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The Impact of Sharing Economy on Transaction Costs: The comparative case of Uber's platform and traditional taxis

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Master in Business Economics and Competition

Supervisor:
Doctor Professor Vítor Hugo dos Santos Ferreira, Invited Associate Professor
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June, 2023

BUSINESS
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Economics Department

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Acknowledgements

First and foremost, my greatest thanks go to my mom and sister, my biggest support and incentive to go further and be persistent.

To André, for all the times he had to read and discuss this thesis, for all the encouragement, and for making my life happier, a special thank you.

A last word of thanks to Prof. Vítor Ferreira and Prof. Nádia Simões for all the helpful and critical contributions that were fundamental to the conclusion of this thesis.

Abstract

Although we can say that sharing has existed for as long as mankind, the sharing economy itself has arisen with the development of digital platforms and technological improvements that facilitate sharing behavior. Underlying the premise that people want to use things and not really own them, the sharing economy helps this vision become a reality with a great impact on the reduction of transaction costs.

Understanding the relationship between the sharing economy and transaction costs is the main purpose of this research which has studied the Portuguese population's perception of transaction costs in the sharing economy (Uber) and the traditional market (taxis) with the elaboration of a questionnaire. The statistical analysis of the obtained answers shows that the consumer perceives to have lower transaction costs when choosing the sharing economy over the traditional market, in other words, when choosing Uber over taxis. On top of that, with the development of an econometric model, it was possible to conclude that the perception of transaction costs influences the preference between the sharing economy and the traditional market: the consumer will choose the option that allows him to have lower perceived transaction costs.

Whether it is the decrease in waiting time, the convenience of ordering a car from anywhere, or the decrease in the effort spent on tracking the service, the Uber sharing economy platform presents better features than taxis traditional model, making transaction costs decrease and being more appealing to the consumer.

Keywords: Sharing Economy, Transaction Costs, Consumer, Uber, Taxis
JEL Classification: D23, D61

Resumo

Embora se possa dizer que o ato de partilhar existe há tanto tempo quanto a humanidade, a economia de partilha só surgiu com o desenvolvimento de plataformas digitais e melhorias tecnológicas que facilitam o comportamento de partilha. Considerando a premissa de que as pessoas querem usufruir das coisas e não realmente possuí-las, a economia de partilha ajuda esta visão a tornar-se realidade com um grande impacto na redução dos custos de transação.

Perceber as dinâmicas desta relação é o principal objetivo desta investigação que estudou a perceção da população portuguesa sobre os custos de transação na economia de partilha e no mercado tradicional com a elaboração de um questionário. A análise estatística das respostas mostra que o consumidor perceciona menores custos de transação quando escolhe a economia de partilha em detrimento do mercado tradicional, ou seja, quando escolhe a Uber em vez dos táxis. Para além disso, com o desenvolvimento de um modelo econométrico foi possível concluir que a perceção dos custos de transação influencia a preferência entre a economia de partilha e o mercado tradicional: o consumidor escolherá a opção que lhe permita ter menores custos de transação percecionados.

Quer seja pela diminuição do tempo de espera, pela comodidade de pedir um carro a partir de qualquer lugar ou pela diminuição do esforço na monitorização do serviço, a plataforma da Uber apresenta melhores características do que o modelo tradicional dos táxis, fazendo com que os custos de transação diminuam e seja mais apelativa para o consumidor.

Palavras-chave: Economia de Partilha, Custos de Transação, Consumidor, Uber, Táxis
Classificação JEL: D23, D61

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CHAPTER 1: Introduction

One of the new paradigms of the global economy is based on the concept of sharing economy, where is possible to consume goods and enjoy services without the need for ownership of the resource and paying only for what is enjoyed/used. In a generic way, it can also be defined as the phenomenon of transformation and exploitation of unused or underused assets into productive resources (Botsman & Rogers, 2010).

The massification of digital platforms has been fundamental to the growth of this sharing economy business model, directly connecting the consumer to the service provider and optimizing these business opportunities (Matzler et al., 2015). The growth of these practices represents an innovation that allows reallocating money across the value chain, bringing benefits to consumers (Schor & Fitzmaurice, 2015).

Considering the main features of the sharing economy companies or, more specifically, platforms, such as reputation and feedback system, quickness and accessibility, GPS monitoring, and more information available on your options, all in one place, one can conclude why the sharing economy can be more appealing than the traditional market. Not only it is economically interesting for consumers and customers, but it has also an impact on the supplier perspective, allowing, as well, cost reduction - especially, on transaction costs that can be quite high in the traditional economy, where there are many different intermediaries involved in one single transaction.

Henten & Winderkilde (2015:17) stated that "transaction cost theory is a central theoretical tool to understand the sharing economy", given that the reduction of transaction costs allows the exchange of goods and services between people through online platforms. Munger (2015:189) agrees and defends we will have an economy where "the key value proposition won't be selling products, but selling reductions in transactions costs", which is exactly what sharing economy platforms are already doing.

If we think about transaction costs they have existed as long as economic transactions, that is, they have always existed, although they were only considered and studied in the 20th century. With the introduction of the term by Coase (1937), establishing transaction costs as searching for information, negotiating contracts, or monitoring transactions, and later with the work of Williamson (1985) that provided support for the transaction cost theory, it was considered to have more than just production and transportation costs in a market transaction.

Unlike transaction costs, the sharing economy is a current topic that is expected to keep growing in popularity and evolve in the coming years.[1] When associated with the decrease of transaction costs, powered by the growth of mobile technologies, sharing economy can be a potential key player in changing the way the market works.

Being a recent subject is one of the points that make this theme relevant to be analyzed, but the possible impact that this business model has on transaction costs and market optimization is what makes this topic economically interesting. For individuals, it makes it easier to monetize underutilized assets and to have access to other goods without the need for ownership, and for society as a whole, the more efficient use of resources can promote sustainability and reduce waste.

Therefore, it is important to study and deepen this relationship – which is the main purpose of this thesis. It is intended to explore the dynamics between sharing economy and transaction costs, analyze which factors in sharing economy influence transaction costs and, with that, understand the biggest differences between sharing economy and the traditional market. It is also expected to be able to understand whether the consumer chooses the sharing economy because of perceived decrease in transaction costs.

With the aims described above in mind, the following main questions were defined:

- Do consumers perceive different transaction costs between the traditional market and the sharing economy?
- Do transaction costs influence the preference between the traditional market and the sharing economy?

For obtaining answers to the questions raised a concrete example of a sharing economy company – Uber – and a correspondent example from the traditional market – taxis – were analyzed through an online questionnaire aimed at their users. The questionnaire was elaborated to link the transaction cost – in this thesis, considering the dimensions: of searching, uncertainty, and monitoring - with the characteristics present in the service obtained with Uber and taxis. With a sample of 293 respondents achieved by sharing the survey on social networks, the information collected was statistically analyzed, after ensuring that all the information is viable and added value to the research. Besides the statistical exploration carried out to validate the hypothesis formulated and understand the perception of the consumer, it was also developed an econometric model to study the influence of transaction costs on the choice

[1] PricewaterhouseCoopers conducted a study with growth expectations of the sharing economy until 2025. For more information see https://www.pwc.com/hu/en/kiadvanyok/assets/pdf/sharing-economy-en.pdf

between the sharing economy and the traditional market. The results were optimized using IBM SPSS software tools.

The present work is divided into five sections: the first with the theoretical framework on sharing economy and transaction costs, followed by the description of the methodology that was applied, a brief presentation of the case studies used to explore this theme, the development of the hypothesis under analysis, the survey structure explanation and a section clarifying what methods were used to analyze the data. Finally, the discussion of the results obtained and, in the end, the conclusions about the influence of the sharing economy on the transaction costs and the limitations and possible future improvements of this work.

CHAPTER 2: Literature Review

2.1. Sharing Economy

2.1.1. Defining Sharing Economy

Various attempts to label this emergent phenomenon have appeared, however, there was no clear agreement on the correct definition (Görög, 2018). When searching for the relatively recent term *sharing economy* we found several definitions for these new commercial and consumption practices: *collaborative consumption* (Botsman & Rogers, 2010)*, peer-to-peer activity* (Hamari et al., 2015)*, digital matching firms* (ESA, 2016), *digital economy* (Rinne, 2017), *middleman economy* (Munger, 2018)*, gig economy* (Murillo et al., 2017)*,* and so on.

Lessig (2008:143) described sharing economy as a "collaborative consumption made by the activities of sharing, exchanging, and rental of resources without owning the goods". It emerged from society's need to prioritize access to goods and services rather than their possession, as collaborative consumption, which made sharing more appealing than in the past (Botsman & Rogers, 2010).

Basselier et al. (2018) claimed that it consists of the matching of demand with the supply of underused goods or skills through intermediaries more quickly, efficiently, and on a larger scale, without the change of ownership. Pasimeni (2021) agreed with the ownership topic and added in his narrative that the main characteristic is that goods are used by more than one person, which brings two positive effects: savings and more efficient use of resources.

On the other hand, Belk (2014:11) had a slightly different opinion from the previous authors, by outlining collaborative consumption as "people coordinating the acquisition and distribution of a resource for a fee or other compensation." In this case, there was a direct association between collaborative consumption and recompense. Frenken & Schor (2017) also mentioned the hypothesis of profit in the sharing economy underlining that is perhaps for money the reason why consumers give each other temporary access to their underutilized assets. Rinne (2017) followed the same idea adding that this model improves efficiency, sustainability, and community.

The act of sharing was understood as the process of distributing what is ours for the enjoyment of others and/or the process of receiving something from others for our enjoyment. The ideals of sharing economy enterprises, whose main activity involves market transactions and monetary exchanges, lie in a middle ground, with elements of both sharing and market transactions (Belk, 2014). In general, they allow more efficient use of durable goods and

promote the concept of market exchange, while receiving some profit. However, for Gansky (2010) the focus on access rather than ownership was also presented by these activities, being characteristics of the sharing concept and meeting the middle ground defined earlier by Belk.

There was as well a direct connection between digital platforms and the sharing economy: Frenken & Schor (2017) argued that people lend goods to others that they don't know because the Internet allows a decrease in transaction costs. Although there is no direct intermediary, transactions are only facilitated in the sharing economy due to online platforms – normally, operating on a smartphone or tablet used for communication and service delivery, connecting buyers and sellers to exchange access to resources in return for a monetary or non-monetary reward (Breidbach & Brodie, 2016). Hamari et al. (2015:1) defended it as a "peer-to-peer based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services" and, following the same logic, to Samuel (2015), technologies allowed people to get the goods and services they need from each other, peer to peer, rather than buying from established corporations.

These days, ever more businesses exist online, whether they have a website or an email address. This digital economy, one of the definitions of sharing economy and one of the positive consequences of the Internet, improves economic performance with the help of technology and allows for numerous everyday connections among people, businesses, and devices (Cassar et al. 2010).

The definition provided by Carter (2016:23) was simple but very complete and covers all foundational cores of sharing economy from compensation to digital footprint and access to assets: "The sharing economy is composed of hundreds of online platforms that enable people to turn otherwise unproductive assets into income producing ones." Additionally, he also covered what could be understood as the reason why consumers participate in the sharing economy: the cost-effectiveness, as the consumers are not so much interested in the sharing aspect, but in the economic advantages of this relationship.

Some organizations have also tried to reach a definition of sharing economy: for PricewaterhouseCoopers (2015) was an emergent ecosystem that is upgrading mature business models allowing customers to have access to, rather than ownership, of assets through digital platforms. The OECD (2015) had a similar point of view describing it as an online business specialized in matching demand and supply, enabling direct sales and rentals. The European Commission (2016), on the other side, emphasized that there was no consensual definition.

