Determinants of e-commerce development in the regions of Kazakhstan

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ZHOLAMANOVA, Bakyt

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Zholamanova Bakyt (MPP-2022, Kazakhstan)

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LIST OF ABBREVIATIONS

GMM	Generalized method of moments
UNCTAD	United Nations Conference on Trade and Development
OECD	The Organisation for Economic Co-operation and Development
WTO	World Trade Organization

Chapter 1: Introduction

1.1. Background and Objective of the Study

In recent years, due to globalization and advanced digital technology, the global electronic commerce (e-commerce) market has expanded quickly, and this trend is going to continue (World Trade Organozation, 2018). According to the World Bank, e-commerce promotes global integration and has the potential to be a significant driver of economic growth since it allows users to overcome geographic barriers, reduce search and transaction costs, and enable SMEs to access new markets (2019). As Berger notes, e-commerce today is "one of the last areas where businesses can gain an advantage and a place for future global competition." (2008, p.670).

To begin with, the broad definition of electronic commerce is “the production, marketing, sale, and/or delivery of goods and services through electronic channels” (World Trade Organization, 2018). However, "generalized e-commerce" is the term for conducting business using various electronic tools (Chen & Sun, 2017). The thesis employs the term of generalized e-commerce.

According to numerous studies, the regional retail industry has been significantly impacted by the growth of online shopping, consumer landscape, logistics system, and transportation geography. For example, a study from China showed that freight volume changed in response to changes in e-commerce transaction volume. This in turn led to the development of logistics in the region because the most important factor for logistics development is freight volume (Tang & Wang, 2020). Equally important, e-commerce has a significant impact on retail services. As is well known, the majority of street retail business owners view digital commerce as a "potential danger" to their industry. However, for traditional Italian retailers, e-commerce has developed into a useful tool for creating a showcase and reaching more people (McKinsey, 2020).

Developing countries have huge potential for e-commerce development (World Bank, 2019) since the scope to maximize efficiency and boost productivity is much bigger in developing countries (Constantinescu, 2011). Moreover, according to Roland Berger's research, 97% of

worldwide population growth is taking place in developing countries (2015), which means they will account for the largest part of consumption in the future.

However, while the majority of people in developed nations now shop online and reap profits, this is still not the case in most developing countries, such as Kazakhstan. This is mainly due to the digital divide and poor infrastructure. Nonetheless, a recent UNCTAD report revealed that the adoption of e-commerce in most developing countries is low, even though businesses have a comparatively high Internet access rate (2004). Furthermore, the absence of personal interaction hinders the advancement of e-commerce, particularly in developing nations, where consumers prefer closer connections with their vendors (Lawrence, 2002). Interestingly, this trend is common in regions with a high rate of older people. It appears that online shopping usage is currently shaped not only by the availability of computers and the Internet but also by local contextual factors and demographic characteristics. Besides having Internet accessibility, e-commerce development requires the ability to manage or operate in an online environment, the capacity to identify business opportunities, and the courage to experiment and invent.

Kazakhstan is the largest country in Central Asia and the ninth largest in the world. The population of Kazakhstan is roughly 18.2 million (World Bank, 2020) and women make up 51.4% of this number while men make up 48.6% (McLaughlin, 2018). At the beginning of 2022, 42.0 per cent of people lived in rural areas, and 58.0 per cent lived in urban areas (Datareportal, 2022). According to the administrative-territorial structure, the country is divided into 14 regions and three cities of national importance (Astana, Almaty, and Shymkent). These cities have a special status and are considered to be of national importance, which suggests that they may have different economic, cultural, and social characteristics compared to the other regions. Therefore, it is important to consider these three cities separately in addition to the 14 regions when studying e-commerce development in Kazakhstan.

Moreover, it is ranked 52nd out of 176 countries in the Information and Communication Technology (ICT) Development Index (ICT, 2017) and has nearly all of its residents online (86% in 2022). The index includes four metrics: the percentage of people using the Internet, the postal reliability index, the quantity of secure Internet servers per one million users, and people with bank accounts who are at least 15 years old (as a percentage). At this point, Kazakhstan has significant growth potential in e-commerce, driven by its large and growing population, supportive government policies, the advancement of transportation and logistics infrastructure, as well as the increasing acceptance and digital technologies use. In terms of state support, the government has developed and approved the roadmap for developing electronic commerce in 2018–2020. To carry out these directives, the Tax Code of the Republic of Kazakhstan established legal definitions for the terms "e-commerce of goods," "online store," and "Internet marketplace" in 2018. Moreover, to establish a successful business environment and stimulate the development of e-commerce trade, legal entities, and individual entrepreneurs are exempt from paying corporate and individual income tax until 2023 (Zhanbozova et al., 2021).

