depends on the questionnaire since it is the best communicative mean to exchange with the study sample. It is similarly the best mean to acquire different information that other sources cannot afford, and it is the least expensive and time-consuming investigation tool (Maineri & Van Mol, 2021).

Saudi Arabia Population is 35,854,230 people (Worldometer, 2021). Using the statistical sample size formula:

$$n = \left( \frac{Z_{1-\alpha/2} + Z_{1-\beta}}{ES} \right)^2$$

N = population size • e = Margin of error (percentage in decimal form) • z = z-score (surveymonkey, 2022). The calculated sample size is 385, that means the sample size must be equal to or more than 385, and the confidence interval is 95% with a margin error 0.05. Successfully via the online-based questionnaires randomly distributed, we managed to get 399 completed questionnaire responses. Sampling is the method of choosing a statistically illustrative sample of persons from a relevant population (Umair Majid, 2020). Sampling is an essential instrument for research studies since the relevant population commonly contains several persons for any research project to comprise as respondents. After receiving the necessary consent from the study sample for sending the questionnaire to their email inbox, they are primarily accepted to share in this questionnaire prior to the questionnaire delivery to their email accounts to get their responses.

The participants will reveal their buying frequency with a phrase/statement on a five-point Likert scale ("very low" = 1 to "very high" = 5). The questionnaire will cover three main parts: The first part is about personal information, such as age, income, and education, in order to give more factors to consider and link who to what. For example, we will see if the education level of participants will affect their preferences in term of buying online.

Obviously, we could think that a participant who is less educated would be less familiar with e-commerce and would prefer more traditional ways to deal with, but we never know how the results could surprise us. The second part will be about the preferences when buying online or offline in each of the categories of products or services based on the spending categories in the Annual statistical report of Saudi for 2018 [7]. This would give more detailed information about which categories are more covered by e-commerce, and which need more solutions. Furthermore, we will get more sights of how much a consumer spends online off overall spending. The third part will cover the obstacles that stand between a consumer and online buying, such as payment methods, lead time. The Statistical Package for social Sciences (SPSS) version 21, as a computer software, is used to perform the statistical analysis. The subsequent statistical tools will be applied for statistical analysis, which include:

- o Cronbach's Alpha (α), which is a coefficient of reliability, is a measure of internal consistency, specifically the best way to correlate a set of items as a group (Bonett and Wright, 2014).
- o The descriptive analysis (percentages) to explain the participants' opinions toward every single statement/phrase,
- o Pearson Correlation coefficient, which is a linear correlation coefficient and it returns a value between +1 and -1, is used to test the internal consistency (Samuels and Gilchrist, 2014).
- o Chi-square. It is a test of goodness of fitness which is used to check the opinion of the respondents toward each question.
- o Kaiser-Meyer-Olkin test to determine how suited for factor analysis.
- o Principal component analysis which allows to summarize the information content in large data tables by means of a smaller set of "summary indicate" that can be more easily visualized and analyzed.
- o Exploratory factor analysis which observed variable is potentially a measure of every factor, and the goal is to determine relationship (between observed variables and factors) are strongest.
- o Simple regression is used to estimate the relationship between two quantities variables.

AHP provides a rational framework for a needed decision by quantifying its criteria and alternative options, and for relating those elements to overall goal.

## IV. RESULTS AND DISCUSSION

About 54.4% of the respondents are in their 20s and 30s. 21.1% of respondents are from Jeddah. 64.7% of them drive and have a car. The least income groups were less than 5000 by percent of 40%. In our case, Cronbach's alpha has been calculated. (Validity and Reliability of Survey Scales, 2018). All values were higher than 0.70, so the scale is able to measure dimensions for source of shopping online scale, preferring on shopping online scale, preferring on shopping stores scale, payment method for online shopping scale

**Descriptive Analysis**

**Analysis of categories Variables Descriptive Before Covid-19:**
The answers to Likert scale questions show that, on average, customers' satisfaction of buying categories online before covid-19 is in most cases satisfactory to low (average value<2.6).

**Analysis of categories Variables Descriptive after Covid-19:**
The answers to Likert scale questions show that, on average, customers' satisfaction of buying categories online after Covid-19 is in most cases satisfactory to medium (average value between [2.61-3.40]). The frequency of buying food from restaurants online after covid-19 was the best by mean with 3.24 points. On the other hand, the frequency of buying auto mobile parts and accessories online was the least important by mean with 2.40 points.

**Analysis Descriptive of shopping online websites:**
The answers to Likert scale questions show that, on average, customers' satisfaction of buying online from websites is in most cases satisfactory to neutral (average value between [3.22-3.38]). The frequency of buying online from specialized websites was the best by mean with 3.38 points. On the other hand, the frequency of buying online from platform websites was the least important by mean with 2.22 points.

**Descriptive analysis of time spending for shopping (online/shops):**
37.8% of consumers spend in average more than 60 minutes per shopping session for shopping online, followed by 34.8% of those who spend between 30 and 60 minutes on shopping online, and the least percentage was 27.3% for who spends less than 30 minutes on shopping online. On other hand, 34.6% of consumers spend an average less than 30 minutes on shopping from shops, followed by 34.3% of those who spend more than 60 minutes on shopping from shops, and the least percent was 31.1% for who spend between 30 and 60 minutes on shopping from shops.

**Descriptive Analysis of variables make online shopping better than stores(preferences):**
The answers of Likert scale questions show the on average customer preferences of buying online is in most cases satisfactory to agree (average value between [3.4-4.20] by 6/9 of all variables that were (faster, cheaper, easier, less physical effort, more variety, save time). see table 4.11. 23% of consumers were strongly agree with that shopping online is easier than shopping from shops by mean of 3.61 points. The least mean was 3.12 points for trusting of shopping online.

**Descriptive Analysis of payment method using by online shopping:**

The answers to Likert scale questions show the on average payment method of buying online is in most cases satisfactory to neutral (average value between 2.61-3.40]. 39% of consumers were strongly agree with that debit/credit card is good for online payment by mean of 3.51 points. The least mean was 2.99 points for STC pay method.