2.1.2. Business Model

All in all, the sharing economy transactions involve three sides: the provider (or supplier), the user, and the middleman. However, the latter does not work typically as in the capitalistic model (Botsman, 2015), in this case, it is a connector between provider and consumer using matching algorithms and not a company that buys from a supplier and sells to a customer at a higher price - the middleman sells access to the software. With this business model, providers and consumers can increase the value created by their assets, and sometimes they are so efficient that they can become a competition to traditional market players (Wallsten, 2015; Petropoulos, 2016).

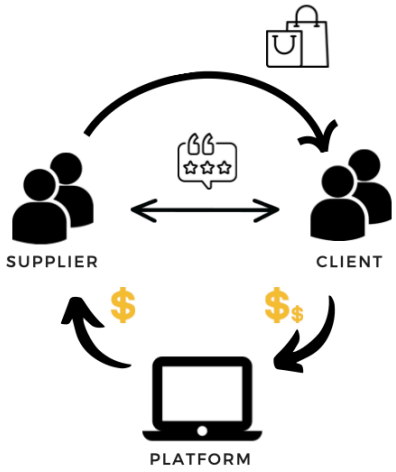

Figure 1 - Sharing economy

Source: Author's elaboration

Munger (2018), unlike other authors mentioned before, denoted a different value proposition between the middleman economy and the sharing economy. The former is the sale of reduced transaction costs, enabling mutually beneficial exchanges that probably would not be conceived in another way, and the second, making better and more efficient use of under-utilized resources modifying the average life of those resources. Although he defined different values, he also recognized the tie between the two threads: the excess capacity combined with the opportunity cost, associated with decreased transaction costs allows the use of an item during the downtime, and with that combination a decrease in the prices.

The Economics and Statistics Administration (ESA) of the US Commerce Department (2016) attempted to define the contours of this emerging economy, labeling its participants as digital matching firms that provide online platforms for matching service providers with customers. In their report, this sector was described with four main characteristics: use of information technology (web-based platforms) to facilitate peer-to-peer transactions in real-

time, depending on rating systems for quality control to ensure a level of trust between parties who have not met, offer service providers flexibility to choose their working hours and rely on them to use their own assets to provide the service.

Using the power of technology to connect at a distance and build trust among strangers through a reputation and feedback system (Görög, 2018), might be one of the greatest advantages of collaborative consumption (Botsman & Rogers, 2010; Pasimeni, 2021). Luca (2011) defined it as an essential part of decision-making, as the risk is diminished through these evaluation mechanisms. These digital platforms can furthermore reduce the considerable transaction costs in peer-to-peer economies, which lowers prices for consumers and makes buying from strangers more appealing.

The idea of running a company without the need to have service-related assets may seem unrealistic, but possible with sharing economy enterprises. As stated before, in this business model the service providers are forced to have the means necessary for the success of the transaction, be it having a car, motorcycle, or an empty room (Wallsten, 2015). This practice not only allows companies to save money but also grants them to have many more assets at their disposal. With that, what remains under their control is booking, fare setting, payment, and brand communications associated with the service (Jenk, 2015). These firms described themselves as technology companies that sell access to an online platform and not as the formal industry that provides the service or product associated.

It was also interesting to compare sharing economy companies with the traditional market, where money is the main resource for ownership and enjoyment of a product or service, while in the sharing economy, it is highlighted the captured value in the short-term access (Daunorienė et al., 2015). There was always sharing among friends and families without an associated payment and this peer-to-peer economy is similar but for a larger market and with an exchange for compensation. In this new model, the greater innovation is the cheaper business transactions compared to a similar transaction where the participants are buying goods and services in the traditional market (Möhlmann, 2015).

2.1.3. Potential Problems

At first sight, the sharing economy might seem to only bring advantages for both customers and suppliers/service providers. However, the growth of these practices generates a debate around the implications for businesses still using traditional models of sales and ownership (Belk, 2014) and the lack of legal regulation, consumer protection, and working conditions (Malhotra & Alstyne, 2014) proves that this concept still has some flaws. Schor (2014) also

highlighted the erosion of workers' rights and the unfair competition between platforms and regular companies, emphasizing the tendency toward monopoly.

Some of the studies related to the sharing economy have focused on the lack of regulation of this type of market (Miller, 2016), which eases growth and resource allocation in comparison to non-sharing economy companies that are regulated and have a larger number of laws and legal requirements to comply with. On one hand, there were those against any intervention: "Excessive legislation and regulation could absorb and neutralize the consumer and efficiency gains produced by technological innovation" and, on the other, there were those who were in favor of some form of regulation: "Attempting a compromise to ensure consumers' protection and safety without stifling innovation" (Codagnone & Martens, 2016:21).

Regarding workers' rights, this topic has been a point of controversy, since the majority of digital matching firm service providers are classified as independent contractors and this type of temporary and flexible contract is currently associated with the gig economy. There is no doubt that the rapid growth of these companies would not have been the same if they were forced to hire all their service providers as employees, and for that reason, for some, it can be seen as a cost-saving matter and an opportunity in the labor market (Murillo et al., 2017). For others, this type of contract creates a bad work situation for the employees, given that they are not eligible to receive the same benefits as full-time workers, such as a minimum wage and overtime pay, which generates income instability (Minter, 2017).

The topic of data protection and security was as well widely discussed considering that this business model is extremely dependent on customer information to be able to adapt its offer to the client's preferences and needs and it can equally be used to facilitate price discrimination against passengers (Yaraghi & Ravi, 2017). As privacy is one of the fundamental human rights, these companies must avoid any exposure of the data collected that might be a threat to their participants' safety (Grotkowska, 2020).

2.2. Transaction Costs

At the beginning of neo-classical economics, it was assumed that all economic agents in the market have full information and that the only costs to be considered were production and transportation. Therefore, there were no transaction costs, given that all the information on prices, quality, and production of the goods was available (Williamson, 2005).

2.2.1. Coase's approach

The assumption of no transaction costs was first modified by Coase (1937) in his paper *The Nature of the Firm* where a real-world perspective was considered, in which hardly all economic agents have complete and equal information. Furthermore, Coase claimed that there were more costs related to market transactions, such as costs of searching for and gathering information, costs of negotiating and concluding contracts, or costs of monitoring and evaluating transactions.

With this approach, the way the market works changed, and for Coase, the origin of the firm rested on lowering the costs of using the price mechanism, in other words, the market. Thus, he advocated two models of coordination of economic activity: the market and the firm, with the choice between the two being made based on the transaction costs associated with each one. That is, the higher the cost of transacting across markets, the greater the advantage of organizing within the firm: "A firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transactions by means of an exchange on the open market or the costs of organizing in another firm" (Coase, 1937:395). It is possible to deduce that variations in transaction costs will affect the make vs. buy management decisions, changing the size of the company and its vertical integrations.

In 1960, Coase revisited this topic in his book *The Problem of Social Cost*, where he reinforced that there were no costless market transactions: "In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on" (Coase, 1960:15). All these steps enumerated by Coase that precede an economic transaction and the control of its correct execution were the transaction costs mentioned in his earlier book.

Coase's two published books were pioneers in the investigation of the costs involved in economic transactions, although the subject only gained relevance after the last one was shared, opening doors for more authors to take the initiative to explore the subject. Arrow (1969), in a more ample way, described transaction costs as all economic system operation costs. For Alchian & Demsetz (1971), those were the costs of defining, exchanging, and protecting property rights, and for North (1992) transaction costs included the effort of measuring the value of goods and services being exchanged.

2.2.2. Williamson's contribution

Following Coase, Williamson later defined the core focus of transaction cost theory on transactions and the costs that attend to completing transactions by one institutional mode rather than another. He recognized transaction costs as the costs of drafting and negotiating an agreement and the costs that arise when contract execution is misaligned because of gaps or errors, in other words, the costs of running the economic system (Williamson, 2005).

Williamson additionally established that these costs were created in the market due to uncertainty, asset specificity, and the frequency with which transactions occur, making vertical integration more efficient than market governance. Uncertainty referred to the unpredictable way in which circumstances change and the existence of asymmetric information. Uncertainty can be reduced, but by its very nature, never eliminated. Asset specificity concerned the extent to which an asset can be reallocated to different uses without losing productive value. It is considered the critical determinant of choice, the keystone to which transaction cost economics owes its predictive content (Williamson, 1985) and when asset specificity was coupled with a high degree of uncertainty, the transaction was even more likely to be organized inside the firm. Frequency was related to the repetition effect, which depended on the transaction being repeated by the same vendor, that is, if a transaction was rarely repeated, it could not be cost-effective to develop it internally, but if it occurred frequently, then it was possible to recover the costs of creating a specialized infrastructure. (Tadelis & Williamson, 2012).

In addition to market or firm-based structures of governance, Williamson noted the existence of intermediate forms of contracting, later recognized as hybrid models, which consisted of the middle ground between the previous two. This idea was explored as a different contractual relationship that could be designed to maintain trading but provided for an additional governance structure. Hybrid organizations thrive when specific relationships are developed among partners while maintaining autonomous ownership (Williamson, 1985).

The transaction costs theory was also impacted by two key assumptions about human behavior that can be summarized as bounded rationality and opportunism. Bounded rationality could be understood as our limited capacity to understand all factors regarding the environment surrounding us and opportunism was related to actions taken in an individual's best interests, which could create mistrust between parties. Those human behaviors were considered the cause of inefficiency in economic allocation, and it was thereby important to organize transactions in order to minimize bounded rationality and the opportunistic conduct (Williamson, 2005).

Based on Williamson's view, Fredikind (2014) described transaction costs as the cost of reaching an agreement and implementing the economic exchange and considered the transaction the unit of analysis being studied in the transaction cost theory. Suematsu (2014) defined transaction as the smallest unit of economic activity and added, as Fredikind, that the activity within companies can be analyzed reflecting the idea of a transaction cost. He also considered connection, presentation, negotiation, exchange, and ex-post processing as elements of a transaction that could increase costs.

2.2.3. The impact of technology

Transaction cost theory has proven to be an important resource for understanding the nature of transactions and the organization of economic activity. In recent years, the theme of transaction costs has continued to be explored, not so much in terms of trying to define what they are, but rather to understand their impact across a variety of industries and institutional settings and possible ways to reduce them. There have been studies relating transaction cost theory to, for example, blockchain management (Schmidt & Wagner, 2019), financial investment (Hennart, 2005), the pharmaceutical industry (Gruchmann, 2023), digital platforms, and so on - the latter was perhaps most associated with this theory. Although the topics described before are quite different from each other, there is one commonality in their studies: technology and digital tools, which are pointed as a path to lower transaction costs.

In Coase´s work, digitally mediated transactions were not even on the horizon, but in Williamson's, the role of technology has already been mentioned. There is no doubt about how information and communication technologies have benefited firms, people, and governments by decreasing the costs of searching for and acquiring information, making decisions, and monitoring transactions (Deichmann et al., 2016). However, the increasing dominance of technology in the economy has also raised numerous questions as to the interaction of organizations and the market-based ecosystem.

