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How the COVID-19 pandemic has provoked a change in the way Spanish consumers buy. Current situation and future forecasts from an industry perspective.

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ABSTRACT

The COVID-19 pandemic has disrupted many activities that were part of people's daily lives, among other things, consumer behaviours and the way of purchasing. The new consumer shifts as well as the measures taken to combat this virus have aggravated the situation for many industries. However, there were other industries that saw a boost in their demand. This study examines the changes in the Spanish consumer behaviour provoked by COVID-19 depending on the consumer characteristics gender, generational cohort, studies, residence, monthly income and fear to the virus. It also explores the future consumer behaviour or "Next Normal" and its influence in the performance of different industries inside the Spanish Consumer Goods Sector through forecasts. In order to do an effective analysis of the current situation and the future implications for industries, a quantitative research is conducted with the help of a questionnaire, multiple linear regressions and forecasts per industry. The findings achieved in this dissertation are compared to the ones obtained in previous studies to see analogies and divergences. Moreover, the evidence shows that the changes in consumer behaviour depend mainly on the generational cohort and gender of the participants presenting an increase in cleaning products, communication and online entertainment. Contrarily, the fashion and wellbeing industries reveal a decrease. Looking these changes and projecting them in the future, the winner industries in the medium and long-term seem to be cleaning products. Nonetheless, the fashion and wellbeing industries present positive results but are less conclusive, and the communication industry seems to reduce its demand in the future. These outcomes demonstrate that a constant analysis of consumer behaviour has to be done if companies and industries want to be able to react quickly to the new habits and cover future demands.

Key words: COVID-19 pandemic, consumer behaviour shift, forecasts, generational cohorts, Spanish Consumer Goods Sector, industries, online shopping, trends.

1. INTRODUCTION

1.1 Background

It all started on March 11th of 2020 when the World Health Organization (2020) declared COVID-19 to be characterized as a pandemic. Since then, the profound impact that this virus has had in millions of lives around the globe has affected how people work, socialize, think, travel and even spend. The pandemic has caused millions of deaths in the entire world and particularly, in Spain, the total number of deaths since the first case was diagnosed exceeded 75 thousand (Forte, 2021). The consequences that the virus and the measures created to deal with it, such as lockdowns and social distancing, were unpredictable and have disrupted the consumer habits. Consumer perspectives have changed to adapt to this new situation and new consumer patterns have been found as well as the acceleration of existing trends in consumption (An *et al.*, 2020). As it has been declared that there has been a shift in what consumers buy nowadays, the question for many businesses now is, are these changes going to be permanent or is the past behaviour going to be re-established? Knowing the answer to this question is crucial as companies need to forecast the future demand in order to be in line with the supply and cover customer needs. Therefore, this dissertation will focus wholly in the Spanish Consumer Goods Sector and the evolution of the consumer behaviour changes since the start of the COVID-19. A future forecast with the possible outcomes of the pandemic will be produced with regard to know which companies will be the ones benefited in the short, mid and long-term. The categories inside the Spanish Consumer Goods Sector that this dissertation will examine are: alcohol, canned food, cleaning products, communication, fashion, fresh food, frozen food, online entertainment, personal hygiene and wellbeing.

1.2 Relevance of the topic and motives

Regarding the relevance of the topic chosen, consultancies such as Deloitte, Accenture, EY, PwC, JP Morgan or McKinsey & Company have seen the shift that COVID-19 has provoked in consumers and how that could affect the profits and the whole business strategy of many industries. The uncertainty that the actual pandemic has brought is palpable and the preoccupation about not knowing what the future looks like has been a struggle since the beginning. For that reason, this study tries to address this uncertainty helping companies to know how the "Next Normal" will look like. It is necessary to perfectly know the patterns of consumption to design sales strategies and marketing campaigns in line to those movements.

However, the importance of this topic also relies in the massive loss of lives that has occurred during this last year, the loss of jobs, and consequently, the upcoming crisis. According to the World Bank (2020) the economic crisis that COVID-19 has brought is "the deepest recession since the Second World War, with the largest fraction of economies experiencing declines in per capita output since 1870". The consequences that a recession of such magnitude carries are also related to mental health problems such as anxiety and depression as people lose their jobs and cannot longer maintain their families. Therefore, by analysing and forecasting consumer's needs, not only are industries being supported but also individuals as key pieces of the global economy.

The personal motives that led to the study of this theme were, firstly, to learn more about this world issue in the perspective of a consumer as well as in the perspective of a businessperson. Moreover, the topic in question has been observed through a quantitative lens due to my interest in business analytics and statistics and the use of these fields to obtain a better decision making in companies. The study is focused on Spain given my origin and the willingness to know more about the consumption phenomenon in my country. Another reason for choosing this country is because Spain has been one of the top ten most negatively impacted countries of the world due to the COVID-19 in terms of human casualties and economy (O'Hurtado, 2020). Finally, when I started doing investigation and research of the topic I saw that most of the articles and papers related to this topic were not written for Spain and I wanted to prove if the results obtained in this dissertation were similar to the other countries analysis. Furthermore, the econometric techniques used in this dissertation were not tackled by other papers and scientific studies.

1.3 Aims and objectives

The main research aims that this dissertation will answer are: to investigate the changes in the Spanish consumer behaviour provoked by COVID-19 depending on the consumer characteristics (A1) and to explore how the consumer behaviour in the situation of the COVID-19 pandemic can affect the performance of different industries in the Spanish

Consumer Goods Sector by using forecasts (A2). The research objectives that will make sure those aims are met and answered are:

1. Conducting a survey in order to obtain data of the Spanish population and use it to see the consumer patterns as well as the future trends (O1).
2. Developing a statistical model to explain the consumer behaviour in times of COVID-19 using multiple linear regressions to see which individual characteristics (gender, generational cohort, education, residence, monthly income and COVID-19 concern level) influenced the changes of consumption in different industries (O2).
3. Forecasting the Spanish consumer behaviour using the variables gender and generational cohort for diverse industries (O3).

1.4 Structure of the analysis

This dissertation is organised following a structure of five main sections. Firstly, a critical analysis of previous studies related to pre, during and post COVID-19 consumer behaviour in Spain will be done as well as a review of the Spanish performance industry in times of crisis. Next, in the methodology chapter, it will be explained the process of how the research was produced, how the data was collected using a survey, which are the relevant variables used in the final model, the statistical model choice and future forecasts that would help companies to anticipate the future of their businesses. As for the third section, the findings about the substantial changes that the coronavirus crisis has brought and the "winning" as well as the affected industries will be shown. There will also be an interpretation of those results to get the sense of why they are important to shape the future of the "Next Normal". The final chapter will expound the next steps for future studies and the contribution of this dissertation to the business reorientation in order to cover the new consumer needs.

2. LITERATURE REVIEW

Although COVID-19 and its relation to the change in consumer patterns is a really up to date topic, there are numerous papers and studies that examine the shifts in different industries and most importantly, their permanency. The purpose of the literature review is to investigate first, relevant theories and concepts that can help understand the context of what is being analysed to then, examine other studies related to this one so as to see what was their contribution to the knowledge field, find relationships between them and define the gaps that justify the research study carried out in this dissertation. The literature review is organised taking into account the topics that are related to the research aims which were: to investigate the changes in the Spanish consumer behaviour provoked by the COVID-19 (A1) and to forecast the Spanish consumer behaviour after the coronavirus pandemic for different industries (A2).

The order in which this critical analysis will take place goes from broader themes such as the pandemic to particular issues such as the performance of each industry in Spain due to COVID-19. The structure that will follow is divided into four sections. The first one is an explanation of a relevant previous pandemic and the consequences that it brought in order to see any possible patterns with COVID-19. Second, a theoretical approach will be taken towards consumer behaviour and the influence of variables such as gender and generational cohort. Third, a breakdown of the Spanish Consumer Goods Sector performance as well as an analysis of pre, during and post-COVID-19 consumer behaviour will be done. Last, it will be conducted an evaluation of the main perspectives related to this topic to see their connections and conflicting views among them and regarding this dissertation.

2.1 Pandemics and behavioural change

Pandemics, contrary to what most of people think, are not rare events as they seem to happen periodically. Concretely, according to Potter (2001) pandemics occur at 10 to 50 years intervals as an emergence of new viruses that were a recombination of other viruses. For instance, during the last 50 years there have been 7 known pandemics (Pitlik, 2020). Understanding past pandemics and how they affected society is vital if quick responses and measures want to be taken so as to be prepared in case this happens again (Donthu and Gustafsson, 2020; LePan, 2020).

The measures taken to stop the coronavirus outbreak had consequences that affected the economic, behavioural and societal spheres and caused diverse responses among society. In order to see how these responses changed consumer behaviour patterns, it will be chosen one recent virus that caused an outbreak so as to compare it with the actual COVID-19. The focus will be posed in the Ebola virus due to its severity and the amount of information available. Although the first case of Ebola occurred in 1976, the WHO (2014) considered it an outbreak in 2014 and it lasted until 2016 in West Africa. This epidemic caused 11,300 deaths whereas COVID-19 reached in April of 2021 an amount of 3,200,000 deaths (LePan, 2020). Both viruses were different in their transmission, case fatality rates and countries they affected; nevertheless, they had one same common denominator, they provoked a change in consumer behaviour. In both outbreaks, this behaviour was influenced by characteristics such as uncertainty, chaos, fear and confusion (Health Communication Capacity, 2017). The Ebola virus managed to enter to Spain in 2014 through a missionary that infected one nurse. This incident caused a sanitary crisis with a great social impact and political implications having only one person infected (La Nueva España, 2015). The message that can be extracted from this event was the enormous fear of the population that was generated even with only one case in Spain. According to a study conducted during the Nigerian outbreak, the change in consumer behaviour was observed in an increase of consumption in products such as sanitisers, cleaning agents, soaps and antibiotics (Bali, Stewart and Pate, 2016). This study also proved that "fear led to trade restrictions, changes in consumption patterns, the spread of rumours and an epidemic of fear", all these changes being similar to the outbreak of SARS (Bali, Stewart and Pate, 2016). Thus, it has been demonstrated that other outbreaks have provoked changes in behaviour in the past that made consumers buy differently. Now, this statement poses the centre of attention on the actual changes and the similar patterns that are shared by consumers regardless of the type of infectious agent.

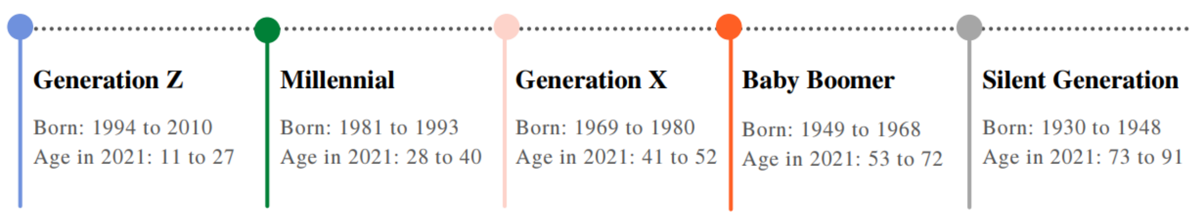
2.2 Consumer behaviour shift

After having seen the connection between pandemics and the behavioural changes in buyers, some theory related to the consumer behaviour must be explained so as to, later on, set the current situation to see the actual trends that emerged in the coronavirus pandemic. Consumer behaviour is a complex field of study that involves the decision making of customers of "when, why, how and where they do or do not buy a product" (Lakshmi, 2017). Globalization has created a more universal and collective consumerism among different countries which has made consumers from the entire world share similar patterns in the way they buy. This statement can be seen in Mark Cleveland and Michel Laroche (2007) research in which they argued that "the increasing globalization is reducing the homogeneity of consumer behaviours within countries, while increasing communalities across countries". However, these behaviours have still some differences depending on the country and culture being considered.

Likewise, the drivers that have changed the consumer behaviour are relevant if the shift to other consumption habits wants to be understood. The cultural values from different countries mentioned before seem to be influential in the purchase intentions of consumers across different markets (Rajagopal, 2018). Nevertheless, this factor is not the only one. Apart from the cultural aspects, there are other intrinsic characteristics that affect the population such as income, age, residence, lifestyle, attitudes, beliefs, personality and many other factors that are both internal and external to the consumer (Khan, 2006). In this analysis, the drivers chosen that were incorporated were: gender, generational cohorts, residence, level of studies, monthly income and concern due to COVID-19. The variables that appear the most in other studies, especially when speaking about shifts in purchasing behaviour, are gender and generational cohort. The differences between men and women are not only biological but something else. It is a variable that has a strong impact on the purchasing behaviour (Lakshmi, 2017). According to Swarna Bakshi (2012) men are more externally focused, analytical, logical and value more quality and efficiency, whereas women are more internally focused, subjective, intuitive and value more emotional value and relations. Besides, there are differences in how they buy as men tend to buy products that are immediate needs and do a heuristic search. Contrarily, women purchase considering a long period of time and do an in depth and elaborative search before buying.

The reason of choosing generational cohorts instead of age separately is that many studies either use it in their research instead of age, or they study how generational cohorts affect consumer patterns (Eger *et al.*, 2021; Bathmanathan *et al.*, 2018; Eastman and Liu, 2012; Elan, 2020; Marathovouniotis, 2020; Marcos *et al.*, 2021; Kopka *et al.*, 2020; Gerstell *et al.*, 2020; Mehta *et al.*, 2020). A similar argument can be seen in "Theory of generations", a theory proposed by Karl Mannheim (1952) in which generations help to describe and understand social changes. The importance of using generational cohorts rests in their "pivotal role in describing the different consumer behaviours and trends" (Bathmanathan *et al.*, 2018). The groups are made taking into account similar historical and social life experiences (Sarraf, 2019). This social context in which they live impacts significantly their "personality, feelings towards authority, values and beliefs, work ethic and their goals and aspirations for their work life" (Smola and Sutton, 2002). The generations used in this analysis were chosen taking into account the Spanish population, as the events that occurred in Spain are not the same as the ones that occurred in other countries. Besides, Millennials and Z Generation are the only generations considered to be global because of the globalization and the small or no differences among young people from different countries (Concejo, 2018). In Figure 1 it can be seen the different generational cohorts in ascendant order and the years that comprise each generation.

Figure 1. Generational cohort timeline in Spain



Source: own elaboration based on the generational taxonomy from La Vanguardia, 2018.

In order to understand how these generations could react depending on the situation, a brief description of their behaviour will be provided. Firstly, the oldest generation, also known as Silent Generation, is formed by the people that grew after the Spanish civil war (from 1936 to 1939) which marked them and made them austere and hard-working people. Second, the Baby Boomer generation were characterised to live in peace and in a prosperity period after the war. They were the first generation to enjoy holidays in the beach and buy their first car. Generation X in Spain started later than in the rest of the European countries due to Franco's regime. They lived the consumerism splendour and obsession to triumph. Next, Millennials grew with the digitalisation and the economic crisis. They are described as lazy, individualist and conformist but also as the ones that boosted a healthy lifestyle and environmentalism. Last, Generation Z are entrepreneurial, quick learners and self-taught people. They have lived in a world completely technological, they are very creative and are able to adapt to different situations and countries. However, they look for immediacy at all times and cannot stay focused for a long time (Concejo, 2018).

Having explained the characteristics that conform these generations, how the pandemic has affected the purchasing behaviour of each of them needs to be investigated. The Silent Generation does not have enough literature to discuss their behaviour during the pandemic due to the small size of this cohort (Marcos *et al.*, 2020). However, Baby Boomers are characterised for they tendency to alter their behavioural patterns when shopping if the economic situation changes (Williams and Page, 2011). Thus, as an economic crisis has started due to the pandemic, it seems reasonable to assume that this group will try to reduce some expenses and increase others. In fact, this generation has become "e-commerce consumers in masse given their higher levels of risk they face during the pandemic" (Thomann, 2020). Similarly to Baby Boomers, Generation X are cost conscious and look for discounts and promotions where possible (Ordun, 2015). According to the survey conducted by McKinsey & Company in Spain (Marcos *et al.*, 2020) people from this generation and low household income will spend less than a 27% in leisure activities in 2021. Unlike the last two generations mentioned, Millennials do not ask for further information because they think they will get the best deal for that product and are environmental friendly (Bathmanathan *et al.*, 2018). The previous survey mentioned (Marcos *et al.*, 2020) stated that millennials with a high monthly income will be one of the groups that will spend most (57%) in leisure activities. Lastly, according to Priya Elan (2020) generation Z seems to have changed their mentality in relation to the fast fashion industry after the pandemic, being in favour of a more circular and sustainable fashion. This generation is similar to Millennials in that they will be the cohort that spends most money in treating themselves, concretely a 60% for the highest monthly income in this group (Marcos *et al.*, 2020).

Contrarily with what has been explained, Zach Thomann (2020), Executive Vice President & General Manager at PFS, stated the fact that attitudes and behaviours are starting to blur among different generations due to the pandemic. Still, this argument needs further study and support in order to determine if it is accurate and if it will be enhanced in the future.

Apart from the internal factors that were explained before and influenced the purchasing behaviour, there are external factors that provoke different reactions in consumers. The external factors that occurred during the pandemic, apart from the virus in itself, were the measures taken to fight it such as lockdowns, distancing measures and wearing masks. The reactions to the coronavirus threat went from clearing the shelves of toilet paper to disinfectant and cleaning products and even water (NCSolutions, 2020). The scarcity lived during the first months of the pandemic caused "consumers to adopt a competitive mindset in which they saw others seeking these goods as adversaries, leading to territorial behaviour" (Kirk *et al.*, 2018). However, this lack of product availability motivated consumers to be artistic and create products by themselves (Kirk and Rifkin, 2020).

2.3 Trends in the Spanish Consumer Goods Sector and its performance.

The Spanish Consumer Goods Sector has been forced to unprecedented instabilities due to the COVID-19 outbreak, which has affected many enterprises and sectors (Donthu and Gustafsson, 2020). As it was explained previously, there have been changes in relation to what people consumed and how they consumed it. In this subsection, it will be done a brief introduction of the sector and the industries that it covers. Then, the main trends that existed before COVID-19, during the COVID-19 and the future trends in the "Next Normal" will be shown using perspectives from multiple studies.

