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Predictors of Online Shopping Behavior of Women in Turkey: A Model and Empirical Study

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Abstract

Women's dominant position in purchase decisions brings them to a primary decision-making position in families and households in terms of shopping. In this study, sociodemographic and economic factors, which were, included taking into account individual differences to explain the online purchase intention of female consumers living in Turkey, are aimed to be observed in terms of their difference. The data used in this study were obtained from Information and Communication Technologies in households conducted by the Turkish Statistical Institute between 2014 and 2018. The data were collected from a total of 68,087 people. In the study, a chi-square independence test was used to examine the relationship between women's e-commerce usage and sociodemographic and economic variables, and the results indicated a significant relationship. Binary probit and binary logistic regression analyses were then conducted to detect the factors influencing e-commerce usage among women 15 years and older in Turkey. According to the results of the study, it was determined that the survey year, age, education, employment status, income status, region, and household size variables affect women's e-commerce usage. Users' reactions to e-commerce shopping practices can be analyzed in detail, and e-commerce can be used more widely by using different methods. Based on the results of this study, it is suggested to inform and raise awareness of users about the use of e-commerce.

Key words: electronic commerce, online shopping, binary logistic regression, women, Turkey

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1. Introduction

In the past, the internet was used solely to exchange information between research laboratories, universities and government agencies (Kraus & dos Santos, 2018). Nevertheless, the increased usage of devices that can connect to the internet via wireless or mobile networks expanded the application area of the internet and made it an essential tool. Moreover, the widespread use of the internet and such devices has led the concept of electronic commerce (e-commerce) to infiltrate our lives (Ngai & Gunasekaran, 2007). The most comprehensive description of e-commerce was made by the World Trade Organization (WTO), which defined it as "the sale or purchase of goods or services conducted over computer networks with specifically designed methods for trade, to receive or place orders" (WTO, 2013). This description, which is considered to be assertive, comprehensive, and different, includes three fundamental steps: 1) the research stage of manufacturers and consumers or buyers and sellers, 2) the order and payment stage and 3) the delivery stage of the goods to the buyer (Kaya & Aydın, 2019).

Buyer and seller profiles vary in e-commerce. Today, there are six types of buyer and seller profiles: business to business e-commerce, e-commerce between businesses and consumers, e-commerce between businesses and public administration, e-commerce between consumers and public administrations, and e-commerce between consumers and interstate e-commerce. The most prevalent types of e-commerce are business to business, business to consumer, and consumer to consumer (Kaya & Aydın, 2019).

E-commerce allows businesses to share information, operate between networks and computer platforms, and work together across geographical boundaries (Alqahtani et al., 2018b). As a result, access to products that are not available in a specific city or country becomes possible from anywhere around the world with just a few clicks (Kim et al., 2011). E-commerce infers internet-based business activities such as online retail (Al Mazrouei & Krotov, 2016) and is used extensively by people today (Tanuar et al., 2018). E-commerce is now widely accepted as a way of purchasing goods and services (Ünver & Alkan, 2022). E-commerce can be a tool for trading in a world where buyers and sellers do not have to meet. The use of e-commerce tools is favored because they present essential convenience to various buyers and sellers as transactions are conducted swiftly and on some e-commerce platforms, they are negotiable (Chandra, 2018). In addition, e-commerce presents efficiency to businesses at every stage of the production process and can contribute to the solution of the problems that hinder development (Agren & Barbutiu, 2018). E-commerce can be associated with the sale or purchase of services and/or products over the internet in many areas (Alkan & Ünver, 2021). Various platforms are available for this purpose, the most utilized of which are specialized websites, smartphone apps and online auctions. Recently, e-commerce has been used for almost all kinds of products and services, ranging from food to

alcoholic beverages. With this regard, it has become apparent that the use of e-commerce may evolve over time (Faraoni et al., 2019).

E-commerce, which is regarded as one of the most powerful trading and marketing tools of today, has many advantages. Its main advantage, however, is that it reduces time and distance limitations between buyers and sellers (Nathan et al., 2019). E-commerce provides low price opportunities to consumers while maintaining a wide range of products and enabling access to broader potential markets for businesses (Wood, 2004), and thus expanding the number of potential customers (Anastasiadou et al., 2019). In addition, e-commerce is a platform that comprises the ideas of all customers who have bought the same product. In this sense, it provides a convenience for buyers when choosing products (Chandra, 2018). E-commerce provides not only an advantage for small-scale local markets but also a solution to the insufficiencies in physical infrastructures (Qasim et al., 2018). When companies form a solid business strategy using e-commerce, they can achive an advantage of competition over their competitors. Thus, the number of companies using e-commerce around the world is increasing day by day (Al Mazrouei & Krotov, 2016). With e-commerce, companies can find new business partners, build international partnerships and develop their trade volume. At the same time, businesses can obtain raw materials and products more easily and for cheaper. In addition, as the supply of goods and services is rapid in e-commerce, production and marketing are also faster than local enterprises. It is simpler for businesses on such platforms to become a brand. The constant registration of shopping transactions eliminates negative features such as tax loss and informality, while the guarantees it provides increase usage rates (Kaya & Aydın, 2019). E-commerce also eliminates the problems encountered by people with physical disabilities as they do not have to worry about leaving their home, transportation or finding accessible retail stores (Aichner & Shaltoni, 2018).

Being the subject of research by different disciplines, online shopping helps researchers with its social and economic outputs, especially in making inferences about marketing and consumer behavior (Gefen et al., 2003; Kim, 2012). Some studies on online shopping have given priority to identifying consumer profiles. In this context, the effects of socio-economic factors such as age, generation, gender, income, and wealth are considered as important factors in determining consumer profiles (Dhanapal et al., 2015). The concept of generation is a community recognized by the year of birth, age, place, and events that make up its personality (Smith & Nichols, 2015; Wey Smola & Sutton, 2002).

The literature involves five generations defined as Silent Generation (1928-1945), Baby Boomers Generation (1944-1964), Generation X (1965-1980), Generation Y (1981-1995) and Generation Z (1995-2009) (Yiğit, 2020). Since people in the same generation are exposed to similar social, political, and economic events, they exhibit common attitudes in terms of ideas, values, and beliefs (Schewe & Meredith, 2004). These ideas, values, and beliefs reflect on the expectations and behaviors of generations, forming a common identity among individuals. This identity not only awakens many social factors in individuals but also significantly affects shopping behavior in the context of consumers (Hung et al., 2007). While some studies in the literature only focus on the attitudes and preferences of a

particular generation, others have been designed to reveal the differences by making intergenerational comparisons. However, what matters here is how online shopping affects generations and in what respects there are differences in online shopping (Muda et al., 2016). Individuals in the Generation X, who use classical methods in their purchasing behaviors, demand explanations about the features of the product and why these features are necessary according to their risk aversion attitudes (Reisenwitz & Iyer, 2009). The consumers in the Generation X are indecisive in their purchasing tendency and get ideas from others. They often shop from value-oriented retailers, as they tend to ignore advertisements directed at them and reject the marketing technique (Lissitsa & Kol, 2016). The Generation Y uses technology in almost every aspect of their lives. Individuals in the Generation Y have higher purchasing power than other generations and tend to buy online (San et al., 2015).

Generation Z accounts for more than 27% of the world's population (Thangavel et al., 2021). The Generation Z, who has knowledge of technology, has many unique features (Persada et al., 2021). Generation Z is a generation that marketers pay special attention to, not only because of their potential market size, but also because they are very influential in their families' consumption decisions. People in this generation do the shopping consciously. Since the advantages of e-commerce sites outweigh stores, they buy more from e-commerce stores. Doing a lot of research before making a purchase has made them the most difficult target consumer group (Thangavel et al., 2021). Especially the Generation Z born after 2000 regards shopping not only as an act of purchasing, but also as a means of obtaining information. This has made it easier for many individuals of the Generation Z to adopt e-commerce. For, they think that they can get more information from e-commerce web-sites compared to stores (Ayob, 2021).