Benkler (2006) has highlighted the importance of technology in transactions, Cordella (2009) argued that information technology can be used to reduce transaction costs in different economic organizations and, more recently, Rindfleisch (2020), stated that the increasing pace of technological change will likely have an important influence on the future of transaction cost theory. Clemons et al. (2017), followed the same idea: technologies can reduce ex-ante coordination costs by providing more information available on transaction prices and conditions for all the players in the market. And equally the ex-post costs, having a positive impact on monitoring contract compliance using real-time databases, improving data

availability, and contributing to the reduction of uncertainty (Roeck et al., 2020). On the same path of thought as Clemons et al., Parra-Domínguez et al. (2020) defended that new technologies can, additionally, improve communication, bringing quicker and more effective ways of transmission of information and allowing direct contact with all the parties evolve.

These findings gathered from different authors raised the question of whether the new digital economies, which are heavily dependent on technology, will be a good example of transaction cost decrease. Nagle et al. (2020) tried to understand if the transaction cost theory can also help explain the transactions in the new digital economy considering three related areas: reputation mechanisms, privacy, and non-pecuniary transactions. As stated before, the existence of asymmetric information between parties, which leads to uncertainty in transactions – an idea previously explored in the sharing economy chapter -, can impede the exchange of goods and the respective gains. The reputation mechanisms coupled with digital trace information can help mitigate those concerns and it is expected "less vertical integration in digital markets with well-functioning reputation mechanisms" (Nagle et al., 2020:10). The digital trace of private user information needed for these mechanisms to work well is only possible because users give up some of their privacy in return for access to the service for 'free' – it is considered that consumers pay for using online platforms with their personal information, which is then monetized through advertising. In overview, the ideas presented in this essay are, in part, in line with some of the topics discussed previously in the sharing economy chapter, which lead to the conclusion that transaction costs theory can indeed be considered relevant for the clarification of these new economic models, specifically the sharing economy.

2.3. Sharing Economy and Transaction Costs

As became evident in the first part of this chapter, there have been many research studies dedicated to analyzing the impact of these new business models: some focusing on the factors that promote the sharing economy, others on its users, on the business areas where it is more profitable or even on its regulation, or lack of it. Despite the increase, in recent years, of empirical studies on sharing economy, a small number of papers have studied sharing economy's impact on transaction costs.

Transaction cost theory is a central and important tool to understand the sharing economy, given that the reduction of transaction costs, such as searching and contracting, allows the exchange of goods and services between people through online platforms (Henten & Winderkilde, 2015). In a simpler way, there is also a connection between a class of *shareable*

goods and transaction costs, considering that, when comparing transaction costs and motivation, this class may be better exploited through sharing relationships than through secondary markets (Benkler, 2004).

In the transaction costs section, it was explored the distinction between make vs. buy and a similar relation appears in the sharing economy which is associated with the rent vs. own choice of doing business. A lot of economists have questioned: why do we own instead of rent? It is given the example of a power drill, which nobody really wants to own, but which many people have idle at home because they needed to use it briefly: "I don't need a drill. What I need is a hole in this wall, now, right here" (Munger, 2018:21). This example could be applied to a lot of other things we have unused at home, and it would seem logical to rent a power drill for a few hours rather than buy one, but the problem here is that that transaction involves many costs: transaction costs.

For Munger (2015:189), we will have an economy where "the key value proposition won't be selling products, but selling reductions in transactions costs". What he called the Transaction Cost Revolution will not bring innovation and disruption factors through new and better ways of making things, providing services, or new delivery strategies to new places – as happened in the Neolithic and Industrial Revolutions - but a more intense and better use of existing ones, with less need for ownership - underlying the premise that people want to use things and not really own them. He defended, as Coase did, that transaction costs, due to their nature, cannot be defined clearly, since they depend on particular circumstances such as time, place, and inconvenience for that transaction, but characterizes them as a crucial part of the competition (Munger, 2018).

It is known that transactions are the essence of transaction cost theory, but transactions as we know from the traditional market are becoming more and more digital than physical. The sharing economy has its foundations in technology and digital tools and, as evidenced earlier, these are features that can allow the decrease of transaction costs. Munger (2018) stated that every transaction requires triangulation, transfer, and trust to minimize transaction costs, and those are all solved in sharing platforms due to their characteristics: software platforms, matching algorithms connecting consumers and supplier/service providers, non-physical monetary exchanges, and reputation and feedback systems. More specifically, triangulation is the information about identity and location, a way to coordinate all parties involved in the transaction. The transfer is the delivery of the product and the corresponding payment in a fast, immediate, and digital way. And trust is the reliability that all parties will ensure compliance with the terms of the contract. All these key dimensions increase mutual confidence and process

transparency, which enables risk mitigation for both consumers and suppliers (Frenken & Schor, 2017; Fitzmaurice & Schor, 2015).

The opinion shared by Henten & Winderkilde (2015) and Munger (2018), is also supported by other authors who likewise think the innovation provided by sharing economy companies has considerably contributed to the reduction of transaction costs. Involved in connecting service providers with users, it reduces information uncertainty, increases knowledge, and reduces negotiating costs through the reduction in communications. Uber, Lyft, Airbnb, and Amazon are some of the companies pointed out as real-life examples of the impact that these disruptive businesses have on transaction costs, selling reductions on transaction costs (Hira & Reilly, 2017; Fraiberger & Sundararajan, 2015).

Considering the consumers' perspective, the choice between sharing economy enterprises and the traditional market has raised interest among economists who have tried to interpret the motivation behind that option. The analysis of the experiences of the consumer and the correspondent interpretation of the information collected allowed to conclude that the perceived value from the market is affected by transaction costs (Liang et al., 2021). In the early development of online shopping, Teo & Yu (2005) had similar deductions in their research study using a transaction cost perspective to understand consumers' online buying behavior. Considering the uncertainty and buying frequency and adding to that trust, they established that when consumers perceive less uncertainty in online shopping and have more online experiences, they are more likely to buy online, in other words, when consumers notice lower transaction costs, they are more open to buying online.

More recently, others have attempted to relate the transaction cost theory – considering the dimensions: of frequency, uncertainty, and asset specificity - to the emergence of sharing platforms like Airbnb, to analyze its impact on the traditional market of the hotel industry (Akbar & Tracogna, 2018; Li & Fang, 2022). With the development of hypotheses, the main findings reached were that sharing economy platforms allow better management of uncertainty and consumers perceive different costs related to the transaction.

Although, in theory, it is possible to state that transaction costs decrease in a sharing economy, as demonstrated throughout the literature review chapter, few research studies examine if this statement is true in practice. The examples mentioned above are theory-based to the generality of sharing platforms or specific to one business area, which raises the question of whether it is also possible to obtain the same results if applied to other business areas. It is relevant to understand if the majority of sharing economy firms allow transaction costs to

decrease – from a consumer perspective - compared to the traditional market, that is, to verify if theory coincides with reality.

CHAPTER 3: Methodology

3.1. Applied Methodology

In the first stage, the search for information on the two dominant themes of this thesis: sharing economy and transaction costs, was deepened – which corresponds to the literature review presented. This was an important step since it allowed us to recognize the studies already developed on the issues under analysis, being the starting point for the remaining steps.

According to Marconi & Lakatos (2003:83), "the method is the set of systematic and rational activities that, with greater security and economy, allows the goal to be reached - valid and true knowledge - tracing the path to be followed, detecting errors and helping the scientist's decisions". Hence, from the collected research, empirical studies directly related and relevant to the theme were analyzed in greater detail, in order to settle which were the best methods and strategies to follow for data collection and processing to obtain answers to the formulated research questions: "Do consumers perceive different transaction costs between the traditional market and the sharing economy?" and "Do transaction costs influence the preference between the traditional market and the sharing economy?".

The chosen methodology was based on quantitative analysis, using accurate data collected through the elaboration of a questionnaire, something already applied by other authors, but specifically developed for the questions raised in this thesis. A questionnaire is considered a good tool to compare data through statistical methods and give us the possibility to obtain results that are representative of the population under analysis - although there is awareness of the limitation in defining the sample and that responses can be biased (Evans & Mathur, 2005). This option also allows the anonymity of the participants, the possibility of choosing the most opportune moment to answer, and does not influence their answers (Tourangeau, 2018).

One company operating in the sharing economy (Uber) and an equivalent company from the traditional market (taxis), considering the utility for the consumer, were selected to apply the survey questions to a concrete example - the choice of these businesses will be clarified in section 3.2. The target audience was users of Uber and taxis and not their service providers and at the beginning of the questionnaire there was also a set of demographic questions to characterize the sample under study – the survey applied can be found in the appendices.

The structure of the survey was based on the adaptation of the work developed by other authors - detailed in section 3.4. - to gather a set of comparative characteristics of the two cases under analysis. With the thought of linking those characteristics with the transaction cost, the

dimensions considered were adjusted to the consumer's perspective – as explained in section 3.3.

The questionnaire was elaborated in the Google Forms platform that allows the online sharing of the questionnaires and the corresponding collection of information. Since one of the case studies operates strictly online, sharing the survey online seems appropriate to get relevant information and, accordingly, it was shared on different social media such as Facebook and LinkedIn. As no similar studies were found in Portugal and to simplify the analysis by restricting it to one region, the questionnaire was aimed at users living in Portugal who have already used Uber and taxis. Although this thesis was written in English, the questionnaire was developed and shared in Portuguese, taking into account the target audience explained.

3.2. Case Studies

Considering that a case study seeks to elucidate the features of a population, that is, to represent a population, it was extremely important to choose a good and truly representative case of what was being analyzed (Seawright & Gerring, 2008). That being said, the following points have a brief contextualization of the cases under analysis as well as the reasons that led to their selection.

3.2.1. Uber

In the year 2008, two friends, Travis Kalanick and Garrett Camp, thought it would be nice to be able to get a ride via cell phone through an application after they couldn't find an available taxi at the end of a conference in Paris. In 2009, UberCab is founded and in 2010 the app is born, already with the name reduced to Uber. In the early days, it was only possible to request a black luxury car, offering a premium service, with prices higher than those of cabs but, later in 2012, UberX was introduced, a cheaper option that allowed the choice of any type of vehicle, with no requirement for the luxury category (Uber, 2023).

These days, Uber defines itself as a technology company whose mission is to help people and things move. Uber's core business is connecting passengers who are looking for a ride with available drivers, and all of this happens through the Uber platform for smartphones or tablets. The user chooses on Uber's platform the type of vehicle desired and the number of people to be transported and an estimate of the time it will take for the driver to arrive, and the respective cost is provided - the price is calculated with an algorithm that varies according to variables such as demand, distance to be traveled, and the number of available drivers. In the application,

the payment data is already filled in and the location of the passenger and the desired vehicle are recognized through GPS. At the end of the trip, the value of the service automatically comes out of the passenger's account, so neither the driver nor the passenger needs to deal directly with the payment - is made directly to Uber, which takes a percentage on each trip made and then pays the drivers.

In line with what was described in the literature review, Uber does not own any of the vehicles, the drivers use their cars to provide the service, hence the concept of a ride-sharing company, and can choose their working hours since they are independent contractors. One of the factors that increase the quality level of Uber's platform is the mutual evaluation system, where users evaluate drivers and, in turn, drivers evaluate customers. Drivers and customers who do not maintain a good rating may no longer have access to the platform.

In this way, Uber represents a business platform that promotes the sharing economy, being the main value delivered, both to passengers and drivers, the lower transaction costs. What it does is reduce the costs of looking for someone willing to provide a low-cost ride, lower than the opportunity cost of standing on a street waiting to be able to find a cab or, increasingly, the opportunity costs of having a car parked nearby (Henten & Winderkilde, 2016; Munger, 2018).