The Spanish Consumer Goods Sector, sometimes also denoted as industry, is formed by the products and services that are "purchased by individuals and households rather than by manufacturers and industries" (Investopedia, 2020). At the same time, this sector is composed of other industries that will be grouped in this dissertation as consumer staples and consumer discretionary depending on how necessary or indispensable are those products in consumer's lives. The former is used for the essential products that are always in demand, no matter if the economy in not performing well (Chen, 2020). The latter represents the goods or services which are not essential but desirable if people has enough money to purchase them (Scott, 2020).

<u>Pre COVID-19</u>

Before the pandemic in 2019, the Spanish consumer behaviour was characterised for price hypersensitivity that led to lack of brand loyalty. According to Santander (2021) in 2019 "75% of Spaniards looked for a bargain before buying something, while 24% left their regular retailer if they find lower prices elsewhere". The key trends of the consumer behaviour in 2019 were: moving to a customized service, presence in online platforms, an increase of the e-sports, streaming war, request for immediacy and more sustainable and environmental brands (EAE Business School, 2019; Desarrollando Ideas, 2019). In 2019 the consumer opted for more healthy products and that is why there was an increase in fresh food such as vegetables and fruits (Planas, 2020). Consumers were willing to pay more for quality products and reduce in alcohol. In addition, e-commerce in Spain that same year had an increase of an 18% in total (Planas, 2020).

<u>During COVID-19</u>

As it was introduced briefly with the generational cohorts, there have been changes in the past trends due to the pandemic. These changes were addressed thoroughly by many consultancies and scientific studies that will be critically analysed and compared. A good framework that can explain the consumer behaviour and their motivations during the pandemic is the Maslow's Hierarchy of Needs (Maslow, 1943). According to this theory, there are five levels that match with the needs of individuals and those levels have an order. The order must be followed, accomplishing each of the levels step by step starting from the bottom of the pyramid to the top. The first level is the physiological needs that have the biological requirements for human survival. After having completed the first level, the second type of needs arise, the safety needs, for example personal security or employment. Relating this framework to the pandemic, the first and second steps were achieved as people cared about their health and security against the virus which correspond to the consumer staples category. However, the third step that was about love and belonging needs, had constraints such as the lockdown, no possible physical proximity to others, online working, online shopping… (Duygun and Sen, 2020; Mehta *et al.*, 2020). This same argument was supported by S&P Global (Shand, 2020) as they concluded that "discretionary subsectors faced material declines in sales and profits because of social distancing mandates and the recession which will likely take credit metrics 2-3 years to recover to 2019 levels."

Knowing now why the consumer staples industries were more demanded during the pandemic, a further explanation of the trends triggered by the pandemic can be shown so as to see their performances from different views. The industries that will be analysed using other studies are the ones that were chose for the latter research and that were pointed out in the introduction.

A useful tool to check the consumer interest in different products is Google Trends. Essentially, “Google Trends is used for monitoring and analysing conducts in order to examine actual human behaviour” (Mavragani, Ochoa and Tsagarakis, 2018). This resource will be used in this research because it helps to “predict future purchase decisions, determine the effectiveness of marketing campaigns and forecast online consumer brand engagement” (Silva *et al.*, 2019). The next graphs show the evolution of different searches in Google Trends depending on the word being used during the pandemic. The words chosen were written in Spanish in order to observe only the Spanish population and the order of the graphs follows the same one as the industries. These words correspond to products for each category in the consumer goods industry and there is only one word per category. The red dot in the evolution charts indicates the starting date of the first lockdown in Spain, 15th of March of 2020 (Vivas and Castro, 2021).

Figure 2. Searched word *“cerveza”* (beer).

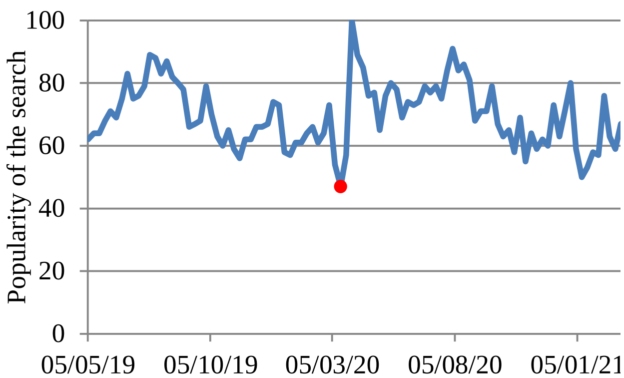
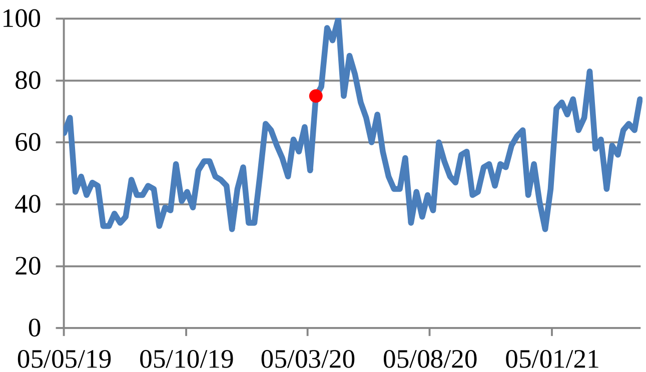


Figure 3. Searched word *“guisantes”* (green peas).



Source: Google Trends data from 2019 to 2021.

Figures 2 and 3 show the evolution of the searches for beer (alcohol industry) and green peas (canned food industry). In both figures there has been a sudden increase after the start of the first lockdown due to the fear people had in that moment as the virus was something new. For the first industry, during the lockdown period, it can be seen that people searched the word more than before which could be interpreted as an increase in consumption of that product. Besides, the trend seems to be stable in the long run because the start and the end of the evolution are around 64 of interest which means that the alcohol industry did not have much change. Looking into studies done for other countries such as S&P’s, contrary with what was seen in the Google Trends chart, it was stated that the alcoholic sector was severely affected by the pandemic from March to May (Shand, 2020). This study also says that it is possible that the sales for alcohol will be flat once economies fully reopen which is similar to what Google Trends showed. Another important study, done in Spain by McKinsey (Marcos *et al.*, 2021) stated the same movement; a negative trend for the alcoholic beverages. Apart from these two studies, Accenture's paper sustains that the alcohol industry decreased by more than a 5% in all the consumer groups they had (Wright and Blackburn, 2020). Green peas that belong to the canned food industry in Figure 3 shows a similar pattern as the one just described for beer, but the jump in this case for the lockdown period was greater as citizens were worried that the food will run out and started stockpiling non-perishable goods (Wang *et al.*, 2020). According to the research made by Accenture (Wright and Blackburn, 2020), tinned food was one of the industries that has a larger increase in its consumption, having all the consumer types increased it by more than a 5%.

Figure 4. Searched word *"gel hidroalcohólico"* (hand sanitizer).

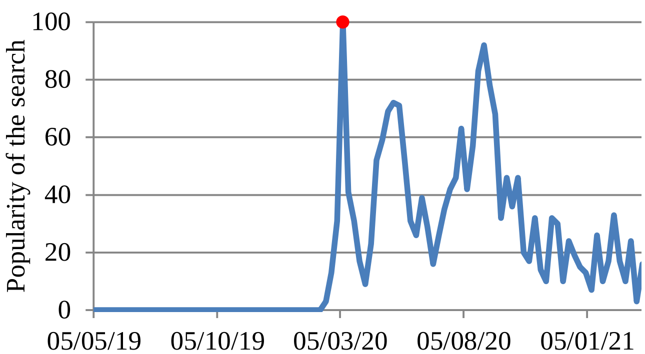
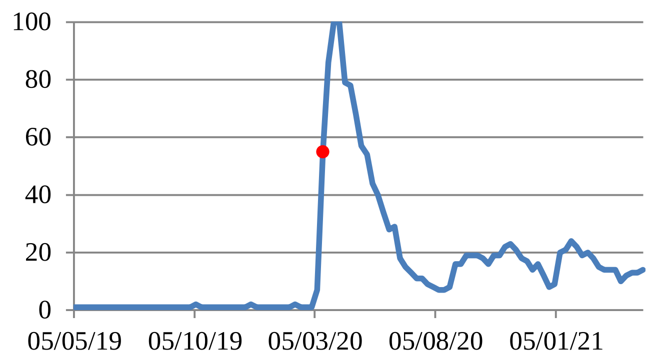


Figure 5. Searched word *"Zoom"*.



Source: Google Trends data from 2019 to 2021.

Figures 4 and 5 show the evolution of the searches for hand sanitizer (cleaning products industry) and Zoom (communication industry), respectively. Both words were chosen for those industries as they were really significant and used during the pandemic. For instance, Zoom video services was chosen as according to Seth (2020) is the obvious example for the behaviour of embracing digital technology. For the first figure, it is clear that this type of product was not used before the pandemic started as it is observed that there is no interest. However, after that, it has had an increase that seems to be maintained in the short-term. This increase is also seen in Accenture's study, in which this industry was the second one with the largest increase due to the pandemic in all consumer segments analysed (Wright and Blackburn, 2020). Additionally, others studies (Shand, 2020; Laguna *et al.*, 2020) affirmed that consumers bought more quantity of cleaning products, thus, being this industry benefited from the COVID-19 situation in the short-term.

Zoom platform for the communication industry, seems to have a similar pattern because it was not really used before the pandemic and suddenly it had a major increase that it is also maintained in the short-term. Wright and Blackburn's study (2020) also showed that the results for the communication industry were relatively different from the obtained in Google Trends, as there were two consumer segments that had more than a 5% of increase, while the other three types of consumers maintained their consumption during COVID-19. The same line of argument is followed in Deloitte's survey (Zierlein *et al.*, 2020) as the increase during COVID-19 of these digital services was of a 43.2%. Besides, an interesting finding was that women used it more than men, concretely, an 8% more.

Figure 6. Searched word *"traje"* (suit).

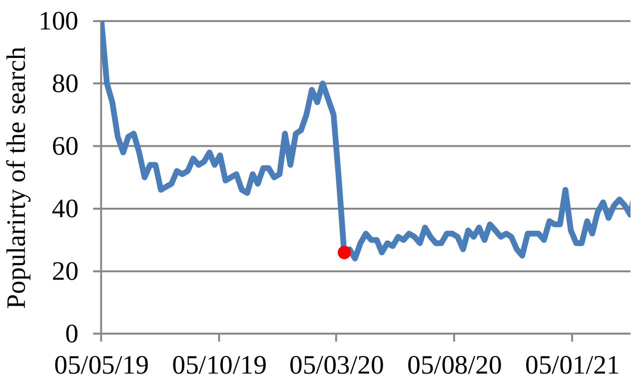
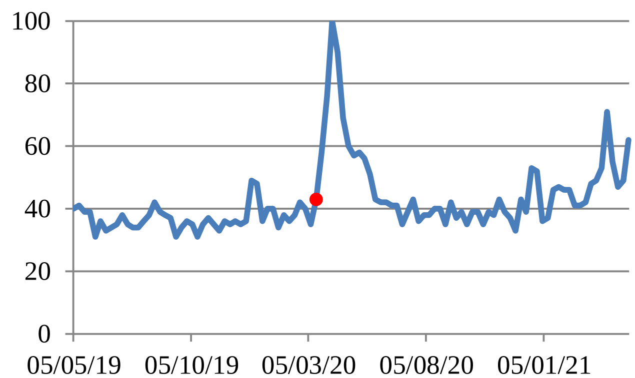


Figure 7. Searched word *"huevos"* (eggs).



Source: Google Trends data from 2019 to 2021.

Focusing on Figure 6 in the product searched for the fashion industry, there is an abrupt drop when the COVID-19 pandemic was declared. Moreover, the overall trend plunged as in 2019 it was reaching a 98 of interest and in the same date for 2021, it was in 49. Nonetheless, after the pandemic started there is a gradual increase that seems to continue in the short-term. Other studies also have the same findings. For instance, Deloitte's survey (Zierlin *et al.*, 2020) declared that this industry will face large adjustments and insolvencies, being pessimistic of the recovery of the fashion industry in the future. Something similar is supported by EY's study (Rogers and Cosgrove, 2020). The results were conclusive; a 90% of the respondents that belonged to the segment "cut deep" (mainly people over 45 years old) said that they spent less in clothing and footwear due to COVID-19. The reasons for this fall were: the restrictions on travel, a more sustainable style taken by consumers and the lack of physicals stores being open (Berg, 2021).

For fresh food in Figure 7, according to Mehta *et al.* (2020) this industry has been a top winner during the pandemic, having increased its consumption. A similar approach can be seen in Figure 7 in which the interest in the word “eggs” had a peak during the first lockdown and afterwards it had a slightly growing trend in the short-term that overall shows an important increase from 40 to 62 if interest. Besides, Laguna *et al.* (2020) affirmed the same change in consumer behaviour, being a 58.3% the participants of their study that increased their consumption in this industry.

Figure 8. Searched word *“espinacas congeladas”* (frozen spinach).

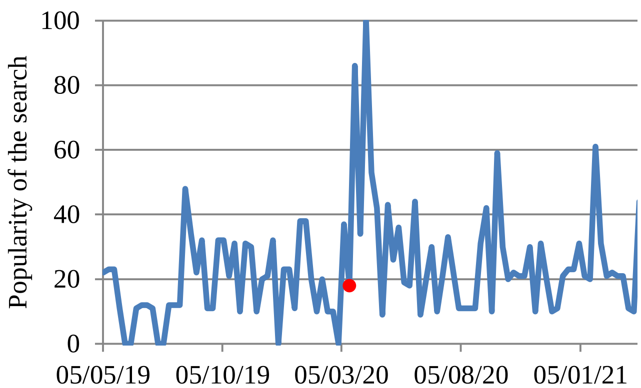
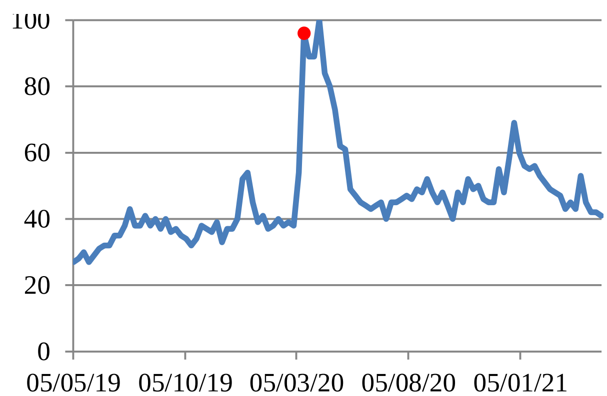


Figure 9. Searched word *“Netflix”*.



Source: Google Trends data from 2019 to 2021.

The next industries that will be examined are frozen food and online entertainment. In Figure 8, the word being analysed in frozen spinach and the evolution chart shows intermittent demand before the pandemic happened, but when it started, the levels slightly rose during the ongoing pandemic. Comparing the same date in 2019 and 2021, the difference confirms that the interest in that product has climbed from 22 to 39. Accenture’s paper (Wright and Blackburn, 2020) also mentions a total net increase of 11.7%. Nevertheless, Jenssen *et el.* (2021) in their survey for Denmark, Germany and Slovenia showed that in all these countries the majority of people did not change their consumption in this industry.

For online entertainment in Figure 9 the word chosen was the online platform Netflix. It is noticeable that there was more interest in this industry compared to frozen food. Moreover, it is evident that there is an upward trend for this service due to the pandemic. The rise in this industry was also seen by Wright and Blackburn (2020) with a total net change of 9.5% and Puttaiah *et al.*, (2020) with a "27% of US consumers that subscribed to at least one new digital streaming service".

Figure 10. Searched word *"papel higiénico"* (toilet paper).

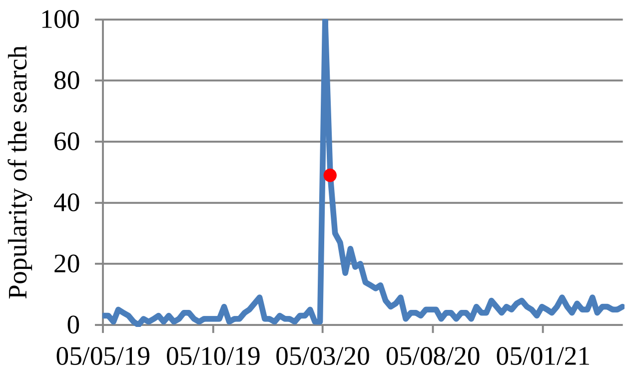
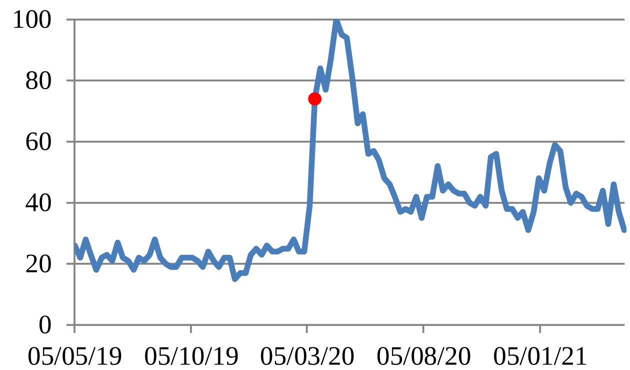


Figure 11. Searched word *"pesas"* (weights).



Source: Google Trends data from 2019 to 2021.

In Figures 10 and 11 it can be observed the evolution of the searches for toilet paper and weights. Concretely, in Figure 10, the sudden peak for this product has been the largest change seen (going from approximately 5 of interest to 100) as consumers started panicking and hoarding toilet paper because they thought there were not going to be more supplies. However, later on, it can be observed that it was momentary behaviour and that the increase in this type of product has been really little after the lockdown. Looking into other perspectives, Accenture's study sustained an increase in its consumption due to COVID-19, being the industry with the highest increase (Wright and Blackburn, 2020). Besides, S&P's study (Shand, 2020) said that "the sector has benefitted from COVID-19, putting health centre stage for many consumers, and people have defined higher hygiene standards".