The ready-made clothing sector, which has been affected by the development of e-commerce, has also become the second most preferred sector from the internet (Sumarliah et al., 2021). Thus, global fashion has reached its peak in recent years (Sanny et al., 2022). The share of online clothing shopping in total clothing sales in the USA increased from 11% in 2011 to 19% in 2016 (Czech & Wielechowski, 2021). While e-commerce revenue in Indonesia, a Muslim country, was $18.8 million in 2019, it reached $26.9 million in 2020. Indonesia generated approximately $4.8 million income in the fashion category in 2019, making Indonesia the country that makes the biggest contribution in the e-commerce sector. Studies have supported that the trust factor, which is one of the crucial indicators affecting e-commerce, differs according to religious belief (Siala et al., 2004). In a similar study, it was stated that religion is an essential indicator of online shopping (Azam et al., 2013). In addition, religion impacts the services and products offered on the Internet (Rawat, Upadhayay, & Tiwari, 2013). The fashion industry, which is the strongest sector of the market, is expected to reach a market volume of 12.6 million dollars and an annual growth rate of 16.8% by 2024. It has also been estimated that 35% of the total market revenue will derive from online sales by 2024 (Sanny et al., 2022; Sumarliah et al., 2021). Fashion-related e-commerce sales are expected to rise from $383.1 million in Saudi Arabia in 2019 to $469 million by 2024. Saudi Arabia made the biggest contribution to 8.3 billion dollars of online

sales from Middle East and North African countries (Roper & Al-Kahifah, 2020). Poland's annual expenditure on clothing increased from 2007 to 2015 by 53%, making it the largest share of the EU countries' clothing industry. It is estimated that these rates will reach 43 billion zlotys by 2022 with an annual average growth of 5%-6% (Czajkowski & Szymański, 2020).

Many sectors have been under the influence of the COVID-19 outbreak, which has affected the world (Settey et al., 2021; Villa & Monzón, 2021). The spread of the pandemic has led to prohibitions and some restrictions (D'Adamo et al., 2021). The pandemic has caused great difficulties for the countries to reach the goods and the suppliers who deliver these goods to the consumers. The measures put into practice by the governments have disrupted the supply chain, especially in crowded and large cities where the population is dense. Many suppliers have taken advantage of the pandemic, making things more complicated (Kitukutha et al., 2021). The fear and anxiety resulting from COVID-19 pandemic have caused people to store products, which brought along an increase in prices and an indirect effect of COVID-19 on the economy (Agus et al., 2021; Beckers et al., 2021). This process has led people to different trade routes that do not have time and place constraints to reach the goods (Beckers et al., 2021; Ofori & Appiah-Nimo, 2019).

Especially during the pandemic period, consumers have tended to do online shopping more in terms of both their safety and convenience, regardless of place and time constraints in purchasing goods and services under quarantine measures (Chetioui et al., 2020; D'Adamo et al., 2021). Online shopping is preferred since it is cheaper, easier, and faster than shopping in traditional stores and has a wide product range and price comparison feature (Chetioui et al., 2020; Roper & Al-Kahifah, 2020). In this sense, the benefits and practicality of e-commerce have accelerated its development (Ofori & Appiah-Nimo, 2019; Rao et al., 2021). The global e-commerce grew by 17% in the first quarter of 2020, 81% in the second quarter, 59 percent in the third quarter, 52% in the fourth quarter, and 58% in the first quarter of 2021 (D'Adamo et al., 2021). At least 1 billion consumers worldwide purchase goods and services online each year. It is stated that the percentage of people who purchased goods and services online (24%) before the COVID-19 pandemic almost doubled (47%) during the pandemic (Meghisan-Toma et al., 2021). While the e-commerce turnover in the world was 3.53 trillion dollars in 2019, it is expected to reach 6.54 trillion dollars by 2022 (Černiauskaitė et al., 2020).

In 2019, the annual growth rates of e-commerce in Indonesia, South Africa, Brazil, Mexico, India, Nigeria, and China are 60%, 20%, 15%, 15%, 30%, 20% and 10%, respectively. The closure of stores due to the pandemic has led to the significant growth of e-commerce. The e-commerce annual growth rates for these countries for 2020 are120%, 100%, 100%, 80%, 70%, 50% and 20%, respectively (D'Adamo et al., 2021). It is observed that e-commerce has a tremendous growth trend in developing countries such as Indonesia (Reardon et al., 2021). With the fourth largest population in the world and one of the fastest growing sources of e-commerce, Indonesian internet retailing has grown by 60%-70% since 2014 and is expected to increase from $8 billion in 2016 to $60 billion by the end of 2022. The Indian retail market is projected to grow from $641 billion in 2016 to $1.6 trillion

by 2026. E-commerce in India is expected to reach $188 billion by 2025 (Sarkar et al., 2019). The increase in the rate of internet usage day by day ensures the rapid increase in online shopping between consumers and sellers in Ghana (Sarkar et al., 2019).

While a decrease was observed in general trade during the beginning of the pandemic, such a decrease was not observed in e-commerce, on the contrary, e-commerce has continued its uptrend. While the ratio of e-commerce volume to general trade in Turkey was 9.8% in 2019, which was before the COVID-19 period, it increased by 5.9 points to an average of 15.7% in 2020, when the COVID-19 period emerged. It is observed that as of 2020, while there was an increase in some goods and services expenditure of consumers within the scope of e-commerce, there was also a decrease in some sectors. As for e-commerce, highest rates of increase occurred in white goods with 129%, clothing, shoes, and accessories by 38%, electronics by 56%, food by 61%, home, garden, furniture, and decoration sector by 105%, food-supermarket with an increase of over 200%, education and consultancy by 43%, floriculture by 100%, and metallurgy and chemistry by 189%. There was a decrease of up to 46% in the airlines, travel, transportation, accommodation, entertainment, and arts sectors compared to 2019 (Statistics, 2021).

According to the Informatics Industry Association of Turkey (TUBISAD), the size of Turkey's e-commerce market is continually growing each year as they reported that it grew from 42.2 billion TL in 2017 to 59.9 billion TL in 2018. Even though the e-commerce sector in Turkey was affected by global events in 2018 and exchange rate fluctuations in the economy, the growth in e-commerce transactions continued with a 42% rend in TL compared to the previous year, while it remained at 7% on the US Dollar basis (TÜBİSAD, 2017).

The situation in Turkey is different from other countries. Although the volume of internet usage is similar to the worldwide usage, the e-commerce transaction volume is rather low. There has been a steady increase in the use of e-commerce in Turkey. Between 2016 and 2020, the average annual growth rate of e-commerce usage across the country was 31% (Öztürk, 2021). The ratio of online retail in total retail trade in Turkey was 5.3% in 2018 and 6.2% in 2019. With this ratio, Turkey remained below 6.7%, which is the average of developing countries (TÜBİSAD, 2019). The number of businesses participating in e-commerce increased from 2015 to 2020 by a total of 42%. However, this increase is 36% in Europe. E-commerce activities contributed to the Turkish economy with an expenditure of 216 billion from local businesses, total gross value added (GVA) of 253 billion TL, a total employment of 1.9 million people, total tax of 56 billion TL (TÜBİSAD, 2020). It has been reported that women in Turkey spend approximately 18 min 54 sec of their time on e-commerce sites on a daily basis. The five most popular websites among female internet users were determined as Trendyol, Çiçeksepeti, Google, Shein and Netflix (Webrazzi, 2019).