Figure 1 illustrates that the most common mean of payment was by card related to 70% of importance coefficient value, followed by cash on delivery by 68%. The least used means of payment are STC pay and bank transfer method, with 60%.
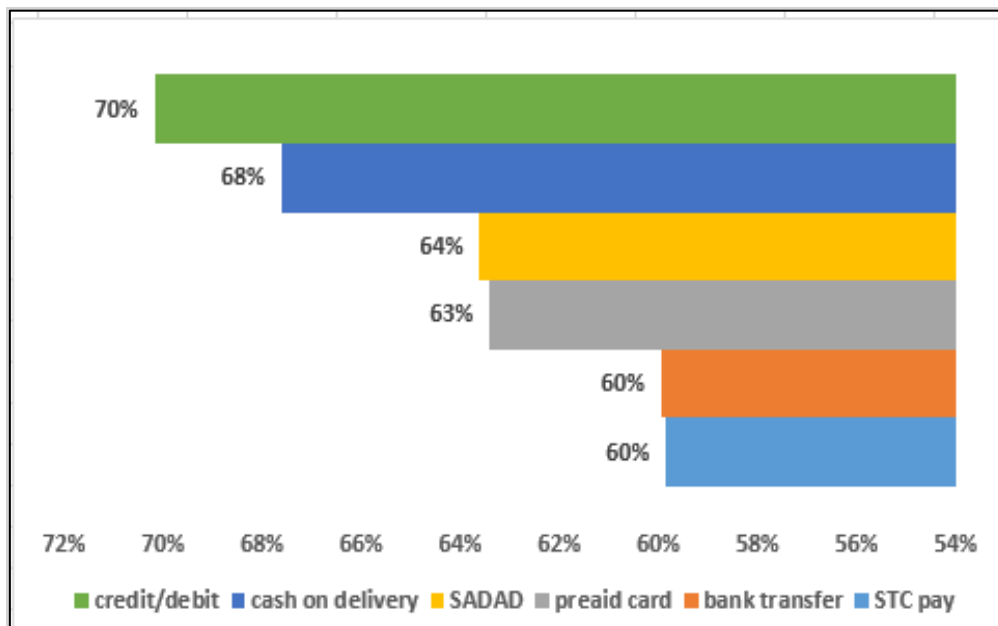


**Figure 1. Importance coefficient percentages of online payment methods**

**Descriptive analysis of online purchases in 2030 (question 29)**

Figure 2 illustrates that 34% of the respondents agreed that their purchases will be online only by year 2030, followed by those who strongly agreed with the same view, by percent of 26%. Only 4% of the respondents strongly disagreed that their purchases will be exclusively online by year 2030.
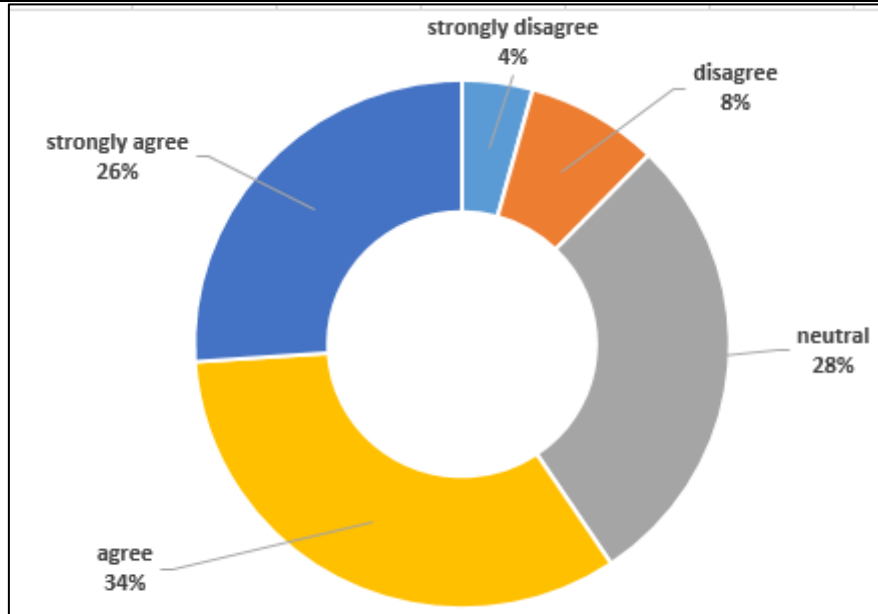
**Figure 2. the future of online purchasing**

**Frequencies analysis of first time to buy online (question 30)**

Figure 3 illustrates the first group to buy online were between 2016 and 2019 by 38%, followed by year group [2000-2005] by 19%, while the third place were for year 2020 by percent of 16%.
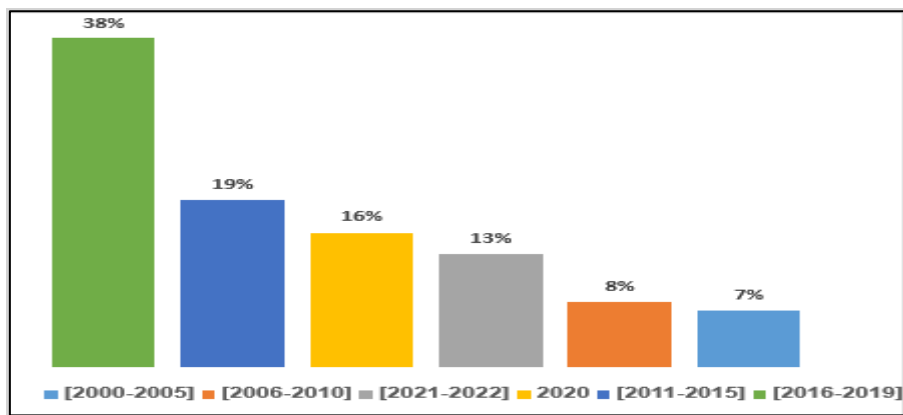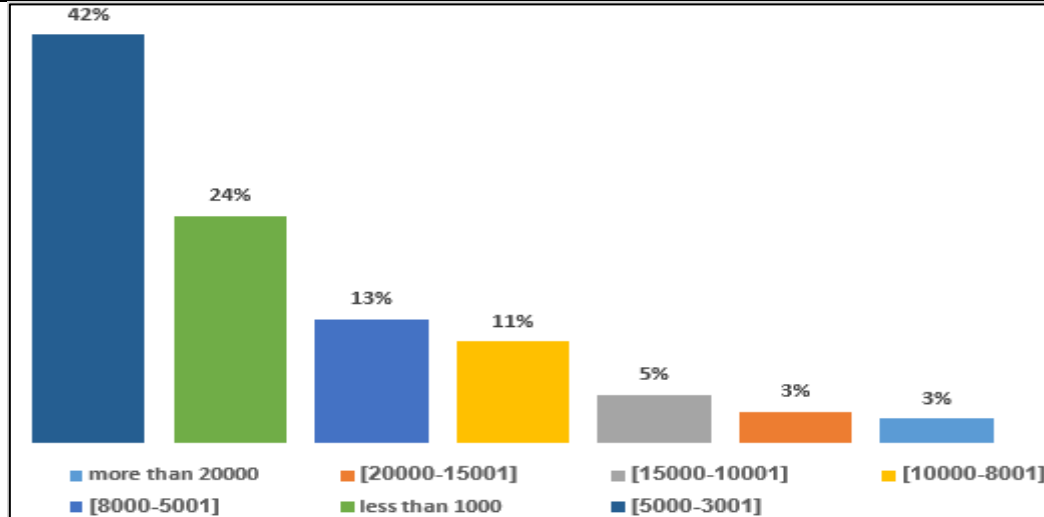


