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UNMANNED CONVENIENCE STORES: THE FUTURE OF RETAIL OR JUST GLORIFIED VENDING MACHINES?

Empirical Evidence of Consumer Resistance in Sweden

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Abstract

A new business model of unmanned convenience stores has been introduced to the retail industry in recent years. An unmanned convenience store is a store format where customers can carry out their errands without involvement of service personnel due to fully automated payment solutions. Because of the decreased need for employees, the new concepts can increase both efficiency and revenues as well as decrease costs for the companies. Due to low overhead costs, the store has the potential to be located both in rural and sparsely populated areas as well as in urban areas with growing population who values efficiency. Scholars have highlighted that such solutions may induce resistance among customers as they believe that it only serves the companies while harming the communities. Despite this, no previous research has studied consumer resistance towards unmanned convenience stores empirically.

The purpose of this thesis was to empirically examine the underlying factors that affect the level of consumer resistance towards unmanned convenience stores. This was done by investigating the relative importance of psychological-, functional- and individual barriers derived from existing literature regarding factors that hamper the adoption process of innovations. Thus, the following research question was formulated: "What are the underlying factors that affect the level of consumer resistance towards unmanned convenience stores?" The study focused on respondents that had no previous experience from unmanned convenience stores because of the apparent void in existing literature with such focus. To answer the research question, nine hypotheses were formulated and tested against the variable consumer resistance. A quantitative research design was applied where data was collected by distributing a survey to potential consumers in Sweden. In total, 172 respondents answered the survey where 131 respondents did not have previous experience of unmanned convenience stores. The data was analyzed through a regression analysis using ordinary least squares.

The result shows that need for interaction, perceived performance risk, lack of perceived convenience value and self-image incongruence positively influence consumer resistance in stated order of precedence. The results can be used as guidelines for companies trying to mitigate consumer resistance towards unmanned convenience stores. The final conceptual framework presented in this thesis can be used in future research to predict consumer resistance. Thus, this thesis contributes to the literature on consumer resistance by studying a new context still in its infancy.

Key words: *Consumer resistance, Innovation barriers, Retail industry, Unmanned convenience stores.*

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1. Introduction

In this chapter, the background to the thesis and the research question is presented. The purpose of the chapter is to provide an understanding of the subject and the problem that will be solved. Further, previous research in the field is presented in order to identify a research gap, a research question and the purpose of the thesis. Lastly, delimitations are presented to provide an understanding about the scope of the thesis.

1.1 Problem Background

Advancements in digitalization have mushroomed in recent years, causing massive disruptions within the retail industry (Denuwara et al., 2021, p. 2). New reports have doomed the overall brick-and-mortar retail landscape in favor of the thriving e-commerce (Helm et al., 2020, p. 1). Some industry experts predict that the physical retail environment is facing damages at virtually catastrophic levels. This development can almost resemble a 'retail apocalypse' where physical retail is ruled out by the advent of online retail (Helm et al., 2020, p. 1). As a consequence, the competition within the physical retail industry has been further intensified (Denuwara et al., 2021, p. 7). Not even grocery stores, which can be considered a necessity, remain unaffected by this paradigm shift. Quite the opposite, many grocery stores have been forced to shut down due to increased competition (Denuwara et al., 2021, p. 7). This is particularly salient in smaller communities. The profitability for small-community grocers is often low due to high staff expenses and low traffic. Larger stores possess the capacity of more convenient opening hours and lower prices because of higher demand (Denuwara et al., 2021, p. 7). Sweden does not constitute an exception to this trend. In fact, the store structure in Sweden has changed significantly since the 1990s (Swedish Agency for Economic and Regional Growth, 2021, p. 7).

The retail industry in Sweden continues to digitize at a rapid pace and e-commerce has acquired large market shares from conventional physical retail (HUI Research, 2021). The number of small grocery stores has immensely decreased in urban areas, as well as in sparsely populated and rural areas. Simultaneously, the very largest stores have not only increased in number, but also in absolute size (Swedish Agency for Economic and Regional Growth, 2021, p. 31). However, the total number of stores has decreased by approximately five percent during the last decade (Swedish Agency for Economic and Regional Growth, 2021, p. 7). The reduction of grocery stores particularly affects residents in sparsely populated and rural areas as the consequence of closed stores often result in long distances to the nearest service point in these areas (Swedish Agency for Economic and Regional Growth, 2021, p. 7). Suburbs are also affected similarly by closed stores (Swedish Agency for Economic and Regional Growth, 2021, p. 7). Consequently, as stated by Helm et al. (2020, p. 2):

> *"Retail changes are macro-level phenomena with micro-level implications."*

In 2021, the Swedish government announced that they pursue a strong policy to enable development and prosperity in the whole country (Government Offices of Sweden, 2021). Regardless of where one resides, there should be an opportunity for self-realization (Government Offices of Sweden, 2021). A prerequisite is that all residents have access to public and commercial services (Swedish Agency for Economic and Regional Growth,

2021, p. 11). Accessibility to grocery stores is often emphasized as one of the most basic factors when accessibility to services is discussed (Swedish Agency for Economic and Regional Growth, 2021, p. 36). This stems from the assumption that all people, to some extent, are dependent on the services provided by grocers (Swedish Agency for Economic and Regional Growth, 2021, p. 36). In addition, many grocery stores act as service points who provide access to other types of community services, e.g., pharmacies and postal services (Swedish Agency for Economic and Regional Growth, 2021, p. 7). However, smaller communities are facing diminishing populations and attracting new residents are becoming increasingly difficult (Denuwara et al., 2021, p. 7). This is especially true for communities without close access to grocery stores (Denuwara et al., 2021, p. 7). Hence, this is conflicting with, and can act as a barrier to achieve the national goal of prosperity since accessibility to service points is essential for the whole country to thrive.

As a response to this conjuncture, a new business model for unmanned convenience stores has been introduced to the market (Denuwara et al., 2021, p. 2). Innovations of this kind can be observed globally. Amazon launched its first unmanned convenience store 'Amazon Go' to the public in 2018, and today 24 stores are operating in the U.S. (Amazon, 2022). In this retail startup, customers are able to carry out their errands without involvement of service personnel due to fully automated payment solutions (Ives et al., 2019, p. 2). Cameras and sensors observe the actions from the consumers and mirror it in virtual shopping carts, which completely eradicates the need of checkout clerks (Ives et al., 2019, p. 2). The convenience chain 7-eleven has also implemented a similar concept called X-store in Taiwan, providing around the clock service with no physical contact with cashiers (Lin, 2022, p. 1). The main difference between unmanned convenience stores (e.g., Amazon Go and X-store) and self-scanning in conventional grocery stores is that the first do not require staff. Instead, identification and payment are enabled by digital tools, such as smartphones and self-checkout stations (Yao et al., 2020, p. 612). Worth noting is that unmanned convenience stores could be either fully automated or semi-automated (Denuwara et al., 2021, p. 10). In fully automated stores, all routines are handled by robots (e.g., cleaning and stocking), whereas in semi-automated stores, most of the behind-the-scenes routines are still handled by humans. The latter is by far the most common (Denuwara et al., 2021, p. 10). Henceforth, when unmanned convenience stores are discussed in this thesis it refers to semi-automated stores.

Swedish companies are considered to be at the forefront with regards to the development of unmanned convenience stores (HUI Research, 2021). It is mainly the progress within digital payment solutions and physical locking functions that has enabled stores to keep open without the presence of staff (Swedish Agency for Economic and Regional Growth, 2021, p. 18). The digital infrastructure in Sweden, encompassing advanced technology related to both identification as well as payment solutions, is being emphasized as almost unique by HUI Research (2021). Both the grocery giants ICA and Coop (HUI Research, 2021) and the convenience chain Pressbyrån (Convenience Stores, 2021, p. 34) have recently implemented unmanned store solutions in their offerings. Additionally, new businesses that solely have unmanned convenience stores in their value proposition have arisen in Sweden in recent years, e.g., Lifvs, AutoMat and 24sju (Convenience Stores, 2021, pp. 66-69). The retail chain AutoMat has ambitious expansion plans for the future and intends to open 200 unmanned convenience stores before the end of year 2024 (Convenience Stores, 2021, p. 14). This clearly illustrates the potential this business model might possess in the coming years.

Scholars have highlighted several benefits of unmanned store solutions. Denuwara et al. (2021, pp. 7, 25) postulates that unmanned convenience stores can increase both efficiency and revenue as well as decrease costs due to the absence of service personnel. It can also provide convenience values to customers as they can save time from waiting in the queue (Lin, 2022, p. 1). Because of low overhead costs, unmanned convenience stores could be located in rural and sparsely populated areas where stores otherwise may have difficulties with profitability due to high labor expenses and low demand (Denuwara et al., 2021, p. 7). Since the closure of stores in these areas often result in significantly longer distances to the nearest grocery store, such solutions are not solely beneficial for the companies, but also to the local community as a whole. Moreover, unmanned convenience stores are a promising solution for urban areas with increasing populations who value efficiency and convenience (Denuwara et al., 2021, p. 7). Yao et al. (2020, p. 612) further emphasize that due to the compact store format of unmanned convenience stores, they have the potential to be established in various places, e.g., hospitals, schools and airports. Unmanned conveniences are also appraised by many governments as they provide social benefits and a superior working environment (Yao et al., 2020, p. 610). As unmanned convenience stores do not require staff on duty, it facilitates employee health because of more flexible working hours resulting in more spare time to engage in social activities (Yao et al., 2020, p. 610). Despite said benefits, there are some obstacles that need to be overcome when implementing an unmanned convenience store. To quote Denuwara et al. (2021, p. 10):

"One problem that might arise is customers' unwillingness to use an unmanned store because they view it as a glorified vending machine."

Denuwara et al. (2021, p. 25) further explain that it is a common perception among customers that technological advancements within the retail industry only serve the companies in terms of increasing profits while harming the communities. Such perceptions may cause a certain resistance. In 2021, HUI Research and BankID were scouting the potential of unmanned convenience stores (HUI Research, 2021). They found that only 20 percent of the inhabitants in Sweden had previous experience from shopping in unmanned convenience stores. Moreover, 30 percent of the inexperienced inhabitants had no intention of doing so in the future. They mainly discussed the lack of service and social interactions as potential inhibitors. Additionally, they emphasized how this store format may induce a sense of insecurity among customers (HUI Research, 2021). Consequently, in order to obtain the benefits that these innovative store solutions can provide for companies and the society as a whole, companies must overcome these obstacles. Hence, it is crucial for companies to understand the aspects that underlie consumer resistance. This study can be considered as a first step towards such knowledge.

1.2 Previous Research

Ever since 2018, when Amazon launched its first unmanned convenience store (Amazon Go) in the U.S., scholars have directed its attention towards the subject. Polacco and Backes (2018) made one of the first attempts to study unmanned convenience stores. The authors conducted a study in the context of Amazon Go and scouted the implications, applications, and sustainability within the industry (Polacco & Backes, 2018, p. 80). The research was of exploratory character, and six managers within the retail industry in the U.S. were interviewed (Polacco & Backes, 2018, p. 81). The authors both examined the

used technology in Amazon Go as well as investigated the industry and communities exploiting the new innovations (Polacco & Backes, 2018, p. 81). The authors found that an implementation of Amazon Go may lead to cost-savings due to reduced need for check-out assistants (Polacco & Backes, 2018, p. 89). However, Polacco and Backes (2018, p. 89) emphasized that it is still uncertain whether such innovations would be widely adopted in the industry of grocery stores.

Chuawatcharin and Gerdsri (2019) empirically studied Thai consumers' attitudes and intention to use just walk out technology (JWOT) in unmanned convenience stores. The study was conducted through a survey sent to 400 Bangkokians (Chuawatcharin & Gerdsri, 2019, p. 152) The authors highlighted JWOT as one of the latest innovations in the retail industry. JWOT is an umbrella term, describing a system that combines several technologies such as computers, sensors, and learning algorithms (Chuawatcharin & Gerdsri, 2019, p. 147). The customers' chosen items will be added to a virtual shopping cart, and the customers will be charged accordingly when walking out the store by receiving an electronic bill to their smartphones (Chuawatcharin & Gerdsri, 2019, p. 147). Chuawatcharin and Gerdsri (2019, p. 149) studied the variables facilitating the adoption of such technologies. The authors concluded that perceived ease of use and perceived usefulness are important factors that stores must focus on when implementing JWOT, implying that the stores have the possibility to enhance the customer attitudes if the store and its system are easy to use (Chuawatcharin & Gerdsri, 2019, p. 160). Furthermore, they presented empirical evidence that demographic attributes of the customers result in different levels of adoption towards JWOT, for instance by how customers with high income and high education show higher levels of intention to use in comparison with their opposite (Chuawatcharin & Gerdsri, 2019, p. 158).

Yao et al. (2020, p. 610) investigated operational problems with unmanned convenience stores and emphasized economic and social performance as the two antecedents. The authors argued that due to the rise of online retail, physical retail encounters significant challenges that must be overcome. Thus, it is important that practitioners understand their operational performance as it allows better management practice and effective resource planning (Yao et al., 2020, p. 610). Yao et al. (2020, p. 613) measured economic performance in terms of sales, profits and market share whereas social performance was measured in terms of social acceptance and employee loyalty. The study was focused on operational performance of unmanned convenience stores in China (Yao et al., 2020, p. 611). The results indicated that the overall economic performance was heavily fluctuating and relatively low in unmanned convenience stores and that the social performance was significantly higher (Yao et al., 2020, p. 623).

Wang et al. (2021) conducted a study on a specific unmanned convenience store in the Taiwaneese-context, with the purpose of examining factors that may influence the consumer intention to use it. The authors utilized the Technology Acceptance Model (TAM) and further emphasized the importance of including the risk perspective, i.e., if the perceived risk might influence the behavior of the consumers (Wang et al., 2021, p. 2). The data was collected by a questionnaire that were answered by consumers who had previous experience of visiting convenience stores in Taiwan (Wang et al., 2021, p. 4). The authors presented empirical evidence that the consumer attitude towards the unmanned store was affected by the perceived usefulness and perceived ease of use (Wang et al., 2021, p. 10). Notably, they did interesting findings regarding how the perception of risk moderated the behavioral intention to use the store, as well as how

female customers demonstrated higher levels of perceived risk towards the unmanned store in relation to the men (Wang et al., 2021, p. 11).

Denuwara et al. (2021, pp. 3-4) adopted a unique approach towards the concept of unmanned stores and how it relates to the three dimensions of sustainability. The reasoning from Denuwara et al. (2021, p. 4) of why this perspective was relevant is because of the several aspects that need to be accomplished to create viable unmanned store, i.e., aspects that may affect the sustainability of the store. Denuwara et al. (2021, p. 13) describes this as an ecosystem, consisting of several actors. The authors did by this perspective adopt a critical analysis on unmanned stores and its impact with regards to sustainability (Denuwara et al., 2021, p. 3). The study was conducted through a questionnaire given to companies described as key players (Denuwara et al., 2021, p. 13). Denuwara et al. (2021, p. 24) concluded that unmanned grocery stores in the future have large opportunities to exceed the ones that can be found in the online industry for groceries. The opportunities that relate to data collection about the customers is as well emphasized as a potential leverage (Denuwara et al., 2021, p. 24). The authors concluded that there are large opportunities for the industry in the future in terms of how efficiency can be increased, how data analytics can enhance revenues, and how waste can be reduced by dynamic prices of goods (Denawara et al., 2021, p. 24).

Park and Zhang (2022) investigated consumer attitudes and continued intention of usage of unmanned convenience stores in China. The authors argued that consumers may experience ambivalent feelings towards new technologies, such as unmanned stores (Park & Zhang, 2022, p. 2). Positive attitudes may occur because the innovation is perceived to have relative advantages (Park & Zhang, 2022, p. 2). However, such innovations may also result in fears of inaccurate identification and unclearness when doing transactions (Park & Zhang, 2022, p. 2). The authors conceptualized these contradictory feelings as the technological paradoxes (Park & Zhang, 2022, p. 2). The authors conducted a survey with respondents who already had experience of visiting an unmanned convenience store (Park & Zhang, 2022, p. 4). By this, the study aimed to examine the relationship between technology paradoxes and the attitudes and intentions to continuously use such stores (Park & Zhang, 2022, p. 7). The results showed that high levels of technology readiness influence the attitudes towards unmanned convenience stores in a positive way. On the contrary, low levels of technology readiness increased the dissatisfaction with the unmanned convenience store (Park & Zhang, 2022, p. 7). Furthermore, privacy leakage, chaos and insecurity negatively influenced the attitudes toward unmanned stores (Park & Zhang, 2022, p. 7).

Lastly, Lin (2022) examined factors that affect the attitudes and intentions to patronage intelligent unmanned convenience stores. In similarity with earlier mentioned researchers (Chuawatcharin & Gerdsri, 2019; Park & Zhang, 2022; Wang et al., 2021), Lin (2022) did also particularly focus on the Asian context, specifically on the Taiwaneese. But, in contrast to the aforementioned, Lin (2022, p. 3) utilized the unified theory of acceptance and use of technology (UTAUT) model in order to examine the customers' intention to use such smart services. Lin (2022, p. 9) conducted this particular study through a survey that was answered by consumers in Taipei, Taiwan. The majority of the sample had previous experience from shopping in unmanned convenience stores (Lin, 2022, p. 1). Furthermore, Lin (2022, p. 5) stated that UTAUT lacks some perspectives, such as perceived risk, convenience value and novelty value, which consequently was added to the study. The results demonstrated that the UTAUT elements (performance, social

influence, and effort expectancy) positively affected the attitude towards unmanned convenience stores (Lin, 2022, p. 12). The level of perceived risk that consumers might experience towards using unmanned convenience stores was stated to reduce the intention to patronage (Lin, 2022, p. 13). The author emphasized that this finding implies that new concepts launched by retailers might be met with low intentions to patronize due to the perceived level of risk, although the consumers may appreciate the idea (Lin, 2022, p. 13).

1.3 Research Gap

The previous research on unmanned convenience stores is limited and takes its starting point in the implications from an economic and sustainability perspective. Previous scholars have highlighted several benefits of such innovations, e.g., cost-savings (Polacco & Backes, 2018, p. 89), increased social performance (Yao et al., 2020, p. 623), increased efficiency and reduced waste (Denawara et al., 2021, p. 24). Consequently, there is an apparent lack of studies that encompasses the negative dimensions of unmanned convenience stores, alternatively, reasons why consumers might perceive resistance and reluctance to use such stores. Hence, the existing literature regarding resistance towards unmanned convenience stores falls short in several areas. How consumers' responds to innovations is conceptualized in two research paradigms in the field of marketing: 1) innovation adoption and, 2) resistance to innovations (Laukkanen, 2016, p. 2433). The majority of existing research embraces the adoption or diffusion approach while studying technological innovations (Mani & Chouk, 2017, p. 2). Whereas these perspectives are advantageous in enabling credible assessments of the innovations market potential and predicting the success of an innovation, they are insufficient on some levels (Mani & Chouk, 2017, p. 2). The adoption or diffusion approaches do not consider potential oppositional reactions from consumers (Ram & Sheth, 1989, p. 6). Because the drivers of consumer resistance may act as barriers to adoption and diffusion of an innovation, these drivers should not be neglected (Mani & Chouk, 2017, p. 2). Indeed, an understanding of consumer adoption is important. However, identifying adoption barriers represents better contributions for practitioners due to the fact that such knowledge can enable avoidance of failure (Laukkanen, 2016, p. 2433).

The research focusing specifically on consumers attitudes towards unmanned convenience stores is surprisingly scarce. The studies that exist have mainly focused on the adoption and usage intention of unmanned convenience stores (Lin, 2022, p. 2; Park & Zhang, 2022, p. 7). However, one can only reach the adoption stage after the consumers' initial resistance towards such innovations is overcome (Mani & Chouk, 2017, p. 3). Consequently, it is necessary to understand consumer resistance in the early stage of the innovation life cycle. Since much of the existing literature focuses on consumers who already have visited unmanned convenience stores (Park & Zhang, 2022; Wang et al., 2021), they fall short in explaining the drivers of rejecting such innovations. Park and Zhang (2022, p. 8) noted that scholars in the future could focus on studying consumers without any previous experience from visiting unmanned convenience stores.

Moreover, the studies that encompasses unmanned convenience stores in relation to consumers focused exclusively on stores in Asia, e.g., Taiwan (Lin, 2022, p. 8; Wang, 2021, p. 4), Thailand (Chuawatcharin & Gerdsri, 2019, p. 7) and China (Park & Zhang, 2022, p. 4; Yao, 2021, p. 617). Hence, it can be argued that most of the previous research has been conducted in, and focused on, Asian markets and Asian consumers. Intuitively,

there are both cultural and technological differences compared to other areas that may hamper the generalizability. For instance, Lin (2022, p. 14) argues that Taiwan is a newly industrialized and highly collectivistic country, and the results can therefore not directly be translated to Western countries because of cultural differences. In relation to this, Sweden is considered one of the most individualistic societies in the world (Heinö, 2009, p. 298). Moreover, in the latest annual report from the European Commission' of the progress of digitalization in the member states, it can be observed that Sweden currently holds a third place in digitization, closely after two of the other Nordic neighboring countries Denmark and Finland (EU-Commission, 2021, p. 3). These aforementioned contextual differences, both by the cultural dimension as well as by the eminent level of digitization in Sweden, opens up interesting opportunities for scholars to examine.

Thus, it can be ascertained that there is a lack of understanding regarding consumer resistance towards unmanned convenience stores. This gets even more obvious when adopting the Swedish context in particular. Potential resistance that can act as barriers towards the implementation of unmanned store solutions is yet to be discussed in the literature. Heidenreich and Handrich (2015, p. 879) postulate that when consumers immediately resist an innovation, before evaluating its potential, all following investments will be wasted. The substantial waste spent on marketing products that fail in the early stages of the innovation life cycle is counted at 135 billion USD yearly in the U.S. (Heidenreich and Handrich, 2015, p. 879) This clearly illustrates the importance of understanding consumer resistance. Based on the problem background and previous research, a research gap is identified. Knowledge of consumer resistance would both enrich the literature and provide practical relevance to companies.

1.4 Research Question

Based on the aforementioned background and research gap in the literature, the following research question have been formulated:

What are the underlying factors that affect the level of consumer resistance towards unmanned convenience stores?

1.5 Purpose

The purpose of this study is to examine the underlying factors that affect the level of consumer resistance towards unmanned convenience stores. This will be done by investigating the relative importance of psychological, functional and individual barriers. The findings will provide a better understanding of the aspects that need to be considered when establishing unmanned convenience stores in Sweden.

1.6 Delimitations

It is necessary that any research project is being refined as much as possible in order to make it feasible to conduct (Saunders et al., 2007, p. 19). Firstly, this thesis intends to solely examine factors that might influence consumer resistance towards unmanned convenience stores. Thus, factors that positively might influence general attitudes towards this subject have been omitted. Moreover, this thesis mainly focuses on consumers who have no previous experience with unmanned convenience stores. This

study has purposefully been limited to the Swedish context, i.e., concerning unmanned convenience stores established in Sweden.

2. Scientific Methodology

In this chapter, the pillars of the study are presented. The purpose is to explain the theoretical methodology that governs the research process. Initially, preconceptions are presented to explain how it may affect the thesis. Further, an explanation about the choice of subject is provided. The chapter then turns into a detailed elaboration regarding the choice of positivistic research paradigm, ontology and epistemology assumptions, deductive scientific approach and quantitative research design. The purpose is to explain why these choices are suitable for the present thesis. Then follows a description about the time horizon and choice of cross-sectional study. The chapter ends with an explanation regarding how source criticism has been accounted for, and the literature search process.

2.1 Preconceptions

Generally, every author has different degrees of preconceptions when working with a subject, which consequently influences their interpretation (Thurén, 2019, p. 113). The authors of this study are aware of these potential implications and will thereby briefly explain their academic background as well as clarifying other experiences that are presumed as relevant. The authors behind this thesis have both graduated with one-year Master's degrees in business administration from Umeå School of Business, Economics and Statistics. Both authors are currently enrolled at the Master's program in Business Development and Internationalization. Additionally, one of the authors has a Bachelor's degree in Economics. Both authors have an apparent interest for the subject of business development which consequently also can be seen as the foundation regarding why this subject of matter was chosen.

The authors have collectively gained wide knowledge about different methodological approaches and practices since both are familiar with either quantitative or qualitative studies due to recent theses. The Bachelor's degree in Economics that one of the authors possesses has provided valuable knowledge and abilities regarding how statistical data can be managed through econometrics. One of the authors also has experience from retail and supply chain management due to specialization during previous studies. From a professional perspective, it can be concluded that one of the authors has several years of experience from working at different grocery stores. Collectively, these experiences have enabled a deeper dimension during the discussions since it allows for store- and industry specific insights that may have been impossible to reach otherwise.

Previous experiences from a subject influence how the authors perceive the reality, which according to Thurén (2019, p. 113) may occur more than expected. It is crucial for individuals to possess some kind of basic preconception since understanding and learning would be impossible otherwise (Thurén, 2019, p. 114). The authors of this thesis are therefore believing that the existing preconceptions have been a resource when conducting this research, since both theoretical as well as practical experiences have enabled a holistic perspective of the retailing industry. By this the authors may collectively possess a broad perspective of the theoretical and practical issues that relate to the retailing industry, and its presumed future with regards to current trends. There is nothing wrong with having preconceptions (Thurén, 2019, p. 114), and by thoroughly informing of relevant academic, professional, and personal experiences, the authors believe that potential sources of influence have been disclosed.

2.2 Choice of Subject

The choice of subject of this thesis is based upon the interest that both of the authors possess towards entrepreneurship and business development, and how such preferences may be stimulated in a practical and theoretical sense. The authors had a strong wish that the subject of choice for this thesis would complement their existing competencies and act as a tool for gaining deeper knowledge about how business development can be manifested in practice. In that sense, a choice of subject that would contribute with valuable and practical knowledge towards a concept that has been getting increasing amounts of interest in academic literature in recent years was perceived as exciting. In the course Strategic Business Development D at Umeå university, one of the authors had the opportunity to suggest a business model innovation to a convenience store in a sparsely populated area in Sweden. The client had an apparent interest for the concept of unmanned convenience stores as a potential solution for their low profitability. This sparked an interest from the authors as it indicated that actors within the industry consider it as a realistic option for the future. Hence, the authors believed that this subject would contribute with practical relevance that practitioners could benefit from.

There is an apparent trend, both on an international scale, as well as nationally in Sweden, that unmanned stores are getting increased attention and the frequency of new establishments are increasing. The whole retail industry has simultaneously been significantly affected by the effects of the ongoing digitalization (HUI Research, 2021). Hence, it can be argued that this direction of development may further continue in the future, with new concepts and innovative solutions that businesses can use to offer value to their consumers. In parallel with this development, it can be perceived as a lack of existing scientific work that focuses on unmanned stores in general, and by that, also towards unmanned convenience stores. In this context, the lack of studies that relates to the Swedish market is particularly salient. The authors perceive that there are large amounts of articles that focus on facilitating factors when studying innovations and new technical solutions, which sometimes neglects factors that may cause resistance amongst the users. Consequently, this choice of subject illustrates an alternative approach towards a store concept that is trending and believed to be an even more common sight in future societies.

2.3 Research Philosophy

A paradigm is a concept that encompasses how reality may be perceived (Thurén, 2019, p. 70). Kuhn (1970, p. 176), who is considered as the founder of the term paradigm, states that a paradigm encompasses what a scientific community share. In that sense, the paradigm can be understood as a system that guides the researcher during the study, both by practical choices but also in terms of its epistemological and ontological approach (Lincoln & Guba, 1994, p. 105). More generally described, Collis and Hussey (2014, p. 43) describes it as a framework that works as a guidance on how research should be realized. Therefore, as the aforementioned similarities reveal, it can be argued that a paradigm is a term that encompasses fundamental assumptions that collectively influences the orientation that researchers embrace when conducting research. These fundamental and influential assumptions will entail that researchers may discard knowledge and observations that do not fully fit the salient paradigm (Marsh & Furlong, 2002, p. 24). Marsh and Furlong (2002, p. 24) exemplifies how shifts in paradigms eventually occur when researchers finally dare to question the current paradigm due to

increased amounts of empirical observations that signal something else than what the salient paradigm suggests. This concept can be linked with Ryan (2018, p. 14), who states that research philosophy is concerned with the reality of how researchers perceive knowledge, reality, and what is to be regarded as truth. Hence, research philosophy entails influential assumptions regarding how the researcher perceives and interprets the world (Saunders et al., 2007, p. 101).

There are several ways of classifying research paradigms. One approach mentioned by Marsh and Furlong (2002, p. 21) is by categorizing the paradigms into three positions; positivism, interpretivism and realism. In this case, the inclusion of the realism component is the biggest distinction from another influential categorization emphasized by Collis and Hussey (2014) which omits realism. The categorization of Collis and Hussey (2014, p. 44) solely consists of positivism and interpretivism. These two paradigms can be perceived as the opposites of a continuum, which can be differentiated through some fundamental differences. While research linked to the positivist tradition tends to use quantitative methods to find causal relationships, and by that, generate objective findings that can be easily generalizable to the rest of the population, interpretivist researchers rather tend to emphasize the mere understanding rather than explanation (Marsh & Furlong, 2002, p. 21). Bryman (1997, p. 23) emphasizes that the most foundational aspect of the positivist paradigm is how it claims that methods from natural science are applicable to all types of knowledge. It is by this possible to apply natural science related methods and approaches on subjects derived from social sciences (Bryman, 1997, p. 24). Research that is based upon the interpretivist paradigm tends instead to utilize qualitative methods to produce qualitative evidence which can be seen as an interpretation of the phenomena that has been studied (Marsh & Furlong, 2002, p. 21). These distinctions will also have impacts on the approach of the researchers towards epistemological and ontological standpoints, which will be discussed further down in this section.

This study has adopted the positivist paradigm, which according to the reasoning by Marsh and Furlong (2002, p. 17) consequently will influence the ontological and epistemological positions. This study is not intended to scrutinize why individuals might demonstrate resistance towards unmanned convenience stores. If that would be the case, the interpretivist approach would have been found suitable due to its ability to generate qualitative data and provide interpretation of the subject that is being studied. Instead, the positivist approach is adopted since the authors of this study intend to disclose relationships between variables that may influence the level of resistance towards unmanned convenience stores. Consequently, the authors of this study perceive the positivist approach as more suitable due to its ability to generate objective facts (Marsh & Furlong, 2002, p. 21) rather than adopting an interpretivist approach that focuses on a rich explanation of a few cases.

Neither of the research paradigms excludes the usage of either a quantitative or qualitative approach when conducting a study. Guba and Lincoln (1994, p. 105) states that choices regarding if the researcher should apply a qualitative or quantitative approach is secondary with regards to the paradigm. Marsh and Furlong (2002, p. 17) states that the orientation of each researcher towards any subject within social sciences is influenced by the epistemological and ontological position. Since this influence is considered as inevitable, Marsh and Furlong (2002, p. 17) describes how it should be considered as a skin instead of a sweater, meaning that researchers must be aware that these positions are

not interchangeable when conducting research. Ontology and epistemology must be separated although they are two related concepts (Marsh & Furlong, 2002, p. 18). McBride and Wuebker (2020, p. 5) differentiate these two concepts by explaining that epistemology is the study that encompasses what humans believe about something, whereas ontology rather encompasses the study of what that something is. This approach is further strengthened by Turyahikayo (2021, p. 210) who emphasizes how the term research philosophy can be understood through its components "philo" and "sophia". By this distinction, philo refers to the study of something, whereas sophia refers to knowledge (Turyahikayo, 2021, p. 210). Hence, the philosophical assumptions that underpin the two major research paradigms of interpretivism and positivism are issues that each researcher carefully must consider since it largely influences what the researcher constitutes as knowledge or not. The ontological and epistemological positions used in this thesis will therefore be influenced by the attributes of the positivist paradigm, and will be explained in detail further down in this chapter.

2.3.1 Ontological Assumptions

As recently mentioned, ontology is described by McBride and Wuebker (2020, p. 5) as "the study of what something is". It is hence linked with the nature of reality (Antwi & Hamza, 2015, p. 217; Collis & Hussey, 2014, p. 47; Ryan, 2018, p. 15; Saunders et al. 2007, p. 106; Yilmaz, 2013, p. 316) and consequently, if the world that is being studied is independent or not (Marsh & Furlong, 2002, p. 18). The reality is by this perspective fully dependent upon how each individual experience it (Fleetwood, 2005, p. 197). From an ontological perspective, positivistic researchers believe that the reality is identical for every individual and that facts can be empirically proven by observations (Ryan, 2018, p. 15). Since this particular perspective is influenced by the assumption that the reality is objective and the same for every social entity, positivistic researchers can use independent instruments in order to quantify and systematize the truth (Antwi & Hamza, 2015, p. 218). Consequently, this implies that it is solely phenomenon that are directly observable that can be considered as valid knowledge (Bryman, 1997, p. 24). In contrast to this perspective, interpretivist researchers rather see the reality as something non-homogenous, resulting in a belief that there are many different realities that individuals and entities experience (Turyahikayo, 2021, p. 213). By recalling back to the idea that the two major paradigms can be understood as the opposites of a continuum, positivist researchers see the world as objective and thus, external, whereas interpretivists see the world as socially constructed, and thus, the reality as something subjective for each individual (Collis & Hussey, 2014, p. 47). Hence, as the ontological position in this thesis in particular is influenced by the positivist paradigm, this study assumes that the reality is objective and by such, can be empirically proven by observations. Knowledge will therefore solely be accepted as valid if it is directly observable.

There are two major positions within ontology, consisting of objectivism and constructionism (Antwi & Hamza, 2015, p. 218; Bryman, 2018, p. 57; Saunders et al., 2007, p. 108). The major difference between these two positions is constituted by how social entities and social phenomenon are regarded. According to Saunders et al. (2007, p. 108), objectivism portrays reality as social actors externally to social entities, which can be compared to constructionism that rather perceives reality as something that is collectively being constructed. By this, the world is constantly evolving due to social interactions. Since the world is fully external according to objectivism, facts are independent from others and thus, cannot be influenced by the researcher (Bryman & Bell, 2011, p. 21). This study has adopted the objectivistic position towards ontology,

which implies that the authors assume that the reality is objective and consistent for each individual. Thus, the authors argue, in line with the positivist approach, that it is possible to remain objective and independent when collecting and analyzing the empirical data to generate valid knowledge. The authors believe that resistance toward unmanned convenience stores is considered as external, i.e., not a phenomenon that is being socially constructed by the consumers collectively. Every consumer is external and objective towards unmanned convenience stores, whereas the resistance is individual and not collectively being made. The consumers and unmanned convenience stores exist independently from each other. Therefore, adopting an objectivistic position towards ontology is more appropriate than adopting a constructionist view that rather sees the reality as something being collectively constructed (Saunders et al., 2007, p. 108).

2.3.2 Epistemological Assumptions

Epistemology concerns how people may know and perceive the world (Ryan, 2018, p. 14). The philosophical question that researchers may ask themselves is relating to what the truth is (Ryan, 2018, p. 15), and what they are considering as real (Saunders et al., 2007, p. 103). Two other additional central issues that relate to this concept are relating to the relationship and the subject that is being researched, as well as regarding what it really is that constitutes knowledge (Antwi & Hamza, 2015, p. 219). Epistemology can by this be understood as what kind of knowledge that is acceptable (Saunders et al., 2007, p. 102), i.e., more pedagogically described as what researchers believe of something (McBride & Wuebker, 2020, p. 5). Thus, epistemological standpoints refer to in what way researchers interpret knowledge and consists of two major approaches: positivism and interpretivism (Antwi & Hamza, 2015, p. 2019). Another position within epistemology is by some researchers described as realism, which shares ideas with the positivistic position since it has a similar scientific approach towards knowledge (Saunders et al., 2016, p. 105) but do not consider direct observations as crucial as the positivists (Marsh & Furlong, 2002, p. 20). By this, realists emphasize that some facts cannot be directly observed, but still be needed for making a correct explanation of the phenomena (Marsh & Furlong, 2002, p. 20). The authors of this thesis consider valid knowledge as objective evidence that has been observed. Hence, the data collection of this study will be based upon surveys that provide numerical data to hypotheses which are based upon existing theories. Additionally, the role of the researchers in this study is to maintain distance and its objectivity, both from the phenomena itself as well as from the respondents. This is aligned with the approach that this study adopts, i.e., by how the authors will keep the distance towards the subject that is being examined. These aforementioned positions are aligned with important concerns according to the epistemological assumptions described by Collis and Hussey (2014, p. 47).