In recent times, internet use has become more popular among women and the population of female internet users has almost reached the level of male users.

At the same time, women have a tendency to shop more actively in an offline shopping environment. Therefore, it is reasonable to expect them to become online shoppers like men are right now (Bae & Lee, 2011; Weiser, 2000; Yang & Wu, 2004). In addition, women have more spending power and play a significant role in purchasing decisions (Chou et al., 2015; Huddleston & Minahan, 2011). In general, they are good communicators who like to share both positive and negative verbal feedback to influence the purchasing decisions of their friends, family and colleagues. Women tend to rely on the information they hear and advice receive from their own environment reduces the perceived risk of online shopping for female consumers (Chou et al., 2015; Garbarino & Strahilevitz, 2004; Huddleston & Minahan, 2011).

Within this context, the present study aimed to define the main factors affecting the e-commerce usage of women in Turkey. In this study, e-commerce was assessed and examined in terms of buyers (individual), and the factors that are considered to affect the e-commerce usage of women.

The reasons for focusing on women's e-commerce usage in the study can be summarized as follows:

- Women have a dominant position in shopping and are largely responsible for purchasing decisions (Nazir & Haq, 2018; Van Droogenbroeck & Van Hove, 2020).
- The life cycle has a greater impact on women than men (Stalker, 2014; Wepfer et al., 2015).
- Studies have shown that less women were online, and a large proportion of them recommend their online purchases to other women (Raman, 2020).
- Women represent the primary decision makers in families and households in terms of shopping (Al-Maghrabi & Dennis, 2012; Alreck & Settle, 2002).
- Women have high views on information technology and tend to adopt information technology because they are more attracted to the ease of use (Venkatesh et al., 2000).

All these reasons have shown that more importance should be placed on women in terms of e-commerce. Considering e-commerce for women and taking steps in this direction will significantly contribute to the overall widening of the e-commerce pie and the degree of inclusion in society, as it can increase the sustainable growth of online shopping.

2. Literature Review

In the modern world, the development of the internet has advanced in every period. The improvement in development of the internet has been critical in most areas. It opened a new era, particularly in trade, which is a branch of the economy, and ensured its development. E-commerce is the new form of doing business that is continuously developing. Moreover, its transaction volume is gradually increasing, it appeals to all segments of the society and carried on as a new way of doing business on the internet (Ngai & Gunasekaran, 2007).

E-commerce has removed constraints such as space, warehouse and time that are now required in trade and provided access to everyone with internet

(Serrano-Cinca et al., 2018). E-commerce lags behind when compared to traditional commerce. However, the volume of e-commerce is increasing as a result of its continuous development (Acilar, 2016).

As e-commerce is associated with the producer, consumer and seller, it is important to identify and understand its determinants (Kaya & Aydın, 2019). It has been emphasized that the sociodemographic and economic determinants in the use of e-commerce and their roles should be taken into account (Edrisi et al., 2020).

In the literature, demographic characteristics such as gender (Akhlaq & Ahmed, 2016; Yu & Cui, 2019), age (Ali et al., 2019; Alqahtani et al., 2018b; Bahaddad et al., 2013; Kose & Arslan, 2020; Martínez-Domínguez & Mora-Rivera, 2020), and education level (Bahaddad et al., 2013; Edrisi et al., 2020; Hannon & Schumm, 2017; İlhan & İşçioğlu, 2015; Mehrotra et al., 2020; Serrano-Cinca et al., 2018) have been found to be effective in the use of e-commerce. In addition, factors such as region (Martínez-Domínguez & Mora-Rivera, 2020) and the number of individuals in the household (Edrisi et al., 2020; Martínez-Domínguez & Mora-Rivera, 2020; Naseri & Elliott, 2011) and economic factors such as income (Akhter, 2015; Ali et al., 2019; Hannon & Schumm, 2017; Kose & Arslan, 2020; Ladhari et al., 2019; Mehrotra et al., 2020) and job status (Kose & Arslan, 2020; Ladhari et al., 2019; Martínez-Domínguez & Mora-Rivera, 2020) have also been found to have an effect on the use of e-commerce.

Studies in the literature have reported that the education level of consumers is a factor that influences e-commerce (Serrano-Cinca et al., 2018). It has been determined that with the increase in the level of education, people become more open to innovation and assess e-commerce more moderately (Bellman et al., 1999). In another study, it was found that the variable of education level had a significant impact on online shopping (Punj, 2011).

There are various studies in the literature that have also reported that the age of the consumers shopping online is a factor influencing e-commerce (Serrano-Cinca et al., 2018). In a study, in which the demographic and cultural factors influencing the adoption of e-commerce in Saudi Arabia were examined, the age variable was found to be highly influential on usage (Alqahtani et al., 2018b). In another study, it was determined that the age variable had a meaningful effect on online shopping (Punj, 2011). Other studies in the literature have also reported that the age variable influences the possibility of shopping online (Morganosky & Cude, 2000; Yayar & Sadaklıoğlu, 2012).

In a study, in which the effect of various variables on online shopping were investigated, it was determined that the income variable had a meaningful effect (Punj, 2011). It has been shown that individuals of an older age/higher income are more inclined to make a purchase from an online site or by mail than individuals of a younger age/lower income (White & Manning, 1998). Studies have found that that a person with a higher income is more likely to shop online (Li et al., 1999; Raijas & Tuunainen, 2001; Vrechopoulos et al., 2001). It was observed in another study that monthly allowance had a definite and significant effect on online shopping behavior (Kalia et al., 2016). It has also been reported that those who

adapt to online shopping early are individuals with the highest household income (Li et al., 1999). Another study discovered that income had a meaningful and definite effect on both online shopping and online banking (Akhter, 2015). Similarly, income has been determined to have a positive effect on online shopping (Korgaonkar & Wolin, 1999).

In a study in the literature, it was determined that the variable of employment status was one of the major factors that influenced e-commerce behavior (Serrano-Cinca et al., 2018). Martínez-Domínguez and Mora-Rivera (2020), it was found that employment status influenced the determinants of internet usage. The usage of e-commerce, which improves in association with the usage of the internet, was also examined and it was determined that the employment status variable was statistically significant (Martínez-Domínguez & Mora-Rivera, 2020). One study reported a definite relationship between the possibility of online grocery shopping and household size (Naseri & Elliott, 2011). Martínez-Domínguez and Mora-Rivera (2020), it was found that employment status influenced the determinants of internet usage. The expectation that households living in suburban or rural areas that are at a distance to shops have a higher tendency to make purchases online compared to urban households has been partially confirmed by various studies (Farag et al., 2003b).

Furthermore, factors such as loyalty (Abumalloh et al., 2020), online purchase intention (Anastasiadou et al., 2019; Mann & Liu-Thompkins, 2019; Zendehdel et al., 2020), technology skills (Kose & Arslan, 2020), and trust in internet/online shopping (Kose & Arslan, 2020; Lee et al., 2011) have also been determined to have an impact on e-commerce use.

The literature review has shown that studies have focused on determining the behavior of consumers with sociodemographic variables related to online shopping in different countries. Although many studies have reached similar results on the basis of variables, different results have been achieved in some studies.