Although it has been several decades since online shops first emerged in Kazakhstan, the industry is still undeveloped and uneven (Zhanbozova et al., 2021). By the end of 2021, Kazakhstan's e-commerce sector accounted for 11 per cent of the retail industry; whereas, other countries, including China and the UK, had an e-commerce sector share of 30 per cent or higher (PricewaterhouseCoopers, 2022). Moreover, despite the growth in e-commerce less than 7 per cent of the population is shopping online.

It is well known that people's demographic characteristics influence them before they demonstrate certain behavior (Zhang, 2005). As a result, demographic characteristics may also play a role in consumer confidence in online shopping in Kazakhstan. For example, older consumers may be less familiar with online shopping and more hesitant to trust unfamiliar online retailers, while younger consumers may be more tech-savvy and more likely to shop online. Similarly,

consumers with lower levels of education or income may be less likely to have access to reliable Internet connectivity and online payment options, which could limit their ability to shop online and decrease their confidence in the process.

Regional variations in these factors may also exist in Kazakhstan, depending on factors such as population density, urbanization, level of education, and income. Therefore, it is interesting to research how different demographic groups use e-commerce differently in a variety of ways. However, despite the variety of previous findings regarding the demographic determinants of e-commerce adoption, many of them used data from developed countries, whereas only a few pieces of literature can be found in Kazakhstan or Central Asia (Samadi, Gharlegh & Syrymbetova, 2015; Karimov, 2011). Furthermore, the majority of previous research methodologies are still at the qualitative level (Toleuuly et al., 2020; Barykin et al., 2021). This study sought to fill these gaps by determining the demographic factors affecting e-commerce development in the regions of Kazakhstan. The findings of this study may serve as a policy implication regarding e-commerce development for other developing countries. The underlying issue of e-commerce will be addressed by providing answers to the following key question:

Do demographic characteristics affect e-commerce development among different regions in Kazakhstan?

To answer this question, the researcher will quantitatively investigate the impact of demographic determinants such as the percentage of the urban population, income, education level, gender, and the ratio of youth population on per capita regional e-commerce sales by using cross-sectional data from the National Bank and Kazakhstan National Bureau of Statistics from 2019 to 2021.

The author hypothesized that the ratio of urban population is positively correlated with e-commerce development. This is because consumers in more urbanized areas typically have greater access to online shopping options, as well as reliable Internet connectivity and delivery systems.

This can increase their confidence in e-commerce and make them more likely to adopt it as a shopping method. In addition, urban areas have higher population densities than rural areas, which means that e-commerce businesses can reach a larger customer base more easily. This can lead to greater competition in the e-commerce market, which in turn can drive innovation and growth. Therefore, the hypothesis is that e-commerce development will be higher in regions with a higher ratio of the urban population compared to regions with a higher ratio of rural areas.

The author hypothesized that higher levels of income would be positively correlated with e-commerce development, as consumers with higher incomes may have greater access to reliable Internet connectivity, smartphones, and other digital devices needed for online shopping. Additionally, they may be more likely to have credit cards or other forms of online payment methods, which can facilitate e-commerce transactions. On the contrary, individuals with lower income levels may have restricted access to these resources, which may hinder their capacity to participate in e-commerce and reduce their trust in the process.

The author hypothesized that higher levels of education may positively correlate with e-commerce development. This hypothesis is based on the idea that individuals with higher levels of education may be more familiar with technology and have more experience using digital devices, which can make them more comfortable with e-commerce platforms.

It is important to note that gender may also play a role in e-commerce development, but the direction of the correlation may vary depending on cultural and social norms. For example, in some societies, women may have less access to digital devices and online platforms due to gender disparities in education and employment. In other cases, women may be more likely to engage in e-commerce due to social and cultural norms that prioritize convenience and household management. The author hypothesized that gender (the ratio of females) has a positive correlation with e-commerce development in the Kazakhstan case. The hypothesis is based on the assumption that in Kazakhstan, women often play a significant role in managing the household and caring for family

members. As a result, women may have less time to go shopping in physical stores due to their household and family responsibilities, and therefore turn to e-commerce as a more convenient option.