**Figure 3. First time to buy online ordered by years.**

**Frequencies analysis of first time to buy online (question 31)**

Figure 4 illustrates that the most respondents have spent between 3,001 RSA and 5,000 RSA in the past 12 month, by percent of 42%, followed by those who have spent less than 1,000 RSA at the same period.

**Figure 4. the amount that has been spent in past 12 months**

**Normality Tests for data sample**

With large enough sample sizes (> 30 or 40), the violation of the normality assumption should not cause major problems; this implies that we can use parametric procedures even when the data are not normally distributed. If we have samples consisting of hundreds of observations, we can ignore the distribution of the data. According to the central limit theorem, (a) if the sample data are approximately normal then the sampling distribution too will be normal; (b) in large samples (> 30 or 40), the sampling distribution tends to be normal, regardless of the shape of the data (2, 8); and (c) means of random samples from any distribution will themselves have normal distribution (3). Although true normality is considered to be a myth. (Asghar Ghasemi; Saleh Zahediasl, 2012). As concluded, data distribution of the sample = 399 where they are larger than 40, is normal distribution, as a result parametric tests will be calculated for hypothesis tests.

**Assess customers' preferences to buy online or offline based on age and type of product in each category of products.**

The one-way ANOVA is a parametric test used to determine whether a statistically significant difference in the means of three or more groups, the assumptions for ANOVA are (Stacey B. Plichta, ScD, CPH, 2013): the characteristic of interest should be a continuous variable that is normally distributed, and the groups should be mutually exclusive and independent of each other, and the groups should have equal variances (homogeneity of variance requirement). The research question that will be used to illustrate the use of the one-way ANOVA is "Do customers' preferences in one age group differs from other age groups related to the categories?"

The costumers above 50 years old preferred to buy Groceries and Beverages online before Covid-19, by the highest value of mean (2.85) followed by those in [41-50] age group who preferred to buy perfumes, Make up and personal care online before covid-19, by the value of mean (2.71). On the contrary, the customers in [20-30] age group preferred to buy Automobile parts and Accessories offline, the least mean was 1.72 for 116 respondents were included in the age group mentioned above. Although it appears that the no "age group" is different from the others, the one-way ANOVA must be performed, followed by post hoc tests, to confirm these impressions. the differences were calculated as figure (5) illustrates:

Levene's statistic is non-significant because the p-value above our a-level of 0.05) for all references, indicating that homogeneity of variance is present, except (q13, q19, q20).

P-value for some categories > a = 0.05, hence, null hypotheses couldn't be rejected, as a conclusion we can say that there is no difference in the mean of buying food from restaurants (q10), and buying Apparel, Clothing (q13), and buying furniture and home finishing(q17), and buying electronics (q18), and buying games, music and TV series (q19), and buying taxi services/ground transport (q21), and buying insurance schemes (q22), online before Covid-19, associated to the five age groups.
On the other hand, alternative hypotheses has been accepted for the rest of categories.

Costumers above 50 years old preferred to buy food from restaurants online after Covid-19, by the highest value of mean (3.69) followed by those in [41-50] age group who preferred to buy groceries and beverages online after Covid-19, by the value of mean (3.67). On the contrary, the customers in [20-30] age group preferred to buy Automobile parts and Accessories offline, the least mean was 2.12 for 116 respondents were included in the age group mentioned above.

The one-way ANOVA must be performed, followed by post hoc tests, to confirm these differences. Table 4.18, shows that Levene's statistic is non-significant because the p-value is above our a-level of 0.05) for most references, indicating that homogeneity of variance is present, except (q16). P-value for all categories < a = 0.05, hence, null hypotheses can be rejected for all categories.

**Assess customers' preferences to buy online or offline based on gender and type of product in each category of products.**

If we want to compare the distribution of a numerical variable for two different groups, we can use the independent samples t test (compare the mean for each group), (Stacey B. Plichta, ScD, CPH, 2013), The independent samples t-test is a parametric test, meaning that the variable must meet certain assumptions regarding their distribution for the test to be valid, which allows the comparison of the means of the two groups. (Stacey B. Plichta, ScD, CPH, 2013).

The t-test was developed by an Englishman, William Sealy Gosset (1876 to 1937), who published under the pseudonym "Student." He originally developed the independent t test for the Guinness brewery for quality control in beer brewing. To do this, Gosset needed to develop a way to analyze small data samples. The modern version of Student's t-distribution was derived by R.A. Fisher (1890 to 1962) in 1925. (Stacey B. Plichta, ScD, CPH, 2013).

Female costumers preferred to buy Groceries and Beverages online before Covid-19, by the highest value of mean (2.69) followed by female customers who preferred to buy perfumes, Make up and personal care online before Covid-19, by the value of mean (2.56).

On the contrary, male customers preferred to buy Automobile parts and Accessories offline, table 20 shows that the least mean was 1.86, followed by male customers who preferred to buy apparel, clothing, and accessories offline by mean of 1.87.

Although it appears that the "no gender group" is different from the others, the t-student test must be performed, followed by post hoc tests, to confirm these impressions.