Currently, Uber is present in more than 70 countries, on all continents, and started in Portugal in 2014, where, according to Statista (2022), has 42% of the market share. In 2022, over 131 million people monthly used Uber, which has over 5.5 million drivers (Uber, 2022). These numbers and the business model presented make Uber a major player in the sharing economy – it is the world's largest ride-hailing service operator and the largest in Portugal -, and it is, therefore, relevant to consider it in the development of this research.

3.2.2. Taxis in Portugal

When selecting Uber as a representative example of the sharing economy, the activity of the comparative model of the traditional market must have the same perception among the public. In this sense, although Uber is not a transportation company, the comparison will be made with the service provided by taxis, a transportation service from point A to point B, the main utility obtained by consumers from platforms such as Uber.

At the beginning of the 20th century, with the introduction of the car in Portugal, the cab service began to be more similar to what we can find today: cab services are defined as public transport for hire in passenger vehicles. Taxis are a common mode of transportation, especially in urban areas, and are generally easy to find in city centers. Taxi fares in Portugal are regulated by law, and the rates are posted inside the taxi, which requires them to be equipped with a

taximeter. The price is calculated based on the distance traveled, the time spent waiting in traffic, and any additional fees for luggage or tolls (Autoridade da Mobilidade e dos Transportes, 2020).

According to the Instituto da Mobilidade e Transportes, in 2021, there were 21902 taxi drivers and 25318 TVDE[2] drivers in Portugal – company-specific figures are not publicly available. Uber was the first company of its type to be established in Portugal and it is rapid growth has been accompanied by successive protests by taxi drivers, who have experienced a decline in their activity due to the obligation to comply with different regulations than those applied to ride-sharing drivers. Uber has disrupted the traditional taxi industry by introducing a new app-based model, which has led to intense competition between the two services. Given this, taxis are an illustrative example of a traditional industry that can help understand if the differences between traditional and sharing models can be justified with transaction costs.

3.3. Hypothesis Formulation

The statistical process of hypothesis testing was used to analyze specific predictions and to provide a framework for establishing population-related determinations (Davis & Mukamal, 2006). Considering the two main questions raised in this thesis: "Do consumers perceive different transaction costs between the traditional market and the sharing economy?" and "Do transaction costs influence the preference between the traditional market and the sharing economy?" and the two examples selected to get the respective answers – Uber and taxis – the hypotheses formulation and the correspondent elaboration of the questionnaire had into account the specificities of these companies.

Unlike the work developed by Li & Fang (2022) and Akbar & Tracogna (2018), where the transaction costs theory was introduced considering the dimensions of uncertainty, asset specificity, and frequency, in this research, they were not applied, taking into consideration the client's point of view, more specifically, their perception of decreased transaction costs, and not the reduction in the company. As stated before, sharing economy companies, due to characteristics such as matching algorithms, user and driver reviews, and transparent pricing systems, are considered to be capable of lowering transaction costs in the market, and with this in mind, for the development of this thesis, these costs were considered: searching, uncertainty,

[2] TVDE is the acronym used in Portugal to identify cars used for individual passenger transport from electronic platforms, which includes the drivers associated with the transport promoted by Uber. For more information about this denomination, please see:
https://www.imt-ip.pt/sites/IMTT/Portugues/TransportesRodoviarios/TVDE/Paginas/TVDE.aspx

and monitoring. The selection of this particular set of dimensions and the formulation of hypotheses to analyze them were justified below:

H_1: Consumers perceive different searching costs between the traditional market and the sharing economy.

The searching is regarding the time spent looking for an available taxi on the street or calling for one and the time to find a car with the specific characteristics needed. In generic terms, it can also be defined as the time and effort used to compare prices and features between different suppliers (Teo & Yu, 2005; Li & Fang, 2022). Time is considered the most valuable resource an individual can have, and the amount of time wasted leads to a lack of efficiency and benefits no one (Calo & Rosenblat, 2017). Technology-based businesses with matching algorithms can help minimize the time spent looking for a ride or finding someone to pick up and so contribute to the decrease of user transaction costs (Henten & Winderkilde, 2016).

H_2: Consumers perceive different uncertainty costs between the traditional market and the sharing economy.

The uncertainty is about the trust in the driver and the knowledge about the final price to be paid at the end of the ride, if there will not be unknown fees, or about the type of car that will be assigned, if it will be going to live up to expectations. An online business can easily provide convenient information about the available services and their features, which, in this case, decreases the doubt about the type of car that will do the ride and the uncertainty about any unknown fees to be paid, leading to a more confident purchase and with that a decrease in transaction costs (Wu et al., 2014; Li & Fang, 2022).

H_3: Consumers perceive different monitoring costs between the traditional market and the sharing economy.

The monitoring is the effort to analyze if the driver is choosing the best route or if he knows where the exact pick-up and stop spots are. It can also be a struggle to determine how far away the driver is from the pick-up point or how long it is until you reach your destination. Monitoring can also relate to opportunistic human behavior - taking actions in an individual's best interests - which, here, can be identified as the concern of the driver choosing a longer route or with more traffic, taking more time and thus being able to charge a higher fee (Akbar & Tracogna, 2018). When consumers feel the need to spend additional time monitoring a transaction there is an increase in transaction costs (Li & Fang, 2022; Kim, 2017).

H_4: Consumers perceive different transaction costs between the traditional market and the sharing economy.

The evidence from Henten & Winderkilde's (2016) and Munger's (2018) work indicate that sharing economy platforms' specific features enable severe reductions in transaction costs when compared to the traditional market.

H_5: Perceived transaction costs influence the preference between the traditional market and the sharing economy.

When consumers perceive high transaction costs in a market transaction, they are less likely to carry out the transaction and more willing to choose an equivalent substitute with reduced transaction costs (Teo & Yu, 2005; Wu et al. 2014). Consumers who prioritize saving time and effort spent on a transaction will rethink and change their preferences in the marketplace.

With all five hypotheses formulated, we had the following investigation model:

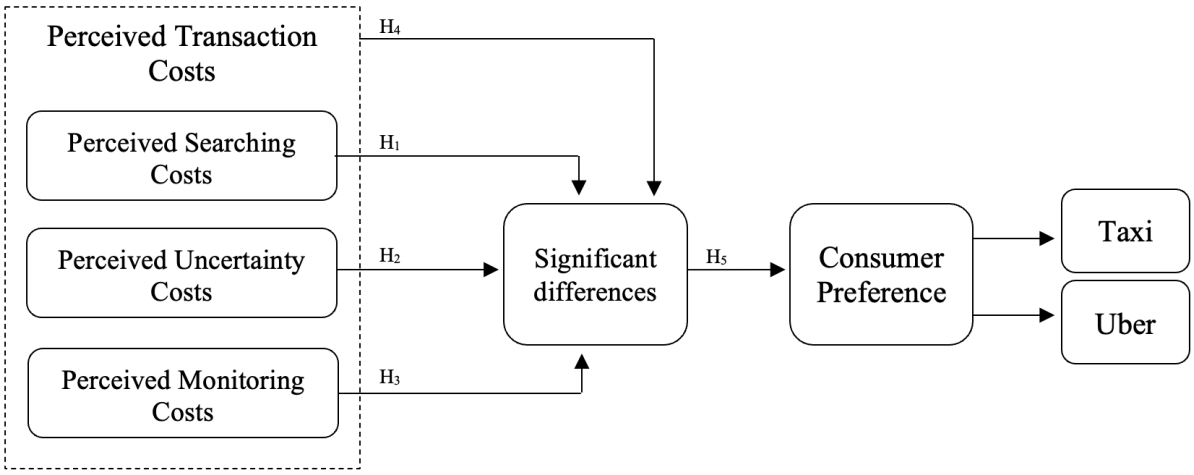

Figure 2 - Investigation model

Source: Author's elaboration

3.4. Questionnaire Structure

Being aware that the vast majority of sharing economy platforms users have no idea of a clear definition of what transaction costs were, and this not being the objective of this work, the questionnaire design has taken this into account, and, in this sense, no question directly used the term transaction costs.

After the set of four demographic questions, there was a section with just one question: "Have you ever used the Uber platform and the taxi service?". This question has the sole purpose of ensuring that the questionnaire was applied to people who at some point have used

Uber's platform and cab service. Since the main objective was to compare the two, it was essential that the participants of the questionnaire have had some experience with both, and if this was not verified the questionnaire would end. For those users who answer affirmatively to the previous question, two questions followed to analyze how often the services were used and how long it took to find an available car.

As stated in the last section, searching, uncertainty and monitoring were the independent variables under analysis – and the ones representing transaction costs in this thesis -, so the next part of the questionnaire was built up with questions to analyze each one of those variables. The questions were built in a Likert scale form (using a scale of five points: between *strongly disagree* and *strongly agree*) with the objective of quantifying the opinion of the users. The choice of the eleven questions presented in Table 1 and included in the questionnaire was based on the work developed by other authors:

Table 1 - Questions description

Variable	Questions	Reference
Searching	1. I can quickly find an available car. 2. I can find a car available at any time. 3. Requesting a car is fast and simple.	Adapted from Li & Fang (2022) and Rayle et al. (2016).
Uncertainty	4. When the journey begins, I know the final price to pay. 5. I don't know what kind of car will do the transportation. 6. I have driver information available. 7. The choice of Uber/taxi conveys safety.	Adapted from Teo & Yu (2005), Wu et al. (2014), and Liang et al. (2021).
Monitoring	8. I need to explain to the driver where the pickup and stop spots are. 9. I can tell if the driver is choosing the best route. 10. I can contact the driver at any time. 11. I know how far the driver is from the pickup location.	Adapted from Jin et al. (2018), Teo & Yu (2005), and Aguilera-García et al. (2022).

Source: Author's elaboration

With the questions in the table above, it was expected to understand if users of both traditional market (taxi) and sharing economy platforms (Uber) perceive that their transaction costs were lowered when using platforms such as Uber and increased when using taxis, which was in line with the literature review explored and the two main questions raised in this study.

The work developed by Diao et al. (2022), Cheah et al. (2022), and Sharma (2019), evidence that price is one of the main factors influencing consumers' ride choices. With this in

mind, at the end of the survey was a question to understand which was the selected option by the users - Uber or taxi - if the price factor was the same, per kilometer. It was intended to analyze which factors, excluding price, were more relevant in the choice between Uber and taxi, in other words, if that choice was made because of perceived transaction costs – as shown in Table 2.

Table 2 - Dimension in analysis

Dimension	Representative factor
Searching	Car availability
	Quickness in finding a car
	Easy to order a car
Uncertainty	Trust in the service
	Know the final price to pay
Monitoring	Best route choice
	Ease of understanding the pickup location
Others	Service Quality
	Payment Method
	Safer driving

Source: Author's elaboration

This questionnaire was conducted solely through closed-ended questions, as this question methodology allowed for an easier application of statistical analysis to interpret the answers (Hill & Hill, 2008). Prior to the application of the questionnaire, a pre-test was administered to ten individuals, some modifications had to be made to improve the formulative perception of the questions and, for that reason, these results were not considered in the final sample analyzed.

3.5. Data Analysis

Considering the different types of questions on the survey, there were different methodologies applied to a better understanding of the results obtained. As in the research work by Rayle et al. (2016), to estimate differences between participants' experiences with Uber and taxis a statistical analysis was considered appropriate. In addition, an econometric model was developed, something already explored by Teo & Yu (2005) and Li & Fang (2022) for similar

research but adjusted to the specific questions of this investigation and with the aim of understanding the transaction cost influence in the market preference.

3.5.1. Statistical Analysis

With the purpose of answering the question: "Do consumers perceive different transaction costs between the traditional market and the sharing economy?" a statistical analysis of the data obtained from the survey's answers was done.