In the wellness or wellbeing industry, there has been a focus on self-care which resulted in an increase due to COVID-19 (An *et al.*, 2020; Puttaiah *et al.*, 2020). A 69% of the participants from PwC's survey agreed that mental and physical health care have risen in this situation. Additionally, a 64% of the respondents agreed to have increase their medical needs and a 63% did the same for diet (An *et al.*, 2020). McKinsey's results supported the same argument, more fitness on demand and e-pharmacy and e-doctors at scale (Kohli *et al.*, 2020). Interestingly, Figure 11 shows a rapid raise during the lockdown and after it finished for the product weights, which meant that it may be true that there is more concern in being healthy. Nonetheless, as people bought weights and more equipment to do exercise, the new trend for doing sports seems to be at home and not at the gyms at happened before the pandemic.

Last, the way the products or services were bought during the ongoing pandemic was an important shift due to its radical acceleration of online platforms usage. The growth on internet sales has been remarkable, with an increase of 92% in volume and 114.5% in value (Planas, 2020). Moreover, according to Zierlein *et al.* (2020) in Deloitte's survey, "a 36% of buyers state that they plan to use digital channels more often to buy products during the coming 12 months". The reasons of this shift are firstly, health concerns (41%), convenience (27%) and saving time (19%). PwC (An *et al.,* 2020) says something similar, adding as well that there was a bigger increase in online shopping via mobile phone (45% of contestants increased their use for this purpose) whereas, before the coronavirus happened the in-store buying was the most popular way of shopping (47% of people used to buy).

<u>Post COVID-19: "Next Normal"</u>

The global permanency of the shifts in consumer behaviour in the "Next Normal", seems to be clear. Most of the papers and studies already mentioned affirm that in "The Next Normal", consumers will embrace these changes permanently (Kohli *et al.,* 2020; Wright and Blackburn, 2020; Martinez et *al.,* 2020; Chan *et al.,* 2020). EY survey (Rogers and Cosgrove, 2020) also supports this affirmation as "45% believe that how they shop will have changed permanently, and 38% say the same about what they will buy". However, according to Seth (2020) consumers will go back to their old habits of purchasing unless technology brings significant changes to their lives. It has to be mentioned as well, that the permanency of these trends can also depend on the different industries and further research should be done taking this into account.

2.4 Key perspectives and takeaways

Having explored the trends that occurred in the different industries and what it is known about the topic from different points of view, a summary of the most mentioned changes will be done. In this subsection, there will be a brief but more direct comparison and evaluation of the main views of this topic in order to see the differences and similarities among them and with this dissertation. The reports, scientific papers and studies chosen will be the ones that share more common aspects with the dissertation being carried out. Most of the studies come from consultancies because they have a wider perspective of the different industries and were the ones that provided a better and a more in depth analysis. Overall, it is clear that changes have occurred during the pandemic concerning the products or services buyers purchased as well as the channels in which they used to buy. The trends that were identified before, depend on the perspective taken into account. However, the common trends that were mostly repeated in the studies were: increase in e-commerce, increase in online entertainment platforms, rise in media consumption, discretionary spend decline and focus on health and personal caring. The key papers that bear a resemblance to this dissertation are: Accenture's (Wright and Blackburn, 2020), Deloitte's (Zierlin *et al.*, 2020), S&P's (Shand, 2020), McKinsey's (Marcos *et al.,* 2021) and Laguna's *et al.* (2020). Now, there will be done a brief description of the strengths these studies have. Wright and Blackburn paper (2020) is the most important study for this dissertation because it was considered as the main framework and approach. The positive aptitudes it has are: the division of consumers into five segments, an international analysis that covers a large scope of industries. For Zierlin *et al.* study (2020) the strengths are related to the short and medium-term projections, an international scope as it happened with the previous paper and the business proposal with changes per product in relation to the capacity those business have. The third study is the one carried out by Shand (2020) and the main advantage that it has is a really good in depth analysis of the subsectors and industries affected by COVID-19. Next, Marcos *et al.* survey (2021) had as positive aspects that it was done for Spain, took into account some generations (except Silent Generation), considered pharmaceutical intervention action such as the vaccination process and has high granularity in the categories used. The last study that resembles to this dissertation is the one conducted by Laguna *et al.* (2020). It is also focused in Spain, identifies the trends for different types of food and uses Google Trends and Twitter to see the frequency and interest in these food industries.

Still, it is also worth mentioning the shortcomings that these studies had and challenge possible assumptions. The next identification of gaps in knowledge wanted to be filled in this dissertation. In all of the studies exposed before, except from Laguna *et al.* (2020), the statistical methods used for the variable selection were not detailed which makes it difficult to know their methodology. It is not deeply detailed the variables that they used in their studies for doing segmentation among consumers and the methodology is too short (e.g. Marcos *et al.*

paper or Wright and Blackburn's). In relation to this, the cohort effect is identified in some studies but not considered for the final model (e.g. Zierlin *et al.* paper). Moreover, the projections that some of the studies did (Zierlin *et al.,* 2020; Marcos *et al.,* 2021), are partial and in the short and medium term, not in the long-run. In the same line, Accenture's paper had a panic index with the industries and their changes depending on the consumer but it only considered two weeks. Another shortcoming is that the analysis that wanted to be done in this dissertation was focused on the Spanish Consumer Goods Sector and some studies were focused either in another country or in a set of countries (e.g. Zierlin *et al*. was conducted in Germany whereas Wright and Blackburn's, and Shand's were centred internationally).

3. METHODOLOGY

It is important to revisit again the aims of the research to have a better understanding of why the methods that were chose are the best fit. As it was stated in the introduction chapter, "A1" was to investigate the changes in the Spanish consumer behaviour provoked by COVID-19 depending on the consumer characteristics and "A2" to explore how the consumer behaviour in the situation of the COVID-19 pandemic can affect the performance of different industries in the Spanish Consumer Goods Sector by using forecasts.

There have already been discussed in the literature review other studies related to the one carried out in this dissertation by doing a critical interpretation of them. Nevertheless, throughout the analysis to study the changes in consumer behaviour after COVID-19 started, a strong quantitative analysis is crucial to identify those shifts with the help of statistical methods and tools. This section aspires to explain in a deeper way the steps followed for the exploration of the data obtained in the questionnaire, the methods used to achieve the final model and to find an answer to the aims of this research. This section is organised into four subsections that give more details about the research design, data collection and analysis, evaluation of significant variables and forecasts.

3.1 Research Design

The research objectives mentioned in the introduction chapter (O1, O2 and O3) will be the key points discussed and evaluated in the methodology section as those will be the steps that the analysis will follow. The approach in which this dissertation has been written was using a deductive logic. The reason is that this dissertation was structured, firstly, introducing the theoretical considerations and other perspectives about this topic to later on, formulate hypothesis that will be subjected to empirical scrutiny (Bell *et al.*, 2019). It starts posing general statements to finally end in concrete answers. The advantages that made this approach be chosen for the study were: it can explain the causal relationship between concepts and variables, it can quantitatively measure concepts, and can summarize research results to a certain extent (Dudovskiy, 2018). The deductive approach is closely related to scientific or positivist research since the intention of this epistemological position is to have a rigorous proof of evidence that could be analysed to show its validity for the field.

According to Benedictine University (2021) “primary research is understood as first hand data gathered by the researcher himself and secondary research as data collected by someone else earlier”. Having explained this, the research process carried out required a mix of the two different methods: primary research by using a survey specifically made for this dissertation, and secondary research for the forecasts as the dataset chosen to see how the Spanish population will change in the future was taken from the Spanish Statistical Office (INE).

As mentioned above, the dissertation follows a deductive approach, scientific or positivist model and takes reality as objective. Thus, the research strategy conducted corresponds to a quantitative analysis. It also has clear parameters that help to interpret the results. Besides, due to the characteristics and nature of the data, the dissertation was planned to be a non-experimental design. The reason is that I, as the researcher, did not have any control on the independent variables used in the survey because the individuals belonged to different groups by means of self-selection. The second reason is that the groups were neither aleatory nor equivalent (Zurita *et al.*, 2019).

The framework adopted for the realization of this dissertation was the one that Accenture used in their study “How COVID-19 will permanently change consumer behaviour” (Wright and Blackburn, 2020). The reason for using this study is because it is very complete as it has different groups of consumers depending on their gender, age and fear to COVID-19. It also has a panic index that relates the type of consumer with different industries to see the shifts in purchasing (measured using -5%, 0% or 5%). Accenture’s approach was expanded in this dissertation by introducing more independent variables such as generational cohort, level of studies residence and monthly income. Besides, the centre of attention is concentrated in ten industries (which seem to be the most relevant from the literature) while Accenture’s study focuses on seventeen. Wright and Blackburn’s study (2020) was really useful as it contained similar information of what wanted to be discussed in this dissertation. However, as the attention is posed in numerous countries and this study is only focused on Spain, it is possible that the results show a completely different outcome.

For this study, the research strategy used was a self-completion questionnaire distributed mostly in online platforms and the observations obtained were cross-sectional since the observations were acquired at a single point in time, the data collected was connected with more than two variables and the aim was to examine that data to detect patterns of association

(Bell *et al*., 2019). The decision of using this research strategy was firstly, because through a questionnaire it can be obtained large numbers of participants in a short period of time; second, because the questions posed control the answers of the contestants and third because there is less social desirability bias than in an interview (Bell *et al*., 2019). To overcome the research limitations, questions were made in advance taking into account other people's feedback before distributing it to find any possible errors. The survey was created using Google Forms because it has attractive formats, allows to put as many questions as necessary and shows immediately the responses in graphs to interpret the results easier. The survey was launched at the beginning of January 2021 and the objective of the questionnaire was to gather enough information about the consumer behaviours in Spain to be able to use statistical techniques and have conclusive results that could be useful for companies, and more broadly, to society; therefore, completing the first research objective (O1).

Since the dissertation wanted to examine the consumer behaviour of the adult Spanish population, the target audience towards which the questionnaire was directed, was people in between 18 and 82 years old. Based on Bullen (2014), the minimum sample size required to have a meaningful result is 100 but it also depends on the situation. Therefore, as 284 responses were gathered, the representativeness of the achieved sample was reasonable considering the time, cost and availability of resources. Having a sample greater than the minimum required, makes the sample to be likely more precise as the sample error decreases (Bell *et al*., 2019). The next step that was taken to produce a good questionnaire was choosing a sampling technique. The one used in this study was the probability sampling and in particular the simple random sampling because every situation in the sample had the same probability of being included (Taherdoost, 2020).

The questions format was of closed type questions instead of open, because the intention was to have as many responses as possible in order to have a representative sample of the Spanish population. Creating closed questions makes it easier for participants to answer so more people would fill the survey (Bell *et al*., 2019). The only open question asked was the age and there was a total amount of twenty questions asked in the questionnaire. Another aspect that helped to have a large participation was the structure. The questionnaire was clear as it was divided into sections depending on the topic. The first one was about personal information such as their gender, age, level of studies, residence, monthly income and COVID-19 concern. The second part involved an identification of the expense variation due to COVID-19 in different products from the Spanish Consumer Goods Sector. The third and final part of the survey consisted on other questions to know attitudes or consumer habits that were not captured in the second section and were notorious changes that appeared in the studies from the literature review. For instance, the questions were related to the total expense variation during the COVID-19 pandemic, online shopping and its possible increase during the pandemic and the future duration of the acknowledged changes. Furthermore, as the questionnaire was written in Spanish because it was directed only to the Spanish population, an English translation of the full questionnaire can be found in Appendix 1.

Social media platforms such as WhatsApp, Instagram, Twitter and Facebook were the main distribution channels handled. Nevertheless, according to Dr Bran Knowles and Professor Vicki Hanson (2018), "older adults use significantly fewer digital applications and spend less time online than younger adults". This statement explains the reason why there were fewer respondents as the age increased. To correct that issue and have respondents of all ages, the survey was also distributed in the streets to older people so as to get a better equilibrium and randomness on the answers and correct possible biases.

The softwares used for this study which helped to produce the analysis were Excel, R and Gretl. Excel was used for the data cleaning and first exploration. It was employed to delete any errors or see if there were any missing values. Additionally, the graphs to forecast each product in the findings section were done with Excel. R was used to visualise the rest of the data through plots and graphs because there are more graphs options and designs than in Excel. All the script *ad-hoc* written to represent the graphs can be found in Appendix 2 so that anyone can replicate the plots. For the variables selection and the test of the linear regressions formulated, Gretl was the tool employed. The reason to use this platform is its specialisation in econometric analysis, its open-source software and intuitive interface.

It is equally important to mention possible issues that can arise and try not to avoid them. This paragraph will treat the possible assumptions, personal biases and limitations that the study could have. Discussing these concerns allows the researcher to find gaps or wrongdoings which can help to address them on time and produce a more objective investigation. This dissertation assumes that the COVID-19 situation is constant; however, since the questionnaire was distributed, the situation has changed. If the survey was done now, it is possible that the answers would have been slightly different. The solution to this problem would be to do a periodic analysis and repetition of the survey (e.g., every month). Nonetheless, as this dissertation has limited resources and time constraints, it would not be possible. Another problem that has to be mentioned is the existence of possible personal biases. One of the reasons is that the distribution of the survey was done using my personal social media accounts so the results could be influenced by my close circle of friends and family. However, to avoid this problem, the survey was also distributed in the streets to random people. Another possible source to have personal biases is that the results obtained do not follow the exact Spanish population distribution which could change slightly the final results. The behaviour obtained tries to resemble as much as possible the real one but it may not be completely accurate. Additionally, the limitations found in the research process were related to its distribution, sample size and range of the questions asked. As it was explained before, the sample was obtained using a questionnaire and was distributed by social media and internet. This type of distribution may have affected the sample as participation relied in having access to internet and social media. Moreover, the primary goal for inferential statistics is to "draw conclusions from a sample and generalize them to the population" (Singh, 2018). Therefore, having a small sample may prevent the findings from being extrapolated (Faber and Fonseca, 2014). In this case 284 participants answered the survey and the sample size calculation using Survey Monkey revealed that in order to have a confidence level of 95% and a 5% of error the sample size should be 385. Thus, it would have been better to have a larger number of respondents. When talking about the questions asked, the range of options was pre-established as the questionnaire was thought to have mostly closed questions. This was chosen in order to have a greater participation but it lowered possible interpretation and spontaneity of the participants. It is also important to communicate that the study aimed to examine only the Spanish population. The cultural focus in Spain has to be taken into account for further studies as the extrapolation of this dissertation to other cultures or nationalities could not be the same.

Being aware of the research ethical considerations is essential if informed decisions want to be made ensuring the minimization of possible risks. Consequently, ethical considerations such as anonymity, use of consent forms, confidentiality and approach to sensitive issues have been addressed in this research. Firstly, anonymity was protected by not having record of the participant's names. Informed consent as well as confidentiality were treated at the beginning of the questionnaire by informing the participants what type of study was being carried out, that the data would only be used for this dissertation and that it would not be distributed to any third parties. Finally, culturally sensitive issues such as gender or age were asked. Nevertheless, as the questionnaire was anonymous, the records could not identify the person that answered. Besides, an ethical form was approved by my supervisor, Elena Luchinskaya and the programme director of BBA Hons in Lancaster University, Kostas Amiridis, following the ethical guidelines of the university.

3.2 Data Collection and Analysis

The next step to be followed after having collected the data is to clean it so as to avoid outliers and remove incorrect or incomplete data (Tableau, 2021). For instance, there were found in the dataset three irrelevant observations that were deleted because the study was not taking into account people under 18 years old. That left 281 observations for the study. After having cleaned the data, the variables that were used have to be fully explained. As mentioned in the research design, there are three types of variables: dependent, independent and other variables. Next, a summary of the outcome variables and their descriptions can be seen in Table 1**.**

Table 1. Dependent variables description summary.

	Variables	Description examples
Y_1	Alcohol	Beer, wine or distilled beverages
Y_2	Canned Food	-
Y_3	Cleaning Products	Hand sanitizer, gloves, bleach…
Y_4	Communication	Internet (Wi-Fi), telephony service, social media…
Y_5	Fashion	Clothes, footwear, accessories...
Y_6	Fresh Food	Fish, beef, vegetables…
Y_7	Frozen Food	-
Y_8	Online Entertainment	Netflix, HBO, Amazon prime, videogames…
Y_9	Personal Hygiene	Shampoo, body lotion, toothpaste, toilet paper…
Y_{10}	Wellbeing	Gym, psychologist, beauty salons…

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey, conducted in January.

The variables belong to the Spanish Consumer Goods Sector, but at the same time they can be divided into consumer staples and consumer discretionary, as it was previously explained in the literature review. The first type includes alcohol, canned food, cleaning products, communication, fresh food, frozen food and personal hygiene. The second type, consumer discretionary embedded fashion, online entretainment and wellbeing. Moreover, all the responding variables had the same range of options, -5% (a decrease in their consumption expense after the pandemic started), 0% (same consumption expense as before the pandemic started) and -5% (an increase in their consumption expense after the pandemic started). Altough the options were expressed with a percentage, the variables have a categorical component because there are only three options. Besides, the variable has a numerical component since -5% is less than 0% and, at the same time is less than 5%. The reason for these percentages or intervals was that Accenture's paper examined in the literature review (Wright and Blackburn, 2020) used the same percentages which allowed an easier the comparison between both studies. The limit of having this variable categorized is the stickiness to an explanatory analysis rather than being able to use it to predict as well. The choice of these variables was done considering other similar papers such as Accenture's (Wright and Blackburn, 2020), McKinsey's (Marcos *et al.,* 2021), Deloitte's (Zierlein *et al.,*2020), Swiss Re Institute's (Puttaiah *et al.,* 2020), S&P Global Ratings'(Shand, 2020) already mentioned in the literature review. Most of these papers had more categories in their studies but this dissertation wanted to analyse a few of those in order to provide more concrete results.

Table 2. Independent variables description summary.

