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Impact of Covid-19 on E-Commerce: Survey on Customers' Perspective

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Abstract

Studies have been conducted on how the current Covid-19 pandemic affected the E-Commerce businesses, mainly from companies' financial point of view. These analyses enlightened how these kind of companies have seen their revenues and customer base increase greatly, and how businesses have to rely more and more on an omni-channel strategy instead of a pure brick-and-mortar model if they want to survive the crisis. Researchers have focused mainly on US territory, finding out that the main consequences of the current situation lie in an increased use of E-Commerce from customers and in an augmented degree of digitalization from companies that desire to stay profitable and gain even larger market share in the upcoming years. Studies conclude then that this crisis projected E-Commerce businesses forward of roughly 5 years over the past forecasts, and that a "new normal" has been set that will last for decades.

This study focuses on the customers' point of view about E-Commerce during the pandemic. It analyzes how their behavior and opinion about digital retailers changed over the past months and investigates from an operational point of view the perceived quality of digital retailers and distributors services to final consumers. The analysis started with a survey (728 respondents) conceived to compare customers pre-pandemic online purchasing habits to their current ones. It then investigates the main product categories purchased by consumers before and during the pandemic to individuate relevant differences in customers' preferences. The study also focuses on how the entire value chain quality is perceived by customers by using as metrics the frequency of stock-outs and damaged products delivered, in order to assess how manufacturers and distributors coped with the crisis from an operational point of view. The survey respondents have then been segmented by age, education level and salary. This analysis allowed to gather interesting insights on how different segments of final consumers changed their online purchasing habits in terms of purchase frequency, purchased product categories, and how lasting the impact of the crisis will be after the pandemic subsides.

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1. E-Commerce & Covid-19 Literature Evidence

This section is the starting point of this study. It provides context by giving an initial overview of the E-Commerce business, presenting its evolution over the decades. It then explains the business segments this research focuses on among the different ones present nowadays. It also briefly investigates the impact of past pandemics on E-Commerce to define a benchmark against which measuring how Covid-19 affected the business. It reports quantitatively studies on how the current crisis shaped the online retail businesses all over the world, and finally it explains what has not been analyzed in the studies reported and how this research aim at filling those gaps.

1.1 E-Commerce Overview

E-Commerce (electronic commerce) is the activity of electronically buying or selling of products on online services or over the Internet. E-commerce has seen an incredible growth over the past decades, and it has captured billions of customers from all over the world. The history of E-Commerce begins in 1994, when a man sold a CD by Sting to his friend through his website NetMarket, an American retail platform. This is the first example of a consumer purchasing a product from a business through the World Wide Web - or "E-Commerce" as it is commonly known today (Arcand, 2019). Since then, E-Commerce has evolved to make products easier to discover and purchase through online retailers and marketplaces. Independent freelancers, small businesses, and large corporations have all benefited from ecommerce, which enables them to sell their goods and services at a scale that was not possible with traditional offline retail. In 2019, retail E-Commerce sales worldwide amounted to 3.53 trillion US dollars (Sabanoglu, 2020). E-Commerce can be classified in several different ways, depending on who is involved in the transactions and what kind of products are sold. There are four main types of E-Commerce models that can describe almost every transaction that takes place between consumers and businesses (Subramanya, Somani, 2017).

- **Business to Consumer (B2C)**: When a business sells a good or service to an individual consumer (e.g. You buy a pair of shoes from an online retailer).
- **Business to Business (B2B)**: When a business sells a good or service to another business (e.g. A business sells software-as-a-service for other businesses to use)
- **Consumer to Consumer (C2C)**: When a consumer sells a good or service to another consumer (e.g. You sell your old furniture on eBay to another consumer).

- **Consumer to Business (C2B)**: When a consumer sells their own products or services to a business or organization (e.g. An influencer offers exposure to their online audience in exchange for a fee, or a photographer licenses their photo for a business to use).

These four models cover every kind of transaction in the world, and they make it easier to understand the different characteristics and nuances of this particular kind of business. Usually different models require different pricing, logistics, marketing and social adjustments, and that is way it is important to understand the basic differentiation presented above. This study will be focused mainly on the B2C model, since its aim is to analyze the evolution of the consumers behavior during the pandemic Covid-19. C2C transactions had been very popular some years ago, mainly through websites such as eBay, nevertheless now the vast majority of transactions involving consumers as buyer is represented by B2C purchase.

There is another way to classify E-commerce, it involves the type of transactional relationship as well as the type of product exchanged in these relationships (Taylor, 2020).

- **Retail**: The sale of a product by a business directly to a customer without any intermediary.
- **Wholesale**: The sale of products in bulk, often to a retailer that then sells them directly to consumers.
- **Dropshipping**: The sale of a product, which is manufactured and shipped to the consumer by a third party
- **Crowdfunding**: The collection of money from consumers in advance of a product being available in order to raise the startup capital necessary to bring it to market.
- **Subscription**: The automatic recurring purchase of a product or service on a regular basis until the subscriber chooses to cancel.
- **Physical products**: Any tangible good that requires inventory to be replenished and orders to be physically shipped to customers as sales are made.
- **Digital products**: Downloadable digital goods, templates, and courses, or media that must be purchased for consumption or licensed for use.
- **Services**: A skill or set of skills provided in exchange for compensation. The service provider's time can be purchased for a fee.

The type of transactions and the kinds of products involved are usually strictly connected to the model of E-Commerce in place. For instance, it is unlikely to see a selling of a Subscription in a C2C model. This study will be focused mainly on the Retail and Dropshipping transactions, since those are the main models usually employed in B2C. Wholesale is more often a B2B type of selling. Retail often relates to purchasing of both physical and digital products, whereas Dropshipping it is connected to the selling of physical products, since it involves a shipping (useless in digital product purchases). For these reasons this study will be focused on B2C transactions, involving Retail and/or Dropshipping of both physical and digital products.

It is also worth saying that E-Commerce has had a disruptive impact across a lot of different aspects in how purchases are made nowadays. The technologies involved radically changed the way business is done, and it is relevant to grasp the main disruptions brought by E-Commerce to better understand the phenomenon observed in this study (Griffin, 2018).

- **Impact on supply chain management** E-commerce has the capability to integrate all inter-company and intra-company functions, meaning that the three flows (physical flow, financial flow and information flow) of the supply chain could be also affected by e-commerce. The affections on physical flows improved the way of product and inventory movement level for companies. For the information flows, e-commerce optimized the capacity of information processing than companies used to have, and for the financial flows, e-commerce allows companies to have more efficient payment and settlement solutions.
- **Impact on employment:** E-commerce helps create new job opportunities due to information related services, software app and digital products. It also causes job losses. The areas with the greatest predicted job-loss are retail, postal, and travel agencies. The development of e-commerce will create jobs that require highly skilled workers to manage large amounts of information, customer demands, and production processes. In contrast, people with poor technical skills cannot enjoy the wages welfare. On the other hand, because e-commerce requires sufficient stocks that could be delivered to customers in time, the warehouse becomes an important element.
- **Impact on customers**: E-commerce brings convenience for customers as they do not have to leave home and only need to browse website online, especially for buying the products which are not sold in nearby shops. It could help customers buy wider range of products and save time. Consumers also gain power through online shopping. They are able to research products

and compare prices among retailers. Also, online shopping often provides sales promotion or discounts code, thus it is more price effective for customers. Moreover, E-commerce provides products' detailed information, when even the in-store staff cannot offer such detailed explanation. Customers can also review and track the order history online. E-commerce technologies cut transaction costs by allowing both manufactures and consumers to avoid using intermediaries. This is achieved through by extending the search area best price deals and by group purchase. The success of e-commerce in urban and regional levels depend on how the local firms and consumers have adopted to e-commerce. However, e-commerce lacks human interaction for customers, especially who prefer face-to-face connection. Customers are also concerned with the security of online transactions and tend to remain loyal to well-known retailers.

- **Impact on the environment**: In 2018, E-commerce generated 1.3 million tons of container cardboard in North America, an increase from 1.1 million in 2017. Only 35% of North American cardboard manufacturing capacity is from recycled content. The recycling rate in Europe is 80% and Asia is 93%. Amazon, the largest user of boxes, has a strategy to cut back on packing material and has reduced packaging material used by 19% by weight since 2016. Amazon is requiring retailers to manufacture their product packaging in a way that doesn't require additional shipping packaging. Amazon also has an 85-person team researching ways to reduce and improve their packaging and shipping materials.
- **Impact on traditional retail**: E-commerce has been cited as a major force for the failure of major retailers in a trend frequently referred to as a "retail apocalypse". The rise of e-commerce outlets like Amazon has made it harder for traditional retailers to attract customers to their stores and forced companies to change their sales strategies. Many companies have turned to sales promotions and increased digital efforts to lure shoppers while shutting down brick-and-mortar locations.

1.2 E-Commerce & Covid-19

Covid-19 outbreak disrupted people lives in so many ways. It was an unexpected tragedy that hit the world unprepared and unaware of the implications that it would have brought to it. People had never been forced before not to go out from their houses, nor to avoid every kind of physical contact with each other. The pandemic fostered a climate of fear and distrust that compelled many people to change their habits and routines and radically alter the structure of their days. Unfortunately, the crisis is still going on at the time of this research, so it is impossible to draw some considerations about the post-Covid-19 era. That is why this study will only be focused on how people lives have changed over the last year, and it is going to analyze how typical purchasing habits changed under this unconventional and unprecedented times.

1.2.1 E-Commerce vs Pandemics

Even if many people may be unaware of that, this is not the first virus outbreak in recent times. Developing countries are always facing fatal diseases, and also Asian countries have to deal with new diseases more often that one would think. The best example of that is the SARS outbreak of 2002, who started in China and affected over 8,000 people in 28 different countries. This is a significant example because those years were critical for the E-commerce platform Alibaba, nowadays the main competitors of Amazon with more than $70 billions of revenues (Zheng, 2020). At that time, Alibaba was not the giant people are used to see now. It was a 3-years old company that focused on B2B. They were working on Taobao, the C2C platform that was to bring Alibaba to consumers. When a worker from the company contracted the virus, the company seemed doomed, with the employers sent home and quarantined in one of the most crucial milestones in their history. Nevertheless, as they say, in times of crisis there are always opportunities. Many countries around the world issued travel warnings for businessmen traveling to China, and thus many turned to Alibaba's online business to source Chinese goods. Starting in March 2003, Alibaba's B2B e-commerce business added 4,000 new members and 9,000 listings each day, a 3-5x increase over the pre-SARS rate (Zheng, 2020). Chinese suppliers, faced with few options, also invested more in online marketing on Alibaba's platform. Alibaba's business grew 50% that year and was seeing daily revenues of 10 million. Over half of the 1.4 million suppliers on the B2B platform saw strong sales growth (Zheng, 2020). Moreover, the launch of Taobao could not be more successful (Sigmar, 2020). That is because the SARS pandemic in China didn't just close factories - it shook retail. Supply chains were disrupted; retailers faced a dearth of activity as shoppers were quarantined; consumers faced roadblocks to acquiring necessities. All of these crippling consequences

of SARS were, ultimately, a boon to Alibaba as it gave consumers a reason to use Taobao that would not have otherwise existed. Taobao was launched in July 2003, and within two years the upstart platform surpassed eBay to be the number one C2C marketplace in China. Moreover, Alibaba strategically offered new users fee-free sales for three years and leveraged the stability and success of the B2B platform. SARS served then as an accelerant to the digitalization of the Chinese economy and proved to be a main driver in Taobao's success (Sigmar, 2020). Had Ma been less decisive, or taken his foot off the pedal during the pandemic, the outcomes would likely not have been as good or as fast. This example perfectly explains how times of crisis such as a virus outbreak could lead to incredible grow rate for E-commerce platform. SARS was a turning point for China's online retail leader Alibaba (Zheng, 2020) and it boosted the growth of the platform way over Ma's expectations. Those facts are confirmed by the incredible growth experienced by Alibaba in recent years. The SARS crisis in 2003 is in fact widely known for kickstarting Alibaba's and other Chinese companies' E-commerce successes in Asia (Nyrop et al., 2020). Alibaba launched its online marketplace for consumers during the SARS crisis when many Chinese were at home in quarantine. The SARS pandemic accelerated the behavioral change of the internet becoming the mass medium in China. This is somehow logical and could have been expected. People were used to shop in brick-and-mortar marketplace, physical places, but a widespread pandemic got rid of this option. Workers and shoppers stayed home in droves, causing retail sales to plummet. The only chance left was turning to the internet for daily purchases, and so the Chinese population did. The self-imposed quarantine restrictions were causing Chinese consumers to turn to the internet to procure items for the first time, launching the wider acceptance of e-commerce in the mainland. These signals are worth to be noted because they may be a hint of how E-Commerce platforms perform during these kinds of crisis. Many people know how close the Covid-19 pandemic resembles SARS outbreak in 2002. There are numerous parallels between the two epidemics: both diseases originated in China, and both caused consumers to change expectations towards online shopping to fill a physical retail gap. That is why it is very important to analyze past trends and patterns to try to decipher how the current situation will impact the future. Looking at the years immediately after the first outbreak can give us prospective in understanding how Covid-19 will shape the future years. As a successful company, Alibaba was shaped in the aftermath of the SARS coronavirus epidemic in the early 00's (Devanesan, 2020). These clues point to the fact that the current pandemic may have the same effect (maybe even greater) and lead customers to increase their E-Commerce purchases, as well as help tech companies enhance their customers base and recognition all over the world. Of course, the only information that can be drawn from the SARS pandemic are related to Asian countries, since the virus did not spread to other continents, unlike Covid-19. That is why the considerations presented

above are not to be taken as a sure forecast of how the current crisis will affect the entire world in the upcoming years. It is impossible to know the behavior of other countries in the future, since their economic, political technological and social settings are very different compared to China's ones. It can only be stated that is seems reasonable that similar crisis will bring similar consequences in similar contexts, and that is why it seems likable to think that at least in Asia the current pandemic will lead to an increased usage of E-Commerce platforms and to a wider customer base for companies like Alibaba. For what concerns the other countries, further conclusions can be drawn by analyzing the customers' behavior and opinions in the past months, putting them in perspective and forecasting what could be the most likely outcome.

1.2.2 E-Commerce Growth

It has been presented that in specific scenarios a pandemic outbreak may be a significant boost for online retail platforms. Customers are forced to shift from brick-and-mortar marketplaces to online retailers, leading those same platforms to an increased customer base and sales amount. While the previous analysis involved only Asian countries, given that the SARS pandemic was a phenomenon that interested almost exclusively China (Zheng, 2020), the interested of the study is also focused on finding some answers related to the impact of the current crisis on countries with a different structure. In a study of the E-Commerce in Denmark it is stated that:

"The pandemic is rapidly changing our behavior toward online channels, and the shifts are likely to stick post-pandemic. While many companies are challenged to survive in the short-term, the crisis also presents opportunity; bold companies that invest ambitiously and timely in their online business are likely to emerge as market leaders."

(Nyrop, Nathan, Lindquist & Karlsen, 2020)

There is a recurrent theme of opportunity arising during times of crisis. That is evidently true, as for some businesses such as E-Commerce these times are representing a decisive boost in both revenues and customer base. A recent study showed that Covid-19 has massively accelerated the growth of E-commerce in US as well. Total online spending in May 2020 hit $82.5 billion, up 77% YoY (Koetsier, 2020). Those are not the only relevant data tough. There are several statistics increasing way over even the most optimistic forecasts (2020 Adobe Digital Trends).

- **E-Commerce**: jumped $52 billion
- **Mobile's share of E-Commerce**: grew from January but not much, up just 10%

- **BOPIS**: buy online, pick up in-store grew 195% in May
- **Travel**: flight bookings tripled from early April to late May
- **E-Commerce sales** are forecasted to have increased 32.4% in 2020 with brick-and-mortar forecasted to fall 3.2%.
- **Best Buy** saw the largest YoY ecommerce sales growth in 2020 (105.5%), followed by **Target** (103.5%) and **Kroger (**79.2%).
- **Amazon** saw 39.1% year-over-year sales growth in 2020.

Higher rates of E-Commerce and BOPIS (buy online, pick up in- store) may be the "new abnormal" indicates the Adobe data (Koetsier, 2020). There are also several testimonies in favor of these new trends in E-Commerce. The following statements acquire even more authority if one thinks that Adobe's Digital Economy Index analyzes over one trillion online transactions across 100 million product SKUs.

"We are seeing signs that online purchasing trends formed during the pandemic may see permanent adoption. While BOPIS was a niche delivery option pre-pandemic, it is fast becoming the delivery method of choice as consumers become more familiar with the ease, convenience and experience."

Taylor Schreiner, Director, Adobe Digital Insights

"According to our data, it would've taken between 4 and 6 years to get to the levels that we saw in May if the growth continued at the same levels it was at for the past few years."

Vivek Pandya, Manager, Adobe Digital Insights

This is consistent with the new data from IBM's U.S. Retail Index, according to which the pandemic has accelerated the shift away from physical stores to digital shopping by roughly five years (Perez, 2020). From the numbers and statements it seems evident that E-Commerce in US is largely benefiting from the current crisis. It seems that the pandemic gave it a strong boost in increasing revenues and making customers' change their habits seamlessly. This figures are confirmed by other reports in the US. According to the Q2 2020 report from the US Census Bureau, US retail e-commerce reached $211.5 billion, up 31.8% from the first quarter, and 44.5% year-over-year. E-Commerce also accounted for 16.1% of total retail sales in Q2, up from 11.8% in the first quarter of 2020 (Goetzen, 2020). It is also worth noticing another curious pattern in E-Commerce trends. Customers are shifting their spending from certain product categories to different ones. In US electronics and apparel purchases are up 12%. IBM also recognized that groceries, alcohol and home improvement materials accelerated by 12%, 16%

and 14%, respectively. On the other side, other categories have been deeply negatively affected by the current crisis. Clothing is down 16%, and jewelry is down 46% (Adobe, 2020). This phenomenon is recognizable not only in US, as stated in a Deloitte Report for the E-Commerce in Denmark (Nyrop, et al., 2020). It appears that different product segments are reacting differently to these new purchase habits, increasing or decreasing their spending amount versus the expectation before the outbreak.

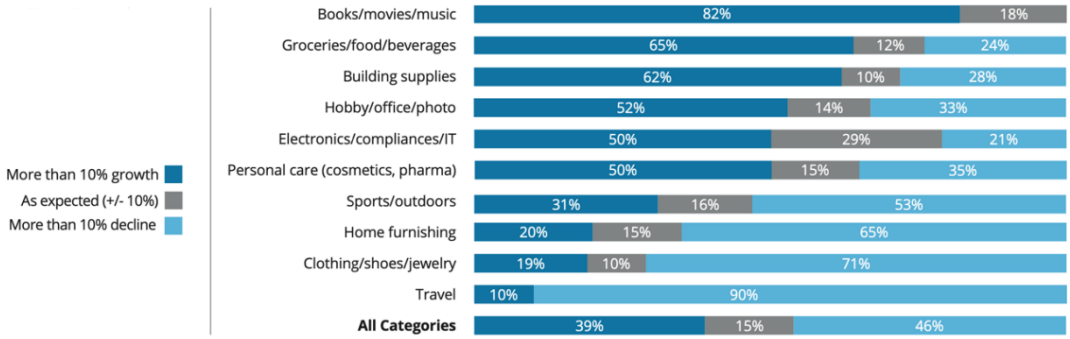

Figure 1 – Reported revenue development in March 2020 versus expectations before the outbreak by product category
(Nyrop et al., 2020)

Figure 1 shows clearly that these kinds of trends are arising all over the world and are not limited to certain zones. The quarantine calls for a different lifestyle, and the purchases of the population are reflecting this new lifestyle. Categories such as books/movies/music (entertainment) are observing a peak since people need those to fill the absence of social life. People started to read more books, watch more TV series and movies, only because they found themselves with a lot of free time that they used to devote to something else. It is the same with groceries, or electronics/IT apparels. On the other side, some categories saw a deep decline due to the pandemic. People wear less jewelry, and also the clothing appear less important now that you can work in your sweatpants. The travel industry observed a huge decrease, since it is impossible to move freely across the majority of the affected countries. It is then important to acknowledge that not only the channel people use to do their shopping is changing, but also the very content of the spending is observing a shift in its original structure. It is becoming increasingly clear that the crisis will permanently shape the societal and economic order of the future, as has been the case with other historical crises such as the SARS outbreak. Societal trends related to how people work, learn, shop, and use technology are changing rapidly. While these trends were already unfolding before the crisis, it is now evident an acceleration that will lead to a new normal coming out of the crisis. While a short-term reaction is needed to survive, a long-term view will make winners (Nyrop et al., 2020). Companies that invest courageously and timely in pivoting their businesses toward the behavioral changes can capture market shares and emerge as market leaders post-pandemic. Time

is now to launch that digital marketplace, click-and-collect universe or acquire the critical digital talent you have been considering to ensure that your business is fit for fight post-pandemic. A common message across studies and reports is that physical retailers should make a step towards an omnichannel model as soon as possible. This is a moment of reckoning for organizations historically dependent on foot traffic because races are won in the curves, and we're looking at a hairpin turn. A sharp eye will see the convergence of omnichannel trends in this digital acceleration and will take advantage of technologies that can accommodate a new online retail experience. Forward-thinking organizations will double down and anticipate the need to flex and scale to evolve with a marketplace in flux. The very best will understand the intricacies and demands of omnichannel and the unique requirements of online consumers who, in the years since SARS, have become uncompromising in their expectation of a unified buying journey (Sigmar, 2020). This statement finds foundation in the IBM Report, that suggests that department store retailers will need to more quickly pivot to omnichannel fulfillment capabilities in order to remain competitive in the new environment. Specifically, they will need to drive traffic to their stores through services like buy online and pickup in store (BOPIS) and will need to offer an expanded set of ship-from-store services. The convenience of an omnichannel approach in testified by two of the largest physical retailers in the US, Walmart and Target. They both have embraced an omnichannel fulfillment and leveraged it to their advantage. Both reported stellar earnings this month thanks to their earlier investments in e-commerce. In Walmart's case, the pandemic helped drive e-commerce sales up 97% in its last quarter. Target set a sales record as its same-day fulfillment services grew 273% in the quarter (Perez, 2020). Both retailers have also invested in online grocery, with Walmart today offering grocery pickup and delivery services, the latter through partners. Target has also just now rolled out grocery pickup and runs delivery through Shipt. Amazon, naturally, has also benefited from the shift to digital with its recent record quarterly profit and 40% sales growth. This is true not only in the US, but also in Europe as it is shown in the Deloitte Report for Denmark (Nyrop et al., 2020).

Figure 2 shows that Danish businesses specialized in E-Commerce throve during the crisis (or at least did not lose too much), whereas omni-channel businesses found it hard to cope with the pandemic. This should not lead to biased conclusions. The figure clearly shows that the online side of a business help in coping with the losses of the physical side. A brick-and-mortar store or activity sure found it hard to survive during the global pandemic, and that is why several experts suggest them to start thinking at an omni-channel approach.