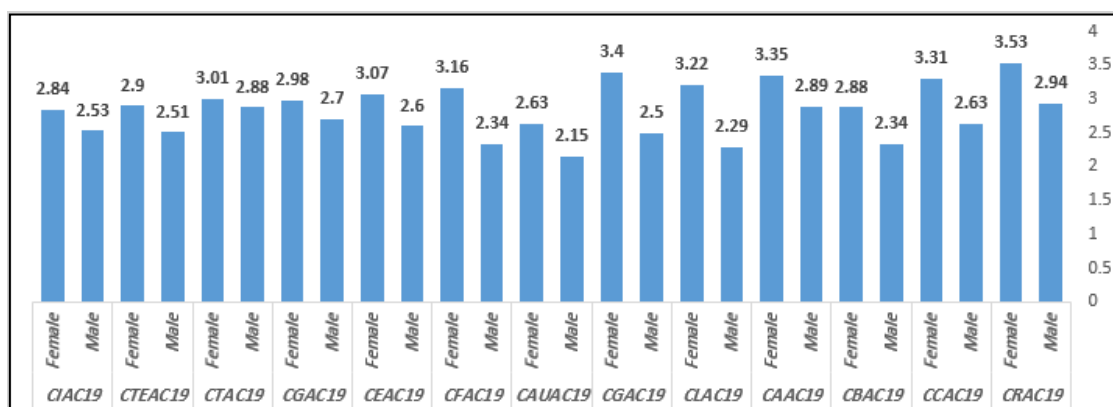The differences were calculated as figure (5) illustrates:
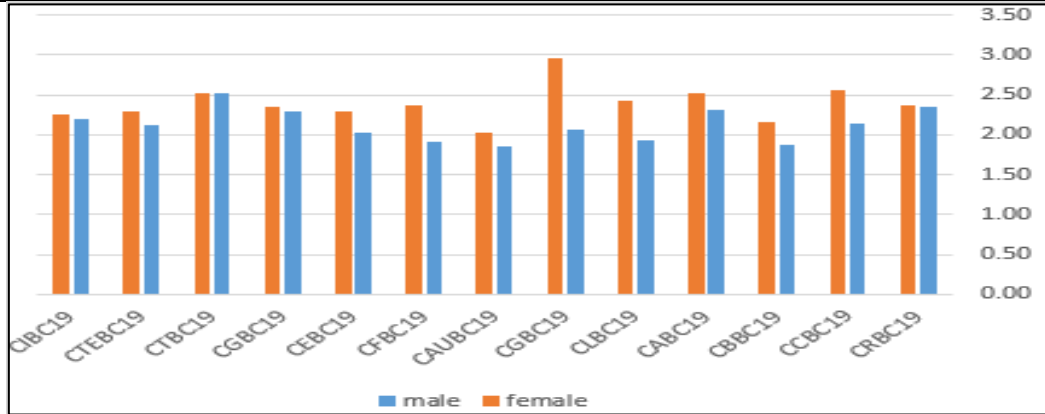
**Figure 5. The mean differences of customers' preferences to buy online before Covid-19, between gender groups.**

Levene's statistic is non-significant because the p-value is above our a-level of 0.05) for all references, indicating that homogeneity of variance is present, except (q13, q19, q20, q22).

P-value for some categories > a = 0.05, hence, null hypotheses couldn't be rejected, as a conclusion we can say that there is no difference in the means of buying food from restaurants (q10), and buying Apparel, Clothing (q13), buying furniture and home finishing(q17), buying electronics (q18), buying games, music and TV series (q19), buying taxi services/ground transport (q21), and buying insurance schemes (q22), online before Covid-19, associated to gender groups. On the other hand, alternative hypotheses have been accepted for the rest of the categories.

Female costumers preferred to buy food from restaurants online after Covid-19, by the highest value of mean (3.53) followed by female customers who preferred to buy luxury goods online after Covid-19, by the value of mean (3.40). On the contrary, male customers preferred to buy Automobile parts and Accessories offline, the least mean was 2.15, followed by male customers who preferred to buy luxury goods offline by mean of 2.29. Although it appears that the "no gender group" is different from the others, the t-student test must be performed, followed by post hoc tests, to confirm these impressions. The differences were calculated as figure (6) illustrates.



**Figure 6. The mean differences of customers' preferences to buy online after Covid-19, between gender groups.**

Levene's statistic is non-significant because the p-value is above our a-level of 0.05) for all references, indicating that homogeneity of variance is present, except (q11, q19).

P-value for one category > a = 0.05, hence, null hypotheses couldn't be rejected, as a conclusion we can say that there is no difference in the means of buying travel and event tickets online (q20) after Covid-19. On the other hand, alternative hypotheses has been accepted for the rest of categories.

**Assesses the relationship between education level and time spent on online purchasing:**

43.9% of customers who went to high school, spent less than 30 minutes on purchasing online, and 19.7% of them who had a bachelor degree spent less than 30 minutes on purchasing online, and (15.5%), (16.9%) for those who had a master and/or a PhD degree. 34.5% of those who went to high school, (35%) of who had a bachelor degree, (36.6%) of who had a master degree, and 16.7% of those who had PhD spent between 30 and 60 minutes on purchasing online.

The Pearson chi-square value will be used to examine the effect of education level on the time spent online, the computed chi-square value is 38.05 with an associated p-value of 0.00 < a =0.05, so null hypothesis (there is no relationship between education level and time spent online), as a conclusion we can say that when the level of education is high, the time spent online increases as table 4.26 showed.

**Assess effect of Covid-19 on customers' preferences:**

In this section, test of the following hypotheses will be included to prove the effect of coronavirus on customers' preferences:

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying food from restaurants online.**

There is a positive correlation between Covid-19 and buying food from restaurants online by value of R = +0.365, where Covid-19 is responsible for 13% (R Square = 0.13) of all changes on buying food from restaurants online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.88, that means that if Covid-19 increases by 1 point, the buying of food from restaurants online will increase by 0.88 point.
The model can be written as equation:

$$CR_{(buying\ food\ from\ restaurants\ online)} = 1.49 + 0.88 \times (\text{covid}_{19})$$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying perfumes, makeup and personal care product online.**

There is a positive correlation between Covid-19 and buying perfumes, makeup and personal care product online by value of R = +0.263, where Covid-19 is responsible for 7% (R Square = 0.07) of all changes of buying perfumes, makeup and personal care product online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.62, that means that if Covid-19 increases by 1 point, the buying perfumes, makeup and personal care product online will increase by 0.62 point. The model can be written as the following equation:

$$CC_{(\ buying\ perfumes, makeup\ and\ personal\ care\ product\ online)} = 1.73 + 0.62 \times (\text{covid}_{19})$$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying books and stationery online.**

There is a positive correlation between Covid-19 and buying books and stationery online by value of R = +0.240, where Covid-19 is responsible of 6% (R Square = 0.06) of all changes of buying books and stationery online, and this relationship is significant (P-value = 0 < 0.05). On the other hand, the value of this effect is 0.59, that means that if Covid-19 increases by 1 point, the buying of books and stationery online will increase by 0.59 point.