The author hypothesized that a high ratio of the youth population has positive relationship with e-commerce development. The hypothesis is founded on the premise that the younger generation is generally more knowledgeable about e-commerce and may assist their parents in online shopping. This may lead to increased e-commerce adoption and growth in regions with a higher proportion of young people, as they can serve as a bridge between older generations and the digital world.

The structure of the paper goes as follows: firstly, it introduces background information about e-commerce, and then it proceeds with a discussion of existing literature. The methodology, findings, and conclusion are presented in the second part of the paper. Finally, key ideas and findings will be summed up, and policy recommendations will be made for other policymakers regarding e-commerce development.

1.2. Literature Review

Research on the relationship between urban population and e-commerce development:

The proportion of the urban population is a significant determinant in the progress of e-commerce (Wassem et.al., 2018). As Tie, Zhao, and Dai (2017) pointed out, e-commerce consumption was greater in urban areas compared to rural areas. This conclusion might be biased by the nature of urbanization; urban areas tend to have better access to digital technology, including devices and Internet connectivity. This makes it easier for urban consumers to access e-commerce platforms and complete transactions (Badircea et al., 2022). Additionally, urban consumers may be more likely to trust e-commerce platforms compared to their rural counterparts.

This may be due to greater exposure to e-commerce platforms and greater familiarity with buying things online (Waseem et. al., 2018).

As opposed to that, the proliferation of technology and Internet connectivity in rural regions has created fresh avenues for e-commerce to expand its reach to a broader demographic. This has the potential to increase sales and revenue for online businesses, as well as provide access to products and services for rural populations who may have limited options in their local area. This conclusion was confirmed by a study from the Netherlands, which demonstrated a greater tendency to shop online in rural areas with limited access to physical stores because online adoption makes a wider range of stores more accessible to consumers (Farag, Weltevreden & Oort, 2006). Furthermore, a study of 145 countries discovered that the impact of urban population is not as significant as other factors (demographic variables) considered (Tarafda & Vaidya, 2006). These studies are in line with a study from Italy, which claims that compared to non-urban consumers, urban consumers use the Internet much more frequently; however, the size of the city has little impact on the use of e-commerce (De Blasio, 2008). It means the number of people in a city is not the deciding factor when it comes to the adoption of e-commerce.

However, urban areas generally have greater access to technology, infrastructure, and a higher population density, which are factors that are often associated with higher levels of e-commerce development. So, the author proposed the following hypothesis:

Hypothesis 1 (H1). There is a positive relationship between per capita regional e-commerce sales and the urban population.

Research on the relationship between income and e-commerce development:

Income and e-commerce use are two factors that are closely related. This is because higher-income individuals have more resources to invest in the necessary technology, such as computers and smartphones, as well as reliable Internet connections. As the income level of a population increases, so does its willingness to engage in e-commerce (Unver & Alkan, 2021). This could be

explained by that high-income individuals often have busier schedules and less time to physically go to stores. This makes online shopping a more convenient option for them. This can be seen in countries such as India and China, where the rapid growth of e-commerce has been driven by rising incomes and increasing access to technology (Kinda, 2019).

Previous research reports have examined the role of income in e-commerce development in different countries. For example, Vicente (2015) pointed out that individuals are more inclined to utilize e-commerce as their income levels increase. This conclusion is based on the fact that higher-income people might want to save time through online shopping because time is more valuable to them. In addition, in-home shoppers tend to be higher earners, even before online shopping became widely popular (Darian, 1987).

Because they are less tolerant of financial loss than people with high incomes, low-income people approach online shopping with caution and suspicion (Popovic, 2018). Even if the payment system and returns policy are well established, poor people may still approach online shopping with suspicion (Raymond, 2015). This is because poor people may have limited financial resources and may be hesitant to risk losing their money on a purchase that they are not sure about. They may also be wary of scams and fraudulent websites that can be difficult to identify, especially if they are not familiar with online shopping. Moreover, poor people may also face challenges in terms of access to information and education about online shopping. They may not be aware of the resources and tools available to them to help them shop online safely and securely.