Since the majority of the questionnaire has Likert scale data (from *strongly disagree* to *strongly agree*) we transformed those into numerical data, where: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree* and 5 = *strongly agree*, in order to make the interpretation of the data easier and clearer (Spencer, 2015). Adding to this, it was also fundamental for calculating the means and frequency of the responses.

To reach a conclusion about the formulated hypotheses it was conducted the comparison of the mean values obtained in each of the Likert scale questions, considering that the higher the mean the better the agreement with the settlement under analysis and with that a greater or lesser perception of different transaction costs in the traditional market (taxis) and the sharing economy (Uber) (Boone & Boone, 2012).

Additionally, it was tested if there were significant differences in the responses about Uber and taxis. First, a Kolmogorov-Smirnov statistic test was applied to certify that the variables under analysis fit a normal distribution with the following hypotheses (Marôco, 2011):

- H_0: The variable follows a normal distribution.
- H_1: The variable does not follow a normal distribution

If one variable had a p-value lower than 0.05, we must reject the null hypothesis (H_0) and consider that the variable does not follow a normal distribution. When this is the case, it is not possible to perform parametric tests, and non-parametric tests are indicated.

The non-parametric Sign test, also known as the paired-samples sign test, is indicated to compare the medians of paired observations (in this case, transaction costs in taxis and Uber) while not assuming a specific distribution or symmetrical observations (Gravetter & Wallnau, 2012). The following hypotheses were considered in this test:

- H_0: There are no differences in the median values of the paired observations.
- H_1: There are differences in the median values of the paired observations.

If the p-value was lower than the confidence level of 5%, the null hypothesis (H_0) was rejected, and it is considered to have significant differences between the two observations. If the p-value was higher than 0.05 we did not reject the null hypothesis.

3.5.2. Econometric Model

Connected with the analysis previously described the research for the second question: "Do transaction costs influence the preference between the traditional market and the sharing economy?", was based on the Likert scale data obtained from the twenty-two questions about searching, uncertainty, and monitoring (eleven about Uber and eleven about taxis) and the answer to the question that considers the choice between the two, excluding price. We had the following variables under analysis:

Table 3 - Variables under analysis

Question	Variable name	Type of variable	Answer options
If the final price is the same, which one do you choose?	Preference	Dependent	0 - Taxi or 1 - Uber
I can quickly find an available car.	S1U/S1T	Independent	1 - SD to 5 - SA
I can find a car available at any time.	S2U/S2T	Independent	1 - SD to 5 - SA
Requesting a car is fast and simple.	S3U/S3T	Independent	1 - SD to 5 - SA
When the journey begins, I know the final price to pay.	U1U/U1T	Independent	1 - SD to 5 - SA
I don't know what kind of car will do the transportation.	U2U/U2T	Independent	1 - SD to 5 - SA
I have driver information available.	U3U/U3T	Independent	1 - SD to 5 - SA
The choice for Uber/taxi conveys safety.	U4U/U4T	Independent	1 - SD to 5 - SA
I have to explain to the driver where the pickup and stop spots are.	M1U/M1T	Independent	1 - SD to 5 - SA
I can tell if the driver is choosing the best route.	M2U/M2T	Independent	1 - SD to 5 - SA
I can contact the driver at any time.	M3U/M3T	Independent	1 - SD to 5 - SA
I know how far the driver is from the pickup location.	M4U/M4T	Independent	1 - SD to 5 - SA

Source: Author's elaboration. Note: SD – strongly disagree and SA – strongly agree

Reflecting the Table 3 and bearing in mind the work of Wooldridge (2010) and King (2008) a binary logistic regression model seemed the appropriate way to analyze this data. This type of model, also known as logit, is indicated when there are binary dependent (dummy) variables

and its objective is to estimate the probability of a given event taking place – in this case, the choice between Uber and taxis -, based on a certain number of explanatory independent variables (Harrell, 2015). A logarithmic function that restricts the estimated probability values of the dependent variable to the interval {0,1} was used, considering a cumulative logistic distribution function with the following specification:

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 X_{1i} + \cdots \beta_k X_{ki} + u_i \qquad 0 \leq \hat{P}_i \leq 1 \tag{1}$$

Where "$\ln\left(\frac{P_i}{1-P_i}\right)$" represented the binary variable, "x" the independent variables, "β" the coefficients, and "u" the non-observed error for "k" number of observations.

When choosing to analyze the data with a binary logistic regression model it implied to verify a set of assumptions as the following (Harrell, 2015):

1. The dependent variable should be measured on a dichotomous scale – as the choice between taxis and Uber, where taxi = 0 and Uber = 1.
2. There must be one or more independent variables, which can be either continuous or categorical – the 5-point Likert scale was considered ordinal and for that reason categorical.
3. There must be independence of observations and the dependent variable should have mutually exclusive and exhaustive categories – it was not possible to have both Uber and taxis as an outcome and it will always be one of those two options.
4. There needs to be a linear relationship between any continuous independent variables and the logit transformation of the dependent variable – the Box-Tidwell test was performed, and this assumption was verified for all the independent variables.

All the above assumptions were proved, which means we were able to use a binomial logistical regression model for our data analysis.

The estimation of the model was performed using the Maximum Likelihood method, which is a technique employed to determine the parameters of a presumed probability distribution based on observed data. Wald's statistical test was appropriate to understand if the set of independent variables is collectively statistically significant, and the following hypotheses were considered:

- H_0: $\beta_k = 0$
- H_1: $\beta_k \neq 0$

If the p-value was lower than the confidence level of 5%, the null hypothesis (H_0) was rejected, which means that the independent variable was statistically significant in explaining the dependent variable and should remain in the model under study. When H_0 was not rejected, in this case, when the p-value was higher than the confidence level of 5%, we could conclude that the independent variable did not explain the dependent variable and it should be removed from the model. After this analysis, it was equally important to verify the sign of the coefficient of the variables in the model, in order to understand its impact on the dependent variable and to validate if it makes sense in our research (Wooldridge, 2010).

Additionally, it was also taken into account the proportion of variation in the dependent variable explained by the independent variables using the pseudo-R^2 - here represented by Nagelkerke R Square -, which varies between 0 and 1: the closer the indicator is to 1, the greater the explanatory capacity (Nagelkerke, 1991). Similarly, it was analyzed the predictive capacity of the model - compares the values predicted by the independent variables with the observed values - and the Hosmer and Lemeshow test which evaluates the overall model fit, whose proof value must be higher than the 5% significance level to not reject the null hypothesis, considering the hypotheses (Hosmer et al., 2013):

- H_0: The logistic regression model has a good fit.
- H_1: The logistic regression model does not have a good fit.

CHAPTER 4: Discussion of Results

4.1. Sample Characterization

In a questionnaire analysis, the sample characterization is important to understand critical information about the characteristics of the group under analysis, if they are representative of the population, and how these may or may not interfere with the results of the research.

Although the questionnaire was answered by 359 individuals from the Portuguese population, only 293 (81.6% of the sample) finished the same due to the requirement, as stated in the methodology chapter, to only have participants with experience in the two services, and therefore the sample characterization only considers those. The questionnaire was available from April 1st to April 30th, 2023.

Of the individuals contemplated, 58.4% were female, 41% male, and 0.6% identified as other:

Table 4 - Gender

Gender	Frequency	Percentage
Female	171	58,4%
Male	120	41,0%
Other	2	0,6%

The age of respondents was divided into 5 age ranges, with the largest group being in the 18-24 age bracket, corresponding to 48.1% of the sample.

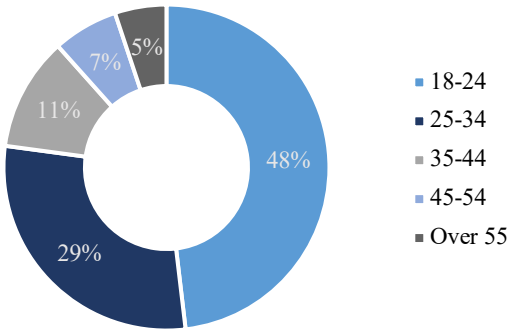

Figure 3 - Age

Source: Author's elaboration

As the questionnaire was aimed at people living in Portugal, the residence options were divided between the eighteen continental districts and the two archipelagos. Most of the sample lived in Lisboa (38%), followed by Porto (16%) and Viseu (10%).

Table 5 - Residence

District	Frequency	Percentage	District	Frequency	Percentage
Açores	3	1.0%	**Madeira**	3	1.0%
Aveiro	17	5.8%	**Porto**	47	16.0%
Braga	8	2.7%	**Santarém**	8	2.7%
Coimbra	12	4.1%	**Setúbal**	14	4.8%
Évora	3	1.0%	**V. Castelo**	3	1.0%
Faro	14	4.8%	**Vila Real**	3	1.0%
Leiria	16	5.5%	**Viseu**	30	10.2%
Lisboa	112	38.2%	**Total**	293	100%

Source: Author's elaboration

Regarding the level of education, the majority had a college degree with 51.5% of the sample with a bachelor's degree and 26.3% with a master's degree.

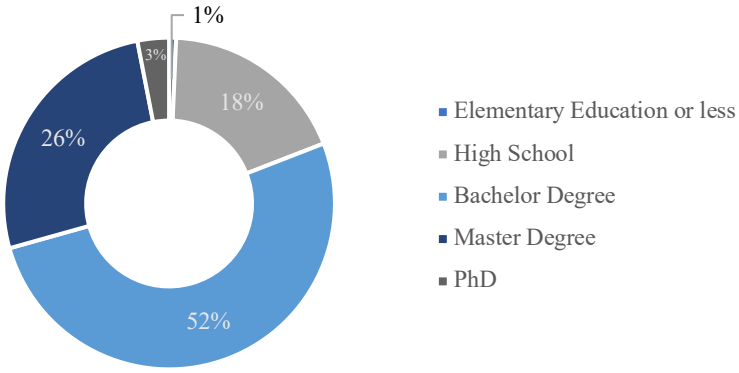

Figure 4 - Education

Source: Author's elaboration

The sample respondents mostly used Uber or taxis at least once a month (39.9%), a small number use these services every week (12.3%), and even less every day (1.4%).

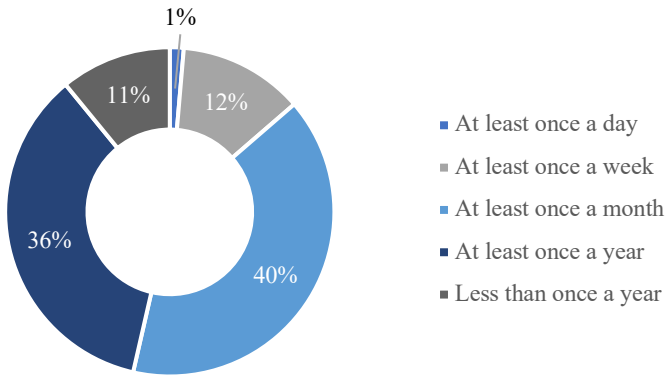

Figure 5 - Regularity of use

Source: Author's elaboration

4.2. Empirical Analysis

After sharing the questionnaires, the information obtained needed to be organized and analyzed to ensure that all the information was viable and added value to the research. Following this, with the support of IBM SPSS 28 (Statistical Package for the Social Sciences) software, the empirical analysis of the first four formulated hypotheses was verified with the statistical analysis – average values and sign test – of the twenty-two Likert scale questions and, thus, the first research question: "Do consumers perceive different transaction costs between the traditional market and the sharing economy?" was answered. The fifth hypothesis was confirmed with the development of an econometric model considering the variables described in Table 3 and, likewise, the second research question: "Do transaction costs influence the preference between the traditional market and the sharing economy?" was also checked.