The model can be written as equation:

$$CC_{(buying\ books\ and\ stationery\ online)} = 1.43 + 0.59 \times (covid_{19})$$

Where $(covid_{19})$ variable equals to $\begin{matrix} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{matrix}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying apparel, clothing, and accessories online.**

There is a positive correlation between Covid-19 and buying apparel, clothing, and accessories online by value of R = +0.282, where Covid-19 is responsible for 8% (R Square = 0.08) of all changes of buying apparel, clothing, and accessories online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.71, that means that if Covid-19 increases by 1 point, the buying apparel, clothing, and accessories online will increase by 0.59 point.

The model can be written as the following equation:

$$CA_{(buying\ apparel,\ clothing,\ and\ accessories\ online)} = 1.71 + 0.71 \times (covid_{19})$$

Where $(covid_{19})$ variable equal to $\begin{matrix} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{matrix}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying luxury goods online.**

There is a positive correlation between Covid-19 and buying luxury goods online by value of R = +0.234, where Covid-19 is responsible for 5% (R Square = 0.05) of all changes of buying luxury goods online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.58, that means that if Covid-19 increases by 1 point, the buying of luxury goods online will increase by 0.58 point.

The model can be written as equation:

$$CL_{(buying\ luxury\ goods\ online)} = 1.61 + 0.58 \times (covid_{19})$$

Where $(covid_{19})$ variable equals to $\begin{matrix} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{matrix}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying groceries, and beverages online.**

There is a positive correlation between Covid-19 and buying groceries, and beverages online by value of R = +0.222, where Covid-19 is responsible for 5% (R Square = 0.05) of all changes of buying groceries, and beverages online, and this relationship is significant (P-value = 0 < 0.05. The value of this effect is 0.57, that means that if Covid-19 increases by 1 point, the buying of groceries, and beverages online will increase by 0.57 point.

The model can be written as the following equation:

$$CGB_{(buying\ groceries,\ and\ beverages\ online)} = 1.80 + 0.57 \times (covid_{19})$$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying automobile parts and accessories online.**

There is a positive correlation between Covid-19 and buying automobile parts and accessories online by value of R = +0.189, where Covid-19 is responsible for 4% (R Square = 0.04) of all changes of buying automobile parts and accessories online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.45, that means that if Covid-19 increases by 1 point, the buying of automobile parts and accessories online will increase by 0.45 point.
The model can be written as the following equation:

$CAU_{(\,buying\ automobile\ parts\ and\ accessories\ online)} = 1.50 + 0.45 \times (\text{covid}_{19})$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying furniture and home furnishing online.**

There is a positive correlation between Covid-19 and buying furniture and home furnishing online by value of R = +0.248, where Covid-19 is responsible for 6% (R Square = 0.06) of all changes of buying furniture and home furnishing online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.61, that means that if Covid-19 increases by 1 point, the buying of furniture and home furnishing online will increase by 0.61 point.
The model can be written as equation:

$CF_{(\,buying\ furniture\ and\ home\ furnishing\ online)} = 1.54 + 0.61 \times (\text{covid}_{19})$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying electronics online.**

There is a positive correlation between Covid-19 and buying electronics online by value of R = +0.278, where Covid-19 is responsible for 8% (R Square = 0.08) of all changes of buying electronics online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.68, that means that if Covid-19 increases by 1 point, the buying of electronics online will increase by 0.68 point.
The model can be written as equation:

$CE_{(\,buying\ electronics\ online)} = 1.48 + 0.68 \times (\text{covid}_{19})$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying games, music, movies, TV series online.**

There is a positive correlation between Covid-19 and buying games, music, movies, TV series online by value of R = +0.208, where Covid-19 is responsible for 4% (R Square = 0.04) of all changes of buying games, music, movies, TV series online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.52, that means that if Covid-19 increases by 1 point, the buying of games, music, movies, TV series online will increase by 0.52 point.

The model can be written as equation:

$$CG_{(\text{buying games,music,movies,TV series online})} = 1.80 + 0.52 \times (\text{covid}_{19})$$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying travel and events tickets online.**

There is a positive correlation between Covid-19 and buying travel and events tickets online by value of R = +0.208, where Covid-19 is responsible for 4% (R Square = 0.04) of all changes of buying travel and events tickets online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.52, that means that if Covid-19 increases by 1 point, the buying of travel and events tickets online will increase by 0.52 point.

The model can be written as equation:

$$CT_{(\text{buying travel and events tickets online})} = 2.10 + 0.43 \times (\text{covid}_{19})$$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on using taxi services/ground transport online.**

There is a positive correlation between Covid-19 and using taxi services/ground transport online by value of R = +0.200, where Covid-19 is responsible for 4% (R Square = 0.04) of all changes of using taxi services/ground transport online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.49, that means that if Covid-19 increases by 1 point, the using of taxi services/ground transport online will increase by 0.49 point.

The model can be written as equation:

$$CTE_{(\text{using taxi services/ground transport online})} = 1.72 + 0.49 \times (\text{covid}_{19})$$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$

**There is no significant, statistically significant effect of the independent variables of the spread of the Coronavirus on buying insurance schemes/policies online.**

There is a positive correlation between Covid-19 and buying insurance schemes/policies online by value of R = +0.188, where Covid-19 is responsible for 4% (R Square = 0.04) of all changes of buying insurance schemes/policies online, and this relationship is significant (P-value = 0 < 0.05). The value of this effect is 0.46, that means that if Covid-19 increases by 1 point, the buying of insurance schemes/policies online will increase by 0.46 point.

The model can be written as equation:

$$CI_{(\text{buying insurance schemes/policies online})} = 1.77 + 0.46 \times (\text{covid}_{19})$$

Where $(\text{covid}_{19})$ variable equals to $\begin{array}{l} 1: before\ covid - 19 \\ 2: after\ covid - 19 \end{array}$
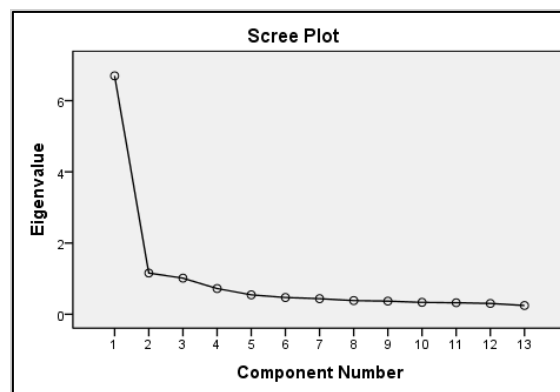
**Exploratory Factor Analysis**

**EFA for customers' preferences before Covid-19:**

The KMO value is 0.93, which is an excellent value for applying factor analysis to the dataset. KMO can be used for assessing sample adequacy (Kaiser, 1970). The Bartlett's test of sphericity is highly

significant (p-value <. 001). Indicates that the sample correlation matrix is not an identity matrix (Tabachnick and Fidell, 2001).