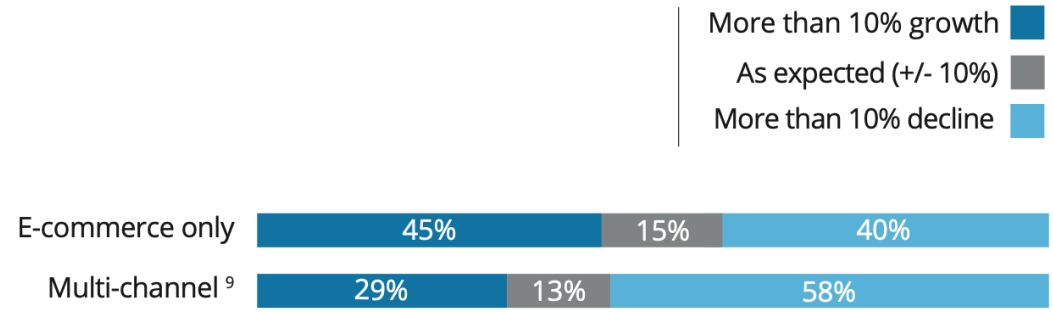

Figure 2 – Reported revenue development in March 2020 versus expectations before the outbreak by company type
(Nyrop et al., 2020)

The bottom line of this argument is that online businesses had an easier way to survive the crisis compared to physical ones, and that is why physical activities should think about starting an online line of business (and becoming an omni-channel entity) instead of insisting without an E-Commerce side of business. Now the question is, given that crisis-induced shifts in demand are temporary, will the underlying shifts in consumer behavior stick? Will categories such as food and beverages partly stay online? And will the pure online E-commerce players be able to protect their acquired market shares? According to recent reports, it depends on category, but we can be fairly certain that some specific categories will stick with online transactions even after the end of the pandemic.

"The Covid-19 crisis will result in permanent change to our shopping behavior and ways of conducting business in Denmark. While some businesses have experienced a temporary short-term peak in demand, other categories will be moving online for good."

(Nyrop, Nathan, Lindquist & Karlsen, 2020)

There are several reasons supporting this theory. First, experts think of the consequences of the SARS outbreak in China in 2002 (Zheng, 2020). As it was explained in the previous chapter, E-Commerce platform benefited from the pandemic, as it served as a boost to enhance both their revenues and customer base. This is a clue that the pattern could be repeated nowadays. Moreover, reports state further considerations to account for when talking about the future of consumers' purchasing habits (Nyrop et al., 2020).

- **Convenience beats price as the #1 reason for online shopping**: People are getting used to online convenience, and new habits quickly become persistent. Last year, convenience topped the list of reasons for online shopping. Essential product categories, such as beverages and fresh food, may be particularly susceptible to the convenience wave.

- **The risk of a pandemic blowback leads to continued social distancing**: There is an underlying concern in society about a pandemic blowback in the midterm, and the increased focus on personal hygiene and social distancing will encourage continued online shopping, reinforcing behavioral change in the longer term.
- **Intensified online competition**: E-commerce players seeing a surge in volume will do everything in their power to retain their newly acquired customers through loyalty programs, subscription models, promotions, and expansion of the product range. The competition intensifies with consumers using price engines and referral sites to find the best deals online.
- **New distribution and logistics capacity**: Distribution companies are experiencing an overwhelming demand for last-mile and contactless package delivery, which has enabled them to build up new capacity. In addition, new crowd peer-to-peer platforms are accelerating, for example, the Dutch company Burd that offers sameday delivery of packages in Denmark.
- **Elderly consumers go online**: As the elderly population is in self-imposed quarantine (and for longer time), their online shopping is expected to further increase as the existing behavioral trend is accelerated.

Of course, the considerations listed above have solid foundations, on the other hand it is also true that it may be difficult to forecast the future pattern in E-Commerce habits given that the current crisis is something of unprecedented and unexpected for the vast majority of the European countries affected. That said, a lot of the points stated in the report find confirmation in several different studies and research published over the past months. It is true that online shopping presents significant economic advantages when compared with physical shopping. There are many discounts, promotions, coupons and cashback to account for when deciding the purchase of an item through online channels. Moreover, it is easier to compare different prices online rather than visiting several different physical shops. It is also true that the risk of another wave of virus bind customers to continue the social distancing and avoid gathering e crowded places such as malls or stores. The online competition is intensifying mainly because retailers are noticing the convenience of an online shop and try to capture and attract customers by offering more and more benefits in terms of pricing and additional services. The supply chains are also changing their structure, as it was stated in the first chapter. Supply Chain management is one of the main features affected by E-Commerce, and it is one of the main competitive advantages for some companies such as Amazon and Alibaba who have become master in their fields and can guarantee a same-day delivery for the vast majority of items offered on their platforms. The most critical point involves elderly consumers, that is because even if they are shopping online nowadays due to pandemic

restriction and fear, it is difficult to predict how they will behave when the virus will be defeated. Elderly are usually a segment devoted to physical shops, and while some of them may radically change their habits in favor of online shopping even after the end of the pandemic, it is unlikely that this will be a wide and common movement among those generations. A good point in favor of the new habits elderly customers may take in the future is that the typical learning cost related to the usage of new technologies due to Covid-19 has already been experienced and now they are more likely to keep shopping online (Kim, 2020). That is true for all the customers segment, but it is worth noticing that usually the elderly are the ones who find the hardest to overcome this barrier and now they have already did it because they were forced by external conditions. The bottom line of the scientific articles, economics reports and experts speeches is that E-Commerce is greatly benefiting from the current crisis, being pushed forward by 4-6 Years (Koetsier, 2020) and exploiting the new trends generated by this new lifestyle. Companies should then focus on their digital selling channels, for who already has an online shopping platform, or start an online side of the business, for who has not, and become an omni-channel entity. Future trends regarding customers segments and products category are far to be certain but it seems reasonably likely that certain categories will rest online as well as certain customers segment who will never come back to their old physical shopping stores. The question is, what are the companies who were already online doing to defend themselves from the new competition and gain an even larger share of the business? Online shopping provides greater convenience in aspects of time and location compared to shopping in-stores. However, one reason why some consumers still prefer to shop in physical stores can be that it is more difficult to process information when they shop online. When consumers shop online, product information is often limited to images and product descriptions provided by sellers. Managers might want to utilize recent technologies to help consumers make decisions more easily while they shop online (Kim, 2020). On Carvana, an used cars dealer company, consumers can view the car and interior virtually with patented 360° photo technology. Amazon offers virtual clothes fitting experience by utilizing augmented reality (AR) technology. Virtual reality (VR) and AR techs are expected to open new opportunities for personalized shopping experiences online. Furthermore, previous studies suggests that music in advertisements improves attention span and product evaluation. Managers might want to implement music in online stores to grab consumers' attention and induce a positive mood while they shop online (Kim, 2020). Also, interactivity can improve the cognitive processing and memory. Managers might innovate a way to provide interactive shopping experiences online. Whole Food offers a chatbot that helps customers decide on ingredients to shop from the store by suggesting new recipes. When a customer is in a rush, they can simply send a food emoji to instantly get the specific kind of recipe (Kim, 2020). One challenge for digital sales is

consumers' skepticism about making purchases online. "Trust" is often a determinant factor to predict whether a consumer is willing to shop or return to purchase again in E-Commerce. Consumers are likely to trust, be loyal to, and advocate for anthropomorphic brands with specific human characteristics, such as displaying emotions or expressing friendliness. Managers might personify the brand on social media and interact with customers to create an emotional connection. Consumers who have an emotional connection with a brand have a 306% higher lifetime value. Additionally, online reviews can help reduce skepticism about making purchases online (Kim, 2020). The hotel industry makes 82% of its sales completely online even if hotels are experience goods and booking accommodations online involves a high level of risk. Consumers often can evaluate hotels and reduce risk effectively by reading customer reviews that are available on most of the hotel booking websites. Managers might enable online reviews and encourage consumers to provide feedback to help reduce the uncertainty involved in making purchases online (Kim, 2020). Those are just mere examples of how a business can implement an online sales channel to attract more customers. That said, it is fair to state that E-Commerce as a whole has seen an incredible growth in the past year, registering revenues and increased customer base never experienced before. Businesses should understand that and try to perform a transition towards an omni-channel model or at least a digital sales channel to seize the opportunity created by this crisis. While some customers' segment and product categories will stay online even after the end of the pandemic, it is reasonable to assert that some of them will return to their traditional habits. The last update from January 19th states that retail E-Commerce sales grew 27.6% in 2020 after being projected to decline 16.5% mid-pandemic. Meanwhile, total global retail sales declined 3.0%. E-Commerce will continue to be crucial for brands and retailers in 2021 even if the pandemic subsides (Kim, 2020).

1.2.3 Customers' Response

The previous chapters analyzed how the E-Commerce business is coping with the crisis, and what is to be expected from companies in the future. It presented trends and reports about increased revenues and customer base, but it did not engage in a deeper discussion about what customers think and how they reacted and will react to the crisis. This chapter will focus on customers' point of view, analyzing their opinions and behaviors over the past year. As expected, the growth of E-Commerce is directly connected with an increased usage of online sales platform from customers. E-Commerce was in fact already growing, but it accelerated even faster when the pandemic hit the world population in March 2020. New trends shows that the old normal of 2019 and the early months of 2020 is almost certainly gone for good. In a global study released by Salesforce, 63% of consumers said the way they obtain

goods and services "transformed" during 2020 and 57% said the same about the ways they engage with companies (Melton, 2020). 62% said this year changed how they conduct their lives offline and an equal percentage said it changed their online lives. Also, 58% of consumers said they expect to do more online shopping after the pandemic than they did before it and 80% of business buyers surveyed expect to do more business purchasing online in the post-pandemic era, compared with the pre-pandemic period (Melton, 2020). Salesforce collected its data from a survey conducted from July 16 through Aug. 18, 2020. Respondents represented 27 countries on six continents. The study included responses from 12,000 consumers and 3,600 business buyers. Salesforce weighted the data to represent the general population accurately. Salesforce found consumers now interact online with companies 60% of the time and offline 40% of the time (Melton, 2020). In 2019, the split was 42% online and 68% offline. And they expect to do more of the same in the future: 88% of customers expect companies of all kinds to accelerate digital initiatives due to the pandemic and 83% expect retailers to provide flexible shipping and fulfillment options such as buy-online-pick-up-in-store. Also, as shown in Figure 3, 68% said Covid-19 elevated their expectations of companies' digital capabilities, 61% expect to spend more time online after the pandemic than before it hit, and 60% said Covid-19 is changing their relationships with technology (Melton, 2020).

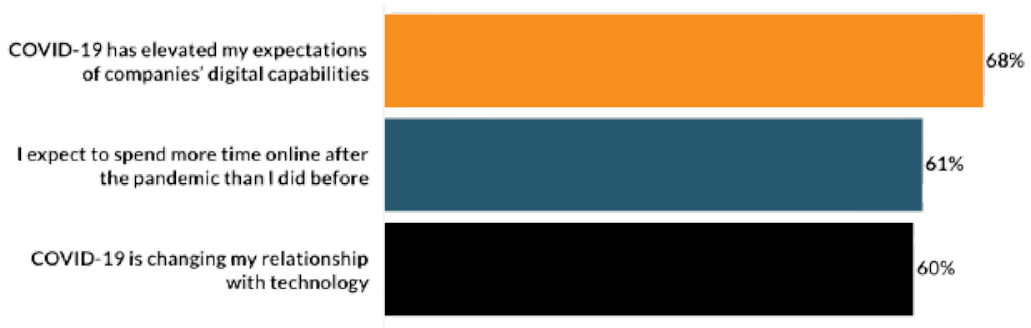

Figure 3 – Percentage of consumer who agree with the following statements (Melton, 2020)

This is not the only consequences of the pandemic. Customers not only started to use more online channels and looked at the digitalization degree of a company, but they also surveyed how companies reacted to the crisis in terms of values and ethic. Salesforce in fact found a heightened awareness among consumers and business buyers about companies' ethics and values and their suppliers. In the Salesforce survey, 71% of consumers said they pay closer attention to companies' ethics than they did a year ago and 61% said they stopped buying from a company because its values did not align with theirs, as shown in Figure 4. Likewise, 75% of business buyers said vendors' ethics increasingly factor into their purchasing decisions. 90% of consumers surveyed say how a company acts during a crisis reveals its

trustworthiness. 51% of consumers trust a company more because of its response to this year's crisis and 31% trust a company less for the same reason (Melton, 2020). Those data show that customers' are radically changing not only in terms of what and how they shop, but also in terms of what they look for in a company when deciding whether to buy for it or not.

"A new generation of consumers have learned to buy online this year and are shifting their buying behavior."

Carson Krieg, Co-Founder & Director, Convey

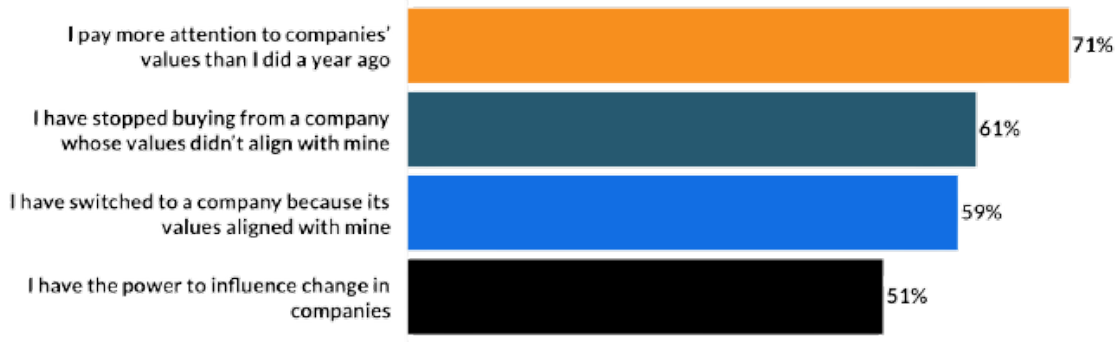

Figure 4 – Percentage of consumers who agree with the following statements (Melton, 2020)

Customers' are also trying new alternatives in terms of purchase and delivery options. Since in-store shopping is highly discouraged or even impossible, many consumers are experiencing delivery at home or BOPIS as substitutes and most of them are enjoying it. According to a study promoted by Digital Commerce 360 (Evans, 2020), these were the statistics as of October 15th:

- 36% of consumers shop online weekly since the rise of Covid-19, up from 28% pre-pandemic.
- 29% say they currently shop more online than in person, while 35% have an even mix of online and in store shopping.
- 64% of shoppers surveyed want mobile and contactless pickup options, with 79% saying contactless store pickup is very important.
- 60% want curbside pickup options. 85% of shoppers have significantly increased their use of the curbside pickup option over the course of the pandemic.
- 90% of consumers prefer home delivery over a store visit, 80% are likely to use digital communications with store associates, and only 28% plan to increase in-store shopping between August 2020 and February 2021.

It is evident from these data how customers' where experiencing a surge in their online purchases, or how they were interested in some pickup options usually overlooked. As it has been presented before, the pandemic is shaping customers' habits in unprecedented ways, leading them to new ways of shopping and delivery never seen before. It is also important to notice though that not all of them were enthusiastic about the situation. At the question "What about after coronavirus subsides?" 28% said they would continue to shop mostly online after the pandemic, with 39% saying they will shop both online and in-store, 24% saying they "can't wait" to shop in-store, and 10% not sure (Evans, 2020). It is worth noticing that a relevant share of customers "could not wait" to get back to their old habits. These customers are most likely people who do not like to change their shopping habits and are waiting for the end of the crisis to get back to brick-and-mortar shops. Nonetheless, they have been forced to change their shopping behavior due to Covid-19, and it is fair to think that some of them will stick with online purchase when the pandemic subsides. According to data from Narvar and eMarketer, these are some E-Commerce statistics (Davis, Toney, 2021) as of January 7th:

- 56% of consumers have tried a new retailer during the pandemic.
- 18% of consumers have tried curbside pickup for the first time over the Covid-19 period.
- 36% of consumers have experienced substantial shipping delays due to Covid-19.

These numbers clearly show that last year marked a huge shift in customers' shopping habits and also in their willingness and goodwill in terms of how to shop online. They had to try several options different from their normal purchase process, and some of them enjoyed that. Of course, they have also experienced shipping delays related to their online purchases, but this is mainly due at the great volume of transactions online businesses were unprepared to face.

An interesting study conducted by Digital Commerce 360 explains that the growth of E-Commerce will follow different paces depending on the country affected. In many countries, online shopping hadn't been easy because of underdeveloped infrastructure and the reluctance, or inability, of consumers to use banks and electronic payment. That stalled growth in a lot of the world, but Covid-19's disruption has forced rapid change. Take Mexico, where fewer than half of adults have bank accounts and less than 5% of retail sales occurred online before the pandemic—a third of the global average. The lack of access to banking and mistrust of the financial system left it out of the online boom happening in Europe, China and the U.S. But when stores closed to slow Covid-19, millions of holdouts moved to the web. Mexican companies responded on the fly igniting a 54% jump in web sales and accelerated

the online ecosystem by years (Evans, 2020). This kind of upheaval also took place in other major economies, like India, Russia and Brazil, that were slow to E-Commerce.

"I had never bought anything online before the pandemic, I've always been very distrustful."

Miriam Sota, 39 years-old Mexican shopper

These examples are useful to understand that not every customer thinks the same, and that people in developing countries may be easier prey for E-Commerce businesses compared to consumers in developed countries. To conclude, it is fair to state that customers' started to use E-Commerce websites in an intensive and massive way, mainly because they were forced by the external circumstances due to the global pandemic. They also started looking at companies in a different way, thinking about their values and behaviors during the crisis, and experienced new purchase options that they never tried before. Some of them were satisfied by these new standards and some others were not, but the general opinion is positive, and it leads to think that this new normality may become something stable in the future. Of course, there is a distinction between customers in terms of age and geography that make some segments easy to capture than other. Youths and people in developing countries are an easier target for online retail companies, while elderly and people in already develop country may represent a mor difficult target.

1.3 Research Gap

The previous sections were useful to give an initial context of what is commonly referred to as E-Commerce, and how this business has changed after the Covid-19 outbreak. It has also been presented customers' point of view, with data mainly related to the usage of E-Commerce websites. The analyses and reports presented lack though of some important points that this study aims at tackling to fully cover the topic under observation. Listed below in Table 1 are some of the articles referred to in the previous sections, all of them with a trait in common. They focus on the economic growth of E-Commerce and customers' point of view, leaving still open some important gaps in literature that this research is going to cover.

Article	Author	Year
The impact of Covid-19 on Consumers: Preparing for Digital Sales	Kim, R.Y.	2020
Shopping behavior keeps evolving as the pandemic continues	Melton, J.	2020
COVID-19 pandemic accelerated shift to e-commerce by 5 years, new report says	Perez, S.	2020
COVID-19 Accelerated E-Commerce Growth '4 To 6 Years'	Koetsier, J.	2020
How Coronavirus (COVID-19) Is Impacting Ecommerce	Davis, S. Toney, L.	2020
COVID-19 will permanently change e-commerce in Denmark	Nyrop, M. Nathan, A. Lindquist, M.B. Karlsen, J.T.	2020
Coronavirus: impact on e-commerce in the U.S. - Statistics & Facts	Clement, J.	2020
Post-Pandemic Retail: Lessons from SARS and the Success of Alibaba	Sigmar, C.	2020
How SARS contributed to the birth of China ecommerce	Zheng, K.	2020

Table 1 – Scientific articles analyzing Covid-19's impact exclusively from business economics and customers' point of view

1.3.1 Geography

The first thing that comes to mind is the extensive lack of studies and research in Europe, and specifically in Italy. The vast majority of the literature about the argument in question is focused on the US, probably because of the large number of experts and E-Commerce companies present on American soil. Several articles and reports – some of them presented below in Table 2 – have been written regarding the US market, ignoring the impact of Covid-19 on other important markets such as European countries. It is true that the United States have always been a leading country for what concerns economy and entrepreneurship, and that is why most of the research conducted come from there and analyze their situation. Nonetheless, it is also important to assess the impact of Covid-19 in the rest of the world in order to have a clear overview of what to expect globally in the next years. That is important because,

as previously stated, countries with different structures may also present different consequences when Covid-19 subsides. That is why it has been decided to center the study on the Italian population.

Article	Author	Year
The impact of Covid-19 on Consumers: Preparing for Digital Sales	Kim, R.Y.	2020
Shopping behavior keeps evolving as the pandemic continues	Melton, J.	2020
COVID-19 pandemic accelerated shift to e-commerce by 5 years, new report says	Perez, S.	2020
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Coronavirus: impact on e-commerce in the U.S. - Statistics & Facts	Clement, J.	2020
Post-Pandemic Retail: Lessons from SARS and the Success of Alibaba	Sigmar, C.	2020

Table 2 – Scientific articles analyzing Covid-19's impact exclusively on US soil

1.3.1 Consumers' Habits

This study is prompted by a questionnaire that is articulated in different sections, each one of which analyzes the impact of the crisis on consumers' E-Commerce habits from a different point of view. Other studies and reports – presented below in Table 3 – already analyzed customers' response to the crisis, as shown in the previous sections, but almost none of them posed the questions present in this survey, and for sure none of them posed all of those questions in the same study.

- **E-Commerce Frequency:** the first section of the questionnaire promoted in this research engages customers from their personal point of view and online familiarity, posing questions related to their habits and opinion about E-Commerce. Specifically, there are questions asking how many times per week respondents engaged in E-Commerce activities before and during the pandemic Covid-19. That pair of questions help in drawing a parallel between the "pre-pandemic" and the "during-pandemic" scenarios, with a good level of granularity since it allows to study the changes in frequency for each individual respondent.
- **Product Category:** the first section also investigates how the customers' purchases changed over the past month. Another pair of questions asks for the typical product categories bought before the Covid-19 outbreak and during the crisis, so to analyze the shift in the needs of the final consumers in terms of typology of product preferred. The only information present in literature relate to aggregated data and does not allow for a deeper understanding of what substituted what in customers' online charts.

- **Spending:** the first section terminates with questions focused on how the weekly spending changed between the phases pre and during Covid-19. That is interesting because the only data in literature analyze how the overall spending increased in the past months, while this kind of research allows for an understanding of how some customers segments changed the amount of their purchases from a certain spending level to another one.

Article	Author	Year
The impact of Covid-19 on Consumers: Preparing for Digital Sales	Kim, R.Y.	2020
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Coronavirus: impact on e-commerce in the U.S. - Statistics & Facts	Clement, J.	2020

Table 3 – Scientific articles analyzing Covid-19's impact on consumers' behavior missing some of all points above

1.3.2 Operations

The literature analysis showed that little attention were paid to how supply chains handled the greatly augmentation of volumes brought by the virus outbreak. It seems almost like nobody thought of how hard and troubling would be for a typical supply chain to satisfy a number of orders double or triple than the normal. In Table 4 are presented some articles missing out on reporting how supply chains reacted to the current crisis. That is why the second section of the questionnaire is focused on understanding how supply chain (manufacturers and distributors) coped with the abnormal situation generated by the crisis.