In a study investigating the effect of home internet on online shopping in Spain, it was determined that the variables of settlement size, employment status, education, and survey year have a positive relationship with e-commerce usage and that the number of children in the household and the age variable also affect e-commerce negatively (Pérez-Hernández & Sánchez-Mangas, 2011). In the study conducted in the Netherlands and the USA, it was determined that income had a significant positive effect in both countries (Farag et al., 2006). In a study investigating the possible effect of e-shopping on travel behavior in the Netherlands, it was determined that age, gender, region, education, and income variables have a significant positive effect (Farag et al., 2003a). In a study conducted in India, it was found that online shopping was significantly affected by various demographic factors such as age, gender, marital status, household size, and income (Nagra & Gopal, 2013). In another study investigating the shopping behavior of individuals in India, it was found that education level and income variables had a significant positive effect (Bhatt, 2019). In the study investigating the use of e-commerce in the Southeast Asian Nations Association (SANA) countries, a significant positive effect was determined between education, income, employment status, and gender. It was also determined in the study that the age

variable had a significant negative effect (Ayob, 2021). Similar results were obtained in a study conducted in Singapore, and it was concluded that there was a positive and significant relationship between education and online shopping (Hui & Wan, 2007). In a study investigating demographic and cultural factors in the adoption of e-commerce in Saudi Arabia, it was concluded that the variables of age, gender, and computer proficiency were significant (Alqahtani et al., 2018a). In the study investigating the effect of Chinese consumers on shopping intention, the effect of age, income, education, marital status, and practicality variables gives similar results with the literature (Gong et al., 2013). In study investigating Saudi women's attitudes towards shopping, it was concluded that education and income were positively associated with their online shopping experience (Hannon & Schumm, 2017). In the study conducted in the Gulf Cooperation Council countries, it was found that education and income had a significant impact on the use of e-shopping (Mehrotra et al., 2020). In a study conducted in Spain which investigated the shopping behaviors of consumers who use m-commerce, which is a sub-branch of e-commerce, it was determined that there was a significant positive relationship between the education, income, and profession of the household head and m-commerce behavior (Bigne et al., 2005).

The use of e-commerce in Turkey has also been extensively studied. A study focusing on the spatial distribution of e-commerce usage rates in Turkey on the basis of provinces with visual presentations has revealed that there is a heterogeneous spatial distribution throughout Turkey and that there is a skewness in the use of e-commerce in places where the population is low (Öztürk, 2021). It has been determined that the factors of age, gender, education level, profession, income level, region, and family size are effective on e-commerce in individuals' use of e-commerce in Turkey (Alkan, Küçükoğlu, et al., 2021). It was determined that the use of e-commerce differs according to the education level of individuals in Turkey and the tendency towards e-commerce increases as the education level increases (Ünver & Alkan, 2021). As a result of another study conducted with households in Turkey, it was determined that factors such as education, age, marital status, employment status, income, life insurance ownership, credit card use, automobile ownership, and the year the survey was conducted affect the online shopping behaviors of households (Karaaslan, 2021). It has been found that working women who are well-educated, live in urban areas, and have smaller families are more likely to use the internet and do the online shopping. At the same time, it was determined that while age had a significant effect on internet use, it had no effect on online shopping (İlhan & İşçioğlu, 2015). In a study investigating sociodemographic factors affecting online purchasing behavior in Turkey, it was found that age, income, and education level had a significant effect on online purchasing behavior (Akman & Rehan, 2014). In the study focusing on socioeconomic and demographic factors that are effective in purchasing or ordering goods and services on the Internet in Turkey, it was determined that women are more likely to shop for clothing and sports equipment on the Internet than men (Abar & Alkan, 2020). According to a study, it was determined that women are more likely to participate in e-commerce, but their e-commerce expenditures are less than men (Kose & Arslan, 2020). In another study, it was determined that

anxiety is more effective on consumer intentions of older women who have less experience in online shopping channels (Celik, 2016). It has been determined that demographic variables such as age, gender, income, and education level have a significant effect on the online shopping frequency of consumers. In particular, it was reported that gender has a significant impact on what consumers buy, how often they buy, and why they buy certain products/services (Ergin & Akbay, 2008).

There are also studies on different aspects of the use of e-commerce in Turkey. Büyüközkan and Uzturk (2019), determined the most appropriate strategy for using e-commerce for a selected Small and Medium Enterprises (SME) in the textile industry from Turkey. Durmuş et al. (2013), examined the effects of e-service quality and e-service recovery dimensions on customer e-loyalty. Gökmen (2012), states that Turkey's e-commerce volume has increased as a remedy to close the foreign trade deficit, but it is still not enough when compared to the total trade volume, and Turkey should have an effective e-government mechanism and e-signature law to increase its e-commerce volume. Coşar (2017), found that delivery services and privacy policies play an important role in online ordering. Gurcan (2017), examined the online shopping behavior of China and Turkey. Topaloğlu (2012), investigated the factors affecting the search and purchase intentions of consumers using e-commerce. Çelik and Yilmaz (2011), determined the causal relationships between the Technology Acceptance Model and the factors believed to affect Turkish consumers' e-shopping behavior and e-purchasing.

3. Method

Data

In this study, the micro data sets of 68,087 women who participated in the Information and Communication Technology (ICT) Usage Survey in Households conducted by the Turkish Statistical Institute (TurkStat) between 2014-2018 were utilized.

The goal of the ICT Usage Survey in Households is to define the criteria of the information society and create relevant statistics. The scope of the survey covers households that are located in the settlements within the boundaries of Turkey. Those who were in schools, dormitories, hotels, kindergartens, nursing homes, hospitals, and prisons and described as the institutional population, and those who were living in barracks and army houses were excluded from the survey. Settlements that are considered to be ineffectual, such as small villages, oba (large nomad tents), and hamlets, with a population not surpassing 1% of the total population were also excluded. According to the methodology, individuals between the ages of 16-74 were included in the survey. A stratified two-stage cluster sampling method was applied to collect the data. The first stage sampling unit randomly selected blocks from clusters (blocks) that hold an average of 100 household addresses and the second stage sampling unit denoted the systematically and randomly selected household addresses from each selected cluster (TurkStat, 2018).

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Measures and variables

The dependent variable of the study was the e-commerce usage of women that was measured in the ICT Usage Survey in Households with the statement "buying goods or services for personal use or ordering via the Internet (web sites or mobile applications) (except orders via e-mail, SMS and MMS)". For the dependent variable, a rate of 1 was given if women used e-commerce, and 0 if they did not. As the e-commerce use status was a two-category dependent variable developed with the options "uses" and "does not use" binary logistic and probit regression analyses were applied.

The independent variables in this study were determined in accordance with the literature review. The socio-demographic and economic factors that can influence the use of e-commerce were considered as the independent variables, which were survey year (2014-2018), age (15-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years and 65+ years), educational level (illiterate, primary school graduate, secondary school graduate, high school graduate and university graduate), income status (first level income, second level income, third level income, fourth level income), employment status (unemployed, paid/salaried/casual worker, employer, self-employed and unpaid family worker) and household size (two individuals or less, three individuals, four individuals, five individuals, and six individuals or more).