The eigenvalue greater than 1 (K>1) method was applied as a first method for component extraction. Components with eigenvalue greater than one retained for interpretation (Kaiser's 1960). This method is the most used and the most known (Fabrigar, Wegener et al. 1999), because it is easy to use. Two components were extracted, the first and second eigenvalues were 6.70 (51.51%) and 1.16 (8.9%). These components could explain 60.41% variation in the dataset.

The second method used to extract the components is Cattell's Scree test. The researcher is looking for a break point (elbow) were the data point above that break point, not included the break point, is the components to retain below indicates there are two components to retain:



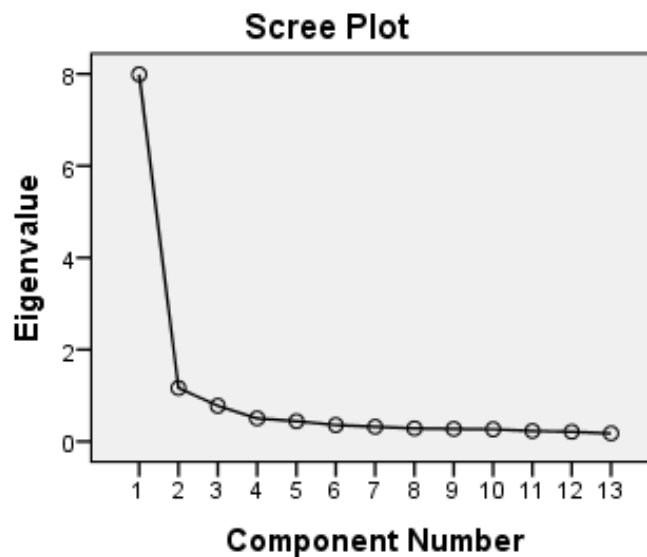**Figure 7: Scree plot before Covid-19 spreading.**

The above graph shows that break point occurs at component number three; as a result, the number of components to retain is two. The scree plot test confirms the K-1 (Kaiser) method, the researcher decided to apply two component solution for the variables before Covid-19 spreading.

**EFA for customer's preference's after covid-19:**

The KMO value is 0.94, which is an excellent value for applying factor analysis to the dataset. KMO can be used for assessing sample adequacy (Kaiser, 1970). The Bartlett's test of sphericity is highly significant (p-value <. 001). It indicates that the sample correlation matrix is not an identity matrix (Tabachnick and Fidell, 2001):

Eigenvalue is greater than 1 (K>1) method was applied as a first method for component extraction. Components with eigenvalue greater than one retained for interpretation (Kaiser's 1960). This method is the most used and the most known (Fabrigar, Wegener et al. 1999), because it is easy to use. Two components were extracted, the first and second eigenvalues were 7.989 (61.451%) and 1.164 (8.95%). These components could explain 70.402% variation in the dataset.

The second method used to extract the components is Cattell's Scree test. The researcher is looking for a break point (elbow) where the data point above that break point, not included the break point, is the components to retain below indicates there are two components to retain:

**Figure 8. Scree plot after Covid-19 spreading**

The above graph shows that breakpoint occurs at component number three. As a result, the number of components to retain is two. The scree plot test confirms the K-1 (Kaiser) method, the researcher decided to apply two component solutions for the variables before the spreading of Covid-19.

**EFA for customers' preferences associating to online and offline shopping:**

The KMO value is 0.90, which is an excellent value for applying factor analysis to the dataset. KMO can be used for assessing sample adequacy (Kaiser, 1970). The Bartlett's test of sphericity is highly significant (p-value <. 001). Indicates that the sample correlation matrix is not an identity matrix (Tabachnick and Fidell, 2001):

Eigenvalue greater than 1 (K>1) method was applied as a first method for component extraction. Components with eigenvalue greater than one retained for interpretation (Kaiser's 1960). This method is the most used and the most known (Fabrigar, Wegener et al. 1999), because it is easy to use. Three components were extracted, the first and second eigenvalues were 6.77 (45.16%) and 3.43 (22.89%), and the third component has eigenvalue of 1.05 (6.97%), These components could explain 75.03% variation in the dataset.

The second method used to extract the components is Cattell's Scree test. The researcher is looking for a break point (elbow) were the data point above that break point, not included the break point, is the components to retain below indicates there are three components to retain:
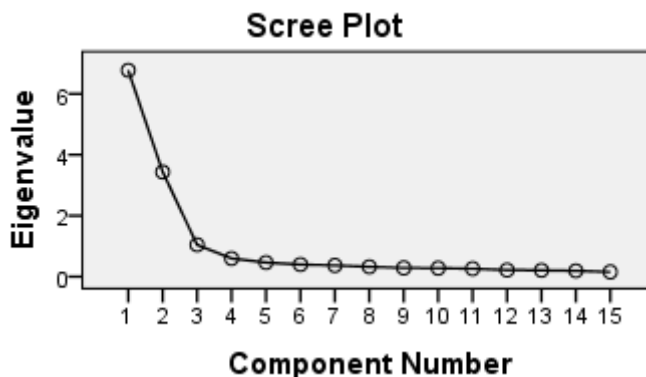
**Figure 9: Scree plot**

The above graph shows that break point occurs at component number four; as a result, the number of components to retain is two. The scree plot test confirms the K-1 (Kaiser) method, the researcher decided to apply three component solutions for the variables.