- **Stock-Out:** the second section analyzes how supply chains handled the large volumes inducted by the Covid-19 outbreak. A pair of questions asks respondents if they have experienced some differences in terms of stock-out (absence of a product from the shelf or the online marketplace) between the two phases before and during the pandemic. That pair of questions help in assessing how manufacturers coped with the crisis and if they have been able to produce enough items for every customers, or if they have been caught unprepared to satisfy such a large number of orders. Great differences between the two scenarios would prove the inefficiency of some manufacturers, while little to no difference may be an indicator that manufacturers well adapted to the crisis.
- **Damaged Goods:** the second section also poses questions regarding the distributors. A pair of questions investigates if customers experienced a lot of damaged product in delivery

compared to the pre-Covid-19 scenario. As before, little to no difference may indicate a good reaction to the crisis, while a larger number of damaged products may mean the contrary.

Article	Author	Year
The impact of Covid-19 on Consumers: Preparing for Digital Sales	Kim, R.Y.	2020
Shopping behavior keeps evolving as the pandemic continues	Melton, J.	2020
COVID-19 pandemic accelerated shift to e-commerce by 5 years, new report says	Perez, S.	2020
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Coronavirus: impact on e-commerce in the U.S. - Statistics & Facts	Clement, J.	2020
Post-Pandemic Retail: Lessons from SARS and the Success of Alibaba	Sigmar, C.	2020
How SARS contributed to the birth of China ecommerce	Zheng, K.	2020

Table 4 – Scientific articles analyzing Covid-19's impact missing some of all operational points above

2. Survey Research

This section aims at giving some basic guidelines on how a Survey Research is performed nowadays and what are the main features to look at when deciding how to proceed with this kind of study. It shows pros and cons for a diversity of features and discuss thoroughly which are considered the best practices from a theoretical point of view and how this guidelines are then put into practice.

2.1 Methodology

This section is going to examine and analyze the main traits to account for when approaching a Survey Research. There is a vast literature that explains what to do and how to choose certain features for a Survey Research, and it is extremely important to understand what is to be done and why. Failing in considering certain aspects of a survey may result in a biased output or even in a meaningless response from the participants, leading to inaccurate or even adulterate data. Thus, before starting the circulation of the survey it is always better to check if the questionnaire is adhering to the important guidelines established in the literature.

2.1.1 Survey Research Definition

Survey Research is defined as the process of conducting research using surveys that researchers send to survey respondents. The data collected from surveys is then statistically analyzed to draw meaningful research conclusions. Survey research is used:

"To answer questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyze trends across time, and generally, to describe what exists, in what amount, and in what context."

(Isaac & Michael, 1997, p. 136)

The essence of survey method can be explained as "questioning individuals on a topic or topics and then describing their responses". The traditional definition of survey research is a quantitative method for collecting information from a pool of respondents by asking multiple survey questions. In business studies survey method of primary data collection is used in order to test concepts, reflect attitude of people, establish the level of customer satisfaction, conduct segmentation research and a set of other purposes. Researchers can conduct researches in multiple ways, but surveys are proven to be one of the

most effective and trustworthy research methods. A survey is in fact an efficient method for extracting information about a significant business matter from an individual or a group of individuals. It consists of a collection of structured questions that motivate the participants to respond by leveraging their personal experience or opinion. Creditable survey research can give researchers and businesses access to a vast information bank. Organizations in media, other companies, and even governments often rely on survey research to obtain accurate data. This research type includes the recruitment of individuals, collection, and analysis of data. Generally, it's the primary step towards obtaining quick information about mainstream topics and conducting more rigorous and detailed quantitative research methods like surveys/polls or qualitative research methods like focus groups/on-call interviews can follow. Survey method can be used in both, quantitative, as well as, qualitative studies (Chiang, Jhangiani, Price, 2015). There are in fact many situations where researchers can conduct research using a blend of both qualitative and quantitative strategies. Kraemer (1991) identified three distinguishing characteristics of survey research. First, survey research is used to quantitatively describe specific aspects of a given population. These aspects often involve examining the relationships among variables. Second, the data required for survey research are collected from people and are, therefore, subjective. Finally, survey research uses a selected portion of the population from which the findings can later be generalized back to the population. This last aspect calls for considerable attention regarding the issue of sampling. In particular, survey researchers have a strong preference for large random samples because they provide the most accurate estimates of what is true in the population. In fact, survey research may be the only approach in psychology in which random sampling is routinely used.

To summarize, Surveys are capable of obtaining information from large samples of the population. They are also well suited to gathering demographic data that describe the composition of the sample (McIntyre, 1999). Surveys are inclusive in the types and number of variables that can be studied, require minimal investment to develop and administer, and are relatively easy for making generalizations (Bell, 1996). Surveys can also elicit information about attitudes that are otherwise difficult to measure using observational techniques (McIntyre, 1999). It is important to note, however, that surveys only provide estimates for the true population, not exact measurements (Salant & Dillman, 1994). On the other side, (Pinsonneault and Kraemer, 1993) it has been noted that surveys are generally unsuitable where an understanding of the historical context of phenomena is required. It has been observed (Bell, 1996) that biases may occur, either in the lack of response from intended participants or in the nature and accuracy of the responses that are received. Other sources of error include intentional misreporting of behaviors by respondents to confound the survey results or to hide inappropriate behavior. Finally, respondents

may have difficulty assessing their own behavior or have poor recall of the circumstances surrounding their behavior.

2.1.2 Survey Research Methods

There are three main survey research methods, divided based on the medium of conducting survey research. Each of them presents its own advantages (Chiang, Jhangiani, Price, 2015):

- **Online/ Email**: Online survey research is one of the most popular survey research methods today. The cost involved in online survey research is extremely minimal, and the responses gathered are highly accurate.

  The main advantages in Online surveys relate to the following points:

  - **Accuracy**: In an online research study, the margin of error is low, as the respondents register their responses by easy selection buttons. Tradition methods require human interference, and according to a study, human intervention increases the margin of error by 10%.
  - **Data Analysis**: Since all the responses are registered online, it is straightforward to analyze the data in real-time. It is also ready to draw inferences and share the result.
  - **Ease of participation**: In this new age technology-oriented universe, most people on this planet have access to the internet. Respondents prefer receiving the survey over the email. Ease of participation dramatically increases as the respondents can choose a suitable time and place, according to their convenience, to register their responses.
  - **Honesty and Flexibility**: According to a study, researchers have found increased participation by respondents when deployed with online surveys rather than answering lengthy questions. By designing questionnaires that ask relevant questions, respondents are honest with their answers and can skip the questions or respondents to a more neutral option, increasing their flexibility to respond.

- **Phone**: Survey research conducted over the telephone (CATI Computer Assisted Telephone Interviewing) can be useful in collecting data from a more extensive section of the target population. There are chances that the money invested in phone surveys will be higher than other mediums, and the time required will be higher.

  The main advantages in Phone surveys relate to the following points:

  - **Fast Data Collection**: Research can be gathered quickly because phone interviews are immediate and skilled interviewers can complete a lot of surveys in a day of work.

- **High Reachability**: Most people have telephones, so you have an ample audience for gathering a representative sample to complete the survey.
- **Personal Touch**: A telephone interview has a personal touch, so it can lead to valuable brand-building benefits if the interviewer surveys in a professional and skilled way.
- **Cost-Effective**: Telephone interviews can be cost-effective as you can have a higher response rate than web surveys, for example.

- **Face-to-Face:** Researchers conduct face-to-face in-depth interviews in situations where there is a complicated problem to solve. The response rate for this method is the highest, but it can be costly.

  The main advantages in Face-to-face surveys relate to the following points:

  - Accurate screening: Face-to-face interviews help with more accurate screening. The individual being interviewed is unable to provide false information during screening questions such as gender, age, or race. It is possible to get around screening questions in online and mobile surveys. Online and mobile surveys that offer incentives may actually encourage answer falsification. Individuals may enter incorrect demographic information so they are able to complete the survey and gain the incentive. The answers the individual provides may all be truthful, but for the purpose of data analysis, the data will be inaccurate and misleading.
  - Capture verbal and non-verbal ques: A face-to-face interview is no doubt going to capture verbal and non-verbal ques, but this method also affords the capture of non-verbal ques including body language, which can indicate a level of discomfort with the questions. Adversely, it can also indicate a level of enthusiasm for the topics being discussed in the interview. Let's discuss an employee job interview, for example. Capturing non-verbal ques may make the difference between selecting an employee that is less skilled, but displays a tremendous amount of enthusiasm for the position. Capturing non-verbal ques is not possible in online or mobile surveys.
  - Keep focus: The interviewer is the one that has control over the interview and can keep the interviewee focused and on track to completion. Online and mobile surveys are often completed during time convenient for the respondent, but are often in the midst of other distractions such as texting, reading and answering emails, video

streaming, web surfing, social sharing, and more. Face-to-face interviews are in-the-moment, free from technological distractions.

- Capture emotions and behaviors: Face-to-face interviews can no doubt capture an interviewee's emotions and behaviors. Similar to not being able to capture verbal and non-verbal ques, online and mobile surveys can also not capture raw emotions and behavior.

Furthermore, based on the time taken, survey research can be classified into two methods:

- **Longitudinal Survey Research**: Longitudinal survey research involves conducting survey research over a continuum of time and spread across years and decades. The data collected using this survey research method from one time period to another is qualitative or quantitative. Respondent behavior, preferences, attitudes are continuously observed over time to analyze reasons for a change in behavior or preferences. For example, suppose a researcher intends to learn about the eating habits of teenagers. In that case, he/she will follow a sample of teenagers over a considerable period to ensure that the collected information is reliable. Often, cross-sectional survey research follows a longitudinal survey research study.

- **Cross-Sectional Survey Research**: Researchers conduct a cross-sectional survey to collect insights from a target audience at a particular time interval. This survey research method is implemented in various sectors such as retail, education, healthcare, SME businesses, etc. Cross-sectional survey research can either be descriptive or analytical. It is quick and helps researchers collected information in a brief period. Researchers rely on cross-sectional survey research method in situations where descriptive analysis of a subject is required.

The different methods listed above are a good representation of all the options available to researchers when investigating a scientific argument through a questionnaire. In recent years, the most common methodology is the Online survey, for both its flexibility and accessibility. Furthermore, it is cost and time effective compared to the Face-to-Face method. It is by far the most widely accepted way of conducting research interview, and it is employed by many organizations and companies on several different topics. It was employed in June 2020 by the United Nations Conference of Trade and Development in partnership with the Netcomm Suisse Observatory for a study related to E-Commerce across several different countries (UNCTAD & Netcomm Suisse, 2020). It has also been also employed by the Office for National Statistics for investigating data related to E-Commerce businesses in UK.

2.1.3 Survey Research Sampling

Sample selection depends on the population size, its homogeneity, the sample media and its cost of use, and the degree of precision required (Salant & Dillman, 1994). The people selected to participate in the sample must be selected at random; they must have an equal (or known) chance of being selected (p. 13). It has also been observed (Salant and Dillman, 1994) observed that a prerequisite to sample selection is to define the target population as narrowly as possible. It is often not possible, however, to know the true population. In such cases, (Attewell and Rule, 1991) it has been suggested that a theoretical sample may be used. Theoretical samples purposively select organizations that exhibit the desired features that are the focus of the researcher's study. Although the theoretical sample is not randomly selected, individual respondents from within that sample can be selected at random to achieve an approximate effect (Chiang, Jhangiani, Price, 2015). There are two different kind of sampling for a Survey Research:

- **Probability-Based Samples**: Pick members based on a known probability. This uses random selection methods like simple random sampling or systematic sampling. Listed below are the main types of Probability-Based Samples, with their own advantages.
    - **Simple Random Sampling** is a completely random method of selecting subjects. These can include assigning numbers to all subjects and then using a random number generator to choose random numbers. Classic ball and urn experiments are another example of this process (assuming the balls are sufficiently mixed). The members whose numbers are chosen are included in the sample. It is the method that creates the highest population representative samples.
    - **Stratified Random Sampling** involves splitting the target population into mutually exclusive groups and then using simple random sampling to choose members from groups. It creates strata or layers that are highly representative of strata or layers in the population.
    - **Systematic Sampling** means that you choose every "nth" participant from a complete list. For example, you could choose every 10th person listed. creates samples that are highly representative of the population, without the need for a random number generator.
    - **Cluster Random Sampling** is a way to randomly select participants from a list that is too large for simple random sampling. For example, if you wanted to choose 1000 participants from the entire population of the U.S., it is likely impossible to get a

complete list of everyone. Instead, the researcher randomly selects areas (i.e. cities or counties) and randomly selects from within those boundaries. It is one of the most convenient and easy to use methods.

- **Non-Probability Samples**: The probability of choosing a member cannot be calculated. Instead, non-random selection methods use the researcher's judgment, proximity of subjects, or others non-random factor. Listed below are the main types of Non-Probability Samples, with their own advantages.
    - **Convenience Sampling** involves collecting a sample from somewhere convenient to you: the mall, your local school, your church. Sometimes called accidental sampling, opportunity sampling or grab sampling.
    - **Haphazard Sampling** requires the researcher to choose items haphazardly, trying to simulate randomness. However, the result may not be random at all and is often tainted by selection bias.
    - **Purposive Sampling** involves the researcher choosing a sample based on their knowledge about the population and the study itself. The study participants are chosen based on the study's purpose. There are several types of purposive sampling. For a full list, advantages and disadvantages of the method, see the article: Purposive Sampling.
    - **Expert Sampling** is where the researcher draws the sample from a list of experts in the field.
    - **Heterogeneity Sampling/Diversity Sampling** is a type of sampling where you deliberately choose members so that all views are represented. However, those views may or may not be represented proportionally.
    - **Modal Instance Sampling** expects the most "typical" members to be chosen from a set.
    - **Quota Sampling** is where the groups (i.e. men and women) in the sample are proportional to the groups in the population.
    - **Snowball Sampling** involves research participants recruiting other members for the study. This method is particularly useful when participants might be hard to find. For example, a study on working prostitutes or current heroin users.

It is worth saying that usually Probability-Based samples have preference over Non-Probability Samples. The main reason lies in the fact the using the latter makes it impossible to know how well you are representing the population. It is also important to recognize that often the Survey Research Method and the Survey Research Sampling are interdependent from each other (Chiang, Jhangiani, Price, 2015). It may in fact be difficult or impossible to perform a certain type of sampling while using a particular method.

In the 2020 Report from UNCTAD & Netcomm Suisse (UNCTAD & Netcomm Suisse, 2020) it has been chosen to perform a Quota Sampling. They first calibrated the population to have a clear overview of the different segment in terms of age and sex, and then drawn a sample from the target population so to respect the original proportion observed in the calibration. Although generally is preferable to perform a Probability-Based Sampling, a Quota Sample is usually a good enough choice since it allows researchers to investigate a sample population that fairly represents the target population. In an interesting study described by Tran (2020), the author explains how he used a Snowball Sampling to speed up the data collection and also the reachability of his survey. The motivations behind his choice lie in the fact that the Snowball technique is useful when respondents are difficult to identify and contact while the survey needs to be conducted expediently.

2.1.4 Survey Research Questions

The questions in a survey always fall into one of two different main categories, Open-Ended and Closed-Ended Questions (Chiang, Jhangiani, Price, 2015). They are posed for different kind of answers, according to how much freedom the researcher wants to give to the survey participants.

- **Open-Ended** questions allow respondents to answer in their own words. Open-Ended questions also allow the researcher to explore ideas that would not otherwise be aired and are useful where additional insights are sought (Salant & Dillman, 1994). They are also useful where the researcher is less familiar with the subject area and cannot offer specific response options. Open-Ended questions require greater thought and contemplation on the part of the respondent, and are, therefore, more time intensive to answer (Salant & Dillman, 1994). The results obtained from Open-Ended questions are also more difficult to analyze. Finally, it is more difficult to identify a single course of action from the broad range of responses that are received to open-ended questions.

- **Closed-Ended** questions require the respondent to choose from among a given set of responses (McIntyre, 1999). This category is often divided into three sub-categories, according to the type of the answers proposed to the survey participant.

    - **Ordered Choice Closed-Ended** questions require the respondent to examine each possible response independent of the other choices. The choices form a continuum of responses, such as those provided by Likert scales and numerical ranges. These types of questions are easiest for respondents to answer and for researchers to analyze the data. The main scales used in this type of questions are listed below:
        - **Nominal Scale**: A nominal scale associates numbers with variables for mere naming or labeling, and the numbers usually have no other relevance. It is the most basic of the four levels of measurement.
        - **Ordinal Scale**: The ordinal scale has an innate order within the variables along with labels. It establishes the rank between the variables of a scale but not the difference value between the variables.
        - **Interval Scale**: The interval scale is a step ahead in comparison to the other two scales. Along with establishing a rank and name of variables, the scale also makes known the difference between the two variables. The only drawback is that there is no fixed start point of the scale, i.e., the actual zero value is absent.
        - **Ratio Scale**: The ratio scale is the most advanced measurement scale, which has variables that are labeled in order and have a calculated difference between variables. In addition to what interval scale orders, this scale has a fixed starting point, i.e., the actual zero value is present.
        - **Likert Scale**: Five (or seven) point scale which is used to allow the individual to express how much they agree or disagree with a particular statement. assumes that the strength/intensity of an attitude is linear, i.e. on a continuum from strongly agree to strongly disagree, and makes the assumption that attitudes can be measured.
        - **Dichotomous Scale:** Dichotomous scales have two choices that are diametrically opposed to each other. There's no nuance, and there's no way for a respondent to be neutral. But there's a lot of value in the lack of a neutral option. Sometimes, especially in long surveys, you're subject to what's known

as the error of central tendency. Answers gradually regress to the middle of the scale—the neutral options. A dichotomous scale gives you a clearer, binary answer, but it can also fall prey to fatigue. When that happens, respondents lean toward positive answers.

- **Unordered Choice Closed-Ended** questions (Salant & Dillman, 1994) ask the respondent to compare possible responses and select one. Multiple choice questions are an example of this type. The researcher must ensure that the respondent is given a comprehensive selection of responses. Closed-ended questions with unordered choices are useful for ranking items in order of preference.
- **Partial Closed-Ended** questions are the questions in which the respondent is asked to compare possible responses and select one or write in "Other". It has been observed (Salant and Dillman, 1994) that most respondents choose one of the given responses when this type of question is presented.

The questions should focus almost entirely on the topic of the survey, with the exception for Demographical questions. While the majority of the questions should point to the main subject of the research, usually 4-5 questions at maximum can be devoted to better understand the demographics of the respondent. Those questions usually ask for gender, age, salary, education and so on. Their purpose is to better understand how some segments answer to the survey and help in individuating particular trends involving only a part of the population with one or more traits in common. The Demographical questions can be placed either at the beginning or at the end of the Survey, not in the middle. That is because it is better not to break the focus of the participant with some off-topic questions right in the middle of their answering.

Open-Ended questions are usually a rarity in Online questionnaire, since they allow for a certain degree of freedom that can trouble researchers. However, they can be extremely useful since they let respondents answer with their own words and opinions, without binding them to choose between the set of answer provided by the researchers themselves. In the 2020 Report from UNCTAD & Netcomm Suisse (UNCTAD & Netcomm Suisse, 2020) there is a vast majority of both Ordered and Unordered Choice Closed-Ended questions. There is also an intensive use of the Likert scale and the Dichotomous scale, both extremely useful when tracing respondents' preferences.

2.1.5 Additional Considerations

Once decided the subject of the research, the method and the sampling and also the type of questions (or mix of types) survey respondents are going to answer, it is extremely important to account for more adjustments so to further improve our survey and consequently the quality of the answers we are going to collect.

Question Wording indicates the choice of words and phrasing of the questions in the survey. Survey questions should use words that are consistent with the educational level of the intended respondents (McIntyre, 1999). Both the question and any response options must be clear to both the respondent and the researcher (Fowler, 1995; Salant & Dillman, 1994). The wording should preclude alternative interpretations or incomplete sentences that would allow misinterpretation (Browne & Keeley, 1998; Fowler, 1995; Salant & Dillman, 1994). Survey questions should not be combined where the respondent may wish to answer affirmatively for one part, but negatively for another. The researcher should avoid questions that involve double negatives. The questions should be phrased in the clearest possible way, with little to no chance of misunderstanding or ambiguity (Chiang, Jhangiani, Price, 2015). This is a fundamental trait that can help participants respond different questions with different answers, without the risk of giving a single and inaccurate answer to a question that may call for multiple answers.

Feasibility & Ethic indicates that good survey questions must be feasible to answer and respondents must be willing to answer them (Fowler, 1995). Questions must be civil and ethical (McIntyre, 1999). The researcher must avoid questions that ask the respondent for data they could not or do not have, including questions that assume the respondent knows something about the subject (Salant & Dillman, 1994). Personal questions, objectionable statements that reflect the researcher's bias and questions that require difficult calculations should similarly be avoided (Chiang, Jhangiani, Price, 2015). Questions should be posed giving the respondents all the instruments and knowledge they need to answer, so to have them express their thoughts in a conscientious and responsible way. Furthermore, the questions should not show any kind of bias nor influence the respondent in any way, since any kind of influence would result in a biased answer. The personal opinion of the researchers should never transpire from the survey, and participants should be let free to answer as they see fit, following only their thoughts and personal opinions.

Length is an undervalued yet extremely important feature for a survey. It has been (McIntyre, 1999) emphasized that the length of the survey should not be onerous. Many respondents help with the research without any expectation of compensation, so it is always better not to annoy them with

extremely long questionnaires. That is because survey participants do not usually have any incentives in doing the survey right and answer questions correctly, so they may start to answer questions randomly or read them less carefully. That results in a huge bias in the data collected. It is also fundamental to avoid long questions that lose the respondent in the reading. This argument, deeply connected with the Good Wording, presents the same reasons stated above. Respondents have to be fully focused on the survey and have them answer the questions in the way that best reflects their opinion, and that becomes impossible when they are so bored or annoyed that they do not read the questions through the end.

2.2 Research Approach

This section is presenting how it has been decided to build the survey to explore and investigate the subject of the research. The chapter is mirroring the previous one so to allow for an easy understanding of the various steps taken on this matter. Each subchapter in the previous chapter is mirrored by a homonymous in this one, making it possible to easily confront the decisions taken compared to the literature. The chapter is also going into extensive details on the reasons why it has been decided to use certain features and what are the main advantages it is possible to leverage by using them.

2.2.1 Survey Research Methods

It has been decided to use an Online survey for the research. That is because of both legal and efficiency reasons. First of all, the legislation did not allow to do a Face-to-Face survey, because with the pandemic still rampaging in the country the population was quarantined, not allowed to go out and respond the survey in person. This was actually not a big constraint, because it had already been established that the in-person approach was not the most-effective one. That is because the main advantages usually valid for this method were not applicable on this situation. Capturing the emotions and non-verbal behaviors of the respondents would not allow to capture much more information, since the subject of the research was not a complex ethical argument or something that would lead people to lie. Screening the survey participants was also a not great perk, because since incentives were not offered it was highly unlikely that people would lie in the Demographic part of the survey. The only real and useful advantage was to keep the respondents focused on the survey, but it has been decided to make the questionnaire not too long and easily understandable so not to incur in this kind of risk. There were then left only the Online and the Phone approach. It has been determined that the Phone approach, although it was a viable solution, was not the most efficient one either. That is because most of the advantages were not applicable to this case or were not superior to the Online ones. Regarding the fast data collection, high reachability and cost-effectiveness, it was widely known that the Online method would have had the same (if not greater) perks to rely on. The only exclusive advantage the Phone method had compared to the Online was the personal touch. It seemed evident that is this kind of survey it was not required to add any personal touch to the questionnaire, and that the advantages of the Online method would greatly offset the lack of human apport in the survey. It has therefore been decided to go with the Online approach, distributing the survey through an online form that could be easily accessed via link and then filled in a few minutes. The form is attached in the Appendix (Exhibits 1a-1f). It is written in Italian because the target population (as explicated in the next section) is the Italian population itself.