	Variable	Type	Categories
X_1	Gender	Dummy	Men = 0 Women = 1
X_2	Generational cohort	Categorical	Z Generation Millennial X Generation Baby Boomer Silent Generation
X_3	Level of studies	Dummy	Non-university = 0 University = 1
X_4	Residence	Dummy	Rural = 0 Urban = 1
X_5	Monthly income	Categorical	From 0 to 999 € From 1000 to 1999 € From 2000 to 2999 € From 3000 €
X_6	Concern due to COVID-19	Categorical	1-Calm 2-Little worried 3-Worried 4-Very worried 5-Extremely worried

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The input variables chosen (see Table 2) are related to the participant's social characteristics of the survey. Firstly, gender is an independent, qualitative and dummy variable that measures if the person that is being asked in the survey is a man (coded as 0) or a woman (coded as 1), thus creating a differenciation in gender. It is a key variable because gender will be used to do the future projection to see which companies will be benefited. The second independent variable is the generational cohort. When the survey was created, the question was related to the age (in years) the participant had so the variable was numerical. However, when the first exploration was made, the benefits of having the answers grouped by generational cohort outnumbered the benefits of having it as quantitative. The variable generational cohort is categorical and ordinal as it conveys qualitative information (Everitt and Dunn, 2001). The main reason to do this was that within the same generation there were found similar characteristics in consumption patterns as it was explained in the literature review. The importance of doing this division relies in the need of retailers and marketers to monitor the changes in order to understand what changes in strategies they need to adopt depending on the generation (Eger *et al.*, 2021). This variable is also key because generational cohort will be used for the products future forecast. The next input variables are level of studies and residence. Both are qualitative and dummy variables as they have only two categories. Particularly, for level of studies the value 1 meant that the respondent had university studies and the value of 0 the lack of them. In the case of the residence variable, 1 meant to live in a city and 0 to live in a rural area. Furthermore, the participants were asked for their monthly income. The variable is composed of four categories: from 0 to 999 €, from 1,000 to 1,999 €, from 2,000 to 2,999 € and from 3,000 €. Hence, it is an independent, ordinal variable. The last explanatory variable is the level of concern due to COVID-19. This variable is similar to the monthly income variable because it is also ordinal as it has different levels that go from calmed to extremely worried, following an ascendant order.

Lastly, other variables were recorded in the questionnaire for the purpose of analysing other changes that could not be captured as product or services such as the total expense during the pandemic, the trend towards digital commerce or the possible permanence of all these changes. The description summary of these variables can be seen in Table 3. The first variable wanted to explore the total amount of expense during COVID-19 in order to see if there had been a change compared to 2019. The second and the third variables were used to identify the channel of purchase, in this case was to test if there had been an acceleration or increase of the online channel compared to 2019 (before the pandemic). The last variable wanted to check the permanency of the changes mentioned by the participants which will be really useful for the final forecasts.

Table 3. Other variables description summary.

Variable	Type	Categories
Total expense during COVID-19	Categorical	-5% 0% 5%
Online shopping before the pandemic	Dummy	No Yes
Increase online shopping	Categorical	I don't buy online No, I did the same online shopping Yes, a bit more than before the pandemic Yes, a lot more than before the pandemic
Permanent/transient changes	Categorical	No, I didn't notice any changes in my consumption No, I will go back to consumption habits I had before the pandemic Yes, I will maintain the changes provoked by COVID-19 Yes, I will even increase them

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

3.3 Significant variables for model evaluation

The second research objective (O2) of the dissertation was to develop a statistical model that shows how the individual characteristics influence the changes in consumption of different industries. The method that will be used for the evaluation of the significant variables is the multiple linear regression analysis. Firstly, it is multiple because the analysis will be done using $p>1$ explanatory variables (Helwig, 2017). Secondly, a linear regression analysis will take place because this procedure "estimates the coefficients of the linear equation, involving one or more independent variables" (Alexopoulos, 2010). The purpose of using this type of model is to "attempt to recognize any non-random pattern or structure requiring explanation" (Everitt and Dunn, 2001). The selection of the model was made considering the simplicity and the ability to provide a good answer to the main aims of the dissertation. In this dissertation the importance was to study the changes in consumer behaviour and not to choose which model would do that job in a more precise or better way. However, another explicative model that could have been used is the multinomial logistic regression. This type of model was not chosen because the dependent variable that was analysed had both, a numerical and a categorical component, so if the variable was considered only categorical, really valuable information would have been lost (Altman, 2006). For instance, the averages of the responses by category could not have been done using multinomial logistic regression.

The hypotheses thought to test the individual significance of the variables were:

$$H_0: \beta_i = 0 \qquad \forall\, i \in \{1, 2, 3 \dots, n\}$$

$$H_1: \beta_i \neq 0 \qquad \forall\, i \in \{1, 2, 3 \dots, n\}$$

If the null hypothesis (H_0) was true, this would indicate that the variable being analysed in that moment is not significant and that it does not influence in the dependent variable. Contrarily, if the alternative hypothesis (H_1) was true, that variable would be significant and it would explain the response variable. It is important to highlight that the model would only be used to see the individual significance of each variable and not the joint significance of the model as it will not be used to predict. An analogous study using the individual significance of the variables was done by Janssen *et al.*, (2021).

The generic LRM formula applied in this dissertation can be seen in below (Guajarati, 2019):

$$y_k = \beta_{1,k} + \beta_{2,k} \cdot x_1 + \dots + \beta_{i-1,k} \cdot x_{i-1} + u_{i,k} \qquad \mathrm{i} \in \{1, 2, 3 \dots, \mathrm{n}\}, \mathrm{k} \in \{1, 2, 3 \dots, \mathrm{m}\}$$

where

y_k is the set of *k* dependent variables.

x are the *i-1* independent variables, being *i* the vector of observations.

β_1 is the regression intercept.

β_i are the regression parameters or coefficients.

u is the disturbance term or random component.

All the variables explained in the previous section will now be incorporated to the complete model in order to see which ones are significant. After having checked this, the final model for each dependent variable can be determined. The model will be employed with the only purpose of analysing the parameters (betas). Particularly, what will be studied is the effect of the explanatory variables and how they influence, positively or negatively to the dependent variable. The following expression shows the complete model for any of the *k* dependent variables:

$$y_k = \beta_1 + \beta_2 \cdot Women + \beta_3 \cdot Z\ Generation + \beta_4 \cdot Millennial + \beta_5 \cdot X\ Generation + \beta_6 \cdot Baby\ Boomer + \beta_7 \cdot University + \beta_8 \cdot Urban + \beta_9 \cdot From\ 1000\ to\ 1999\ € + \beta_{10} \cdot From\ 2000\ to\ 2999\ € + \beta_{11} \cdot From\ 3000\ € + \beta_{12} \cdot little\ worried + \beta_{13} \cdot worried + \beta_{14} \cdot very\ worried + \beta_{15} \cdot extremely\ worried + u_{i,k}$$

The estimation method used in this dissertation for the multiple LRM model is the ordinary least squares, also known as OLS. According to Stanford Weisberg (2013) the OLS is the method "in which parameter estimates are chosen to minimize a quantity called the residual sum of squares".

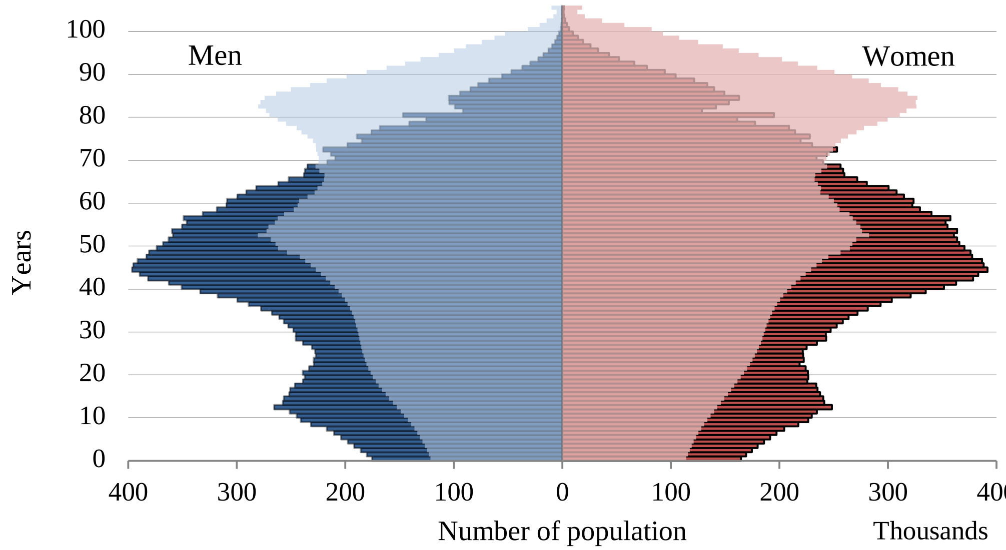
As it was explained previously, the dependent variables that showed a change in the consumption patterns were: cleaning products, communication, fashion, online entertainment and wellbeing. The next step that will be taken is to apply the dependent variables that had a change separately with all the independent variables into the linear regressions in order to estimate the parameters. This will let choose the input variables that are significant for each of the response variables. The study of the significant variables will be individual so the aggregate significance will not be covered in this dissertation. The screenshots from the initial model that had all the explanatory variables for each dependent variable can be found in Appendix 3.

In preparation for the modelling, the independent variables have to follow some rules in order to provide a correct analysis and estimation of parameters (Zurita *et al.,* 2019). These rules are applied depending on the nature of the variables, if they are numerical or categorical as it will be seen next. The first variable that was evaluated was gender. As mentioned previously, it is a dummy variable because it is composed of two categories men and women (man takes the value of 0 and woman takes the value of 1). Therefore, the interpretation for the parameter β_2 will be the differential effect (Zorita *et al*., 2019). Generational cohort is the second variable and it is categorical and ordinal so when it was incorporated to the model, one of the options was chosen as the base category and the rest was incorporated as if they were dummy variables (Zorita *et al.,* 2019). In this study, the base category chosen was Silent Generation so it was not included when the estimation took place. The interpretation is the same as in the dummy variables. The next explanatory variables are level of studies and residence which are also dummy variables. For this reason, a value of 0 was assigned to non-university studies (for level of studies) and rural (for residence) and a value of 1 was assigned for university studies (for level of studies) and urban (for residence). These variables are also interpreted using the differential effect. Monthly income is the fifth variable evaluated and as it has 4 levels that follow an order, it is categorical and ordinal. This variable reproduces the same steps as the generational cohort. The base category chosen was “From 0 to 999 €” and the rest were incorporated as dummies. Lastly, the level of concern due to COVID-19 sticks to the same rules of generational cohorts and monthly income, having as base category “Calm”. The results of these multiple regressions with the estimation of the coefficients will be showed in the findings sections as tables along with graphs in order to have a more complete perspective.

3.4 Forecasts

The final step in the methodology is to do forecasts that help analyse the future consumer behaviour and trends as stated in the third research objective (O3). The projection of the future expense evolution was developed in accordance with the previsions evolution of the Spanish population. The dataset used for this projection was taken from the Statistics National Institute of Spain, also known as INE (2020). In order to know the source and understand the methodology of these projections, the document of the methodology will be summarised. The Population Forecast constitutes a statistical simulation of the population evolution that would live in Spain in the next years. It also takes into account the associated demographic phenomena, in the event that the currently observed demographic trends and behaviours are maintained (INE, 2020). The calculus was done taking into consideration drivers such as fertility, mortality and external and internal migration. The importance of these projections relies in the relevant changes produced in the structure of the 2021 and 2070 population pyramids. Since there are evident differences in consumption by age group and gender, the consumption habits will also differ in time.

Figure 12. Spanish population projections in 2021 and 2070.



Source: own elaboration based on data from INE: projections of the Spanish population, 2021 & 2070.

**The pyramid at the back corresponds to the one for 2021 and the transparent coincides with the population of 2070.*

In Figure 12 it can be clearly observed the phenomena of a radical aging Spanish population. This process will have important implications in the consumer behaviour and the trends that will arise or accelerate in the long-term.

Figure 13. Relative distribution per year considering cohort and gender (men).

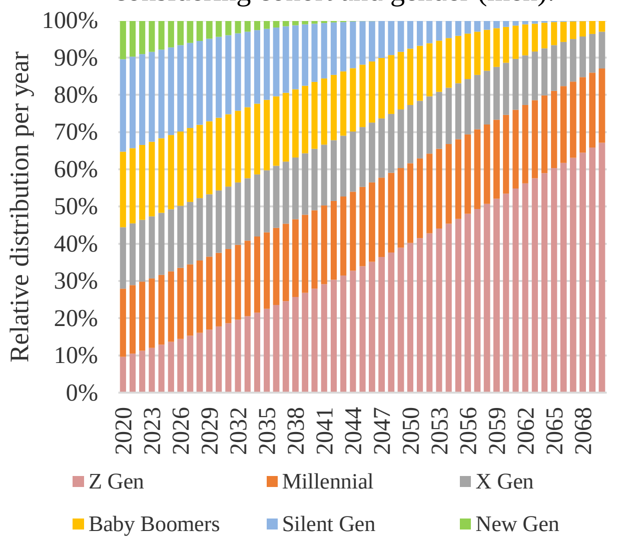
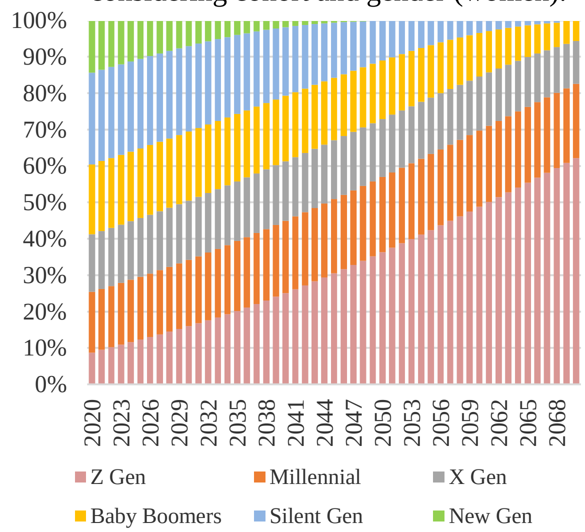


Figure 14. Relative distribution per year considering cohort and gender (women).



Source: own elaboration based on data from INE: projections of the Spanish population, 2021 & 2070.

The next step taken was to assign to each generation their corresponding birth year bearing in mind the generational cohorts explained in the literature review. Ageing was considered adding one year to each cohort based on the projections explained above. In Figures 13 and 14 it can be observed how the pink variable, that represents the new generation, starts increasing its presence over time. It is being assumed that all the new generations will act in the same way regarding their consumption patterns and that is why they are all grouped together in one cohort. Moreover, it is being assumed that the data from the survey does not vary over time nor takes into account other factors. These hypotheses are reasonable if the changes produced by the COVID-19 are permanent as the literature stated previously. Besides, given that the closest generation to the new one is Z Generation, it is also assumed that the consumption increases are the same as for that generation. Although both graphs are similar in their evolutions, some differences can be appreciated. The difference between both graphs comes from the longer life expectancy of women. This provokes that the women from older cohorts take longer to disappear.

After having analysed the evolution of the generational cohorts, an examination of the expense variations per cohort and gender taking into account the type of products/service from the survey, has to be done. The next step was to multiply the people from each cohort and gender by their expense variations. The following expression shows the calculation that was carried out to obtain the weighted average:

$$\Delta\bar{P}_{i,t} = \frac{\sum_{\forall\, x,g,t} N_{x,g,t} \times \Delta\bar{P}_{i,x,g,2020}}{\sum_{\forall\, x,g,t} N_{x,g,t}}$$

where

$\Delta\bar{P}_{i,t}$ is relative variation of product *i* in year *t*.

$N_{x,g,t}$ is number of people, being *x* generational cohort and *g* gender.

x is generational cohort.

g is gender, men and women.

t is year, from 2020 to 2070.

In the previous formula, the mean observed in 2020 corresponds to the one obtained in the survey and the values for the number of people were taken from INE (for more details about the methodology see "Proyecciones de la Población de España 2020-2070" in the reference section). The variables that will be represented graphically are the dependent variables that were studied previously and that had as significant independent variables gender, cohort or both. These two explanatory variables were chosen because the dataset that was used had gender and age as main variables.

During this chapter, the research design was explained talking about the questionnaire in depth, its limitations and ethical considerations. Moreover, the variables were described and the analysis was clarified by identifying the significant variables in order to accomplish the final model for each dependent variable. It was also mentioned some theory of the multiple linear models and the future forecasts methodology. In the next chapter, the findings obtained from the whole study will be showed and interpreted so as to address the main aims of the dissertation.

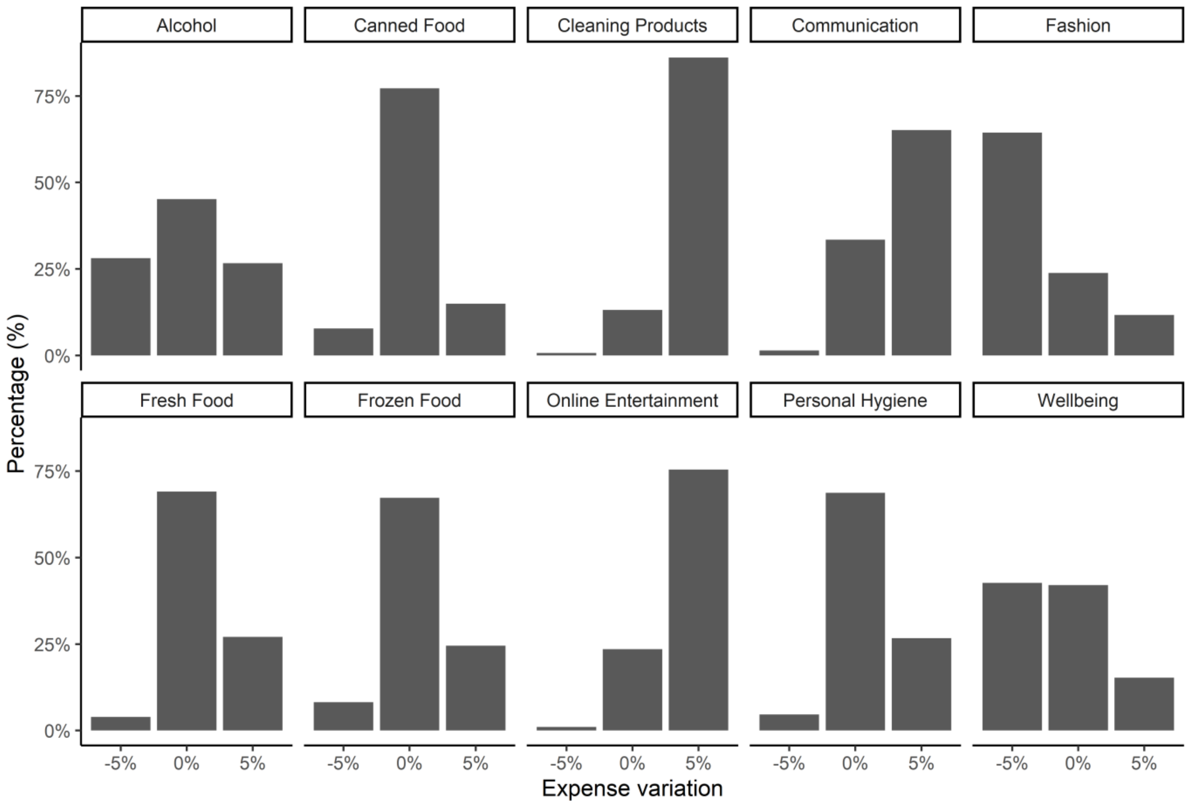
4. FINDINGS

In this chapter, there will be a presentation as well as an interpretation of the findings collected from all the research, the analysis of the final models and the forecasts. First, the univariable analysis distribution of the dependent and independent variables will be visualized. Second, the screenshots with the estimation of the parameters produced with the OLS method in the multiple regressions will be presented in tables. After that, the results of the significant independent variables for the industries that had a change in their consumption will be discussed by using graphs. These charts are entirely based on the answers from the Spanish COVID-19 Consumer Behavioural Survey. The findings will be divided into two parts that are closely related to the two aims (A1 and A2) of the whole research and a final comparison with the framework used. For the second aim (A2), the findings will be presented using a line plot as that type of graph is the correct one for evolutions in time (Vandemeulebroecke *et al.,* 2019).