4.2.1. Do consumers perceive different transaction costs?

4.2.1.1. Searching Costs

The analysis of searching costs was based on two types of information, being the first one determining the average time it takes the respondents to find a car. With this data it was possible to compare if the consumer experiences different waiting times between Uber and taxis, and from the answers obtained, taxis have longer waiting times than Uber – 71.2% of the sample could find an Uber within 5 minutes and only 33.6% could find a taxi at the same time (Rayle et al., 2016).

Table 6 - Average waiting time

Average time	Taxi	Uber
Less than 2 minutes	7.8%	28.5%
Between 2 minutes and 5 minutes	25.8%	42.7%
Between 5 minutes and 10 minutes	37.3%	24.1%
More than 10 minutes	29.2%	4.7%

Source: Author's elaboration

The answers to the three Likert scale questions – identified in Table 1 for searching costs - were individually analyzed. Uber presented higher mean values, and all the questions were above three, which means the consumer, generally, agreed with the statements under analysis. On the other side, taxis only had one question slightly above three, indicating there was more disagreement. Question 3 had the biggest differences between the two, with 92% of the

respondents strongly agreeing or agreeing about Uber, against only 35% about taxis - the exact answers distributed by level can be found in Appendix B.

Table 7 - Searching costs

Variables	Questions	Taxi	Uber
S1T/S1U	1. I can quickly find an available car.	3.1468	4.1195
S2T/S2U	2. I can find a car available at any time.	2.9010	3.7406
S3T/S3U	3. Requesting a car is fast and simple.	2.9317	4.3754

Source: Author's elaboration

With the results presented in Table 7, we can conclude that the respondents experienced that quickness, availability, and process simplicity can be more easily found in Uber than in taxis and with that, that the perceived searching costs were lower in Uber than in taxis (Jin et al., 2018; Roger, 2015; Edelman & Geradin, 2015). Such findings and the conclusion from the analysis of the average waiting time, allowed us to consider that **Hypothesis 1 is validated**.

Additionally, as can be seen in Table 8, all the variables had a p-value < 0.05 for the Kolmogorov-Smirnov test, which means we can reject the null hypothesis and assume that these variables do not follow a normal distribution. This way, we can conclude that our variables are non-parametric, and the analysis of the Sign test was appropriate. For all the comparisons between the variables representing Uber and taxis, we had a p-value < 0.05 for this test, so we can reject the null hypothesis and considered there were significant differences between the participants' answers about Uber searching costs and taxi searching costs.

Table 8 – Searching costs: Kolmogorov-Smirnov test

K-S test	S1U	S1T	S2U	S2T	S3U	S3T
Test Statistic	0.283	0.208	0.293	0.195	0.287	0.205
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001

Source: Author's elaboration

Table 9 - Searching costs: Sign test

Sign test	S1T - S1U	S2T - S2U	S3T - S3U
Z	-10.410	-8.619	-13.088
Asymp. Sig. (2-tailed)	<.001	<.001	<.001

Source: Author's elaboration

A higher absolute Z value indicates a greater deviation from the null hypothesis and suggests stronger evidence for a significant difference. We can see there was a higher absolute Z value at S1 and S3 variables, which was accordingly to the data in Table 7, where questions 1 and 3 were the ones having the biggest deviation in the mean values between taxis and Uber.

4.2.1.2. Uncertainty Costs

Uncertainty costs were seen as lower in Uber than in taxis, as the participants had fewer doubts about the final price to pay and the type of car that is doing the service when traveling with Uber. In Table 10, there was a massive discrepancy in question number 4, where only 1% of the sample strongly agree about taxis, in contradiction of the 60% about Uber. The same happens with the available information about the driver, 38% strongly agree about Uber, and only 3% about taxis. The question about perceived safety was the one that presents the most neutral opinion, especially on the taxi side. In Glöss et al. (2016) research, Uber passengers felt safer because of the rating and tracking system available, which was in line with the findings presented.

Table 10 - Uncertainty costs

Variables	Questions	Taxi	Uber
U1T/U1U	4. When the journey begins, I know the final price to pay.	1.6075	4.4642
U2T/U2U	5. I don't know what kind of car will do the transportation.	3.1638	2.6177
U3T/U3U	6. I have driver information available.	1.7611	4.0785
U4T/U4U	7. The choice of Uber/taxi conveys safety.	3.0341	3.6485

Source: Author's elaboration

As in the searching costs, all variables in the uncertainty costs showed a p-value < 0.05 for the Kolmogorov-Smirnov test, meaning a normal distribution was not found and, therefore, the null hypothesis was rejected for all variables. The Sign test was also considered to verify differences between the answers and all the comparing variables had a p-value < 0.05 for this test, so we can reject the null hypothesis and consider there were significant differences between the participants' answers. With the outcomes of the four questions gathered and the Sign test, we can consider **Hypothesis 2 is validated.**

Table 11 - Uncertainty costs: Kolmogorov-Smirnov test

K-S test	U1U	U1T	U2U	U2T	U3U	U3T	U4U	U4T
Test Statistic	0.336	0.318	0.216	0.223	0.263	0.293	0.271	0.190
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

Source: Author's elaboration

Table 12 - Uncertainty costs: Sign test

Sign test	U1T - U1U	U2T - U2U	U3T - U3U	U4T - U4U
Z	-16.220	-3.480	-14.597	-6.226
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	<.001

Source: Author's elaboration

If we analyze the absolute Z value, we can see higher values in U1 and U3 which implies wider differences of opinion between taxis and Uber. Topics such as knowing the final price to pay and having the driver's information were the ones that lead to the greatest divergence of opinion, which was consolidated with the comparison of average values above.

4.2.1.3. Monitoring Costs

In Table 13, we can check that the effort and time explaining where the pick-up and stop spots are and the possibility to identify the distance of the driver had opposite answers, 25% strongly agree about taxis against 2% about Uber, and 1% strongly agree about taxis against 48% about Uber, respectively. According to these outcomes, we can state that the perceived effort needed with taxis to ensure the transaction was minimized with Uber (Jin et al, 2018; Glöss et al., 2016) and, for that reason, the perceived monitoring costs decreased with Uber when compared to taxis, which leads to the conclusion that **Hypothesis 3 is validated**.

Table 13 - Monitoring costs

Variables	Questions	Taxi	Uber
M1T/M1U	8. I need to explain to the driver where the pickup and stop spots are.	3.7474	2.2048
M2T/M2U	9. I can tell if the driver is choosing the best route.	2.4198	3.6962
M3T/M3U	10. I can contact the driver at any time.	2.4437	3.9181
M4T/M4U	11. I know how far the driver is from the pickup location.	1.9181	4.3481

Source: Author's elaboration

Like the previous two dimensions, all variables representing the monitoring costs showed a $p < 0.05$ for the Kolmogorov-Smirnov test and, consequently, the null hypothesis was rejected for all variables. A p-value < 0.05 for the Sign test was found in all variables, so we can consider there were significant differences between the participants' answers and reject the null hypothesis.

Table 14 - Monitoring costs: Kolmogorov-Smirnov test

K-S test	**M1U**	**M1T**	**M2U**	**M2T**	**M3U**	**M3T**	**M4U**	**M4T**
Test Statistic	0.254	0.281	0.261	0.223	0.282	0.237	0.284	0.244
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

Source: Author's elaboration

Table 15 - Monitoring costs: Sign test

Sign test	**M1T - M1U**	**M2T - M2U**	**M3T - M3U**	**M4T - M4U**
Z	-12.533	-11.447	-12.273	-15.448
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	<.001

Source: Author's elaboration

We can see there were high absolute Z values in all the variables in the analysis in Table 15, with the one representing M4 questions with the higher value, which represented the factor of knowing where the driver is before the pick-up that was also evidenced in the analysis of the mean values between Uber and taxis.

4.2.1.4. Transaction Costs

Recalling that the first three hypotheses were validated and being, in this research, transaction costs represented by searching, uncertainty, and monitoring costs, we can conclude that transaction costs were perceived as different and lower in a sharing economy – here, represented by Uber - when compared to the traditional market – here, represented by taxis - and, therefore, **Hypothesis 4 is validated**. With the four hypotheses validated, we can answer positively to the first research question and consider that the consumer observed different transaction costs between the sharing economy and the traditional market.

4.2.2. Do transaction costs influence consumer market choice?

Analyzing the previous experience of users of sharing economy platforms and the traditional market is essential when trying to understand the influence of transaction costs in the choice between the two. While the work from Akbar & Tracogna (2018) and Li & Fang (2022) focus on the influence of sharing economy features on transaction costs, in this research the focus was to comprehend their impact on consumer choices and the second research question meets this analysis.

Considering all the variables presented in the methodology chapter and having in consideration Wald's statistical test, the independent variables in Table 16 were the ones that could be included in the econometric model:

Table 16 - Independent variables in the model

Variable name	β	p-value	Constant
S3T	-0.713	0.002	5.641
U3U	0.570	0.007	
U4U	1.430	<.001	
U4T	-1.553	<.001	
M1U	-0.752	0.001	
M3T	-0.601	0.007	

Source: Author's elaboration

As we can see, all the variables presented a p-value under 0.05, hence, the null hypothesis was rejected, and the six independent variables were all considered statistically significant and must be included in the model. The final equation obtained was:

$$\ln\left(\frac{Preference}{1-Preference}\right) = 5.641 - 0.713S3T + 0.570U3U + 1.430U4U - 1.553U4T - 0.752M1U - 0.601M3T \quad (2)$$

The interpretation of the coefficient values (β) was also important to understand the impact of each independent variable in the dependent variable, having in consideration taxi = 0 and Uber = 1:

1. It was estimated that, on average, for each additional unit in **S3T,** the preference for Uber decreases by 0.713 units, *ceteris paribus* (β = -0.713). Being the statement here

represented: “Requesting a cab is fast and simple”, measured by a five-point Likert scale from 1 - *strongly disagree* to 5 - *strongly agree*, an increase of one unit means more agreement with this sentence, which allowed us to conclude that the easier and simpler it is to order a taxi, the more likely it is to choose taxis over Uber.

2. It was estimated that, on average, for each additional unit in **U3U,** the preference for Uber increases by 0.570 units, *ceteris paribus* (β = 0.570). U3U represented the question: “I have the Uber driver information available”, and an increase of one unit means greater agreement with that, leading to the conclusion that the less uncertainty there was about the Uber driver (diminished here by the availability of information), the stronger the preference for Uber over taxis.
3. It was estimated that, on average, for each additional unit in **U4U,** the preference for Uber increases by 1.430 units, *ceteris paribus* (β = 1.430). Taking into account: “The choice for Uber conveys safety”, an increase of one unit means greater agreement with that and, therefore, the less uncertainty there was about the Uber trip, the greater the preference for Uber over taxis.
4. It was estimated that, on average, for each additional unit in **U4T,** the preference for Uber decreases by 1.553 units, *ceteris paribus* (β = -1.553). The statement here analyzed is: “The choice for taxi conveys safety”, an increase of one unit means greater agreement with that and, consequently, the less uncertainty there was about the taxi trip, the less likely to choose Uber over taxis.
5. It was estimated that, on average, for each additional unit in **M1U,** the preference for Uber decreases by 0.752 units, *ceteris paribus* (β = -0.752). Considering: “I have to explain to the Uber driver where the pickup and stop spots are”, the more the consumer agrees with this statement, the higher the Uber monitoring costs were and, with that, the choice for Uber over taxis decreases.
6. It was estimated that, on average, for each additional unit in **M3T,** the preference for Uber decreases by 0.601 units, *ceteris paribus* (β = -0.601). The matter herein analysis is: “I can contact the taxi driver at any time” and if there is a greater agreement with this, consumers may perceive their monitoring costs minimized with taxis, which will lead to choosing taxis over Uber.