2.4 Research Approach

There are two contrasting approaches regarding how the researcher may draw conclusions; a deductive approach or an inductive approach (Ryan, 2018, p. 15; Saunders et al., 2019, p. 152; Thurén, 2019, p. 44). Mantere and Ketokivi (2013, p. 70) explains this by using the term scientific reasoning, while Saunders et al. (2019, p. 128) describes it as possible ways to develop theory. Both Mantere and Ketokivi (2013) and Saunders et al. (2019) are including abduction as a complementary approach alongside deduction and induction. Abduction is described as a combination of approaches by Suddaby (2006, p. 639), which therefore can include both deductive as well as inductive elements (Sanders et al., 2019, p. 155). The main difference between the two contrasting approaches of

deduction and induction is relating to what the conclusion is based upon, which in the case with deduction refers to logic and induction instead refers to empirical data (Thurén, 2019, p. 44).

Research that adopts an inductive approach is therefore closely linked with general conclusions based on empirical evidence compared with those who adopt a deductive approach (Thurén, 2019, p. 45). Hence, quantitative researchers utilize deduction in order to test theories while qualitative researchers generate theories by induction (Antwi & Hamza, 2015, p. 222). Consequently, positivist researchers are more prone to the deductive approach whereas interpretivists use induction (Boeren, 2015, p. 420; Saunders et al., 2006, p. 117). The scientific reasoning in this thesis is aligned with the deductive approach since the conclusions will be based upon quantified results that relate to the hypotheses grounded in existing theories, i.e., by testing theories. Alternatively, if the authors of this study instead intended to examine the underlying factors of customer resistance towards unmanned stores, and from this, develop a new theory, an inductive approach which is based upon the empirical data would be more appropriate.

Deductive logic is going from a general level towards particularity (Marsh & Furlong, 2002, p. 37). Consequently, while the deductive research is going towards the particular, based on the general, induction goes in the reverse direction. By this, induction emphasizes general inferences that are based, i.e., induced, from the particular instead (Collis & Hussey, 2014, p. 7). Another way of understanding these two approaches is by seeing deductive research as theory-driven, while inductive research can be seen as rather data-driven (Boeren, 2015, p. 420). These two ways of reasoning bring two significant distinctions in how inference can be drawn. Quantitative researchers, with their deductive approach, can due to their procedures of utilizing existing theory and by constructing predetermined responses, obtain generalizable results (Yilmaz, 2013, p. 313). The role of the quantitative researcher is in these settings to remain neutral, while qualitative researchers interact with the respondents in order to obtain in-depth data which helps them to fully understand the world that the respondent is perceiving by experiences, feelings or meanings (Yilmaz, 2013, p. 313).

Hence, these three aforementioned types of reasoning are considered as the three main instruments of inferences (Mantere & Ketokivi, 2013, p. 72). For this particular study, a deductive approach has been adopted since the study is based upon existing theories in the academic literature. Furthermore, this study does not intend to develop new theories or theoretical propositions. If that would be the case, an inductive approach towards theoretical reasoning would be more adequate. Instead, specific theories and models are used as a foundation for the hypotheses for this study, which in a later stage are tested with empirical observations. Existing theories and frameworks that relate to adoption and resistance towards innovations have not yet been applied towards the Swedish context of unmanned convenience stores, a research gap that the authors considered to be interesting to bridge. Since the theoretical propositions have been applied towards innovations in general, the same principles would apply to such an innovative store concept. By this, a deductive way of reasoning is being used since the prediction will be followed by either confirmation or disconfirmation (Mantere & Ketokivi, 2013, p. 72).

2.5 Research Design and Strategy

Research design is according to Robson (2002, p. 79) about how the researcher may convert their research question into an explicit project. Qualitative and quantitative research are the two major approaches that researchers may adapt when conducting research. Whether a qualitative or quantitative research strategy should be adopted by the researcher is according to Robson (2002, p. 70) fully dependent on which kind of questions that the researcher wants to solve. One of the simplest descriptions of the difference between quantitative and qualitative studies is that quantitative researchers focus on issues that can be explained and described by numbers, while qualitative researchers rather tend to focus on issues that solely can be described by words (Eliasson, 2018, p. 21). The major implication of this distinction is that qualitative researchers have the ability to study phenomenon more deeply than quantitative researchers, while quantitative researchers instead have better abilities to generalize its results outside of the studied sample (Eliasson, 2018, p. 21).

Quantitative research is described by Yilmaz (2013, p. 311) as research that, with the help of analyzed numerical data, explains phenomenon. A similar description is used by Eliasson (2018, p. 27) who describes it as several methods that collectively involve mathematical tools in order to analyze data. Hence, it is focusing on ways that the researcher can use to collect and analyze quantitative data, often in the form of surveys (Eliasson, 2018, p. 28). The quantitative researcher is adopting distance towards the respondents since they want the reality to be studied objectively, implying that the researcher needs to adopt a neutral role during the study (Yilmaz, 2013, p. 313). As mentioned earlier in this thesis, quantitative research is often closely linked with a deductive approach, meaning that the researcher is basing its questions on existing theory, i.e., theory-driven approach.

Shah and Corley (2006, p. 1832) states that one of the fundamental limitations of quantitative research is its inability to generate theory, which qualitative methods have the ability to overcome. Qualitative research allows the researcher to collect rich information which are required when generating theories (Shah & Corley, 2006, p. 1821). Corbin and Strauss (2008, p. 11) suggest that qualitative research allows the respondents to get richer insights from the respondent, involving personal experiences. The research process is by this approach more dynamic and explorative, leaning more towards the discovery of new variables rather than purposefully testing them (Corbin & Strauss, 2008, p. 11).

The authors of this thesis argue that the research question is particularly appropriate for adapting a quantitative research design. By this, the study is based upon a quantitative perspective in order to adapt a theory-driven approach that encompasses factors that the existing academic literature emphasizes as influential for resistance towards innovations. Such factors, with regards to the selected ontological approach of objectivism, entails that numerical structure and analysis of data is the most appropriate approach since every respondent experiences the same reality. Hence, already existing literature is the foundation of the hypotheses that are tested in order to establish an understanding whether specific factors are influencing the resistance or not. The chosen factors have not yet been applied and tested in the context of unmanned convenience stores, which makes it interesting to test. If the subject already would have been excessively studied prior to this study, another approach such as the qualitative design with induction, would have been

appropriate since its ability to discover new variables as emphasized by Corbin and Strauss (2008, p. 11). Consequently, the authors of this thesis do not consider the choice of a quantitative design as a limitation since the thesis does not have the purpose to generate new theory which is in line with the reasoning from Shah and Corley (2006, p. 1832).

2.6 Type of Study

While the logic for a study can be based upon either a deductive, or an inductive approach, the mere purpose that the research has can be categorized accordingly to which kind of results that the researcher is intended to obtain. There are three major groups that studies can be categorized into in terms of explanatory studies, exploratory studies, respectively, descriptive studies (Saunders et al., 2007, p. 133). Since this particular thesis and its research question is focused on specific underlying factors that may affects customer resistance towards unmanned convenience stores, this study seeks to obtain answers that are of an explanatory nature. Hence, the answers should clarify which variables have an influence, as well as to what extent. This is aligned with Robson (2002, p. 59), who describes that researcher who conduct explanatory studies strive to offer an explanation to something, often with support via causal relationships. The explanation itself consists of patterns and eventual relationships between variables related to the phenomenon studied (Robson, 2002, p. 60). The main goal of such studies is therefore to establish or explain relationships between variables which can help to achieve a better understanding of the situation that is being studied (Saunders et al., 2007, p. 134). On the other hand, exploratory studies rather strive for achieving new insights about a phenomenon, for instance by studying what it is that occurs or by assessing a phenomenon from a new perspective (Robson, 2002, p. 59). Saunders et al. (2007, p. 133) exemplifies how these types of studies are especially useful when there is a problem that needs to be further clarified.

Lastly, descriptive studies intend to focus on particular events, situations or individuals. This type requires large amounts of previous knowledge about the phenomenon that is being studied in order for the researcher to know which specific aspects are relevant (Robson, 2002, p. 59). Saunders et al. (2007, p. 134) notes that descriptive studies tend to fit well as a predecessor to the other types of research since its ability to generate knowledge about something particular. By this, descriptive studies can be seen as a tool for achieving a goal rather than the goal itself (Saunders et al., 2007, p. 134). Based on the aforementioned, this thesis is categorized as an explanatory study since it seeks to examine and explain relationships between variables and consumer resistance, which consequently fulfills the description of an explanatory study when compared to the descriptions of exploratory and descriptive studies.

2.7 Time Horizon

There are two main approaches to how research may be designed with regards to the timeframe that the study covers. Saunders et al. (2007, p. 148) states that it is an important question for researchers to ask themselves when planning a project, since different designs will entail different periods of time that the researcher will study. Longitudinal studies refer to studies that each respondent of interest is being studied several times over long periods of time, which gives the researcher the possibility to scrutinize the influence of the time (Lantz, 2014, p. 27). The change that may have occurred over time, and

thereby influenced the empirical data, is often the main reason why some researchers chose this type (Lantz, 2014, p. 28), and as well its biggest advantage (Saunders et al., 2007, p. 148).

The contrary type of study is cross-sectional studies, which refers to studies that focus solely on a specific phenomenon during a given time (Saunders et al., 2007, p. 148). This is one of the most commonly used designs within social research, particularly used with surveys (Robson, 2002, p. 157). Cross-sectional studies are often used by researchers in order to explain the presence or frequency of factors or how these may be related (Saunders et al., 2007, p. 148). In terms of advantages, cross-sectional studies allow the researcher to collect large amounts of data relatively cost effectively (Thrane, 2019, p. 139). This study has adopted a cross-sectional perspective because the phenomenon that is being studied does not imply that changes over periods of time are of importance. Instead, this study is intended to examine factors that are influencing consumer behavior at a given time, i.e., right now. If the purpose was to examine how such factors affecting consumer resistance were changing over a period of time, a longitudinal approach would have been more appropriate.

2.8 Source Criticism

The ability to critically scrutinize sources is of great importance when conducting research in order to ensure the quality. Source criticism is relating to how the researcher successfully can assess the quality and reliability of the source (Thurén & Werner, 2019, p. 11) and how the researcher may adopt a critical approach to the sources that are being used (Alexanderson, 2016, p. 10). Both Alexanderson (2016) and Thurén and Werner (2019) emphasize the importance of using four principles when assessing a source. When using these principles, Alexanderson (2016, p. 9) believes that a successful source criticism is applied. These basic principles consist of the following four dimensions; authenticity, time, independence, and freedom of tendency (Alexanderson, 2016, p. 9; Thurén & Werner, 2019, p. 12).

The authenticity addresses issues related to if the source is the one who it claims to be, i.e., if the source is genuine or false. This aspect is especially important, and problematic, when sources are derived from the internet since every individual can publish what messages they want (Alexanderson, 2016, p. 14). Independence refers to whether the source is considered as independent or if it possibly has any linkages to other actors, nor being any information that has been summarized from a third part. It is also important to evaluate if the information can be considered as relevant with regards to the length of time since it was published, and also, if the source may have any interest to distort the information of any reasons (Alexanderson, 2016, p. 9; Thurén & Werner, 2019, p. 12). The probability of using low quality sources is reduced by systematically applying these principles when searching for sources. Lastly, it can be relatively effective to see if several independent sources provide the same information in order to ensure that the source should be considered as reliable or not (Alexanderson, 2016, p. 10). In the next section of this thesis, the course of action that has been adopted during this study will be further explained via practical examples. The four aforementioned principles of source criticism emphasized by Alexanderson (2016, p. 9) and Thurén and Werner (2019, p. 12) have been influential when searching for literature for this thesis. Consequently, in order to ensure high quality of sources, the authors of this thesis have controlled that the sources are perceived as genuine and are primary sources, i.e., avoided to use secondary referencing.

Much of the previous research that has been conducted within this subject of unmanned convenience stores has been done within a relatively short period of time from now, which implies that the time dimension of source criticism is fulfilled. The previous scientific literature is hence not considered as being too old.

2.9 Literature Search

In order to abide by these principles, and by that, carefully follow existing guidelines with the purpose of avoiding unreliable sources, the authors of this thesis have been careful in what kind of, and from where, sources have been obtained. The search function on the webpage of Umeå university library (https://www.umu.se/en/library/) has been utilized as the main source of scientific articles. Complementary search activity has been done via Google Scholar (https://scholar.google.com/) and other academic search browsers, such as EBSCOhost (https://search.ebscohost.com/) since it can provide an easier and more comprehensive view of available scientific articles. Any articles found via search browsers were afterwards examined on the webpage of Umeå university library in order to ensure its reliability due to its function of ensuring that it has been peer reviewed. It is important to keep in mind that external search browsers, such as Google Scholar, may have economic interests in how their algorithms prioritizes the results (Alexanderson, 2016, p. 21), which consequently may influence what the researcher finds.

Examples of keywords and concepts that have been used when browsing academic articles were: *Consumer adoption*, *consumer resistance*, *digitalization*, *innovation acceptance*, *innovation barriers*, *innovation resistance*, *retail*, *unmanned store*, *unattended convenience store*, *unmanned convenience store*, *unmanned food store*, *smart store*, *technology acceptance*, *technology acceptance model (TAM)*, *unified theory of acceptance and use of technology (UTAUT)*, *unified theory of acceptance and use of technology 2 (UTAUT2)*. Such keywords and concepts have been used both individually as well as combined in a variety of ways. Consequently, peer-reviewed articles found on the Umeå university library search browser by using "*consumer resistance" (263 185 articles)* and "*unmanned stores" (8 065 articles)* yielded a total of 239 articles. See Appendix 1 for an overview of the number of articles that were found on the Umeå university library search browser using these keywords and concepts.

The same principle has been applied on articles that are the foundation to the theoretical frame of reference, as well as for methodological purposes. Many textbooks have also been utilized, such as course books borrowed from Umeå university library, which the authors believe is a sign of authenticity and reliability. The majority of these have been related to methodology. Scientific articles that have been provided from the university, both by the Thesis manual of Umeå School of Business, Economics and Statistics as well as in previous courses, have been utilized. Particularly, a course on masters-level named *Research Methodology in Business Research* provided insights from several sources via its literature list. This list suggested several scientific articles that related to advanced knowledge about scientific processes and business research. Additional scientific articles were obtained from the section of *literature suggestions* in the thesis manual, specifically related to general issues of business research as well as for qualitative and quantitative approaches.

There has also been an inclusion of non-scientific articles and sources, particularly in the introductory parts of the thesis in order to provide an interesting, comprehensive and rich

background. The aforementioned four principles of source criticism have been particularly important to apply in these cases, which ensures that utilized sources are characterized by quality and good reliability. Apart from using governmental sources, non-governmental sources have been used to provide industry-specific information about unmanned stores in general, and for the Swedish industry specifically. Since these types of sources originate from companies and organizations that may have apparent economic interests in promoting their own industry and company, additional sources have been used in order to mitigate the risks related to freedom of tendency and independence. The researchers of this thesis strongly believe that all utilized sources are trustworthy and as such, satisfies the principles of source criticism.

3. Theoretical Framework

This chapter will present the theoretical foundation that the thesis is built upon. Thus, influential theories and concepts that have been identified within the subject of consumer resistance and adoption will be presented. Particularly, the Ram and Sheth (1989) framework of barriers towards innovation will be further utilized and act as pillars of the study. Nine hypotheses chosen from the literature based on their relevance to consumer resistance towards unmanned convenience stores will be presented. Excluded variables will then be discussed to provide an understanding of why they are not considered in this thesis. The chapter will be concluded by a conceptual framework.

3.1 Innovation Adoption and Resistance to Change

As mentioned in chapter 1.3, the existing literature regarding consumers' response to innovation is divided into two separate paradigms – innovation adoption and resistance to innovations (Laukkanen, 2016, p. 2433). The first paradigm is focused on the process of adopting an innovation. The concept is built upon Roger's (1983) seminal publication "Diffusion of innovations" (Mani & Chouk, 2018, p. 783). Diffusion can be defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1983, p. 5). An innovation is as an idea, practice, or object that the user perceives as new. Hence, it is not of particular relevance whether the innovation is objectively new, but it rather depends on the individual's perception of its novelty (Rogers, 1983, p. 11). The innovation adoption paradigm is also built upon acceptance of innovation (Ajzen, 1991; Davis, 1989). Several researchers have incorporated these ideas into theoretical models in order to explain consumer adoption of innovations. These models have been extensively tested and validated (Mani & Chouk, 2018, p. 783). Examples of such models are technology acceptance model – TAM (Davis, 1989), the theory of planned behavior – TPB (Ajzen, 1991), the unified theory of acceptance and use of technology – UTAUT (Venkatesh et al., 2003), and the unified theory of acceptance and use of technology 2 – UTAUT2 (Venkatesh et al., 2012).

The other paradigm instead focuses on consumers' resistance toward innovations (Mani & Chouk, 2018, p. 783). Gatignon and Robertson (1989, p. 36) argue that previous diffusion literature almost exclusively encompasses the adoption of innovations. The authors continue to emphasize that rejection of an innovation cannot be explained by the same variables. On the contrary, Ram (1987, cited in Mani & Chouk, 2018, p. 783) explains that innovation resistance is not the ultimate opposite of adoption. Instead, adoption and resistance can coexist during the life cycle of an innovation. Consequently, a few events can be explained by similar variables. Scholars on the resistance paradigm typically emphasize the concept of resistance to change while studying the determinants of consumers' unwillingness to adopt a new product, service or other innovation (Mani & Chouk, 2018, p. 783). Precursor scholars in the field of innovation resistance argue that consumers are typically satisfied within the status quo, and hence resistant to change (Sheth, 1981, p. 275). In the field of business administration, such resistance to change has been studied in the context of introducing new products and services to the market (e.g. Kleijnen, 2009, p. 345; Laukkanen, 2016, p. 2433; Mani & Chouk, 2018, p. 782; Mani & Chouk, 2019, p. 1461; Ram & Sheth, 1989, p. 6). Since unmanned convenience stores are a relatively new concept which has not yet been studied outside the Asian market, the authors of this thesis propose adopting the second paradigm and thus, focus

on resistance that consumers might demonstrate towards unmanned convenience stores rather than adopting the first paradigm.

3.2 The Ram and Sheth Framework

Ram and Sheth (1989, p. 7) explain that consumers have several barriers that hamper their desire to adopt an innovation. The authors further suggest that these barriers can be grouped into two categories that explain consumer resistance towards innovations: 1) functional barriers and 2) psychological barriers. The functional barriers consist of three factors (i.e., the usage barrier, the value barrier and, the risk barrier). Such barriers may occur if the consumer experiences significant changes from adopting an innovation. More closely described, Ram and Sheth (1989, p. 7) proposes that the usage barrier refers to the process that needs to be accomplished before the customers perceive acceptance. Thus, one of the most frequent reasons why resistance towards innovations occurs is due to the particular innovation's lack of compatibility to existing habits or practices (Ram & Sheth, 1989, p. 7). The value barrier was included in the original model by Ram and Sheth (1989, p. 8) because of the customers' need to perceive that they have some type of incentive to change from the current product or service to a new one. The incentive, in this perspective, is that the innovation offers more value than the old one. Lastly, the risk barrier proposed by Ram and Sheth (1989, p. 8), refers to the sense of uncertainty that all types of innovations bring to the customer, which as well encompasses the risk of unknown negative side effects. Ram and Sheth (1989, p. 8) included four different types of risks in their model: physical risk, economic risk, functional risk and lastly, social risk.

In turn, the psychological barriers consist of two factors (i.e., tradition barrier and image barrier). These barriers may arise if the innovation is conflicting with the consumers prior beliefs. Specifically, the tradition barrier was proposed since innovations bring cultural changes to the customer (Ram & Sheth, 1989, p. 9). Thus, the more the innovation deviates from established traditions, the larger the resistance (Ram & Sheth, 1989, p. 9). The psychological barrier is as well including an image barrier, which according to Ram and Sheth (1989, p. 9) refer to how innovations may bring unfavorable associations for the consumer, such as if the product has been manufactured in a country that the consumer dislikes. In such cases, the negative attitude of the country gets associated with the innovation. The image barrier is therefore linked to how an innovation might be associated with negative feelings that enhances the risk of resistance (Ram & Sheth, 1989, p. 9).

This thesis builds upon the existing marketing literature on consumer resistance in services (e.g., Claudy et al., 2014; Laukkanen, 2016; Mani & Chouk, 2018). These existing studies are rooted in Ram and Sheth's (1989) framework in order to empirically analyze barriers resulting in consumer resistance in services. The Ram and Sheth (1989) framework provide a solid foundation to start from, since the authors have identified the major barriers for adoption that create an overall picture of resistance (Mani & Chouk, 2018, p. 784). This model has also been adopted by several scholars and tested empirically within the field of services. As the purpose of this study is to investigate which factors influence consumer resistance towards unmanned stores, the authors of this thesis argue that it is a suitable model to apply.

Since the Ram and Sheth (1989) framework is relatively old, it has later been extended. Heinze et al. (2017, p. 363) argue that the model requires adjustments to the digital age.

Mani and Chouk (2018, p. 784) follow this argumentation. The authors argue that the original framework does not consider the technological progress within the service industry that has drastically changed consumers' attitudes and beliefs. They further propose an extension of the model by including the technological vulnerability barrier (Mani & Chouk, 2018, p. 784). Ng and Wakenshaw (2017, p. 14) postulates that more research is needed to understand vulnerability in digital domains. Baker et al. (2005, p. 134) describe vulnerability as a state of powerlessness that occurs when the consumer experiences a lack of control. Parasuraman (2000, p. 317) emphasizes that individuals who are not ready to adopt new technology might experience certain anxiety, even though they are relatively optimistic towards it. Consumers who believe that they are too reliant on technology may experience dependency, or even addiction, which can serve as a driver for resistance (Mani & Chouk, 2017, p. 85). Based on these assumptions, Mani and Chouk (2018, p. 786) extends the Ram and Sheth (1989) framework by including additional variables to predict resistance to innovations.

By this, Mani and Chouk (2018) proposed an extension of the model by Ram and Sheth (1989) to better include the technological evolution that had occurred. The extensions that were included with regards to the original model made by Ram and Sheth (1989) consisted of three main components. Apart from using the original barriers (i.e., sources of resistance) via the functional barriers (usage barrier, value barrier, and risk barrier) and the psychological barriers (tradition barrier and image barrier), Mani and Chouk (2018, p. 787) included an individual barrier, an ideological barrier as well as a barrier focusing on technological vulnerability. The individual barrier, which focused on the traits by the individual, consisted of inertia and related to the personal desire to avoid uncertainties that comes from changes (Mani & Chouk, 2018, p. 794).

While the individual barrier referred to personal traits of avoiding changes did the ideological barrier as well relate to personal traits, but more linked to the overall skepticism that individuals might demonstrate negative thoughts towards Internet of Things (IoT) technology (Mani & Chouk, 2018, p. 795). This barrier was by Mani and Chouk (2018, p. 7995) considered of a mediating character since it was proposed to explain why the technological vulnerability barrier and the individual barrier negatively might influence the level of consumer resistance. The technological barrier was encompassing the perceived technological dependence and technological anxiety. The dependency was described as the feeling that individuals may perceive themselves too dependent upon technologies and such, experiences reduced autonomy while the technological anxiety refers to the stress individuals may experience due to constant access to smart service anytime and anywhere (e.g., via IoT devices) (Mani & Chouk, 2018, p. 793).

3.3 Adopter Categories

To understand the resistance of an innovation, it is fruitful to distinguish between different types of adopters. This stems from the assumption that not all individuals adopt an innovation at the same point of time (Rogers, 1983, p. 241). At what time an individual chooses to adopt an innovation rather depends on their degree of innovativeness (Rogers, 1983, p. 242). An individual with a high degree of innovativeness will adopt an innovation at a faster pace compared to an individual with low degree of innovativeness (Rogers, 1983, p. 242). Rogers (1983, p. 22) further classifies five categories of adopters, namely, innovators, early adopters, early majority, late majority and laggards. The

innovators are typically less sensitive to uncertainties as they cannot rely on the subjective assessment of other individuals (Rogers, 1983, pp. 22-23). Instead, they tend to be active information seekers and are usually associated with a high degree of exposure to mass media (Rogers, 1983, p. 22). Innovators tend to be less resistant to change as they possess more positive attitudes to new ideas (Rogers, 1983, p. 205). On the other extreme are the laggards, who are typically frankly suspicious towards new innovations and display high degrees of resistance to change (Rogers, 1983, p. 250). Rogers (1983, p. 23) illustrates the diffusion process in an S-shaped curve. Initially, only the innovators adopt the innovation. As more individuals adopt the innovation, the diffusion curve starts to climb. When there are only a few individuals remaining, who have not yet adopted the innovation, the trajectory of the S-curve begins to level off (Rogers, 1983, p. 23).

It is important to be aware of these categorizations because what may attract innovators and early adopters may not attract the common man. Heidenreich and Handrich (2015, p. 894) explain that innovators and early adopters only constitute a small portion of the total number of consumers. The majority are comfortable within the status quo and are more resistant to change (Heidenreich & Handrich, 2015, p. 894). As previously mentioned, only 20 percent of the inhabitants in Sweden have previous experience of unmanned convenience stores (HUI Research, 2021). Rogers (1983, p. 304) explains that the tipping point of the S-curve (i.e., when the curve starts to climb exponentially), occurs when around 20 percent have adopted the innovation. These 20 percent mainly constitute the innovators and early adopters. For that reason, the remaining 80 percent require more focus as they display more resistance to innovations (Heidenreich & Handrich, 2015, p. 894). Thus, the authors of this thesis argue that in order to succeed with the diffusion of an unmanned convenience store, one must understand what causes resistance among the majority of the consumers.

3.4 Hypotheses

3.4.1 Usage Barrier: Perceived Complexity

According to Ram and Sheth (1989, p. 7), the usage barrier is the best predictor of consumer resistance to innovations. The usage barrier emerges when the consumers do not consider the innovation as compatible with existing habits, workflows or practices. One can assume a relatively long process before acceptance is reached when the innovation requires changes in the consumers' routines (Ram & Sheth, 1989, p. 7). The usage barrier is equivalent to complexity in the innovation diffusion theory (Mani & Chouk, 2018, p. 790). Rogers (1983, p. 15) proposes complexity as an inhibitor of adoption. The author explains that if an innovation is perceived as complicated, it will be adopted at a slower rate. This stems from the idea that a more complex innovation would require users to develop new skills (Rogers, 1983, p. 15). The same principles can be identified in the technology acceptance model (Laukkanen, 2016, p. 2433). Davis (1989, p. 320) entitles the concept as perceived ease of use, which refers to the consumer's belief that usage of a certain system would be effortless. Hence, it is a reversed construct of complexity.

The majority of previous studies supports a positive relationship between ease of use and the attitudes towards smart retail technologies and self-service technologies (e.g., Blut et al., 2016, p. 410; Elliot et al., 2012, p. 323-324; Oghazi et al., 2012, p. 205; Roy et al, 2018, p. 155; Weijters et al., 2007, p. 16). Kim and Qu (2014, p. 227) studied hotel guests'

attitudes and behavioral intentions towards hotel self-service kiosks and includes ease of use as an antecedent. The authors found that ease of use is one of the strongest influences on hotel guests' attitudes towards using hotel self-service kiosks (Kim & Qu, 2014, p. 239). Lin (2022, pp. 1-2) studied the drivers of consumers' attitudes and patronage intentions towards an unmanned convenience store called X-store in Taiwan. The result showed that ease of use has a positive effect on consumers' attitudes towards the unmanned convenience store and was the second-best predictor of adoption intention (Lin, 2022, pp. 12-13). Mani and Chouk (2018, p. 781, 796) studied specifically consumer resistance towards smart services in the banking sector. They included perceived complexity as a major driver of resistance (Mani & Chouk, 2018, p. 787). The results indicated that complexity significantly explains consumer resistance (Mani & Chouk, 2018, p. 799).

Despite the relatively strong support for ease of use on consumers' attitudes towards smart retail technologies and self-service technologies, it should be noted that other studies confirmed an insignificant relationship. Laukkanen (2016, p. 2433) studied the drivers of consumer resistance towards Internet and mobile technologies and finds that complexity does not have a significant relationship with consumer resistance (Laukkanen, 2016, p. 2437). Moreover, Curran and Meuter (2005, p. 106) studied the antecedents of consumer attitudes and intention to use self-service technology and compare three different settings. They found that ease of use is a significant predictor for consumers' attitudes towards ATMs. However, no effect was demonstrated on attitudes towards banks by phone or online banking (Curran & Meuter, 2005, p. 110). Hence, it can be assumed that the effect of ease of use is mandated by the particular setting. Since the literature on unmanned convenience stores is rather scarce, this calls for further investigation. As complexity in the resistance literature is a reversed construct of ease of use in the adoption paradigm, it is predicted to positively influence consumer resistance. Thus, the following hypothesis is proposed:

H1. Perceived complexity positively influences consumers' resistance towards unmanned convenience stores.

3.4.2 Value Barrier: Perceived Price and Perceived Convenience Value

Ram and Sheth (1989, pp. 7-8) explain that a value barrier occurs if the innovation does not confer advantages, such as better monetary value or performance, compared to its predecessor. Zeithaml (1988, p. 10) conceptualizes this as perceived price, which refers to what the consumer has to sacrifice to acquire a product or service. Perceived price is usually the variable under investigation when referring to the value barrier in the literature of resistance to innovation (Mani & Chouk, 2018, p. 790). Laukkanen (2016, p. 2433) argues that the value barrier can be used synonymously with relative advantage in innovation diffusion theory (IDT) and perceived usefulness in TAM. Rogers (1983, p. 15) uses relative advantage to describe consumer acceptance of an innovation. The author describes relative advantage as the degree to which an innovation is perceived as superior to its predecessor. Rogers (1983, p. 15) further explains that the rate of adoption of an innovation will be more rapid if the potential user perceives the innovation to possess relative advantage. Davis (1989, p. 320) entitles the same concept as perceived usefulness and argues that consumers will find an innovation more useful if they believe that the innovation would enhance their job performance.

Several studies have examined the value barrier on resistance to innovations. Antioco and Kleijnen (2010, p. 1702) study the barriers for consumer adoption of technology innovations in two different contexts. The value barrier is conceptualized as the performance-to-price ratio and measured in terms of product prices (Antioco & Kleijnen, 2010, pp. 1703, 1723). The authors find that the value barrier negatively influences the consumer intention to adopt the innovation (Antioco & Kleijnen, 2010, p. 1714). Additionally, Antioco and Kleijnen (2010, p. 1714) find that the value barrier significantly outweighs all the other barriers in one setting. Claudy et al. (2014, p. 534) study house owners in Ireland's purchase intention of renewable energy systems (i.e. micro wind turbines). The value barrier is described as high upfront costs of such systems (Claudy et al., 2014, p. 535). In line with Antioco and Kleijnen (2010, p. 1714), they find that the value barrier is the most significant barrier for adoption (Claudy et al., 2014, p. 539).

Mani and Chouk (2018, pp. 781, 796) studies the antecedents of consumer resistance toward smart services (i.e., IoT devices in the banking sector). Contrary to the aforementioned literature, they find that perceived price did not significantly predict resistance to smart services (Mani & Chouk, 2018, p. 800). They argue that a potential reason for the insignificant result is that the respondents had not yet tried the service under investigation, which may have caused problems in evaluating the cost of the innovation (Mani & Chouk, 2018, p. 800). Lin (2022, p. 5) argues that unmanned convenience stores are a form of free smart services that would rather produce non-monetary values to its users. Hence, the authors propose convenience value and novelty value as better predictors of attitude and behavior (Lin, 2022, p. 6). However, the authors of this thesis argue that consumers may not perceive that the technology used in unmanned stores as costly per se, but rather have a perception that the groceries will be expensive.

Koschmann and Isaac (2018, p. 377) emphasize that consumers do not only associate different price images with particular retailers, but also with specific store formats. Store formats serve as a way of categorizing stores that are perceived to have various characteristics in common, e.g., grocery stores, convenience stores and specialty stores (Koschmann & Isaac, 2018, p. 366). Isaac and Schindler (2014, p. 1181) discuss that categorization speeds up consumer decision making since it is an efficient way of processing large sets of information. Koschmann and Isaac (2018, p. 377) find that the price image associated with different store formats impacts consumers' price expectations, and by extension their choice of store. The results further indicate that the price image is higher for convenience stores than for grocery stores and dollar stores (Koschmann & Isaac, 2018, p. 367). Consequently, one can argue that this would also be applicable in the case of unmanned convenience stores.

Unmanned convenience stores entail that the consumer will engage in co-production. Co-production refers to consumers' actively participating in the production of the core offering (Lusch & Vargo, 2006, p. 284), whereas the firm plays a more inert role and are restricted to provide the needed tools and devices to the customer (Troye & Supphellen, 2012, p. 33). Self-service technology is an excellent example of co-production (Meuter et at., 2005, p. 61). Bitner et al. (2002, p. 98) states that one of the most prominent reasons for firms to introduce self-service technology into the offering is to reduce costs. Such solutions can significantly cut labor expenses (Bitner et al., 2002, p. 98). However, Haumann et al. (2015, p. 28) finds that when the co-production is considered to be intense, it has a negative effect on consumers' satisfaction with the co-production process.

Haumann et al. (2015, p. 29) further argues that consumers who are informed about economic compensation for engaging in the co-production process are less negative towards engaging in it. Hence, firms should communicate that the consumer's efforts are reflected in lower prices (Haumann et al., 2015, p. 29).

Loy et al. (2020, p. 1) argue that price is one of the most crucial criteria for store choice among consumers. Despite this, customers' price image is often severely inaccurate (Loy, et al., 2020, p. 1). The authors of this present thesis argue that the price image of convenience stores may be conflicting with expected economic compensation for co-production and potentially cause a paradox. However, uncertainty regarding economic compensation for co-production can result in consumers assuming high prices because of the store format. Such assumptions could have a positive effect on resistance towards unmanned convenience stores. Given the strong support for perceived price on consumer resistance in the literature, the authors of this thesis assume that a high perceived price of groceries in unmanned convenience stores, and uncertainty regarding economic compensation for co-production, may influence consumer resistance. Thus, the following hypothesis is proposed:

H2a. Perceived high prices positively influence consumers' resistance towards unmanned convenience stores.

Sweeney and Soutar (2001, p. 215) develop a 19-item measure named PERVAL with the purpose of assessing users' perception of value in retail purchase situations. The measure is constructed to determine which consumption values that stimulate attitude and behavior (Sweeney & Soutar, 2001, p. 204). The scale emerged into four dimensions; emotional, social, quality/performance, and price/value for money, where all four significantly predicted attitudes and behavior (Sweeney & Soutar, 2001, p. 211, 214). Several other studies have also measured value in non-monetary terms. Kim et al. (2007, p. 113) argue that measuring the value of a product or service based on price is valuable. However, such measurements are insufficient since they ignore other attributes that may influence consumer resistance. The unilateral models disregard the multi-dimensionality of consumer decision making. Hence, it is an inadequate representation of consumers' perceived benefits and sacrifices of products or services (Kim et al., 2007, p. 113). Instead, the authors propose non-monetary costs (e.g., time costs and convenience costs) as a compliment (Kim et al., 2007, p. 117). The purpose of their study is to examine consumer adoption of Mobile Internet (Kim et al., 2007, p. 112). The results indicate that both monetary and non-monetary sacrifices negatively influence the perceived value, and by extension the adoption of Mobile Internet (Kim et al., 2007, p. 117).

Kleijnen et al. (2007, pp. 33-34) examines the value creation in mobile transaction services. The author emphasizes time convenience as a form of non-monetary value, i.e., speed and time efficiency (Kleijnen et al., 2007, p. 37). The results indicate that time convenience is the most important benefit of mobile service delivery, and that consumers evaluate whether they would acquire time-related gains from the service (Kleijnen et al, 2007, p. 42). Laukkanen (2016, p. 2433) studies consumer resistance in the light of internet and mobile banking services. The author conceptualizes the barrier as a lack of relative advantages of the service (Laukkanen, 2016, p. 2434). The findings also support the value barrier as the dominant predictor of resistance (Laukkanen, 2016, p. 2436). Lin (2022, p. 13) examines the effect of convenience value in unmanned convenience stores and finds that it is the second strongest predictor of attitudes towards unmanned

convenience stores after social influence. Unmanned convenience stores are expected to provide more convenience value than traditional convenience stores since it both shortens the service process and saves the consumer time by reducing the interaction with checkout assistants (Chuawatcharin & Gerdsri, 2019, p. 147; Polacco & Backes, 2018, p. 89).