The Online approach presents numerous advantages, as shown in the previous chapter, and after looking even more thoroughly at it, it turned out that there were several more perks that could be exploited by using this method.

- **Fast** - The time span needed to complete an online survey project is on average two-thirds shorter than that of traditional research methods. Because information is being gathered automatically, you don't have to wait for paper questionnaires to come back to you - response time is almost instant. Online marketing experts say that more than half of responses are received within the first three days of the research project.
- **Cost-Effective** - Using online questionnaires reduces your research costs. You will save money on postage and you don't have to allocate time and resources to enter the information into a database. Responses are processed automatically, and the results are accessible at any time.
- **Accurate** - The margin of error is greatly reduced with online surveys because participants enter their responses directly into the system. Traditional methods rely on the attentiveness of staff to enter all details correctly, and naturally human error can creep in whenever a person has to perform a repetitive task.
- **Quick to Analyze** - The results of the online survey are ready to be analyzed at any time. View results in real-time so you can act quickly, create graphs for reporting, export data for further analysis and share your results with anyone.
- **Easy Usable for Participants** - The majority of people that have access to the Internet prefer to answer surveys online instead of using the telephone. With an online survey, participants can pick a moment that suits them best and the time needed to complete the survey is much shorter. This leads to a higher response rate.
- **Easy to use for Researchers** - The main benefit of online surveys for researchers is that they increase productivity by saving time. Data is instantly available and can easily be transferred into specialized statistical software or spreadsheets when more detailed analysis is needed.
- **More Honest** - Market researchers have found that participants overwhelmingly prefer to complete online surveys rather than take part in written questionnaires or telephone interviews and usually provide longer and more detailed answers. By designing and sending relevant and targeted surveys, people are more likely to respond with honest answers.
- **More Selective** - With an online survey you can pre-screen participants and allow only those who match your target profile to complete the survey.

- **More Flexible** - The order of the questions in an online survey can be changed, or questions can be skipped altogether, depending on the answer to a previous question. This way, a survey can be tailored to each participant as he or she proceeds.
- **No Interviewer** - Since respondents are not disclosing their answers directly to another person, it is easier for them to open up. Interviewers can also influence responses in some cases.

Of course, there are also some disadvantages in Online survey. It is extremely important to define them in order to try to mitigate them and possibly overcome them. The main ones are listed below.

- **Survey Fraud** - This is the biggest challenge. If your survey is long and/or confusing you might get fake answers. Since there is less accountability, the chances for people just hitting buttons to finish are high. Check the questions you use carefully. People often take surveys because they're promised a reward at the end, resulting in them not accurately contributing to your study.
- **Limited Sampling and Respondent Availability** - Certain populations (like the elderly) are less likely to have internet access and to respond to online questionnaires. Drawing samples is harder based on email addresses or website visitations.
- **Possible Cooperation Problems** - Online surveys could be deleted and ignored. People hate feeling poked and if they get annoyed, they just have to click delete.
- **No Interviewer** – This is a double-side blade. The lack of a trained interviewer to clarify and probe can lead to less reliable data.

To sum it up, online surveys are a great option for people and organizations and individuals who would like to conduct their own research. They are less time consuming, cheaper, you get the results faster, and you can transfer and use the data in various applications to answer important questions software. That said, it is always important to look for possible risks and try to mitigate them in order to get an unbiased collection of data to work on. Otherwise, the survey is just meaningless.

The link for the form has been distributed mainly through social media, carefully defining the people who were going to receive it. It was fundamental to leverage personal connections to involve different layers of the target population, and also exploited some of the participants to further recruit more people from their contacts to fill the form.

It is also worth saying that the study approach can be classified as a Cross-Sectional Survey Research. Although the questionnaire investigates respondents' habits in the present and in the past, the survey

itself did not followed the participants for a long and continued span of time. The survey was distributed at a particular time, and that is the fact that drives the categorization in Longitudinal or Cross-Sectional. In the end, it has been reached a first contact response rate of 58,24% for a total of 728 respondents.

2.2.2 Survey Research Sampling

Given the method chosen (Online survey), the sampling had to be coherent with the choice previously taken. As stated before, it is hard to pair some kind of sampling with certain methods, for instance it is difficult to pair Systematic Sampling with a Face-to-Face approach. In this case, given the particular times this study was approached, even more constraints were encountered. There was limited access to large datasets of people and it also lacked the exposure necessary to equally gather people from all over the country, so it has been decided to use a mixed sampling approach. In the end it has been chosen to use a mix of Cluster Random, Quota and Snowball sampling.

- **Cluster Random Sampling** is a way to randomly select participants from a list that is too large for simple random sampling. For example, if you wanted to choose 1000 participants from the entire population of the U.S., it is likely impossible to get a complete list of everyone. Instead, the researcher randomly selects areas (e.g. cities or counties) and randomly selects from within those boundaries. It is one of the most convenient and easy to use methods.
- **Quota Sampling** is where the groups (e.g. men and women) in the sample are proportional to the groups in the population.
- **Snowball Sampling** involves research participants recruiting other members for the study. This method is particularly useful when participants might be hard to find. For example, a study on working prostitutes or current heroin users.

It has been used the Cluster Random to define the main area to focus on. It was really difficult to reach people too far from the center of the research because there was not the proper exposure, so it has been resolved to focus on a singular city, Torino, that seemed to be a fair representation of the total population the study wanted to investigate. It was also taken into account the segmentation in terms of age of the total population and it has been tried to replicate the same proportion in the final sample. There are of course several factors that can be considered when deciding where to focus the proportionality with the original population (age, gender, income, education), but it is common practice to just focus on the ones more relevant for the subject of the research, in this case the age. When considering the proportion of the sample compared to the total population, it has been performed a Quota Sampling. Finally, it has

also been asked respondents to share the survey with their families and friends, so to reach a vast number of people. This of course represents a loss in terms of proportion control and therefore resemblance to the total population, but it still is a convenient tradeoff since it allowed to exponentially increase the participants in the survey. This last feature of the sampling is well defined as Snowball Sampling, where the survey participants recruit other members for the study. Using this mixed approach allowed the survey to reach several hundreds of people (728 participants) with a good representation of the target population.

2.2.3 Survey Research Questions

Deciding how many and which type of questions are going to compose the questionnaire is a delicate and critical phase in survey construction. As stated before, the questions should not be too many in order to engage the participant without bore or annoy him. In this case, it has been determined that the questionnaire was to comprise 22 questions including 4 Demographical ones. Moreover, the question should cover all the issues raised in the research and should also be ordered in an efficient way so to optimize respondent's focus and willingness to complete the survey. It has been decided to use a mix of different types of questions because the survey needed different kinds of answers that could be provided only with a wide range of specific types of question. Listed below are the types of questions with the scales that have been paired them with when possible.

- **Open-Ended** questions allow respondents to answer in their own words. Open-Ended questions also allow the researcher to explore ideas that would not otherwise be aired and are useful where additional insights are sought (Salant & Dillman, 1994). They are also useful where the researcher is less familiar with the subject area and cannot offer specific response options. Open-Ended questions require greater thought and contemplation on the part of the respondent, and are, therefore, more time intensive to answer (Salant & Dillman, 1994). The results obtained from Open-Ended questions are also more difficult to analyze. Finally, it is more difficult to identify a single course of action from the broad range of responses that are received to open-ended questions.
- **Closed-Ended** questions require the respondent to choose from among a given set of responses (McIntyre, 1999). This category is often divided into three sub-categories, according to the type of the answers proposed to the survey participant.
    - **Ordered Choice Closed-Ended** questions require the respondent to examine each possible response independent of the other choices. The choices form a continuum

of responses, such as those provided by Likert scales and numerical ranges. These types of questions are easiest for respondents to answer and for researchers to analyze the data. The main scales used in this type of questions are listed below:

- **Ordinal Scale**: The ordinal scale has an innate order within the variables along with labels. It establishes the rank between the variables of a scale but not the difference value between the variables.
- **Ratio Scale**: The ratio scale is the most advanced measurement scale, which has variables that are labeled in order and have a calculated difference between variables. In addition to what interval scale orders, this scale has a fixed starting point, i.e., the actual zero value is present.
- **Likert Scale**: Five (or seven) point scale which is used to allow the individual to express how much they agree or disagree with a particular statement. assumes that the strength/intensity of an attitude is linear, i.e. on a continuum from strongly agree to strongly disagree, and makes the assumption that attitudes can be measured.
- **Dichotomous Scale:** Dichotomous scales have two choices that are diametrically opposed to each other. There's no nuance, and there's no way for a respondent to be neutral. But there's a lot of value in the lack of a neutral option. Sometimes, especially in long surveys, you're subject to what's known as the error of central tendency. Answers gradually regress to the middle of the scale—the neutral options. A dichotomous scale gives you a clearer, binary answer, but it can also fall prey to fatigue. When that happens, respondents lean toward positive answers.

- **Partial Closed-Ended** questions are the questions in which the respondent is asked to compare possible responses and select one or write in "Other". It has been observed (Salant and Dillman, 1994) that most respondents choose one of the given responses when this type of question is presented.

The questions have been organized in four different categories to make the respondents easily understand what the topic was they were called to answer about. The four sections are the following, associated with the types of question chosen to employ.

Section 1 – Online Purchase Experience

1. Ordered Choice Closed-Ended (Ratio Scale)
2. Open Ended
3. Ordered Choice Closed-Ended (Ratio Scale)
4. Open Ended
5. Partial Closed-Ended
6. Partial Closed-Ended
7. Ordered Choice Closed-Ended (Ratio Scale)
8. Ordered Choice Closed-Ended (Ratio Scale)

Section 2 – Delivery Experience

1. Ordered Choice Closed-Ended (Dichotomous Scale)
2. Ordered Choice Closed-Ended (Dichotomous Scale)
3. Ordered Choice Closed-Ended (Dichotomous Scale)
4. Partial Closed-Ended
5. Ordered Choice Closed-Ended (Dichotomous Scale)
6. Partial Closed-Ended
7. Ordered Choice Closed-Ended (Likert Scale)

Section 3 – E-Commerce Habits & Covid-19

1. Ordered Choice Closed-Ended (Likert Scale)
2. Ordered Choice Closed-Ended (Likert Scale)
3. Ordered Choice Closed-Ended (Likert Scale)

Section 4 – Demographical Questions

1. Ordered Choice Closed-Ended (Ratio Scale)
2. Ordered Choice Closed-Ended (Ordinal Scale)
3. Ordered Choice Closed-Ended (Ratio Scale)
4. Ordered Choice Closed-Ended (Ratio Scale)

As it is shown in the previous enumeration, it has been tried to give a precise structure to the questionnaire so to make it easy for respondents to understand the topic they were being interviewed on. The questions were stated in the clearest way possible, avoiding to pair two different interrogatives in the same question. This way participants could answer without second-questioning their choices due to ambiguity in the questions. It has been decided to start by analyzing customers' experience in Online Purchase drawing a comparison between the pre-pandemic phase and the during-pandemic phase. The questions in this section are posed in a subsequent way to facilitate the mental process of respondents trying to individuate the main differences in their purchasing habits during the two different phases. The second section, regarding Delivery Experience, follows the same logic. Questions are always posed in pair, first referring to the pre-pandemic situation and right after to the during-pandemic phase. In the first section it has been analyzed customers' point of view, while in Section 2 the problem has been approached from an operational side. The efficiency of the logistics distribution during the pandemic

has been investigated by stimulating considerations regarding stock-outs, damaged products and failed deliveries. In Section 3 were discussed customers' opinions on their future E-Commerce habits, inquiring whether they have been satisfied by E-Commerce platform performance and if they think this experience is going to impact their future online purchasing behavior in terms of frequency and loyalty. Finally, the Demographical questions were asked right at the end of the questionnaire. The reason of that lies in the interest of segmenting the respondents through several factors, in order to better understand if the pandemic affected the online purchasing habits of some particular segmentation. Demographical have been posed at the end because they are the easiest ones for respondents to answer, this way they could focus on the subject of the research from the very first questions without being distracted or annoyed. Furthermore, it is more likely for a survey participant to complete the questionnaire if the questions left are quick and easy to respond to, and Demographical questions represent exactly this category.

2.2.4 Additional Considerations

The last considerations taken before sending out the survey involved additional features and considerations to optimize the response rate. After having decided the circulation method, the sampling and also defined the questions, the last thing to do was to make sure participants were further engaged by avoiding trivial mistakes in the survey draft. This mistakes often relates to three main issues that have to been avoided in order to increase the efficiency and engagement rate of a questionnaire.

Question Wording indicates the choice of words and phrasing of the questions in the survey. A lot of attention was paid in the wording, drafting and vetting several options before choosing the final version of the questions. Double negatives were avoided, and it has been established to pose only a single interrogative for each question, in order to eschew ambiguity. The questionnaire has been delivered in Italian, so to optimize respondent's understanding of the questions respondents were called to answer. Clarity is always better when distributing a questionnaire to hundreds of strangers. It has been used an easily understandable language, avoiding specific and technical terms to make the survey accessible for people without any previous knowledge of E-Commerce or operations.

Feasibility & Ethic indicates that good survey questions must be feasible to answer to and respondents must be willing to answer them. This has never been a big issue since the topic of the research had little to no ethical sides. It has been decided to give respondents the chance to not disclose their annual income because money is always a sensitive matter.

Length is an undervalued yet extremely important feature for a survey. It has been repeatedly stressed out the fact that the questionnaire should not be too long, because otherwise respondents would get bored or annoyed. The survey several drafts started with a pool of questions that have been repeatedly adjusted to find the perfect trade-off between efficiency and length. At the end 15 research questions plus 4 Demographical questions were chosen, and after several filling simulations it was noticed that the average filling time for the form was 2 minutes, short enough not to bore respondents but at the same time fully able to gather all the information that needed to be extracted from the participants. Once this good trade-off was reached, it was time to distribute the survey and wait for the data to be collected and then analyzed.

3. Data Analysis

This section shows how the data analysis has been performed. It provides a general overview of the database with the information gathered from the survey, so to understand how it is shaped the source of the data. It then proceeds to present the formal reasons behind the choice of the statistical test performed on the data, and it also explains why it has been chosen a particular type of test over others. It ends with a meaningful and complete description of the results drafted from the statistical analysis.

3.1 Database Overview

The database this research worked on was formed by the data collected from the survey. The data have been stored altogether after the completion of the responses gathering and then cleaned and formatted properly so to make them treatable from statistical software for further analyses. The database included both qualitative and quantitative data points, depending on the question the data itself was meant to answer. The different questions were employed as columns, whereas every row represents a singular respondent. It follows that every one of the 728 rows (respondents) contained as many data points as the total number of questions, 22. Adjusting the total number of data for missing data points and multiple answers (mainly related to product categories questions) leads to the final total number of data points, 33,500+. Below are presented visual examples from the dataset, so to make the comprehension of the source of data easier and more immediate to the reader.

	Q1	Q2	Q3	Q4
Respondent 1	1-2 volte al mese		1-2 volte al mese	
Respondent 2	Meno di una volta al mese		Meno di una volta al mese	
Respondent 3	Meno di una volta al mese		1-2 volte al mese	
Respondent 4	Meno di una volta al mese		1-2 volte al mese	
Respondent 5	1-2 volte al mese		1-2 volte al mese	

Table 5a – First section of questionnaire in dataset form

	Q5	Q6	Q7	Q8
Respondent 1	Libri	Libri	200€ - 400€	200€ - 400€
Respondent 2	Articoli Elettronici	Articoli Elettronici	0 - 100€	0 - 100€
Respondent 3	Vestiti & Accessori	Articoli Elettronici	0 - 100€	100€ - 200€
Respondent 4	Libri	Libri	0 - 100€	0 - 100€
Respondent 5	Musica & Film	Musica & Film	100€ - 200€	100€ - 200€

Table 5b – First section of questionnaire in dataset form

Tables 5 show how it looks the first section of the questionnaire (Online Purchasing Experience) when converted to dataset form. As previously explained, the questions are represented on the columns and

the survey respondents are individuated on the rows. This way it is immediate to understand what a given respondent answered to a specific question in the survey. The first section of the questionnaire, as it previously stated, contains qualitative questions regarding the frequency of online purchasing before and during the pandemic, the preferred product category purchased online before and during the pandemic by a given respondent, and the monthly expense range for online purchases before and during the pandemic. This questions have been voluntarily posed in pairs so to trace a clear comparison between the two scenarios (pre and during pandemic).

	Q1	**Q2**	**Q3**
Respondent 1	Si	No	No
Respondent 2	No	No	No
Respondent 3	No	No	Si
Respondent 4	No	Si	Si
Respondent 5	No	No	No

Table 6a – Second section of questionnaire in dataset form

	Q4	**Q5**	**Q6**	**Q7**
Respondent 1		No		4
Respondent 2		Si	Generi Alimentari	4
Respondent 3	Generi Alimentari	Si	Articoli Elettronici	5
Respondent 4	Libri	No		4
Respondent 5		Si	Articoli Elettronici	5

Table 6b – Second section of questionnaire in dataset form

Tables 6 present the second section of the questionnaire (Delivery Experience) in dataset form. This section investigates the operations of the supply chain and how companies coped with the crisis from a customers' point of view. The questions posed relate to experienced stock-outs and related product categories, damaged/wrong products delivered and overall consumers' satisfaction towards delivery systems during the pandemic. This section's goal was to measure how customers' perceived the quality of the service offered from online retailers and if they experienced significant changes between the pre pandemic scenario and the during pandemic one.

	Q1	Q2	Q3
Respondent 1	5	4	5
Respondent 2	4	3	3
Respondent 3	3	5	2
Respondent 4	4	5	2
Respondent 5	2	3	2

Table 7 – Third section of questionnaire in dataset form

Table 7 shows the third part of the questionnaire (E-Commerce & Covid-19 Habits) in dataset form. This section investigates how consumers' reacted to forced online shopping during the pandemic, how satisfied they are with the services and whether they are going to stick with them or not when the crisis subsides. This questions ask for a quantitative value (from 1 to 5, Likert scale) to assess the degree of satisfaction/agreement of the respondent in relation with the specific service or statement discussed in the question. The aim of this part of the survey is to analyze what consumers think of online purchasing and the likelihood of their pursuance in using online retailer in the future.

	Q1	Q2	Q3	Q4
Respondent 1	36-49	Dottorato di Ricerca	50.000€ - 75.000€	1
Respondent 2	19-35	Diploma di Scuola Secondaria di II Grado	Preferisco non rispondere	5+
Respondent 3	50-69	Diploma di Scuola Secondaria di II Grado	50.000€ - 75.000€	4
Respondent 4	0-18	Diploma di Scuola Secondaria di I Grado (Scuola Media)	Preferisco non rispondere	5+
Respondent 5	19-35	Laurea Triennale	100.000€ +	3

Table 8 – Fourth section of questionnaire in dataset form

Table 8 presents the fourth and last section of the questionnaire (Demographic Questions) in dataset form. This last section is extremely important as it asks for information of relevant value when used to segment the respondent by age, education, salary and household dimension. The respondents answered this last section simply by giving out basic information about themselves that have then been employed to assess how and to what extent the crisis impacted different segment of the population investigated. The data points gathered here complete the set of information this research wanted to trace and study, and combined with the data from the previous sections of the questionnaire can be extremely useful when used to perform statistical analysis.

As stated before, the data collected through the survey have been cleaned up and formatted so to allow for further manipulation. The multiple answers (such as questions about product categories) have been scattered through different cells, leading to having one piece of information for each cell. The missing data points have been accounted for when performed the several statistical analyses on the database, and the data format has been checked and adjusted, if needed. This process led to a clean and easily analyzable dataset full of information ready to be extracted and then studied, as described in the next sections.

3.2 Analysis Methodology

The data collection, cleaning and formatting have been fundamental steps for what is next, that is the data analysis itself. The analysis had been carried out carefully and thoroughly by first assessing which kind of test was to perform to the data and only then proceeding with the actual testing. Given the particular types of data at disposal, the chosen test for the analysis is the Kruskal-Wallis, a very popular method useful as a general nonparametric test for comparing more than two independent samples (Ostertagova et al., 2014). Nonparametric methods require less stringent assumptions than do their parametric counterparts; on the other hand, they also use less information from the data. This makes the nonparametric tests somewhat less powerful than the corresponding parametric tests for the same situations, when the assumptions of the parametric tests are met. When the assumptions of the parametric tests are not met, the nonparametric tests are the ones we should use. The ANOVA F-test is used to test the equality more than two population means. The assumptions behind this method include that the data in each group come from a normal distribution, that the population variances in each group are equal (homoscedasticity) and that the data are independent of one another. However, these assumptions are frequently ignored and often violated when used in real world applications. That is why Kruskal-Wallis is often a better method to establish whether different samples come from the same distribution. The Kruskal-Wallis test does not make assumptions about normality. However, it assumes that the observations in each group come from populations with the same shape of distribution and that the samples are random and independent (Ostertagová et al., 2014). If the researcher can make the assumptions of an identically shaped and scaled distribution for all groups, except for any difference in medians, then the null hypothesis of the test is that the medians of all groups are equal, and the alternative hypothesis is that at least one population median of one group is different from the population median of at least one other group. This is exactly the case of this study, and therefore it is possible to state the null and the alternative hypotheses as:

H_0: The medians of all groups analyzed are equal

H_1: At least one population median of one group is different from the population mean of at least one other group

The Kruskal-Wallis method tests the medians instead of the mean because it does not support the assumption typical of the ANOVA test, and therefore it considers in its analysis the ranks of the observations instead of the observation themselves. Talking about ranks of the observation leads to an

analysis of the medians, and that is why the null and the alternative hypotheses are built around that. To fully understand the proceedings behind the method, it is advisable to follow the process presented below step by step so to have a clear overview on how to perform a Kruskal-Wallis. As explained, the test purpose is to establish whether the medians from different groups can be considered statistically equal to each other. The notation used for the test follows below.

- The number of groups the test is considering is g
- The total number of observations across all groups is N
- The number of observations in group i is n_i
- The rank (among all observations) of observation j from group i is r_{ij}
- The average of all the r_{ij} is $\bar{r}$

$$\bar{r} = \frac{1}{2}(\mathrm{N} + 1)$$

- The average rank of all observations in group *i* is $\bar{r}_{i.}$

$$\bar{r}_{i.} = \frac{\sum_{j=1}^{n_i} r_{ij}}{n_i}$$

Now that the notation is established, the formal description of the Kruskal-Wallis test follows.