Considering the main utility obtained by the consumer when using services such as taxis and Uber, the key evidence from this model was that consumers will choose the transaction that allows them to economize on perceived transaction costs. This reflection meets the

previous findings from Teo & Yu's (2005) work and in this case, customers' choice or, in other words, willingness to buy has an inverse relationship with the increase of transaction costs. Li & Fang (2022) added that consumers feel less confident in purchasing if there are high transaction costs and in Wu et al. (2014) work, searching and uncertainty costs have a large impact on the repurchase intention. With these considerations, we can state that transaction costs affect the preference between the sharing economy (Uber) and the traditional market (taxi) and consider **Hypothesis 5 is validated**.

To help to validate our data and reflect the methodology described before, the final econometric model obtained had the following results:

Table 17 - Validation of the model

Pseudo-R^2 Nagelkerke	**Hosmer and Lemeshow test**	
	Chi-Square	p-value
0.590	4.536	0.806

Source: Author's elaboration

Table 18 - Category prediction

Preference	**Predicted Percentage**
Taxi	55.6%
Uber	95.8%
Overall percentage	88.4%

Source: Author's elaboration

The Nagelkerke R^2 value of 0.590 indicated that almost 60% of the variation in the dependent variable - choosing Uber or taxis - was explained by the independent variables in this model – transaction costs. Hosmer and Lemeshow's test had a p-value greater than 0.05 (p-value = 0.806) which suggests a good-fitting model since it doesn't reject the null hypothesis. Overall, the model classified well 88.4% of the choices between Uber and taxis and ranked well 55.6% of the options for taxis and 95.8% of the preferences for Uber. Therefore, we can conclude that the model reflected the choice between Uber and taxis, considering the influence of transaction costs.

4.2.3. Factors of choice

A great portion of the sample preferred Uber (81.57%) if the price per kilometer is equal between the two and to justify it selected knowing the final price to pay (93.72%), the ease of ordering a car (79.08%) and the payment method (75.73%) as the most relevant factors. The selection made was in line with what was highlighted by Rayle et al. (2016) work, where speed and convenience were the main factors to choose ride-hailing services. In our research, it can be underlined that people tend to choose Uber because of minimized uncertainty and searching costs, however, it was interesting to note that the payment method was also a feature of big importance. The selection of payment method can be associated with the convenience of not having to carry cash to pay, which decreases the waste of time at the end of the trip and the effort of checking if the change is correct, factors that can be associated with transaction costs.

Otherwise, when choosing taxis (18.43%), the respondents prioritized trust in the service (70.37%), service quality (46.30%), and safer driving (44.44%). We can infer that people who choose taxis perceive them as safer than Uber and see their uncertainty costs minimized with taxis. Additionally, the selection of service quality and safer driving - characteristics that are specific to the driver providing the service and, for that reason, were not considered as transaction costs in this research – as important factors illustrate that people who choose a taxi ride prioritize factors not directly related to reducing transaction costs.

Table 19 - Choice if the price is equal

Choice if the price is equal	Frequency	Percentage
Taxi	54	18.43%
Uber	239	81.57%
Total	293	100%

Source: Author's elaboration

Table 20 - Factors of choice

Dimension	Factors	Taxi	Uber
Searching costs	Quickness in finding a car	24.07%	71.55%
	Car availability	25.93%	56.49%
	Easy to order a car	25.93%	**79.08%**
Uncertainty costs	Know the final price to pay	9.26%	**93.72%**
	Trust in the service	**70.37%**	44.35%

Monitoring costs	Best route choice	12.96%	30.54%
	Ease of understanding the pickup location	24.07%	39.75%
Others	Payment Method	16.67%	**75.73%**
	Safer driving	**44.44%**	12.97%
	Service Quality	**46.30%**	33.05%

Source: Author's elaboration

When the participants were asked if they would change their first choice between Uber and taxis if the price was higher, 57% of the participants who choose Uber, would maintain that option if Uber had a higher price than taxis, but only 31% would keep the same choice when choosing taxis. If we put this information together with the main factors that lead consumers to choose Uber over taxis, we realize that people who tend to prefer Uber value the decrease in their transaction costs more than the monetary savings, that is, they don't mind paying more if the time and effort put into the transaction decreases.

Table 21 - Choice if the price is higher

Would you maintain your choice if:	**No**	**Yes**
Taxi's price was higher?	68.52%	31.48%
Uber's price was higher?	42.68%	57.32%

Source: Author's elaboration

This last set of data allowed us to reinforce the conclusions already obtained in the previous sections: consumers will choose what is perceived as having lower transaction costs. A decrease in transaction costs was more noticeable when using Uber compared to taxis, being this one of the main reasons why there was so much divergence in the answers between Uber and taxis and why there was a stronger tendency to choose Uber over taxis: Uber is already selling reductions in transaction costs.

CHAPTER 5: Conclusion

5.1. Transaction costs perception and influence on market choices

Although we can say that sharing has existed for as long as mankind, the sharing economy itself has arisen with the development of digital platforms and technological improvements that facilitate sharing behavior. The main concept of sharing economy is to enable suppliers to turn unproductive assets into income-producing ones and consumers to find assets or services at a lower price, with the mediation of an online platform.

As stated at the beginning of this work, transacting in a market involves more costs than those associated with production and transportation, it should also be considered the time and effort put into searching for information, negotiating contracts, and monitoring and evaluating the transaction.

The specific characteristics of sharing economy facilitate market transactions, being the reduction of transaction costs where there is the greatest impact. Factors such as uncertainty reduction, knowledge increase, and the decrease in communications, all present in the sharing economy, are considered essential to the transaction costs decrease. Underlying the premise that people want to use things and not really own them, the sharing economy helps this vision become a reality.

Considering that there were not many studies on sharing economy based on practical examples, it was relevant to analyze whether theory and reality coincide with the help of Uber as a representative example of the sharing economy and the taxi industry as the example of the traditional market. Taking into account that consumer choices are greatly affected by their perception of the market, the analysis of their previous experiences showed that consumers notice lower transaction costs with Uber than with taxis, this being evident in all dimensions considered - searching, uncertainty, and monitoring costs. It is worth noting that, in the case of searching costs, 71.2% of the sample will find an Uber within 5 minutes and only 33.6% will find a taxi in the same time and the feature with the biggest differences of opinion is the process of requesting a car. Regarding uncertainty costs, knowing the final price to pay and having the driver's information are the ones with the biggest differences between Uber and taxis, and in the monitoring costs, knowing where the driver is before the pick-up is the variable with the largest result discrepancy.

The development of an econometric model considering the influence of transaction costs on the preference between Uber and taxis, allowed us to understand that the choice between

the two is affected by the perception of transaction costs. This model classifies well 88% of the preferences between Uber and taxis and proves that there is an inverse relationship between this choice and the increase in transaction costs: the consumer will choose the transaction that allows him to have lower perceived transaction costs. With this in mind, it is evident that the choice between the sharing economy and the traditional market is influenced by transaction costs.

Considering an equal price per kilometer to Uber and taxis, for a trip from point A to point B, approximately, for every one person who chooses a taxi, four decided to use Uber. The reason for choosing taxis is based on greater confidence in the service, safer driving, and service quality, which could indicate that when choosing taxis people don't prioritize the decrease in transaction costs. The ones who choose Uber selected factors such as knowing the final price to pay, ease of ordering a car, and the payment method. The first two are directly associated with the decrease in transaction costs and the last one is related to the convenience of paying with a credit card, which could also be considered a transaction cost.

The final question considering if the participant would change his choice if the price was higher, allows us to notice that people who choose Uber prioritize the decrease in transaction costs instead of saving money, while people who choose taxis prioritize saving money, as the majority will change their first selection and choose Uber (69%). This evidence is relevant for understanding decision-making and consumer behavior in different circumstances, emphasizing that money is not always the main driver in market choices.

The bottom line is that whether it is the decrease in waiting time, the convenience of ordering a car from anywhere, or the decrease in the effort spent on tracking the service, the Uber sharing economy platform presents better features than taxis traditional model, making transaction costs decrease and being more appealing to the consumer. These findings suggest that the sharing economy has the potential to disrupt traditional markets by providing a perceived cost advantage. Businesses operating in traditional markets, such as taxis, should explore opportunities to incorporate elements of the sharing economy, like Uber, into their business models, in an attempt to improve customer experience and stay competitive.

Sharing economy represents the emergence of new economic models and the importance of understanding and leveraging perceived transaction costs. Both managers and researchers can utilize these findings to guide strategic decisions, explore business opportunities, and deepen our understanding of market dynamics.

5.2. Limitations and Future Improvements

While accomplishing this research some limitations were inevitably faced. Although there are many studies considering sharing economy and transaction costs independently, there is limited literature that relates the two topics, being this the first challenge this research has brought. Related to this, the fact that there are very few studies that consider real examples of the sharing economy, also made the subsequent elaboration of the questionnaire more difficult.

The distribution of the sample by district of residence may also not be considered fully representative of Portugal, as there are no participants from all districts and there is a greater tendency for participants from Lisbon and Porto (54% of the sample). Additionally, the sample may be biased by being obtained online through social networks and by self-selection, which prevents us from generalizing the results obtained for the entire Portuguese population.

The independent variables considered in the econometric model may also have influenced the results obtained, since there may be other types of transaction costs equally capable of explaining the choice between the traditional market and the sharing economy.

For future improvements to this research, we would suggest considering an identical study in other countries in order to compare whether the results are identical. Likewise, applying an identical questionnaire considering another sharing economy company, such as Airbnb, would also be interesting.

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Appendices

Appendix A – Questionnaire

Questionário - Táxi vs. Uber

No âmbito da investigação para a dissertação de mestrado em Economia da Empresa e da Concorrência, realizado no ISCTE-IUL, o presente questionário tem como objetivo entender a perceção do consumidor relativamente ao transporte fornecido pelo setor dos táxis e promovido pela Uber.
O preenchimento do questionário é totalmente anónimo e os resultados obtidos serão utilizados para fins meramente académicos, sendo a informação confidencial.
Desta forma, solicita-se que leia com atenção todas as questões apresentadas e responda com base na sua experiência.

* Indica uma pergunta obrigatória

1. 1. Com que género se identifica? *

   Marcar apenas uma oval.

   - ◯ Feminino
   - ◯ Masculino
   - ◯ Outro

2. 2. Em que faixa etária se encontra? *

   Marcar apenas uma oval.

   - ◯ Menos de 18 anos
   - ◯ 18-24 anos
   - ◯ 25-34 anos
   - ◯ 35-44 anos
   - ◯ 45-54 anos
   - ◯ Mais de 55 anos

3. 3. Onde vive? *

Marcar apenas uma oval.

- ◯ Açores
- ◯ Aveiro
- ◯ Beja
- ◯ Braga
- ◯ Bragança
- ◯ Castelo Branco
- ◯ Coimbra
- ◯ Évora
- ◯ Faro
- ◯ Guarda
- ◯ Leiria
- ◯ Lisboa
- ◯ Madeira
- ◯ Portalegre
- ◯ Porto
- ◯ Santarém
- ◯ Setúbal
- ◯ Viana do Castelo
- ◯ Vila Real
- ◯ Viseu

4. 4. Qual é o seu nível de educação? *

Marcar apenas uma oval.