**Analytic Hierarchy Process (AHP)**
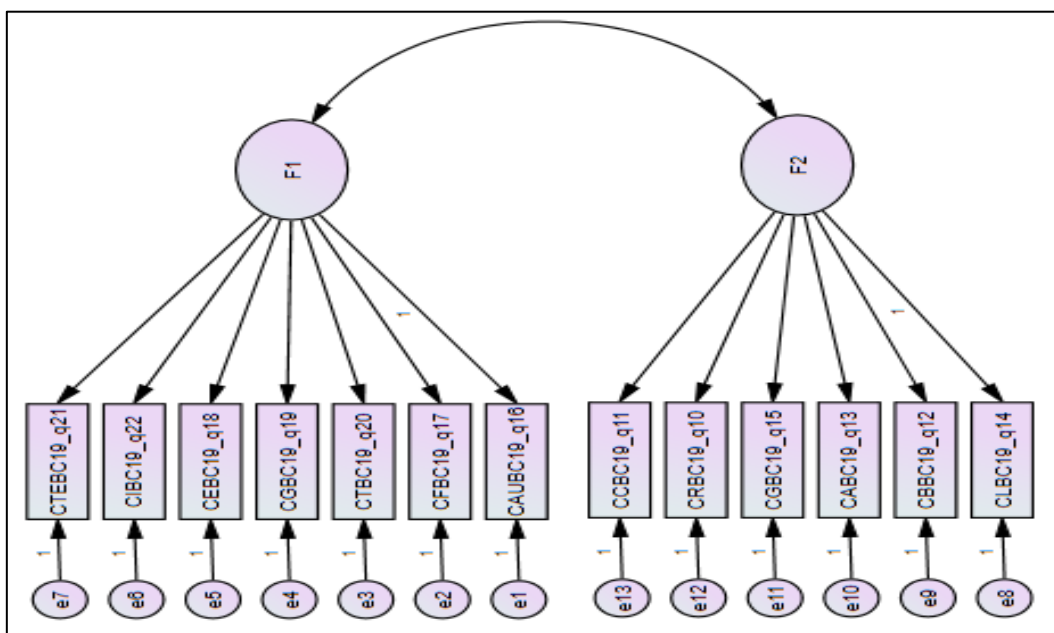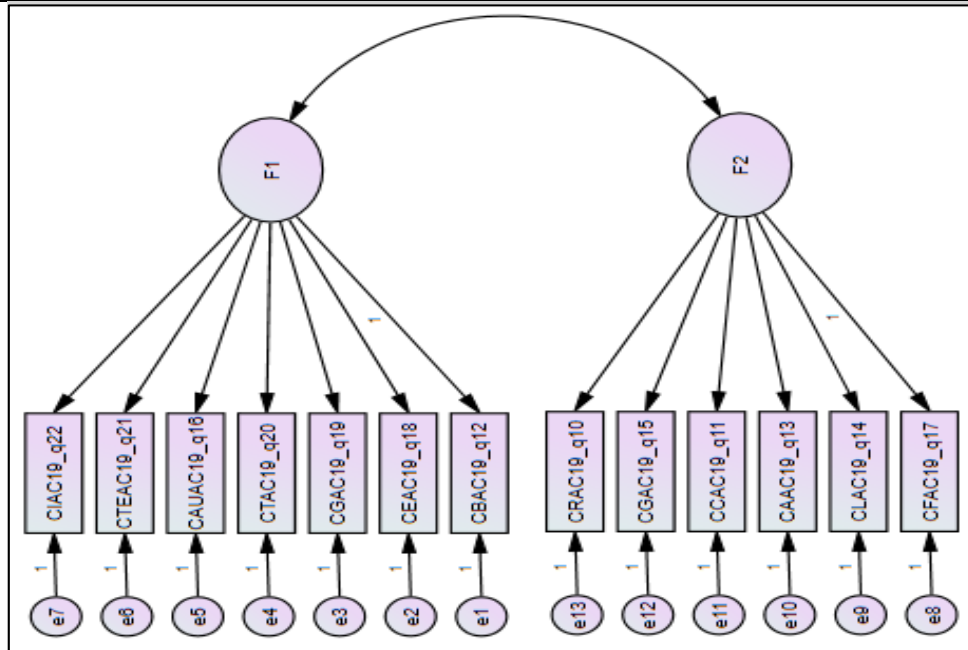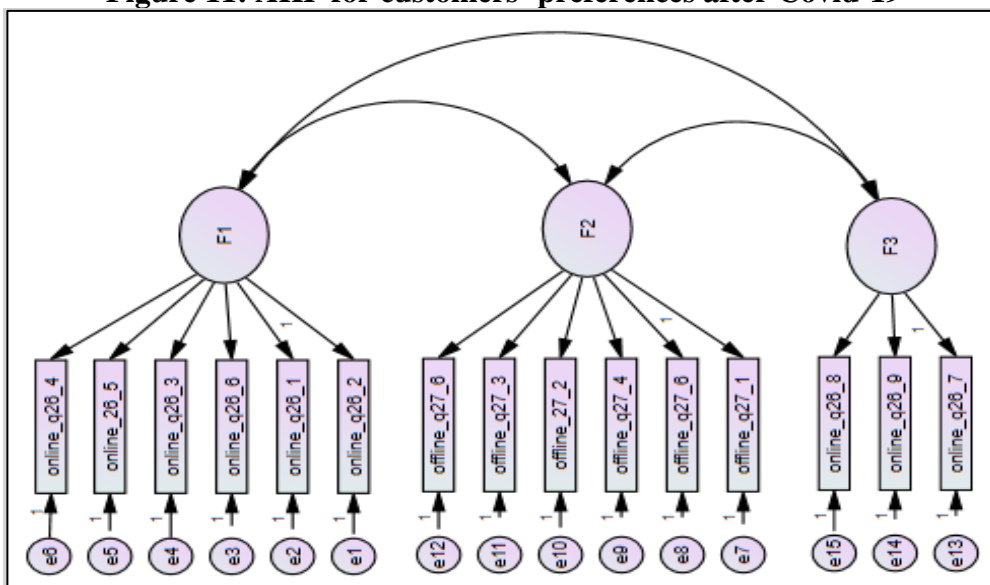
The outcome of AHP is presented in figure 10 & 11.