4.1 Exploration of the shifts depending on consumer characteristics (A1)

The steps that this subsection will follow are: firstly, showing the results of the Exploratory Data Analysis carried out in this study, to later on, show the final models and the significant variables obtained, to finally achieve the results of how the consumer behaviour has changed depending on consumer characteristics. After having explained the preparation of the dataset in the methodology, an Exploratory Data Analysis, also known as EDA, needs to be done. Plotting the raw data obtained can ease the data's structure observation and ensure a better final approach. By doing EDA, "the more one knows about the data, the more effectively data can be used to develop, test, and refine theory" (Harting and Dearing, 1979). It is important to do this descriptive exploration because it will show the first findings; the industries (dependent variables) that had a change in consumption and the social characteristics distribution of the participants from the survey. The first variables analysed and interpreted will be the outcome variables.

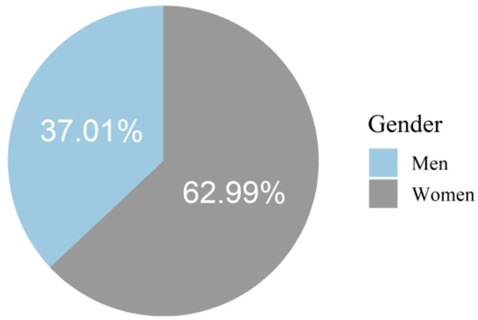
Figure 15. Dependent variables univariate analysis.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

As it can be observed in Figure 15, the dependent variables that had a significant change were: cleaning products, communication, fashion, online entertainment and wellbeing. The other response variables (alcohol, canned food, fresh food, frozen food and personal hygiene) were either constant or had a little change (less than 1% considering the weighted average) which can be observed in the responses of the questionnaire. Therefore, the response variables that will be studied in depth in this dissertation are the ones in which there was aprecciated a change in consumption. This election was made looking into the bar charts made for each category and choosing the categories that had a greater amount of people in -5% or 5% rather than in 0%. After knowing which dependent variables or industries had a change, the exploratory analysis for the independent variables can take place.

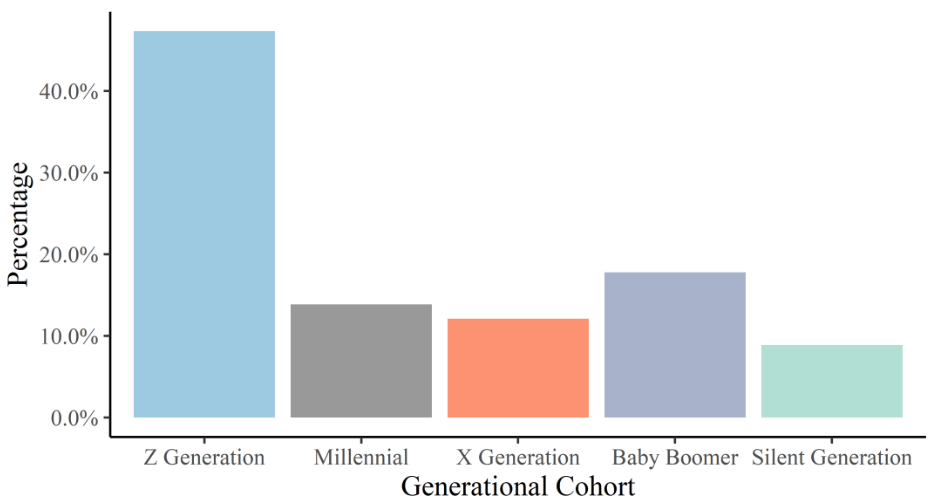
Figure 16. Individual distribution analysis for X_1 variable gender.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The first explanatory variable is gender, which is divided into men and women. In Figure 16 it can be observed the percentage of respondents that were men (37.01%) was less compared to women (62.99%).

Figure 17. Individual distribution analysis for X_2 variable generational cohort.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The second variable being plotted is generational cohort. In the histogram from Figure 17, the generational cohorts considered were the ones already mentioned in the literature review: Z Generation, Millennial, X Generation, Baby Boomer and Silent Generation. It can be observed that the data is not equally distributed among the different generations. As explained in the research design this could be due to the distribution of the questionnaire into social media platforms that are not as used by older generations as much as by younger ones.

Figure 18. Individual distribution analysis for X_3 variable level of studies.

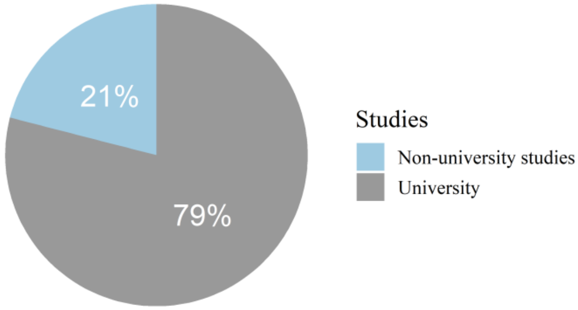
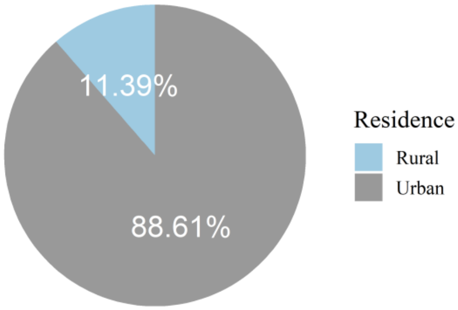


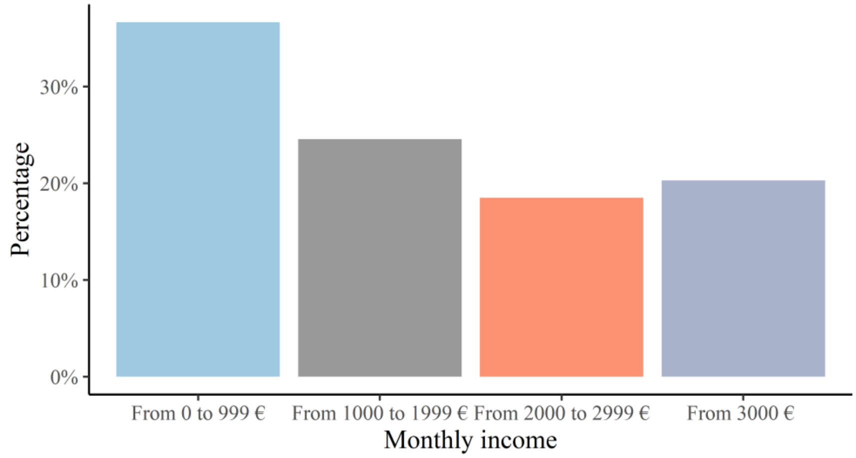
Figure 19. Individual distribution analysis for X_4 variable residence.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

Level of studies and residence will be analysed together since both are dummy variables. As observed in Figure 18, the individual distribution of the variable level of studies shows the predominance of the university participants (79%) over the non-university studies (21%). Regarding Figure 19, the difference between both groups is even greater than in Figure 18 as urban has an 88.61% of the participants while rural only has an 11.39%.

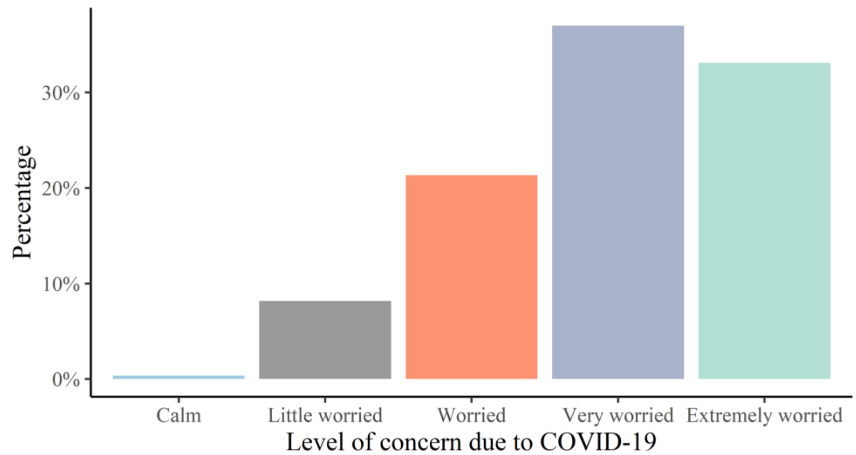
Figure 20. Individual distribution analysis for X_5 variable monthly income.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

Monthly income was also considered in the study. In Figure 20 the distribution shows an important concentration of participants (38%) that earn from 0 to 999 €, which is probably related with the amount of people from younger generations (Figure 17 and Figure 20 have a similar distribution). The rest of the levels are similarly distributed, being from 1,000 to 1,999 € the second level with most respondents (25%).

Figure 21. Individual distribution analysis for X_6 variable Level of concern due to COVID-19.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The next variable explored is level of concern due to COVID-19. Looking at Figure 21 it can clearly be seen the high concern of the Spanish population with regard to the virus since the responses were concentrated on the right side of the histogram, in the categories very worried and extremely worried (approximately a 70% of the participants).

After having done this exploration and knowing the social characteristics of the consumers that answered the survey, the findings for the multiple regression models will be shown using tables that have the estimations, and graphs that make it easier to visualize the results. These tables show the final models that used the OLS method for each dependent variable excluding the variables that were not relevant for the model. The levels of significance that were used in the following models correspond to 0.10 (10%), 0.05 (5%), or 0.01 (1%). In order to understand it better, "the 5% level of significance means that if the null hypothesis is true, it will not be rejected more than 5% of the time. If $\alpha = 1\%$, it means the null hypothesis will not be rejected more than 1% of the time" (Gujarati, 2019). An asterisk rating system will be used to determine the level of significance, being *** a 1%, ** a 5% and * a 10%.

Table 4: model 1 using OLS, using observations from 1-281
Dependent variable: Cleaning Products (Y_3)

	Coefficient	P-value	Significance level
Constant	0.0369844	6.27e-18	***
X_1 Woman	0.00795356	0.0005	***
X_6 University	0.00711779	0.0084	***
X_7 Urban	-0.00554439	0.1069	

R^2= 0.1673

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

It is vital to mention that the importance of the estimation for this study rests in the sign of the coefficient obtained and not in the quantity of that variation. The significant variables that appeared initially for cleaning products were gender, level of studies and residence. However, as shown in Table 4, the ones that were significant (being both significant at 1% level of significance) were gender and level of studies. Residence was close to being significant at a 10%.

Table 5: model 2 using OLS, using observations from 1-281
Dependent variable: Communication (Y_4)

	Coefficient	P-value	Significance level
Constant	0.0432687	2.98e-10	***
X_1 Woman	0.00799679	0.0095	***
X_2 Z Generation	-0.0211107	0.0006	***
X_3 Millennial	-0.0191339	0.0039	***
X_4 X Generation	-0.0122767	0.0647	*
X_5 Baby Boomer	-0.00730419	0.2273	
X_8 From 1,000 € to 1,999 €	0.00288427	0.5052	
X_9 From 2,000 € to 2,999 €	0.00118742	0.8099	
X_{10} 3,000 € or more	-0.00961620	0.0530	*

R^2= 0.2077

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

In Table 5, the final model for communication shows that the significant variables were: woman, Z Generation, Millennial, X Generation and 3,000€ or more, the first three having a level of significance of 1% and the last two of 10%.

Table 6: model 3 using OLS, using observations from 1-281
Dependent variable: Fashion (Y_5)

	Coefficient	P-value	Significance level
Constant	-0.0509973	11.02e-08	***
X_2 Z Generation	0.0308626	0.0002	***
X_3 Millennial	0.0147294	0.1011	
X_4 X Generation	0.0203175	0.0251	**
X_5 Baby Boomer	0.00272552	0.7411	
X_8 From 1,000 € to 1,999 €	0.00545856	0.3545	
X_9 From 2,000 € to 2,999 €	-0.000222117	0.9736	
X_{10} 3,000 € or more	0.0185795	0.0063	***

R^2= 0.2053

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

Table 6 shows the levels of significance for the fashion final model. The variables that have a high significance or, in other words, have a smaller p-value than a 0.01 are: Z Generation and 3,000 € or more. The next significant variable that is seen in the table is X Generation with a p-value of 0.0251 which is below the 5% level of significance.

Table 7: model 4 using OLS, using observations from 1-281
Dependent variable: Online Entertainment (Y_8)

	Coefficient	P-value	Significance level
Constant	-0.00301790	0.8952	
X_8 From 1,000 € to 1,999 €	-6.6571e-05	0.9850	
X_9 From 2,000 € to 2,999 €	0.00301790	0.4506	
X_{10} 3,000 € or more	-0.0111750	0.0038	***
X_{11} Little worried	0.037647	0.1059	
X_{12} Worried	0.0449477	0.0965	*
X_{13} Very worried	0.0449477	0.0503	*
X_{14} Extremely worried	0.0424116	0.0641	*

R^2= 0.1678

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

Here, in Table 7 the significant variables were 3,000 € or more, worried, very worried and extremely worried. The highest level of significance (1%) was achieved by the variable 3,000€ or more, followed by worried, very worried and extremely worried which had a level of significance of 10%.

Table 8: model 5 using OLS, using observations from 1-281
Dependent variable: Wellbeing (Y_{10})

	Coefficient	P-value	Significance level
Constant	-0.0280000	8.42e-05	***
X_2 Z Generation	0.0208571	0.0068	***
X_3 Millennial	0.0138974	0.1231	
X_4 X Generation	0.0132941	0.1514	
X_5 Baby Boomer	0.0050000	0.5611	

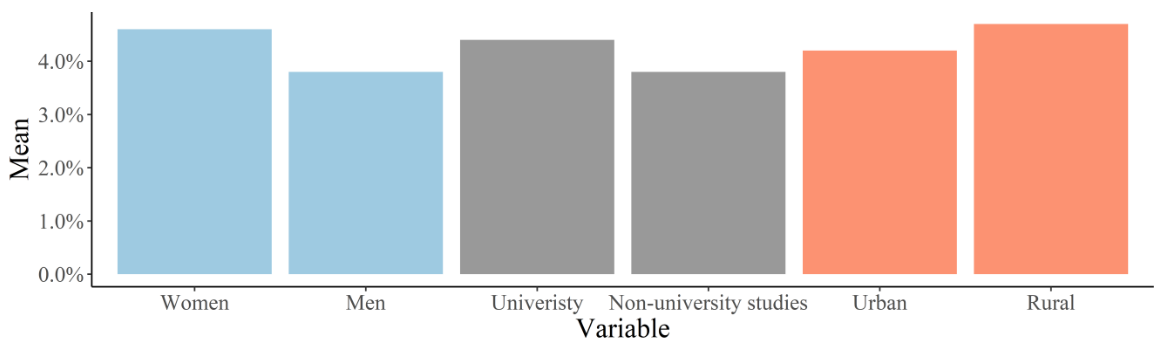
R^2= 0.1428

Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The last model in Table 8 shows that the only significant variable for wellbeing is Z Generation. The level of significance achieved was of a 1% which means that the null hypothesis would be rejected at that level.

The following graphs will show better the relationship of each of the dependent variables that had a change in relation to the social characteristics that were significant in the previous tables. The social characteristics will vary among the products or services and are grouped using different colours to distinguish between the variables. Knowing and understanding both, the products that will be more demanded and the characteristics of the people that would buy them is vital for future marketing campaigns and how to target customers.