Table 1. Statistical region units classification -Level 1

Code	Level 1	Provinces
TR1	Istanbul	İstanbul
TR2/ TR4	West Marmara/ East Marmara	Tekirdağ, Edirne, Kırklareli, Balıkesir, Çanakkale, Bursa, Eskişehir, Bilecik, Kocaeli, Sakarya, Düzce, Bolu, Yalova
TR3	Aegean	İzmir, Aydın, Denizli, Muğla, Manisa, Afyonkarahisar, Kütahya, Uşak
TR5/ TR7	Western Anatolia/ Central Anatolia	Ankara, Konya, Karaman, Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir, Kayseri, Sivas, Yozgat
TR6	Mediterranean	Antalya, Isparta, Burdur, Adana, Mersin, Hatay, Kahramanmaraş, Osmaniye
TR8/ TR9	West Blacksea/ East Blacksea	Zonguldak, Karabük, Bartın, Kastamonu, Çankırı, Sinop, Samsun, Tokat, Çorum, Amasya, Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane
TRA/ TRB	NortheasternAnatolia/ East Anatolia	Erzurum, Erzincan, Bayburt, Ağrı, Kars, Iğdır, Ardahan, Malatya, Elazığ, Bingöl, Tunceli, Van, Muş, Bitlis, Hakkâri
TRC	Southeastern Anatolia	Gaziantep, Adıyaman, Kilis, Şanlıurfa, Diyarbakır, Mardin, Batman, Şırnak, Siirt

Source: Authors' calculations

In addition, the region variable was determined among the independent variables. At the basis of the establishment of the Nomenclature of Units for Territorial Statistics in Turkey (NUTS) lies the obligation of the establishment of development agencies. The national program developed after the accession partnership agreement signed between Turkey and the EU made it essential to establish NUTS regions, as the EU regards NUTS regions as a prerequisite for the

establishment of development agencies. In the creation of NUTS, the current geographical regions of Turkey were not considered. Instead, the region boundaries were determined depending entirely on different criteria, the first of which was population. In addition, cultural structure and the development status of the provinces were also considered (Alkan et al., 2015). As a result, Turkey was divided into 12 regions at Level 1 in accordance with NUTS. In order to obtain more significant results from the analysis, some regions were merged and expressed within the eight regions (Alkan, Küçükoğlu, et al., 2021). These regions and their provinces are presented in Table 1.

Survey year (five categories), employment status (five categories) and region (eight categories) variables included in the model are nominal scale variables. Age (six categories), educational level (five categories), income status (four categories) and household size (five categories) variables are ordinal scale variables.

Research method

Survey statistics in Stata 15 (Stata Corporation) were used to account for the complex sampling design and weights. In this study, a weighted analysis was carried out (Alkan, Abar, et al., 2021). The frequencies and percentages of the women participating in the study were obtained in accordance with their e-commerce usage status. Chi-square independence tests were carried out to analyze the relationship between the e-commerce usage status and independent variables. Binary logistic regression and binary probit regression analyses were conducted to determine the socio-demographic and economic factors affecting the e-commerce usage of the women.

4. Results

Frequency analysis and chi-square independence tests

The frequency analysis of the socio-demographic and economic variables and the chi-square independence test results are presented in Table 2. The study group included women who had participated in the ICT Usage Survey in Households carried out between 2014 and 2018. The highest participation rate of 21.9% was found in the 35-44 age group with, while the lowest rate of 10.5% was found in the 65 and above age group. 21.9% of the women had not graduated primary school, 34.6% of them were primary school graduates, 15.7% of them were secondary school graduates, 15.3% of them were high school graduates and 12.5% of them were university graduates. 31.8% of the women were of the first level income, while 22% of them were of the second level income. 77.2% of the women were unemployed, 15.8% of them worked as paid, salaried or casual employees, 0.4% were employers, 1.5% were self-employed, and 5.1% were unpaid family workers. The women who used e-commerce the most (16.2%) resided in the TR5/TR7 region. When the household size variable was examined, it was observed that 23.3% of the women lived in a household with two or less individuals, while 17.3% lived in a household with six or more individuals. According to the results of the chi-square independence test, a significant relationship was determined between the e-commerce usage of the women and the socio-demographic and economic variables of the study.

Table 2. Frequency analysis and chi-square independence test results of the factors that can influence e-commerce usage

Variables	E-commerce usage		n (%)	χ2	P
	No	Yes			
Survey year					
2014	10937(19.4)	1365(11.7)	12302(18.1)	871.039	<0.001
2015	10281(18.2)	1658(14.2)	11939(17.5)		
2016	11182(19.8)	2177(18.7)	13359(19.6)		
2017	12489(22.1)	2946(25.2)	15435(22.7)		
2018	11527(20.4)	3525(30.2)	15052(22.1)		
Age					
15-24 years	8176(14.5)	3168(27.1)	11344(16.7)	6569.608	<0.001
25-34 years	9289(16.5)	4465(38.3)	13754(20.2)		
35-44 years	12140(21.5)	2783(23.8)	14923(21.9)		
45-54 years	11491(20.4)	953(8.2)	12444(18.3)		
55-64 years	9395(16.7)	264(2.3)	9659(14.2)		
65+ years	5925(10.5)	38(0.3)	5963(8.8)		
Educational level					
Illiterate	14857(26.3)	81(0.7)	14938(21.9)	19345.570	<0.001
Primary school graduate	22616(40.1)	934(8.0)	23550(34.6)		
Secondary school graduate	8794(15.6)	1864(16.0)	10658(15.7)		
High school graduate	6790(12.0)	3656(31.3)	10446(15.3)		
University graduate	3359(6.0)	5136(44.0)	8495(12.5)		
Employment status					
Unemployed	46268(82.0)	6290(53.9)	52558(77.2)	7834.410	<0.001
Paid/salaried/casual worker	5851(10.4)	4880(41.8)	10731(15.8)		
Employer	107(0.2)	144(1.2)	251(0.4)		
Self-employed	805(1.4)	239(2.0)	1044(1.5)		
Unpaid family worker	3385(6.0)	118(1.0)	3503(5.1)		
Income level					
First level income (lowest)	20409(36.2)	1268(10.9)	21677(31.8)	6574.549	<0.001
Second level income	13565(24.0)	1939(16.6)	15504(22.8)		
Third level income	13105(23.2)	2848(24.4)	15953(23.4)		
Fourth level income (highest)	9337(16.6)	5616(48.1)	14953(22.0)		
Region					
TR1	6771(12.0)	2260(19.4)	9031(13.3)	1091.605	<0.001
TR2/TR4	8267(14.7)	1909(16.4)	10176(14.9)		
TR3	5973(10.6)	1464(12.5)	7437(10.9)		
TR6	5855(10.4)	1303(11.2)	7158(10.5)		
TR5/TR7	8987(15.9)	2062(17.7)	11049(16.2)		
TR8/TR9	7301(12.9)	1252(10.7)	8553(12.6)		
TRC	5945(10.5)	573(4.9)	6518(9.6)		
TRA/TRB	7317(13.0)	848(7.3)	8165(12.0)		
Household size					
2 person or less	13487(23.9)	2373(20.3)	15860(23.3)	1737.512	<0.001
3-person	10968(19.4)	3562(30.5)	14530(21.3)		
4-person	12749(22.6)	3487(29.9)	16236(23.8)		
5-person	8258(14.6)	1445(12.4)	9703(14.3)		
6 person or more	10954(19.4)	804(6.9)	11758(17.3)		

Source: Authors' calculations

Model estimation

Binary logistics and binary probit regression analyses were conducted to determine the factors that influence the e-commerce usage of the women. The coefficient (β), standard error and confidence interval values for the binary logistic and binary probit regression analyses results are presented in Table 3. As a result of the analysis, it was determined that the variables of survey year (2015, 2016, 2017 and 2018), age (15-24 years, 35-44 years, 45-54 years and 55-64 years), educational level (primary school graduate, secondary school graduate, high school graduate and university graduate), employment status (paid/salaried/casual worker, employer, self-employed and unpaid family worker), income status (first level income, second level income and third level income), region (TR1, TR2/TR4, TR3, TR6, TR8/TR9, TRC) and household size (3 individuals, 4 individuals, 5 individuals and 6 individuals or more) were statistically significant.