1. Rank all data from all groups together. Rank the data from 1 to *N* ignoring group membership. Assign any tied values the average of the ranks they would have received had they not been tied.
2. The test statistics is given by

$$\mathrm{H} = (\mathrm{N} - 1)\frac{\sum_{i=1}^{g} n_i(\bar{r}_{i.} - \bar{r})^2}{\sum_{i=1}^{g}\sum_{j=1}^{n_i}(r_{ij} - \bar{r})^2}$$

3. Finally, the decision to reject or not the null hypothesis is made by comparing H to a critical value H_c obtained from a table or a software for a given significance (or α level). If H is bigger than H_c, the null hypothesis is rejected. The distribution of H can be approximated by a Chi-Squared distribution with *g-1* degrees of freedom.

4. If the statistics is not significant, then there is no evidence of stochastic dominance between the samples. However, if the test is significant then at least one sample stochastically dominates another sample.

The significance level chosen for this research corresponds to 5%. This means that a test can be considered significative if and only if the p-value of the test itself is <5%. If this happens it is legit to assume that at least one group among all considered dominates or it is stochastically dominated by at least another group in the set, therefore having different medians. The data had been run through a statistical software in various combination of factors and responses. The factors, meaning the sets of groups confronted to each other, amounted to 10. The responses, that is the observations who are ranked and then used to perform the test, are 4. That led to the completion of 40 different statistical tests with some of them bringing interesting outputs, allowing for further considerations. Each test considers a factor, that is a particular feature of the sample population (age, online purchase frequency, education, favorite product category, ...) that split the population of the sample itself in different groups. The factor is basically useful to segment the sample population and form the groups that are put under statistical analysis by studying their medians. Those groups are then analyzed focusing on their responses on different quantitative questions. Those questions have been answered with values from 1 to 5, allowing to perform a Kruskal-Wallis by ranking these responses and drawing statistical conclusions about the medians of the different groups. The totality of 40 tests with respective outputs can be found at the bottom of this paper, in the Appendix. They are shown starting from Exhibit 2 to Exhibit 41.

3.3 Results Discussion

This section aims at presenting the results of the analyses performed on the data and draw some meaningful insights about the results of the research, who are going to be further explored in the next section. The section opens with the results of the statistical analysis described in the previous section, presenting and discussing the results of the 40 Kruskal-Wallis tests divided by factor. The second part of the section shows some additional data insight gathered with the questionnaire responses. This second part does not involve any statistical analysis but shows graphs and insights regarding the distribution of the answers provided by the 728 respondents.

3.3.1 Statistical Analysis Results

The statistical analysis performed with the Kruskal-Wallis test brought some interesting results that are being discussed in this section. To allow for an easier understanding of the results, they have been summarized in tables, one for each factor put under study in the analysis. Each table has the same format. On the columns there are the different groups individuated depending on the factor considered, the columns may in fact change from one table to another depending on the factor under analysis. On the rows there are the so-called responses, that is the four quantitative questions posed through the survey with the respective medians and means by group. The four responses are the same for every table and investigate the following points:

- Satisfaction about Delivery Service during Covid-19
- Opinion about Online Shopping changed positively after Covid-19
- More Online Shopping due to Covid-19
- Keeping new shopping habits when pandemic subsides

They are all answered with a value from 1 to 5, following to a classic Likert Scale. With 1 meaning totally disagreement or total unsatisfaction, and 5 meaning maximum agreement or maximum satisfaction.
The first point investigates how much consumers are satisfied with delivery services during the pandemic. It is useful in determining how supply chains coped with the crisis and assessing the perceived quality of the service by customers. The second point asks whether customers' opinion about online shopping changed positively after the pandemic. This point is instrumental is determining if their opinion about E-Commerce will be better at the end of the crisis compared to their opinion at the beginning. The third aspect inquires whether consumers started to use more online retailers due to Covid-19. The question aim at understanding if and which segments of people increased or decreased

their online shopping during the pandemic. The four and last question establishes if and how much people are considering to keeping the current shopping habits adopted during the crisis when the pandemic subsides. This is a strong clue about how much the impact brought by Covid-19 on consumers and online retailers can be considered lo last in the long-term.

Response	Never		< 1 / Month		1-2 / Month		1 / Week		2+ / Week		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	3,5	4	4,1	4	4,2	4	4,4	5	4,4	0,000
Opinion about Online Shopping changed positively after Covid-19	3	2,8	3	3,3	3	3,2	4	3,7	3	3,2	0,001
More Online Shopping due to Covid-19	3	2,9	4	3,4	4	3,5	4	3,7	3,5	2,9	0,048
Keeping new shopping habits when pandemic subsides	2	2,1	3	2,8	3	3,2	3	3,5	4	3,7	0,000

Table 9 – Kruskal-Wallis test results with "Online Purchase Frequency pre-Covid-19" as factor

The first test considers as factor the Online Purchase Frequency pre-Covid-19 of consumers, meaning how often the respondents were used to use E-Commerce and online retailers before the advent of the pandemic. This segmentation individuates 5 different groups, that have been put under analysis and investigated in order to find significant differences between their medians. First of all, it is easy to see that the P-Value is significant for all 4 tests. All the P-Values are in fact <%5, meaning that the four test are significant and at least one group median is different than at least another group median. That is easy to see for each of the 4 tests in Table 5. For the Satisfaction about Delivery Service all groups have median 4 but the last one, with median 5. The last group comprises the most loyal customers, the ones who were used to use online retailing even before the pandemic and who are therefore more inclined to trust and happily accept their services. The other groups are still content with the delivery services, having a median of 4. The opinion about shopping did not change much across all groups, with the majority of them having a median of 3. The only segment with median 4, and therefore with a positive changed attitude towards E-Commerce, is the group with customers used to shop online 1/week before the crisis. That can be explained saying that the most loyal customers were probably already in love with E-Commerce, and therefore their opinion did not change much. The 2nd most loyal group, on the other hand, received from the pandemic the little push they needed to trust online retailers even more than before. Regarding how much online shopping activity the groups have experienced during the pandemic, the results are different. The group of the less loyal customers answered with a median of 3 to this questions, basically saying that they did not see a great increase in their online purchase. That is probably because even before they never used these websites and are therefore scared or suspicious towards E-Commerce. The groups "in the middle" show a median of 4 each, confirming that they started to use online retailers more often due to Covid-19. The last group shows a median of 3,5, that probably is because they were already using online shopping heavily and so they did not see a significant increment in their usage. Regarding the last point, there are some interesting insights involving the loyalty of the different groups. The less loyal group shows a low median of 2. That confirms the fact that their

opinion about E-Commerce has not changed and they aim at restoring their shopping habits the moment the pandemic subsides. The other groups answered with a median of 3 (it is worth noticing how the means are increasing linearly with loyalty for this test), meaning that they are not particularly prone one extreme solution. The most loyal group has a median of 4 because they have basically maintained their old heavily online shopping-based habits, so they plan to keep those on also in the future.

Response	Never		< 1 / Month		1-2 / Month		1 / Week		2+ / Week		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	3	2,9	4	4,0	4	4,1	4	4,3	5	4,5	0,000
Opinion about Online Shopping changed positively after Covid-19	2	2,3	3	2,8	3	3,3	4	3,6	4	3,7	0,000
More Online Shopping due to Covid-19	1	1,4	3	2,6	4	3,6	4	4,0	4	3,9	0,000
Keeping new shopping habits when pandemic subsides	1	2,0	3	2,5	3	3,0	3	3,3	4	3,8	0,000

Table 10 – Kruskal-Wallis test results with "Online Purchase Frequency during Covid-19" as factor

The second set of tests is similar to the first one and help in tracing a comparison between the pre-Covid-19 scenario and the during Covid-19 scenario. The factor considered is in fact the Online Purchase Frequency during Covid-19, and it individuates the same segments as before (but these time the frequency are related to the months of the pandemic). The first test is significant with a very low P-Value and shows how the less loyal group is as often the less satisfied with online shopping services, with a median of 3. The other groups show a median of 4, meaning that they are satisfied with the delivery services they experienced, and the most loyal group shows a median of 5, demonstrating how the most loyal consumers are always the most satisfied with the E-Commerce. This test shows that with the increase of the usage increases also the satisfaction with the delivery service. This may be addressed to the fact that the most loyal and experienced users often use the best and more reliable online retailers (they have already experienced the learning cost) and do not incur in bad surprises when using this providers. The less loyal and navigated consumers may on the contrary incur in bad or unreliable websites and therefore having a worse shopping experience. The second test is significant as well and individuates the usual difference in opinion between the less and the most loyal consumers. The less loyal have a median of 2, meaning that their opinion did not change for the better but actually, on the contrary, it slighted changed for the worse. That is explainable with the output of the precedent questions and may be connected to their bad experiences. The two successive groups show a median of 3, meaning that they are not inclined on either side. The two last groups show a median of 4, this means that their opinion changed positively. This may be because they started to buy more online during

the pandemic, or they kept buying as often as before and have been satisfied with the service. The third test shows results consistent with the previous ones. The less loyal group has a median of 1, meaning that their online shopping did not increase during the crisis. This is consistent with the fact that this group answered "Never" to the question regarding the Online Purchase Frequency during Covid-19. The second group has a median of 3, meaning that they did not buy much before the pandemic and they did not increase their consumption in a significant way. The last 3 groups have all a median of 4, that is because they probably increased to some extent their online purchasing and that is why these three groups are also the most loyal among the 5 segments analyzed. The last test, significant as the others, shows that the less loyal consumers are not keeping their new online shopping habits when the pandemic subside (also because it looks like they never changed their shopping channels). The 3 "middle groups" have a median of 3, that means they are not inclined neither to increase nor decrease their online shopping frequency after the pandemic. The last group shows interesting result. These group is made of consumers who were loyal before and stayed loyal or people who were not that loyal before and started to use online shopping heavily because of the pandemic. The group has a median of 4, that means that they intend to keep these new habits and this is a good win for E-Commerce, who manage to secure the customers that were not that loyal before and became loyal thanks to the pandemic.

Response	Electronics		Books		Music & Movies		Clothes		Trips & Events		Various		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	4,1	4	4,2	4	4,1	4	4,1	4	4,0	4	4,1	0,616
Opinion about Online Shopping changed positively after Covid-19	3	3,4	3	3,3	3	3,2	3	3,4	3	3,1	3	3,2	0,635
More Online Shopping due to Covid-19	4	3,4	4	3,5	4	3,5	4	3,4	4	3,1	4	3,4	0,589
Keeping new shopping habits when pandemic subsides	3	3,1	3	3,0	3	3,0	3	3,0	3	2,5	3	2,9	0,015

Table 11 – Kruskal-Wallis test results with "Favorite Product Category pre-Covid-19" as factor

This set of tests presents a different type of factor. It investigates the "Favorite Product Category pre-Covid-19" as factor, and therefore individuates different segments compared to the previous two tests. The groups are named after the favorite product category pre-Covid-19 chosen by every customer. It is easy to notice how only the last test is significant, compared to the first 3 who have a P-Value really high. The first test in fact shows that every customer segment has a median of 4, meaning that people are quite satisfied with the delivery system regardless of which product they preferred to buy online before the pandemic. This makes sense because preferences of consumers before the pandemic hardly influence their satisfaction during Covid-19. The second test shows that every group presents a median of 3. This means that customers did not change their opinion about Covid-19 much, at least not if

looked up segmented by product category of preference before Covid-19. This may find an explanation in the fact that even if some customers changed their opinion about E-Commerce due to the crisis – as seen in the previous tests – this is not related to which product category they used to buy before the pandemic. The third test shows that all the segments went with a median of 4, meaning that regardless of their preferred category pre-Covid-19 there is a common tendency of increasing the online purchases spread across all the groups. The medians and also the means are pretty close to each other and this confirms that there is no statistical evidence about a significant difference across all the groups. The fourth and last test of this set is interesting for a peculiar reason. Even if the medians are all equal across the segments with a value of 3, the P-Value is <5% meaning that the test is significant and therefore the null hypothesis is to be rejected. That is, one cannot exclude that one group can have a median different than at least one other group among all of those considered. In particular, looking at the means, it is easy to notice how the segment who preferred Trips & Events before the pandemic shows a lower mean compared to the other groups. This may imply that people who were used to buy online mainly for these kind of products and services do not intend to keep the new habits when the pandemic subsides, and plan to going back to their normal routines in the future. They have probably been forced to buy other categories different from Trips & Events online, and they wish to going back to purchase those categories in physical shops as soon as they can.

Response	Electronics		Books		Music & Movies		Clothes		Trips & Events		Various		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	4,2	4	4,2	4	4,2	4	4,2	3	3,6	4	4,1	0,653
Opinion about Online Shopping changed positively after Covid-19	3	3,2	3	3,3	3	3	4	3,5	3	3,4	3	3,0	0,003
More Online Shopping due to Covid-19	4	3,3	4	3,5	3,5	3,3	4	3,7	3	3,2	3,5	3,2	0,058
Keeping new shopping habits when pandemic subsides	3	2,9	3	3,0	3	3,0	3	3,0	2	2,2	3	2,8	0,518

Table 12 – Kruskal-Wallis test results with "Favorite Product Category during Covid-19" as factor

This set of test, as always, help in tracing a comparison between the scenario before Covid-19 and the scenario during Covid-19. If in the previous test the factor was the Favorite Product Category pre-Covid-19, this test analyzes as factor the Favorite Product Category during Covid-19. The first test is not significant, having a high P-Value, therefore the null hypothesis cannot be rejected and there is statistical evidence that all the medians are equal. This is interesting because the medians are different from each other, but there is not statistical evidence that this may imply a consistent different in the medians of the population of the groups themselves. Every group but one has median 4, that means that they are quite satisfied with the delivery services experienced during Covid-19, regardless of their

category of preference. This means that every value chain behaved correctly, regardless of the product under analysis. The only different one is the Trips & Events category, with a median of 3. That said, the numerosity of this group – as seen in the appendix – is really low (during the pandemic not a lot of people buy Trip or Events of course). This may be the reason why, even if the median is lower than the other groups, the test found no statistical evidence about that. The second test on the other hand presents some very interesting results. The test is significant with a low P-Value, rejecting the null hypothesis of equivalence of medians across all groups. All group but one have a median of 3, implying that these customers did not change much their opinion about E-Commerce during the last months. Regardless of the product category of preference, their thoughts and attitude towards Covid-19 did not change much. The only exception is the Clothes category. This is interesting because indicates that people who started or kept purchasing Clothes online, experienced a change of opinion during the last months. More specifically, they had a positive change of mind towards E-Commerce. This means that people found out that buying Clothes online can be satisfying and efficient, when before the pandemic was not the most common way of buying these kind of products. People were used to buy their clothes in physical stores, maybe because they wanted to try them on or the enjoyed personal contact with sales assistants. However, the pandemic forced them to buy Clothes online, and they have been pleasantly surprised by the quality of the service. The third test has a low P-Value, but it is not significant since the value is >5%. However, the medians are different from each other. This case is similar to the first test of this set, where different medians do not necessarily imply significance in the test probably due to the different numerosity of the groups. Three groups out of 6 (Electronics, Books, Clothes) have a higher median with a value of 4. This means that people in this group have experienced a tendency to increase their online purchase for products that they were probably used to buy offline before the pandemic. Two groups, Music & Movies and Various, present a median of 3,5. This implies that they have experienced a slight increase in their online retailers usage as well, probably because they were used to buy at least part of this products offline. The only group with a median of 3 is Trips & Events. This may be because this segment comprises the people that chose as preferred category during the pandemic Trips & Events, that means that even before Covid-19 they were used to buy mainly this category online and therefore did not see a big increasing in their E-Commerce usage over the past month. Probably these people prefer to buy all the other categories offline, and this is the reason why, by sticking with Trips & Events as favorite category, they did not experience any more online shopping recently. The last test is not significant, even if the P-Value is really close to 5%. In fact, the medians across all groups are different from each other, and this is a signal of the ambiguity of this last test. All segments show a median of 3, and also the means are close to each other, meaning that these people are not inclined to

either extremes. They do not intend to stubbornly keep with the shopping habits the pandemic forced on them, nor they desire to come back with a full offline shopping. This may indicate that they prefer to buy some products online, while using offline channels for other products or services. The only group that stands out with e median of 2, and also a lower mean, is the Trips & Events segment. Probably these people, as stated before, have always used online channels to buy mainly Trips & Events before the pandemic, and have been forced to change their shopping routines during the crisis, buying some other products or services through the web. These people probably desire to come back to their old shopping routines when the pandemic subsides and use online retailers only for their category of election, Trips & Events.

Response	0 - 100€		100€ - 200€		200€ - 400€		400€ - 600€		600€+		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	4,1	4	4,2	4	4,0	4	4,0	5	4,7	0,448
Opinion about Online Shopping changed positively after Covid-19	3	3,2	3	3,4	4	3,6	3	2,6	2	2,0	0,034
More Online Shopping due to Covid-19	4	3,4	4	3,6	3	3,3	3	2,8	1	2,0	0,197
Keeping new shopping habits when pandemic subsides	3	2,9	3	3,2	3	3,5	4	3,5	3	3,00	0,000

Table 13 – Kruskal-Wallis test results with "Average Online Spending pre-Covid-19" as factor

This set of tests radically changes the prospective and investigates as factor the Average Online Spending pre-Covid-19, per month. This factor individuates 5 layers of spending, splitting people in different groups depending on how much money they used to spend in online shopping before the pandemic. The first test is not significant, even if the medians are different across segments, probably because of the difference in the numerosity of the groups. The first 4 groups have a median of 4, meaning that they are quite satisfied with their delivery systems regardless of how much they were spending for online purchasing before the pandemic. The means are very close to each other as well, confirming that these segments perceived a similar quality in the service. The last group has a higher median and mean, confirming that the most loyal consumers often have a more positive opinion about the service in question, otherwise they would probably not be the most loyal at all. The second test is significant, with a P-Value of 3.4% < 5%. The interesting take-aways from this tests are that the most loyal segment shows a low median of 2, probably because they had a pretty high opinion about E-Commerce and the crisis did not change that significantly. Three groups have a median of 3, meaning that their opinion did not change much over the past months. It is interesting to notice that the 400€ - 600€ segment has a low mean compared to the other groups with median 3, that may be because they already had a good

opinion on online retailers and so they behave more similarly to the most loyal consumers in that way. The only group with median 4, is the group 200€ - 400€. This perfectly reflects the scenario investigated in the first set of test, where the middle segment changed their opinion towards E-Commerce more than all the others. This may be for the same reasons exposed before. These people are not the most loyal consumers, so they had a good but not very high opinion about online shopping. Probably the crisis made them more aware of the potential of E-Commerce, changing their minds towards a more positive and trustier attitude towards online retailers. The third test is not significant, even if the medians are different across the segments. The two less loyal groups present a median of 4, meaning that they noticed an increased usage of E-Commerce during the pandemic. This is consistent with the fact that these two groups were spending not much on online retailers before the arise of the crisis, and so they sure observed an increase to some extent in their online shopping habits. The two successive groups have a median of 3. This is also consistent with the data, because these segments include people who were already using E-Commerce quite heavily, and it is normal that they saw a less significant surge in their online shopping usage compared to the two less loyal groups. The most loyal segment has a median of 1, and that is easy to explain. They were already using E-Commerce heavily before the crisis, spending 600€+ per month in online retailers. For this reason they probably maintained the same pace during the crisis, not seeing any relevant increase in their personal usage. The last test has a very low P-Value and it is then significant. All segments but one have a median of 3, showing that these groups are not particularly prone to either sides of the medal. They are not sure of keeping the habits adopted during the crisis, but they are not certain either about going back to their old routines. It is interesting to notice that also the most loyal group of consumers has a median of 3, probably because their old habits and new habits coincide. The only group with a different median is group 400€ - 600€. This segment in the previous tests did not stand out of the crowd, but the last test results indicate that they are the most inclined to keep their new shopping habits after the pandemic subsides. This is probably given by the fact that people who used to be good users in the past have increased the usage of online channels during the pandemic and wish to keep this augmented level of consumption after the crisis ends. This corroborates the assumptions drawn from the previous test, meaning that users who were already in a good position towards online shopping during the pandemic experienced this service even more, and have been acquired as loyal consumers by online retailers who managed to gain their trust through a good service and user experience.

Response	0 - 100€		100€ - 200€		200€ - 400€		400€ - 600€		600€+		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	4,0	4	4,2	4	4,2	4	4,2	5	4,5	0,005
Opinion about Online Shopping changed positively after Covid-19	3	3,0	3	3,5	4	3,6	3	3,3	3	3,0	0,000
More Online Shopping due to Covid-19	3	2,9	4	3,9	4	3,9	4	3,9	4	3,6	0,000
Keeping new shopping habits when pandemic subsides	3	2,7	3	3,1	3	3,3	4	4,0	4	3,60	0,000

Table 14 – Kruskal-Wallis test results with "Average Online Spending during Covid-19" as factor

This set of test, as always, traces a comparison with the previous one. It investigates as factor the Average Online Spending during Covid-19, per month. It is opposed to the Average Online Spending pre-Covid-19, per month analyzed in the previous set of Kruskal-Wallis. It is worth noticing that all tests are significant with a very low P-Value, that means that there is statistical evidence for each one of these tests that at least one layers behaved differently compared to the others. The first test as always investigates the satisfaction of the groups towards delivery systems during the pandemic. All group answered with a 4 but one, meaning that these groups have all been quite satisfied with the service offered by supply chains during Covid-19, regardless of how much they used to spend. The only group with a different mean is the most loyal group, the people who spent 600€+ during the crisis. These customers are the most experienced and navigated users, they rely heavily on E-Commerce and therefore have already paid the so-called learning cost usually in place when dealing with a new technology. They know the best sites, the most efficient and reliable retailers, and therefore receive a better service. It is also worth noticing that these customers are probably the ones with premium accounts, that come with all sorts of benefits among which it is common to find a same-day delivery or similar. That may be an additional reason why they are extremely satisfied with the services provided by online retailers. This test reflects the results of the same test in the previous set, where only the most loyal group showed a median of 5 compared to the other groups, with a median of 4. The second test, significant as well with a very low P-Value, shows some interesting insights. All segments but one present a median of 3, meaning that these groups did not change much their opinion for the better during the last months. This may be because they have not been impressed with E-Commerce, or because their opinion was already really high and positive. Only one group, with a median of 4, stands out of the crowd. People who spent 200€ - 400€ during the pandemic showed a positive change in their attitude towards online retailers. This is the same pattern explored in several previous tests, such as the same test in the previous set and the same test in the first set of tests. In the ladder example, people with a 1/week online purchase frequency before Covid-19 showed a higher median than all the other

segments, even than those who had a higher frequency. That may be because the most loyal customers, both in terms of frequency and spending, already have a pretty high opinion about E-Commerce, otherwise they would not use it that much. On the other end, people who already had a good opinion about online shopping, such as the 2nd or the 3rd groups in terms of loyalty, have been pushed by this little crisis to use E-Commerce a little bit more and therefore have become more loyal and started to trust and use online channels even more. In other words the crisis helped customers who were already positive towards E-Commerce but not really in love with it to do the last little step towards complete trust and addiction towards online retailers. The third test, with a low P-Value and for that reason being significant, investigates whether people used E-Commerce more often during the pandemic. All groups but one have median of 4 meaning that to some extent all of them saw an increase in their online shopping consumption at some point. This was to expect, since Covid-19 forced a lot of people to change at least in part to a shopping approach more online-based and less offline-focused. The only group with a different median is the less loyal group of people, the ones who comprises people with spending in the range 0 - 100€ monthly during the pandemic. That is probably because these people for some personal reason do not trust or do not desire to learn to use E-Commerce, and so tried as much as possible to stick with their offline shopping habits. It is also consistent with the fact that the people in this segment are the ones using E-Commerce the less during the pandemic, and probably for this reason they did not experience a big surge in their online shopping consumption. The last test shows a low P-Value, as the previous one, meaning that the test is to be considered significant as well. The two most loyal groups show a median of 4, meaning that they intend to stick with their online heavily based shopping approach when the pandemic subsides. This was predictable, since those people are the most loyal customers since they use to spend a lot of money on E-Commerce even during the crisis. The last three groups, on the other hand, show a median of 3. This means that probably they are undecided about how to behave when the crisis subsides, and do not tend to either extreme. They are the less loyal, however they did not show a low median, meaning that they are unsure about what to do when the pandemic ends. These may be a clue about the possibility of them using E-Commerce even after the crisis.