- ◯ Ensino Básico ou inferior
- ◯ Ensino Secundário
- ◯ Licenciatura
- ◯ Mestrado
- ◯ Doutoramento

Táxi vs. Uber

Sendo o objetivo deste questionário analisar a escolha entre Uber e táxi, é importante que todos os participantes tenham alguma experiência com os dois.

5. 1. Já usufruiu da plataforma Uber e do serviço de táxi? Apenas responda sim se já tiver utilizado os dois serviços.

   Marcar apenas uma oval.

   - ◯ Sim
   - ◯ Não

Táxi vs. Uber

Assinale a opção que melhor representa a sua experiência.

6. 1. Com que regularidade usa a plataforma Uber ou serviço de táxi?

   Marcar apenas uma oval.

   - ◯ Pelo menos 1 vez por dia
   - ◯ Pelo menos 1 vez por semana
   - ◯ Pelo menos 1 vez por mês
   - ◯ Pelo menos 1 vez por ano
   - ◯ Menos do que 1 vez por ano

7. 2. Em média, quanto tempo demora a encontrar um carro? *

   Marcar apenas uma oval por linha.

	Menos de 2 minutos	Entre 2 minutos a 5 minutos	Entre 5 minutos a 10 minutos	Mais de 10 minutos
Uber	◯	◯	◯	◯
Taxi	◯	◯	◯	◯

No conjunto de questões que se segue, assinale a opção que melhor representa a sua opinião em relação à Uber e táxis. É obrigatório uma resposta em cada linha.

8. 1. Consigo, rapidamente, encontrar um carro disponível. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber	◯	◯	◯	◯	◯
Táxi	◯	◯	◯	◯	◯

9. 2. Encontro um carro disponível a qualquer hora. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber	◯	◯	◯	◯	◯
Táxi	◯	◯	◯	◯	◯

10. 3. Pedir um carro é rápido e simples. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber	◯	◯	◯	◯	◯
Táxi	◯	◯	◯	◯	◯

11. 4. Quando a viagem começa sei o preço final a pagar. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber	◯	◯	◯	◯	◯
Táxi	◯	◯	◯	◯	◯

12. 5. Desconheço o tipo de carro que irá efetuar o transporte. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber					
Táxi					

13. 6. Tenho informação sobre o condutor disponível. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber					
Táxi					

14. 7. A escolha pelo Uber/táxi transmite segurança. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber					
Táxi					

15. 8. Tenho de explicar ao condutor onde é o local de recolha e paragem. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber					
Táxi					

16. 9. Consigo perceber se o condutor está a escolher a melhor rota. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber					
Táxi					

17. 10. Posso contactar o condutor a qualquer momento. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber	◯	◯	◯	◯	◯
Táxi	◯	◯	◯	◯	◯

18. 11. Sei a que distância se encontra o condutor do local de recolha. *

Marcar apenas uma oval por linha.

	Discordo totalmente	Discordo	Neutro	Concordo	Concordo totalmente
Uber	◯	◯	◯	◯	◯
Táxi	◯	◯	◯	◯	◯

Táxi vs. Uber

Considerando uma viagem com o mesmo destino e preço final entre Uber e táxi, assinale a opção que melhor representa a sua opinião.

19. 1. Se o preço final for igual, qual escolhe? *

Marcar apenas uma oval.

◯ Táxi *Avançar para a pergunta 20*

◯ Uber *Avançar para a pergunta 22*

Táxi

Selecione todas as opções que considera relevantes.

20. Quais os fatores mais relevantes para escolher o táxi? *

Marcar tudo o que for aplicável.

- [ ] Disponibilidade de carros
- [ ] Rapidez em encontrar um carro
- [ ] Confiança no serviço
- [ ] Melhor escolha de rota
- [ ] Facilidade em pedir um carro
- [ ] Qualidade do serviço
- [ ] Condução mais segura
- [ ] Saber o preço final a pagar
- [ ] Método de pagamento
- [ ] Facilidade em perceber o local de recolha

21. Se o preço final do táxi for superior ao do Uber, continua a escolher o táxi? *

Marcar apenas uma oval.

- ◯ Sim
- ◯ Não

Uber

Selecione todas as opções que considera relevantes.

22. Quais os fatores mais relevantes para escolher o Uber? *

Marcar tudo o que for aplicável.

- [ ] Disponibilidade de carros
- [ ] Rapidez em encontrar um carro
- [ ] Confiança no serviço
- [ ] Melhor escolha de rota
- [ ] Facilidade em pedir um carro
- [ ] Qualidade do serviço
- [ ] Condução mais segura
- [ ] Saber o preço final a pagar
- [ ] Método de pagamento
- [ ] Facilidade em perceber o local de recolha

23. Se o preço final do Uber for superior ao do táxi, continua a escolher o Uber? *

Marcar apenas uma oval.

- ◯ Sim
- ◯ Não

Appendix B – Likert scale questions results

For a better understanding, the meaning of the abbreviations in the following figures can be found below:

- S1 - I can quickly find an available car.
- S2 - I can find a car available at any time.
- S3 - Requesting a car is fast and simple.
- U1 - When the journey begins, I know the final price to pay.
- U2 - I don't know what kind of car will do the transportation.
- U3 - I have driver information available.
- U4 - The choice for Uber/taxi conveys safety.
- M1 - I have to explain to the driver where the pickup and stop spots are.
- M2 - I can tell if the driver is choosing the best route.
- M3 - I can contact the driver at any time.
- M4 - I know how far the driver is from the pickup location.

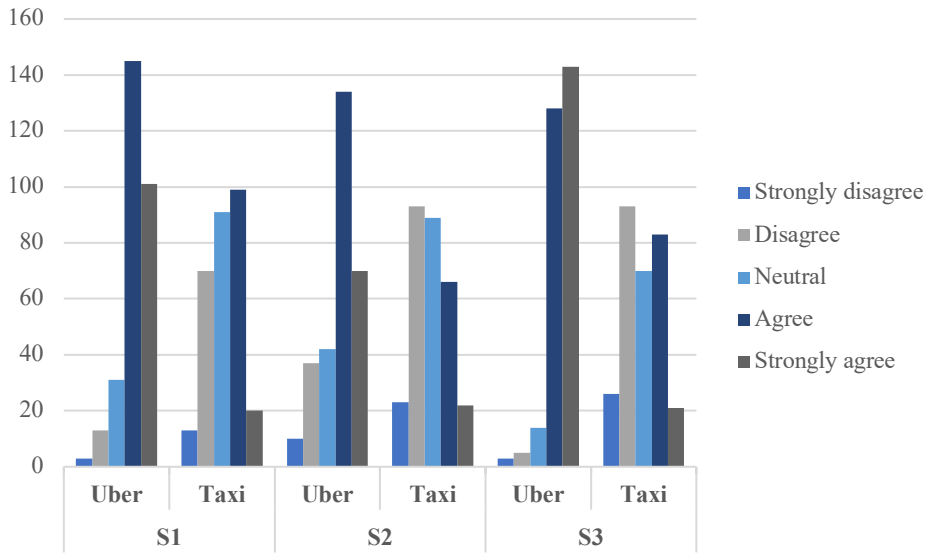

Figure 6 - Searching costs answers

Source: Author's elaboration

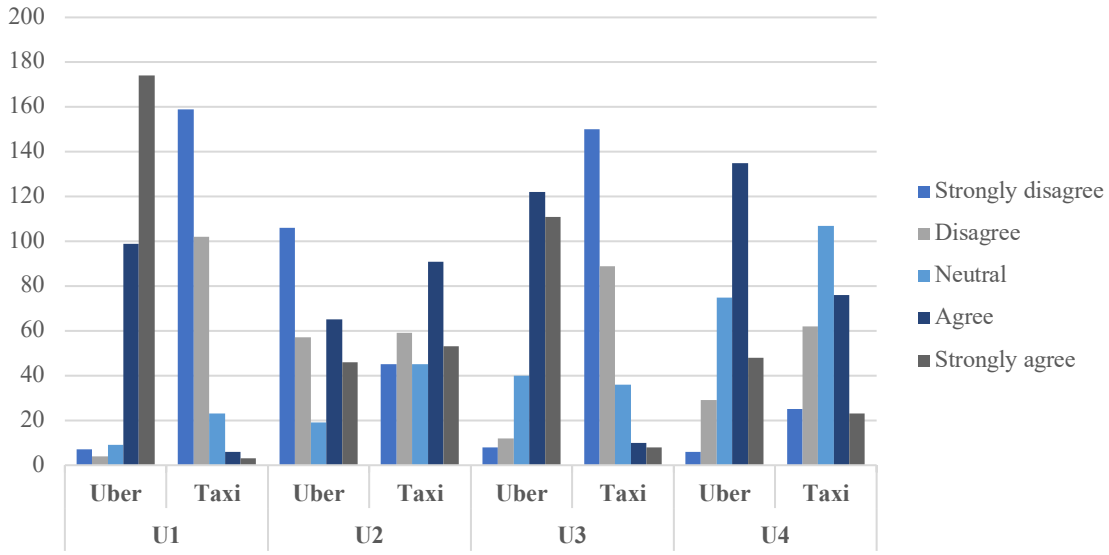

Figure 7 - Uncertainty costs answers

Source: Author's elaboration

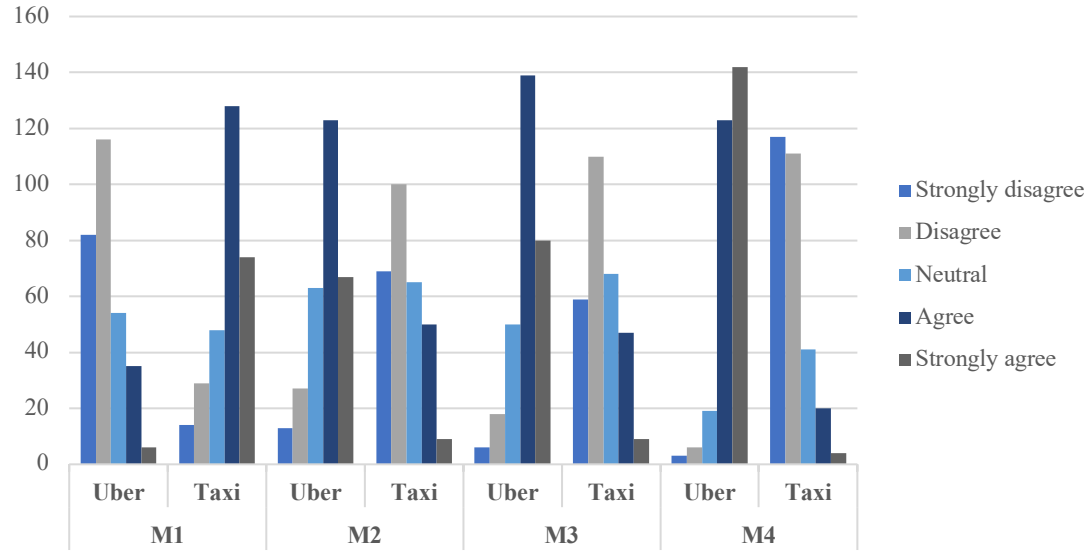

Figure 8 - Monitoring costs answers

Source: Author's elaboration