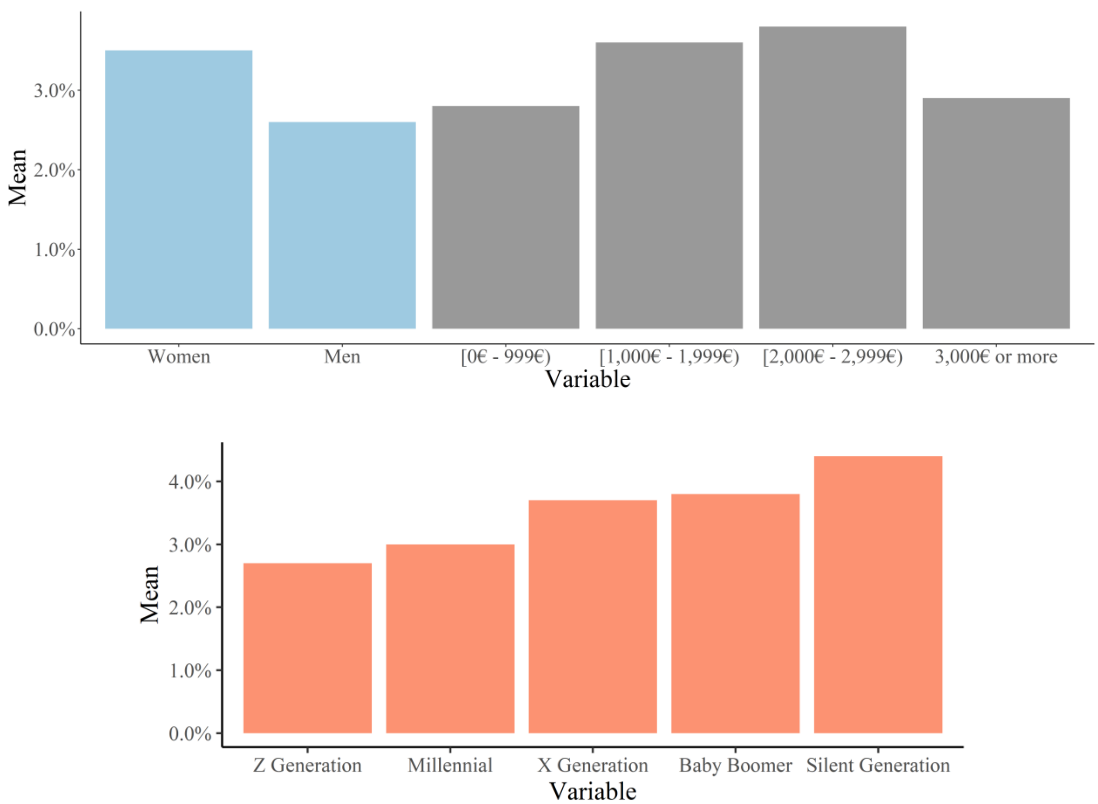
Figure 22. Average of the significant explanatory variables for cleaning products.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The interpretation of the findings obtained will make use of the Table 4 mentioned before, as well as the Figure 22. First of all, it is empirical that there has been a clear increase in the consumption of cleaning products provoked by the coronavirus. In Figure 22, the bar chart illustrates the averages (being 5% de maximum) of each significant independent variable for the cleaning products. Particularly, for the variable women, *ceteris paribus*, it can be said that women have increased their consumption in cleaning products more than men due to COVID-19. This difference was approximately of a 22% increase. In the same vein, *ceteris paribus*, people with university studies have increased their consumption in cleaning products more than people who did not go to university. The difference was approximately of a 20% increase. Then, cleaning companies could target a profile with a higher education level by doing an advertising campaign directed to them. Lastly, *ceteris paribus*, people that live in a city have decreased their expenses in relation to cleaning products more than people that live in a village. In this case, the increase was of a 16%. At first it does not seem really reasonable that people from a village have increased their consumption of this type of products as in cities there is more people and more contact among citizens. However, this independent variable may be influenced by the age. This argument is also backed up by Elelman as he explains that "the majority of residents in more than 400 Spanish villages are over 65 years old, and more than 300 localities have no one living there under the age of 20" (2019). This could also be related to the vulnerability older people have to the coronavirus and the consequent fear attached to it (Javadi *et al.*, 2020). Overall, the changes in the use of cleaning products were similar among the different categories of the explanatory variables. This means that targeting a future consumer depending on their characteristics may be difficult; however, this also implies that the increase was homogeneous in all these variables and there is no need to draw any distinctions between consumers.

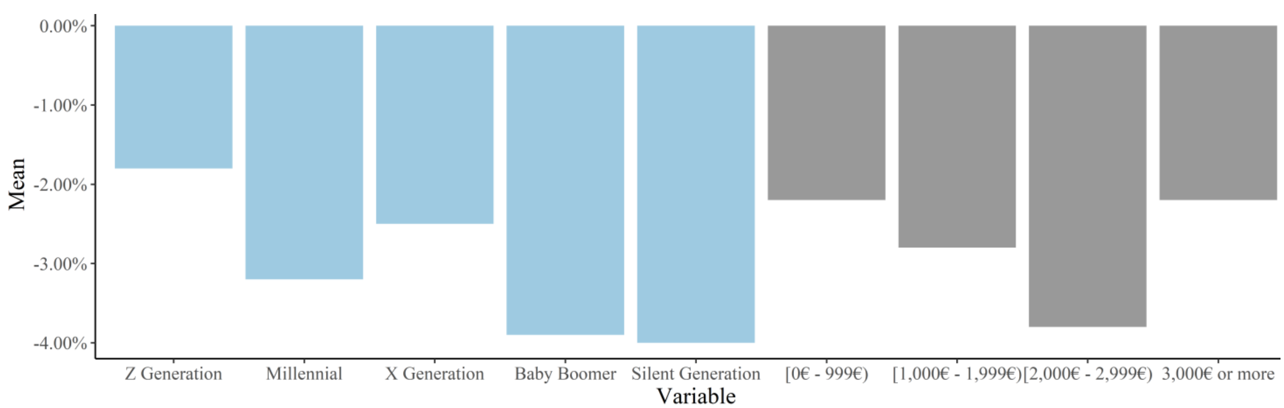
Figure 23. Average of the significant explanatory variables for communication.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The variable woman had a positive coefficient in Table 5 as well as a considerable rise in Figure 23 which meant that *ceteris paribus*, women have increased their consumption in communication more than men due to the pandemic. The variable monthly income shows a positive trend from [0 - 999€) to [2,000€ - 2,999€) until the drop in 3,000€ or more. The interpretation of this fall could be related to the free time people have and the occupations they have. It could happen that people with higher monthly income have a high-ranking in the organization they work for, resulting in more responsibilities and less free time which consequently leads to less use of the communication services and products such as social media or telephony services. Z Generation, Millennial and X Generation had a negative coefficient which, comparing it with the base category, Silent Generation, meant that *ceteris paribus*, these three generations have had increased less in communication products/services than the Silent Generation. Analysing in more detail the graph in Figure 23, there is a positive trend in the generational cohort variable since the older people are having a bigger communication expense due to COVID-19. The reason behind this affirmation is that older people were not used to interact with their families in social media (WhatsApp, Skype, Zoom...) and the measures such as the lockdowns isolated many older people that where living alone. After these measures were established, the elderly population had to look for new ways to contact with their families. Overall, the most radical change was produced in women in between the 53 to 82 years old with a mid-range monthly income. What has to be analysed now is the permanence of this change in order for the communication companies to target this type of consumers which will be shown in the second aim (A2).

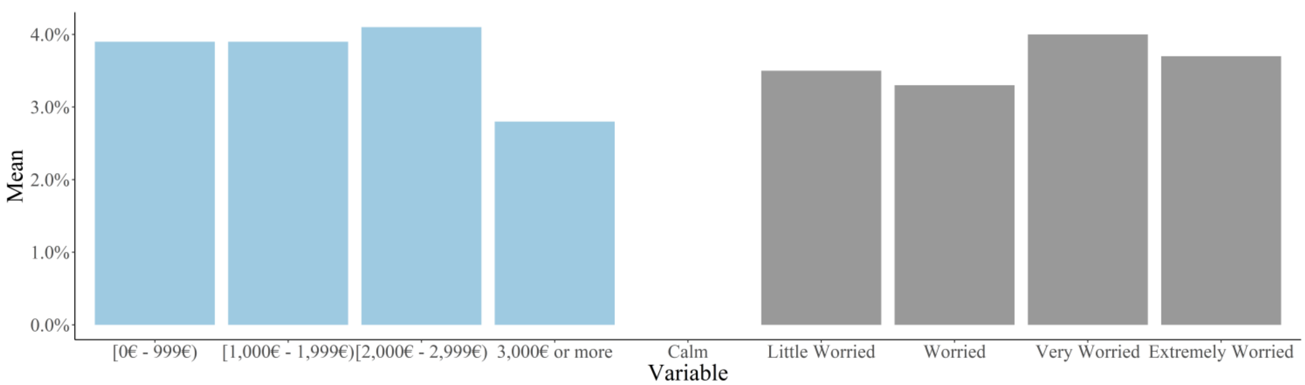
Figure 25. Average of the significant explanatory variables for online entertainment.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

Figure 24 shows the findings of the changes due to COVID-19 in the fashion industry. The significant variables found in the last section were generational cohort and monthly income and particularly, Z Generation and X Generation for the former one and 3,000 € or more for the latter variable. The most striking finding here is the clear and sharply decreases of the whole variable fashion due to the coronavirus. According to Achim Berg, senior partner of McKinsey (2021) this could be explained by a lesser consumption of clothing and footwear than what people was used to, because in many regions there are restrictions to buy it in physical stores. What is more, there are also a lack of opportunities and occasions to dress up. The overview is that people are not only consuming less but differently from the way people used to. Analysing this decrease in the significant variables, the generational cohorts seem to have a downwards trend from Z Generation to Silent Generation. Both Baby Boomer and Silent Generation are the ones with the biggest decrease in the fashion consumption industry which could be due to its consumer discretionary nature and the lack of importance older people give to clothes or what they wear. As the pandemic has provoked an economic crisis and these types of products are non-essential, consumers chose to spend their money in their daily necessities. Observing the other variable, monthly income, there can be seen a downward trend as well, however, for the people that earn more than 3,000€ it would be interesting to do a further analysis as the group seems to not follow the same pattern. All in all, it is certain that the fashion industry has seen diminished its consumption mostly in older people that have a monthly income around 2,000€ and 2,999€.

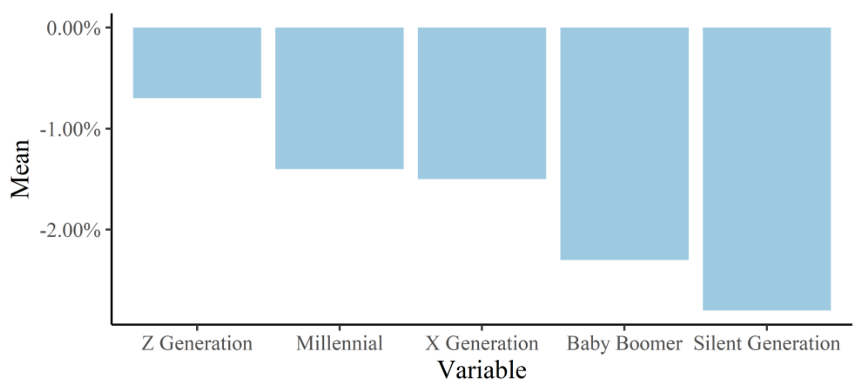
Figure 25. Average of the significant explanatory variables for online entertainment.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

Based on Table 7 and representing it in Figure 25, online entertainment has also had a considerable rise in the consumption expense due to the coronavirus. The monthly income and the concern due to COVID-19 were the significant explanatory variables for this category. Particularly in Table 7, the coefficient for 3,000€ or more was very significant (with a 1% level of significance) and was negative compared to the base category [0€ - 999€) which can also be seen in Figure 25. This indicates that, *ceteris paribus*, people with a monthly income over 3,000 € had a lower increase in online entertainment compared to people with a monthly income from 0 to 999€. Something similar happened in communication, where people with more purchasing power had a lower increase which may suggest that the drop could be related to the lack of free time that this party has. Moreover, communication and online entertainment are quite similar categories. Analysing the concern due to COVID-19, the first thing that catches the eye is the lack of people that are calmed in this situation, having an average of 0 because only 1 participant marked that option. People are worried about "their employment, spreading of the virus and economic and societal consequences" (Mertens *et al.*, 2020). Also in Table 7, the significant variables inside the fear to the coronavirus were: worried, very worried and extremely worried. This could be interpreted as the people that are worried have increased their consumption in online entertainment from those that are calmed. The reason of this increase could be that, the people that are more worried, stay more in their homes and watch films, series or other online entertainment instead of hanging out with friends or going to the cinema for example.

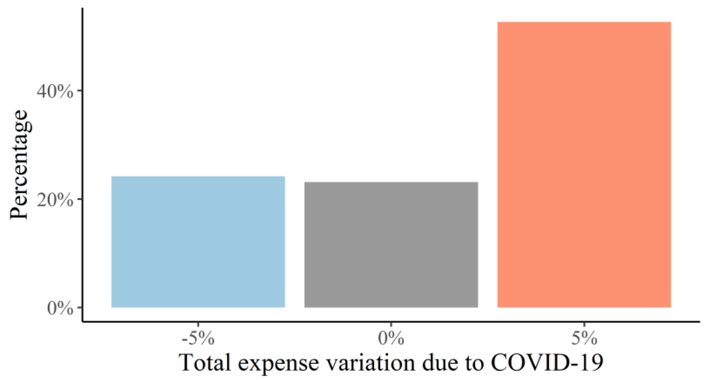
Figure 26. Average of the significant explanatory variables for wellbeing.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The last category that will be analysed is wellbeing. The only significant variable found for wellbeing was generational cohort. In Table 8 the most significant generation was Z Generation with a level of significance of 1%. The pattern that this variable shows is clear as it demonstrates that the older people get, the less money they spend in wellbeing products or services such as fitness/gyms or psychologists. In Figure 26 it can be seen a clear behaviour of less consumption as the age increases. This could be explained by the laziness of older people to go to the gym and the less care of their physique. Furthermore, this could be related to the fear older people have of hospital morbidity and mortality because of COVID-19. This argument was also raised by Said *et al.* (2020) in which it was explained that "one of the possible impacts of social distancing restrictions on older people is a reduction in physical activity. There was a reduction in physical activity because of reduced participation in community activities such as shopping, socializing, attendance at exercise classes, gyms..."

Figure 27. Individual distribution analysis for total expense variation due to COVID-19.

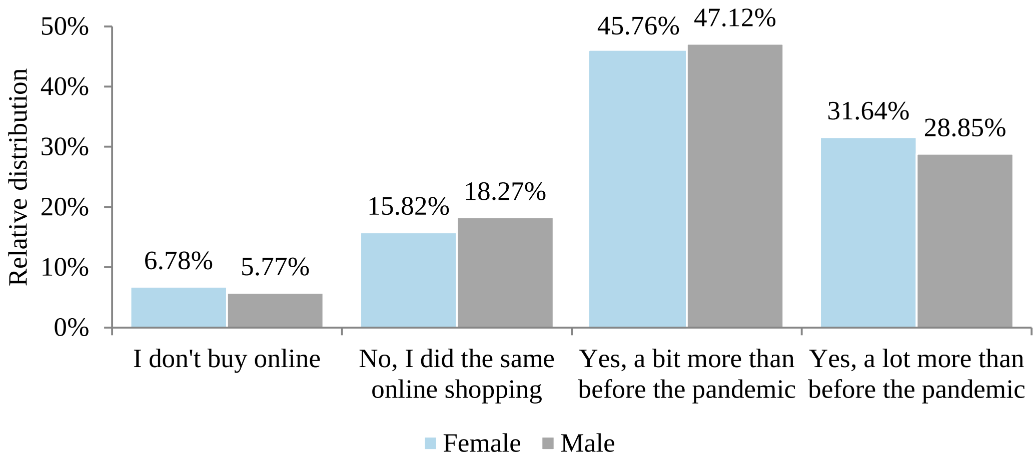


Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

The results for the total expense variation among all the categories can be clearly observed in Figure 27. A 52.67% of the survey participants stated that in general they increased their expenses, comparing it with a 24.20% that decreased their expenses and a 23.13% that maintained their overheads.

Another behaviour taken out from the survey is related to the way in which consumers will buy in the future. It was already seen that customers were changing their preferences from buying in-person to buying from online platforms. The survey conducted by McKinsey (Marcos *et al.*, 2021) showed the drastic movement towards the online channel during the pandemic which accelerated 3 years the adoption of the e-commerce in Europe. For more information, in Appendix 4 it can be seen a graph made by McKinsey with the average share of customer interactions that are digital globally, in Asia-Pacific, Europe and North America. As this speedup is an important issue for companies, it was also asked in the survey of this dissertation. First, it is essential to mention that 93.59% of customers in the survey said they have already used online platforms to buy. From those people, approximately a 77% said they increased their online shopping during the pandemic (taking into account the third and fourth category in Figure 28). In Figure 28 it can be observed this change but in relation to the gender. As there is not a big change depending on the gender of the consumer it can be concluded that there are no differences in relation to online platforms by gender and that it affects globally to both.

Figure 28. Increase in online shopping during the pandemic.



Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

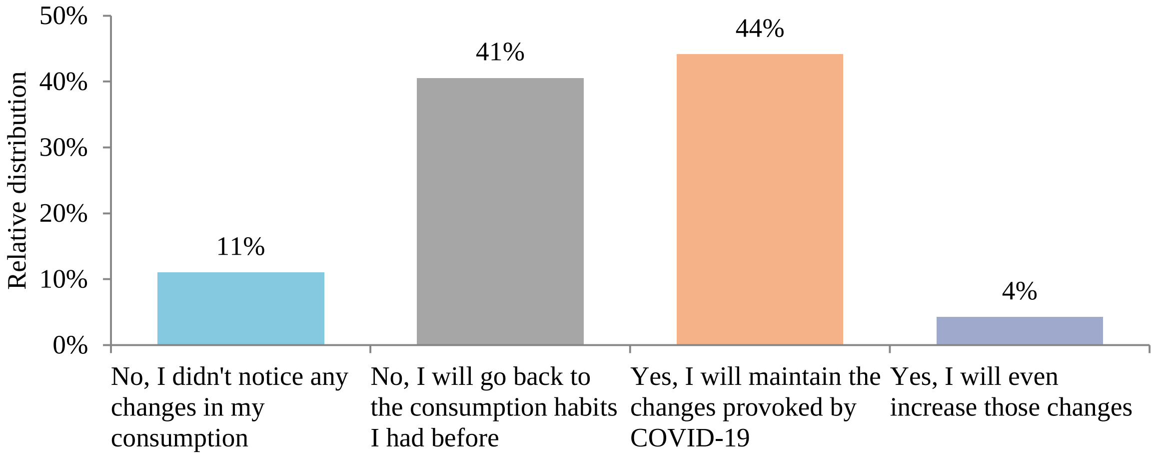
This result demonstrates the acceleration of this trend. What should be asked now is the permanence of this movement in the future. The proposition that Deloitte's (Zierlin *et al.*, 2020) sustains is that this switch to online channels is expected to continue even after the stores reopen.