Response	0 - 18		19 - 35		36 - 49		50 - 69		70+		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	3,9	4	4,1	4	4,2	4	4,3	3,5	3,7	0,000
Opinion about Online Shopping changed positively after Covid-19	3	3,2	3	3,3	3	3,3	3	3,2	3	2,9	0,052
More Online Shopping due to Covid-19	3	3,2	4	3,5	4	3,5	4	3,2	3,5	3,6	0,237
Keeping new shopping habits when pandemic subsides	3	2,7	3	2,9	3	3,2	3	3,1	2,5	2,9	0,000

Table 15 – Kruskal-Wallis test results with "Age" as factor

This set of tests puts under analysis as factor the Age of respondents. It individuates 5 different segments in which research participants are distributed depending on their age. The first test, regarding the satisfaction about delivery service, is significant with a very low P-Value. The first 4 groups present the same median with a value of 4, meaning that regardless of their age they are quite satisfied with the quality of the delivery services put in place by online retailers during the pandemic. The last segment, that comprises the most aged respondent, with an age of 70+, are slightly less satisfied with a median of 3,5 and also a mean lower than the others. This may be explained with the fact that probably the elderly are less inclined to using delivery service that involved another human being taking the product to their houses. They probably do not enjoy allowing a stranger inside the building, let alone having him into their apartments to bring their online purchases. The second test has a P-Value of 5.2% > 5%, so it is not significant even if it goes close to that. The medians are in fact equal across all segments with a value of 3, meaning that no particular age segment changed much its opinion about E-Commerce due to Covid-19. It is fair to assume that, regardless of how their thoughts about online shopping was, the crisis did not change it much neither for the better nor for the worse. The third test, about how often they practice online shopping compared to the pre-Covid-19 scenario, is not significant even if some medians are different from each other. The youngest segment has a median of 3, meaning that they are not shopping online more neither less compared to the last years, probably because every additional spending they need to do online is performed by their family and not by themselves. The three middle segments, that comprises people from 19 to 69 years old, show a median of 4, corroborating the fact that they are experiencing more online shopping due to the forced condition the pandemic put the population under. This is consistent with the result of the test on the youngest segment, who probably delegate to their oldest parents and siblings their additional online purchases. The very last segment presents a median of 3.5, although the mean is pretty close to the means of the previous groups. This means that elderly are not experiencing much more shopping than before, maybe because some younger relative takes care of that of maybe because they simply try to avoid using online shopping

whenever they can. The last test is significant with a very low P-Value and shows that the first four segments present a median of 3. That means that they are unsure about their future line of conduct regarding online shopping, they may keep their new habits as well as go back to their old shopping routines. The very last segment presents a lower median of 2.5, corroborating the fact the elderly are not convinced with these new technology and they rather go back to their old shopping behavior.

Response	Middle School		High School		Bachelor's		Master's		PhD		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	3,8	4	4,2	4	4,2	4	4,2	4	3,5	0,000
Opinion about Online Shopping changed positively after Covid-19	3	3,1	3	3,4	3	3,2	3	3,2	3	3,0	0,060
More Online Shopping due to Covid-19	3,5	3,2	4	3,5	4	3,5	4	3,3	4	3,2	0,173
Keeping new shopping habits when pandemic subsides	3	2,6	3	3,0	3	3,0	3	3,0	4	3,2	0,001

Table 16 – Kruskal-Wallis test results with "Education" as factor

This set of test investigates respondents' answers analyzing the Education Level as factor. The respondents have been distributed across the five segments depending on which is the latest degree of instruction they received. This brought some interesting insights. The first test is significant with a very low P-Value, even if the medians are all equal across all segments. They all have a value of 4, meaning that people are generally satisfied with the delivery service provided by online retailer during the crisis. Regardless of their education level, people found that companies coped well with the crisis and supply chains have been efficient in processing their orders. The means are all close to each other but for the PhD segment, which appears to have a slightly lower mean. The second test presents a low P-Value of 6% > 5%, however not low enough for the test to be significant. In fact the medians are all the same across the different segments, with a value of 3. This means that the opinion about E-Commerce did not change much during the crisis for any education segment. They are not inclined neither to positive nor to negative when talking about how their attitude towards E-Commerce changed in the past month. The third test is not significant with a P-Value of 17.3% > 5% but the medians are slightly different from each other in certain cases. This may be due to the different numerosity of the groups compared. All segments but one have a median of 4, meaning that all people with higher education level and also High School students experienced to some extent an increased usage of E-Commerce in the past recent months. The only exceptions, as predictable, is the Middle School segment, who comprises mostly young kids who are not used to do a lot of online purchasing, having for the majority of cases a family or relatives who take care of these kind of purchases for them. They registered a median of 3.5, slightly

less compared to the other segments. The last test is significant with a P-Value of 0.1% < 5%. In this case in fact we can see some median different from others. The first four segments have all a median of 3, indicating that they are not tendent to neither extreme when talking about their future shopping routines. It is worth noticing that the mean of the Middle School segment is significantly lower compared to the means of the other segments who, on the contrary, are closer to the mean of the last group, who has also a higher median. The last segment in fact, who comprised people with a Doctorate, presents a higher median and also a higher mean if compared to the other groups. That means that these people are the more inclined to proceed with the new shopping routines adopted during the pandemic, meaning more online shopping as it is evident by the third test performed.

Response	0 - 25,000€		25,000€ - 50,000€		50,000€ - 75,000€		75,000€ - 100,000€		100,000+€		No Answer		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	4,1	4	4,2	4	4,3	4	4,4	4	4,3	4	4,0	0,002
Opinion about Online Shopping changed positively after Covid-19	3	3,3	3	3,3	4	3,5	3	3,0	3	3,0	3	3,1	0,011
More Online Shopping due to Covid-19	4	3,4	4	3,4	4	3,6	4	3,6	4	4,1	4	3,3	0,051
Keeping new shopping habits when pandemic subsides	3	3,0	3	3,0	3	3,1	3	3,0	3	3,4	3	2,9	0,305

Table 17 – Kruskal-Wallis test results with "Yearly Income" as factor

This set put under analysis the Yearly Income of respondents as factor to use to categorize the different segments. Since this question touches a sensitive matter, and since some people being student at Middle School and High School do not have a personal income, this question allowed for respondents not to answer by selecting "No Answer" among the options. That is why in this test, differently than the previous ones, there is also this group who will not be considered in the analysis. The first test is significative with a P-Value of 0.2% < 5%, although all the medians observed are equal to each other. The segments have all medians with a value of 4, with similar means as well. This indicates that all category, regardless of their salary and yearly income, are quite satisfied with the delivery service experienced during the pandemic. This result is consistent with all the results found from the previous test, who all claimed a general level of positive satisfaction towards delivery systems from customers. The second test is significant with a P-Value of 1.1% < %5. The medians are in fact different from each other, with all but one being equal to 3 and only one with a value of 4. The only segment with a higher median and also higher mean is the 50,000€ - 75,000€ group. These people shows an increased positive attitude toward E-Commerce, compared to the other segments who do not show any particular shift in their opinion about online retailers. The third test is not significant with a P-Value 5.1% > 5%. These values are really close to each other, making the test not significant but at a border-line level. All segments have median of 4, meaning that they all generally increased their online shopping during the pandemic.

The means are also close to each other, the only exception is the mean of the wealthiest segment, with a 100,000€+ yearly income. Their mean is slightly higher than the others, it may be an indicator that these people increased their online shopping even more than the other segments after all. The last test is not significant with a high P-Value of 30.5% > 5% and all the medians are equal to each other, with a value of 3. This is consistent with the general trend observed in the previous test, when the most common answer to this last question often sees a neutral median from all different segments.

Response	1		2		3		4		5+		Kruskal-Wallis
Issue Under Study	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	P-Value
Satisfaction about Delivery Service during Covid-19	4	4,0	4	4,2	4	4,1	4	4,1	4	4,1	0,454
Opinion about Online Shopping changed positively after Covid-19	3	3,2	3	3,1	3	3,3	3	3,3	3	3,3	0,889
More Online Shopping due to Covid-19	3	2,8	3,5	3,4	4	3,5	4	3,5	4	3,3	0,015
Keeping new shopping habits when pandemic subsides	3	3,1	3	3,1	3	3,1	3	2,8	3	3,0	0,020

Table 18 – Kruskal-Wallis test results with "Household Dimension" as factor

The last set of tests focus on the Household Dimension as a factor, meaning the number of how many people live together as a family or a co-living community for each respondent. This test distributes respondents across 5 segments depending on the fact that they live alone, with another person, or with several different people at the same time. The first test is not significant with a high P-Value of 45.4% > 5%. The medians are in fact all equal across the different segments, with a value of 4. This test is consistent with the previous results obtained from the same test analyzing different factors, who often showed a median that is equal across all segments and also pretty high. This confirms the fact that generally people have been satisfied with the delivery services provided by online retailers, with few to no exceptions. The second test is not significant with a very high P-Value of 88.9% > 5%. The medians are all the same across the five segments, with a value of 3. This means all segments did not change their opinion towards E-Commerce, and this result is also consistent with results from the previous test, who claimed very rarely that people would change opinion based on the recent months. The third test is significant with a P-Value of 1.5% < 5% and shows some interesting insights. The median for the segment of people living alone is 3, meaning that they do not perceive a strong increase in their online shopping during Covid-19. This may be because most of them are elderly people, who as seen in the previous test did not increased much their online shopping. Another reason may be that people living alone have probably reduced quantity in groceries and other kind of products compared to families and large groups, feature that allows them to go to physical shops to do their purchases. The segment of people living in pairs o couples has a median of 3.5 and also a higher mean. This is probably because as

stated before, the more are the people involved in the household and the more difficult is to process all of the purchases offline. That is why couples are slightly more prone to online shopping compared to single people. This fact is further confirmed when looking at the three last groups. The three last segments have a median of 4, higher than the segments considered before. That is because bigger households have more trouble in doing offline purchases, given the bigger quantity of their groceries and needs. They find more comfortable to just order online and have their products delivered at home, and that is why they answered with higher values to the questions related with the increased usage of E-Commerce channels during the pandemic. The last test is significant with P-Value 2% < 5%, although the medians are all equal to each other. As seen in the previous set of tests, the usual answer for this test is a median with value 3 spread across all segments and the trend is confirmed in this test. All segments, regardless of their household dimension, present a median of 3 with also really similar means, indicating that respondents are not clearly determined neither to keep with the new habits adopted during the pandemic nor to go back to their original shopping routines.

3.3.2 Additional Results

This section presents graphs and insights collected directly from the data gathered through the questionnaire. The data presented below have not been put under any kind of statistical analysis, and they are shown exclusively to give an immediate but deep understanding of the distribution of certain features investigated in the survey, especially with a comparison between the pre-Covid-19 scenario and the during Covid-19 situation.

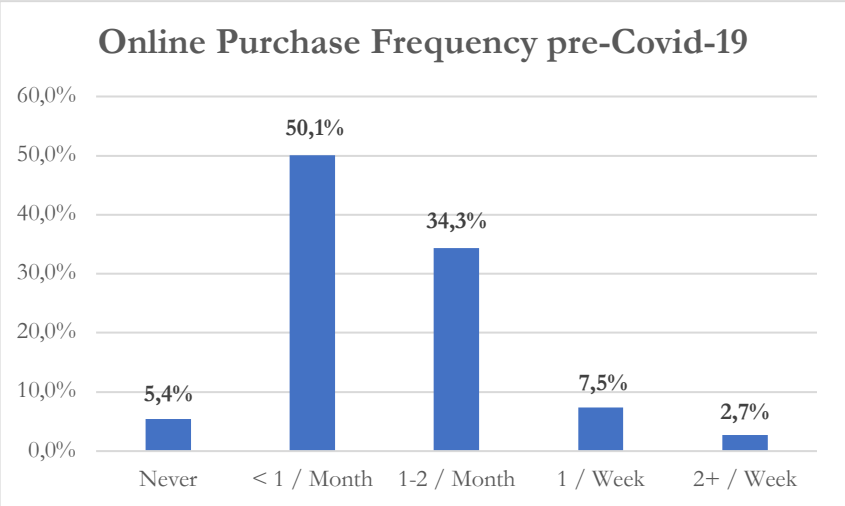

Figure 5 – Distribution of Online Purchase Frequency pre-Covid-19 on 728 survey respondents

Figure 5 shows that the majority of people, roughly half of survey respondents, were used to order online their products less than once a month before the pandemic. The second most numerous segment includes 34,3% of the population, who ordered 1-2 times per months. The rest of the population is distributed into the three remaining groups, who totalized 15,6% altogether. This graph clearly shows the initial tendency of people of not ordering much often through online retailers.

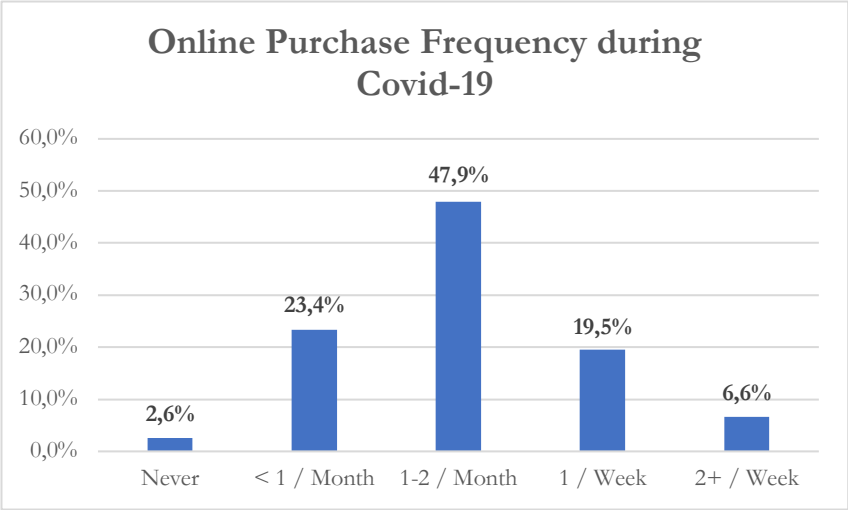

Figure 6 – Distribution of Online Purchase Frequency during Covid-19 on 728 survey respondents

Figure 6 shows how that tendency changed with the advent of Covid-19. The frequency shifted evidently towards an increased and heavier usage of E-Commerce, with the population ordering more than once per month surging from 44,5% in the pre-Covid-19 era to a 74% in the Covid-19 months. Moreover, the percentage of people never ordering through online channels decreased more than 50%. This is a clear sign that Covid-19 enhanced the usage of online channels in Italy, as also proved by the statistical tests in the previous section.

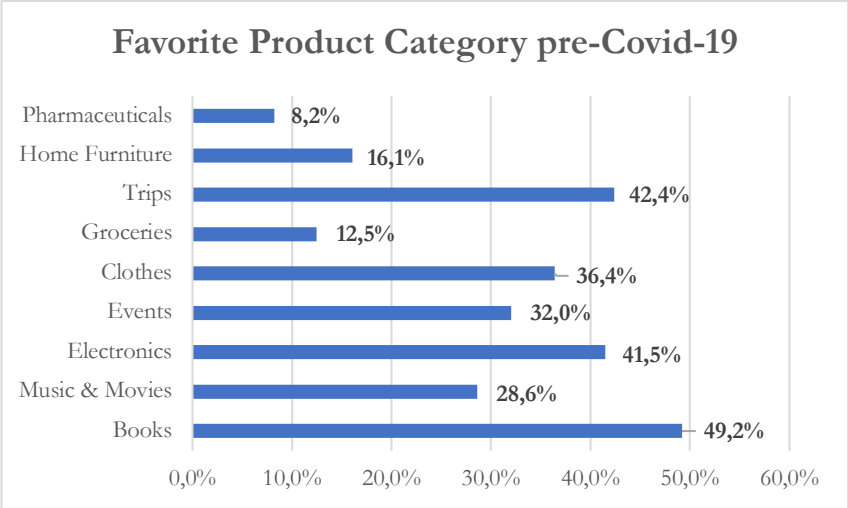

Figure 7 – Distribution of Favorite Product Category pre-Covid-19 on 728 survey respondents

Figure 7 shows the favorite products in the pre-Covid-19 era. Every survey respondent could choose more than one category, that is why the percentage summed up to an amount greater than 100%. It is evident how the favorite categories were once Books and Trips, with respectively 49,2% and 42,4% of survey respondents indicating them as their favorite categories. Follows Electronics, with 41,5%, with Clothes and Events behind at 36,4% and 32% respectively. Grocery and Pharmaceuticals take the two last positions, with only 12,5% and 8,2% indicating them as their first categories of choice.

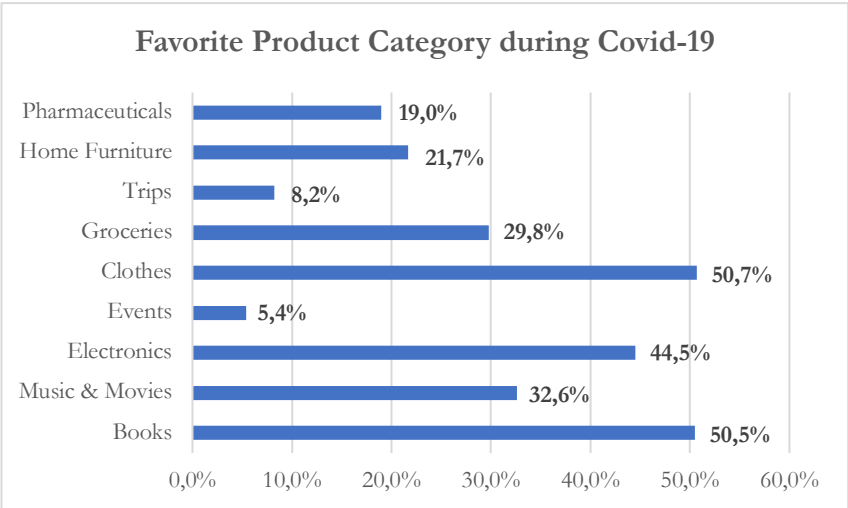

Figure 8 – Distribution of Favorite Product Category during Covid-19 on 728 survey respondents

Figure 8 shows that the favorite product categories have shifted dramatically with the arise of the pandemic. Books remains a dominant category, passing from 49,2% to 50,5%. Clothes surges aggressively from 36,4% to 50,7%, corroborating the statistical tests indicating that people started ordering more clothes online and appreciated the service. Trips fell from 42,4% to 8,2% for obvious reasons, as well as Events experiencing a huge decrease from 32% to 5,4%. Electronics stays high but the true newcomer Grocery, flying from 12,5% to 29,8%, and Pharmaceuticals, rising from 8,2% to 19%. It appears evident how the new lifestyle imposed by Covid-19 shaped consumers' needs and subsequently shopping preference.

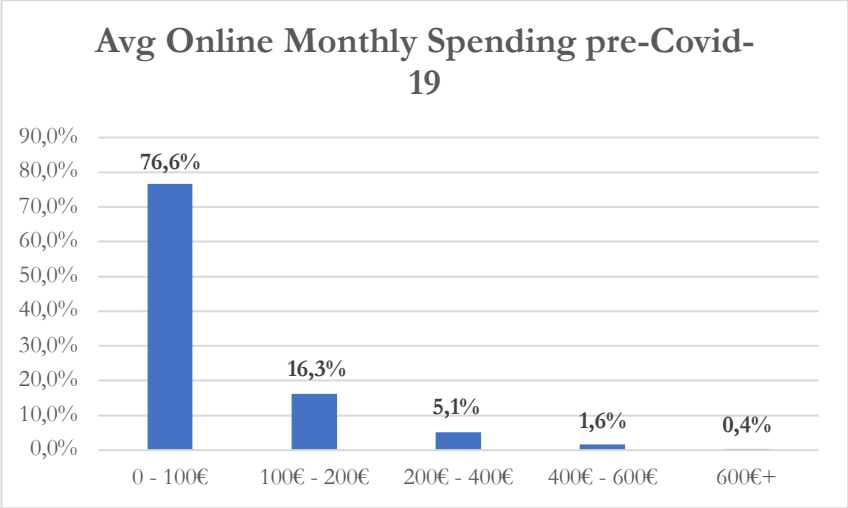

Figure 9 – Distribution of Average Online Monthly Spending pre-Covid-19 on 728 survey respondents

Figure 9 shows that in the pre-Covid-19 era they were not used to spend a lot of money on online retailers. This probably goes along with the low frequency showed in Figure 5. 76,6% used to spend less than 100 € per month, with 16,3% spending between 100 10 and 200 € per month. This leaves only 7,1% of survey respondent with a level of spending greater than 200 €. This trend as stated is probably connected to the fact that the vast majority of people was used to order online less than once a month, and this frequency cannot certainly lead to huge level of spending.

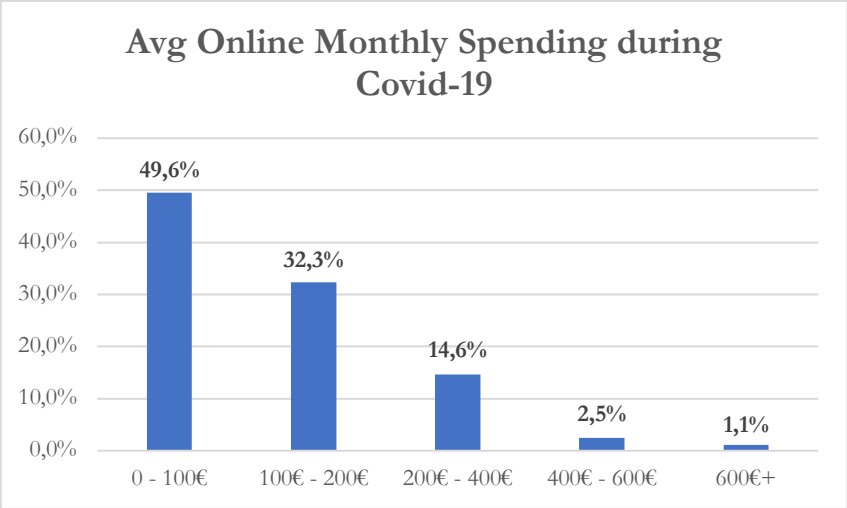

Figure 10 – Distribution of Average Online Monthly Spending during Covid-19 on 728 survey respondents

Figure 10 shows how the Average Monthly Spending changed with the advent of Covid-19. The share of people spending more than 200€ per month surged from 7,1% to 18,2%. Also the people spending between 100€ and 200€ rose from 16,3% to 32,3%. This is probably due at the increased usage of online channels, as shown in Figure 6. With the frequency augmenting that much, it is nothing but normal that also the spending increased in a similar way.