Table 3. Estimated model results associated with the factors influencing e-commerce usage

Variables	Binary Logistic Regression				Binary Probit Regression			
	β	Std. Error	95% CI Lower	95% CI Upper	β	Std. Error	95% CI Lower	95% CI Upper
Survey year (reference category: 2014)								
2015	0.348[a]	0.050	0.249	0.446	0.203[a]	0.028	0.148	0.258
2016	0.592[a]	0.048	0.498	0.687	0.343[a]	0.027	0.289	0.396
2017	0.901[a]	0.046	0.811	0.991	0.510[a]	0.026	0.460	0.560
2018	1.240[a]	0.046	1.149	1.330	0.704[a]	0.026	0.653	0.754
Age (reference category: 65+ years)								
15-24 years	3.398[a]	0.187	3.031	3.765	1.793[a]	0.094	1.609	1.977
25-34 years	3.213[a]	0.185	2.849	3.576	1.693[a]	0.093	1.512	1.875
35-44 years	2.739[a]	0.185	2.375	3.102	1.417[a]	0.093	1.235	1.598
45-54 years	1.751[a]	0.186	1.387	2.116	0.872[a]	0.093	0.690	1.054
55-64 years	0.905[a]	0.194	0.525	1.285	0.430[a]	0.097	0.241	0.620
Educational level (reference category: illiterate)								
Primary school graduate	1.184[a]	0.135	0.918	1.449	0.472[a]	0.056	0.362	0.582
Secondary school graduate	2.060[a]	0.137	1.792	2.327	0.896[a]	0.057	0.784	1.007
High school graduate	2.977[a]	0.135	2.714	3.241	1.433[a]	0.056	1.324	1.542
University graduate	3.663[a]	0.136	3.397	3.929	1.856[a]	0.057	1.744	1.968
Employment status (reference category: unemployed)								
Paid/salaried/casual worker	0.445[a]	0.036	0.376	0.515	0.262[a]	0.020	0.222	0.302
Employer	1.150[a]	0.177	0.803	1.497	0.651[a]	0.100	0.455	0.848
Self-employed	0.803[a]	0.110	0.589	1.018	0.435[a]	0.059	0.320	0.551
Unpaid family worker	-0.440[a]	0.107	-0.650	-0.230	-0.242[a]	0.056	-0.351	-0.133
Income level (reference category: fourth level income)								
First level income	-1.151[a]	0.047	-1.244	-1.059	-0.647[a]	0.026	-0.698	-0.596
Second level income	-0.703[a]	0.042	-0.786	-0.621	-0.401[a]	0.024	-0.448	-0.354
Third level income	-0.547[a]	0.038	-0.621	-0.473	-0.310[a]	0.022	-0.352	-0.268
Region (reference category: TRA/TRB)								
TR1	0.249[a]	0.063	0.126	0.372	0.145[a]	0.035	0.077	0.214
TR2/TR4	0.209[a]	0.065	0.082	0.335	0.128[a]	0.036	0.058	0.198
TR3	0.223[a]	0.067	0.093	0.354	0.135[a]	0.037	0.063	0.208
TR6	0.264[a]	0.067	0.133	0.395	0.154[a]	0.037	0.081	0.227
TR5/TR7	0.059	0.062	-0.063	0.180	0.043	0.035	-0.024	0.111
TR8/TR9	0.164[b]	0.068	0.031	0.297	0.101[a]	0.037	0.027	0.174
TRC	-0.222[a]	0.079	-0.378	-0.067	-0.098[b]	0.044	-0.184	-0.012
Household size (reference category: 2 person or less)								

3-person	-0.262[a]	0.044	-0.349	-0.175	-0.151[a]	0.025	-0.200	-0.102
4-person	-0.538[a]	0.045	-0.626	-0.450	-0.311[a]	0.025	-0.361	-0.261
5-person	-0.709[a]	0.055	-0.817	-0.601	-0.399[a]	0.031	-0.460	-0.338
6 person or more	-1.159[a]	0.062	-1.281	-1.037	-0.653[a]	0.035	-0.721	-0.585

Source: Authors' calculations
[a]p<0.01; [b]p<0.05; [c]p<0.10

The established models were determined to be statistically significant (P <0.000). McKelvey and Zavoina's R^2, which is a measurement of the goodness of fit of the estimated model, was determined to be 0.631 for the binary logistic regression model and 0.606 for the probit model. The accurate classification success of the binary logistics and binary probit models was assessed as 87.10%. The estimated elasticity values and standard errors of the factors affecting the e-commerce usage of the women are presented in Table 4.

Table 4. Estimated elasticity values of the binary logit and binary probit models

Variables	Binary Logistic Regression		Binary Probit Regression		VIF
	Elasticity (%)	Std. Error	Elasticity (%)	Std. Error	
Survey year (reference category: 2014)					
2015	29.88	0.043	44.37	0.062	1.64
2016	50.31	0.041	72.94	0.059	1.70
2017	75.26	0.039	105.08	0.055	1.75
2018	101.54	0.038	139.60	0.055	1.75
Age (reference category: 65+ years)					
15-24 years	303.14	0.181	401.19	0.278	3.67
25-34 years	289.02	0.180	385.79	0.276	3.60
35-44 years	251.24	0.180	339.11	0.277	3.64
45-54 years	165.79	0.181	229.11	0.277	2.90
55-64 years	87.28	0.189	121.47	0.287	2.32
Educational level (reference category: illiterate)					
Primary school graduate	113.30	0.132	113.45	0.144	2.05
Secondary school graduate	192.08	0.132	198.98	0.143	2.12
High school graduate	266.15	0.130	286.39	0.141	2.08
University graduate	313.44	0.130	339.83	0.141	2.35
Employment status (reference category: unemployed)					
Paid/salaried/casual worker	36.07	0.028	49.84	0.037	1.36
Employer	88.78	0.126	114.11	0.152	1.02
Self-employed	63.56	0.082	79.89	0.099	1.01
Unpaid family worker	-37.45	0.093	-51.03	0.122	1.06
Income level (reference category: fourth level income)					
First level income	-95.04	0.040	-126.13	0.053	2.36
Second level income	-56.57	0.034	-74.19	0.045	1.91
Third level income	-43.59	0.030	-56.22	0.040	1.76
Region (reference category: TRA/TRB)					
TR1	20.45	0.052	28.99	0.070	2.04
TR2/TR4	17.19	0.053	25.56	0.072	2.15
TR3	18.36	0.055	26.98	0.074	1.87
TR6	21.62	0.055	30.62	0.075	1.79
TR5/TR7	4.86	0.052	8.84	0.070	2.16
TR8/TR9	13.53	0.056	20.29	0.076	1.90
TRC	-18.74	0.067	-20.43	0.092	1.65

Household size (reference category: 2 person or less)					
3-person	-20.38	0.034	-27.15	0.045	1.71
4-person	-42.67	0.035	-57.75	0.047	1.97
5-person	-56.84	0.044	-75.44	0.060	1.72
6 person or more	-95.33	0.052	-130.21	0.073	2.03

Source: Authors' calculations

[a]p<0.01; [b]p<0.05; [c]p<0.10

According to the values of the binary logistics and binary probit regression models given in Table 4, when the other variables were fixed, the expected possibility of e-commerce usage of a woman participating in the survey was 29.88% and 44.37% higher, respectively, in 2015 compared to 2014. Similarly, the expected possibility of the e-commerce usage of a woman participating in the survey in 2018 was 101.54% and 139.60% higher, respectively, than that of 2014.