4.2 Permanency of the changes and forecasts (A2)

Now, the findings for the products that not only showed a change in their consumption but also had gender, generational cohort or both as significant variables will be plotted to see their evolutions from 2020 to 2070. Thus, the forecast being done in this dissertation will be projected in the short, mid and long-term. The categories analysed are: cleaning products, communication, fashion and wellbeing.

However, before going into the evolution of the products over time, the permanency of the changes has to be discussed. As mentioned in the literature review, the vast majority of the studies (Zierlin *et al.*, 2020; Marcos *et al.*, 2021; Puttaiah *et al.*, 2020; Wright and Blackburn, 2020) stated that the changes provoked by the COVID-19 would be permanent and not transient, which implies that all the shifts mentioned in this dissertation should be taken into account and do a further investigation for future prospects.

Figure 29. Relative distribution of the changes permanency.

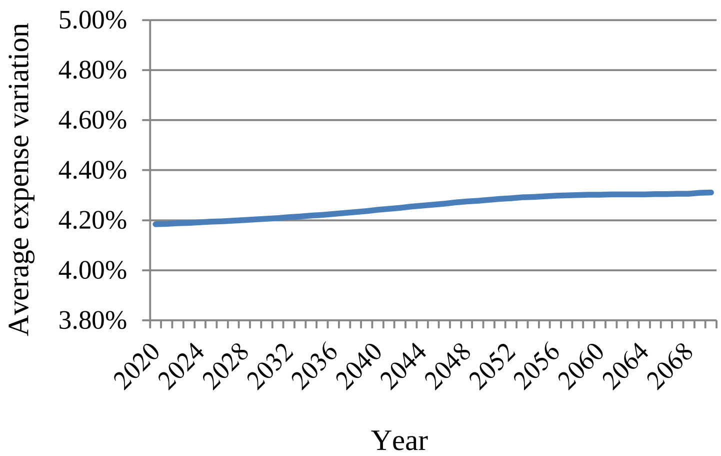


Source: own elaboration based on Spanish COVID-19 Consumer Behavioural Survey.

In Figure 29, the answers of the survey can be visualised in a bar chart. First, the option that affirms they did not notice any changes in their consumption does not count in what is trying to be studied here. Comparing the second option (41%) against the third and fourth options (48% in total) from the left to the right, it can be clearly observed that the changes in people's consumption will be either maintained or increased in the future which demonstrates what was already confirmed in the papers mentioned previously. This finding is one of the most important ones because it entails a whole restructuration of the Spanish Consumer Goods Sector and a new analysis of the consumers in order to capture well the future demand.

Next, the forecasts for the categories are shown in order to see the future evolution of the demand so as to be able for companies to respond and adapt quickly to it. The vertical axis illustrates the average expense variation in percentages and the horizontal axis represents the years from 2020 to 2070.

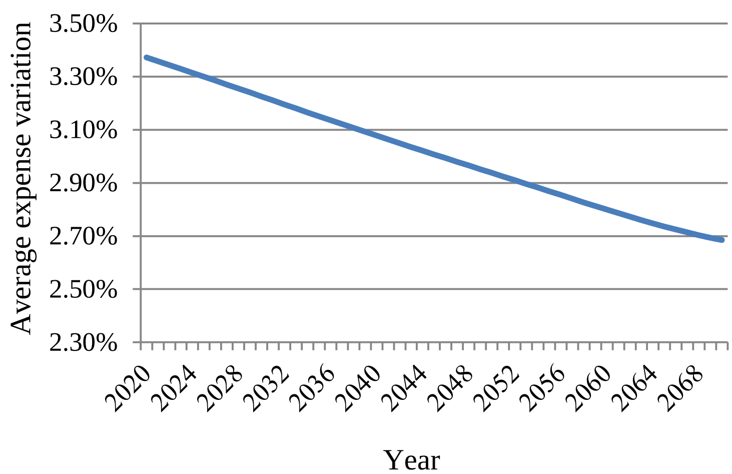
Figure 30. Cleaning products long-term forecast.



Source: own elaboration based on data from INE: projections of the Spanish population, 2021 & 2070.

In Figure 30 it can be observed a slightly positive trend of cleaning products over the years. During the pandemic there was a huge increase of a 4% in the expense variation of cleaning products. However, later on, the average expense goes from 4.18% to 4.31% having a rise of 0.13% in average. This minimal growth demonstrates that the consumption patterns will be mostly stable during the long-term. Other external factors that can happen, for instance another pandemic, could trigger the consumption of cleaning products again which is not being considered in the forecast.

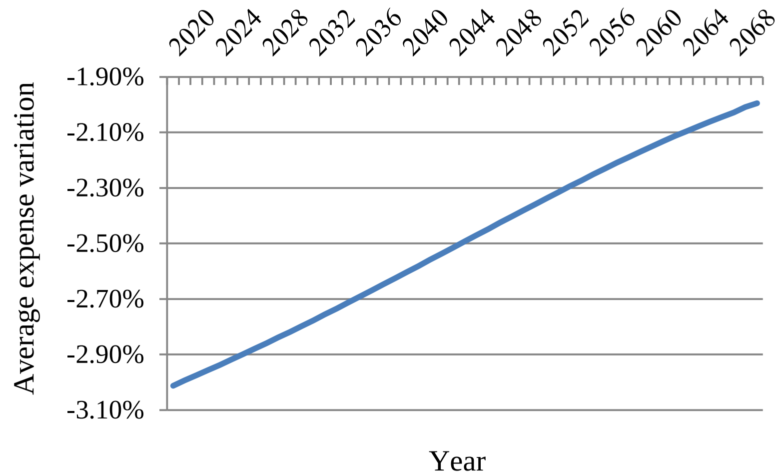
Figure 31. Communication long-term forecast.



Source: own elaboration based on data from INE: projections of the Spanish population, 2021 & 2070.

For the communication forecast shown in Figure 31, there is a sharp solid line going downwards that starts in 3.37% for the 2020 and finishes in 2.68% for the 2070. This shows a total average decrease of 0.69%. This decrease is due to the disappearance of the older groups, Silent Generation and Baby Boomers, which were the ones that increased most their communication expense during the pandemic.

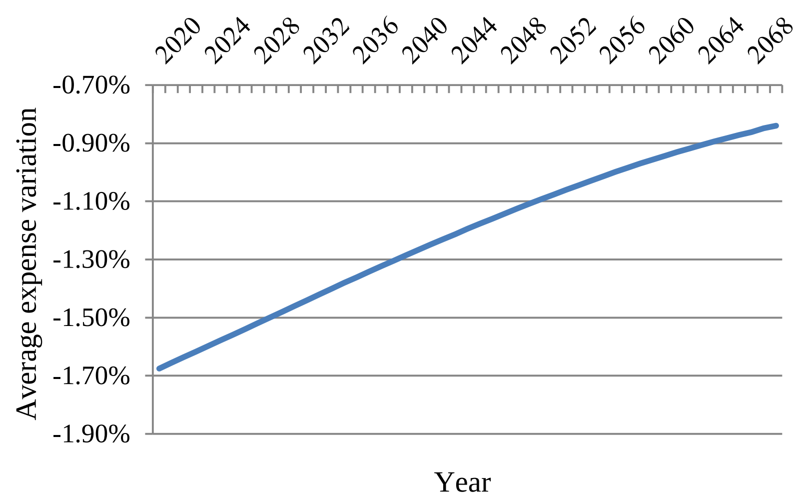
Figure 32. Fashion long-term forecast.



Source: own elaboration based on data from INE: projections of the Spanish population, 2021 & 2070.

The fashion industry however, seems to recover from the losses that happened during the pandemic, which can be seen in Figure 32. The evolution starts from -3.01% to escalate to -2.01%, having a total change of 1%. It is important to notice that the average expense variation is still negative but increasing. The change is related to what was mentioned before, the disappearance of the older generational cohorts that had an important decrease in fashion products compared with the pre-COVID-19 situation.

Figure 33. Wellbeing long-term forecast.



Source: own elaboration based on data from INE: projections of the Spanish population, 2021 & 2070.

Lastly, the wellbeing long-term forecast in Figure 33 shows a similar increase as the one in the fashion industry. It goes from -1.67% to -0.85% which is a total increase of 0.82%. In this case it can be seen a recover over time. Nonetheless, in this particular case, this recover could be better if people retuned to the previous habits in terms of wellbeing, for example many people would want to return to the gyms.

4.3 Comparison of the findings with Accenture's framework

This subsection does a comparison between the findings from the main framework used, Accenture's study and the findings from this dissertation. The other studies and papers reviewed in the literature review will not be compared as they do not have the same exact categories and scope and a direct comparison could not be made.

In the survey done for this research, the industries that changed more significantly were: cleaning products, communication, online entertainment, fashion and wellbeing. However, in Accenture's study (Wright and Blackburn, 2020) and this dissertation the categories do not coincide in all the cases. Some industries show the same pattern of consumption change, for instance, cleaning products, online entertainment, communication and fashion. Interestingly, wellbeing shows the opposite pattern since it diminishes in the study carried out for this dissertation and in Accenture's study it increases. This may be due to the differences in cultures, as the Accenture's study is focused in 15 markets around the globe and the one for this dissertation was only centred in Spain. Additionally, there are several industries that in this analysis do not exhibit any big consumption variations whereas the same industries do show changes in Accenture's study. For the framework paper, the industries tinned food, frozen food and personal hygiene increase, while alcohol diminishes.

Another difference between the studies is that the independent variables that were used. For Accenture, the variables were grouped doing consumers segmentation using gender, age and fear. Although this dissertation did not divide consumers into groups, it used more explanatory variables (monthly income, residence and studies) and the age was processed in generational cohorts. Besides, there were other differences found in both papers. In Accenture's study, as it was mentioned before, one of the fundamental changes occurs in the cleaning products industry. Accenture establishes that the group composed by men between 59 and 69 years old and that are worried, also known as "The Worrier", for the virus are the ones that increase more their consumption inside this industry. Meanwhile, the analysis produced in this dissertation demonstrates that the consumers that increased more their purchases in this category during the pandemic were the ones belonging to the women, university and rural groups. For the communications industry, Wright and Blackburn's study also determine that the same group described before, "The Worrier", is the one that has a greater increase. By contrast, this dissertation affirms that the groups of women, that have in between 2,000 and 2,999 € as monthly income and that belong to the silent generation are the ones that raised their expenses in communication. Next, the fashion industry was marked by "The Activist" group composed by 25 to 31 years old females according to Accenture. In comparison with the studied being carried out, the decrease was produced by Baby Boomers and Silent Generation consumers and the group that has in between 2,000 and 2,999 €. Online entertainment demonstrated to also have "The Worrier" as the ones that had a larger increase in purchases. Referring again to the dissertation, the consumers par excellence were the groups with 2,000 and 2,999 € and that were very worried for the pandemic. Lastly, wellbeing decrease was provoked by the older generations such as the Silent Generation for this dissertation. However, Accenture reported an increase made by "The Worrier".

One of the most important findings in which both studies agree is that there has been an increment in online shopping due to COVID-19. According to Wright and Blackburn "Digital commerce has also seen a boost as new consumers migrate online for grocery shopping". Finally, Accenture does not forecast the future demand but they affirm that it is likely that online shopping is sustained in the future.

5. CONCLUSION AND FURTHER RESEARCH

The intention of this section is to draw the interpretation of the findings that were obtained in this study so as to do a summary of what was achieved, future implications in the professional practice, the contribution of this study to the area of knowledge, recommendations and an identification of possible areas for further research.

5.1 Implications and contribution to knowledge

The change in the consumer behaviour patterns provoked by COVID-19 was something evident, as all the studies that were evaluated in the literature review had enough proof to affirm that. However, the focus of this dissertation was not only in the changes that occurred in Spain but also in the relation of those changes with the social characteristics of the consumers (A1). Besides, this dissertation explained the industries than won during the pandemic as well as the ones that struggled in Spain (A2). The conduction of a survey (O1), the execution of various multiple linear regressions (O2) and forecasts carried out in the long-term (O3) were the objectives met that helped to achieve those aims.

The research findings showed that industries such as cleaning products, communication and online entertainment had an increase in their consumption, whereas fashion and wellbeing had a decrease. Moreover, the industries that remained constant were alcohol, canned food, fresh food, frozen food and personal hygiene. Interestingly, the regression analyses accomplished showed that generational cohort and gender were the most significant variables for the industries analysed. Apart from the changes in the products and services, the way they were bought was also regarded. The results were conclusive as a 77% said that they increased online purchases. Therefore, the consumer behaviour in Spain was marked by a strong digital presence, a greater conscientiousness for the disinfection and hygiene, a shift to online entertainment at home, a substantial increase in the use of communication platforms in older ages, less interest in clothes and footwear and a decrease in self-care.

The permanency of the shifts was one of the most important topics as being able to know if the changes will be maintained over time, would shape the future of many businesses. The results of the survey showed that the changes would be permanent and not transient which lead the way to the following finding. With these results and considering the projections of the Spanish demographic evolution, there were found the industries that presented the best and worst future perspectives in the mid and long term. Cleaning products demonstrated that there will be a slightly increase with a high level of demand in the long run, whereas for communication, the evolution seems to be negative and tough. For the fashion and wellbeing industries the results showed a similar outcome, having both a slow increase that seems to try to recover from all the loses provoked by the COVID-19 crisis. Thus, it was conclusive that the winner industry is and will be cleaning products. Additionally, the improvement of the fashion and wellbeing industries led to a slight recovery. However, these industries will somehow struggle to recover the pre-pandemic levels. This can be achieved if they know how to adapt their marketing campaigns to the new consumer behaviour found.

There are implications to the professional practice taken from the findings gathered. For instance, by knowing the products that will win the battle against COVID-19 and the characteristics of the consumers that made those changes in their purchasing behaviour, businesses can improve their marketing campaigns or strategies towards the new behaviour. Moreover, another implication emerges when launching new products. Being able to know the target audience allows having a better acceptance among consumers.

This dissertation contributed to the area of knowledge for consumer behaviour firstly, by producing a quantitative approach that was only based on Spain. Secondly, it recognized the new trends that arose due to COVID-19 in Spain. It also extended the forecast previously done by other papers, to mid and long-term projection based on the demographic characteristics of the Spanish population. Finally, it identified the consumer type that has provoked the changes in consumption for Spain.

5.2 Recommendations and potential areas for further research

Furthermore, some recommendations that could be taken into account for the future are: enlarging the sample size, doing the same study in another context or country and repeating the survey in different times in order to check possible variations. With a larger sample, the accuracy would be better and additionally prediction could be done. By doing this, other different prediction techniques could be applied. Hence, a more analytical research could be done with the purpose of checking which type of model could predict better the consumer behaviour. Models such as decision forest regressions, neural network regressions or boosted decision tree regressions could be tested in relation to the results in consumer behaviour.

Another potential area of research is to do consumer segmentation groups because that would help to see similar patterns within those groups and ease marketing efforts. This could be achieved by doing clustering (a classification technique) with the explanatory variables that were suggested in this research regarding the consumption shifts as it was done in some studies mentioned in the literature review (Rogers and Cosgrove, 2020;Wright and Blackburn, 2020; Zierlin *et al*., 2020).

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7. APPENDIX

APPENDIX I. Questionnaire used for sample collection translated from Spanish to English.

Spanish COVID-19 Consumer Behavioural Survey

This questionnaire is completely anonymous and it will be used with the only purpose of the accomplishment of this dissertation. Please answer all the questions.

SECTION 1: General variables (independent variables)

1. Gender (man or woman).
2. Age (write your age in numbers).
3. Level of studies (university education or non-university studies).
4. Place of residence (rural or urban).
5. Monthly income (from 0 to 999 €; from 1000€ to 1999€; from 2000€ to 2999€ or more than 3000€).
6. Level of anxiety provoked by the COVID-19 (from 1 to 5, 1 being the least concerned and 5 being really concerned).

SECTION 2: Variation in the expenses (€) of the following products in relation to the pre-COVID-19 situation.

7. **Personal hygiene** (e.g. shampoo, moisturizer, toothpaste…).
   OPTIONS: less (-5%); the same (0%); more (5%).

8. **Cleaning products** (e.g. hand sanitizer, gloves, bleach…).
   OPTIONS: less (-5%); the same (0%); more (5%).

9. **Tinned food.**
   OPTIONS: less (-5%); the same (0%); more (5%).

10. **Fresh food** (e.g. fish, meat, vegetables…).
    OPTIONS: less (-5%); the same (0%); more (5%).

11. **Frozen food.**
    OPTIONS: less (-5%); the same (0%); more (5%).

12. **Online entertainment** (e.g. Netflix, HBO, Amazon prime, videogames…).
    OPTIONS: less (-5%); the same (0%); more (5%).

13. **Communication** (e.g. phone service, internet…).
    OPTIONS: less (-5%); the same (0%); more (5%).

14. **Wellness** (e.g. gym, beauty salons, psychologist…).
    OPTIONS: less (-5%); the same (0%); more (5%).

15. **Alcohol** (beer, wine or distilled spirits).
    OPTIONS: less (-5%); the same (0%); more (5%).

16. **Fashion.**
    OPTIONS: less (-5%); the same (0%); more (5%).

SECTION 3: Other questions.

17. In total, how much money have you spent in your shopping basket during the pandemic?
    OPTIONS: less (-5%); the same (0%); more (5%).

18. Have you done online shopping before?
    OPTIONS: yes; no.

19. Have you increased your online shopping during the pandemic? (Only answer if the previous question was affirmative).
    OPTIONS: no, I have stood the same; yes, a bit more than before the COVID-19; yes, a lot more than before the COVID-19

20. Do you think the changes in your consumer habits are going to be prolonged when the pandemic finishes?

OPTIONS: no, I have not noticed any changes in my consumption; no, I will go back to the previous habits I had; yes, I will maintain the changes provoked by the COVID-19; yes, I will even increase them.