According to Liljander et al. (2006, p. 179), previous research has shown that the resistance towards innovations is affected by the expected benefits. By this, consumers who expect higher levels of expected benefits from an innovation will perceive lower levels of resistance, and vice versa. Hence, it is suggested that when consumers perceive low levels of expected benefits, they will also display high levels of resistance towards innovations. One example that relates to the context of unmanned convenience stores and self-service technology can be observed from Liljander et al. (2006, p. 187), who stated that if the customer is not expecting any benefits from SST-services, the customer will avoid utilizing it, i.e., display higher levels of resistance towards it. Based on the strong support in the literature regarding non-monetary value on adoption, the authors of this thesis propose that convenience value could work as an antecedent of resistance toward unmanned convenience stores. If consumers perceive that unmanned convenience stores would offer relative advantages compared to traditional convenience stores (e.g., save time from waiting in the queue etcetera), it could mitigate the potential resistance. Thus, the following hypothesis is proposed:

H2b. Lack of perceived convenience value positively influences consumers' resistance towards unmanned convenience stores.

3.4.3 Risk Barrier: Perceived Performance and Financial Risk

Ram and Sheth (1989, p. 8) justified the risk barrier since "all innovations, to some extent, represent uncertainty and pose potential side effects that cannot be anticipated". This line of reasoning is similar to Antioco and Kleijnen (2010, p. 1704) which states that almost all types of innovations bring risks and potential side effects that cannot be foreseen. Park and Zhang (2022, p. 3) argue that shopping via unmanned convenience stores might lead to different types of challenges, such as uncertainties and risks. Featherman and Pavlou (2003, p. 453) states that the perceived risk often is being referred to as the perceived uncertainty of eventual negative consequences in situations when a service or product is being used. By such, Featherman and Pavlou (2003, p. 454) conclude that perceived risk can be defined as "the potential for loss in the pursuit of a desired outcome of using an e-service" when studying how risks influences consumers while utilizing e-services. Featherman and Pavlou (2003, p. 455) further categorize the different facets of the risk concept that characterizes each type of risks, resulting in seven distinct types; performance risks, financial risks, time risk, psychological risk, social risk, privacy risk, and lastly, overall risk which encompasses all criteria of the perceived risks together.

In similarity, the same distinction is used by Wang et al. (2021, p, 2) with the exception that overall risks were not considered as a separate type of risk. In the context of internet-based commerce, Featherman and Pavlou (2003, p. 455) emphasizes that the privacy risk is especially relevant when consumers are making purchases over the internet, which relates to concerns for both thefts of private information as well as for companies potentially misusing collected private information. Furthermore, Park and Zhang (2022, p. 4) are emphasizing the risk that consumers may perceive regarding disclosure of personal information to perform transactions.

The perception of risk is highly subjective and dependent on the individual, making some situations or features evoke different levels of risk, which also influences the risk aversion. Due to this level of subjectivity, many scholars have used Likert scales in order to measure the perceived risk from individuals (Curran & Meuter, 2005, p. 106; Featherman & Pavlou, 2003, p. 458; Lin, 2022, p. 8; Park & Zhang, 2022, p. 4; Roy et al., 2017, p. 7). One alternative measurement method that has been used is according to Featherman and Pavlou (2003, p. 454) by calculating its expectancy value using the uncertainty element (for instance the probability of loss), and the severity component (for instance the cost of the loss). A similar definition is used by Horton (1976, p. 695) when describing the *perceived risk model*, consisting of a combination of the risk and its probability of occurrence.

By looking at the concept of risk from the perspective of shopping behaviors in general and specifically related to unmanned stores, Lin (2022, p. 13) states that the level of perceived risk reduces the intentions of patronage towards unmanned convenience stores. Even if the consumers appreciate the idea of an unmanned convenience store, the perceived risk reduces their willingness to patronize (Lin, 2022, p. 13). These insights are important for retailers who may plan to introduce such relatively new concepts to a market with no prior experience causing uncertainty. Roy et al. (2017, p. 266) presents similar conclusions from their study, stating that retailers who introduce or utilize smart technologies should focus to minimize the risk level that the consumers might perceive in order to avoid negative effects such as lower levels of repurchase intentions. By this, the perceived risk negatively affects the intentions of the customer to utilize smart retail technology (Roy et al., 2017, p. 265). Furthermore, Wang et al. (2021, p. 10) found that the perceived risk of the consumers moderated the intentions to visit X-store, which is described as a Taiwanese unmanned convenience store.

Featherman and Pavlou (2003, p. 468) states that academics previously have emphasized the level of perceived risk as a factor that negatively affects the behavior of the consumers. Even if self-service features provide benefits to the consumers in terms of efficiency and convenience, Featherman and Pavlou (2003, p. 468) conclude that the privacy risk is particularly salient for the consumers. The authors also conclude that the risks that relate to performance were salient apart from the privacy concerns. It is by this likely that individuals who are older or possesses reduced level of digital skills would show higher levels of perceived risks when using internet-based services (Featherman & Pavlou, 2003, p. 469). Yoo (2021, p. 15) provides further empirical evidence that the level of perceived risk positively affects the resistance towards unmanned order payment services, i.e., such payment terminals that can be found in some fast food restaurants and cafes.

Different types of risk-reducing activities can be adopted by retailers to counter the amounts of perceived risks that consumers might hold. Featherman and Pavlou (2003, p. 469) states that activities such as satisfaction- and money-back-guarantees may be effective in reducing the perceived risk of the consumers if they truly believe that the retailer or service provider is trustworthy. Other simple, yet influential activities, can be offered via statements about safe transactions, privacy policies, and security systems may help to reduce the perceived risks (Featherman & Pavlou, 2003, p. 470). Furthermore, these types of relatively easily achieved activities can be implemented directly in the interface to the consumers (Featherman & Pavlou (2003, p. 470).

Antioco and Kleijnen (2010) studied the functional and psychological barriers that affect the consumers' level of adoption towards technological innovations. They categorized different innovations according to its incompatibility and its level of uncertainty, which they argued would benefit managers since it provides deeper insights regarding how consumers adopt different kinds of new technologies (Antioco & Kleijnen, 2010, p. 1700). The authors argue that in situations where the level of uncertainty and incompatibility is high, two types of risks are particularly relevant: performance risk and financial risk (Antioco & Kleijnen, 2010, p. 1704). Hence, Antioco and Kleijnen (2010, p. 1710) provided empirical evidence that both the performance risks, and financial risks, negatively affected the intention of adoption in situations characterized by high uncertainty and high incompatibility. The way the customer perceived the financial risks were found to be negatively affecting adoption in any given situation (Antioco & Kleijnen, 2010, p. 1712), whereas the performance risk only affects situations with high levels of uncertainty and incompatibility (Antioco & Kleijnen, 2010, p. 1714). Furthermore, Szmigin and Foxall (1998, cited in Antioco & Kleijnen, 2010, 1714) found that performance risk is especially salient in situations that customers perceive as highly uncertain, suggesting a postponement of the purchase until the perceived uncertainty is reduced for the customer.

Kiang et al. (2011, p. 31) describes performance risk as the probability that a product fails to fulfill the expected requirements. Bruner (2014, p. 567) describes that the performance risk is related to the uncertainty and eventual consequences that a malfunctioning product entails in relation to what was expected. In similarity, other researchers draw parallels between this type of risk towards the perceived functionality of the product, which makes this type of risk associated with how the product or service is performing in relation to what it is expected to perform by the consumer (Lim, 2003, p. 219; Ram & Sheth, 1989, p. 8). Hence, the performance risk is undeniably related to the performance of a product or service in comparison to what it is expected to deliver. According to Featherman and Pavlou (2003, p. 451), the performance-based risk negatively affects the adoption of e-services. They further conclude that the performance-based risk is considered to be the most salient risk when studying the adoption of e-services (Featherman & Pavlou, 2003, p. 468). Since the store format is expected to be relatively new for the customers in Sweden, customers might have conflicting perceptions regarding what value and functions the store format will provide. It is therefore suggested that unmanned convenience stores will be perceived as highly uncertain by the customers. Thus, the following hypothesis is proposed:

H3a. Perceived performance risk positively influences consumers' resistance toward unmanned convenience stores.

Furthermore, there are similarities regarding how researchers define the financial risk as well as in the case with the performance risk. Financial risk is described as the monetary outlays and the maintenance costs that are linked to a purchase by Grewal et al. (1994, p. 146), and according to Kiang et al. (2011, p. 31) as the likelihood that a faulty product brings financial losses to the customer due to maintenance costs, replacement costs or by hidden costs. Financial risk is often recalled as economic risks according to Lim (2003, p. 219). Nawi et al. (2019, p. 8) states that financial risks are shown to negatively affect purchasing behaviors in an online context. This is also emphasized by Kiang et al. (2011, p. 32) since the financial risk often is perceived as high when customers purchase expensive goods online. Grewal et al. (1994, p. 148) believes that consumers who are

possessing high levels of risk-aversion might use the price of a product to assess the level of financial risk in comparison to consumers who possess relatively lower levels of risk-aversion. To this risk facet, Featherman & Pavlou (2003, p. 455) adds the potential of financial losses that can occur because of fraud as a part of the elements that constitutes financial risks. This aspect is also emphasized by Lim (2003, p. 222) in terms of how hackers may steal credit card information and by that cause financial losses for the customers, resulting in higher levels of perceived financial risk. Hence, financial risks therefore encompass events and circumstances that may cause financial losses for the consumer both directly and indirectly related to a purchase. As unmanned convenience stores are based upon payment solutions that replace the need of cashiers, no staff will be present to manually correct errors or resolve eventual complaints. Thus, the following hypothesis is proposed:

H3b. Perceived financial risk positively influences consumers' resistance toward unmanned convenience stores.

3.4.4 Image Barrier: Self-Image Incongruence

In the adoption literature, innovation image is described as the degree to which the consumer perceives that the usage of a particular innovation enhances their social status (Moore & Benbasat, 1991, p. 195; Venkatesh & Bala, 2008, p. 277). However, in the resistance literature, the innovation image is conceptualized slightly differently. In the case of resistance, the identity of an innovation is related to a psychological barrier. Ram and Sheth (1989, p. 9) argue that an innovation is assigned an identity from their origin. Such identities can include the product type or the particular industry it operates in, as well as the manufacturing country of the products or services. If the consumer has negative associations with any of these identities, it creates a barrier for adoption (Kuisma et al., 2007, p. 77; Ram & Sheth, 1989, p. 9). Mani and Chouk (2018, p. 792) argue that an image barrier may also occur due to the absence of self-image congruence, i.e., when the innovation image is conflicting with the consumer's personal image. The personal image relates to the consumers lifestyle, beliefs and personality (Mani & Chouk, 2018, p. 792). Sirgy et al. (1997, p. 230) further postulate that consumer behavior is partly determined by the congruence stemmed from a psychological comparison between the product-users image and their self-concept (e.g. their actual, ideal or social self-image).

A number of studies have emphasized the effect of self-image incongruence on consumer behavior. Kleijnen et al. (2005, p. 344) investigate the fit between self-image incongruence on attitudes and intention to adopt wireless mobile services. The authors hypothesize that consumers with high image congruence will experience the innovation more positively than consumers with image incongruence (Kleijnen et al., 2005, pp. 345-346). A significant positive relationship was established between image incongruence and attitude, as well as adoption (Kleijnen et al., 2005, p. 356). Likewise, Cowart et al. (2008, p. 1116) investigate the effect of self-image incongruence on behavioral intention to purchase new products. The authors study this in the context of three industries: home entertainment equipment, music, and handheld devices (Cowart et al., 2008, p. 1119). No direct relationship was observed, but the relationship was mediated by the variable satisfaction (Cowart et al., 2008, p. 1112). Other studies highlight the effect of self-image incongruence on resistance to change. Antón et al. (2013, p. 375) argue that low levels of self-image incongruence results in resistance to technology. The authors hypothesize that e-book readers will have a more positive attitude, and greater intention to adopt an e-book service if the innovation is perceived to be compatible with their lifestyle and preferences

(Antón et al., 2013, p. 375). The hypothesized relationship was supported (Antón et al., 2013, p. 381).

Similarly, O'Cass and Grace (2008, p. 525) postulate that consumers are expected to experience more negative feelings or exhibit negative behaviors towards a new product or service if they identify an incongruence between the product image and their self-image. O'Cass and Grace (2008) investigates the impact of retailer service provision and service scape on whether consumers perceive they get value for their money. Moreover, the study includes image congruence in the stated relationship. The observed individuals with high self-image congruence were found to perceive more value from the provided service and the store environment (O'Cass & Grace, 2008, p. 532). Mani and Chouk (2018, p. 781) extend the literature of self-image incongruence and studies consumer resistance toward smart services (i.e., IoT devices in the banking sector). The authors hypothesize that self-image incongruence positively impacts consumer resistance towards smart services (Mani & Chouk, 2018, p. 792). They postulate that some consumers perceive a gap between self-image and the smart service, and the proposition was supported by the analysis (Mani & Chouk, 2018, p. 800).

In summary, several authors highlight the importance of considering self-image incongruence while studying consumer behavior. Intuitively, a lack of congruence between the image of an unmanned convenience store and consumers' self-image can fuel the resistance of such solutions and hamper the adoption. That said, a negative image of unmanned convenience stores can go in the opposite direction of the consumer's self-image, resulting in resistance. Consequently, if the consumer perceives their self-image (i.e., lifestyle, beliefs and personality) to be incompatible with the image of unmanned convenience stores, the resistance towards such solutions will be stronger. Thus, the following hypothesis is proposed:

H4. Self-image incongruence positively influences consumer resistance towards unmanned convenience stores.

3.4.5 Tradition Barrier: Need for Human Interaction

The tradition barrier occurs when the innovation is not considered compatible with the consumer's established traditions, such as norms, values, beliefs or past experiences (Ram & Sheth, 1989, p. 9). Laukkanen et al. (2010, p. 377) implies that the need for interaction in the service context may act as a tradition barrier to adoption. Dabholkar and Bagozzi (2002, p. 188) describe that the need for interaction refers to consumers finding human interaction as an important part of the service encounter. There is numerous research that highlights the importance of considering the need for human interaction while studying consumer behavior. Mani and Chouk (2018, p. 793) imply that many face-to-face services have been ruled out because of digitalization. However, firms may still experience significant obstacles while implementing contactless services. Mani and Chouk (2018, p. 800) find that the need for interaction positively influences consumer resistance towards smart services. According to Evanschitzky et al. (2015, p. 464), all consumers do not exclusively perceive the shopping process as a business transaction. They also perceive it as obtaining social benefits (e.g., interaction with service personnel and other consumers). Evanschitzky et al. (2015, p. 472) find that the need for human interaction negatively influences continuous usage of self-service technology. Marr and Prendergast (1993, p. 10) also find that the main reason for resistance to self-service technology in retail banking is the unfulfilled preference of human interaction.

Walker and Johnson (2006, p. 125) studies why consumers use technology-enabled services and present two interesting findings. Firstly, some individuals prefer human interaction regardless of situations, whereas others use self-service technologies to avoid human interaction to the extent possible (Walker & Johnson, 2006, p. 132). Secondly, other individuals prefer human interaction only in specific circumstances, for instance while filing a complaint, to receive an answer to a question or help with a certain problem (Walker & Johnson, 2006, p. 132). Other studies also point at these contradictions, referring to some consumers appreciating self-service technologies because of the lack of human interaction, whereas some refrain from it based on the same reasoning. For instance, Meuter et al. (2000, p. 55) report that three percent of their respondents voluntarily choose to use self-service technology because of the belief that they could streamline the service process when not interacting with service clerks. However, three percent is a relatively small number compared to the total number of respondents. Meuter et al. (2005, p. 77) show that the need for human interaction negatively impacts consumers' willingness to try self-service technologies. Further, Dabholkar and Bagozzi (2022, p. 195) emphasize that a strong need for interaction with service personnel reinforce the relationship between ease of use and attitude, and enjoyment and attitude towards self-service technology. Moreover, White et al. (2012, p. 257) finds that individuals with stronger need for human interaction feels that it is unfair to use a push policy, i.e., forcing the consumer to use self-service technologies.

Studies regarding unmanned convenience stores highlight that unmanned store solutions are expected to provide more convenience value to consumers' than traditional convenience stores since it both shortens the service process and saves the consumer time by reducing the interaction with checkout assistants (Chuawatcharin & Gerdsri, 2019, p. 147; Polacco & Backes, 2018, p. 89). Lin (2022, p. 13) studies the effect of convenience value and finds that it is the second strongest predictor of attitudes towards unmanned convenience stores after social influence. However, it should be noted that the aforementioned studies focus on the success factors of adoption. Based on previous research of different types of self-services, it can be assumed that not all customers will experience the absence of human interaction as beneficial. Intuitively, the need for human interaction can act as a tradition barrier to adoption. An unmanned convenience store is the ultimate example of push-policy, as described by White et al. (2012, p. 251). Forcing consumers to use self-service could therefore create certain resistance that calls for further investigation. Thus, the following hypothesis is proposed:

H5. Need for human interaction positively influences consumer resistance towards unmanned convenience stores.

3.4.6 Technological Barrier: Technology Readiness

Mani and Chouk (2018, p. 284) believe that the attitudes from the customers have changed since the technological developments have resulted in increased interactions with technology for customers. Large numbers of individuals nowadays have grown up surrounded by technology in everyday life, and therefore it is necessary to include variables that take the past technological developments into account (Mani & Chouk, 2018, p. 784). As already have been described in this thesis, the pace of the technology revolution has been immense until now and there are no signs that this direction of development will slow down. Rather, it is expected to further accelerate due to increased connectivity, ease of use and capacity to mention a few aspects (Parasuraman & Colby,

2015, p. 59). Due to the increased influence and utilization of such technologies, the role of technologies in the interactions between companies and its customers as well as the number of technological services and products that are being offered are rapidly increasing (Parasuraman, 2000, p. 307). Parasuraman and Colby (2015, p. 59) emphasizes that such trends induced by technological developments can be observed in several industries. This ongoing development has led to major transformative changes for both the customers and the companies and how the interactions are characterized (Parasuraman, 2000, p. 307). Liljander et al. (2006, p. 177) describes this transformation as it has revolutionized the way customers and service providers interact. Although it has resulted in benefits and opportunities for the customers there is evidence that customers are perceiving an increased level of frustration when dealing with such technologies (Parasuraman, 2000, p. 307).

The technology readiness (TR) refers to the "propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman, 2000, p. 308; Lam et al., 2008, p. 20). The individual's readiness to adopt and embrace new technology is influenced by personality traits (Lin & Chang, 2011, p. 428), and personal feelings about technologies (Parasuraman, 2000, p. 309). This theory is proposed as an approach to distinguish between factors which hinder or foster the adoptability of new kinds of technologies (Liljander et al., 2006, p. 178). This implies that the technology readiness is therefore fully dependent upon the personality and characteristic of the user. The personality is as well emphasized as important with regards to consumer resistance (Szmigin & Foxall, 1998, p. 466) Parasuraman (2000, p. 308) states that the concept of technology readiness can be understood as a state of mind based on inhibitors and enablers that together determines the propensity and willingness to utilize new technology. Since there is a lack of research regarding the readiness for people to utilize technological systems, Parasuraman (2000, p. 307) constructed an index aimed to successfully assess the level of technology readiness that people possess when dealing with technology. The index provides better understanding of the propensity of embracing new technological services for individuals (Blur & Wang, 2019, p. 649), and a predictor of behaviors related to use of technology (Parasuraman, 2000, p. 311). By this, the breakthrough of technological products and services among individuals can be measured (Kaushik & Agrawal, 2021, p. 486).

During the development of the technology readiness index (TRI), data that was obtained from interviews illustrated themes related to both positive and negative feelings about technology (Parasuraman, 2000, p. 310). Through reduction and grouping of the data, four different dimensions emerged; optimism, innovativeness, discomfort, and insecurity (Parasuraman, 2000, p. 314). By this, insecurity and discomfort are inhibitors of technology readiness and innovativeness and optimism drivers (Parasuraman, 2000, p. 311). Lam et al. (2008, p. 429) states that the positive drivers entail encouragement towards usage of technological products, whereas the negative drivers (inhibitors) rather make customers reluctant to utilize technology. Blut and Wang (2019, p. 650) emphasizes through a meta-analysis that both these two dimensions exert strong indirect influence through mediators, for instance by its usefulness and ease of use (Blut & Wang, 2019, p. 661). The dimension of optimism refers to as having a positive view of technology; the innovativeness as the tendency to be a pioneer with technology; the discomfort as perceived lack of control; and lastly, insecurity as distrust of technology (Parasuraman, 2000, p. 311; Lam et al., 2008, p. 20; Lin & Chang, 2011, pp. 428-429).

By successfully applying the TRI scale upon the customers of a company, insights regarding the strategy and appropriate approaches how the utilization of technology towards the customers can be obtained (Parasuraman, 2000, p. 317). By this, companies can get a better understanding of the actual level of technology readiness that their customers possess. This may further reveal any segments of customers possessing different levels of technological readiness, if the pace of the implementation is appropriate or if any support is needed to simplify for the customers (Parasuraman, 2000, p. 317). Blut and Wang (2019, p. 666) emphasizes the opportunities that arise from a managerial perspective regarding how technology readiness can act as a base when segmenting potential customers as well as the importance of considering technology readiness when designing technical solutions that the customers will face.

The original version of the TRI (Parasuraman, 2000) was 15 years later updated by Parasuraman and Colby (2015) in order to include the ground-breaking developments that had been made during this period of time within technology. Parasuraman and Colby (2015, p. 60) stress that the broad introduction and use of revolutionary technologies, such as social media, cloud computing and mobile commerce, have had major impacts upon the technological landscape which imposed the need to update the initial TRI (TRI 1.0). The mean score of the TRI 2.0 was slightly higher than in the TRI 1.0, whereas the mean scores regarding insecurity and discomfort was lower for TRI 2.0 when compared to TRI 1.0 (Parasuraman & Colby, 2015, p. 70). By segmenting the sample into five categories: skeptics, explorers, avoiders, pioneers, and hesitators, distinctions regarding how the segments had changed their beliefs from TRI 1.0 to TRI 2.0 appeared (Parasuraman & Colby, 2015, p. 71). Hence, based on this comparison it can be concluded that the level of technological readiness of the respondents had increased, resulting in lower levels of displayed inhibitors.

Parasuraman and Colby (2015, p. 71) states that individuals who are categorized as *explorers* tend to display low resistance towards new technologies, which can be compared with the category of *avoiders* who rather display high resistance towards new technologies. These categories are similar to the concepts of early adopters and laggards (Parasuraman & Colby, 2015, p. 71) derived from the *innovation diffusion model*. It can also be concluded that explorers possess higher levels of technological readiness when compared to avoiders (Parasuraman & Colby, 2015, p. 71). Consequently, individuals who possess low levels of technological readiness have higher resistance towards utilizing new technologies. Park and Zhang (2022) studied how technology readiness influences the attitudes of consumers, and furthermore their patronage intention towards unmanned convenience stores. They concluded that high levels of technology readiness resulted in greater positive feelings among the consumers while they performed their shopping (Park & Zhang, 2022, p. 7). More specifically, consumers that were linked to innovativeness and optimism, i.e., drivers of TR, demonstrated lower levels of negative attitudes towards unmanned convenience stores and that consumers that were not ready to utilize new technologies demonstrated higher levels of dissatisfaction (Park & Zhang, 2022, p. 7). Based on the aforementioned, the following hypothesis is proposed:

H6. Low level of technological readiness positively affects consumer resistance towards unmanned convenience stores.

3.4.7 Individual Barrier: Inertia

Inertia negatively influences the customer adoption of new technologies (Mani & Chouk, 2018, p. 802; Polites & Karahanna, 2012; p. 36). According to Mani and Chouk (2018, p. 794), inertia can be seen as an individual barrier since it includes the tendency of people to maintain the status quo. Polites and Karahanna (2012, p. 22) states that inertia can be described as the *status quo bias*, where people demonstrate attachment to already existing behaviors although there might be better alternatives and by that, rational incentives to implement the change. By this, inertia explains why some people might prefer their current situation and setting prior to the uncertainty that change brings, which ultimately acts as a resistance towards innovations (Mani & Chouk, 2018, p. 794). Polites and Karahanna (2012, p. 24) explains that inertia is the unwillingness of the individual to abandon the current state regardless if any other alternative is available. Heidenreich and Handrich (2015, p. 894) postulate that the majority of consumers do not have a priori desire to change. They further explain that innovators and early adopters only constitute a small minority of the total number of consumers. For that reason, marketers and innovation managers must pay more attention to the status quo bias and the majority of consumers who resist change (Heidenreich & Handrich, 2015, p. 894).

There is empirical evidence that the level of inertia successfully predicts the level of consumer resistance (Mani & Chouk, 2018, p. 799), and that it also has an indirect effect on the level of resistance via skepticism (Mani & Chouk, 2018, p. 802) which can be understood as the ideological tendency to express doubt (Mani & Chouk, 2018, p. 786). Polites and Karahanna (2012, p. 22) study the use of incumbent systems and propose inertia as a potential inhibitor of usage intention. The authors find that inertia directly affects the intention to use such systems negatively (Polites & Karahanna, 2012, p. 36). Heidenreich and Handrich (2015, p. 893) study consumers' passive resistance towards innovations and find consumers' status quo satisfaction as a driver. Hence, there are reasons to believe that the personal traits of each individual affect the probability of successful adoption and openness towards new technologies and habits, such as for the utilization of unmanned convenience stores when the customer normally is used to utilizing conventional grocery stores for shopping. Thus, the following hypothesis is proposed:

H7: Inertia positively influences consumer resistance towards unmanned convenience stores.

3.5 Excluded Variables

This study, and the context of how consumer resistance is examined, has resulted in the exclusion of some variables that are to be found in the models of Mani and Chouk (2018) and Ram and Sheth (1989). It has already been mentioned in this chapter that the framework of Ram and Sheth (1989) is to be considered as relatively old, which was further enriched and updated by the model of Mani and Chouk (2018). The latter was stated to better acknowledge the digital evolution that has occurred since the model of Ram and Sheth (1989), which furthermore was emphasized in the reasoning by Heinze et al. (2017, p. 363) by the need of updating models for keeping the barriers more accurate. The authors of this thesis agree with this line of reasoning and believe that the existing models can be further refined to cover resistance barriers that relate to unmanned convenience stores. Changes have been done both to the functional barriers as well as the psychological barriers and will be described below. An additional barrier, which Mani

and Chouk (2018, p. 795) named Ideological barrier, has been completely removed. This original barrier did solely consist of one variable, Skepticism towards IoT, which due to its exclusion implied that the whole barrier was removed. Followingly, these decisions will be explained in this section.

For the functional barrier, in terms of the risk variables, Ram and Sheth (1989, p. 8) included physical risk, economic risk, functional risk, and social risk. Mani and Chouk (2018, p. 787) replaced these and used perceived security and perceived health risk instead. This thesis has excluded these variables in favor of perceived performance risk and perceived financial risk, which are illustrated by hypotheses H3a and H3b. Perceived security risk was excluded based on how Mani and Chouk (2018, p. 791) particularly emphasized the context of the internet, which the authors of this thesis did not perceive as relevant for the purpose of examining resistance towards physical unmanned convenience stores. The reason for this decision was that unmanned convenience stores are physical objects which entails that the customers will have physical proximity to the store. If the purpose would be to rather study resistance towards online based grocery suppliers, such a variable may have been more suitable. The second risk stated by Mani and Chouk (2018, p. 791), perceived health risk, was excluded due to its linkage to the perceived risks of physical damage to the user, for instance caused by electromagnetic fields, Wi-Fi and other technical protocols. Hence, the authors of this thesis did not perceive this type of risk as relevant as the other two risks that instead were used to encompass the risk barrier.

The variables relating to the technological vulnerability barrier that appeared in the model of Mani and Chouk (2018, p. 784) as a solution to include the past technological revolution, was in the conceptual model of this thesis replaced with Technological readiness, found in hypothesis H6. The authors of this thesis believe that technological readiness is appropriate for examining the propensity of utilizing new technologies, whereas low levels of technological readiness are suggested to entail high resistance towards unmanned convenience stores. The technological vulnerability consisted of perceived technological dependence and technological anxiety (Mani & Chouk, 2018, p. 787). The perceived technological dependence was excluded because of the characteristics of what dependence constitutes of, since this aspect relates to how people might perceive that technologies may reduce their sense of autonomy (Mani & Chouk, 2018, p. 793). By this, an increasing amount of technologies being used in today's society could entail an increased level of dependence for the user (Mani & Chouk, 2018, p. 793). Therefore, the authors of this thesis argue that unmanned convenience stores have the potential to increase the perceived autonomy rather than dependency since the costumers can visit the store whenever they want, i.e., not dependent on conventional opening hours. Neither Mani & Chouk (2017, p. 14) or Mani & Chouk (2018, p. 799) found a significant result between the technology dependency variable and consumer resistance. Furthermore, as the technology dependency variable is partly captured by the technology readiness index (see Appendix 4), it was not considered necessary to study in isolation. Hence, the technology dependency variable was excluded.

The technological anxiety variable was excluded since unmanned convenience stores are physical objects, which do not fully apply to Mani and Chouk's (2018, p. 794) reasoning of how smart services often enable users and consumers to access the service seamlessly, not dependent on time, device or place. By this, the authors of this thesis argue that such reasoning better fits innovations with other characteristics than unmanned convenience

stores, such as smartphones, apps or smart watches. Thus, since stores are physical objects, they cannot stress the customers to the same extent. The last variable that was excluded from the model of Mani and Chouk (2018, p. 795) is the Skepticism towards IoT. This variable represented the ideological barrier that consumers may demonstrate towards innovations (Mani & Chouk, 2018, p. 786), and was not replaced in the conceptual model of this thesis. The purpose of excluding this variable was based upon the reasoning by Mani and Chouk (2018, p. 795) of how skepticism may induce doubt among the consumers, for instance by questioning the expected benefits that the company and what its service can provide. This appears similar to the description of the perceived performance risk, which relates to the risks associated with the expected functionality of the product (Lim, 2003, p. 219; Ram & Sheth, 1989, p. 8). Consequently, this variable was perceived as similar to the perceived performance risk that is included in the conceptual framework. Thus, the skepticism was removed due to the risk of correlation with the performance risk variable.

3.6 Conceptual Framework

To summarize the presented hypothesis and the theoretical framework, a conceptual framework has been constructed, illustrated in Figure 1. The core of the hypothesis model is based on Ram and Sheth's (1989) framework on consumer resistance, i.e., the functional barrier (usage barrier, value barrier and risk barrier), and the psychological barrier (tradition barrier and image barrier). Adjustments have been made to the original framework with regards to Mani and Chouk (2018) and its inclusion of barriers and variables that ensures that the model is adjusted to the past technological revolution since Ram and Sheth (1989) development of the original model. Hence, the psychological barrier has been enriched with a technological barrier. The individual barrier, consisting of inertia, is also included in this conceptual model with inspiration from Mani and Chouk (2018, p. 802) since its positive influence on consumer resistance towards smart services. Hence, the authors of this study propose that it is possible that this factor influences the resistance towards unmanned convenience stores as well due to current shopping habits. By this, existing shopping habits that involve conventional physical stores positively may influence the resistance towards a new concept, such as shopping via unmanned convenience stores due to the status quo bias stated by Polites and Karahanna (2012, p. 22). Thus, the individual may demonstrate attachment towards its current choice of store which may cause an unwillingness to change.

The value barrier proposed by Ram and Sheth (1989, p. 7; Mani & Chouk, 2018, p. 798) has been replaced with perceived price and perceived convenience value based upon previous literature on consumer resistance. All adjustments have been done to ensure that the conceptual framework and its hypotheses are refined according to the specific context that is being studied, i.e., resistance towards unmanned convenience stores. Mani and Chouk (2018, p. 795) used consumer demographics, in the form of gender and age, as variables when examining the consumer resistance towards the usage of smart bank services. The authors of this study have included these variables in order for enabling descriptive statistics, i.e., no hypotheses are constructed using these. Every other barrier and its variables will be tested in this thesis in order to examine how they might influence consumer resistance.

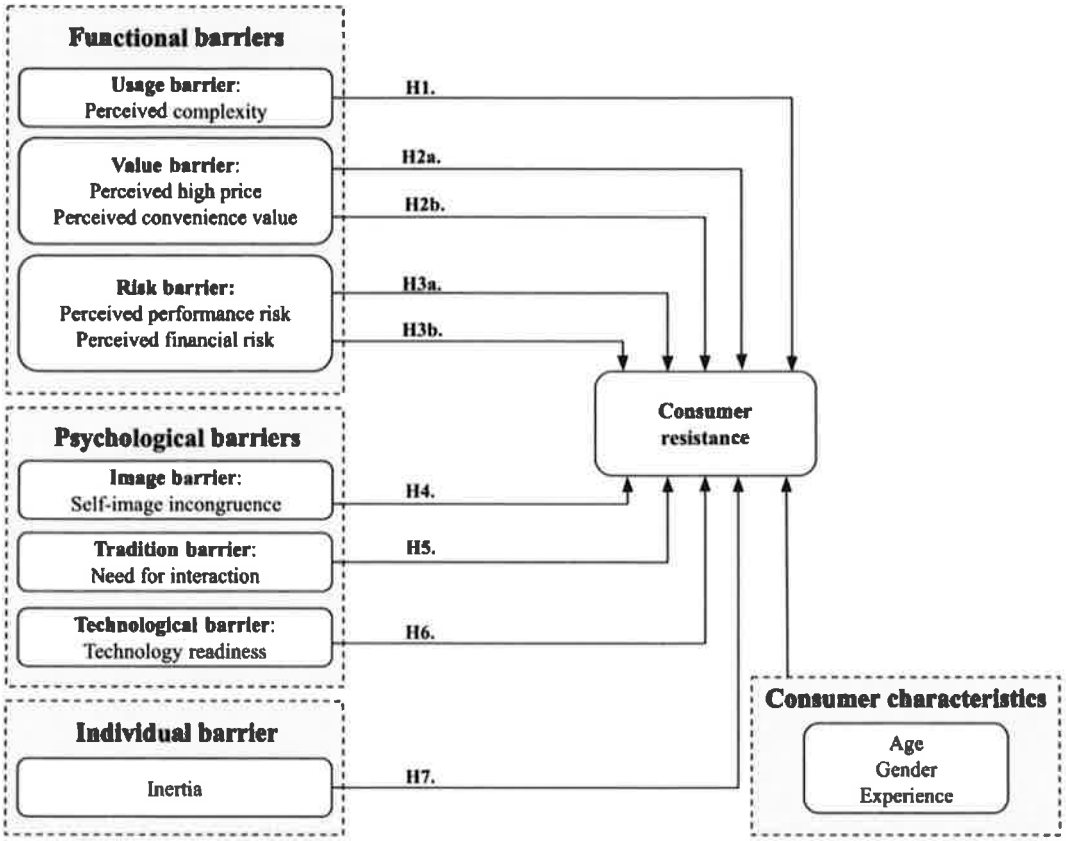

Figure 1. Conceptual framework

4. Practical Methodology

In this chapter, the practical methodology is presented which was used when analyzing the gathered data. The chapter begins with an explanation about the selection method, a description of the sample frame and the method of reaching the respondents. The survey construction is further described with regards to how ethical principles have been followed. The item constructions and used scales are then motivated. The chapter continues with the results from the pilot study to explain how the survey has been refined. The analysis procedure is further explained along with the assumptions that need to be fulfilled. Later, the chapter explains how the results will be assessed with regards to p-value, t-value, confidence interval and coefficient of determination. The chapter concludes with explaining how the thesis has taken quality criteria into account.