The women in the 15-24 age group increased the expected probability of e-commerce usage by 303.14% according to the binary logistics model and 401.19% according to the binary probit regression model compared to the reference group (65+). Similarly, the expected probability of the e-commerce usage of the women in the 25-34 age group was 289.02% and 385.79% higher, respectively, and in the 55-64 age group was 87.28% and 121.47% higher, respectively.

The expected probability of the e-commerce usage of a woman who had graduated primary school was 113.30% higher according to the binary logistics model and 113.45% higher according to the binary probit regression model than that of the reference group (illiterate). Similarly, the expected probability of the e-commerce usage of a woman who had graduated secondary school was 192.08% and 198.98% higher, a woman who graduated high school was 266.15% and 286.39% higher, and a woman who had graduated university was 313.44% and 339.83% higher or even more, respectively.

The expected probability of the e-commerce usage of a woman working as a paid, salaried or casual employee was 36.07% higher according to the binary logistics model and 49.84% higher according to the binary probit regression model than that of the e-commerce usage of an unemployed woman. The expected probability of the e-commerce usage of a woman who was an employer was 88.78% and 114.11% higher, respectively, and the expected probability of the e-commerce usage of a self-employed woman was 63.56% and 79.89% higher, respectively. The expected probability of the e-commerce usage of an unpaid family worker was 37.45% and 51.03% lower, respectively, than that of an unemployed woman.

The expected probability of the e-commerce usage of a woman of the first level income was 95.04% lower according to the binary logistics model and 126.13% lower according to the binary probit regression model than that of a woman of the fourth level income. The expected probability of the e-commerce usage of a woman of the second level income was 56.57% and 74.19% lower, and the expected probability of e-commerce use of a woman from the third level income was 43.59% and 56.22% lower, respectively.

The expected probability of the e-commerce usage of a woman living in the TR1 region was 20.45% higher according to the binary logistics model and 28.99% higher according to the binary probit regression model than that of the reference

group (TRA/TRB region). Similarly, the expected probability of the e-commerce usage of a woman living in the TR2/TR4 region was 17.19% and 25.56% higher, and the expected probability of e-commerce usage of a woman living in the TR3 region was 18.36% and 26.98% higher, respectively. The expected probability of the e-commerce usage of a woman living in the TR6 region was 21.62% and 30.62% higher, a woman living in the TR5/TR7 region was 4.86% and 8.84% higher, a woman living in the TR8/TR9 region was 3.53% and 20.29% higher, respectively. The expected probability of the e-commerce usage of a woman living in the TRC region was 18.74% and 20.43% lower than that of a woman living in the TRA/TRB region.

The expected probability of the e-commerce usage of a woman living in a 3-person household was 20.38% lower according to the binary logistics model and 27.15% lower according to the binary probit regression model than a woman living in a household of 2 or less. The expected probability of the e-commerce usage of a woman living in a 4-person household was 42.67% and 57.75% lower, a woman living in a 4-person household was 56.84% and 75.44% lower and a woman living in a household with 6 or more people was 95.33% and 130.21% lower, respectively, than that of women living in a household of 2 or less. In other words, as household size increased the probability of the e-commerce usage of the women decreased.

Sample probabilities were also calculated from the estimated logistic regression model. According to the probability results of the study, considering the working women (earning a certain income) who participated in the survey from the TR1 region in 2018, it was observed that the probability of e-commerce usage of a woman in the 25-34 age group, at the 3rd income level and who is a primary, secondary, high school and university graduate in a 3-person household is 28%, 48%, 70%, and 82% respectively.

Similarly, considering working women (earning a certain income) who participated in the survey from the TR1 region in 2018, it was seen that the probability of e-commerce of a woman in the 25-34 age group, at the 1st income, 2nd income, 3rd income, and 4th income levels, and who are university graduates in 3-person household is 72%, 80%, 82%, and 89%, respectively.

Generational differences in e-commerce rates were also examined. There were also significant differences in e-commerce rates between generations. 29.56% of women surveyed in 2018 use electronic commerce (purchasing or ordering goods or services for personal use on the Internet). E-commerce rates in the Silent Generation (1928-1945), Baby Boomers Generation (1944-1964), Generation X (1965-1980), Generation Y (1981-1995) and Generation Z (1995-2009) were 0.55%, 6.26%, 22.23%, 48.11%, and 38.73%, respectively.

Model assumptions

One of the assumptions of the binary logistic regression model is the assumption of independence of errors. Essentially, this means that the observations should not be related to each other. That is, there should not be more than one simultaneous observation of the same statistical decision unit. Violating this

assumption causes overdispersion. Overdispersion is when the observed variance is greater than the expected variance (Field, 2009). Overdispersed models cause the standard errors to be biased. Therefore, standard errors that are not actually significant may appear to be significant. In the model, if the ratio of deviance and Pearson distribution statistics to degrees of freedom is greater than 1, there is overdispersion (Hilbe, 2009). Since the ratio of the deviance and Pearson statistics values to the degrees of freedom of the model obtained in this study was less than 1, there was no overdispersion (the ratio of deviance = 0.57; the ratio of Pearson = 0.84).

Another assumption of regression models is that there is no multicollinearity in the model. In the model, whether there was multicollinearity between the independent variables was examined. It is thought that those with variance inflation factor (VIF) values ranging between 5 and above cause moderate multicollinearity, while those ranging between 10 and above cause high degree of multicollinearity (Alkan & Güney, 2021). According to the VIF results given in Table 4, there is no variable that causes the multicollinearity problem between the variables.

Another assumption of binary logistic regression is that logit is linear with continuous independent variables (Hosmer & Lemeshow, 2000). If this assumption is not met, one of the solutions to be applied is to convert the continuous independent variables into ordinal scale variables and include them in the model (StatisticsSolutions, 2021). All of the variables included in the model in this study are categorical variables obtained with nominal or ordinal scales. When a categorical variable is included in the model, it is recoded as a dummy variable (Hosmer & Lemeshow, 2000). To observe the effects of the categories of all variables in the models, the ordinal and nominal variables were determined as dummy variables (Güney et al., 2022). Therefore, since all of the variables in the study are categorical, there is no need to look at this assumption.

Outliers should also be looked at in the analysis. Outliers are observations that do not fit the relationship being studied. Outliers in the analysis are found by examining the contribution of individual observations to a particular measure of fit and selecting those that contribute the least (Cramer, 2003). Examining residuals and outliers is an important way to evaluate the fit of a regression model. The residuals are the difference between the predicted and observed outcome of a model for each case. Cases with larger residuals are known as outliers (Long & Freese, 2001). The primary use of residuals is the detection of outliers (Christensen, 1997). Standardized residuals values are examined. Any case with an absolute value greater than about 3 can be an outlier (Field, 2009). In this study, models were obtained with 68,087 cases. The standardized residuals values of the predicted model were calculated. It was determined that there were 806 cases with an absolute value above 3.

5. Discussion and Conclusion

The internet, which, in recent years, has been improving and gradually increasing its popularity, has formed an environment of interaction. As a result of this environment, the internet now dominates many areas and plays a crucial role in the operation and perception of the economy. The developing internet has built

an unlimited universe for its users and contributed to its growth by providing a new dimension in various areas. Among the more particular uses of the internet are social networks and e-commerce (Serrano-Cinca et al., 2018).

The world economy is passing through a period in which the internet is widely used. The e-commerce platform, which became popular in this period, has created changes in the traditional business model with its advantages such as low cost, high efficiency, and wide product range, while establishing a wide communication network between manufacturers and consumers. E-commerce, which has an important place in the development of countries, is accepted as one of the strongest industries of the world economy (Tang & Zeng, 2021). E-commerce is a new-age technology with which potential buyers and sellers can meet. It is one of the means of purchasing goods and services that are frequently used in Turkey as well as around the world. In this study, e-commerce was assessed in terms of buyers (individual) and the factors that are considered to affect the e-commerce usage of women. In addition, this study determined that the variables of survey year, age, region, job status, educational level, income status, and household size were effective in the e-commerce usage of women.