**Figure 10: AHP for customers' preferences before Covid-19**

**Figure 11: AHP for customers' preferences after Covid-19**



**Figure 12: AHP for customers' preferences related by causes for buying online and offline**

There is no statistically significant effect of the spread of the Coronavirus on buying online associated to years from 2015 to 2021. There is positive correlation between covid-19 associated to years and online by value of R = 0.96, where the covid-19 responsible of 91% (R Square = 0.91) of all changes on buying online, and this relationship is significant (P-value = 0 < 0.05), on other hand the value of this effect is 2.858 that mean if covid-19 increases by 1 point, the buying online will increase by 2.858 point. The model can be written as equation:

$$BO_{(buyin fonline)} = -0.517 + 2.858 \times (year_s)$$

For forecasting by future till 2030 we noticed that buying online will be increased by value of (45 b) as a double of 2021.
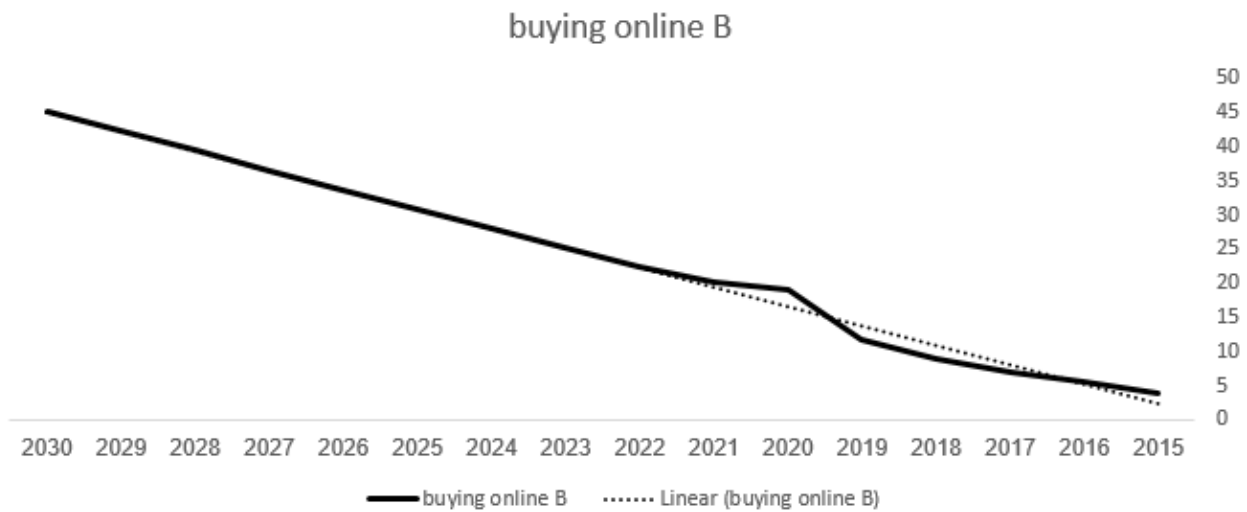
**Figure 13: Forecasting online sales till 2030.**

Based on historical data mentioned by the authorities of statistics in the annual report of the Saudi market, it is expected that the market of online retail will keep growing until it reaches around 45B Sar.

## V. CONCLUSION AND RECOMMENDATIONS

This research has addressed the theme of "*The future of retail chains in the E-commerce era in Saudi Arabia*", through a survey which measures the frequency of customers' online purchase, which reflect the preferences of customers in buying online versus buying offline. Around 54% of the participants were less than 30 years old, and 84% were less than 40 years old, which can give us some prediction of how the future of retail will look like. Participants were from all over Saudi, mainly form Jeddah (21.1%), followed by Buraidah ( 20.8%), Riyadh (11.3%), Dammam (6.8%), Khobar ( 6.8%), Taif ( 6.5 %), Makkah ( 6%), Madinah (4.5%), Khamis Mushat (4.0%), and 8.8% from other cities, although this might not be matching the population size of each city, it will give us the same indicator since we target the behavior of customers in the Saudi market in general. In terms of education, 34.8% of the participants have a high school degree, 45.9% have bachelor degree which give a total of 80.7% for both degrees; on the other hand, 17.8% hold a master degree, 1.5% hold a PhD. Regarding the income, 40.1% earn below 5,000 Saudi Riyals per month, 20.6% earn less than 8,000 and more than 5,000, 23.6% earn below 15,000 and more than 8,000, 11.3% earn below 20,000 and more than 15,000 and only 4.5% earn more than 20,000. In term of marital status, 43.9% are married, 49.1% are single and 7% are divorced. We are trying to find some common factors in participants that may affect their preference in buying online or offline: 64.7% of the participants have and drive a car and 35.3 do not drive nor have a car, and 56.9% are in position of responsibility to buy for their families while 43.1% don't.

The findings of the current research can be briefly summarized into the next points:
1. Customers' preferences vary from a category to another, as buying food online was the highest among all other categories, followed by clothes and accessories, care products, grocery and beverages, events tickets, games and tv series, electronics, luxury good, furniture, taxi services, insurance, books and finally automobile parts, this give indicator to retailers in each sector and how frequent their customers are buying online in their industry.
2. All categories without any exceptions were affected by COVID-19 in terms of customer frequency in buying online. It was not a temporary change in behavior, it was a game changer that accelerated the transition to online shopping. The most affected industry was restaurants

industry with a change from 2.36 to 3.24 in median, which explains the fast spread of concepts as cloud kitchens and huge evaluation of delivery companies as JAHIZ. Overall, customers' behavior is changing towards online shopping which will affect all categories.

3. Females are more frequently buying online compared to males and most of online users are females.

4. People spend more time online shopping than walk in shopping malls: it could be due to the huge variety of available items in online shopping, or to the physical fatigue of physical shopping. Many people will think that online shopping is faster and the study shows that the more educated the participant is, the more time he will spend shopping online.

5. The two preferred methods to pay when shopping online is credit card and cash on delivery.

6. 60% of the participants think that all purchases will be done online by 2030.

7. Only 13% of the participants started buying online after COVID-19, the rest were already familiar with online shopping, so we can say that COVID-19 may not have increased the number of online shoppers, however, it increases their frequency in buying online versus offline.

As the current research work is well-organized as a systematic exploration about the future of retail chains if the era of e-commerce, the researcher is recommending the following:

o Most of the categories had an increase over time toward the e-commerce, especially after COVID-19, which accelerated the transition process. Although not all categories have the same frequency of selling online, it is matter of time.

o Being too focused into the e-commerce is not the right approach to success, as the E-commerce still represents a small percentage of the overall retail chains, so the development of physical stores is still needed so far.

o Some categories are still not advanced in e-commerce due to many challenges related to the categories, and those who will be the first movers towards solving these issues will be the leaders in the coming era.

o Making sure of making available all payments methods that customers are usually using is important to give the best customer experience.

o The huge shift in customer behavior shows the importance of e-commerce for any coming pandemics or any other similar events that would make physical stores inaccessible.

o Customers are not paying online to save time but rather for full experience.

The study can be expanded to bigger population, more countries, more details in categories, and frequently to measure the change of frequency in buying online, this would keep retail market updated to customer behavior in each category.

**Conflict of interest:** We declare that we have no conflict of interest.

**Ethical statement:** We declare that they have followed ethical responsibilities.

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