4.1 Sample and Data Collection

4.1.1 Population and selection method

In a quantitative study, the population refers to the whole group of individuals that the researchers seek to investigate (Eliasson, 2018, p. 42). A census means to collect data about every individual in that desired population (Fowler, 2009, p. 4). In reality, it is relatively difficult to conduct a census survey when the population is large (Lantz, 2014, p. 102). However, a census survey is often not necessary since it is possible to achieve high precision even with smaller samples (Lantz, 2014, p. 102). Thus, to conduct a sample is the only rational choice when the sample is large (Körner & Wahlgren, 2015, p. 22). A sample is a selected small subset of individuals that is representative for the entire population if constructed correctly (Fowler, 2009, p. 4). A sample frame is needed to select the sample, which is a complete list of the population (Eliasson, 2018, p. 42). With a sample frame, the probability of a respondent to be selected and included in the survey can be calculated (Eliasson, 2018, p. 44). Probability sampling entails to randomly select the units of analysis from the sample frame (Lantz, 2014, p. 103). This sampling method can be conducted in multiple ways, but the most basic sampling procedure is to use simple random selection. It means that every individual in the sample frame has the exact same probability of being chosen to participate in the survey (Lantz, 2014, p. 103).

The survey in this thesis was intended to be answered by people who had not yet tried unmanned convenience stores in Sweden. Thus, a complete list of every individual in Sweden who has not visited an unmanned convenience store would have been ideal. However, in some cases, a registered sample frame does not exist which forces the researcher to make a nonprobability sampling (Schneider & Harknett, 2022, p. 109). Schneider and Harknett (2022, p. 109) exemplify this with populations that are hard to reach for the researcher, or because they are hidden. In such cases, an ordinary probability sampling is not even a feasible option for the researcher (Schneider & Harknett, 2022, p. 109). This is the case for this study since it was not possible to receive a full list of individuals who have not yet tried unmanned convenience stores in Sweden. For that reason, self-selection has been used in this thesis. Self-selection means that the analysis units decide for themselves whether to be included in the sample or not (Hagevi & Viscovi, 2016, p. 164).

According to Hagevi and Viscovi (2016, p. 164), this selection method is common in open web surveys. It should be noted, however, that this type of selection method comes

with some limitations. The generalizability decreases because of lower control over the individuals who participate in the survey. Moreover, there is a risk that those who participate are the ones who feel most compelled to answer the questionnaire or are most involved in the topic (Hagevi & Viscovi, 2016, p. 164). Despite the aforementioned limitations, the authors of this study decided to use self-selection as the primary sampling method. As a register of all people in Sweden who has not tried unmanned convenience stores is not available, it was not possible to carry out a probability sampling. An additional advantage with the self-selection method is that the respondents who decide to participate are most likely interested in contributing with more insights to the research question and thus provide thoughtful answers. This can by extension minimize partial loss of data. For the above stated reasons, the self-selection method was considered appropriate.

A snowball sampling has also been used to a limited extent in this study. Snowball sampling involves identifying individuals in the population and asking them to pass the survey forward to other individuals they believe would be suitable to include in the sample (Lantz, 2014, p. 107). A snowball sample is appropriate when some individuals who belong to the group under investigation is identified, but the whole sample frame is difficult to cover initially (Eliasson, 2018, p. 48). However, such sampling procedures can result in certain biases because the respondents tend to invite other individuals similar to themselves (Saunders et al., 2018, p. 323). Since the snowball sampling method was used complementarity to the self-selection method to reach a larger range of respondents, this is not considered a significant problem. Consequently, self-selection and snowball sampling are primarily used due to an undefined sample frame.

The snowball sampling in this thesis was due to other individuals that assisted with the distribution of the survey by sharing the post on their own social networks. Furthermore, as the initial posts received interactions, e.g., likes and comments, additional spread of the survey was assumed. This procedure enabled the survey to be further distributed and by that, enabled more individuals to answer the survey than the authors of this study would have been able to reach otherwise. Since the goal of the survey was to target individuals in Sweden who had not yet tried an unmanned convenience store, regardless of where one resides, the survey was also distributed online in different forums. To better represent the population in Sweden, the survey was published in separate Facebook groups for people who live in the biggest cities in the three country regions of Sweden (Norrland, Svealand and Götaland). Hence, the chosen cities were Umeå, Stockholm and Gothenburg. In order to get representativeness for people who live in sparsely populated and rural areas, the survey was further published in a group for people living in the countryside regardless of where in Sweden. Additionally, the survey was published on the authors own Facebook-pages and LinkedIn to gather additional responses. For number of respondents see Chapter 5.1.

Stern et al. (2014, p. 285) describes how the desired methods of conducting surveys have changed, from being made in-person, to phone calls, to web-based surveys. Societal developments have influenced how acceptable surveying have changed, and there is today no dominating mode (Stern et al., 2014, p. 285). Schneider and Harknett (2022, p. 110) claim that even though the researching community may be divided regarding the scientific value that research using online-based nonprobability samples provides, such an approach still adheres some advantages for the researcher. There are several options for distributing surveys online. For instance, Facebook offers broad coverage to many

potential respondents while they at the same time take actions towards validating the identities of the accounts (Schneider & Harknett, 2022, p. 110). One additional advantage that Schneider and Harknett (2022, p. 112) emphasizes is how Facebook enables researchers to reach out and access respondents regardless of where they are, i.e., not bound to a specific address or phone number provided by the formal sampling frame. Based on the aforementioned, and that social media provides fast and inexpensive ways of distributing surveys to large amounts of individuals, this procedure was considered as appropriate by the authors of this thesis.

According to the American Marketing Association (AMA, 2022), the best days to post on Facebook for highest engagement are Tuesdays, Wednesdays and Fridays. AMA (2022) further emphasizes that the most consistent user engagement is during the working hours (9 a.m. to 5 p.m.). Indeed, it depends on the content and the audience (AMA, 2022). The survey was first published on Wednesday, April 27th since it is one of the three days with the highest user engagement. Since the survey did not only require exposure, but also called for certain action, the authors of this thesis based the choice of time for posting on some intuitive reasoning. The survey was decided to be published at 3 p.m. because of high user engagement at that point of time. Moreover, since the survey took a few minutes to answer it was preferable that it appeared in the feed even during nighttime whereupon it should not be published too early in the day. The survey was also published on LinkedIn to gather more responses. The algorithms of LinkedIn are more based on quality and trending content compared to other platforms. Therefore, the time of posting is not as important on this platform (AMA, 2022). Hence, it was published on Monday, May 2nd. Apart from the initial postings, re-postings were made in order to remind the potential respondents that the survey was active. These postings were made at lunch on Sunday, May 8th, since the authors of this thesis believed that there could be advantages to re-posting them during the weekend. This reasoning was based upon an estimation that people may have more time to engage in surveys on weekends compared to ordinary working days when work-related obligations may hinder further engagement.

To increase the incentive to respond to the survey, three gift cards were raffled to individuals who decided to participate. The respondents were informed that three randomly selected winners would be personally contacted by email and receive a gift card at the end of May when the data collection was completed. The respondents who wanted to participate in the raffle of gift cards could follow a link placed in the confirmation message after the survey was completed. The link led to another survey where only an email was requested. By doing so, no personal data could be linked to specific answers since the second survey was independent of the first survey. Thus, it was possible to fully secure the anonymity of the respondents.

4.2 Survey Construction

4.2.1 Ethical Considerations

When humans are subjected to research, some ethical considerations must be taken into account (Fowler, 2009, p. 163). One guiding principle is to ensure that no participants are harmed as a consequence of the study (Fowler, 2009, p. 163). European Society for Opinion and Marketing Research/Global Research Business Network, [ESOMAR/GRBN] (2015, p. 5) created the Guideline for Online Research with the purpose of supporting researchers to manage ethical, legal, and practical considerations

in online research. To ensure that this thesis follows research ethics principles, the authors act in accordance with this guideline. In line with Fowler (2009, p. 163), ESOMAR/GRBN (2015, p. 11) explain that researchers are obliged to take all possible precautions to avoid exposing the respondents to any type of harm (e.g., financial, physical, or emotional harm). To minimize the risk, Fowler (2009, p. 164) emphasizes that it is of utmost importance that the respondents are informed about what they are volunteering for. The information can be provided either in advance, or as an introductory part of the survey. The respondents should be assigned information including the name of the organization or person who conducts the research, potential sponsors who are financing the research, and a brief but accurate description of the purpose of the study. Moreover, the respondents should be informed about the degree to which confidentiality is offered, an assurance that participation is completely voluntary, and an assurance that the respondent has the possibility of skipping questions they do not wish to answer (Fowler, 2009, p. 164).

To meet these requirements, an introductory letter was constructed in the survey (Appendix 2). In the introductory part of the letter, the authors names were presented along with an explanation that the authors are students at Umeå School of Business, Economics and Statistics at Umeå University. The purpose of the study was further described. As unmanned convenience stores are a relatively new service, a brief description about the concept was included to provide a basis of understanding and enable the respondents to answer the questions more accurately. The respondents were further informed that participation is completely voluntary and that they have the right to end their participation at any time or skip individual items. The respondents were further informed that they are anonymous since no personal data was collected. Furthermore, the respondents were informed that the final version of the thesis would be published at DiVa, the Digital Scientific Archive. ESOMAR/GRBN (2015, p. 11) explains that harm or discomfort can be minimized by avoiding misleading statements (e.g., regarding approximate time required, or incorrect information about the content). In order to provide an estimate of the time required, a pilot study was conducted (see Chapter 4.2.4), where the respondents were encouraged to share how many minutes it took to fill in the questionnaire. This information was used to calculate an appropriate estimation of time required. Inconveniences can also be minimized by avoiding unsolicited data collection (ESOMAR/GRBN, 2015, p. 11). For that reason, it was decided to not collect data that could be traced to a specific respondent (e.g., name, contact information, or social security number). As mentioned in Chapter 4.1.1., the raffle of gift cards was voluntary, and the emails were collected in a separate form to avoid the possibility of linking a specific person to a certain answer.

ESOMAR/GRBN (2015, p. 14) emphasizes that in cases where incentives are offered to increase the willingness to participate, the researchers must inform about who will distribute the incentives, the type of incentives offered, and when the incentives will be distributed. Thus, a paragraph was included in the introductory letter of the survey which described that three gift cards á 150 SEK would be raffled and that the winners would be contacted by email at the end of May (week 21). Moreover, the incentives must be proportionate to the effort required, and hence not perceived as a bribe (ESOMAR/GRBN, 2015, p. 14). Since the estimated time required was five minutes according to the feedback from the pilot study (see Chapter 4.2.4), a gift card of 150 SEK was considered sufficient. Lastly, the incentive should be appropriate for the specific audience (ESOMAR/GRBN, 2015, p. 14). Because the sampling frame was all

individuals who had not yet tried an unmanned convenience store in Sweden, regardless of age (minimum 18 years old) or gender, it was decided to raffle out the "Super Gift Card" at GoGift, since it can be redeemed at thousands of brands, products and services. Consequently, the respondent could choose what was most suitable for themselves.

The researchers are responsible for ensuring that no data is collected from children without permission from parents or legal guardians (ESOMAR/GRBN, 2015, s. 19). Thus, the researchers are required to ask for the participants' age before any other personal data is collected (ESOMAR/GRBN, 2015, p. 19). To follow this ethical principle, no children were included in the research. Firstly, the information about the age limit was clearly stated in the introductory letter. To avoid the risk of children continuing the survey despite the information about the age limit, it was not possible to continue answering the questionnaire without specifying age, where the lowest available option was 18 years old. ESOMAR/GRBN (2015, s. 12) further describe that the researchers should be prepared to answer any questions that may arise regarding the research. For that reason, the authors email addresses were included in the introductory letter, encouraging participants to seek contact with any inquiries.

4.2.2 Items Construction

Eliasson (2018, p. 11) postulates that a common denominator for all theories is the provided knowledge that can be utilized to construct statements about how the world is shaped. The author further emphasizes that the choice of theory must be made based on which one contributes with the most relevant answers to the research question (Eliasson, 2018, p. 11). Sometimes, one theory is sufficient, whereas in other situations, a combination of different theories (i.e., theory building) is appropriate (Eliasson, 2018, p. 11). Consequently, this thesis has been anchored in existing theory. The Ram and Sheth (1989) theory of resistance has been used as a framework, which has further been developed to increase its applicability to the specific context and era. The theory was then operationalized, which implies making abstract concepts measurable (Eliasson, 2018, p. 12). The operationalizations constitute the foundation for the hypothesis, and hence also the quantified variables in this thesis. Eliasson (2018, p. 14) states that it is acceptable if definitions and variables distinguish from previous research if it is specified. To ensure good validity and operationalization, previous research has been studied carefully. The item construction has been inspired by previous research to a large extent (see Appendix 4 for sources). However, they have been adjusted to suit the specific context.

According to Lantz (2014, p. 47), a survey should preferably begin with a few demographic variables (e.g., age and gender) before continuing with more complex items. This minimizes the risk of potential early dropouts. Some respondents may refrain from participation if they immediately encounter a sensitive or difficult question. By utilizing a funnel approach, such dropouts can be avoided (Lantz, 2014, p. 47). In this study, the respondents were asked to answer two demographic questions (age and gender) and an additional question whether they had ever visited an unmanned convenience store. Gender and age were included in the survey to illustrate the distribution of respondents and thus strengthen the representability (for result see Chapter 5.1). The design of the gender variable was based on recommendations from Statistics Sweden (SCB) (Björneskog & Persson, 2020, pp. 18-19) in order to be as inclusive as possible regarding the respondents' gender identities. The age variable was also included based on recommendations from SCB (Persson, 2016, p. 136) and an age range of 10 years were

chosen. The reason why the question regarding previous experience of unmanned convenience stores was included was because no list of individuals who had tried an unmanned convenience store before was available. Thus, it was required for segmentation. It was decided that the respondents who had previous experience was allowed to continue answering the questionnaire because if there would be differences in the results, it would be interesting to compare the groups. The funnel approach was further used while deciding the order of the item batteries. The pilot study was helpful to create an adequate order of the items (see Chapter 4.2.4 for further details).

Hagevi and Viscovi (2016, p. 159) postulate that it is of utmost importance to consider the length of the survey. This is because a too long survey may exhaust the respondents, which increases the risk of them ending the survey prematurely or starting to respond routinely. For that reason, three items were chosen to measure each index, except for the technology readiness index that had four items. It was not desirable to have less than three items for each index as the authors of this thesis aimed for high reliability and a satisfactory Cronbach's alpha score (see Chapter 4.4.2.1). Fowler (2009, p. 87) states that a well formulated item maximizes the relationship between the gathered responses and what the researchers are seeking knowledge about. The authors further emphasize the importance of avoiding inadequate wording in the survey (Fowler, 2009, p. 89). One type of poor wording is to constitute incomplete sentences, which forces the respondent to add words themselves in order to answer the question (Fowler, 2009, p. 89). To minimize the risk of misinterpretation, incomplete sentences were avoided in the survey (see Appendix 3). Another source of error may arise due to difficulties in interpreting poorly defined terms if the definition varies (Fowler, 2009, p. 93). One poorly defined term was identified in the pilot study (see Chapter 4.2.4). According to Fowler (2009, p. 93), a solution to the problem is to add a definition of the term. This method was adopted for the term technology in the survey, where the parenthesis "(e.g., identification, self-scanning and payment)" were added in relation to all items about technology in unmanned convenience stores to simplify the interpretation.

An additional way of making the item more reliable is to avoid multiple questions at once (Fowler, 2009, p. 94). In an ambiguous question, the respondent's position may go in different directions which will have implications for the interpretation of the answer (Lantz, 2014, p. 48). Thus, only one question was asked at once. Lantz (2014, p. 48) highlights the importance of adapting the language to the intended sample frame. In addition, technical terms should be avoided unless the questionnaire is not aimed at individuals who master a particular professional discourse (Lantz, 2014, p. 48). A simple language was consistently sought to be used in the survey to capture varieties in language skills. Finally, Lantz (2014, p. 48) emphasizes that the researcher should avoid asking unilateral value-laden, sensitive or prestigious questions. In order to fulfill these recommendations, the items were neutrally formulated with an understandable discourse, and sensitive or prestigious questions were avoided. See Appendix 3 for the full survey.

Since this study was aimed at individuals in Sweden who had not yet tested an unmanned convenience store, the questionnaire was translated into Swedish. As previously mentioned, Lantz (2014, p. 48) argues that it is important that the survey is worded understandably for the intended audience. As the English skills may vary strongly between different individuals, and Swedish is the mother tongue in Sweden, a translation of the survey was considered necessary. Thrane (2019, p. 75) emphasizes the importance of not literally rewording each question because of potential cultural differences. A well

translated survey minimizes the risk of misunderstanding. In order to successfully translate a questionnaire, some guidelines must be followed. Firstly, the translator should be fluent in the intended language, and preferably even a native speaker. The art of translation relies on the small subtleties, and commonly used words and phrases take years of cultural immersion to master (Thrane, 2019, p. 75). The authors of this thesis are both born and raised in Sweden, where Swedish is the native language. Thus, both authors were considered qualified to conduct the translation.

Since the original language of the thesis is English, as well as the literature on which the items are based on, the survey was initially constructed in English. After the translation, the survey should be translated back to the original language to ensure that the back-translated version matches the original (Thrane, 2019, p. 75). Thus, after the translation, the Swedish survey was re-translated to English to detect potential errors in the translation process. For the final back-translated survey, see Appendix 3. Finally, the translated survey should be pilot tested on a small group of targeted respondents and revised if potential misunderstandings are detected (Thrane, 2019, p. 75). The pilot study did not indicate any obvious errors. Instead, the respondents provided positive feedback of the used language, considering it professional and easy to understand (see Chapter 4.2.4). This indicated a well-executed translation.

4.2.3 Scale

While constructing the survey in this thesis, different scales were utilized which will be described below. There are four different scales in quantitative research: nominal scale, ordinal scale, interval scale, and ratio scale (Eliasson, 2018, p. 35). A nominal variable is a variable that cannot be ranked (Lantz, 2014, p. 36). It is of qualitative character since it derives its value through subjective assessments. Gender is a typical example of a nominal variable (Lantz, 2014, p. 36). Thus, the variable gender was measured with a nominal scale in this thesis. On the contrary, a quantitative variable can be measured objectively, resulting in a value with a real mathematical meaning (Lantz, 2014, p. 37). The value of a quantitative variable is characterized by equidistance, referring to the distance between every integer value always being the same. Because of equidistance, quantitative data can always be described on the basis of an average value (Lantz, 2014, p. 37). When a quantitative variable is measured on a scale that contains an absolute zero value, it is called a ratio scale (Eliasson, 2018, p. 37). According to Eliasson (2018, p. 36), age is an example of a ratio variable. The variable age in the questionnaire was thus measured with a ratio scale.

An ordinal variable is also of qualitative character (Lantz, 2014, p. 36). The ordinal variable differs from the nominal variable since it can be ranked based on the coded values (Lantz, 2014, p. 37). However, the values do not contain any information about the distances between the alternatives (Eliasson, 2018, p. 36). Wakita et al. (2012, p. 534) report that Likert scale is the most frequently used psychometric scale while gathering self-reported survey data. The Likert scale is a method of measuring subjective constructs that cannot directly be measured in quantitative terms (Dawson, 2017, p. 3). While utilizing the Likert scale, the respondents are requested to take a position on different statements (i.e., items), usually ranging from strongly disagree to strongly agree (Dawson, 2017, pp. 3-4). The number of alternatives varies (e.g., four, five, six or seven). Worth noting is that in cases of odd response options, the scale will yield a neutral option (Dawson, 2017, p. 4). Most of the research used as inspiration for the design of the survey

(Appendix 4) has used a seven-point Likert scale (e.g., Heidenreich & Handrich, 2014, p. 891; Laukkanen, 2016, p. 2435; Mani & Chouk, 2018, p. 797). Moreover, Preston and Colman (2000, p. 11) reported that a seven-point Likert scale or more has the highest internal consistency as well as test-retest reliability compared to other rating options (see Chapter 4.4.2 for definition). Based on this reasoning, a seven-point Likert scale was used to measure the psychometric variables in this thesis. See Appendix 3 for the final survey.

4.2.4 Pilot Testing

A pilot study is an initial trial of a survey that occurs before the final questionnaire is distributed (Fink, 2013, p. 7). The purpose of the pilot study is to better design the questionnaire that will provide the desired information for the analysis (Fink, 2013, p. 7). By collecting a few responses to a draft, one can usually detect areas that need to be improved which will further increase both the validity and reliability of the analysis (Lantz, 2014, p. 49). A pilot study enables detections of inaccuracies at an early stage (Fink, 2013, p. 7). How well the survey is received depends on the clarity of the used language as well as the simplicity of the questions (Fink, 2013, p. 7). In order to get the most out of the pilot study, the respondents should be encouraged to provide feedback (Eliasson, 2018, p. 41). However, it is up to the researcher to decide which feedback will be considered in the final survey (Eliasson, 2018, p. 42). It is beneficial if the questionnaire is tested on respondents that belong to the intended sample of the study (Lantz, 2014, p. 49). Eliasson (2018, p. 40) emphasizes that the respondents in the pilot study should preferably not be the same respondents in the final survey as it potentially could affect their responses.

When selecting the respondents to the pilot study, the intended sample was considered. It is usual that a pilot study is relatively informal, where friends and family are requested to provide feedback (Hagevi & Viscovi, 2016, p. 168). Thus, 11 respondents in the author's personal network were asked to answer a first draft of the survey. The respondents captured all age categories in the survey and the division was approximately even between men and women (five men and six women). As a concluding part of the survey, the respondents were encouraged to answer two questions specifically designed for the pilot study. First, the respondents were asked to state the time of completion in order to provide an approximate time required for the final survey. On average, it took five minutes to complete after which this was included in the introductory letter. Lastly, the respondents were encouraged to provide feedback on the design and item construction. The received feedback was considered in the design of the final survey which will be discussed below.

In general, most respondents found the questionnaire easy to understand. Two respondents highlighted that some of the items were phrased similarly. As this was intentional in order to measure Cronbach's alpha, most items were not changed significantly. Moreover, it was already stated in the introductory letter that some items may be perceived as similar. However, the two sentences "Some questions may be perceived as similar. This is intentional and we ask you to answer the questions as accurately as possible" was added in the preceding section of the item batteries to further clarify this. On the contrary, another respondent pointed out that the information given in the introductory letter was fruitful because it clarified why some items were similar. Thus, the above stated adjustments were considered sufficient.

One respondent highlighted that the items referring to technology were a bit difficult to interpret in the specific context. The respondent assumed that technology referred to self-scanning, identification and payment etcetera. Even though the interpretation was correct, it could not be assumed that it would be obvious to all respondents. Thus, the parenthesis "(e.g., identification, self-scanning and payment)" were added in relation to all items about technology in unmanned convenience stores to simplify the interpretation. One respondent expressed that there were too many response options (Likert scale 1-7). However, since most of the sources that the items were anchored in used a 1-7 Likert scale (e.g., Heidenreich & Handrich, 2014, p. 891; Laukkanen, 2016, p. 2435; Mani & Chouk, 2018, p. 797), and a Likert-scale of seven or more has the highest internal consistency and test-retest reliability (Preston & Colman, 2000, p. 11) it was decided to not change the scale.

Another respondent pointed out that some questions were of more general character than others, which affected the responses. The item batteries for technology readiness and inertia were intended to measure the respondent's general level of technology readiness and inertia. Consequently, they differed from the other variables that were particularly focused at unmanned convenience stores. To avoid confusion, the final survey was divided in two different sections where the first section included the item batteries focused on resistance barriers specifically towards unmanned convenience stores. The other section included the item batteries for technology readiness and inertia. A brief explanation that the items were of a more general character and thus not directly linked to unmanned convenience stores was added in the preceding section of these item batteries. One item in the item battery for inertia were of more specific character towards unmanned convenience stores, whereas two were more focused on inertia in general. Interpreted from the results of the pilot study, this could potentially cause a problem with Cronbach's alpha of the variable in later analysis. Thus, one item was rephrased to increase the reliability. Lastly, one respondent suggested that the difference between unmanned convenience stores and self-scanning in conventional staffed convenience stores would be developed in the introductory letter. Thus, the authors of this study decided to add a small section to further contrast the difference. This section intended to clarify the differences between unmanned convenience stores in relation to conventional stores.

4.3 Analysis Method

4.3.1 Regression Analysis

In this study, regression analysis was used to test the hypotheses (see result in Chapter 5). It is one of the most useful statistical tools (Løvås, 2006, s. 288). Linear regression is a method to predict a single dependent variable with one or multiple variables (Hair et al., 2006, p. 177). When the method involves a single independent variable, it is called simple linear regression (Hair et al., 2006, p. 177). According to Körner and Wahlgren (2015, p. 67), simple linear regression describes the relationship between an independent variable, X, and a dependent variable, Y. However, it is often several independent variables that explain the variance in the dependent variable (Løvås, 2006, s. 288). When the regression model involves two or more independent variables, it is entitled multiple linear regression (Hair et al., 2006, p. 177). In this study, a multiple linear regression was used to test the hypothesis. According to Stock and Watson (2015, p 237), the multiple linear regression is calculated by:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_k X_{ki} + u_i, i = 1, \ldots, n$$

The model enables an estimation of the effect on Y_i while changing one variable X_i and simultaneously holding all other regressors in the model constant (Stock & Watson, 2015, p. 235). The subscript *i* is an indication of the ith of the *n* observations in the studied sample (Stock & Watson, 2015, p. 237). Whereas Y_i denotes the ith observation of the dependent variable, $X_{1i}, X_{2i}, \ldots, X_{ki}$ denotes the ith observations of the *k* regressor variables (Stock & Watson, 2015, p. 238). β_0 is a constant which indicates the intercept with the Y-axis while all X-variables are equal to zero. Moreover, β_1 denotes the slope coefficient on X_1, and is interpreted as the expected change of Y_i that occurs from a change in X_{1i}, ceteris paribus. The interpretation is equivalent for all X-variables. Lastly, u_i constitutes the error term (Stock & Watson, 2015, p. 238). The error term incorporates all other predictors of the dependent variable, Y, that are not explained by the independent variables, X, for a specific observation (Stock & Watson, 2015, p. 158). In this thesis, consumer resistance constituted the dependent variable. The independent variables that were tested against the dependent variable were perceived complexity, perceived price, perceived convenience value, perceived performance risk, perceived financial risk, self-image congruence, need for interaction, technology readiness, and inertia.

The regression model was estimated by the ordinary least square (OLS). The OLS method implies that the equation of the line is determined so that the sum of the squared residuals (vertically measured) from the observed values to the corresponding values of the estimated line is as small as possible (Körner et al., 1984, p. 113). If b_0 and $b_1, \ldots, b_k$ denotes the estimators of β_0 and $\beta_1, \ldots, \beta_k$, the regression line of the estimators, used to predict Y_i, is mathematically expressed as $b_0 + b_1 X_{1i} + \cdots + b_k X_{ki}$ (Stock & Watson, 2015, p. 239). Consequently, the residuals that occur while predicting the ith observation is calculated as $Y_i - (b_0 + b_1 X_i + \cdots + b_k X_{ki}) = Y_i - b_0 - b_1 X_i - \cdots - b_k X_{ki}$. According to Stock and Watson (2015, p. 239), the OLS method is then the sum of squared residuals over all *n* observations, which is mathematically expressed as:

$$\sum_{i=1}^{n} (Y_i - b_0 - b_1 X_{1i} - \cdots - b_k X_{ki})^2$$

4.3.2 Assumptions

In order to apply the OLS method, some assumptions must be fulfilled. In regression analysis, the purpose is not only to obtain the estimator $\hat{\beta}_k$, but also to draw conclusions about the true β_k (Gujarati & Porter, 2009, p. 61). It is of interest to find out how close $\hat{\beta}$ and $\hat{Y}$ is to the true value in the population. Since Y_i is dependent on both X_i and u_i it is of great importance to be specific about how X_i and u_i are generated to make well-grounded interpretations of the estimates. For that reason, several assumptions are made about the independent variables and the error term (Gujarati & Porter, 2009, p. 61). Given that the assumptions are not violated, the least-squares estimates obtain ideal properties according to the Gauss-Markov theorem (Gujarati & Porter, 2009, p. 671). Thus, if the assumptions hold, the estimator is assumed to be the best linear unbiased estimator (BLUE) (Gujarati & Porter, 2009, p. 671). The assumptions will be further explained in the following sections.

Assumption #1: Linearity

The most important assumption that must be fulfilled is that the relationship is approximately linear (Løvås, 2006, p. 282). The degree of change in the dependent variable caused by a change in the independent variable determines the linearity of the relationship (Hair et al., 2006, p. 205). The most frequently used method to detect a nonlinear relationship is to perform a scatter plot (Hair et al., 2006, p. 85). The scatter plot describes the relationship between two quantitative variables, X and Y (Djurfeldt et al., 2018, pp. 153-154). There are several ways of dealing with a detected nonlinear (e.g., curvilinear) relationship (Hair et al., 2006, p. 85). According to Hair et al. (2006, pp. 88, 206), the first corrective action is to alter the data through arithmetic transformation of the values (e.g., taking the square root, logarithm or square of the variables). Another method of handling a nonlinear relationship is to include additional variables (i.e., polynomials) to constitute the nonlinear components (Hair et al., 2006, p. 87). The third measure is to utilize methods specifically developed for dealing with curvilinear, or more complicated nonlinear relationships, e.g., nonlinear regression (Hair et al., 2006, p. 206). The corrective measures for the estimated coefficients in the model will result in both increased validity and more accurate predictions if nonlinearity is detected in the analysis (Hair et al., 2006, p. 206). To control for potential violations of the assumption, a scatter plot was conducted (Appendix 5).

Assumption #2: The Error Terms Are Normally Distributed

Beside linearity, the assumption that the error terms are normally distributed is considered the most basic assumption for statistical analysis (Hair et al., 2006, p. 79). The normality assumption refers to how well the data is modeled in relation to the normal distribution. If a large deviation from the normal distribution is detected, all following tests will be invalid. This is because the assumption of normality needs to be fulfilled in order to conduct tests for F and t statistics (Hair et al., 2006, p. 79). However, it is sufficient if the error terms are approximately normally distributed without extreme values of observed outliers (Løvås, 2006, p. 283). The easiest diagnostic test for normality is to study histograms over the standardized residuals which visualizes the observed data values and compares it to an approximation of the normal distribution (Hair et al., 2006, p. 81). In order to avoid distorted results, extreme values should be removed from further analysis (Djurfeldt et al., 2018, p. 360). A disadvantage with studying histograms is difficulties in assessing which outliers can be tolerated, and which outliers indicate potential problems (Djurfeldt et al., 2018, p. 360).

A more reliable test to check the assumption of normality is to conduct a normal probability plot (Hair et al., 2006, p. 81). This can be done by saving the unstandardized residual as a variable and perform a normality test (Djurfeldt et al., 2018, p. 360). In the normal probability plot, the residuals are plotted against a theoretical normal distribution where the points should fit an approximately straight diagonal line (Hair et al., 2006, p. 81). Deviations from the diagonal line indicate problems with nonnormality (Hair et al., 2006, p. 81). The two graphical portrayals (histograms and normal probability plots) complement each other (Hair et al., 2006, p. 89). However, as with the histogram, it is not always apparent in the normal probability plot if potential deviations from the normal distribution is negligible (Djurfeldt et al., 2018, p. 361).

Another approach of testing the normality assumption is to conduct a statistical test. The most frequently used statistical tests for normality are the Shapiro-Wilks test and the Kolmogorov-Smirnov test (Hair et al., 2006, p. 82). Both tests calculate the significance level of deviations from the normal distribution (Hair et al., 2006, 82). When the number of observations exceeds 50, the Kolmogorov-Smirnov test is preferred (Djurfeldt et al., 2018, p. 362). The p-value determines if the null hypothesis (referring to the residuals being normally distributed) can be rejected, which by extension implies that the normality assumption is fulfilled (Djurfeldt et al., 2018, p. 326). However, it should be noted that the above stated statistical tests are not as useful in smaller samples (less than 30 observations), and relatively sensitive in larger samples (more than 1000 observations) (Hair et al., 2006, p. 82). To fully assess potential violations of the assumption, both statistical tests and graphical portrayals are needed (Hair et al., 2006, p. 82). Thus, both a histogram, a normal probability plot and a Kolmogorov-Smirnov test were used to check the normality assumption in this study in order to get a holistic view and confidently ensure that no problems with nonnormality exist in the analysis (Appendix 6).

Assumption #3: The Conditional Distribution of u_i Has a Mean of Zero

The third assumption implies that the error terms have a conditional mean of zero (Gujarati & Porter, 2009, p. 63). The interpretation is that the independent variables, which are omitted in the model, and hence subsumed in the error term (u_i), have no systematic effect on the mean value of the dependent variable (Gujarati & Porter, 2009, p. 64). Thus, positive values of u_i cancel out negative values of u_i, resulting in the average effect on Y being calculated to zero. The assumption is, according to Gujarati and Porter (2009, p. 63), mathematically expressed as:

$$E(u_i|X_i) = 0$$

A violation of the assumption occurs because of specification biases (Gujarati & Porter, 2009, p. 64). A specification bias refers to omitting important variables in the analysis or including unnecessary variables. If the conditional mean is not equal to zero, it can be an indication that the error term includes variables that instead should have constituted an additional explanatory variable in the model. A bias may also occur if the functional form of the relationship between the dependent and the independent variables has been specified incorrectly (Gujarati & Porter, 2009, p. 64). Lack of theoretical grounding causes specification biases, which makes it immensely difficult to correct in retrospect (Djurfeldt et al., 2018, p. 364). In order to avoid potential violation of the assumption, previous research and theory in the field has been studied carefully. To check for the assumption, the mean values was calculated for the error terms which should cancel out to zero.

Assumption #4: Homoscedasticity

An additional assumption that needs to hold is that no heteroskedasticity is detected in the data. Heteroscedasticity occurs if the conditional variance (σ^2) in the error term (u_i), given the dependent variable (X_i), is not constant (Stock & Watson, 2015, p. 223). Heteroskedasticity illustrates uneven distribution among the error terms (Djurfeldt et al., 2018, p. 368). The assumption of heteroscedasticity is best tested graphically through a scatter plot (Hair et al., 2006, p. 84). If heteroskedasticity is present, the distribution of the error terms will be unequal, i.e., diamond shaped (more dispersion at the center of the

graph) or cone shaped (more dispersion at one side of the graph) (Hair et al., 2006, p. 84). Djurfeldt et al. (2018, p. 386) emphasize that if heteroskedasticity occurs, the standard deviation for the regression coefficients increases and the confidence intervals around these become wider. Thus, the precision of the model decreases as a consequence (Djurfeldt et al., 2018, p. 368). If no violation of the assumption is detected, the data is homoscedastic (Stock & Watson, 2015, p. 223). As stated by Stock and Watson (2015, p. 223), homoscedasticity is mathematically expressed as:

$$Var(u_i|X_i) = \sigma_u^2$$

There is no given standard solution for heteroskedasticity (Djurfeldt et al., 2018, p. 368). However, heteroskedasticity is associated with nonnormality, and similar data transformation could therefore be applied (Hair et al., 2006, p. 84). According to Hair et al. (2006, p. 87), a cone shaped distribution is more common than a diamond shaped distribution. If the dispersion is greater on the right side, the inverse of the independent variable could be a solution. On the contrary, if the dispersion is greater on the left side, the square root of the independent variable could be a remedy (Hair et al., 2006, p. 87). A logarithmic transformation as a solution for nonnormality may also eliminate problems with heteroskedasticity (Hair et al., 2006, p. 94). Many times, nonnormality is the underlying cause of heteroskedasticity. Thus, corrective actions for nonnormality could also even out the dispersion of the variance (Hair et al., 2006, p. 85). To control for potential violation of the assumption, and by extension avoid problems for further analysis, a scatter plot was conducted in this thesis (Appendix 7).

Assumption #5: No Perfect Multicollinearity

When doing a multiple regression analysis, one additional assumption needs to be considered apart from the aforementioned assumption, namely the assumption about no perfect multicollinearity (Stock & Watson, 2015, p. 246). Multicollinearity occurs when there is a perfect linear relationship between two or more independent variables (Gujarati & Porter, 2009, p. 189). Multicollinearity can be both perfect and imperfect (Stock & Watson, 2015, p. 248). Perfect multicollinearity is problematic as it prevents estimations of the OLS regression (Stock & Watson, 2015, p. 247). On the other hand, imperfect multicollinearity occurs when one of the independent variables is highly correlated with another independent variable, but the linear relationship is not perfect (Stock & Watson, 2015, p. 248). Such correlations do not imply problems with conducting the OLS regression (Stock & Watson, 2015, p. 248).