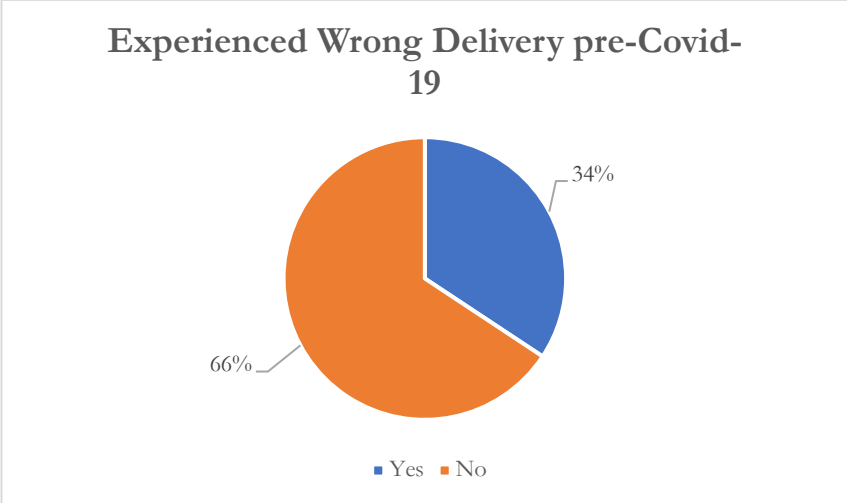

Figure 11 – Distribution of Experienced Wrong Delivery pre-Covid-19 on 728 survey respondents

Figure 11 shows the distribution of survey respondents having experienced a wrong delivery in the pre-Covid-19 era. Wrong delivery means receiving the right product in bad conditions, such as damaged, or receiving the wrong product, that is a different product than the one ordered. It is clear that only 34% of survey respondent ever experienced a wrong delivery in their life as E-Commerce users, while the majority of them never experienced one.

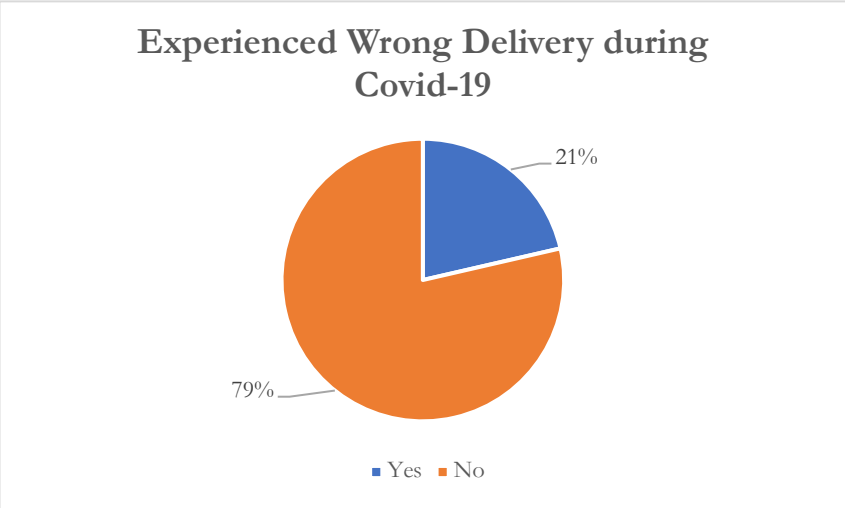

Figure 12 – Distribution of Experienced Wrong Delivery during Covid-19 on 728 survey respondents

Figure 12 shows the distribution of people who experienced a wrong delivery during the Covid-19 months. Surprisingly, only 21% have received a wrong delivery compared to the 34% of survey respondents who experienced one before Covid-19. Of course, the timespan of the two different scenarios is different, and the pre-Covid-19 era lasted years compared to the single year of the Covid-19 scenario. Nonetheless, it is reassuring that the share of people experiencing a wrong delivery is smaller now than before.

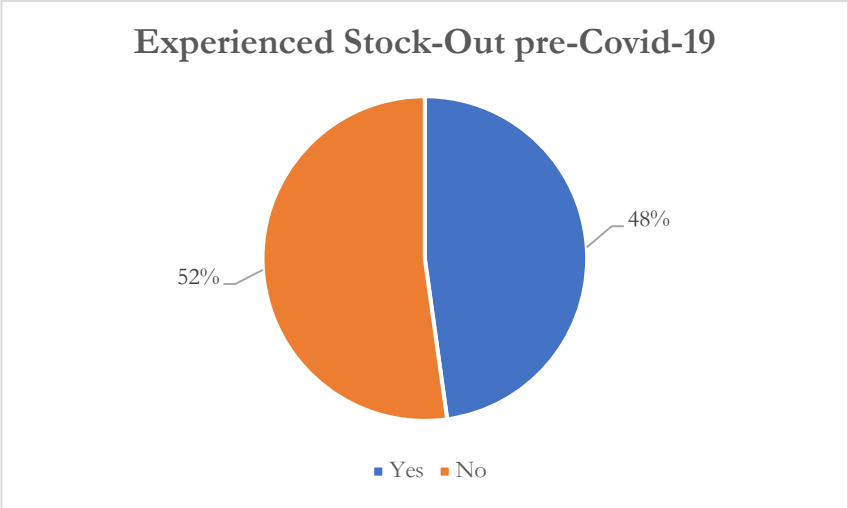

Figure 13 – Distribution of Experienced Stock-Out pre-Covid-19 on 728 survey respondents

Figure 13 shows the distribution of Stock-Outs pre-Covid-19. Stock-Out is the circumstance when a particular product is not available for purchasing because to stock is empty and the retailer does not have any more item on the shelf or in the warehouse. It is a feature that help identifying the efficiency of the value chains, just as the wrong delivery feature investigated before. 52% of the respondents never experienced a stock-out before Covid-19, opposed to 48% of the survey participants who experienced at least once a stock-out.

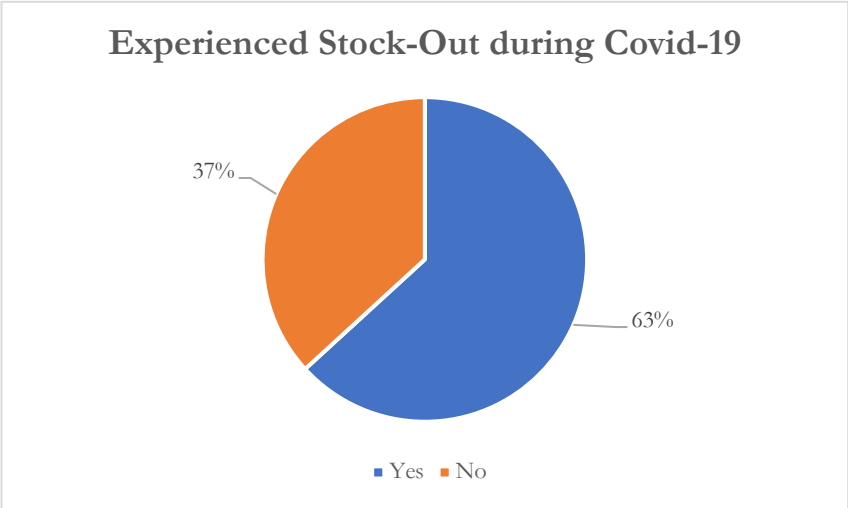

Figure 14 – Distribution of Experienced Stock-Out during Covid-19 on 728 survey respondents

Figure 14 shows the distribution of experienced stock-out during the Covid-19 year. The situation changed dramatically compared to the previous graph, with the people having experienced at least one stock-out surging from 48% to 63%. This is of course to impute to the extreme conditions Covid-19 put the population under in the first months of lockdown. Unfortunately it seems that online retailers have not been able to avoid several stock-out during that phase. For more detailed information about which product went in stock-out, see the graphs below.

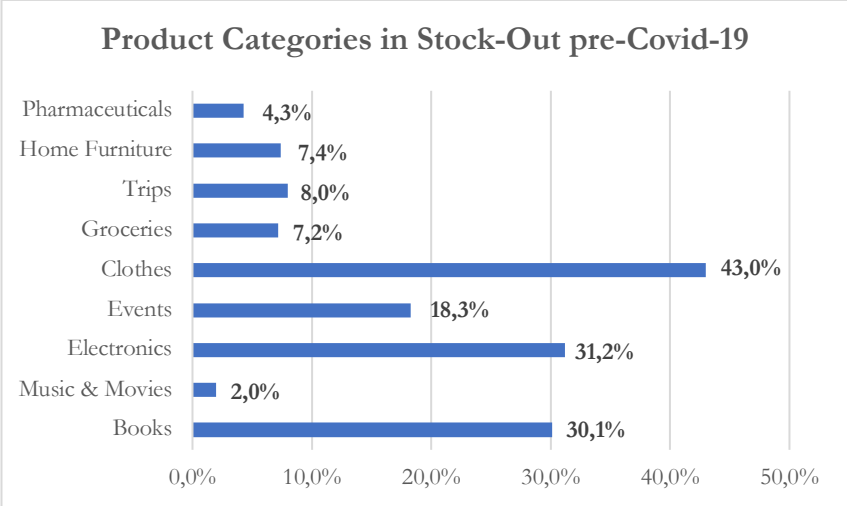

Figure 15- Distribution of Product Categories in Stock-Out pre-Covid-19 on 728 survey respondents

Figure 15 shows the main categories interested in the stock-out phenomenon in the phase pre-Covid-19. The main one is Clothes, with 43% of survey respondents. Follow Electronics and Books, respectively with 31,2% and 30,1%. The last categories are Groceries and Pharmaceuticals, with 7,2% and 4,3% respectively of survey respondents addressing them as first categories of stock-out. Respondents have been allowed to choose more than one category each, that is why the sum of the percentages does not add up to 100%.

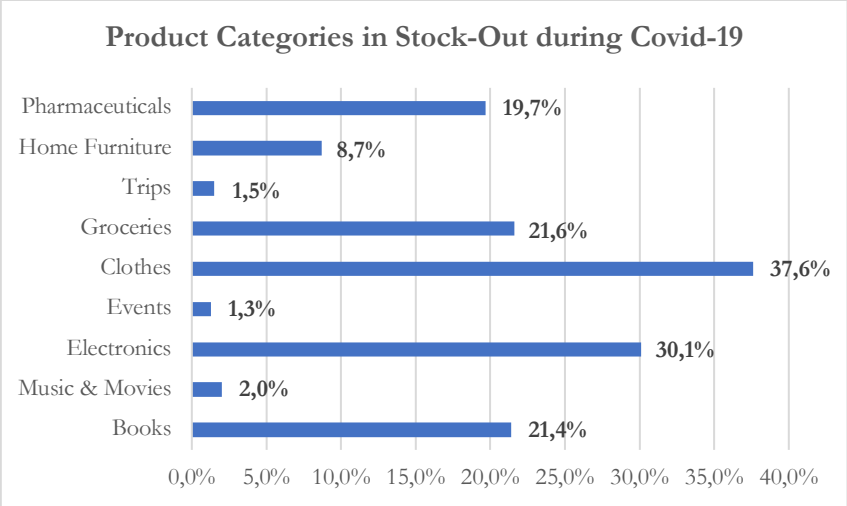

Figure 16 – Distribution of Product Categories in Stock-Out during Covid-19 on 728 survey respondents

Figure 16 shows the distribution of the stock-out of product categories during Covid-19. The first one is Clothes, just as before, declining from 43% to 37,6%. Follow Electronics, with 30,1% compared to 31,2% in the pre-Covid-19 era, remaining stable. Music & Movies remains stable at 2%, while Trips and Events fall from 8% and 18,3% to 1,5% and 1,3% respectively. That is probably because few people are buying this kind of product right now, and with no one buying it does not happen a stock-out. The newcomer are, just as before, Groceries and Pharmaceuticals, flying from 7,2% and 4,3% to 21,6% and 19,7% respectively. This fact is probably connected to the fact that Groceries and Pharmaceuticals are also the two product categories who have risen the most in customers preferences, and probably retailers were not prepared to satisfy such a huge demand, leading to several stock-out mainly in the first months of lockdown.

	Online Purchase Frequency				
	Never	< 1 / Month	1/2 / Month	1 / Week	2+ / Week
Pre-Covid-19	5,4%	50,1%	34,3%	7,5%	2,7%
During Covid-19	2,6%	23,4%	47,9%	19,5%	6,6%
	Favorite Product Category				
	Books	Trips	Events	Pharma	Groceries
Pre-Covid-19	49,2%	42,4%	32%	8,2%	12,5%
During Covid-19	50,5%	8,2%	5,4%	19%	29,8%
	Average Online Monthly Spending				
	0-100€	100€ - 200€	200€ - 400€	400€ - 600€	600€+
Pre-Covid-19	76,6%	6,3%	5,1%	1,6%	0,4%
During Covid-19	49,6%	32,3%	14,6%	2,5%	1,1%
	Experienced Wrong Delivery				
	Yes			No	
Pre-Covid-19	34%			66%	
During Covid-19	21%			79%	
	Experienced Stock-Out				
	Yes			No	
Pre-Covid-19	48%			52%	
During Covid-19	63%			37%	
	Product Categories in Stock-Out				
	Books	Trips	Events	Pharma	Groceries
Pre-Covid-19	30,1%	8%	18,3%	4,3%	7,2%
During Covid-19	21,4%	1,5%	1,3%	19,7%	21,6%

Table 19 – Empirical Analysis Results Summarized

4. Conclusions

This section analyzes the results presented in the previous section to draft meaningful and data-driven conclusions. The concepts here expressed are the consequence of the entire process showed in this paper and are to be taken as the final considerations promoted by this research. The section then presents the main limitations of this study, allowing and encouraging for further investigations who could overcome these constraints. The final section shows some ideas on future direction of the research, so to guarantee a complete analysis of the topic investigated.

4.1 Implications of Thesis Work

This study is among the first to provide a statistical analysis about how current pandemic impacted consumers' E-Commerce behaviors from both an operational and customers' point of views. It collected data through a survey who reached 728 respondents leveraging sampling techniques such as Cluster Random and Snowball samplings. The data collected have then been analyzed using the Kruskal-Wallis test, a useful statistical method to assess whether different groups of a population come from a different distribution by studying their medians. The analysis conducted on 40 different statistical tests led to some interesting results and insights about how consumers engaged with E-Commerce during the crisis and how online retailers' supply chain coped with the pandemic. Customers who were already familiar with E-Commerce and used it quite often even before the pandemic further strengthened their loyalty in terms of satisfaction about delivery service and their opinion about online shopping changed for the better. On the other hand, customers who never used E-Commerce before the pandemic plan on going back to their old habits as the pandemic subsides. This is consistent with the trend observed when looking at the customers' purchasing frequency during the pandemic; the most loyal customers claimed to be extremely satisfied with E-Commerce delivery systems, and also the second most loyal segment indicated that their opinion towards online shopping changed positively. Consumers who use online shopping mainly for Trips & Events have not been satisfied with E-Commerce services during the lockdown and they claim they won't increase their online purchases when the pandemic subsides, as well as the buyers of Music & Movies. On the contrary, people who use online retailers to buy Clothes during the lockdown indicated that their opinion about E-Commerce changed for the better after this experience. People who used to spend a lot of money in online shopping even before the pandemic have been satisfied with the services during the lockdown, have changed their opinion about E-Commerce positively and claim that they are going to keep these new shopping habits even when the pandemic subsides. People who did not spend much money on E-Commerce websites

before the pandemic indicate that they are going to do more online purchasing in the future. Elderly have not been satisfied with online retailers delivery systems during the pandemic and claim that they are going back to their old offline habits as soon as they can. Moreover, they did not increase much their online shopping purchases during the lockdown. Small households, like singles or couple, claimed that they did not practice more online shopping during the lockdown than usual. It is also worth no notice from the aggregated data that both the frequency and the average spending on purchases from online retailers rose dramatically over the last year, according to survey respondents. The preferred categories bought online saw some major changes, with the fall of Trips and Events and the rise of Pharmaceuticals, Groceries and Clothes. These three latter categories are also the ones who went more often in stock-out during the lockdown, according to respondents. Delivery services have however been efficient since few customers experienced episodes of wrong delivery over the past year.

4.2 Limitations

This study, as comprehensive as it can be, could not cover the topic of the impact of Covid-19 on consumers' online shopping behavior in its entirety. The research has been conducted on respondents coming from a single region, Piedmont, Italy. It would be more thorough to perform a statistical analysis countrywide to better assess the macro trends of E-Commerce on the entire Italian population. This could shed some light about different attitude towards E-Commerce across different regions or parts of the country. Aside from the population investigated through the survey, the statistical analysis itself have investigated the issue mainly from an operational point of view in terms of customer perception. Surveying companies about the same argument could complete the picture started with this research. Moreover, companies could provide a different kind of insights related to their supply chains, especially on the manufacturers side. This kind of information is not available to customers and therefore have not been studied in this paper. For what concerns the consumers' side, this study did not investigate which are customers' favorite online retailers. This could be a useful piece of information to determine which platforms customers trust the most and which ones they find unreliable. Moreover, this study could not focus on the consumers' E-Commerce behaviors after the pandemic, since this research has been conducted while Covid-19 is still an important part of people lifestyle. It would be interesting to have the possibility to analyze customers' thoughts about E-Commerce when the pandemic subsides.

4.3 Future Research Directions

This research represents a good starting point in the study of how consumers' behavior towards E-Commerce evolved during the pandemic. It collected enough data to perform interesting statistical analysis and provided some relevant insights about the topic under study. The future researches should focus on analyzing the same issues from companies' point of view, in order to assess how they experienced the same issues investigated in this topic, especially from an operational point of view and value chain efficiency perspective. Moreover, it would be extremely interesting to perform a similar study when the pandemic subsides, so to have a clear picture of the three different scenarios, pre, during and post Covid-19. This could provide further insights about consumers' behavior evolution towards E-Commerce and establish a complete timeline of their shopping habits' transformation.

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Appendix

Sezione 1

Esperienze di acquisto online

Rispondi alle seguenti domande circa le tue esperienze di acquisto online prima e durante l'esplosione della pandemia.

1. Con che frequenza facevi acquisti online prima della pandemia? *

- ☐ Mai
- ☐ Meno di una volta al mese
- ☐ 1-2 volte al mese
- ☐ 1 volta a settimana
- ☐ 2+ volte a settimana

2. Se hai risposto 'Mai' alla domanda precedente, c'è un motivo specifico per cui non facevi acquisti online?

3. Con che frequenza fai acquisti online durante la pandemia? *

- ☐ Mai
- ☐ Meno di una volta al mese
- ☐ 1-2 volte al mese
- ☐ 1 volta a settimana
- ☐ 2+ volte a settimana

4. Se hai risposto 'Mai' alla domanda precedente, c'è un motivo specifico per cui non fai acquisti online?

5. Quali categorie merceologiche acquistavi più frequentemente su Internet prima della pandemia? *

- ☐ Libri (cartacei e non)
- ☐ Musica & Film (attraverso piattaforme come Netflix, iTunes, …)
- ☐ Articoli elettronici (smartphone, computer, …)
- ☐ Eventi (concerti, mostre, opere teatrali, …)
- ☐ Vestiti ed accessori
- ☐ Generi alimentari
- ☐ Viaggi (biglietti aerei, hotel, …)
- ☐ Elettrodomestici (tv, aspirapolvere, …)
- ☐ Prodotti farmaceutici (dispositivi di protezione individuale, …)
- ☐ Altro ...

Exhibit 1a – First section questionnaire (1st page)

6. Quali categorie merceologiche acquisti più frequentemente su Internet durante la pandemia? *

- ☐ Libri (cartacei e non)
- ☐ Musica & Film (attraverso piattaforme come Netflix, iTunes, …)
- ☐ Articoli elettronici (smartphone, computer, …)
- ☐ Eventi (concerti, mostre, opere teatrali, …)
- ☐ Vestiti ed accessori
- ☐ Generi alimentari
- ☐ Viaggi (biglietti aerei, hotel, …)
- ☐ Elettrodomestici (tv, aspirapolvere, …)
- ☐ Prodotti farmaceutici (dispositivi di protezione individuale, …)

Altro ...

7. A quanto ammontava la spesa media mensile per i tuoi acquisti online prima della pandemia? *

- ☐ 0 - 100€
- ☐ 100€ - 200€
- ☐ 200€ - 400€
- ☐ 400€ - 600€
- ☐ 600€ +

8. A quanto ammonta la spesa media mensile per i tuoi acquisti online durante la pandemia? *

- ☐ 0 - 100€
- ☐ 100€ - 200€
- ☐ 200€ - 400€
- ☐ 400€ - 600€
- ☐ 600€ +

Exhibit 1b – First section questionnaire (2nd page)

Sezione 2

Esperienze di consegna

Rispondi alle seguenti domande circa le tue esperienze di consegna prima e durante l'esplosione della pandemia.

1. **Ti era mai capitato prima della pandemia di acquistare un prodotto online per poi riceverlo danneggiato o ricevere un prodotto diverso da quello che avevi acquistato? ***

☐ Si
☐ No

2. **Ti è mai capitato durante la pandemia di acquistare un prodotto online per poi riceverlo danneggiato o ricevere un prodotto diverso da quello che hai acquistato?? ***

☐ Si
☐ No

3. **Prima della pandemia ti eri mai imbattuto in prodotti non disponibili (scorte esaurite) nei tuoi acquisti online? ***

☐ Si
☐ No

4. **Se hai risposto 'Si' alla domanda precedente, a quale categoria merceologica appartenevano i prodotti non disponibili?**

☐ Libri (cartacei e non)
☐ Musica & Film (attraverso piattaforme come Netflix, iTunes, …)
☐ Articoli elettronici (smartphone, computer, …)
☐ Eventi (concerti, mostre, opere teatrali, …)
☐ Vestiti ed accessori
☐ Generi alimentari
☐ Viaggi (biglietti aerei, hotel, …)
☐ Elettrodomestici (tv, aspirapolvere, …)
☐ Prodotti farmaceutici (dispositivi di protezione individuale, …)

Altro ...

5. **Durante la pandemia ti sei mai imbattuto in prodotti non disponibili (scorte esaurite) nei tuoi acquisti online? ***

☐ Si
☐ No

Exhibit 1c – Second section questionnaire (1st page)

6. **Se hai risposto 'Si' alla domanda precedente, a quale categoria merceologica appartenevano i prodotti non disponibili?**

☐ Libri (cartacei e non)
☐ Musica & Film (attraverso piattaforme come Netflix, iTunes, …)
☐ Articoli elettronici (smartphone, computer, …)
☐ Eventi (concerti, mostre, opere teatrali, …)
☐ Vestiti ed accessori
☐ Generi alimentari
☐ Viaggi (biglietti aerei, hotel, …)
☐ Elettrodomestici (tv, aspirapolvere, …)
☐ Prodotti farmaceutici (dispositivi di protezione individuale, …)
☐ Altro ...