APPENDIX II. Code for all the graphs in R.

```
#####################
# Dependent variables #
#####################
datos <- read.csv(file="R_var_depen.csv", sep=";", dec = ",", header = T)

tiff('Figure 1.tiff', height = 5.44, width = 8, units = 'in',compression = "lzw", res = 600)

ggplot(datos, aes(x = var_x, y = Perce)) +
  geom_bar(stat = 'identity') +
  facet_wrap(~Type, ncol = 5) +
  ylab("Percentage (%)") + xlab("Expense variation") +
  theme_classic() +
  scale_y_continuous(labels = scales::percent)

dev.off()

#####################
# Independent variables#
#####################
datos_2 <- read.csv(file="R_var_indep.csv", sep=";", dec = ",", header = T)

#X1 GENDER
datos_2_gen <- datos_2 %>%
  filter(Type == 'Gender')

datos_2_gen$var_x <- as.factor(datos_2_gen$var_x)
colnames(datos_2_gen) <- c("Type", "Number", "Gender", "Perce")

tiff('Figure 2.tiff', height = 3, width = 5.5, units = 'in',compression = "lzw", res = 600)
```

```
ggplot(datos_2_gen, aes(x = "", y = Perce, fill = Gender)) +
  geom_bar(width = 1, stat = "identity") +
  scale_fill_manual(values = c("#9ecae1", "#999999")) +
  coord_polar(theta = "y", start = 0) +
  geom_text(aes(y = Perce, label = paste0(round(Perce*100,2),"%")),
            position = position_stack(vjust = 0.5), family="Times", size=6 ,color = "white") +
  theme_void(base_size = 10) +
  theme(text = element_text(family="Times New Roman", size = 14))

dev.off()

 #X2 COHORT
 datos_2_coh <- datos_2 %>%
   filter(Type == 'Cohort')

 tiff('Figure 3.tiff', height = 3, width = 5.5, units = 'in', compression = "lzw", res = 600)

 datos_2_coh$var_x <- factor(datos_2_coh$var_x,
                        ordered = T, levels = c("Z Generation", "Millennial",
                                                "X Generation", "Baby Boomer", "Silent Generation"))

  ggplot(datos_2_coh, aes(x = var_x, y = Perce, fill=var_x)) +
   geom_bar(stat = 'identity', fill= c("#9ecae1","#999999","#fc9272","#8491B4B2","#91D1C2B2"))+
   ylab("Percentage") + xlab("Generational Cohort") +
   theme_classic() +
   scale_y_continuous(labels = scales::percent) +
   theme(legend.position = "none", text = element_text(family="Times New Roman", size=12))

dev.off()

#X3 STUDIES
 datos_2_stud <- datos_2 %>%
   filter(Type == 'Studies')
```

```
datos_2_stud$var_x <- as.factor(datos_2_stud$var_x)
colnames(datos_2_stud) <- c("Type", "Number", "Studies", "Perce")

tiff('Figure 4.tiff', height = 3, width = 5.5, units = 'in',compression = "lzw", res = 600)

ggplot(datos_2_stud, aes(x = "", y = Perce, fill = Studies)) +
  geom_bar(width = 1, stat = "identity") +
  scale_fill_manual(values = c("#9ecae1", "#999999")) +
  coord_polar(theta = "y", start = 0) +
  geom_text(aes(y = Perce, label = paste0(round(Perce*100,2),"%")),
            position = position_stack(vjust = 0.5), family="Times", size=6 ,color = "white") +
  theme_void(base_size = 10) +
  theme(text = element_text(family="Times New Roman", size = 14))

dev.off()

#X4 RESIDENCE
datos_2_resi <- datos_2 %>%
  filter(Type == 'Residence')

datos_2_resi$var_x <- as.factor(datos_2_resi$var_x)
colnames(datos_2_resi) <- c("Type", "Number", "Residence", "Perce")

tiff('Figure 5.tiff', height = 3, width = 5.5, units = 'in',compression = "lzw", res = 600)

ggplot(datos_2_resi, aes(x = "", y = Perce, fill = Residence)) +
  geom_bar(width = 1, stat = "identity") +
  scale_fill_manual(values = c("#9ecae1", "#999999")) +
  coord_polar(theta = "y", start = 0) +
  geom_text(aes(y = Perce, label = paste0(round(Perce*100,2),"%")),
            position = position_stack(vjust = 0.5), family="Times", size=6 ,color = "white") +
  theme_void(base_size = 10)+
  theme(text = element_text(family="Times New Roman", size = 14))

dev.off()
```

```
#X5 INCOME
datos_2_inc <- datos_2 %>%
  filter(Type == 'Monthly income')

tiff('Figure 6.tiff', height = 3, width = 5.5, units = 'in',compression = "lzw", res = 600)

ggplot(datos_2_inc, aes(x = var_x, y = Perce, fill= var_x)) +
  geom_bar(stat = 'identity', fill= c("#9ecae1","#999999","#fc9272","#8491B4B2")) +
  ylab("Percentage") + xlab("Monthly income") +
  theme_classic() +
  scale_y_continuous(labels = scales::percent)+
  theme(legend.position = "none",  text = element_text(family="Times New Roman", size=12))

dev.off()

#X6 COVID-19 CONCERN
datos_2_covid <- datos_2 %>%
  filter(Type == 'COVID-19 concern')

datos_2_covid$var_x <- factor(datos_2_covid$var_x,
                        ordered = T, levels = c("Calm", "Little worried", "Worried",
                                         "Very worried", "Extremely worried"))

tiff('Figure 7.tiff', height = 3, width = 5.5, units = 'in',compression = "lzw", res = 600)

ggplot(datos_2_covid, aes(x = var_x, y = Perce, fill = var_x)) +
  geom_bar(stat = 'identity',fill= c("#9ecae1","#999999","#fc9272","#8491B4B2","#91D1C2B2")) +
  ylab("Percentage") + xlab("Level of concern due to COVID-19") +
  theme_classic() +
  scale_y_continuous(labels = scales::percent) +
  theme(legend.position = "none", text =element_text(family="Times New Roman", size=12))

dev.off()
```

```
####################
#Graphs for findings
####################

#CLEANING PRODUCTS
datos_clea <- read.csv(file="Cleaning Products.csv", sep=";", dec = ",", header = T)

datos_clea$var_x <- factor(datos_clea$var_x,
                          ordered = T, levels = c("Women", "Men", "Univeristy",
                                                  "Non-university studies" , "Urban",
                                                  "Rural"))

tiff('Figure Clea.tiff', height = 3, width = 10, units = 'in',compression = "lzw", res = 600)

ggplot(datos_clea, aes(x = var_x, y = Promedio, fill= var_x)) +
  geom_bar(stat = 'identity', fill = c("#9ecae1", "#9ecae1", "#999999",
"#999999","#fc9272","#fc9272")) +
  ylab("Mean") + xlab("Variable") +
  theme_classic() +
  scale_y_continuous(labels = scales::percent) +
  theme(legend.position = "none", text = element_text(family="Times New Roman", size=17))

dev.off()

#ONLINE ENTERTAINMENT
datos_onl <- read.csv(file="Online Entertainment.csv", sep=";", dec = ",", header = T)

datos_onl$var_x <- factor(datos_onl$var_x,
                          ordered = T, levels = c("[0€ - 999€)",
                                                  "[1,000€ - 1,999€)", "[2,000€ - 2,999€)",
                                                  "3,000€ or more","Calm", "Little Worried", "Worried", "Very
                                                  Worried", "Extremely Worried"))

tiff('Figure Online.tiff', height = 5, width = 17, units = 'in',compression = "lzw", res = 600)

ggplot(datos_onl, aes(x = var_x, y = Promedio, fill= var_x)) +
```

```
   geom_bar(stat = 'identity', fill = c("#9ecae1", "#9ecae1","#9ecae1", "#9ecae1","#999999",
"#999999","#999999", "#999999", "#999999")) +
   ylab("Mean") + xlab("Variable") +
   theme_classic() +
   scale_y_continuous(labels = scales::percent) +
   theme(legend.position = "none", text = element_text(family="Times New Roman", size=22))

 dev.off()
```

#COMMUNICATION

```
 datos_com$var_x <- factor(datos_com$var_x,
                      ordered = T, levels = c("Women", "Men", "[0€ - 999€)",
                                          "[1,000€ - 1,999€)" , "[2,000€ - 2,999€)","3,000€ or more"))

tiff('Figure Comu.tiff', height = 5, width = 14, units = 'in',compression = "lzw", res = 600)

ggplot(datos_com, aes(x = var_x, y = Promedio, fill= var_x)) +
  geom_bar(stat = 'identity', fill = c("#9ecae1", "#9ecae1", "#999999", "#999999",
"#999999","#999999")) +
  ylab("Mean") + xlab("Variable") +
  theme_classic() +
  scale_y_continuous(labels = scales::percent) +
  theme(legend.position = "none", text = element_text(family="Times New Roman", size=23))

dev.off()
```

#Second part

```
datos_com <- read.csv(file="communication 2.csv", sep=";", dec = ",", header = T)

datos_com$var_x <- factor(datos_com$var_x,
                      ordered = T, levels = c("Z Generation","Millennial",
                                          "X Generation", "Baby Boomer", "Silent Generation"))
tiff('Figure Comu2.tiff', height = 2.5, width = 5.5, units = 'in',compression = "lzw", res = 600)

ggplot(datos_com, aes(x = var_x, y = Promedio, fill= var_x)) +
  geom_bar(stat = 'identity', fill = c("#fc9272", "#fc9272", "#fc9272", "#fc9272", "#fc9272")) +
```

```
 ylab("Mean") + xlab("Variable") +
 theme_classic() +
 scale_y_continuous(labels = scales::percent) +
 theme(legend.position = "none", text = element_text(family="Times New Roman", size=12))

dev.off()
```

#WELLBEING

```
datos_well <- read.csv(file="Wellbeing.csv", sep=";", dec = ",", header = T)


datos_well$var_x <- factor(datos_well$var_x,
                    ordered = T, levels = c("Z Generation", "Millennial", "X Generation", "Baby
                    Boomer","Silent Generation"))


tiff('Figure Well.tiff', height = 2.5, width = 5.5, units = 'in',compression = "lzw", res = 600)


ggplot(datos_well, aes(x = var_x, y = Promedio, fill= var_x)) +
  geom_bar(stat = 'identity', fill = c("#9ecae1","#9ecae1","#9ecae1","#9ecae1","#9ecae1")) +
  ylab("Mean") + xlab("Variable") +
  theme_classic() +
  scale_y_continuous(labels = scales::percent) +
  theme(legend.position = "none", text = element_text(family="Times New Roman", size=12))

dev.off()
```

#FASHION

```
datos_fash <- read.csv(file="Fashion.csv", sep=";", dec = ",", header = T)


datos_fash$var_x <- factor(datos_fash$var_x,
                    ordered = T, levels = c("Z Generation", "Millennial", "X Generation", "Baby
                    Boomer","Silent Generation","[0€- 999€)",
                    "[1,000€ - 1,999€)" , "[2,000€ - 2,999€)",
                    "3,000€ or more"))


tiff('Figure Fash.tiff', height = 5, width = 16, units = 'in',compression = "lzw", res = 600)
```

```
ggplot(datos_fash, aes(x = var_x, y = Promedio, fill= var_x)) +
  geom_bar(stat = 'identity', fill = c "#9ecae1", "#9ecae1","#9ecae1","#9ecae1","#9ecae1","#999999",
"#999999", "#999999","#999999")) +
  ylab("Mean") + xlab("Variable") +
  theme_classic() +
  scale_y_continuous(labels = scales::percent) +
  theme(legend.position = "none", text = element_text(family="Times New Roman", size=14))

dev.off()

######################
#Total expense variation#
######################
datos_other <- read.csv(file="R_other_variables.csv", sep=";", dec = ",", header = T)
 datos_other1 <- datos_other %>%
   filter(Type == 'Total expense during COVID-19')

 tiff('Graph other1.tiff', height = 3, width = 5.5, units = 'in',compression = "lzw", res = 600)
 windows()
 ggplot(datos_other1, aes(x = var_x, y = Perce, fill= var_x)) +
   geom_bar(stat = 'identity',fill= c("#9ecae1","#999999","#fc9272")) +
   ylab("Percentage") + xlab("Total expense variation due to COVID-19") +
   theme_classic() +
   scale_y_continuous(labels = scales::percent)+
   theme(legend.position = "none",  text = element_text(family="Times New Roman", size=14))
 dev.off()
```

APPENDIX III. Gretl initial models screenshots considering all the independent variables.

Model 1: Cleaning Products.

	Coeficiente	Desv. típica	Estadístico t	valor p	
const	0,0355451	0,0193940	1,833	0,0680	*
x1Women	0,00740747	0,00223984	3,307	0,0011	***
x2ZGeneration	0,00217713	0,00452918	0,4807	0,6311	
x3Milennial	−0,00636694	0,00485222	−1,312	0,1906	
x4XGeneration	0,00599743	0,00483002	1,242	0,2154	
x5BabyBoomer	−0,00211751	0,00439255	−0,4821	0,6302	
x6University	0,00691269	0,00284288	2,432	0,0157	**
x7Urban	−0,00590832	0,00339965	−1,738	0,0834	*
x8From1000to1999a	−0,00252836	0,00316113	−0,7998	0,4245	
x9From2000to2999a	0,00386597	0,00372837	1,037	0,3007	
x103000aormore	0,00100907	0,00361415	0,2792	0,7803	
x11littleworried	−0,00999988	0,0183151	−0,5460	0,5855	
x12worried	0,00339165	0,0181988	0,1864	0,8523	
x13veryworried	0,00116856	0,0181046	0,06454	0,9486	
x14extremelyworr~	0,00342864	0,0180884	0,1895	0,8498	

Model 2: Communication.

	Coeficiente	Desv. típica	Estadístico t	valor p	
const	0,00598501	0,0267286	0,2239	0,8230	
x1Women	0,00729464	0,00308693	2,363	0,0188	**
x2ZGeneration	−0,0183121	0,00624208	−2,934	0,0036	***
x3Milennial	−0,0173839	0,00668729	−2,600	0,0099	***
x4XGeneration	−0,0115360	0,00665669	−1,733	0,0843	*
x5BabyBoomer	−0,00713621	0,00605377	−1,179	0,2395	
x6University	−0,00168206	0,00391804	−0,4293	0,6680	
x7Urban	0,00458453	0,00468537	0,9785	0,3287	
x8From1000to1999a	0,00322429	0,00435664	0,7401	0,4599	
x9From2000to2999a	0,00212994	0,00513840	0,4145	0,6788	
x103000aormore	−0,00935693	0,00498099	−1,879	0,0614	*
x11littleworried	0,0278295	0,0252417	1,103	0,2712	
x12worried	0,0277355	0,0250815	1,106	0,2698	
x13veryworried	0,0355805	0,0249516	1,426	0,1550	
x14extremelyworr~	0,0351288	0,0249293	1,409	0,1600	

Model 3: Fashion.

	Coeficiente	Desv. típica	Estadístico t	valor p	
const	−0,0296204	0,0370333	−0,7998	0,4245	
x1Women	0,00104434	0,00427703	0,2442	0,8073	
x2ZGeneration	0,0298667	0,00864857	3,453	0,0006	***
x3Milennial	0,0137850	0,00926542	1,488	0,1380	
x4XGeneration	0,0198707	0,00922303	2,154	0,0321	**
x5BabyBoomer	0,00242831	0,00838767	0,2895	0,7724	
x6University	−0,000183899	0,00542855	−0,03388	0,9730	
x7Urban	−0,000908793	0,00649171	−0,1400	0,8888	
x8From1000to1999a	0,00543596	0,00603625	0,9006	0,3686	
x9From2000to2999a	−0,000197900	0,00711940	−0,02780	0,9778	
x103000aormore	0,0186912	0,00690131	2,708	0,0072	***
x11littleworried	−0,0206926	0,0349731	−0,5917	0,5546	
x12worried	−0,0192821	0,0347511	−0,5549	0,5795	
x13veryworried	−0,0195290	0,0345712	−0,5649	0,5726	
x14extremelyworr~	−0,0222324	0,0345403	−0,6437	0,5203	

Model 4: Online entertainment.

	Coeficiente	Desv. típica	Estadístico t	valor p	
const	−0,00395912	0,0248757	−0,1592	0,8737	
x1Women	−0,00337721	0,00287293	−1,176	0,2408	
x2ZGeneration	0,00173630	0,00580934	0,2989	0,7653	
x3Milennial	0,00133661	0,00622369	0,2148	0,8301	
x4XGeneration	−0,000308884	0,00619521	−0,04986	0,9603	
x5BabyBoomer	0,00515483	0,00563409	0,9149	0,3611	
x6University	−0,00110290	0,00364642	−0,3025	0,7625	
x7Urban	0,00353585	0,00436055	0,8109	0,4182	
x8From1000to1999a	0,000112187	0,00405461	0,02767	0,9779	
x9From2000to2999a	0,00316707	0,00478218	0,6623	0,5084	
x103000aormore	−0,0119630	0,00463569	−2,581	0,0104	**
x11littleworried	0,0364618	0,0234918	1,552	0,1218	
x12worried	0,0371535	0,0233427	1,592	0,1127	
x13veryworried	0,0440365	0,0232218	1,896	0,0590	*
x14extremelyworr~	0,0414648	0,0232011	1,787	0,0750	*

Model 5: Wellbeing.

	Coeficiente	Desv. típica	Estadístico t	valor p	
const	−0,0367863	0,0387302	−0,9498	0,3431	
x1Women	0,00394637	0,00447301	0,8823	0,3784	
x2ZGeneration	0,0206908	0,00904486	2,288	0,0229	**
x3Milennial	0,0114604	0,00968998	1,183	0,2380	
x4XGeneration	0,0107936	0,00964564	1,119	0,2641	
x5BabyBoomer	0,00446345	0,00877200	0,5088	0,6113	
x6University	−0,000544423	0,00567729	−0,09589	0,9237	
x7Urban	0,00620216	0,00678917	0,9135	0,3618	
x8From1000to1999a	0,00613073	0,00631283	0,9712	0,3324	
x9From2000to2999a	0,00649140	0,00744562	0,8718	0,3841	
x103000aormore	0,00147954	0,00721753	0,2050	0,8377	
x11littleworried	0,00875575	0,0365756	0,2394	0,8110	
x12worried	−0,00133086	0,0363434	−0,03662	0,9708	
x13veryworried	0,000757007	0,0361552	0,02094	0,9833	
x14extremelyworr~	−0,00504502	0,0361230	−0,1397	0,8890	

APPENDIX IV. McKinsey's graph about the acceleration of the digitalisation.

The COVID-19 crisis has accelerated the digitization of customer interactions by several years.