One way to detect problems with pairwise collinearity is to run a correlation matrix (Hair et al., 2006, p. 227). In the correlation matrix, the correlations among the independent variables are illustrated along the matrix diagonal (Gujarati & Porter, 2009, p. 348). A rule of thumb is that a value of 0.9 or higher indicates problems with collinearity (Hair et al., 2006, p. 227). However, it is not always possible to detect problems with multicollinearity in a correlation matrix as multicollinearity may occur due to the combined effect of more than two variables. A way to measure both pairwise and multiple collinearities simultaneously is to conduct a test of the variance inflation factor (VIF-test) (Hair et al., 2006, p. 227). A common benchmark is that a VIF-value above 10 indicates problems with multicollinearity (Hair et al., 2006, p. 230). However, Djurfeldt et al. (2018, p. 366) emphasize that a VIF-value below 2.5 is desirable. In order to assure that no perfect multicollinearity exists between the independent variables, which by extension

may cause problems in the analysis, both a correlation matrix and a VIF-test was conducted in this thesis. A way of solving detected multicollinearity is to modify or remove one of the independent variables (Stock & Watson, 2015, p. 246). Another solution is to compute two or several independent variables into one variable (Djurfeldt et al., 2018, p. 366).

Assumption #6: No Autocorrelation

The last least squares assumption refers to an independent variable correlating with itself at different points of time (Stock & Watson, 2015, p. 412). Whereas autocorrelation is applicable in time series data analysis (Stock & Watson, 2015, p. 412), the assumption does not need to be considered when doing cross-sectional data analysis (Gujarati & Porter, 2009, p. 67). Hence, this assumption was not controlled for in the analysis of this thesis.

4.3.3 Coefficient of Determination

Covariance is a measure to describe how two stochastic variables covariates (Stock & Watson, 2006, p. 77). The denotation of covariance is cov(X, Y), or σ_{xy} (Stock & Watson, 2006, p. 77). However, the covariance is often difficult to interpret since the size of the covariance not only depends on the strength of the linear relationship, but also on the variance within the included variables (Nyquist, 2017, p. 134). Thus, a standardized version of the covariance (i.e., correlation) is typically utilized (Nyquist, 2017, p. 134). Moore and Notz (2006, p. 274) describe correlation as both the direction and the strength of a linear relationship between two metric variables. According to Moore and Notz (2006, p. 277), the correlation coefficient (r) will always display a value within the interval - 1 to 1. A value close to 1 indicates a strong positive relationship, whereas a value close to - 1 indicates a strong negative relationship. Moore and Notz (2006, p. 277) further states that if X and Y are independent of each other, the correlation will be 0. According to Stock and Watson (2006, p. 78), the correlation between X and Y is derived from the covariance between X and Y divided by the variable's standard deviations:

$$corr(X,Y) = \frac{cov(X,Y)}{\sqrt{var(X)\ var(Y)}} = \frac{\sigma_{xy}}{\sigma_x \sigma_y}$$

The usefulness of the regression is determined by the strength of the correlation between the variables (Moore & Notz, 2006, p. 297). To get the strength of the association more precise, the observed correlation coefficient should be squared (Moore & Notz, 2006, p. 297). Hair et al. (2006, p. 237) entitle the squared correlation coefficient (R^2) as the coefficient of determination which indicates the total variation in Y explained by the linear relationship between X and Y. The values of R^2 range between 0 and 1. When r = 1, i.e., perfect correlation, $R^2 = 1$. Likewise, when r = 0, i.e., no correlation, $R^2 = 0$ (Djurfeldt et al., 2018, p. 161). It should be noted, however, that adding new regressors to the model will automatically increase the value of R^2 (Stock & Watson, 2006, p. 243). Alas, adding new variables could provide an inflated estimation of R^2. For that reason, an increase in R^2 should not directly be interpreted as a better fit of the data. A remedy for such problems is to deflate the R^2 with some factor, which is called adjusted R^2 (Stock & Watson, 2006, p. 243). Opposed to R^2, adjusted R^2 will only rise if the new independent variable increases the explanatory power of the model (Hair et al., 2006, p. 170). As stated

by Hair et al. (2006, p. 216), the adjusted R^2 is interpreted in the same way as R^2. Based on the argumentation above, adjusted R^2 was used in this thesis as an indicator of how well the regressors predict the values of the dependent variable. It will henceforth be denominated as the adjusted coefficient of determination.

4.3.4 Significance Level and t-statistic

The p-value is, given that the null hypothesis is true, the probability that the sample outcome would be as extreme or more extreme than the observed data values (Moore & Notz, 2006, p. 453). Moore and Notz (2006, p. 453) further explain that the smaller the p-value, the stronger evidence against the null hypothesis provided by the observed data. The p-value is thus a measurement for the statistical significance (Moore & Notz, 2006, p. 456). Worth noting is that the p-value is not a measurement of the importance of the result, but rather an indication that the observations are not likely to happen by chance. The researcher should decide in advance how much evidence against the null hypothesis should be insisted on, i.e., the size of the p-value that should be accepted (Moore & Notz, 2006, p. 456). Frequently used and widely accepted significance levels are p-values at 0.1 %, 1 % and 5 % (Moore & Notz, 2006, p. 457). In line with the generally accepted significance levels, p-values of 0.1 %, 1 % and 5 % were accepted in this thesis.

The z-score and t-statistics are important when determining the distance between two stochastic quantities (Thrane, 2019, p. 109). The z-score illustrates how much a data point deviates from the mean (Thrane, 2019, pp. 108-109). However, the t-statistics are normally reported in statistical programs instead of the z-score. This is because the t-statistics are applicable to all sample sizes, whereas z-scores are only suitable for large samples, i.e., $n > 120$ (Thrane, 2019, pp. 116-117). Even though the sample in this thesis is considered large (see Chapter 5.1), the t-statistic was used as a measure of significance since it has the same meaning as the z-score in large samples (Thrane, 2019, p. 116). The t-test is the most frequently used test and a standard practice when testing the hypothesis of individual slope coefficients (Studenmund, 2014, p. 134). It is an appropriate test when the stochastic error terms are normally distributed, which typically are the case (Studenmund, 2014, p. 134). A t-test is a test of the hypothesis that the coefficient of the independent variable β_k is equal to zero (Gujarati and Porter, 2009, p 115). The interpretation is that the independent variable does not affect the dependent variable. As stated by Studenmund (2014, p. 135), the t-statistic for the slope coefficient is mathematically expressed as:

$$t_k = \frac{\hat{\beta}_k - \beta_{H0}}{SE(\hat{\beta}_k)}$$

where t_k is the t-statistic, $\hat{\beta}_k$ is an estimator of the regression coefficient of the kth variable, β_{H0} is the border value (zero) of the null hypothesis for β_k, and $SE(\hat{\beta}_k)$ is the estimated standard error of $\hat{\beta}_k$ (Studenmund, 2014, p. 135) A critical t-value (t_c) is needed to determine whether the null hypothesis should be rejected or not. The critical t-value varies depending on if the test is one-sided or two-sided, the p-value and on the degrees of freedom (Studenmund, 2014, p. 136). Degrees of freedom refer to individual values in a distribution that have the freedom to vary (Djurfeldt et al., 2018, p. 187). A one-sided t-test is appropriate if the researcher wants to determine if the estimated coefficient in the regression differs from zero (Studenmund, 2014, p. 143). A two-sided t-test is better if the researcher wants to test if the regression coefficient differs from zero in either direction (Studenmund, 2014, p. 148). In this thesis, a two-tailed t-test was used.

According to Stock and Watson (2006, p. 805), the critical value of a two-sided t-test with 5 percent significance level and the degrees of freedom approaching infinity (∞), the critical t-value is ± 1.96. If the t-value exceeded 1.96 or fell below -1.96, the null hypothesis was rejected. Thus, the relationship was considered significant.

4.3.5 Confidence Interval

According to Gujarati and Porter (2009, p. 124), some authors prefer the confidence interval approach in hypothesis testing before other significance tests as it provides insights about the ranges of the parameter values. A confidence interval specifies a range of values that are plausible for the estimated population (Cumming, 2012, p. 5). Any value that lies within the interval can be the true value. Consequently, a shorter interval is better (Cumming, 2012, p. 5). The interpretation of a 95 percent confidence interval is that it would contain the true value with 95 percent probability in the long run with repeated samples (Gujarati & Porter, 2009, p 114). Cumming (2012, p. 5) states that if the confidence interval goes through zero, it means that zero is a plausible true value. Hence, the null hypothesis cannot be rejected (Cumming, 2012, p. 5). In order to get a holistic view of the statistical significance, both confidence interval, t-value and p-value were used in the hypothesis testing in this thesis.

4.4 Quality Criteria

To evaluate the quality of a quantitative study, the researcher must consider different quality criteria (Yilmaz, 2013, p. 317). The overall quality of the study is determined by its validity and reliability. Validity and reliability are further divided in different sub-criteria (Yilmaz, 2013, pp. 317-318). In the following section, these criteria will be defined along with elaborations on how validity and reliability have been considered in this thesis.

4.4.1 Validity

In quantitative research, the term validity refers to the level of accuracy within the research data (Yilmaz, 2013, p. 318). Validity further encompasses how certain the researchers are that they are actually measuring what they intend to measure (Lisper & Lisper, 2005, p. 65). There are mainly three types of validity that need to be considered to ensure validity: construct validity, internal validity and external validity (Yilmaz, 2013, p. 318). The meaning of these types of validity will be described below.

4.4.1.1 Construct Validity

Construct validity relates to which degree conclusions can be drawn from the operationalization, and the relationship between the measurement and the theoretical model (Yilmaz, 2013, p. 318). That is, the treatment of the data should reflect the construct that the research is based upon (Yilmaz, 2013, p. 318). Operationalization refers to the process of going from concepts to concrete, quantifiable questions (Djurfeldt et al., 2018, p. 104). It is one of the most difficult steps in all research. If the operationalization fails, the following research will be marked with systematic errors (Djurfeldt et al., 2018, p. 104).

In order to successfully choose the right method to answer the research question, the researcher must be familiar with both methodology and theory in the studied field

(Djurfeldt et al., 2018, p. 22). Djurfeldt et al., (2018, p. 22) further emphasize the importance of method pluralism, meaning that researchers are well informed with, and able to master different types of methodology. The authors of this thesis have gained wide knowledge of both quantitative and qualitative research methodology due to previous theses, which has resulted in a solid foundation to decide which method is most appropriate to answer the research question. In this thesis, previous empirical research has been studied carefully. Most of the previous research measuring consumer resistance has conducted a quantitative study and gathered data through surveys. For that reason, the authors of this thesis argue that quantitative methodology was most suitable. To successfully answer the research question, theory has been studied thoroughly to assess which variables are most likely to explain consumer resistance. To ensure good operationalization, the survey questions have been constructed based on previous research and the questions have, to a large extent, been inspired by other researchers' question formulations (Appendix 4). Hence, the authors of this thesis are well informed with both theory and methodology which maximizes the possibility of good construct validity.

4.4.1.2 Internal Validity

Internal validity refers to the possibility of unambiguously determining a causal relationship between the dependent and the independent variables (Lisper & Lisper, 2005, p. 73; Yilmaz, 2013, p. 318). Nyquist, (2017, p. 215) described that in order to accept a hypothesis of a causal relationship, it is important to ensure that the covariation between two variables is not explained by the influence of other variables. In order to ensure satisfactory internal validity, previous research has been studied carefully and systematically. It is almost impossible to ensure that all potential explanatory variables that affect consumer resistance have been included. However, the hypothesis has been grounded in theory on consumer resistance towards innovations. Moreover, the authors of this thesis have been engaging in theory building, i.e., combining findings from previous research to create a holistic view of variables that might affect consumer resistance. In the analysis, the adjusted coefficient of determination will be used to assess the total variance of the dependent variable.

4.4.1.3 External Validity

Yilmaz (2013, p. 318) explains that external validity refers to the degree of which the results can be generalized beyond the studied sample. For instance, if the results can be generalized to other settings or individuals, the study is considered to have a satisfactory level of external validity (Yilmaz, 2013, p. 318). In this thesis, surveys have been distributed to a wide range of individuals in Sweden in order to gather data of individuals which have not yet tried an unmanned convenience store. The intention is that the results can be generalized to reflect the population. Hair et al. (2006, p. 196) describe that the sample size not only determines the statistical power of the model, but also how well the results can be generalized. A rule of thumb is that the sample size should not fall below the ratio 5 to 1. The interpretation is that at least five observations per independent variable should be sampled. However, Hair et al. (2006, p. 196) emphasize that it is desirable that the researcher to samples a larger number of observations to be able to generalize the results with better precision. As this thesis has nine independent variables, it would mean that the absolute minimum of observations would calculate to 45. Thus, data have been collected to achieve at least 45 observations. See Chapter 5.1 for response rate.

4.4.2 Reliability

In quantitative research, reliability refers to the consistency of the data, meaning that if the variables were measured repeatedly, it would generate consistent results over time (Yilmaz, 2013, p. 317). Thus, the reliability is a measure of the replicability of the study (Djurfeldt et al., 2018, p. 104). Even if the question has high validity, the reliability of the measuring instrument may vary (Djurfeldt et al., 2018, p. 104). Low levels of reliability can occur due to problems with operationalization, or ambiguous questions (Djurfeldt et al., 2018, p. 105). The degree of reliability in an instrument can be evaluated in different ways (Yilmaz, 2013, p. 317). Test-retest reliability refers to administering the test on two occasions to the same group of individuals (Yilmaz, 2013, p. 318). When the reliability is high, the results would be approximately the same with repeated observations (Nyquist, 2017, p. 263). According to Yilmaz (2013, p. 318), another way of ensuring high reliability is to create parallel forms, i.e., formulate several items to measure the same construct. If the reliability is high, the scores will correlate to a large extent (Yilmaz, 2013, p. 318). In this thesis, the latter method has been utilized as the time frame of the thesis does not allow for repeated observations. For all independent variables, except technology readiness (see discussion in the next section), three items have been formulated to measure the same construct. Cronbach's Alpha was measured to evaluate the internal consistency of these constructs. This will be elaborated below.

4.4.2.1 Cronbach's Alpha

According to Hair et al. (2006, p. 137), Cronbach's alpha is one of the most frequently used diagnostic measures of reliability, i.e., internal consistency. Cronbach's alpha measures the average covariation between different items that are intended to explain the same index (Thrane, 2019, p. 44). Hence, Cronbach's alpha is a measure of the consistency of the entire scale (Hair et al., 2006, p. 137). The value of Cronbach's alpha lies within the interval 0 to 1 (Hair et al., 2006, p. 102). According to Hair et al. (2006, p. 137), the lower limit of Cronbach's alpha is usually 0.7. However, in explanatory research, 0.6 may be accepted (Hair et al., 2006, p. 137). Thrane (2019, p. 44) further explains that a Cronbach's alpha of 0.6 is acceptable when the indexes are self-developed. If items constructed in previous research are used in the analysis, 0.7 is the rule of thumb (Thrane, 2019, p. 44). Thus, the authors of this study decided to accept a Cronbach's alpha of 0.7 for the items anchored in previous literature, and 0.6 for the self-developed index.

Cronbach's alpha was not measured for the items constructing the technology readiness index. This is because technology readiness is measuring four different factors: optimism, innovativeness, discomfort and insecurity. The four factors together constitute the TRI but are not directly focusing on the same thing. This means that Cronbach's alpha is not applicable. The TRI 2.0 was originally constructed of 16 items (Parasuramann & Colby, 2015, p 63). However, technology readiness was not the only variable hypothesized to affect consumer resistance. Thus, in order to keep the length of the survey at a reasonable level, the authors of this thesis decided to select one item per factor. Parasuramann and Colby (2015, p. 60) argues that optimism and innovativeness is positively associated with technology readiness. Hence, these variables were reverse coded in the analysis as the hypothesis states that low level of technology readiness positively affects consumer resistance towards unmanned convenience stores.

5. Results

In this chapter, the results from the data analysis are presented. The data has been analyzed in line with the methodology presented in the previous chapter. The chapter begins with a presentation of the demographic variables in order to illustrate the representability. Descriptive statistics, i.e., number of observations, mean, standard deviation, minimum and maximum values are presented in a table. The findings are compared to the respondents with previous experience as well as the whole sample. Cronbach's Alpha is measured to ensure that the items have sufficient internal consistency. Before the regression analysis, the assumptions presented in the previous chapter are controlled. The hypotheses are then tested with a multiple regression analysis. The strength of the relationship is shown by the adjusted coefficient of determinations and the decisions for the hypothesis are presented in a table. Lastly, the chapter concludes with looping back to the conceptual framework to further clarify the accepted or rejected hypothesis.

5.1 Response Rate and Representability

The initial part of the survey included two demographic variables as well as a question whether the respondent ever visited an unmanned convenience store. In total, 172 respondents answered the questionnaire. However, two respondents were immediately removed from the analysis as they skipped several questions, including the dependent variable of consumer resistance. Such a course of action made further analysis impossible in those specific cases. Hence, 170 answers were left for further analysis. The results of the demographic variables and the experience variable are presented in Table 1. For the gender variable, 50.6 percent of the respondents stated that they are men whereas 48.8 percent stated that they are women and 0.6 percent that they have other gender identity. 25.9 percent of the respondents were between 18-27 years old, 15.3 percent between 18-28 years old, 5.3 percent between 38-47 years old, 15.3 percent between 48-57 years old, 17.6 percent between 38-47 years old, 17.6 percent between 58-67 years old and 20.6 percent older than 68 years old. 21.8 percent of the respondents had previous experience with an unmanned convenience store, 77.1 had never visited and unmanned convenience store and 1.2 percent were not sure.

Table 1 also presents the mean resistance between the distribution of gender, age and experience. Male respondents had a mean of 2.75 for resistance towards unmanned convenience stores whereas female respondents had a mean of 2.78 and other gender identity had a mean of 2.33. Thus, the female respondents had the highest resistance towards unmanned convenience stores, although it was relatively even between the genders. As for the different age groups, 18-27 years old had a mean of 2.14, 28-37 years old had a mean of 2.29, 38-47 years old had a mean of 3.11, 48-57 years old had a mean of 3.41, 58-67 years old had a mean of 2.93 and the respondents older than 68 years old had a mean of 3.18. Thus, the respondents between 48-57 years old indicated the highest resistance towards unmanned convenience stores. Lastly, the mean resistance for the respondents with previous experience of an unmanned convenience store were 2.07 whereas the mean resistance for the respondents without previous experience were 2.96 and the mean resistance for the respondents who were not sure whether they had previous experience was 2.83. Thus, the respondents who had no previous experience showed the highest resistance towards unmanned convenience stores.

Table 1. Demographic variables

Demographic variables		*N*	Percentage	Mean Resistance
Gender	Male	86	50.6	2.75
	Female	83	48.8	2.78
	Other gender identity	1	0.6	2.33
	Total	170	100	2.76
Age	18-27	44	25.9	2.14
	28-37	26	15.3	2.29
	38-47	9	5.3	3.11
	48-57	26	15.3	3.41
	58-67	30	17.6	2.93
	68+	35	20.6	3.18
	Total	170	100	2.76
Experience	Yes	37	21.8	2.07
	No	131	77.1	2.96
	Do not know	2	1.2	2.83
	Total	170	100	2.76

5.2 Descriptive Statistics

Although this study primarily focused on consumers with no previous experience from visiting unmanned convenience stores, it was interesting to compare the observations with respondents that possess such experience. By such, differences in how the respondents answered were made possible to disclose, such as mean values for each variable seen in Table 2. This will be further discussed later in this chapter. A comparable visualization may enable interesting differences and similarities to be disclosed. Consequently, Table 2 illustrates descriptive statistics from respondents that both have, and do not have, previous experience from unmanned convenience stores. Moreover, Table 2 demonstrates a summary of descriptive statistics for the total number of respondents (i.e., respondents with no previous experience, respondents with previous experience and respondents who are unsure whether they have previous experience). The total number of observations was counted at 170. A partial loss of data occurred for the respondents with no previous experience where three single items in total were left unanswered (one each for the item batteries perceived performance risk, self-image incongruence and need for interaction). As the respondents answered all other questions, including the remaining two items in the item batteries, it was not considered to affect the analysis significantly.

Table 2 demonstrates how the mean value for each variable differs between the three designated groups in the sample of the study. This table provides a comprehensive perspective of how the groups in the sample have demonstrated different amounts of influence to the variables, i.e., their sensitivity to each factor. This is illustrated by the third column in the table and its mean value that derives from each one of the variables used in the conceptual model. It can be observed that perceived complexity was found to have the lowest mean in all groups, ranging from 1.67 in the group with previous experience to 2.30 demonstrated in the group with no previous experience of unmanned convenience stores. Furthermore, the opposite can be observed for self-image incongruence which induced the highest mean values for the group with no previous experience, illustrated by a mean value of 4.21. The group with previous experience calculated the highest mean value for perceived price. However, adding all respondents together, the mean value of self-image incongruence still outweighed perceived price. By

this, the group in the sample with no previous experience of unmanned convenience stores demonstrated the highest amount of self-image incongruence.

As mentioned in chapter 5.1, the dependent variable, i.e., consumer resistance, is reportedly at a mean value of 2.96 for the group without previous experience. This can be compared to 2.76 which was demonstrated by the group that includes all respondents, as well as for 2.07 that was found in the group with previous experience. Furthermore, by scrutinizing the obtained values from the group with no previous experience from unmanned convenience stores, it can be concluded that the majority of the mean values was found somewhere in the spectrum of 3.3-3.94. It can be concluded that perceived complexity and inertia diverges from the rest of the factors due to their mean value of 2.30 and 2.52. These variables are the only independent variables that are shown to be under 3.0 for this particular group of respondents.

The standard deviation was relatively even between the different variables and the different groups. For the respondents that had no previous experience from visiting an unmanned convenience store, the standard deviation varied between the lowest value of 1.04, respectively the highest value of 1.63 as seen in Table 2. These values correspond to self-image incongruence, respectively technology readiness. The numbers imply that the spread of observed values from the mean is the greatest at technology readiness, consequently, the spread of observed values from the mean is at the lowest for self-image incongruence. The rest of the variables in this respondent group demonstrated a standard deviation of 1.61 for consumer resistance, 1.15 for perceived complexity, 1.52 for perceived price, 1.30 for perceived convenience value, 1.57 for perceived performance risk, 1.41 for perceived financial risk, 1.71 for the need for interaction, and lastly, 1.08 for inertia.

Furthermore, as seen in Table 2, it can be observed that the group of respondents that had previous experience from unmanned convenience stores demonstrated standard deviations that varied between 0.83 for perceived complexity and 1.92 for the need of interaction. Consequently, this spread is slightly bigger than for the group of respondents with no previous experience. The standard deviation corresponding to all the respondents varied between 1.05 for the technology readiness and 1.76 for the need for interaction. Consequently, it can be observed that the standard deviation is relatively even for this group as well, whereas the group that had previous experience demonstrated the largest deviations from the mean.

The items were measured on a 7-point Likert scale. As can be seen in Table 2, the respondents have mostly utilized the range of available options when answering the questionnaire. The minimum stated value was 1 for all variables. The maximum value in the scale was 7 where most of the variables obtained the maximum value. However, Table 2 reveals that the maximum value was 6.33 for perceived complexity, 6.25 for technology readiness, and 6.33 for inertia among the respondents with no previous experience. Furthermore, the maximum value was 6.33 for consumer resistance, 4 for perceived complexity, 6 for convenience value, 6.33 for perceived performance risk, 6 for financial risk, and 4 for inertia among the respondents with previous experience. In total, only perceived complexity and inertia calculated a maximum level below 7, i.e., a value of 6.33 each. As the three items measuring each variable were computed to an index, a maximum value with decimals is plausible. The interpretation of such values is that no respondents stated the value 7 consistently for the entire item battery.

Table 2. Descriptive statistics

	No previous experience				
Variable	*N*	Mean	SD	Min	Max
Consumer resistance	131	2.96	1.61	1	7
Perceived complexity	131	2.30	1.15	1	6.33
Perceived price	131	3.30	1.52	1	7
Perceived convenience value	131	3.36	1.30	1	7
Perceived performance risk	130	3.79	1.57	1	7
Perceived financial risk	131	3.52	1.41	1	7
Self-image incongruence	130	4.21	1.63	1	7
Need for interaction	130	3.94	1.71	1	7
Technology readiness	131	3.79	1.04	1	6.25
Inertia	131	2.52	1.08	1	6.33
	Previous experience				
Variable	*N*	Mean	SD	Min	Max
Consumer resistance	37	2.07	1.35	1	6.33
Perceived complexity	37	1.67	0.83	1	4
Perceived price	37	3.85	1.72	1	7
Perceived convenience value	37	2.97	1.50	1	6
Perceived performance risk	37	2.97	1.55	1	6.33
Perceived financial risk	37	3.05	1.50	1	6
Self-image incongruence	37	3.49	1.71	1	7
Need for interaction	37	3.70	1.92	1	7
Technology readiness	37	3.84	1.09	1	7
Inertia	37	1.99	0.91	1	4
	All respondents				
Variable	*N*	Mean	SD	Min	Max
Consumer resistance	170	2.76	1.59	1	7
Perceived complexity	170	2.15	1.11	1	6.33
Perceived price	170	3.44	1.59	1	7
Perceived convenience value	170	3.29	1.37	1	7
Perceived performance risk	169	3.62	1.62	1	7
Perceived financial risk	170	3.40	1.44	1	7
Self-image incongruence	169	4.03	1.67	1	7
Need for interaction	169	3.90	1.76	1	7
Technology readiness	170	3.82	1.05	1	7
Inertia	170	2.40	1.07	1	6.33

5.3 Cronbach's Alpha

Cronbach's alpha is a measure of internal consistency, as discussed in Chapter 4.4.2.1. Before the regression analysis could be performed, a Cronbach's alpha larger than 0.7 for the indexes had to be assured, except for the self-developed index (perceived price) that should exhibit a value of at least 0.6. Table 3 summarizes the results for the analysis of Cronbach's alpha. The column number of items describes that three items were consistently used per index. All variables, including the self-developed index, generated a Cronbach's alpha larger than 0.7. Thus, the indexes had strong internal consistency and no corrective actions were necessary. Cronbach's alpha was not measured for the four items constructing technology readiness (see Chapter 4.4.21) and is therefore not included in Table 3.

Table 3. Cronbach's alpha

Variables	Number of items	Cronbach's alpha	Comment
Consumer resistance	3	0.88	Accepted
Perceived complexity	3	0.87	Accepted
Perceived price	3	0.85	Accepted
Perceived convenience value	3	0.83	Accepted
Perceived performance risk	3	0.83	Accepted
Perceived financial risk	3	0.75	Accepted
Self-image incongruence	3	0.92	Accepted
Need for interaction	3	0.89	Accepted
Inertia	3	0.78	Accepted

5.4 Regression Analysis

5.4.1 Assumptions

Before the regression analysis could be performed, a number of assumptions was checked for. To ensure that the assumption of linearity was fulfilled, scatter plots were created for the relationships between the independent variables and the dependent variable. All variables indicated a linear relationship, and no skewed distributions were identified, e.g., curvilinear relationships (Appendix 5). The assumption was thus considered fulfilled. To check for the second assumption of normal distribution, three methods were utilized. Initially, histograms were created over the standardized residuals which resulted in the desired bell-shape (Appendix 6). Secondly, the variables were saved as standardized residuals and plotted against a theoretical normal distribution (normal probability plot) where the points should fit an approximately straight diagonal line. As can be seen in Appendix 6, no major deviations were observed in the normal probability plot. Lastly, a Kolmogorov-Smirnov test was conducted in order to detect potential deviations from normality due to skewness or kurtosis. The Kolmogorov-Smirnov test indicated a p-value of 0.05 (Appendix 6). Thus, the null hypothesis that the error terms are not normally distributed could be rejected. Consequently, the assumption regarding normality was considered fulfilled.

Another assumption to consider before the regression analysis could be conducted is the assumption about homoscedasticity. To control for this assumption, a scatter plot was constructed over the error terms. The scatter plot indicated an even distribution, i.e., the dispersion was neither cone nor diamond shaped (Appendix 7). Thus, no problems with heteroskedasticity were present in the analysis. The assumption that the conditional distribution of the error terms has a mean of zero was controlled by adding the unstandardized residuals together. The sum of the unstandardized residual was equal to zero. The interpretation is that there was no correlation between the error terms and the independent variables. It is also an indication that no specification bias occurred in the analysis. Moreover, the interpretation is that no important explanatory variables were left out, no unnecessary variables were included and that the functional form of the relationship between the dependent and the independent variables was correctly specified. Hence, the assumption was fulfilled.

The final assumption examined in the analysis was the assumption about no perfect multicollinearity. The assumption was controlled in two steps. Initially, a correlation matrix over the independent variables was constructed. As discussed in Chapter 4.3.2, a

correlation coefficient larger than 0.9 between the independent variables indicates problems with pairwise collinearity. The correlation matrix is presented in Table 4. None of the independent variables had a correlation coefficient larger than 0.9. To further control for the assumption of multicollinearity, a VIF-test was conducted. As discussed in chapter 4.3.2, a VIF-value under 10 can be accepted. However, a VIF-value less than 2.5 is desirable. As can be seen in Table 5, all variables indicated a VIF-value less than 2.5. Consequently, the authors of this thesis were comfortable with assuming that no perfect multicollinearity existed in the data.

Table 4. Correlation matrix

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. CR	**1.00**									
2. PC	0.54	**1.00**								
3. PP	0.18	0.18	**1.00**							
4. PCV	0.52	0.38	0.30	**1.00**						
5. PPR	0.60	0.35	0.19	0.27	**1.00**					
6. PFR	0.57	0.53	0.17	0.25	0.67	**1.00**				
7. SII	0.60	0.52	0.17	0.63	0.33	0.33	**1.00**			
8. NFI	0.69	0.52	0.14	0.44	0.50	0.51	0.55	**1.00**		
9. TR	0.45	0.47	0.06	0.22	0.44	0.40	0.42	0.52	**1.00**	
10. IN	0.21	0.42	−0.02	0.14	0.23	0.33	0.17	0.26	0.33	**1.00**

Note: N = 131 for all variables except PPR, SSI, and NFI for which N = 130. CR = Consumer resistance, PC = Perceived complexity, PP = Perceived price, PCV = Perceived convenience value, PPR = Perceived performance risk, PFR = Perceived financial risk, SII = Self-image incongruence, NFI = Need for interaction, TR = Technology readiness, IN = Inertia.

5.4.2 Hypothesis Testing

To test the hypothesis, a multiple regression analysis was performed. The results of the regression analysis are presented in Table 5. As mentioned in Chapter 4.3.6, the confidence interval is used as a test of the hypothesis and the true value would lie within the interval with repeated samples. An interval that goes through zero was not accepted in this thesis as it indicates that zero is a plausible value. All variables with a p-value larger than 0.05 also indicated a confidence interval that goes through zero. The variables with a significant p-value obtained a confidence interval that was not going through zero. The t-values are also presented in Table 5. All variables with a p-value less than 0.05 indicated a t-value ± 1.96. Thus, the confidence interval, the t-values and the p-values agreed, and the authors of this thesis were comfortable with assessing the significance of the analysis.

The explanatory variables: perceived complexity, perceived price, perceived convenience value, perceived performance risk, perceived financial risk, self-image incongruence, need for interaction and technology readiness, were tested against the dependent variable consumer resistance. Perceived complexity, perceived price, perceived financial risk, technology readiness and inertia did not indicate a significant relationship with consumer resistance. Perceived convenience value (β = 0.169, $p<0.05$) displayed a significant relationship with consumer resistance. The items were reverse coded in the analysis as the hypothesis stated that a lack of perceived convenience value positively influences consumer resistance. Thus, the interpretation is that if the perceived lack of convenience value increases with one unit, ceteris paribus, the consumer resistance increases with the standardized beta coefficient, 0.169. Perceived performance risk (β = 0.259, $p<0.001$) indicated a strong significant relationship. If the perceived performance risk increases

with one unit, ceteris paribus, the consumer resistance increases with 0.259 units. Furthermore, the variable self-image incongruence (β = 0.161, $p<0.05$) indicated a significant relationship with the dependent variable. Thus, an increase of self-image incongruence with one unit, ceteris paribus, increases consumer resistance with 0.161 units. Lastly, need for interaction ($\beta = 0.307$, $p<0.001$) displayed a significant relationship with consumer resistance. If the need for interaction increases with one unit, ceteris paribus, consumer resistance increases with 0.307 units. The standardized beta coefficients can be used as comparison of the relative importance between the independent variables and the effect on consumer resistance. As can be seen in Table 5 by the regression model of the data deriving from respondents with no previous experience; need for interaction had the strongest influence on consumer resistance followed by perceived performance risk, lack of perceived convenience value and self-image incongruence in stated order of precedence. This implies that hypotheses H2b, H3a, H4 and H5 were accepted when examining the respondents without previous experience. Consequently, H1, H2a, H3b, H6, and H7 were rejected for the same group of respondents.

Table 5. Regression model no experience

	Unstandardized coefficients		Standardized coefficients					
Variable	B	St. Err.	Beta (β)	t	*p*	[95 % Conf. Int.]		VIF
CR ←								
PC	0.185	0.106	0.133	1.746	0.105	−0.025	0.395	2.032
PP	−0.047	0.060	−0.044	−0.772	0.556	−0.166	0.073	1.150
PCV	0.210	0.090	0.169	2.337	0.040*	0.032	0.387	1.845
PPR	0.263	0.078	0.259	3.363	0.001***	0.108	0.418	2.066
PFR	0.115	0.091	0.102	1.263	0.16	−0.066	0.296	2.266
SII	0.158	0.077	0.161	2.042	0.029*	0.005	0.311	2.177
NFI	0.287	0.071	0.307	4.047	0.000***	0.147	0.428	2.017
TR	−0.017	0.106	−0.011	−0.156	0.911	−0.226	0.193	1.652
IN	−0.077	0.091	−0.052	−0.845	0.319	−0.256	0.103	1.303

***, **, * significance level 0.1 %, 1 % and 5 %

Note: CR = Consumer resistance, PC = Perceived complexity, PP = Perceived price, PCV = Perceived convenience value, PPR = Perceived performance risk, PFR = Perceived financial risk, SII = Self-image incongruence, NFI = Need for interaction, TR = Technology readiness, IN = Inertia.

When analyzing the data, one interesting finding was detected that was decided to proceed with, which is presented in Table 6. In the regression model for the respondents that possess previous experience of unmanned convenience stores, no relationship was significant. This was not surprising as the respondents were relatively few. However, when analyzing all respondents together, i.e., respondents with previous experience, without previous experience and unsure about whether they had previous experience, perceived complexity ($\beta = 0.189$, $p<0.001$) was additionally significant. This implies that an increase in perceived complexity with one unit, ceteris paribus, increases consumer resistance with 0.189 units. As with the respondents with previous experience, the p-value, t-value and the confidence interval agreed for the significant variables. Perceived convenience value ($\beta = 0.151$, $p<0.05$), perceived performance risk ($\beta = 0.247$, $p<0.001$), self-image incongruence (β = 0.213, $p<0.05$), and need for interaction (β = 0.230, $p<0.001$) indicated slightly changes in the standardized beta coefficient, but the significance levels remained unchanged. Thus, an increase with one unit for some of the significant variables, ceteris paribus, represents an increase with the designated

standardized beta coefficient for consumer resistance. Therefore, when examining the regression model in Table 6 which included all respondents, need for interaction, perceived performance risk, self-image incongruence, perceived complexity, and lastly, perceived convenience value, in stated order of precedence were found to be significant.

Table 6. Regression model all respondents

	Unstandardized coefficients		Standardized coefficients					
Variable	B	St. Err.	Beta (β)	t	*p*	[95 % Conf. Int.]		VIF
CR ←								
PC	0.267	0.095	0.189	2.804	0.006***	0.079	0.455	2.080
PP	−0.016	0.048	−0.016	−0.332	0.740	−0.110	0.078	1.067
PCV	0.176	0.070	0.151	2.525	0.013*	0.038	0.313	1.658
PPR	0.240	0.068	0.247	3.547	0.001***	0.106	0.374	2.213
PFR	0.088	0.078	0.080	1.132	0.260	−0.065	0.241	2.301
SII	0.201	0.063	0.213	3.189	0.002***	0.077	0.325	2.040
NFI	0.206	0.060	0.230	3.469	0.001***	0.089	0.324	2.016
TR	−0.015	0.088	−0.010	−0.170	0.865	−0.188	0.158	1.546
IN	−0.033	0.080	−0.022	−0.412	0.681	−0.192	0.126	1.347

***, **, * significance level 0.1 %, 1 % and 5 %

Note: CR = Consumer resistance, PC = Perceived complexity, PP = Perceived price, PCV = Perceived convenience value, PPR = Perceived performance risk, PFR = Perceived financial risk, SII = Self-image incongruence, NFI = Need for interaction, TR = Technology readiness, IN = Inertia.