It means that people with low socioeconomic status tend to do less online shopping than richer people. In addition, research conducted in New Zealand revealed that people trust online sales more when their income is higher (Smith et al., 2008). Since low-income individuals are less likely to recognize the advantages of sending personal and credit card information online and more likely to recognize the risks (Miyazaki & Fernandez, 2001). They may prefer to pay in cash rather than send personal information. Thus, the author posits the following:

Hypothesis 2 (H2). There is a positive relationship between per capita regional e-commerce sales and higher income.

Research on the relationship between education level and e-commerce development:

There is a strong relationship between education level and e-commerce development. A study from China indicates that 72 per cent of people with universities and higher education shop online, compared to only 36% of those with a high school education (World Bank, 2019). This idea was supported by Tarafdar (2006), who observed that a lack of education and training had been noted as the main barrier to adopting e-commerce. Higher education increases a person's knowledge, experience, and risk tolerance, which increases one's desire to use online shopping (Awa et al., 2015). For instance, a study from Turkey assumes that the probability of using e-commerce increases as people's levels of education rise (Unver & Alkan, 2021). This finding is correlated with the Eurostat statement, which claims that when it comes to e-commerce, Internet users with higher education levels outperform those with lower education by 33 percentage points (Eurostat, 2020). This result is based on the results of the annual ICT survey on the use of information technology by households and individuals in the European Union (EU).

One of the best examples of successful e-commerce development is China. Since the emergence of e-commerce, rural China has also experienced some clusters of e-commerce activity, which are now referred to as "Taobao Villages." Taobao villages relate to rural areas in China that have experienced economic growth and development due to the growth of e-commerce, particularly through the online marketplace Taobao, which is owned by Alibaba. These villages are distinguished by an abundance of small and medium-sized enterprises that function in diverse sectors such as manufacturing, agriculture, and handicrafts, among others. With the growth of e-commerce, these villages have been able to sell their products directly to consumers, bypassing traditional supply chains and marketing channels. These villages are typically located in less developed regions of China. A recent study by the World Bank claims that the heads of e-

households in Taobao villages have higher levels of education than those of non-e-households (Luo & Niu, 2019). Furthermore, the possibility of the formation of Taobao villages is increased by a higher level of education within an administrative village or by a large population with secondary education (Jiaqi, Xiaoyong & Hongdong, 2019).

Nevertheless, a study from Nigeria showed that education has little impact on how people shop online (Mbah, Odike, & Akpan, 2019). This stance is justified by the idea that the Internet is becoming increasingly easy to use, so the level of education is becoming less important for online shopping. In addition, a study from the EU shows that the growth of e-commerce activity is negatively impacted by online shopping made by people with higher levels of education (Bădîrcea et al., 2021). Probably since higher educated people spend much less time online because of study or job pressure; therefore, their inexperience affects their consumer decisions.

Consequently, it is assumed the following:

Hypothesis 3 (H3). There is a positive relationship between per capita e-commerce sales and education level.

Research on the relationship between gender and regional e-commerce development:

Gender is a significant demographic variable that influences the willingness to make online purchases (Ayob, 2021). Certainly, both genders have approached shopping and the adoption of e-commerce from different perspectives, with different justifications and considerations (Hasan, 2010). Gender is assumed to have an impact on or even moderate how much and how frequently people participate in online activities (Wells & Chen, 1999). This result correlates with a study by Chou, Wu, and Chen (2011) which showed that male Internet users in Taiwan were more likely to shop online than female Internet users. In addition, a study from the USA showed that men are more likely than women to use e-commerce (Slyke et al., 2010).

Although, from a historical perspective, men were the early adopters of the Internet, women quickly caught up to them, and recently the gap has started to close (Hernandez et al., 2011). For

instance, when it comes to using the Internet for e-commerce, women have overtaken men from the standpoint of the diffusion of new technologies (Schimmel, Morris & Nicholls, 2001). Furthermore, according to the ICT report, just 1/5 of companies involved in offline trade are led by women, compared to 4/5 of small businesses involved in cross-border e-commerce (2019). It demonstrates that female entrepreneurs prefer to conduct business online. Still, in support of this positive relationship, a study of Southeast Asia's e-commerce development shows that women comprised 1/3 of sellers on the Lazada platform in Indonesia and 2/3 of the sellers in the Philippines. Further, in the Philippines and Indonesia, 74 per cent and 41 per cent, respectively, of e-commerce companies were run by women, who also held senior management positions or were elected to the board of directors. The majority of women who work in e-commerce are female, which suggests that women may be using these platforms to bring previously unofficial businesses into the formal economy (International Finance Corporation, 2021).