Gender differences in traditional trade and online trade have been tried to be determined. E-commerce provides a more comfortable and enjoyable shopping environment than traditional commerce. In countries with a higher female population, this situation indicates that e-commerce will be adopted more (Srite & Karahanna, 2006). It was determined that female consumers tend to pay more attention to visual elements and product features on their purchasing decisions. This situation indicates that women behave differently from men in some aspects (Chetioui et al., 2020). One of the factors affecting these behavioral differences is the cultural structure of the society in which female consumers live. The shopping tendencies of women in a society with a restrictive culture may differ from those of women in more liberal societies. For example, in a restrictive society like Saudi Arabia, online shopping can give women more control over their shopping behavior and provide a means to express their attitude towards restrictions by purchasing clothes abroad (Roper & Al-Kahifah, 2020).

According to the results of the study, the education level of the women was an essential factor that influenced their e-commerce usage. It was determined that as the level of education of the women increased, the probability of their e-commerce usage also increased. Education is an obligatory reason for online shopping (İlhan & İşçioğlu, 2015).

Another variable that was determined to influence the e-commerce usage of the women was age. It was concluded that younger women were more inclined to use e-commerce and the probability of using e-commerce decreased as the age of the women increased. It is predicted that young individuals acquire computer skills faster than older individuals. The internet skills of younger individuals make it easier to use e-commerce sites for product purchases (Ayob, 2021). Elderly individuals do not regret their spending and have a high risk aversion tendency, so they stay distant until they trust the quality of the e-commerce site (Chiu & Cho,

2019). For this reason, in some studies, age is included as a variable in the examination of online shopping behavior and is considered as an important factor in explaining an individual's decision to adopt e-commerce (Ayob, 2021; Dębicka et al., 2019). It was observed that older consumers tend to shop at brick and mortar shops, as their trust level in digital platforms is much lower than younger consumers, based on the generations that make up certain age groups, their needs and behaviors. Generation Y consumers growing up in a technological age are easier to make decisions than Generation X users (Černiauskaitė et al., 2020).

Online retailers should focus on the individual characteristics of consumers when developing their marketing strategies. For example, the young population (15-24), constituting approximately 13 million of Turkey's population of approximately 84 million, constitutes the potential customer profiles of retailers. Studies show that the young population has the potential to shop more online than the elderly population. Turkey's young population ratio also creates a great opportunity for retailers to enter existing or potential domestic and foreign online markets (Ergin & Akbay, 2008).

The income level of the women was also found to influence the usage of e-commerce. It was determined that the probability of using e-commerce decreased as the income level decreased. E-commerce can be significantly affected by the financial status of the consumer as income is essential for e-commerce. There are many studies in the literature that support this fact (Serrano-Cinca et al., 2018).

In the present study, it was found that the employment status of the women influenced their usage of e-commerce. E-commerce requires buyers to have an income, which in turn requires them to have a job.

An important advantage of online shopping is the ability to reach the desired goods and services at any time without time constraints. Due to the fact that women have various roles in society and their participation in the labor market is increasing, they need goods and services that will improve the conditions in their daily lives. This is why the trends are increasing from traditional shopping to online shopping. The orientation of women to online shopping contributes to the growth of online shopping and the development and change of the job market. These emerging developments require retailers to develop their marketing strategies by taking into account the expectations of consumers (Ergin & Akbay, 2008; İlhan & İşçioğlu, 2015). There are many studies proving that online shoppers are relatively young, well-educated, and belong to the middle and upper income groups (Ergin & Akbay, 2008). Although women shop less online than men, they have more growth potential than men in using online shopping (Akhlaq & Ahmed, 2016). This presents a new and growing market potential for retailers.

One of the exceptional results obtained in the present study was the fact that household size influenced the usage of e-commerce. It was determined that as household size increased, the women were less inclined to use e-commerce. Similar results have been reported in the literature (Brown & Venkatesh, 2005).

Another essential variable influencing e-commerce was the region where the individual participating in the survey resided. It was determined that the women residing in regions with a high development level were more inclined to use e-

commerce. Turkey is a rapidly developing country. Its developing economic structure and socio-demographic structure has led to an intense urbanization. The rapid increase in the rate of urbanization has increased the public's interest in consumption and has made it difficult for consumers to be satisfied. For retailers, realization and comprehension of the difference between urbanized and less urbanized regions and their efforts to improve themselves will increase their competitiveness (Cengiz & Ozden, 2002).

A more prevalent use of e-commerce can be provided by analyzing the responses of customers to e-commerce shopping applications in detail and by using different methods. In accordance with the results of the present study, it is suggested that users should be informed and made aware of the usage of e-commerce. Additionally, to improve the use of e-commerce for both individuals and businesses, it is suggested to eliminate internet problems, extend networks and decrease costs. Ultimately, training systems must be revised in order to train prospective information technology workers.

Female customers grow with different needs at different stages, so companies particularly targeting female groups should consider personalized services that combine user features (Yin et al., 2014). During the shopping act, consumers make some preferences. These preferences vary from consumer to consumer. Determining these differences and consumer orientations is important for retailers (Sarkar et al., 2019). This study is expected to be useful for creating a better image about the consumption and behavior patterns of female consumers and a guide for retailers. Understanding the behavior of women in clothing shopping will provide great benefits for retailers, as women shop for clothing both for themselves and for men (Edirisinghe et al., 2020). Women are more emotional than men. In addition, women are more motivated by social interaction and perceive greater risk (Bhatt, 2019). Considering these individual differences in explaining the online purchasing intention of female consumers can provide a better understanding of users' adoption of the Internet as a shopping and transaction channel. Considering individual differences, it can increase the e-retailer's market targeting and segmentation effectiveness (Gong et al., 2013).

Estimating e-commerce adoption among consumers requires discovering not only who the customer is, but also where the customer lives (Ayob, 2021). This study is expected to help evaluate women on a regional basis and promote the use of e-commerce in regions with low population of female consumers. Because women care about how they appear to others, they think that the product they buy is a tool that adds value to their status. A study shows that women care relatively more about income and consumption than men (Alpizar et al., 2005). Clothing has been evaluated as a tool that women use to bring themselves to the fore of society. The fact that women's clothing consumption is so strong arises from their diversity and emotional values more than their aesthetic understanding (Millan & Wright, 2018). Service providers who are aware of this situation use marketing strategies that appeal to female consumers. E-commerce provides great convenience to marketers at this point. This is an important clue to marketers to find out the e-commerce profiles of female consumers in Turkey. To continue to appeal to female

consumers, they can market their products to use status-enhancing creatives. It is also necessary to implement new ways to attract consumers, such as continuous promotional offers with a purchased product (Chiu & Cho, 2019).

In 2011, 50.2% of Turkey's population was comprised of men and 49.8% (37,191,315 people) women. In 2020, 50.1% of the population is men and 49.9% is women. The increase in the female population compared to the male population in Turkey in recent years makes it important for online retailers to explore the difference between men and women so that they can formulate a different strategy for each of these consumer groups.

This study had several limitations. Firstly, the data applied in the study were secondary data. Thus, the variables required for the statistical analysis consisted of the variables in the dataset. Secondly, as the data were cross-sectional, it was not possible to obtain a definitive causal relationship with the e-commerce usage of women. Thirdly, the data obtained in the study consisted of the responses of the women. Hence, the data obtained in this data collection method may be biased.

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