5.4.2 Degree of Explanation

For the respondents with no previous experience, R^2 calculated a value of 0.661, and the adjusted R^2 (the adjusted coefficient of determination) calculated a value of 0.635. As the coefficient of determination are adjusted for the number of variables in the multiple regression model, the adjusted R^2 will henceforth be discussed. The interpretation of the adjusted coefficient of determination is that perceived convenience value, perceived performance risk, self-image incongruence, and need for interaction explained 63.5 percent of the variance in consumer resistance.

Table 7. Degree of explanation

Variable	*N*	R	R^2	Adjusted R^2	Std. Error
Consumer resistance	131	0.831	0.661	0.635	0.970

Note: Predictors: Consumer resistance, Perceived complexity, Perceived price, Perceived convenience value, Perceived performance risk, Perceived financial risk, Self-image incongruence, Need for interaction, Technology readiness, and Inertia

5.5 Summary of the Tested Hypotheses

Chapter 5 has presented the statistical results of the study. Table 8 summarizes the results and visualizes the hypothesis that has been accepted or rejected. In conclusion, hypothesis H2b, H3a, H4, and H5 was accepted. Thus, the variables positively influenced consumer resistance towards unmanned convenience stores. When analyzing all respondents together, H1 indicated a significant relationship with consumer resistance, and was by extension accepted.

Table 8. Results hypotheses testing

Hypothesis		Comment
H1.	Perceived complexity positively influences consumers' resistance towards unmanned convenience stores.	Rejected*
H2a.	Perceived high prices positively influence consumers' resistance towards unmanned convenience stores.	Rejected
H2b.	Lack of perceived convenience value positively influences consumers' resistance towards unmanned convenience stores.	Accepted
H3a.	Perceived performance risk positively influences consumers' resistance toward unmanned convenience stores.	Accepted
H3b.	Perceived financial risk positively influences consumers' resistance toward unmanned convenience stores.	Rejected
H4.	Self-image incongruence positively influences consumer resistance towards unmanned convenience stores.	Accepted
H5.	Need for human interaction positively influences consumer resistance towards unmanned convenience stores.	Accepted
H6.	Low level of technological readiness positively influences consumer resistance towards unmanned convenience stores.	Rejected
H7.	Inertia positively influences consumer resistance towards unmanned convenience stores.	Rejected

*Accepted when analyzing all respondents.

5.6 Final Conceptual Framework

In Figure 2, the final conceptual framework is presented. The figure illustrates the supported variables from the regression analysis, and the strength of the relationships is demonstrated with the standardized beta coefficients. The significant relationships are visualized with a solid line, whereas the insignificant relationships are visualized with a dashed line.

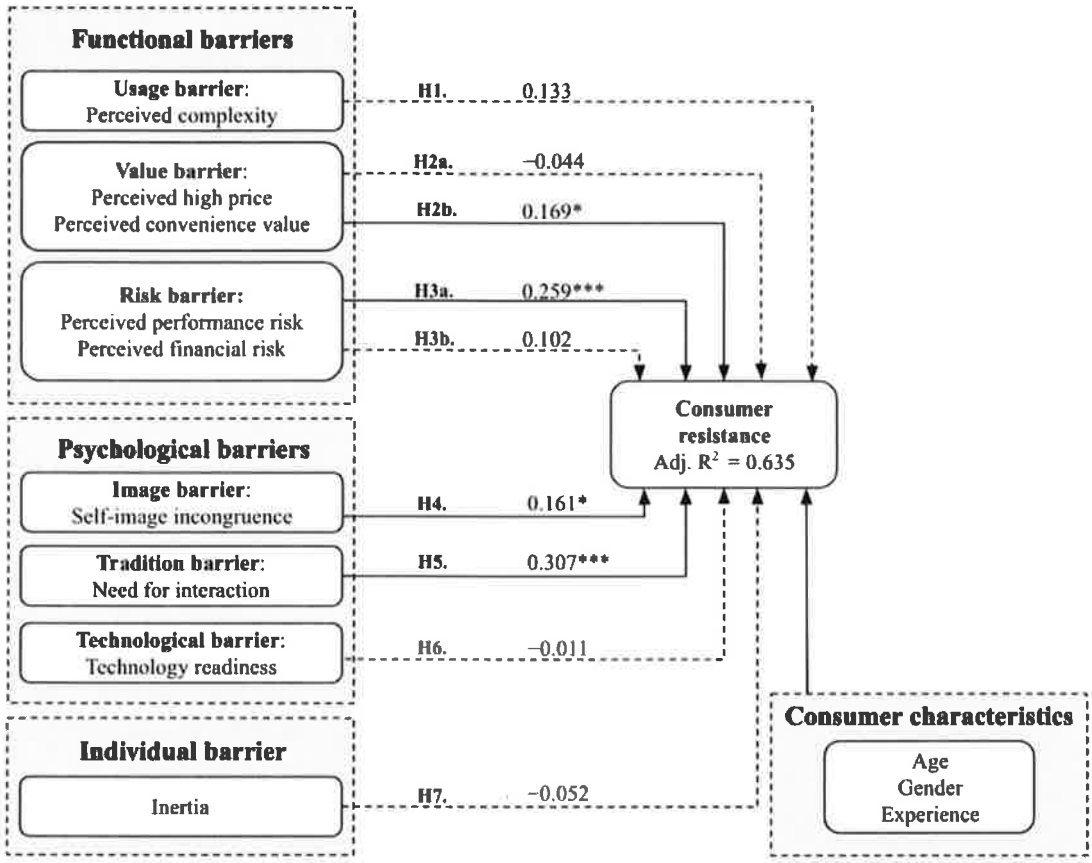

Figure 2. Final conceptual framework

***, **, * significance level 0.1 %, 1 % and 5 %.

6. Analysis and Discussion

In this chapter, the results from the data collection are analyzed. The chapter intends to answer the research question by discussing and analyzing the results presented in chapter 5. Furthermore, the results are compared with the findings from previous research. The chapter continues with a discussion regarding demographics to illustrate the representability. The chapter concludes with a discussion of the overall adjusted coefficient of determination and the strength of the model.

6.1 Demographic Statistics

It is interesting to compare the gender distribution of the respondents with the official statistics over gender distribution in Sweden, i.e., the market that this study focuses on. It can be observed in chapter 5.1 that 50.6 percent of the respondents identified themselves as men, 48.8 percent as women, and lastly, 0.6 percent as having other gender identity. This distribution is very similar to the official statistics in Sweden, which in 2021, according to SCB (2022), consisted of 50.3 percent men and 49.7 percent women. Notably, these are numbers based on official statistics over legal gender identity, i.e., not exactly what this survey has asked the respondents to answer. Instead, the survey asked which gender the respondent identified as, an approach promoted by SCB (2020, p. 18). No official statistics for the numbers of people who identify with other gender identities have been found, which makes it impossible to compare its numbers with the sample. Irrespective of this, this provides an approximation that the authors of this thesis consider as good due to its minimal differences of 0.3 respectively 0.9 percentage points.

The age distribution for the respondents in this survey seems to be quite similar to official statistics. It is thus complicated to directly translate official statistics to this particular context since the groupings are different. According to SCB (2022), approximately 43.0 percent were aged between 15-29, 16.7 percent aged between 30-39, 15.1 percent aged between 40-49, 15.4 percent aged between 50-59 and 18.3 percent older than 70 in Sweden during 2021. The authors of this thesis argue that despite the differences in how this study has grouped the categories and the official statistics, they are considered as acceptable on an overall level since this study intended to reflect the age- and gender demographics of the Swedish population at large. In this perspective, it is also interesting to note that for the total number of respondents in this study, 77.1 percent stated that they had no previous experience from visiting unmanned convenience stores. These numbers are well aligned to the findings provided by HUI Research (2021) who stated that 80 percent of the inhabitants have no previous experience from shopping in unmanned stores. As the study of HUI Research was published in 2021, it is reasonable to believe that the number of individuals who have tried unmanned convenience stores in Sweden has increased slightly, which was supported in this thesis.

6.2 Analysis of the Hypothesis

6.2.1 Hypothesis 1: Perceived Complexity

An empirical support for the variable complexity in the usage barrier could not be ascertained in this thesis for respondents with no previous experience of unmanned convenience stores. The findings from previous literature are conflicting. Several scholars

have highlighted that ease of use positively influence consumers attitudes towards, and by extension, intention to use smart retail technologies and self-service technologies (e.g., Blut et al., 2016, p. 410; Elliot et al., 2012, p. 323-324; Kim & Qu, 2014, p. 214; Lin, 2022, pp. 12-13; Oghazi et al., 2012, p. 205; Roy et al, 2018, p. 155; Weijters et al., 2007, p. 16). Curran and Meuter (2005, p. 110) find that the effect of ease of use was mandated by different settings, i.e., significant for ATMs but insignificant for banks by phone and online banking. As mentioned in chapter 3.3.1, complexity is a reversed construct of ease of use in the innovation diffusion theory. In the literature of consumer resistance, Mani and Chouk (2018, p. 799) found that complexity is a major driver of consumer resistance towards IoT in the banking sector. On the contrary, Laukkanen (2016, p. 2437) rejected the hypothesis that complexity affects consumer resistance towards Internet and mobile technologies. Laukkanen (2016, p. 2437) stated that his finding was the opposite to what the existing literature in marketing suggests, which further was argued to be influenced by the high percentage of the population in Finland that was used to handle such technologies. By such, Laukkanen (2016, p. 2437) draws parallels to the innovation diffusion model described in Chapter 3.3 and how that service was considered in a relatively early stage in the process of adoption. This parallel made by Laukkanen (2016) is aligned with how the authors of this study have interpreted the results, namely due to how the technical complexities in unmanned convenience stores can be perceived as low by the respondents.

The authors of this thesis argue that one potential reason for the insignificant result might depend upon the fact that the average resident in Sweden possesses a high level of digital competence. In the latest annual report from the European Commission', it can be observed that Sweden currently holds a third place in digitization, closely after the neighboring countries Denmark and Finland (EU-Commission, 2021, p. 3). This data from the EU-Commission is well aligned with the reasoning from Laukkanen (2016) that was mentioned in the last paragraph by how the Finnish population was used to handle Internet and mobile technologies. Human capital, i.e., digital competence, appears as one of Sweden's greatest competitive advantages (EU-Commission, 2021, p. 5). Consequently, the relatively high level of digital competence that characterizes the population in Sweden entails that the inhabitants are well familiar and comfortable with managing digital services and solutions. The items in the survey were constructed by asking about the respondents' perception regarding how easy it would be to use the technology (e.g., identification, self-scanning and payment) in an unmanned convenience store. Thus, if the respondents had high levels of digital competence, they might as well have confidence that they would be able to understand and handle the new technology in unmanned convenience stores effortlessly.

Another viable reason for the insignificant relationship can be linked to the fact that the respondents in focus of this study had not yet tried an unmanned convenience store, whereupon it might have been difficult to correctly assess its complexity. A very interesting finding is that complexity was significant when conducting a multiple regression for the entire sample. While studying the respondents that had previous experience in isolation, none of the relationships were significant. This is not surprising as the respondents with previous experience were relatively few. However, when all respondents were grouped together, the relationship between perceived complexity and consumer resistance was significant. Recall that the relationship was not significant when only studying the respondents without previous experience. This supports the argument that there might have been difficulties in assessing the complexity of unmanned

convenience stores with no previous experience. Furthermore, it is an indication, albeit weak, that the respondents with previous experience of unmanned convenience stores find it difficult to use.

6.2.2 Hypothesis 2a: Perceived High Price

There was no empirical support that perceived high prices positively influenced consumers' resistance towards unmanned convenience stores, as can be seen in Table 8. Consequently, the following interpretation admits that the level of consumer resistance does not depend upon if the respondents perceive the pricing as expensive or not at the store, which indicates some contradictions with regards to the previous existing literature on the subject. Although Mani and Chouk (2018, p. 800) states that there are no believed relationship between consumer resistance and the perceived price, several other researchers has emphasized this as an influential factor when consumers choose which store to use (Antioco & Kleijnen, 2010, p. 1714; Koschmann & Isaac, 2018, p. 377; Loy et al., 2020, p. 1). It is interesting to put this result in relation to the findings of Mani and Chouk (2018, p. 800) who argued that their insignificant result may have occurred because the consumers had no experience of IoT banking services, implying that they could have experienced trouble in correctly evaluating the prices. This reasoning might as well be applicable to these results. In that sense, the respondents, due to their absence of experience from unmanned convenience stores, might have insufficient information to fully evaluate the scope of prices associated with unmanned convenience stores. Since this hypothesis solely focused on examining if perceived high prices positively influenced consumer resistance towards unmanned convenience stores, no deeper explanations were obtained. But, when taking Mani and Chouk's (2018, p. 800) reasoning into account, the non-significance of the hypothesis can be explained due to the absence of experience from such stores, meaning that the respondents do not know what prices unmanned convenience stores offer.

A convenience store is according to Koschmann and Isaac (2018, p. 367) related to relatively higher prices than conventional grocery stores. However, it is not determined whether the consumers perceive the absence of staff as something that rather would mitigate this perception. As mentioned by Meuter et al. (2005, p. 61), self-service technologies are good examples of situations where co-creation occurs. Co-creation, i.e., active participation in the value process from the customer, could negatively affect the consumers if they perceive the process too intense and the actions are not reflected in the price image (Haumann et al., 2015, p. 28). Based on this, it is possible that the respondents do not perceive that unmanned convenience stores implies high prices per se, since economic compensation due to the active participation is expected to be noticeably reflected in the price levels. Thus, and according to the reasoning by Koschmann and Isaac (2018, p. 377), the respondents may have associated the particular store format with an acceptable price level.

6.2.3 Hypothesis 2b: Perceived Convenience Value

Lack of perceived convenience value was empirically supported to positively influence the consumers' resistance towards unmanned convenience stores. Thus, the empirical data proved that it is important for the consumers to have a perception that they will receive convenience value when using an unmanned convenience store. As the results from this study and other scholars reveal (e.g., Liljander, 2006, p. 187; Lin, 2022, p. 13), an absence of such perceptions will instead positively affect the resistance, which in this

context implies that the resistance towards unmanned convenience stores would increase. Unmanned convenience stores are expected to provide convenience value because of its characteristics, such as shorter processes and time-saving functions for the customer (Chuawatcharin & Gerdsri, 2019, p. 147; Polacco & Backes, 2018, p. 89), which may be reasons that the respondents in this thesis demonstrated that lack of perceived convenience value positively influence consumer resistance.

These results are aligned with Kim et al. (2007, p. 117) who stated that different types of sacrifices negatively affect the perceived value for the customer. Thus, when the consumer perceives that the store enables effective time management, easy access, or other types of benefiting convenience values, the consumer will perceive lower levels of resistance towards the unmanned convenience store. There are two potential reasons as to why the respondents with lack of perceived convenience value are more resistant towards unmanned convenience stores. The first reason is that they simply do not find unmanned convenience stores to be more efficient than other options and save them time while shopping. The other reason is that they perceive the concept of unmanned convenience stores as innovative, but as they lack practical experience of using unmanned convenience stores, they cannot accurately assess the potential advantages that it entails. For that reason, they cannot see the reason why they should do their grocery shopping in an unmanned convenience store. Either way, this is an interesting finding as has been showed that the respondents with higher resistance do not perceive or believe that this store format would provide convenience value. It is therefore important to assure that the consumers perceive the unmanned convenience stores to provide benefits in order to reduce the resistance.

6.2.4 Hypothesis 3a: Perceived Performance Risk

Perceived performance risk was empirically supported to positively influence consumer resistance toward unmanned convenience stores, as seen in Table 8. In a practical sense, this implies that the resistance will increase if the customer experiences the shopping in an unmanned convenience store as risky with regards to performance-related aspects. Several researchers emphasize that innovations to some extent can be represented by uncertainties and risks (Antioco & Kleijnen, 2010, p. 1704; Ram & Sheth, 1989, p. 8). Furthermore, previous research has concluded that shopping in an unmanned store might entail challenges for the consumers, such as risks and uncertainties (Park & Zhang, 2022, p. 3). Based on the previous findings in the literature, the authors of this thesis argue that one of the main concepts that relates to performance risk is about how new innovations, for instance unmanned convenience stores, might evoke a sense of risk due to the related uncertainty. By such, the uncertainty can be seen as correlating to how individuals feel unsure whether the service will meet the expectations or not. As in the case with individuals that do not have any prior experience of shopping in unmanned convenience stores, the same logic is believed to matter. Thus, when people feel uncertain of the expected performance of this new store concept that they are unfamiliar with, a sense of uncertainty is induced which consequently intensifies the resistance towards using this type of service.

Lin (2022, p. 13) states that even in those cases when a consumer appreciates the idea and benefits that an unmanned convenience store might bring, the level of perceived risk negatively influences its willingness to patronize. Similar ideas are emphasized by several scholars (Roy et al., 2017, p. 265; Wang et al., 2021, p. 10; Yoo, 2021, p. 15), hence the results from this hypothesis are aligned with previous research of how the perceived level

of risk positively affects resistance towards new services. Recent scholars have explained how performance risk is related to the probability of a product dissatisfying a customer with regards to the expected requirements (Bruner, 2014, p. 567; Kiang et al., 2011, p. 31; Lim, 2003, p. 219; Ram & Sheth, 1989, p. 8). Hence, the results from this thesis are interpreted in the way that the respondents perceive uncertainty of the mere shopping experience in an unmanned convenience store that they have never visited before. By such, the authors of this thesis argue that it can seem rational to demonstrate such feelings, whereas unmanned convenience stores must strive to minimize the level of perceived performance risk that potential customers might demonstrate as proposed by Roy et al. (2017 p. 266) in order successfully mitigating resistance derived from the perceived performance risk.

6.2.5 Hypothesis 3b: Perceived Financial Risk

The financial risk was not empirically supported to positively influence consumers' resistance towards unmanned convenience stores, as seen in Table 8. Hence, this study was not able to conclude that the financial risk, or the economic risk as Lim (2003, p. 219) refers to, contributes to an increased consumer resistance. There were reasons to believe that financial risks could increase the resistance based on previous research that have emphasized similar effects on shopping in an online context (e.g., Kiang et al., 2011, p. 32; Nawi et al., 2019, p. 8) and on how the fear of theft of credit card information (Lim, 2003, p. 222) results in increased levels of perceived financial risk. Although unmanned convenience stores are physical objects, they do normally exclude cash as payment method in favor of digital payments. This exclusion of cash is the same approach used by online retailers, where consumers might feel uncertain about how their privacy is protected. Thus, the same risks would possibly be salient in unmanned convenient stores since the payment is digital and takes place without supervision of a cashier. However, as the results in this thesis show, the perceived financial risk was not positively influencing the consumer resistance towards unmanned convenience stores.

The authors of this thesis interpret these results according to the high degree of digital competence, and thus, assumingly high degree of self-confidence by the Swedish consumers of managing digital products and services. As previously reported in section 6.1.1, the Swedish inhabitants have relatively high digital competence (EU-Commission, 2021, p. 5), which strengthens the belief from the authors of this thesis that the respondents are competent about how digital payment works, and thus, aware of the level of security that this service is embedded in. From that perspective, the reason for why this variable was insignificant might be derived from the fact that the respondents are not feeling any uncertainties of how the payment would be made and the safety precautions that the providers of payment solutions guarantee. According to the Swedish central bank (Riksbank, 2020, p. 3), the level of payments done by cash has drastically decreased during the recent years. During this period, the debit card transactions have been relatively stable on a high level whereas the smartphone-based payment-system *Swish* drastically has increased (Riksbank, 2020, p. 3). Thus, Sweden is one of the most digitized payment markets in the world (Riksbank, 2020, p. 4) and the trend towards a society being cashless is clear (The Riksbank, 2020, p. 5). Consequently, the insignificant relationship between perceived financial risk and resistance towards unmanned convenience stores might have been influenced by good faith towards the current digital payment solutions, and that the respondents believe that errors and other complications during the payment process are expected to be resolved without much effort in the absence of conventional cashiers. Thus, this is a highly interesting finding.

6.2.6 Hypothesis 4: Self-Image Incongruence

The results of this study showed that the image barrier, self-image incongruence, was supported with a positive effect on consumer resistance. Several scholars have previously emphasized the importance of considering self-image incongruence. For instance, Kleijnen et al. (2005, p. 356) demonstrated a positive relationship between self-image congruence on attitudes and intention to adopt wireless mobile services, whereas Cowart et al. (2008, p. 1119) find no direct relationship. However, the relationship was mediated by the variable satisfaction (Cowart et al., 2008, p. 1112). Mani and Chouk (2018, p. 781) find that self-image incongruence positively influences consumer resistance towards smart IoT services within the banking industry. Likewise, Antón et al. (2013, p. 375) find significance between self-image incongruence and consumer resistance towards e-book services. Thus, the results are in line with the findings of previous research in how the perceived self-image influences consumer behavior.

Recall that self-image incongruence means that the innovation image is conflicting with the consumer's personal image, e.g., lifestyle, beliefs and personality (Mani & Chouk, 2018, p. 729). According to Sirgy et al. (1997, p. 230) self-image incongruence can also occur due to a comparison between the product-users image and their self-concept (e.g., their actual, ideal or social self-image). The interpretation of the supported relationship in this thesis is that consumers who perceive their self-image to be incompatible with the image of unmanned convenience stores, have higher resistance towards such solutions. Consequently, some consumers perceive a potential gap between their self-image and the unmanned convenience stores. The self-image reflects how the consumers may conceivably act. Hence, this is an interesting finding as high levels of self-image incongruence will increase consumer resistance towards unmanned convenience stores. Therefore, practitioners should not neglect the importance of being appealing to consumers' desired lifestyles and self-image.

6.2.7 Hypothesis 5: Need for Interaction

The tradition barrier, need for interaction, indicated the strongest significant relationship with consumer resistance in the analysis. Numerous researches have presented similar results. For instance, Evanschitzky et al. (2015, p. 472) studies consumers' continuous use of self-service technology and finds the need for human interaction as an inhibitor. Marr and Prendergast (1993, p. 10) further demonstrate that need for interaction is the strongest predictor of consumer resistance towards self-service technology in retail banking. Moreover, Meuter et al. (2005, p. 77) demonstrates that the need for human interaction has a negative effect on consumers' willingness to try self-service technologies. Thus, the result of this thesis is well aligned with previous research.

According to Dabholkar and Bagozzi (2002, p. 188), the need for interaction refers to consumers finding human interaction as an important part of the service encounter. Consequently, the interpretation of the results is that consumers with higher need for interaction will be more resistant towards using unmanned convenience stores. The items were measuring respondents' attitudes towards interacting with technology rather than interacting with humans. These results are interesting as it indicates that not all consumers are solely motivated by economic needs. Meuter et al. (2005, p. 61) emphasize that many customers' find enjoyment in the service encounter itself and appreciate the interaction with service clerks. Evanschitzky et al. (2015, p. 464) argue similarly. Unmanned convenience stores are the ultimate form of a push-policy, meaning to force consumers

to use self-service technologies. White et al. (2012, p. 257) described that individuals with stronger need for interaction may encounter feelings of unfairness when forced to use self-service technologies. This is a potential reason as to why consumers with a high need for human interaction have higher resistance towards unmanned convenience stores.

6.2.8 Hypothesis 6: Technology Readiness

As can be seen in Table 8, low levels of technology readiness did not positively affect the consumer resistance towards unmanned convenience stores. Although Park and Zhang (2022, p. 6) supported the hypothesis that high levels of technology readiness influence consumers' attitudes and intention to continuously use unmanned convenience stores, no similar relationship was found in this study. One aspect that may have complicated this hypothesis is that the original model that inspired the current items consisted of 16 items in total. Since this thesis only used four items for the index, other results may have been possible to reach if all were to be included. However, this reasoning is highly speculative, and the results may as well be interpreted in relation to the high digital competence that Swedish inhabitants possess (EU-Commission, 2021, p. 5).

These findings are nevertheless very exciting. It is undoubtedly a possibility that technology readiness would have been significant years ago. Heinze et al. (2017, p. 363) emphasize the need of adjusting past models of consumer resistance to the digital age. However, the insignificant results indicate that consumers in Sweden may be well past expressing resistance because of low degrees of technology readiness. Although such variables could have been fruitful in previous years, Swedish inhabitants are characterized with high levels of digital competence. As many consumers are comfortable with fintech solutions and self-service technology, there are obviously other factors that are more prominent in explaining consumer resistance towards unmanned convenience stores. Thus, the findings in this thesis show evidence that technology readiness is no longer needed in the model to explain consumer resistance in countries with high digital competencies.

Another viable explanation of these empirics is that unmanned convenience stores are perceived as a new form of service rather than new technology. In that sense, technology readiness may not be as appropriate for examining the consumers' propensity to embrace unmanned convenience stores as would be the case if it exclusively would have been perceived as a new technology. Unmanned convenience stores are not exclusively offering the consumers new, innovative technology. They can rather be seen as a new way of utilizing existing technologies with regards to self-scanning, payment solutions and thus, how the customer experiences the shopping trip. Consequently, this contextual setting is different from how technology readiness was originally described by previous scholars (Parasuraman, 2000, p. 308; Lam et al., 2008, p. 20). While Park and Zhang (2022, p. 3) used technology readiness for examining the attitudes towards unmanned convenience stores, resistance per se was not emphasized. Thus, it is an interpretation from the authors of this thesis that technology readiness might be less accurate when studying consumer resistance towards unmanned convenience stores. Nevertheless, the findings in this study shows that low levels of technological readiness do not positively affect the consumer resistance towards unmanned convenience stores.

6.2.9 Hypothesis 7: Inertia

The hypothesis of the individual barrier, inertia, was not supported in the analysis. The existing literature that has included inertia is relatively scarce. The few studies that exist have demonstrated significant results. For instance, Mani and Chouk (2018, p. 799) find that inertia significantly affects consumer resistance towards smart services in the banking sector, and Polites and Karahanna (2012, p. 36) find that inertia negatively affects consumers' intention to use incumbent systems. Moreover, Heidenreich and Handrich (2015, p. 893) demonstrates a significant relationship with consumers' status quo satisfaction and consumer resistance. Consequently, Heidenreich and Handrich (2015, p. 894) emphasizes the importance of taking this aspect into consideration when promoting innovations since the majority of the consumers have no automatic desire to change apart from those that can be categorized as innovators and early adopters, as mentioned in chapter 3.3. As this thesis was not primarily focusing on innovators and early adopters, the findings that are conflicting with previous research are interesting, yet surprising.

One potential reason for the insignificant results could be that the innovation is not distinguished enough from the consumers current habits, e.g., consumers' usage of self-service in conventional stores. Heidenreich and Handrich (2012, p. 894) argue that it is important to carefully balance the level of innovativeness while implementing an innovation to the market. If the degree of innovativeness is low, it might not produce enough new value to the consumers, whereas a too high degree of innovativeness may impose too much disruption of existing habits which threaten the status quo. Thus, high degrees of innovativeness are more likely to provoke resistance (Heidenreich & Handrich, 2012, p. 894). As many consumers may already be familiar with self-service technologies in conventional stores in Sweden today, there is a reason to believe that the innovation of unmanned convenience stores is not imposing enough levels of innovativeness to disrupt the status quo. As the items in the survey were constructed by asking the respondents about their general level of inertia, it is possible that even respondents with high degrees of general inertia will not find unmanned convenience stores endangering the status quo significantly. This is an interesting finding as too much innovativeness probably leads to consumer resistance.

6.3 Summary of Discussion and Analysis

This chapter has systematically discussed the results that have been obtained from the empirical data and its following statistical analysis. Thus, it can be concluded that four of the hypotheses were accepted whereas the other five were rejected, as seen in Figure 2. Collectively, the barriers that were used to examine this subject yielded a total adjusted coefficient of determination of 63.5 percent (Table 7), indicating that 63.5 percent of the variance can be explained by the significant variables. As seen in Table 6, perceived convenience value, perceived performance risk, self-image incongruence, and the need for interaction was found to be significant. The authors of this thesis consider the value of the adjusted coefficient of determination as fully satisfactory since it by far exceeds the threshold value of 30 percent that SCB (n.d.) emphasize as sufficient. SCB (n.d.) further states that there are a lot of phenomena in the society that cannot correctly be explained by mathematical calculations. The authors of this thesis realize that this is important to have in mind when interpreting the results. Nevertheless, the adjusted coefficient of determination is considered as acceptable and thus, the proposed model provides deeper knowledge about how practitioners within the industry of unmanned convenience stores can mitigate consumer resistance. Notably, it is found interesting that

several parts of the analysis are relevant to discuss with regards to the digital competence that the respondents may possess. By such, the analysis that refers to perceived complexity as well as technology readiness have both been linked to the potentially high level of digital competence that the respondents in this thesis, as well as for the population in Sweden have.

7. Conclusion

This chapter begins with a section of concluding remarks in order to summarize the findings and loop back to the purpose. The chapter then continues with theoretical, practical and societal contributions. In the last part of the chapter, limitations are discussed as well as opportunities for future research.

7.1 Concluding Remarks

The purpose of this thesis was to examine the underlying factors that affect the level of consumer resistance towards unmanned convenience stores. This was done by investigating the relative importance of psychological, functional and individual barriers. By extension, the purpose was to provide a better understanding of the aspects that need to be considered when establishing an unmanned convenience store in Sweden. The purpose resulted in the following research question "What are the underlying factors that affect the level of consumer resistance towards unmanned convenience stores?" The thesis was further delimited to focus on consumers without previous experience of unmanned convenience stores in Sweden but compared to other groups in the analysis to provide a holistic view of potential resistance. The model explained 63.5 percent of the variance in consumer resistance towards unmanned convenience stores. Thus, the research question can be considered successfully answered, albeit some of the variance is still left unexplained. The underlying factors that explain most of the consumer resistance towards unmanned convenience stores is perceived convenience value, perceived performance risk, self-image incongruence and need for interaction.

The chosen variables that were tested against potential consumers' resistance towards unmanned convenience stores were anchored in theory and previous research in the field of marketing and innovation. The present research extended previous models on consumer resistance by integrating perceived convenience value in the value barrier. This was added to obtain a multidimensionality of the value barrier that cannot solely be explained in monetary terms. Furthermore, the content of the risk barrier was replaced with perceived performance risk and perceived financial risk and the content of the technological barrier was replaced with technology readiness. These changes were made to better suit the specific context. See Chapter 3.5 for an in-depth elaboration.

The empirical result showed that need for interaction was the strongest predictor of consumer resistance, followed by perceived performance risk, lack of perceived convenience value and self-image incongruence in stated order. Thus, it can be concluded that the functional barrier partly explains consumer resistance towards unmanned convenience stores in terms of perceived convenience value in the value barrier as well as perceived performance risk in the risk barrier. The psychological barrier did also partly explain consumer resistance in terms of self-image incongruence in the image barrier and need for interaction in the tradition barrier. When analyzing the data for all respondents, complexity further showed a significant relationship with consumer resistance. Hence, the usage barrier perceived complexity further assisted in explaining the consumer resistance when analyzing all respondents. A concluding remark is that if retailers focus on overcoming the barriers, they have come a long way and there is better potential for diffusion and adoption of unmanned convenience stores in the long run.

7.2 Theoretical Contribution

The research on unmanned convenience stores is still in its infancy. This thesis entails several fruitful theoretical contributions, both in the research field of unmanned convenience stores as well as by extending the literature on consumer resistance. This thesis has combined findings from previous research on consumer resistance and applied it in a new context. Scholars have highlighted that consumers may be opposed to using unmanned convenience stores as they believe that it only serves companies in terms of increasing profits while harming the communities (Denuwara et al., 2021, p. 25). Moreover, consumers may experience ambivalent feelings towards unmanned convenience stores, for instance due to fear of inaccurate identification and unclearness when doing transactions (Park & Zhang, 2022, p. 2). Despite this, no previous research has investigated consumer resistance towards unmanned convenience stores. This thesis successfully fills this gap by empirically testing what influences consumer resistance towards unmanned convenience stores.

The early research in the field has mainly focused on the advantages of unmanned convenience stores from an economic and sustainability perspective (Denuwara et al., 2021; Polacco & Backes, 2018; Yao et al., 2020). Later research has studied consumers' attitudes and usage intentions of unmanned convenience stores (Chuawatcharin & Gerdsri, 2019; Lin, 2022; Park & Zhang, 2022; Wang et al., 2021). Even though these studies consider some of the potential negative aspects of consumer attitudes, they do not study resistance explicitly. As stated by Mani and Chouk (2017, p. 3), it is only possible to reach the adoption stage after the consumers' initial resistance is overcome. Since previous research has primarily focused on consumers with previous experience of unmanned convenience stores, they fall short in explaining why consumers are resistant to such innovations to begin with. Moreover, as stated by Heidenreich and Handrich (2015, p. 894), the innovators and early adopters only constitute a small minority of the total number of consumers, whereupon most of the consumers required more attention. Furthermore, consumer attitudes towards unmanned convenience stores had not yet been studied outside the Asian market which limits the generalizability. As stated in chapter 1.3, Lin (2022, p. 14) explains that Taiwan is a newly industrialized and highly collectivistic country, and the results can therefore not directly be translated to Western countries because of cultural differences. This gap in the literature was filled by the contributions of this thesis.

To summarize the theoretical contributions of this thesis, it can first be concluded that it was the first effort to study consumer resistance towards unmanned convenience stores. Secondly, it was the first study that focuses on consumer attitudes towards unmanned convenience in general outside the Asian market. Lastly, it was the first study that has focused on consumers without previous experience of unmanned convenience stores explicitly. The study also contributes to the literature on consumer resistance. The value barrier was extended by integrating the perceived convenience value, and perceived performance risk was added as an explanatory variable of the risk barrier. Both contributions generated significant results. Some of the variables that were significant in previous research (perceived complexity, perceived high price, perceived financial risk, technology readiness and inertia) did not display significant results in this study. Thus, this is an indication that the drivers of consumer resistance are mandated by the particular setting. The findings in this thesis demonstrates that some of the variables that have previously been important in explaining consumer resistance may no longer be relevant

due to the reportedly high levels of digital competence in the Swedish population. Based on the relationships that have been accepted and rejected, a new conceptual framework was constructed (Figure 2). This framework can be used as a basis, and further developed in future research. To summarize, the findings of this thesis have a clear theoretical contribution, both in the literature of unmanned convenience stores as well as in the literature of resistance to innovations. As always, there is room for further research. This will be discussed in chapter 7.6.

7.3 Practical Contribution

Practitioners leverage from the findings in this thesis in several ways since this thesis has revealed the underlying factors that influence consumer resistance towards unmanned convenience stores. This thesis has discovered influential aspects within both the functional barrier (value- and risk barrier) as well as for the psychological barrier (image- and tradition barrier). Firstly, perceived convenience value that was found to be significant in the value barrier indicates that practitioners need to enhance the convenience value that the consumer perceives to successfully mitigate the resistance. By such, actions that strive to increase the perceived non-monetary value must be adopted. Such actions may according to the literature consist of ensuring that the consumer saves time (Chuawatcharin & Gerdsri, 2019, p. 147; Polacco & Backes, 2018, p. 89) or more generally speaking, making the consumer perceive that the expected benefits are high (Liljander et al., 2006, p. 187). Secondly, as perceived performance risk in the value barrier was found to be significant, practitioners need to ensure that the customer is not perceiving uncertainties whether the service will function satisfactorily. For instance, Featherman and Pavlou (2003, p. 469) promotes different types of guarantees that may be effective in convincing the customers. These types of activities are relatively easy to implement according to Featherman and Pavlou (2003, p. 470). Furthermore, these can be presented via simple visual statements (Featherman & Pavlou, 2003, p. 469). Consequently, retailers in the industry of unmanned convenience stores can clarify for the customer how the store will function satisfactorily, for instance by providing customer support or by offering money-back guarantee if the customer is not perceiving the service, or the goods, as satisfactorily. Featherman and Pavlou (2003, p. 469) emphasizes how risk-reducing strategies can mitigate the perceived risks, hence making the customer willing to take the associated risk since they perceive that the retailer is standing behind its offer.