The following hypothesis was developed based on the findings from these works:

Hypothesis 4 (H4). There is a positive relationship between per capita e-commerce sales and the female ratio.

Research on the relationship between the ratio of youth and regional e-commerce development:

Youth plays an important role in increasing the business of e-commerce (Ayob, 2021). To begin with, for statistical purposes, the United Nations considers individuals between the ages of 15 and 24 to be "youth." In addition, the best way to describe youth is as a transitional stage between childhood dependence and adulthood independence (2021).

Although younger generations have grown up with technology, this does not necessarily translate into higher usage of e-commerce. Young people may have limited purchasing power, particularly if they are not yet employed or financially independent. This means that they may rely on their parents or guardians for financial support, and may not have the same level of disposable

income as older age groups. As a result, they may be less likely to participate in e-commerce activities, which could lead to a negative correlation between e-commerce and the youth population.

Moreover, it is incorrect to assume that younger people are already Internet savvy and older people are resistant (Zhang, 2005; Roussos, 2007). Many young people are not familiar with the Internet and technology, and many older people are experts in these areas. In addition, McCloskey (2006) concluded that age does not influence the volume of transactions or overall spending of online shoppers; rather, it only influences the initial decision to make an online purchase. It means that as people gain experience in e-commerce, their behavior becomes consistent regardless of age.

While many youths can not directly make online purchases, they have a major influence on their parents' purchases. This is especially true in households where parents seek input from their children before making a purchase, or where children are responsible for researching and recommending products to their parents. Research has found that children and teens can have a significant impact on family purchasing decisions, particularly for products related to entertainment, technology, and fashion (Shoham & Dalakas, 2003). In addition, evidence from China shows that younger people are more likely to shop and do business online, where the share of people shopping online between 16 and 30 years old was 60% (World Bank, 2019). Those numbers are explained by the fact that youth population representatives are typically those who are financially supported by their parents, so they are a worry-free population. Moreover, these individuals have excellent computer skills, and the capacity for multitasking, and have grown up in an electronic-heavy environment.

The following supposition is made as a result:

Hypothesis 5 (H5). There is positive a relationship between per capita e-commerce sales and the ratio of the youth population.

This paper attempts to fill a gap discovered through an analysis of the previous studies. There is no single study in Kazakhstan that studies the demographic determinants of e-commerce.

Therefore, this research aims to use the whole country's micro-data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan to analyze the correlation between urban population, income, education level, gender, the ratio of youth population and e-commerce development; particularly with a focus on the regions.

Chapter 2: Methodology

2.1. Data, Measure, and Variables

This study investigates e-commerce development determinants in the Kazakhstan region using panel data set analysis. Since data on Kazakhstan's e-commerce started to be gathered in 2019, the study's annual data covers the years from 2019 to 2021. Data were obtained from the Bureau of National Statistics database of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. Data from 14 regions (oblasts) and three major cities were chosen for processing using the principal component analysis principle.

Measure and variables:

Dependent variable:

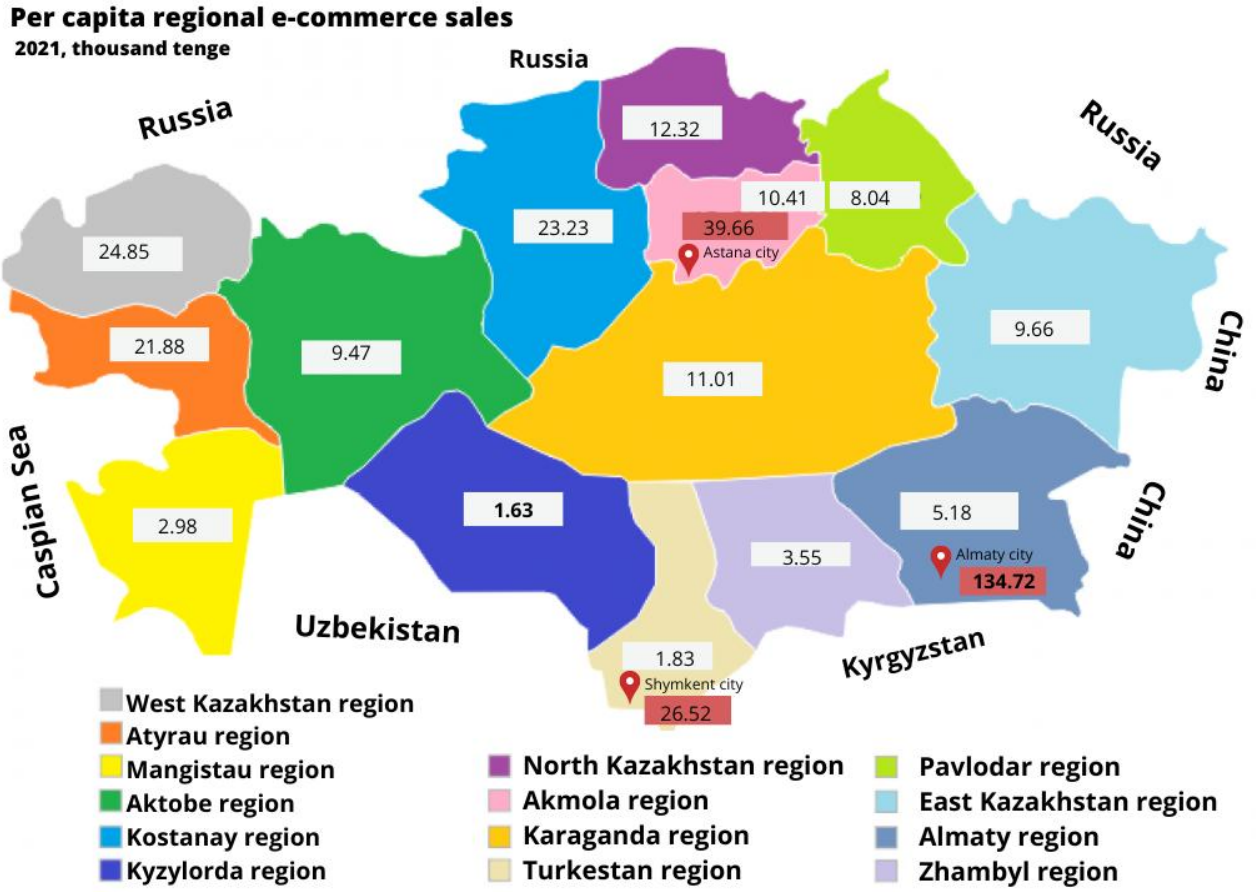
Identifying the determinants of e-commerce development in the regions of Kazakhstan is the study's primary objective. Consequently, this study focuses on per capita regional e-commerce sales. Compared to aggregate data, per capita data offers more detailed information. It is frequently used to make comparisons between nations or regions with various populations (Li, Cai & Cao, 2021). In this study, per capita, regional e-commerce sales are a variable that reflects the level of regional e-commerce retail sales divided by the regional population. This measure is utilized to assess e-commerce growth and patterns across distinct regions and to comprehend the purchasing behaviors and preferences of consumers in those regions. The per capita, regional e-commerce sales can also be used to identify areas that are growing in popularity and areas that may be struggling. For example, if a region has low per capita, regional e-commerce sales, it may indicate that the region is not as developed in terms of technology and online shopping, and may need more investment in these areas.

Table 1: Kazakhstan's per capita regional e-commerce

	Regions	2019	2020	2021
1	Akmola region	0.27	3.94	10.41
2	Aktobe region	0.69	2.98	9.47
3	Almaty region	2.70	3.14	5.18
4	Atyrau region	0.86	3.11	21.88
5	West Kazakhstan region	18.58	30.55	24.85
6	Zhambyl region	1.54	2.61	3.55
7	Karaganda region	5.91	23.63	11.01
8	Kostanay region	2.42	5.80	23.23
9	Kyzylorda region	0.45	1.93	1.63
10	Mangistau region	0.55	2.66	2.98
11	Pavlodar region	3.55	4.56	8.04
12	North Kazakhstan region	2.56	2.64	12.32
13	Turkestan region	0.30	0.88	1.83
14	East Kazakhstan region	1.51	3.61	9.66
15	Astana city	8.10	50.33	39.66
16	Almaty city	80.89	159.14	134.71
17	Shymkent city	3.29	11.61	26.52

Calculated by the author

Image1: Kazakhstan's per capita regional e-commerce (2021)



Made by the author

Independent variables:

The study's primary explanatory variables are the percentage of the urban population, the per capita disposable income, education level, gender, and the ratio of the youth population.