7. **Quanto ti ritieni soddisfatto dei servizi di consegna di prodotti acquistati online sperimentati durante la pandemia?** *

	1	**2**	**3**	**4**	**5**	
Per niente soddisfatto	☐	☐	☐	☐	☐	Estremamente soddisfatto

Exhibit 1d – Second section questionnaire (2nd page)

Sezione 3

Abitudini di e-commerce & Covid-19

Rispondi alle seguenti domande circa il tuo attuale rapporto con lo shopping online.

1. **La mia opinione sullo shopping online è cambiata in positivo in seguito alla pandemia Covid-19.** *

	1	2	3	4	5	
Per niente d'accordo	☐	☐	☐	☐	☐	Estremamente d'accordo

2. **L'esplosione della pandemia Covid-19 ha portato ad un aumento dei miei acquisti online.** *

	1	2	3	4	5	
Per niente d'accordo	☐	☐	☐	☐	☐	Estremamente d'accordo

3. **Al termine della crisi manterrò le nuove abitudini di acquisto online acquisite durante la quarantena.** *

	1	2	3	4	5	
Per niente d'accordo	☐	☐	☐	☐	☐	Estremamente d'accordo

Exhibit 1e – Third section questionnaire

Sezione 4

Domande Demografiche

Rispondi alle seguenti domande demografiche in forma anonima.

1. A quale fascia d'età appartieni? *

- ☐ 0-18
- ☐ 19-35
- ☐ 36-49
- ☐ 50-69
- ☐ 70+

2. Qual è il titolo di istruzione più alto che hai conseguito? *

- ☐ Diploma di Scuola Secondaria di I Grado (Scuola Media)
- ☐ Diploma di Scuola Secondaria di II Grado (Liceo/Istituto Tecnico o Professionale)
- ☐ Laurea Triennale
- ☐ Laurea Magistrale
- ☐ Dottorato di Ricerca

3. A quanto ammonta il tuo reddito familiare? *

- ☐ 0 – 25.000€
- ☐ 25.000€ – 50.000€
- ☐ 50.000€ – 75.000€
- ☐ 75.000€ – 100.000€
- ☐ 100.000€ +
- ☐ Preferisco non rispondere

4. Di quanti membri è composto il tuo nucleo familiare? *

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5+

Exhibit 1f – Fourth section questionnaire

Descriptive Statistics

Frequenza acquisti online pre-C	N	Median	Mean Rank	Z-Value
1 volta a settimana	54	4	435,9	2,59
1-2 volte al mese	254	4	367,1	0,25
2+ volte a settimana	20	5	426,7	1,34
Mai	34	4	261,2	-2,93
Meno di una volta al mese	366	4	358,3	-0,80
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	16,54	0,002
Adjusted for ties	4	20,25	0,000

Exhibit 2 - Soddisfazione servizi di consegna durante Covid-19 vs Frequenza acquisti online pre-Covid-19

Descriptive Statistics

Frequenza acquisti online pre-C	N	Median	Mean Rank	Z-Value
1 volta a settimana	54	4	461,7	3,53
1-2 volte al mese	250	3	354,3	-0,95
2+ volte a settimana	20	3	349,7	-0,32
Mai	39	3	296,3	-2,08
Meno di una volta al mese	365	3	365,2	0,09
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	16,33	0,003
Adjusted for ties	4	18,05	0,001

Exhibit 3 -Opinione online shopping cambiata in positivo dopo il Covid-19 vs Frequenza acquisti online pre-Covid-19

Descriptive Statistics

Frequenza acquisti online pre-C	N	Median	Mean Rank	Z-Value
1 volta a settimana	54	4,0	414,1	1,80
1-2 volte al mese	250	4,0	371,6	0,66
2+ volte a settimana	20	3,5	293,9	-1,52
Mai	39	3,0	301,7	-1,92
Meno di una volta al mese	365	4,0	362,9	-0,21
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	9,04	0,060
Adjusted for ties	4	9,58	0,048

Exhibit 4 -Aumentato acquisti online in seguito al Covid-19 vs Frequenza acquisti online pre-Covid-19

Descriptive Statistics

Frequenza acquisti online pre-C	N	Median	Mean Rank	Z-Value
1 volta a settimana	54	3	473,5	3,96
1-2 volte al mese	250	3	407,0	3,95
2+ volte a settimana	20	4	496,4	2,85
Mai	39	2	211,1	-4,68
Meno di una volta al mese	365	3	328,4	-4,64
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	64,12	0,000
Adjusted for ties	4	69,94	0,000

Exhibit 5 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Frequenza acquisti online pre-Covid-19

Descriptive Statistics

Frequenza acquisti online duran	N	Median	Mean Rank	Z-Value
1 volta a settimana	141	4	410,5	2,89
1-2 volte al mese	352	4	356,2	-1,03
2+ volte a settimana	47	5	466,9	3,45
Mai	12	3	199,3	-2,74
Meno di una volta al mese	176	4	328,2	-2,63
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	31,09	0,000
Adjusted for ties	4	37,78	0,000

Exhibit 6 - Soddisfazione servizi di consegna durante Covid-19 vs Frequenza acquisti online durante Covid-19

Descriptive Statistics

Frequenza acquisti online duran	N	Median	Mean Rank	Z-Value
1 volta a settimana	141	4	427,6	3,97
1-2 volte al mese	352	3	372,9	1,04
2+ volte a settimana	47	4	446,6	2,77
Mai	12	2	243,1	-2,02
Meno di una volta al mese	176	3	283,5	-5,87
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	50,50	0,000
Adjusted for ties	4	55,89	0,000

Exhibit 7 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Frequenza acquisti online durante Covid-19

Descriptive Statistics

Frequenza acquisti online duran	N	Median	Mean Rank	Z-Value
1 volta a settimana	141	4	461,5	6,10
1-2 volte al mese	352	4	386,6	2,74
2+ volte a settimana	47	4	455,3	3,06
Mai	12	1	95,2	-4,47
Meno di una volta al mese	176	3	236,8	-9,25
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	127,27	0,000
Adjusted for ties	4	134,91	0,000

Exhibit 8 - Aumentato acquisti online in seguito al Covid-19 vs Frequenza acquisti online durante Covid-19

Descriptive Statistics

Frequenza acquisti online duran	N	Median	Mean Rank	Z-Value
1 volta a settimana	142	3	424,3	3,78
1-2 volte al mese	349	3	369,5	0,61
2+ volte a settimana	48	4	504,0	4,75
Mai	19	1	214,1	-3,16
Meno di una volta al mese	170	3	281,8	-5,86
Overall	728		364,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	68,83	0,000
Adjusted for ties	4	75,07	0,000

Exhibit 9 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Frequenza acquisti online durante Covid-19

Descriptive Statistics

Categorie preferite pre-Covid19	N	Median	Mean Rank	Z-Value
Articoli Elettronici	108	4	345,5	-0,45
Libri	358	4	363,2	1,28
Musica & Film	89	4	347,7	-0,28
Vari	24	4	336,4	-0,42
Vestiti & Accessori	68	4	358,2	0,20
Viaggi & Eventi	59	4	319,6	-1,33
Overall	706		353,5	

Vari = Vari + Generi Alimentari + Prodotti Farmaceutici

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	2,88	0,718
Adjusted for ties	5	3,55	0,616

Exhibit 10 - Soddisfazione servizi di consegna durante Covid-19 vs Categorie preferite pre-Covid-19

Descriptive Statistics

Categorie preferite pre-Covid19	N	Median	Mean Rank	Z-Value
Articoli Elettronici	108	3	372,3	0,90
Libri	358	3	356,7	0,10
Musica & Film	90	3	347,0	-0,45
Vari	26	3	335,1	-0,53
Vestiti & Accessori	68	3	374,3	0,77
Viaggi & Eventi	61	3	324,6	-1,25
Overall	711		356,0	

Vari = Vari + Generi Alimentari + Prodotti Farmaceutici

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	3,09	0,686
Adjusted for ties	5	3,43	0,635

Exhibit 11 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Categorie preferite pre-Covid-19

Descriptive Statistics

Categorie preferite pre-Covid19	N	Median	Mean Rank	Z-Value
Articoli Elettronici	108	4	354,8	-0,06
Libri	358	4	361,6	0,73
Musica & Film	90	4	353,1	-0,14
Vari	26	4	357,3	0,03
Vestiti & Accessori	68	4	371,7	0,66
Viaggi & Eventi	61	4	311,7	-1,76
Overall	711		356,0	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	3,51	0,621
Adjusted for ties	5	3,73	0,589

Exhibit 12 - Aumentato acquisti online in seguito al Covid-19 vs Categorie preferite pre-Covid-19

Descriptive Statistics

Categorie preferite pre-Covid19	N	Median	Mean Rank	Z-Value
Articoli Elettronici	108	3	377,9	1,20
Libri	358	3	356,0	-0,00
Musica & Film	90	3	384,6	1,41
Vari	26	3	352,0	-0,10
Vestiti & Accessori	68	3	359,3	0,14
Viaggi & Eventi	61	3	273,2	-3,29
Overall	711		356,0	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	12,91	0,024
Adjusted for ties	5	14,12	0,015

Exhibit 13 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Categorie preferite pre-Covid-19

Descriptive Statistics

Categorie preferite durante Cov	N	Median	Mean Rank	Z-Value
Articoli Elettronici	113	4	363,0	0,39
Libri	369	4	354,6	-0,19
Musica & Film	84	4	358,5	0,12
Vari	56	4	349,7	-0,24
Vestiti & Accessori	84	4	362,9	0,33
Viaggi & Eventi	5	3	214,2	-1,55
Overall	711		356,0	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	2,69	0,748
Adjusted for ties	5	3,31	0,653

Exhibit 14 - Soddisfazione servizi di consegna durante Covid-19 vs Categorie preferite durante Covid-19

Descriptive Statistics

Categorie preferite durante Cov	N	Median	Mean Rank	Z-Value
Articoli Elettronici	113	3	349,0	-0,40
Libri	369	3	363,8	1,05
Musica & Film	84	3	309,3	-2,22
Vari	56	3	299,0	-2,16
Vestiti & Accessori	84	4	414,9	2,80
Viaggi & Eventi	5	3	371,7	0,17
Overall	711		356,0	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	16,25	0,006
Adjusted for ties	5	18,02	0,003

Exhibit 15 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Categorie preferite durante Covid-19

Descriptive Statistics

Categorie preferite durante Cov	N	Median	Mean Rank	Z-Value
Articoli Elettronici	113	4,0	338,9	-0,97
Libri	369	4,0	367,1	1,50
Musica & Film	84	3,5	328,2	-1,32
Vari	56	3,5	307,0	-1,86
Vestiti & Accessori	84	4,0	394,6	1,83
Viaggi & Eventi	5	3,0	292,4	-0,69
Overall	711		356,0	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	10,05	0,074
Adjusted for ties	5	10,67	0,058

Exhibit 26 - Aumentato acquisti online in seguito al Covid-19 vs Categorie preferite durante Covid-19

Descriptive Statistics

Categorie preferite durante Cov	N	Median	Mean Rank	Z-Value
Articoli Elettronici	114	3	350,4	-0,37
Libri	368	3	360,6	0,48
Musica & Film	85	3	368,4	0,54
Vari	57	3	333,9	-0,88
Vestiti & Accessori	84	3	363,1	0,29
Viaggi & Eventi	5	2	209,3	-1,61
Overall	713		357,0	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	3,85	0,571
Adjusted for ties	5	4,22	0,518

Exhibit 17 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Categorie preferite durante Covid-19

Descriptive Statistics

Spesa mensile pre-Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	542	4	351,7	-0,89
100€ - 200€	117	4	375,7	1,17
200€ - 400€	37	4	338,9	-0,50
400 - 600€	11	4	346,4	-0,15
600€ +	3	5	496,5	1,19
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	3,01	0,556
Adjusted for ties	4	3,70	0,448

Exhibit 18 - Soddisfazione servizi di consegna durante Covid-19 vs Spesa mensile pre-Covid-19

Descriptive Statistics

Spesa mensile pre-Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	542	3	353,5	-0,46
100€ - 200€	117	3	362,7	0,41
200€ - 400€	37	4	411,0	1,69
400 - 600€	11	3	250,6	-1,71
600€ +	3	2	129,8	-1,91
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	9,41	0,052
Adjusted for ties	4	10,44	0,034

Exhibit 19 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Spesa mensile pre-Covid-19

Descriptive Statistics

Spesa mensile pre-Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	542	4	355,8	0,06
100€ - 200€	117	4	375,1	1,13
200€ - 400€	37	3	326,4	-0,89
400 - 600€	11	3	282,5	-1,19
600€ +	3	1	169,5	-1,57
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	5,67	0,225
Adjusted for ties	4	6,03	0,197

Exhibit 30 - Aumentato acquisti online in seguito al Covid-19 vs Spesa mensile pre-Covid-19

Descriptive Statistics

Spesa mensile pre-Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	542	3	333,6	-5,10
100€ - 200€	117	3	412,6	3,29
200€ - 400€	37	3	448,5	2,83
400 - 600€	11	4	512,0	2,55
600€ +	3	3	357,5	0,02
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	29,23	0,000
Adjusted for ties	4	32,02	0,000

Exhibit 21 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Spesa mensile pre-Covid-19

Descriptive Statistics

Spesa mensile durante Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	346	4	329,7	-3,26
100€ - 200€	233	4	381,1	2,33
200€ - 400€	105	4	375,2	1,07
400 - 600€	18	4	359,9	0,09
600€ +	8	5	454,4	1,37
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	11,94	0,018
Adjusted for ties	4	14,70	0,005

Exhibit 22 - Soddisfazione servizi di consegna durante Covid-19 vs Spesa mensile durante Covid-19

Descriptive Statistics

Spesa mensile durante Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	346	3	309,2	-5,86
100€ - 200€	233	3	395,5	3,63
200€ - 400€	105	4	420,0	3,49
400 - 600€	18	3	370,8	0,32
600€ +	8	3	311,2	-0,61
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	37,33	0,000
Adjusted for ties	4	41,39	0,000

Exhibit 23 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Spesa mensile durante Covid-19

Descriptive Statistics

Spesa mensile durante Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	346	3	283,0	-9,19
100€ - 200€	233	4	421,6	6,00
200€ - 400€	105	4	430,7	4,07
400 - 600€	18	4	433,3	1,63
600€ +	8	4	405,4	0,69
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	84,61	0,000
Adjusted for ties	4	89,87	0,000

Exhibit 24 - Aumentato acquisti online in seguito al Covid-19 vs Spesa mensile durante Covid-19

Descriptive Statistics

Spesa mensile durante Covid19	N	Median	Mean Rank	Z-Value
0 - 100€	346	3	306,3	-6,24
100€ - 200€	233	3	384,1	2,59
200€ - 400€	105	3	412,7	3,09
400 - 600€	18	4	545,1	3,97
600€ +	8	4	476,4	1,68
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	50,77	0,000
Adjusted for ties	4	55,62	0,000

Exhibit 25 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Spesa mensile durante Covid-19

Descriptive Statistics

Fascia d_età	N	Median	Mean Rank	Z-Value
0-18	118	4,0	277,0	-4,56
19-35	345	4,0	347,7	-0,99
36-49	81	4,0	391,1	1,66
50-69	154	4,0	422,9	4,61
70+	12	3,5	247,9	-1,83
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	40,18	0,000
Adjusted for ties	4	49,46	0,000

Exhibit 26 - Soddisfazione servizi di consegna durante Covid-19 vs Fascia d'età

Descriptive Statistics

Fascia d_età	N	Median	Mean Rank	Z-Value
0-18	118	3	343,5	-0,70
19-35	345	3	351,7	-0,48
36-49	81	3	387,3	1,48
50-69	154	3	367,2	0,80
70+	12	3	216,8	-2,36
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	8,47	0,076
Adjusted for ties	4	9,39	0,052

Exhibit 27 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Fascia d'età

Descriptive Statistics

Fascia d_età	N	Median	Mean Rank	Z-Value
0-18	118	3,0	328,1	-1,59
19-35	345	4,0	368,2	1,60
36-49	81	4,0	374,1	0,87
50-69	154	4,0	341,0	-0,99
70+	12	3,5	321,2	-0,58
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	5,21	0,267
Adjusted for ties	4	5,53	0,237

Exhibit 28 - Aumentato acquisti online in seguito al Covid-19 vs Fascia d'età

Descriptive Statistics

Fascia d_età	N	Median	Mean Rank	Z-Value
0-18	118	3,0	306,3	-2,86
19-35	345	3,0	346,6	-1,12
36-49	81	3,0	408,1	2,45
50-69	154	3,0	391,5	2,46
70+	12	2,5	277,9	-1,32
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	19,23	0,001
Adjusted for ties	4	21,07	0,000

Exhibit 29 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Fascia d'età

Descriptive Statistics

Titolo di Istruzione	N	Median	Mean Rank	Z-Value
Diploma di Scuola Secondaria di	118	4	280,1	-4,37
Diploma di Scuola Secondaria di	279	4	368,0	1,31
Dottorato di Ricerca	11	4	312,8	-0,70
Laurea Magistrale	178	4	376,1	1,55
Laurea Triennale	124	4	373,3	1,07
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	20,20	0,000
Adjusted for ties	4	24,87	0,000

Exhibit 30 - Soddisfazione servizi di consegna durante Covid-19 vs Titolo di istruzione

Descriptive Statistics

Titolo di Istruzione	N	Median	Mean Rank	Z-Value
Diploma di Scuola Secondaria di	118	3	326,7	-1,67
Diploma di Scuola Secondaria di	279	3	381,5	2,72
Dottorato di Ricerca	11	3	366,0	0,17
Laurea Magistrale	178	3	345,0	-0,79
Laurea Triennale	124	3	338,6	-1,01
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	8,15	0,086
Adjusted for ties	4	9,03	0,060

Exhibit 31 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Titolo di istruzione

Descriptive Statistics

Titolo di Istruzione	N	Median	Mean Rank	Z-Value
Diploma di Scuola Secondaria di	118	3,5	330,6	-1,45
Diploma di Scuola Secondaria di	279	4,0	372,8	1,81
Dottorato di Ricerca	11	4,0	377,5	0,36
Laurea Magistrale	178	4,0	335,3	-1,52
Laurea Triennale	124	4,0	367,3	0,71
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	6,00	0,199
Adjusted for ties	4	6,37	0,173

Exhibit 32 - Aumentato acquisti online in seguito al Covid-19 vs Titolo di istruzione

Descriptive Statistics

Titolo di Istruzione	N	Median	Mean Rank	Z-Value
Diploma di Scuola Secondaria di	118	3	299,1	-3,27
Diploma di Scuola Secondaria di	279	3	354,1	-0,15
Dottorato di Ricerca	11	4	472,7	1,91
Laurea Magistrale	178	3	385,2	2,23
Laurea Triennale	124	3	359,3	0,23
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	16,29	0,003
Adjusted for ties	4	17,85	0,001

Exhibit 33 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Titolo di istruzione

Descriptive Statistics

Reddito familiare	N	Median	Mean Rank	Z-Value
0 - 25.000€	106	4	329,8	-1,40
100.000€ +	24	4	391,3	0,87
25.000€ - 50.000€	198	4	371,8	1,32
50.000€ - 75.000€	100	4	392,9	1,97
75.000€ - 100.000€	41	4	411,9	1,81
Preferisco non rispondere	241	4	324,7	-2,87
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	15,50	0,008
Adjusted for ties	5	19,08	0,002

Exhibit 34 - Soddisfazione servizi di consegna durante Covid-19 vs Reddito familiare

Descriptive Statistics

Reddito familiare	N	Median	Mean Rank	Z-Value
0 - 25.000€	106	3	368,8	0,73
100.000€ +	24	3	308,8	-1,14
25.000€ - 50.000€	198	3	364,1	0,69
50.000€ - 75.000€	100	4	408,7	2,80
75.000€ - 100.000€	41	3	323,3	-1,04
Preferisco non rispondere	241	3	330,6	-2,32
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	13,33	0,020
Adjusted for ties	5	14,78	0,011

Exhibit 35 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Reddito familiare

Descriptive Statistics

Reddito familiare	N	Median	Mean Rank	Z-Value
0 - 25.000€	106	4	350,1	-0,29
100.000€ +	24	4	454,6	2,41
25.000€ - 50.000€	198	4	350,9	-0,38
50.000€ - 75.000€	100	4	384,9	1,55
75.000€ - 100.000€	41	4	375,6	0,65
Preferisco non rispondere	241	4	336,2	-1,80
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	10,36	0,066
Adjusted for ties	5	11,00	0,051

Exhibit 36 - Aumentato acquisti online in seguito al Covid-19 vs Reddito familiare

Descriptive Statistics

Reddito familiare	N	Median	Mean Rank	Z-Value
0 - 25.000€	106	3	351,3	-0,23
100.000€ +	24	3	423,4	1,65
25.000€ - 50.000€	198	3	357,8	0,18
50.000€ - 75.000€	100	3	379,4	1,26
75.000€ - 100.000€	41	3	349,5	-0,19
Preferisco non rispondere	241	3	339,8	-1,46
Overall	710		355,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	5	5,49	0,359
Adjusted for ties	5	6,02	0,305

Exhibit 37 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Reddito familiare

Descriptive Statistics

Membri nucleo familiare	N	Median	Mean Rank	Z-Value
1	48	4	346,1	-0,46
2	82	4	393,7	1,59
3	176	4	358,5	-0,07
4	295	4	358,4	-0,12
5	117	4	345,4	-0,81
Overall	718		359,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	2,99	0,560
Adjusted for ties	4	3,66	0,454

Exhibit 38 - Soddisfazione servizi di consegna durante Covid-19 vs Nucleo Familiare familiar

Descriptive Statistics

Membri nucleo familiare	N	Median	Mean Rank	Z-Value
1	48	3	345,5	-0,49
2	82	3	350,2	-0,43
3	176	3	365,0	0,40
4	295	3	356,1	-0,37
5	117	3	372,2	0,72
Overall	718		359,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	1,03	0,906
Adjusted for ties	4	1,14	0,889

Exhibit 39 - Opinione online shopping cambiata in positivo dopo il Covid-19 vs Nucleo familiare

Descriptive Statistics

Membri nucleo familiare	N	Median	Mean Rank	Z-Value
1	48	3,0	284,2	-2,60
2	82	3,5	355,5	-0,18
3	176	4,0	369,4	0,73
4	295	4,0	378,7	2,07
5	117	4,0	330,0	-1,68
Overall	718		359,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	11,65	0,020
Adjusted for ties	4	12,35	0,015

Exhibit 40 - Aumentato acquisti online in seguito al Covid-19 vs Nucleo familiare

Descriptive Statistics

Membri nucleo familiare	N	Median	Mean Rank	Z-Value
1	48	3	379,6	0,69
2	82	3	397,6	1,77
3	176	3	381,7	1,63
4	295	3	331,5	-3,02
5	117	3	361,9	0,13
Overall	718		359,5	

Test

Null hypothesis H_0: All medians are equal
Alternative hypothesis H_1: At least one median is different

Method	DF	H-Value	P-Value
Not adjusted for ties	4	10,63	0,031
Adjusted for ties	4	11,61	0,020

Exhibit 41 - Manterrò le nuove abitudini di acquisto online acquisite durante la pandemia vs Nucleo familiare