Thirdly, as self-image incongruence was found significantly influence consumer resistance, practitioners can strive for highlighting how the usage of an unmanned convenience store can enhance the self-image of the individual. This activity is closely related to marketing campaigns. It can preferably focus on creating a link towards modernity, or for instance, that the customers are doing something good for the community since they help to keep the store running when they purchase goods. Lastly, since the need for interaction was found to be significant, practitioners can ensure that human interaction is available, either via other customers or service personnel during certain hours. For instance, Amazon Go has service personnel that solely focus on service-related activities rather than managing the cashiers (Denuwara et al., 2021, p. 6). As most of the unmanned convenience stores are semi-automated, it will require service personnel during certain hours to clean and stock the shelves. A potential solution to mitigate consumers' need for interaction is to have service personnel available during a limited period on a weekly basis. This could be a compromise between simultaneously

having reduced labor costs and still providing the possibility for interaction. By taking these findings into account, practitioners can increase the likelihood that potential consumers will try their offered service and in the longer perspective continue to patronize. Consequently, these practical implications can help practitioners to mitigate the resistance that new customers perceive, and thus, enabling faster acceptance.

7.4 Societal and Ethical Implications

The findings of this thesis have several important societal and ethical implications. The new knowledge provided to practitioners does by extension contribute to economic and social sustainability. As mentioned in Chapter 1.1, unmanned convenience stores come with several benefits, both to companies, as well as to the society. The new business model saves costs (Polacco & Backes, 2018, p. 89), increases social performance in terms of better employee health (Yao et al., 2020, p. 610), and increases efficiency (Denuwara et al., 2021, p. 24). However, many consumers are still resistant towards such innovations (Denuwara, 2021, p. 10), which is a drawback for the diffusion process and hence also the possibility of achieving said benefits. Businesses who fail to launch affect the economy negatively. Despite this, the new business model is predicted to be a potential remedy for the ongoing retail apocalypse caused by the rise of online retail (Denuwara et al., 2021, p. 2).

As previously mentioned in Chapter 1.1, the Swedish government has a national goal for development and prosperity, regardless of where one resides (Government Office of Sweden, 2021). To achieve this goal, all residents should be provided access to public and commercial services, where grocery stores are emphasized as the most prominent service (Swedish Agency for Economic and Regional Growth, 2021, pp. 11, 36). The residents in sparsely populated and rural areas, followed by residents in suburbs, are the most affected by closed stores as it often results in significantly longer distances to the nearest service points (Swedish Agency for Economic and Regional Growth, 2021, p. 7). However, it is often immensely difficult for grocery stores to keep open in these areas because of increased competition, high staff expenses and low traffic (Denuwara et al., 2021, p. 7). Unmanned convenience stores have arisen as a solution to this conjuncture. The findings in this thesis have contributed with new knowledge that can be used to reduce consumer resistance towards unmanned convenience stores. If practitioners focus on mitigating the barriers, the business model has better potential to succeed and thus support the national goal of prosperity. By providing better access to grocery stores, it could as well reduce emissions since many customers would have shorter distances to the nearest store.

Voices have been raised in the public debate regarding unmanned convenience stores completely eradicating job opportunities for millions of people (Denuwara et al., 2021, p. 6). Even though these concerns are valid, unmanned convenience stores primarily rearrange the staff duties and will in the long run create new job opportunities (Denuwara et al., 2021, p. 6), which benefits the development in society. As this thesis is focused on semi-automated unmanned convenience stores, which is by far the most common solution, the store will still need staff, e.g., for cleaning and stocking the shelves. The solution has the potential of providing a better balance between work and personal life for the employees as they do not need to work in shifts or late hours. In the long run, such solutions have health benefits for retail employees. This is in line with United Nations

third sustainable development goals, encompassing healthy lives and well-being for individuals in all ages (United Nations, n.d.).

In summary, this thesis has provided new knowledge about the barriers that cause consumer resistance. By emphasizing the importance of need for interaction, convenience value, performance risk and self-image incongruence, companies have the possibility to adjust and sharpen their value propositions. By overcoming these obstacles, unmanned convenience stores have the potential to be a winning concept that have large implications, both on a macro-level and micro-level, i.e., both for the individual consumer, employees and the society on a larger scale. By overcoming these barriers, unmanned convenience stores can move from being perceived as glorified vending machines to becoming the future of retail.

7.5 Limitations

Some limitations have been identified although this thesis has been designed and executed with the purpose of minimizing its occurrence. The first limitation is related to the practical methodological choices that have been made. In that sense, the sample for this study can be problematized in two perspectives, both in terms of the approach used to reach them, as well as for the composition. As the data collection was made through a nonprobability sampling, there are limitations in the ability to generalize the findings to the whole sample frame. However, precautions have been made to maximize the chances of reflecting the sample frame. For instance, the survey was distributed in different Facebook groups for people living in the three different parts of Sweden (Norrland, Svealand and Götaland) as well as in a group for people living in the countryside of Sweden. As seen in chapter 6.1, the gathered data reflects the official statistics of the Swedish population quite accurately. As no sample frame over the consumers without previous experience was available, a probability sampling was not possible. However, the distribution of individuals in the sample who had or did not have previous experience from unmanned convenience stores reflects the statistics provided by HUI Research (2021).

Another limitation of the sampling technique is that the survey has been distributed on social media since some individuals, or groups of individuals, may be less exposed to such platforms than others. This could possibly have entailed that the individuals who got access to the survey automatically had a higher degree of digital competence since they were active on such platforms. If the survey would have been distributed elsewhere, there is a possibility that the results would have been different. Consequently, the authors of this thesis believe that the limitations derived from the sampling technique have been minimized in the best way possible. Lastly, the final conceptual model has an adjusted coefficient of determination of 63.5 percent. This implies that some of the variance in resistance towards unmanned convenience stores are still left unexplained. Even though the model explains resistance on a satisfactory level, there is room for refinements.

7.6 Opportunities for Future Research

Since this subject is considered as relatively new in the scientific literature, several perspectives, dimensions, and contextual settings are yet to be examined. More closely related to the findings of this thesis, future scholars can refine the proposed model and include other barriers that may influence the consumer resistance toward unmanned

convenience stores. Further significant barriers may be identified to improve the overall power of the model. In addition, future scholars may adopt a qualitative approach in examining the barriers that affect consumer resistance. A qualitative approach can enable deeper insights and new perspectives in why Swedish consumers perceive barriers for utilizing such services. Thus, a deeper understanding of the reasons why some consumers perceive reluctance towards unmanned convenience stores can be obtained. Another potential area of future research is to conduct a longitudinal study and compare how consumer resistance changes over time. It is likely that consumer resistance is not static, which a longitudinal study could test.

Furthermore, researchers can focus on specific activities that practitioners can adapt in order to mitigate the level of resistance, and thus, making their services more desirable for a larger number of consumers. Hence, this thesis can be seen as the first step in the process of identifying solutions that successfully can mitigate consumer resistance. As the need for interaction, lack of perceived convenience value, perceived performance risk and self-image incongruence positively influences consumer resistance towards unmanned convenience stores, future research can specifically focus on ways of overcoming these barriers. This thesis can be used as a source of inspiration for future researchers and their work towards how consumer resistance effectively can be resolved. In that perspective, studies that focus on the continuous usage intentions of unmanned convenience stores would as well enrich and be a welcomed contribution to the scientific literature.

8. Reference List

Adapa, S., Fazal-e-Hasan, S.M., Makam, S.B., Azeem, M.M. & Mortimer, G. (2020). Examining the antecedents and consequences of perceived shopping value through smart retail technology. *Journal of Retailing and Consumer Services*, 52, 1-11.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.

Alexanderson, K. (2016). *Källkritik på Internet*. 2nd edition. Stockholm: Internetstiftelsen i Sverige IIS.

Amazon. (2022). https://www.amazon.com/b?ie=UTF8&node=16008589011 [Retrieved 2022-04-15].

American Marketing Association. (2022). *The Best Times to Post on Social Media in 2022*. [Web page] https://www.ama.org/marketing-news/the-best-times-to-post-on-social-media/. [Retrieved 2022-04-22]

Antioco, M., & Kleijnen, M. (2010). Consumer adoption of technological innovations: Effects of psychological and functional barriers in a lack of content versus a presence of content situation. *European Journal of Marketing*, 44(11), 1700–1724.

Antón, C., Camarero, C., & Rodríguez, J. (2013). Usefulness, Enjoyment, and Self-Image Congruence: The Adoption of e-Book Readers. *Psychology & Marketing*, 30 (4), 372–384.

Antwi, S.K., & Hamza, K. (2015). Qualitative and Quantitative Research Paradigms in Business Research: A Philosophical Reflection. *European Journal of Business and Management*, 7(3), 217-225.

Baker, S.M., Gentry, J. W., & Rittenburg, T. L. (2005). Building Understanding of the Domain of Consumer Vulnerability. *Journal of Macromarketing*, 25(2), 128–139.

Björneskog, L. & Persson, A. (2020) *Stödmaterial för att inkludera transpersoner i enkäter och undersökningar*. SCB. https://www.scb.se/globalassets/stodmaterial-for-att-inkludera-transpersoner-i-enkater-och-undersokningar.pdf [Retrieved April 15, 2022].

Blut, M., Wang, C. & Schoefer, K. (2016). Factors influencing the acceptance of self-service technologies: A Meta-analysis. *Journal of Service Research*, 19(4), 396-416.

Blut, M. & Wang, C. (2019). Technology readiness: A meta-analysis of conceptualizations of the construct and its impact on technology usage. *Journal of the Academy of Marketing Science*, 48(4), 649–669.

Bitner, M.J., Ostrom, A. L., & Meuter, M. L. (2002). Implementing Successful Self-Service Technologies [And Executive Commentary]. *The Academy of Management Executive*, 16(4), 96–109.

Boeren, E. (2015). Surveys as Tools to Measure Qualitative and Quantitative Data. In: V. Wang., & J. Mull. (2015). *Handbook of Research on Scholarly Publishing and Research Methods*. Hershey: Information Science Reference. pp. 415-434.

Bruner, G.C. (2014). *Marketing Scales Handbook: A Compilation of Multi-Item Measures for Consumer Behavior and Advertising Research*. 6th edition. Forth Worth: GCBII Productions.

Bryman, A., & Bell, E. (2011). *Business research methods*. 3rd edition. Oxford: Oxford University Press.

Bryman, A., Carle, J., & Nilsson, B. (1997). *Kvantitet och kvalitet i samhällsvetenskaplig forskning*. 1st edition. Lund: Studentlitteratur.

Bryman, A., & Nilsson, B. 2018. *Samhällsvetenskapliga metoder*. 3rd edition. Stockholm: Liber.

Claudy, M.C., Garcia, R., & O'Driscoll, A. (2014). Consumer resistance to innovation - A behavioral reasoning perspective. *Journal of the Academy of Marketing Science*, 43(4), 528–544.

Chuawatcharin, R., & Gerdsri, N. (2019). Factors influencing the attitudes and behavioural intentions to use just walk out technology among Bangkok consumers. *International Journal of Public Sector Performance Management*, 5(2), 147-162.

Convenience Stores. (2021) *Convenience Stores Report 2021. Convenience Stores Sweden AB.* https://mb.cision.com/Public/1256/3468575/af123f88d831c401.pdf [Retrieved April 4, 2022].

Childers, T.L., Carr, C., L., Peck, J., & Carson, S. (2001). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing,* 77(4), 511-535.

Collis, J., & Hussey, R. (2014). *Business research: A practical guide for undergraduate & postgraduate students*. 4th edition. Basingstoke: Palgrave Macmillan. E-book.

Corbin, J.M., & Strauss, A.L. (2008). *Basics of qualitative research: techniques and procedures for developing grounded theory*. 3rd edition. Los Angeles: SAGE Publication.

Cowart, K.O., Fox, G. L., & Wilson, A. E. (2008). A structural look at consumer innovativeness and self-congruence in new product purchases. *Psychology & Marketing*, 25 (12), 1111–1130.

Cumming, G. (2012). *Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis*. 1st edition. New York: Routledge.

Curran, J.M., & Meuter, M.L. (2005). Self-service technology adoption: Comparing three technologies. *Journal of Services Marketing*, 19(2), 103-113.

Dabholkar, P.A., & Bagozzi, R.P. (2002). An attitudinal model of technology-based self-service: Moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science*, 30(3), 184–201.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of use and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319–340.
Dawson, J. (2017). *Analysing quantitative survey data: for business and management students*. 1st edition. London: SAGE Publications.

Denuwara, N., Maijala, J., & Hakovirta, M. (2021). The impact of unmanned stores' business models on sustainability. *SN Business & Economics*, 1(10), 1-27.

Djurfeldt, G., Larsson, R., & Stjärnhagen, O. (2018). *Statistisk verktygslåda: Samhällsvetenskaplig orsaksanalys med kvantitativa metoder*. 3rd edition. Lund: Studentlitteratur AB.

Eliasson, A. (2018). *Kvantitativ metod från början*. 4th edition. Lund: Studentlitteratur.

Elliott, K., Meng, G., & Hall, M. (2012). The Influence of Technology Readiness on the Evaluation of Self-Service Technology Attributes and Resulting Attitude Toward Technology Usage. *Services Marketing Quarterly*, 33(4), 311–329.

ESOMAR/GRBN. (2015). *Global Guideline Online Research*. [Report]. The Netherlands: ESOMAR. https://ana.esomar.org/documents/esomar-grbn-global-guideline-on-online-research- [Retrieved April 15, 2022]

EU-Commission. (2021). *Index för digital ekonomi och digitalt samhälle*. EU-Comission. https://digital-strategy.ec.europa.eu/en/policies/desi-sweden [Retreived March 29, 2022].

Evanschitzky, H., Iyer, G.R., Pillai, K.G., Kenning, P., & Schütte, R. (2015). Consumer Trial, Continuous Use, and Economic Benefits of a Retail Service Innovation: The Case of the Personal Shopping Assistant. *The Journal of Product Innovation Management*, 32(3), 459–475.

Featherman, M.S., & Pavlou, P.A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International journal of human-computer studies*, 59(4), 451–474.

Fink, A. (2013). *How to conduct surveys: A step-by-step guide*. 5th edition. Thousand Oaks: SAGE Publications.

Fleetwood, S. (2005). Ontology in Organization and Management Studies: A Critical Realist Perspective. *Organization (London, England)*, 12(2), 197–222.

Fowler, F.J., Jr. (2009). *Survey research methods*. 4th edition. Thousand Oaks: Sage Publications, Inc.

Gatignon, H., & Robertson, T.S. (1989). Technology diffusion: An empirical test of competitive effects. *Journal of Marketing*, 53(1), 35-49.

Grewal, D., Gotlieb, J., & Marmorstein, H. (1994). The Moderating Effects of Message Framing and Source Credibility on the Price-Perceived Risk Relationship. *The Journal of consumer research*, 21(1), 145–153.

Gujarati, D.M., & Porter, D.C. (2009). *Basic econometrics*. 5th edition. Boston: McGrawHill.

Hagevi, M., & Viscovi, D. (2016). *Enkäter: Att formulera frågor och svar*. 1st edition. Lund: Studentlitteratur AB.

Hair, J.F., Black, B., Babin, B, Anderson, R.E., & Tatham, R.L. (2006). *Multivariate data analysis*. 6th edition. New Jersey: Pearson Prentice Hall.

Haumann, T., Gunturkun, P., Schons, L.M., & Wieseke, J. (2015). Engaging Customers in Coproduction Processes: How Value-Enhancing and Intensity-Reducing Communication Strategies Mitigate the Negative Effects of Coproduction Intensity. *Journal of Marketing*, 79(6), 17-33.

Heidenreich, S., & Handrich, M. (2015). What about Passive Innovation Resistance? Investigating Adoption-Related Behavior from a Resistance Perspective. *The Journal of product innovation management*. 32(6), 878–903.

Heinze, J., Thomann, M., & Fischer, P. (2017). Ladders to m-commerce resistance: A qualitative means-end approach. *Computers in Human Behavior*, 73, 362–374.

Heinö, A.J. (2009). Democracy between collectivism and individualism. De-nationalisation and individualisation in Swedish national identity. *International Review of Sociology*, 19(2), 297–314.

Helm, S., Kim, S. H., & Van Riper, S. (2020). Navigating the "retail apocalypse": A framework of consumer evaluations of the new retail landscape. *Journal of Retailing and Consumer Services*, 54, 1-9.

Horton, R.L. (1976). The structure of perceived risk: Some further progress. *Journal of the Academy of Marketing Science*, 4(4), 694–706.

HUI Research. (2021, 17 August). Är obemannade butiker räddningen för den fysiska handeln? *HUI Research*. https://hui.se/obemannade-butiker/ [Retrieved March 29, 2022].

Isaac, M.S., & Schindler, R. M. (2014). The Top-Ten Effect: Consumers' Subjective Categorization of Ranked Lists. *The Journal of Consumer Research*, 40(6), 1181–1202.

Ives, B., Cossick, K., & Adams, D. (2019). Amazon Go: Disrupting retail? *Journal of information technology teaching cases*, 9(1), 2–12.

Kaushik, M.K., & Agrawal, D. (2021). Influence of technology readiness in adoption of e-learning. *International journal of educational management*, 35(2), 483–495.

Kleijnen, M.H.P., de Ruyter, J.C., & Aneassen, T.W. (2005). Image Congruence and the Adoption of Service Innovations. *Journal of Service Research*, 7(4), 343–360.

Kleijnen, M., de Ruyter, K., & Wetzels, M. (2007). An assessment of value creation in mobile service delivery and the moderating role of time consciousness. *Journal of Retailing*, 83(1), 33–46.

Kiang, M.Y., Ye, Q., Hao, Y., Chen, M., & Li, Y. (2011). A service-oriented analysis of online product classification methods. *Decision Support Systems*, 52(1), 28–39.

Kim, H-W., Chan, H.C., & Gupta, S. (2007). Value-based Adoption of Mobile Internet: An empirical investigation. *Decision support systems*, 43(1), 111-126.

Kim, M., & Qu, H. (2014). Travelers' behavioral intention toward hotel self-service kiosks usage. *International Journal of Contemporary Hospitality Management*, 26(2), 225-245.

Koschmann, A., & Isaac, M.S. (2018). Retailer Categorization: How Store-Format Price Image Influences Expected Prices and Consumer Choices. *Journal of Retailing*, 94(4), 364–379.

Kuhn, T.S. (1970). *The structure of scientific revolutions*. 2nd edition. Chicago: University of Chicago Press.

Kuisma, T., Laukkanen, T., & Hiltunen, M. (2007). Mapping the reasons for resistance to Internet banking: A means-end approach. *International Journal of Information Management*, 27(2), 75–85.

Körner, S., & Wahlgren, L. (2015). *Statistiska metoder*. 3rd edition. Lund: Studentlitteratur AB.

Lam, S.Y., Chiang, J., & Parasuraman, A. (2008). The effects of the dimensions of technology readiness on technology acceptance: An empirical analysis. *Journal of interactive marketing*, 22(4), 19–39.

Lantz, B. (2014). *Den statistiska undersökningen: grundläggande metodik och typiska problem*. 2nd edition. Lund: Studentlitteratur AB.

Laukkanen, T. (2016). Consumer adoption versus rejection decisions in seemingly similar service innovations: The case of the Internet and mobile banking. *Journal of Business Research*, 69(7), 2432–2439.

Laukkanen, T., & Kiviniemi, V., & Karjaluoto, H. (2010). The role of information in mobile banking resistance. *International Journal of Bank Marketing*, 28(5), 372–388.

Le, N.T., Rao Hill, S., & Troshani, I. (2022). Perceived Control and Perceived Risk in Self-service Technology Recovery. *The Journal of Computer Information Systems*, 62(1), 164–173.

Liljander, V., Gillberg, F., Gummerus, J., & van Riel, A. (2006). Technology readiness and the evaluation and adoption of self-service technologies. *Journal of Retailing and Consumer Services*, 13(3), 177–191.

Lim, N. (2003). Consumers' perceived risk: sources versus consequences. *Electronic commerce research and applications*, 2(3), 216–228.

Lin, C-Y. (2022). Understanding consumer perceptions and attitudes toward smart retail services. *The Journal of Services Marketing*, 1-16.

Lin, J-S.C., & Chang, H-C. (2011). The role of technology readiness in self-service technology acceptance. *Managing service quality*, 21(4), 424–444.

Lisper, H.O., & Lisper, S. (2005). *Statistik för samhällsvetare.* 1st edition. Malmö: Liber.

Lo, C.-H. and Wang, Y.-W. (2019). Constructing an evaluation model for user experience in an unmanned store. *Sustainability (Basel, Switzerland)*, 11(18), 1-29.

Loy, J-P., Ceynowa, C., & Kuhn, L. (2020). Price recall: Brand and store type differences. *Journal of Retailing and Consumer Services*, 53, 1-13.

Lusch, R.F., & Vargo, S. L. (2006). Service-dominant logic: reactions, reflections and refinements. *Marketing Theory*, 6(3), 281-288.

Løvås, G.G. (2006). *Statistik - metoder och tillämpningar.* 1stedition. Malmö: Liber.

Mani, Z., & Chouk, I. (2017). Drivers of consumers' resistance to smart products. *Journal of Marketing Management*, 33(1-2), 76–97.

Mani, Z., & Chouk, I. (2018). Consumer Resistance to Innovation in Services: Challenges and Barriers in the Internet of Things Era. *The Journal of product innovation management*, 35(5), 780–807.

Mani, Z., & Chouk, I. (2019). Impact of privacy concerns on resistance to smart services: Does the "Big Brother effect" matter? *Journal of Marketing Management*, 35, 1460-1479.

Mantere, S., & Ketokivi, M. (2013). Reasoning in organization science. *Academy of Management Review*, 38(1), 70–89.

Marr, N.E., & Prendergast, G. P. (1993). Consumer Adoption of Self-service Technologies in Retail Banking: Is Expert Opinion Supported by Consumer Research? *International Journal of Bank Marketing*, 11(1), 3–10.

Marsh, D. & Furlong, P. (2002). "A skin, not a sweater": Ontology and epistemology in political science, in Marsh, D & Stoker, G, ed. *Theory and methods in political science.* 2nd edition. Basingtoke: Palgrave Macmillan, pp. 17-41.

McBride, R. & Wuebker, R. (2020). Social objectivity and entrepreneurial opportunities. Implications for entrepreneurship and management. *Academy of Management Review*, 1-39.

Meuter, M., Bitner, M., Ostrom, A., & Brown, S. (2005). Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *Journal of Marketing,* 69(2), 61-83.

Moore, D. & Notz, W. (2006). *Statistics: Concepts and controversies*. 6th edition. New York: W.H. Freeman and Company.

Moore, G.C., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, 2(3), 192- 222.

Nawi, N.C., Mamun, A.A., Hamsani, N.H.B., & Bin Muhayiddin, M.N. (2019). Effect of Consumer Demographics and Risk Factors on Online Purchase Behaviour in Malaysia. *Societies (Basel, Switzerland)*, 9(1), 1-11.

Ng, I.C.L., & Wakenshaw, S.Y.L. (2017). The Internet-of-Things: Review and research directions. *International Journal of Research in Marketing*, 34(1), 3–21.

Nyquist, H. (2017). *Statistikens grunder: Vetenskap, empiriska undersökningar och statistisk analys*. 1st edition. Lund: Studentlitteratur AB.

O'Cass, A., & Grace, D. (2008). Understanding the role of retail store service in light of self-image-store image congruence. *Psychology & Marketing*, 25(6), 521–537.

Oghazi, P., Mostaghel, R., Hultman, M., & Parida, V. (2012). Antecedents of Technology-Based Self-Service Acceptance: A Proposed Model. *Services Marketing Quarterly*, 33(3), 195-210.

Parasuraman, A. (2000). Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies. *Journal of service research*, 2(4), 307–320.

Parasuraman, A., & Colby, C.L. (2015). An Updated and Streamlined Technology Readiness Index: TRI 2.0. *Journal of service research*, 18(1), 59–74.

Park, H.J., & Zhang, Y. (2022). Technology readiness and technology paradox of unmanned convenience store users. *Journal of retailing and consumer services*, 65, 1-9.

Persson, A. (2016). *Frågor och svar om frågekonstruktion i enkät- och intervjuundersökningar*. SCB. https://www.scb.se/contentassets/c6dd18d66ab240e89d674ce728e4145f/ov9999_2016a01_br_x08br1601.pdf [Retrieved April 22, 2022]

Polacco, A., & Backes, K. (2018). The amazon go concept: implications, applications, and sustainability. *Journal of Business and Management*, 24(1), 79-92.

Polites, G.L., & Karahanna, E. (2012). Shackled to the Status Quo: The Inhibiting Effects of Incumbent System Habit, Switching Costs, and Inertia on New System Acceptance. *MIS quarterly*, 36(1), 21–42.

Preston, C.C., & Colman, A. M. (2000). Optimal number of response categories in rating scales: reliability, validity, discriminating power, and respondent preferences. *Acta Psychologica*, 104(1), 1–15.

Ram, S., & Sheth, J.N. (1989). Consumer resistance to innovations: The marketing problem and its solutions. *The journal of consumer marketing*, 6(2), 5-14.

Regeringskansliet. (2021, 3 september). Hela landet ska leva – bondepaket och stora satsningar på landsbygden i regeringens budgetproposition. [Press release]. https://www.regeringen.se/pressmeddelanden/2021/09/hela-landet-ska-leva--bondepaket-och-stora-satsningar-pa-landsbygden-i-regeringens-budgetproposition/ [Retrieved March 29, 2022].

Riksbank. (2020). *Payments in Sweden 2020.* [Report]. https://www.riksbank.se/en-gb/payments--cash/payments-in-sweden/payments-in-sweden-2020/ [Retrieved May 19, 2022].

Robson, C. (2002). *Real world research: A resource for social scientists and practitioner-researchers*. 2nd edition. Oxford: Blackwell.

Rogers, E. M. (1983). *Diffusion of innovations.* 3rd edition. New York: The Free Press.

Roy, S.K., Balaji, M.S., Sadeque, S., Nguyen, B., & Melewar, T.C. (2017). Constituents and consequences of smart customer experience in retailing. *Technological forecasting and social change*, 124, 257–270.

Roy, S.K., Balaji, M.S., Quazi, A., & Quaddus, M. (2018). Predictors of customer acceptance of and resistance to smart technologies in the retail sector. *Journal of Retailing and Consumer Services*, 42, 147-160.

Ryan, G. (2018). Introduction to positivism, interpretivism and critical theory. *Nurse researcher*. 25(4), 14–20.

Saunders, M., Lewis, P. and Thornhill, A. (2007). *Research methods for business students.* 4th edition. Harlow: Financial Times/Prentice Hall.

Saunders, M., Lewis, P. and Thornhill, A. (2019). *Research methods for business students Eighth edition.* Harlow: Pearson Education.

Schneider, D. and Harknett, K. (2022). What's to Like? Facebook as a Tool for Survey Data Collection. *Sociological methods & research*, 51(1), 108–140.

Shah, S.K. and Corley, K.G. (2006). Building Better Theory by Bridging the Quantitative-Qualitative Divide. *Journal of management studies*, 43(8), 1821–1835.

Sirgy, M.J., Grewal, D., Mangleburg, T. F., Park, J., Chon, K.-S., Claiborne, C. B., Johar, J. S., & Berkman, H. (1997). Assessing the predictive validity of two methods of measuring self-image congruence. *Journal of the Academy of Marketing Science*, 25(3), 229–241.

Statistics Sweden (n.d.). *Analysmetoder.* https://www.scb.se/dokumentation/statistikguiden/trender-och-analyser/analysmetoder/ [Retrieved 2022-05-19].

Statistics Sweden (2022, April). *Sveriges befolkningspyramid.* https://www.scb.se/hitta-statistik/sverige-i-siffror/manniskorna-i-sverige/sveriges-befolkningspyramid/ [Retrieved 2022-05-19].

Stern, M.J., Bilgen, I. and Dillman, D.A. (2014). The State of Survey Methodology: Challenges, Dilemmas, and New Frontiers in the Era of the Tailored Design. *Field methods*, 26(3), 284–301.

Stock, J.H., & Watson, M.W. (2015). *Introduction to econometrics*. 3rd edition. Harlow: Pearson Education.

Studenmund, A.H. (2014). *Using econometrics: a practical guide*. 6th edition. Harlow: Pearson Education.

Suddaby, R. (2006). From the editors: What grounded theory is not. *Academy of Management journal*, 49(4), 633–642.

Sweeney, J.C., & Soutar, G.N. (2001). Consumer perceived value: the development of a multiple item scale. *Journal of Retailing*, 77(2), 203-220.

Szmigin, I., & Foxall, G. 1998. Three forms of innovation resistance: the case of retail payment methods. *Technovation*, 18(6), 459–468.

The Swedish Agency for Economic and Regional Growth (2021). *Tillgänglighet till kommersiell och offentlig service 2021.* Rapport 0369. Stockholm: The Swedish Agency for Economic and Regional Growth. https://tillvaxtverket.se/download/18.70a5c609179ef9e2050381/1623226054462/Tillg%C3%A4nglighet%20till%20kommersiell%20och%20offentlig%20service%202021%20klar.pdf [Retrieved March 29, 2022].

Thurén, T. (2019). *Vetenskapsteori för nybörjare*. 3rd edition. Stockholm: Liber.

Thurén, T., & Werner, J. (2019). *Källkritik*. 4th edition. Stockholm: Liber.

Thrane, C. (2019). *Kvantitativ metod: En praktisk introduktion.* 1st edition. Lund: Studentlitteratur AB.

Troye, S.V., & Supphellen, M. (2012). Consumer Participation in Coproduction: "I Made It Myself" Effects on Consumers' Sensory Perceptions and Evaluations of Outcome and Input Product. *Journal of Marketing*, 76(2), 33–46.

Turyahikayo, E. (2021). Philosophical paradigms as the bases for knowledge management research and practice. *Knowledge Management & E-Learning*, 13(2), 209–224.

United Nations. (n.d.). Ensure healthy lives and promote well-being for all at all ages. [Webpage]. *United Nations*. https://sdgs.un.org/goals/goal3 [Retrieved 2022-05-20].

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39(2), 273–315.

Venkatesh, V., Morris, M. G., Davis, G.B., & Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425–478.

Venkatesh, V., Thong, J.Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178.

Wakita, T., Ueshima, N., & Noguchi, H. (2012). Psychological Distance Between Categories in the Likert Scale: Comparing Different Numbers of Options. *Educational and Psychological Measurement*, 72(4), 533–546.

Walker, R.H., & Johnson, L.W. (2006). Why consumers use and do not use technology-enabled services. *The Journal of Services Marketing*, 20(2), 125–135.

Wang, I.-C., Liao, C.-W., Lin, K.-P., Wang, C.-H. and Tsai, C.-L. (2021). Evaluate the Consumer Acceptance of AIoT-Based Unmanned Convenience Stores Based on Perceived Risks and Technological Acceptance Models. *Mathematical problems in engineering*, 2021, 1–12.

Weijters, B., Rangarajan, D., Falk, T., & Schillewaert, N. (2007). Determinants and Outcomes of Customers' Use of Self-Service Technology in a Retail Setting. *Journal of Service Research,* 10(1), 3-21.

White, A., Breazeale, M., & Collier, J.E. (2012). The Effects of Perceived Fairness on Customer Responses to Retailer SST Push Policies. *Journal of Retailing,* 88(2), 250- 261.

Yao, L., Shuai, Y., Chen, X., & Xiao, A. (2020). A two-stage EBM-based approach to evaluate operational performance of unattended convenience store. *International Journal of Retail & Distribution Management*, 48(6), 609–627.

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: epistemological, theoretical, and methodological differences. *European Journal of Education*, 48(2), 311-325.

Yoo, J. (2021). The mediating role of resistance to innovative technology between the characteristics of innovative technology and sustainable use of innovative payment service. *Sustainability (Basel, Switzerland)*, 13(19), 1-17.

Zeithaml, V.A. (1988). Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, 52(3), 2–22.

Appendix

Appendix 1. Example of used keywords in literature search

Keywords	Number of peer-reviewed articles
Consumer adoption	248 436
Consumer resistance	263 185
Digitalization	53 633
Innovation acceptance	252 608
Innovation barrier	412 538
Innovation resistance	384 952
Retail	403 712
Unattended convenience store	714
Unmanned store	8 065
Unmanned convenience store	736
Unmanned food store	1 422
Smart store	114 096
Technology acceptance	899 987
TAM	466 858
UTAUT	6 645
UTAUT2	1 375

Appendix 2. Introductory letter to survey

Dear respondent,

Thank you for participating in this survey! By answering the questionnaire, you are contributing to the creation of new knowledge for a store concept that can enable more people to get better access to convenience stores throughout the country. We are two master's students from Umeå School of Business, Economics and Statistics, and this survey is a part of our master thesis in Business Administration. The thesis is intended to examine unmanned convenience stores, where the purpose is to create a better understanding of the barriers that induce consumer resistance to use such services.

Participation

Participation is voluntary and you are free to end your participation at any time. It is also possible to leave individual questions unanswered. The survey takes approximately 5 minutes to finish. Some questions may be perceived as similar. This is intentional and we ask you to answer all questions as accurately as you can. Please note that you should be at least 18 years old to answer the survey as this study follows research ethics principles.

Anonymity

As no personal data is collected, we will not be able to identify who has responded to this survey. You are therefore completely anonymous. The collected information will only be used for the purpose of our thesis where the results from the survey will be synthesized and presented in tables. The thesis will be published on DiVA, the Digital Scientific Archive (www.umu.diva-portal.org).

What is an unmanned convenience store?

Unmanned convenience stores are a store concept which means that the customer's visit to the store normally does not include any interaction with any employees. In these cases, the customer itself is responsible and handles the payment without the presence of staff. Identification and payment take place with the help of digital tools, such as smartphones and self-checkout stations. This concept differs from conventional stores that offer self-scanning as there are staff present in these stores. Most of the unmanned convenience stores that have been established until today are accessible 24 hours a day.

Raffle of gift cards

As a thank you for answering this survey, you can take part in the raffle of three gift cards at the leading gift card portal in the Nordics, GoGift. Each gift card is loaded with 150 SEK which you can redeem yourself at thousands of brands. To participate in this raffle, you need to enter your e-mail address after completing the survey via a separate form which will ensure that your answers will not be linked to the main survey. This means that both you, and your answers, will remain fully anonymous.

More information about the survey is provided by Mirjam Lundin (milu0051@student.umu.se) and Victor Paridon (vipa0025@student.umu.se)

We truly appreciate your participation. Thanks in advance!

Appendix 3. Survey

Introductory question

○ I have read the information stated above, and I accept participation in the survey.

Demographic questions:

Have you ever visited an unmanned store?
o Yes
o No
o Don't know

Specify your age:
Note: The survey is aimed at those who are 18 years or older. If you are younger than 18 years, please do not answer the survey.
o 18-27
o 28-37
o 38-47
o 48-57
o 58-67
o 68+

Are you a male, female or do you have another gender identity?
By other gender identity we mean people who do not feel like a man or a woman.
o Male
o Female
o Another gender identity
o Do not want to specify

We ask you to take a position on the following statements:

---

1. Shopping in an unmanned convenience store would take less time than in a staffed convenience store.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

2. Self-service would make my shopping in a convenience store more effective.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

3. Overall, self-service would be beneficial for me when I shop at a convenience store.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

---

4. I think I would have to pay lower prices due to the convenience store being unmanned.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

5. I think I would have to pay higher prices if the convenience store was staffed.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

6. I think that serving myself in an unmanned convenience store would result in lower prices than if staff would have served me.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

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7. I am not sure if the technology in an unmanned convenience store would work satisfactorily (e.g., identification, self-scanning, and payment).
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

8. There is a great risk that something could go wrong if I were to shop in an unmanned convenience store.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

9. I think it would be riskier to shop in an unmanned convenience store since there are no staff on site.
   Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

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10. I am worried that it might be difficult to correct checkout errors when I shop in an unmanned convenience store.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

11. I would be afraid of accidentally paying the wrong price when shopping in an unmanned convenience store.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

12. There is an increased risk that my bank details will be spread to unauthorized persons if I were to shop in an unmanned convenience store.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

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13. I see myself as the typical customer who would shop in an unmanned convenience store.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

14. I fit into the typical image of a customer to an unmanned convenience store.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

15. The image of the typical customer of an unmanned convenience store reflects me as a person.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

---

16. I would prefer to talk to staff instead of using a self-service station or my smartphone.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

17. My visit to a convenience store would not be as pleasant if I had to use a self-service station or my smartphone instead of getting service from an employee.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

18. When I pay for my goods, I would prefer to interact with staff rather than using a self-service station or my smartphone.
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

---

19. It would be easy for me to learn how the technology works in an unmanned convenience store (e.g., identification, self-scanning, and payment).
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

20. It would be easy for me to become skillful at using the technology in an unmanned convenience store (e.g., identification, self-scanning, and payment).
    Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

21. Overall, I would think it would be easy to shop in an unmanned convenience store.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

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22. Unmanned convenience stores are not interesting to me.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

23. I would probably be against the use of unmanned convenience stores.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

24. Shopping in unmanned convenience stores could cause problems that I do not need.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

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25. New technology contributes to a better quality of life.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

26. Other people come to me for advice on new technology.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

27. Sometimes I think that technological systems are not designed to be used by the common person.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

28. People are too dependent that technology will accomplish things for them.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

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29. Generally, I see changes as something negative.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

30. I would rather use proven methods than test new ones.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

31. I usually avoid change.
Strongly disagree [1] [2] [3] [4] [5] [6] [7] Strongly agree

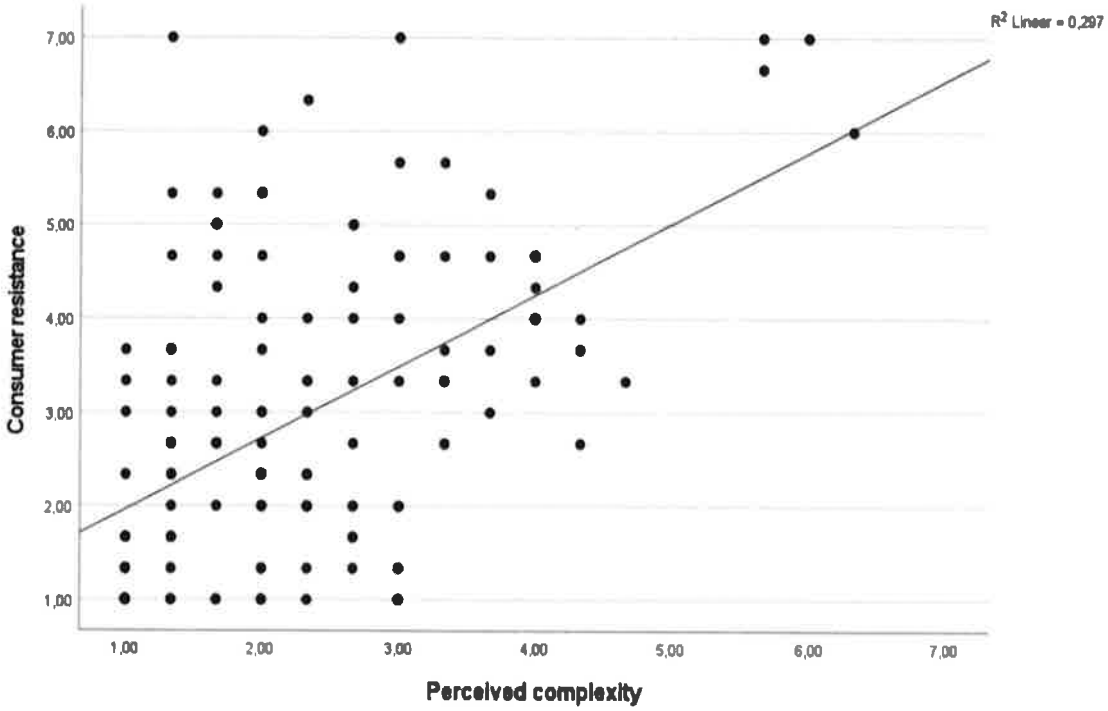
Appendix 4. Survey design

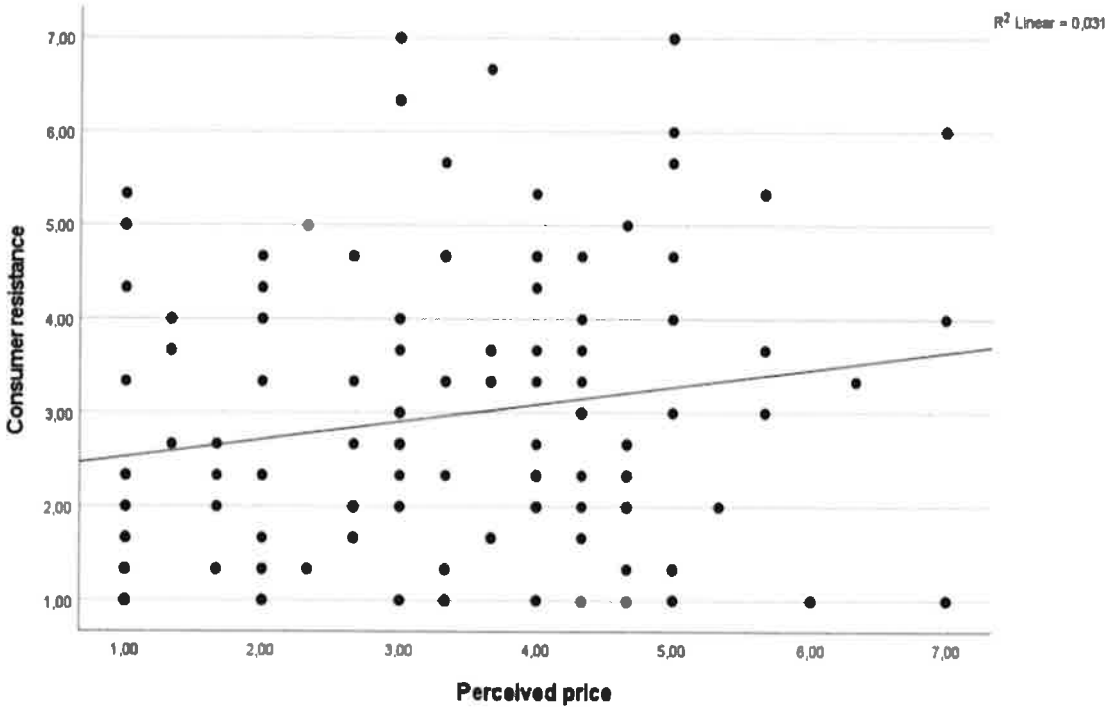
Construct	Code and item	Scale sources
Demographics	Age: Specify your age	Persson, 2016, p. 136
	Gender: Are you a male, female or do you have another gender identity?	Persson, 2016, p. 136; Björneskog & Persson, 2020, p. 18–19
Perceived convenience value	PCV1: Shopping in an unmanned convenience store would take less time than in a staffed convenience store.	Adapa et al., 2020, p. 6; Alalwan, 2020, p. 41; Lin, 2022, p. 10; Moore & Benbasat, 1991, p. 216; Venkatesh et al., 2012, p. 178; Weijter et al., 2007, p. 18
	PCV2: Self-service would make my shopping in a convenience store more effective.	Childers et al., 2001, p. 531; Lin, 2022, p. 10; Weijter et al., 2007, p. 18
	PCV3: Overall, self-service would be beneficial for me when I shop at a convenience store.	Adapa et al., 2020, p. 6; Moore & Benbasat, 1991, p. 216
Perceived price	PP1: I think I would have to pay lower prices due to the convenience store being unmanned.	Self-developed
	PP2: I think I would have had to pay higher prices if the convenience store was staffed.	Self-developed
	PP3: I think that serving myself in an unmanned convenience store would result in lower prices than if staff would have served me.	Self-developed
Perceived performance risk	PPR1: I am not sure if the technology in an unmanned convenience store would work satisfactorily (e.g., identification, self-scanning, and payment).	Bruner, 2014, p. 567; Featherman & Pavlou, 2003, p. 471; Grewal et al., 1994, p. 152; Kim & Qu, 2014, p. 245; Meuter et al., 2005, p. 81; Roy et al., 2017, p. 268
	PPR2: There is a great risk that something could go wrong if I were to shop in an unmanned convenience store.	Curran and Meuter, 2005, p. 107; Featherman & Pavlou, 2003, p. 471; Kim & Qu, 2014, p. 245; Park & Zhang, 2022, p. 5; Roy et al., 2017, p. 268
	PPR3: I think it would be riskier to shop in an unmanned convenience store since there are no staff on site.	Lin, 2022, p. 10
Perceived financial risk	PFR1: I am worried that it might be difficult to correct checkout errors when I shop in an unmanned convenience store.	Le et al., 2022, p. 169
	PFR2: I would be afraid of accidentally paying the wrong price when shopping in an unmanned convenience store.	Featherman & Pavlou, 2003, p. 470; Park & Zhang, 2022, p. 5

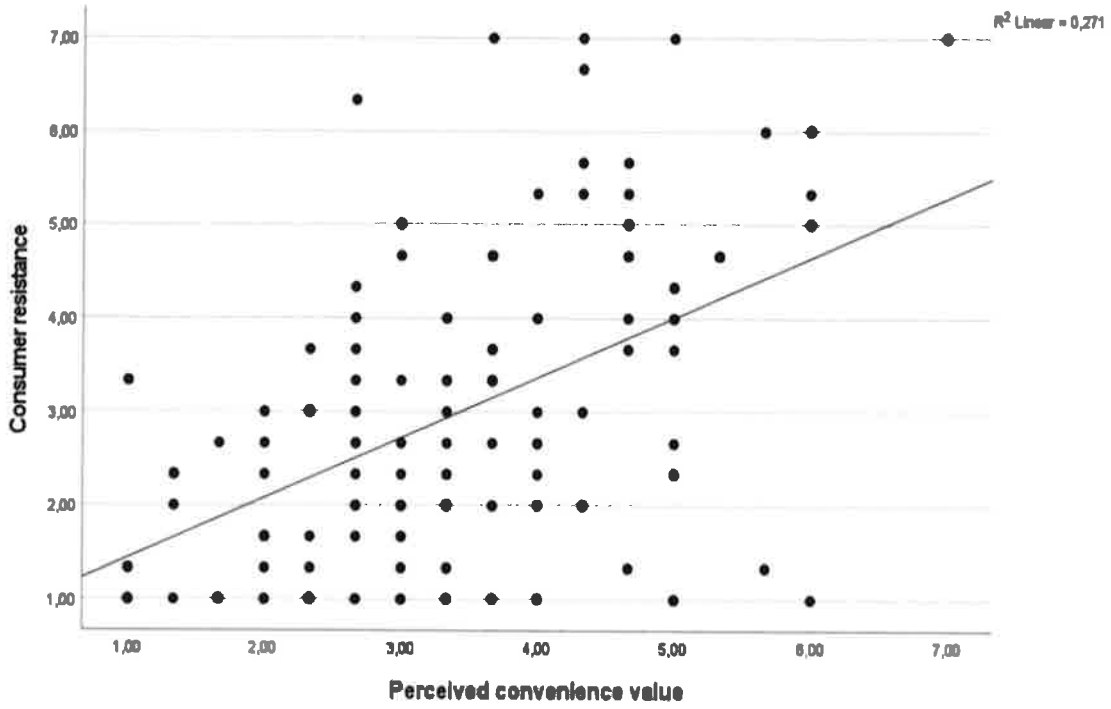
	PFR3: There is an increased risk that my bank details will be spread to unauthorized persons if I were to shop in an unmanned convenience store.	Featherman & Pavlou, 2003, p. 470; Mani & Chouk, 2018, p. 797
Self- image incongruence	SC1: I see myself as the typical customer who would shop in an unmanned convenience store.	Antón et al., 2013, p. 377; Mani & Chouk, 2018, p. 797
	SC2: I fit into the typical image of a customer to an unmanned convenience store.	Antón et al., 2013, p. 377; Mani & Chouk, 2018, p. 797
	SC3: The image of the typical customer to an unmanned convenience store reflects me as a person.	Antón et al., 2013, p. 377; Mani & Chouk, 2018, p. 797
Need for interaction	NFI1: I would prefer to talk to staff instead of using a self-service station or my smartphone.	White et al., 2012, p. 255
	NFI2: My visit to a convenience store would not be as pleasant if I had to use a self-service station or my smartphone instead of getting service from an employee.	Mani & Chouk, 2018, p. 797; White et al., 2012, p. 255
	NFI3: When I pay for my goods, I would prefer to interact with staff rather than using a self-service station or my smartphone.	Curran & Meuter, 2005, p. 107; Dabholkar et al., 2002, p. 199; Meuter et al., 2005 p. 80
Perceived complexity	PC1: It would be easy for me to learn how the technology works in an unmanned convenience store (e.g., identification, self-scanning, and payment	Curran & Meuter, 2005, p. 107; Davis, 1989, p. 340; Lin, 2022, p. 10; Mani & Chouk, 2018, p. 797; Moore & Benbasat, 1991, p. 216; Venkatesh et al., 2012, p. 178
	PC2: It would be easy for me to become skillful at using the technology in an unmanned convenience store (e.g., identification, self-scanning, and payment.	Davis, 1989, p. 340; Curran & Meuter, 2005, p. 107; Lin, 2022, p. 10; Mani & Chouk, 2018, p. 797; Venkatesh et al., 2012, p. 178
	PC3: Overall, I would think it would be easy to shop in an unmanned convenience store.	Laukkanen, 2016, p. 2438; Moore & Benbasat, 1991, p. 216
Consumer resistance	CR1: Unmanned convenience stores are not interesting to me.	Mani & Chouk, 2018, p. 797
	CR2: I would probably be reluctant to use unmanned convenience stores.	Mani & Chouk, 2018, p. 797
	CR3: Shopping in unmanned convenience stores could cause problems that I do not need.	Mani & Chouk, 2018, p. 797

Technological readiness	TR1: New technology contributes to a better quality of life.	Parasuraman & Colby, 2015, p. 64
	TR2: Other people come to me for advice on new technology.	Elliot et al., 2012, p. 322; Parasuraman & Colby, 2015, p. 64; Roy et al., 2018, p. 156
	TR3: Sometimes I think that technological systems are not designed to be used by the common person.	Parasuraman & Colby, 2015, p. 64; Park & Zhang, 2022, p. 5
	TR4: People are too dependent that technology will accomplish things for them.	Parasuraman & Colby, 2015, p. 64
Inertia	IN1: Generally, I see change as something negative.	Heidenreich & Handrich, 2014, p. 885; Mani & Chouk, 2018, p. 797
	IN2: I would rather use proven methods than test new ones.	Heidenreich & Handrich, 2014, p. 885; Mani & Chouk, 2018, p. 797
	IN3: I usually avoid change.	Mani & Chouk, 2018, p. 797

Appendix 5. Assumption 1






R² Linear = 0,271
Consumer resistance
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1,00
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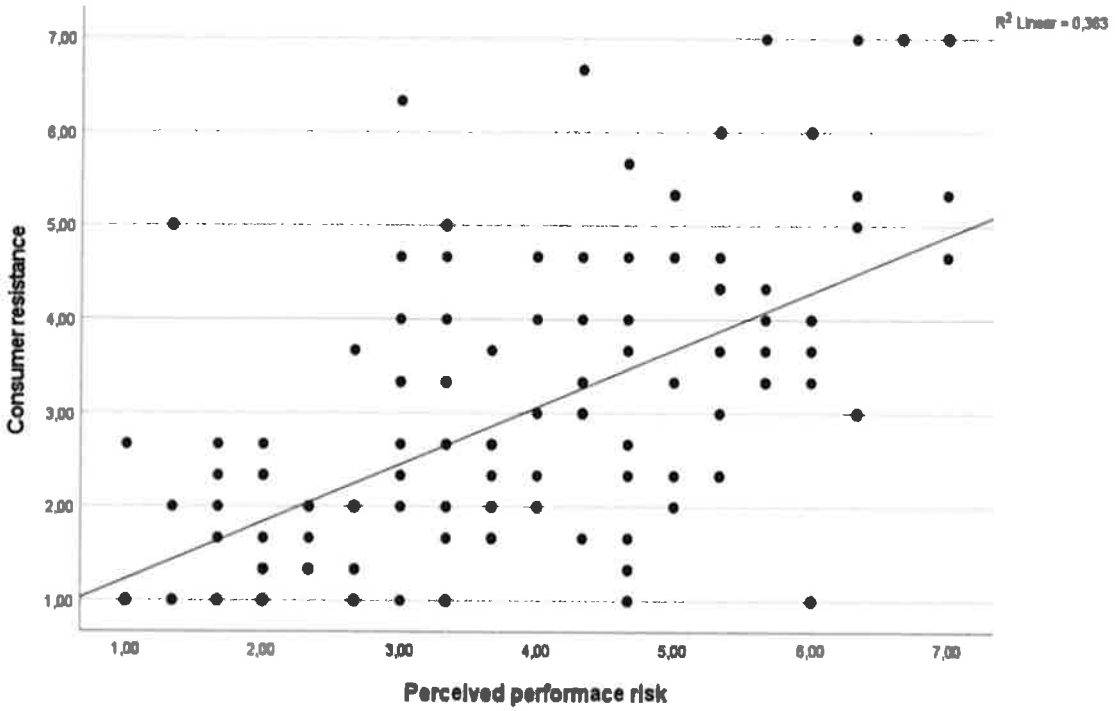
2,00
3,00
4,00
5,00
6,00
7,00
Perceived convenience value


R² Linear = 0,363
Consumer resistance
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5,00
4,00
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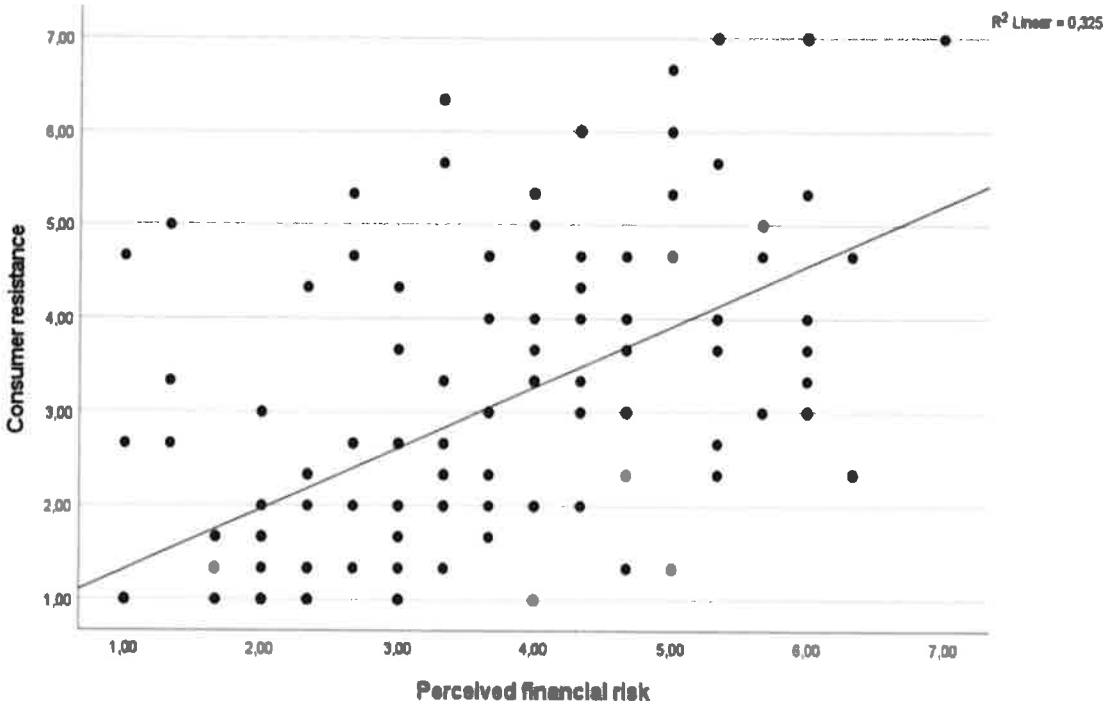
3,00
4,00
5,00
6,00
7,00
Perceived performace risk


R² Linear = 0,325
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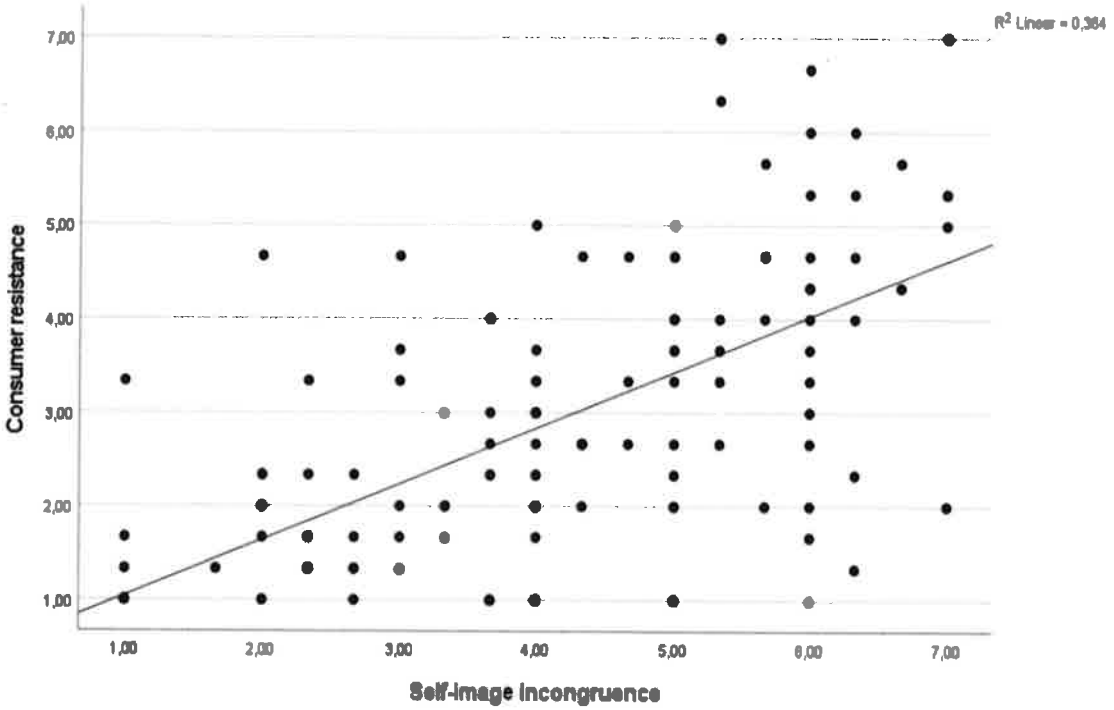
4,00
5,00
6,00
7,00
Perceived financial risk


R² Linear = 0,364
Consumer resistance
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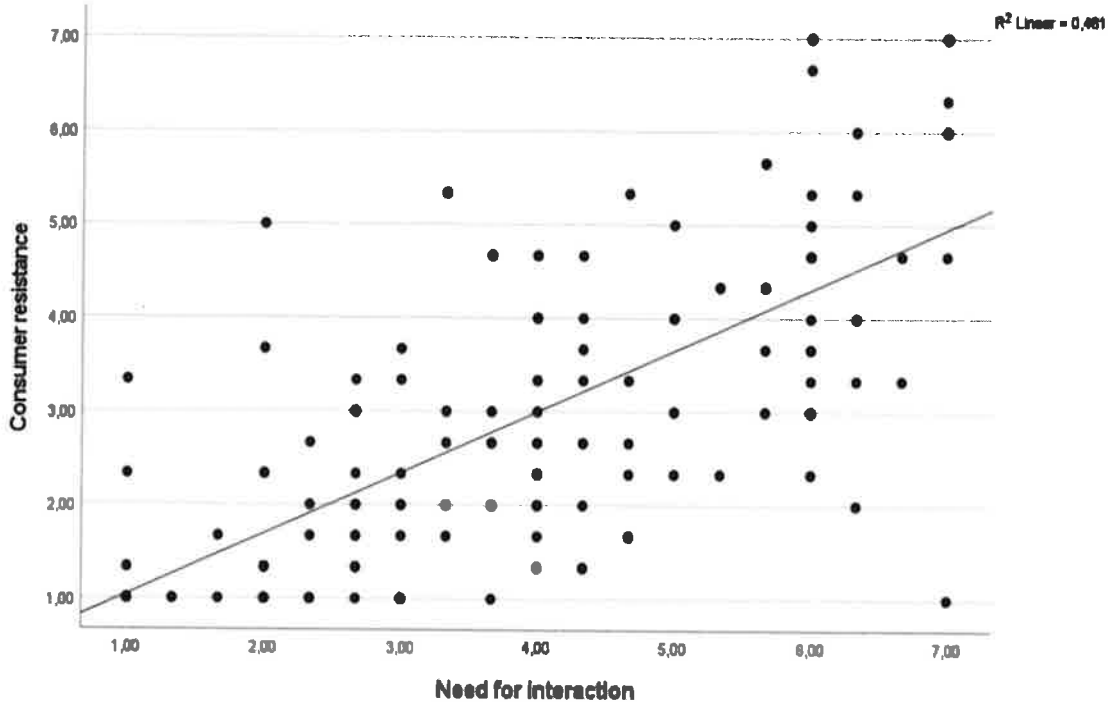
5,00
6,00
7,00
Self-image incongruence


R² Linear = 0,461
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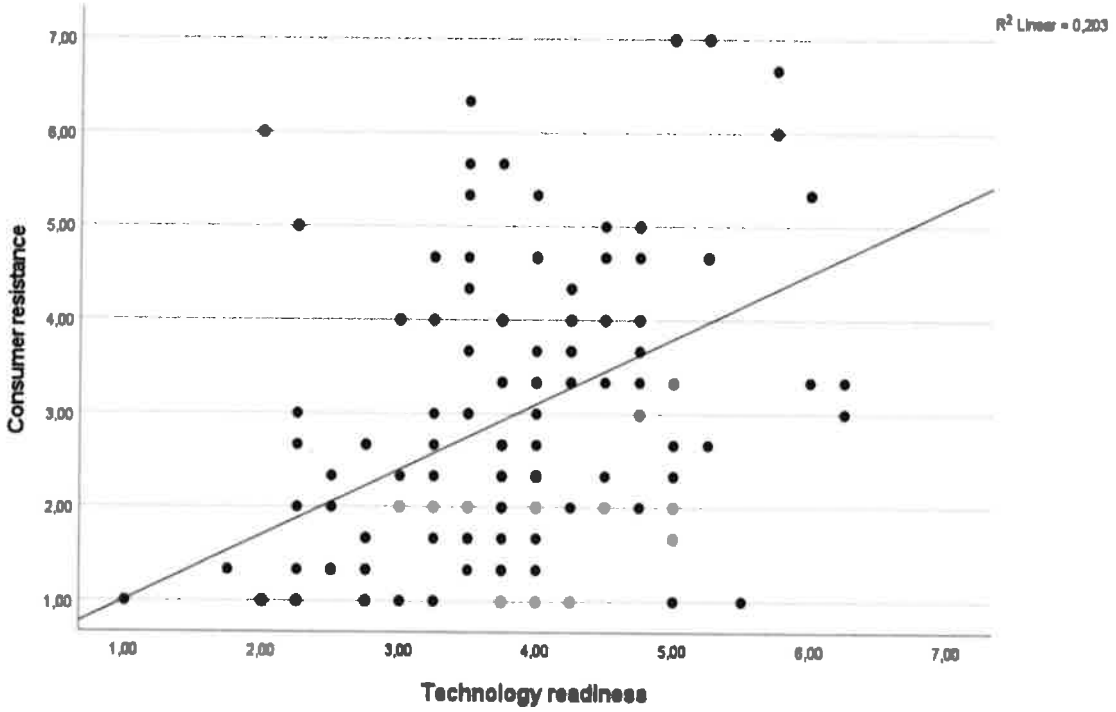
4,00
5,00
6,00
7,00
Need for interaction


R² Linear = 0,203
Consumer resistance
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5,00
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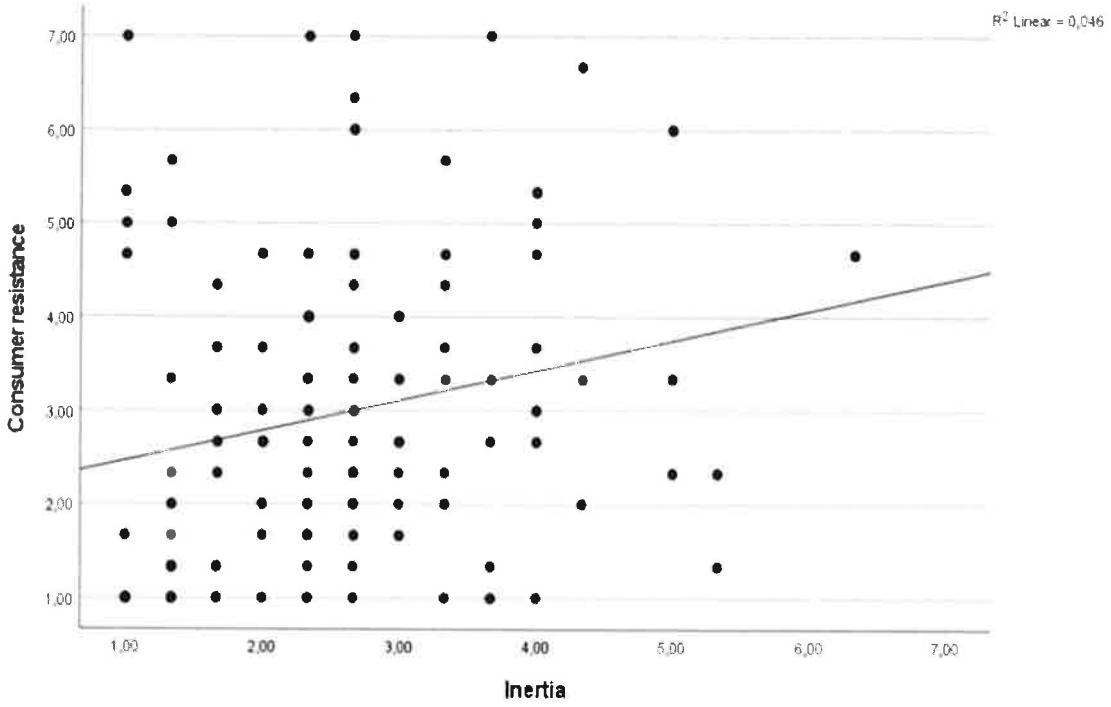
2,00
3,00
4,00
5,00
6,00
7,00
Technology readiness


R² Linear = 0,046
Consumer resistance
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5,00
4,00
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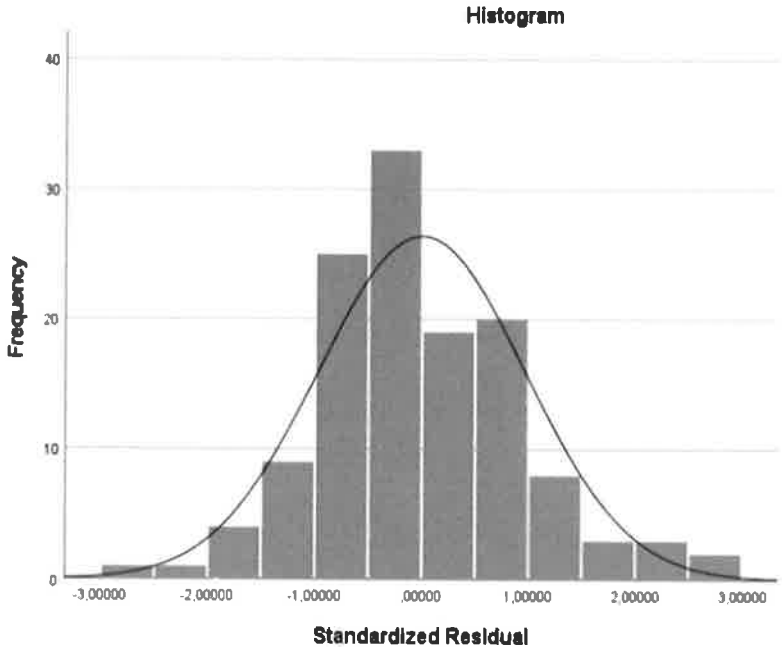
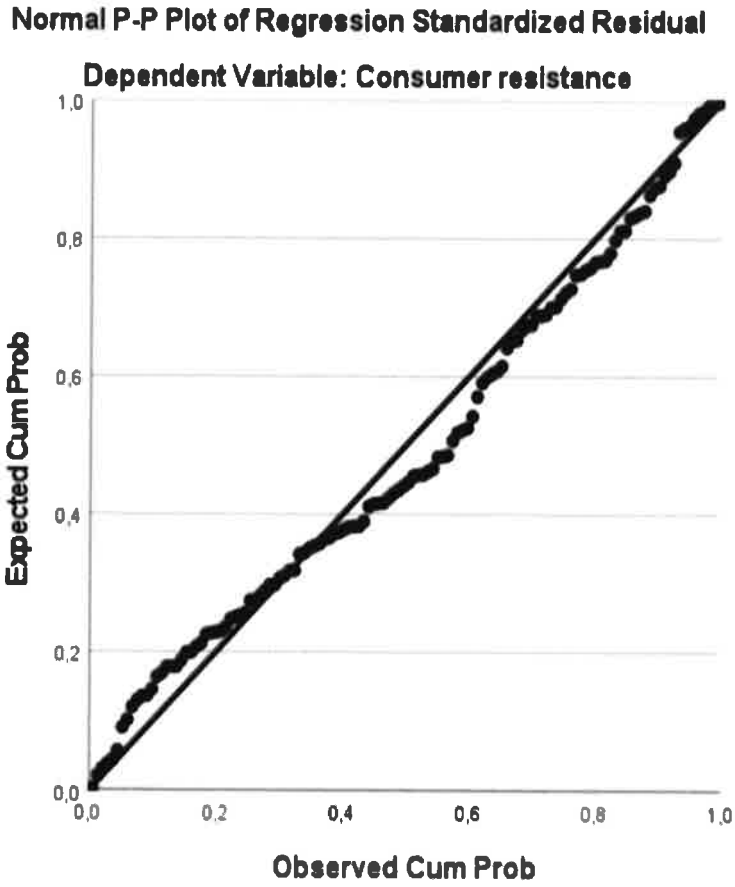
3,00
4,00
5,00
6,00
7,00
Inertia

Appendix 6. Assumption 2

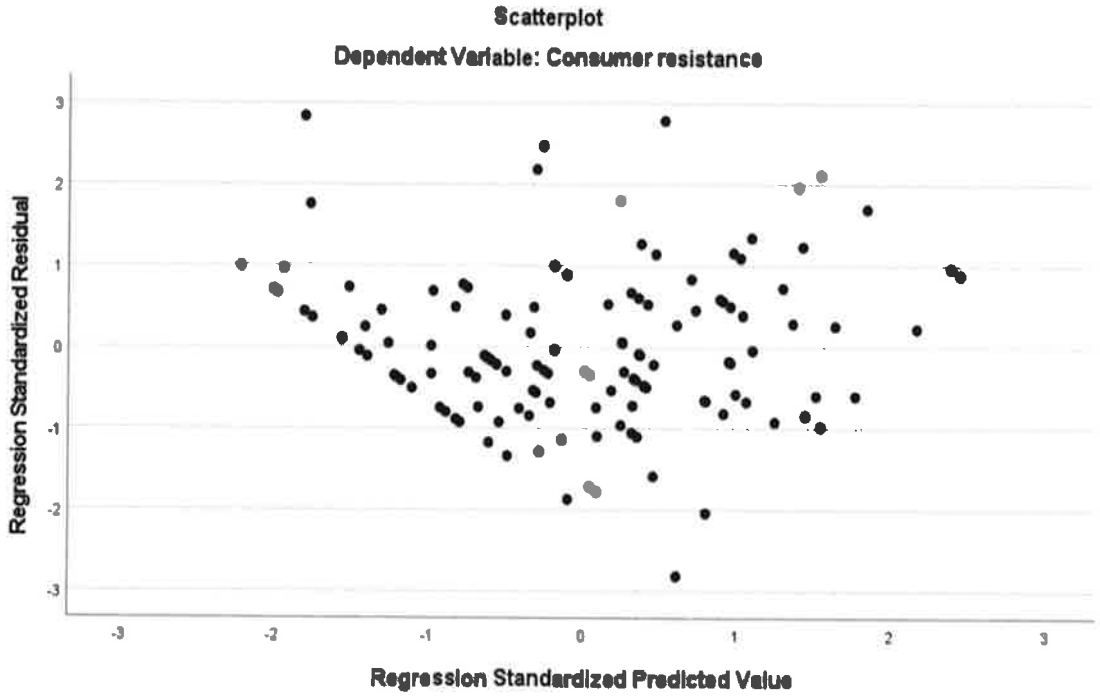




Kolmogorov-Smirnov

Statistic	df	Sig.
0.08	128.00	0.05

Appendix 7. Assumption 4



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