Percentage of urban population (X1): The percentage of the urban population is one of the main influences on e-commerce development. In general, urban areas have a higher concentration of Internet users, smartphones, and electronic payment systems, which are essential components of e-commerce (Espiritu, 2003). Additionally, urban areas tend to have higher disposable income and

a less educated population, which drives demand for online shopping (Mills & Whitacre, 2003). Therefore, the aim is to investigate if there is empirical evidence to support the hypothesis that e-commerce development is linked to urbanization. This will be done by examining the correlation between the percentage of urban population and e-commerce growth in the different regions of Kazakhstan.

Higher education (X2): Higher education is one of the main influences on e-commerce development because high education can shape values and preferences, leading to a desire for high-quality products and an emphasis on convenience and efficiency in their shopping experiences. For instance, Unver & Alkan (2021) determine that high education has significant effects on e-commerce adaptation in the regions of Turkey. Their findings indicate that people's propensity for online shopping increases with their level of education. For this study, the gross enrollment ratio (GER) in higher education will determine high education in regions rather than the number of students attending university (UNESCO Glossary). While the number of students attending university is also an important measure of higher education in regions, using the GER provides a more comprehensive and standardized measure of participation that accounts for a wider range of students and institutions. GER is a statistical measure that is used in the education sector and was formerly used by the United Nations to calculate the Education Index and Human Development Index. This ratio is used as an indicator of a country's educational participation and access and helps to assess the overall level of education in a country. A higher GER indicates that more students are enrolling in school or university, while a lower GER suggests that there are barriers to education access, such as poverty, lack of schools, or cultural attitudes towards education. Therefore, the gross enrollment ratio should be used as a predictor in the study.

Income (X3): Another key interest variable is income which is a factor that may promote or discourage consumers from using online shopping (Yol, Serenko & Turel, 2006). Hernandez (2010) used individual income as an independent variable to explain the discrepancy in the utilization of

e-commerce for making purchases based on income level. This study discovered that people with higher incomes use these platforms more frequently. However, a more accurate record of personal income will be used in this study, as per capita disposable income. The OECD identifies several sources of disposable income per capita, which include wages and salaries, income from self-employment and unincorporated businesses, income from pensions and other social benefits, as well as income from financial investments (2022). However, these sources of income are net of any payments made for taxes, interest on financial liabilities, as well as social insurance. Average per capita income will be used in the regression test analysis, which is calculated by dividing total income by the resident population of the region. It provides a measure of the average amount of money earned by each individual in the area. This statistic is useful for determining the economic well-being of a population, as well as the standard of living and purchasing power of the residents. It is also used as a measure of economic development, as countries with higher average per capita incomes are generally considered to be more economically advanced.

Gender (Female ratio) (X4): Gender is an important variable that retailers must consider when entering the e-commerce market, as it can have a significant impact on the level of interest, adoption, and customer experience of online shopping.

Recent studies reveal that women exhibit a greater inclination towards online shopping in comparison to men, and they prioritize websites with visually pleasing designs, unambiguous product descriptions, and dependable delivery alternatives. Moreover, women are more involved in e-commerce as sellers than as buyers (International Finance Corporation, 2021). Slyke et al. (2010) used ordinary least squares (OLS) regression to explain gender-based differences that influence intentions to use e-commerce in the USA. Following the study by Slyke, this study will employ OLS regression to compute an equation for the female population of the regions to determine whether gender is a significant predictor of e-commerce development. The “female ratio” refers to the proportion of women in a given population or market. In the context of Kazakhstan, it is still

true that women are largely responsible for the majority of childcare and housekeeping tasks. The author believes that many women in the regions of Kazakhstan are using e-commerce platforms to purchase household items, clothing, and other essentials. Therefore, this study should consider the female ratio, because comprehending the function of gender in e-commerce can facilitate the growth of e-commerce in these localities.

Youth population (X5): Age is a significant factor in determining whether or not a person adopts e-commerce. It is explained that each generational group has different attitudes, preferences, and values that ultimately influence purchasing behavior, including preferred shopping and purchasing methods (Parment, 2013). Young people, often referred to as "digital natives," are heavily involved in e-commerce and online shopping. They are comfortable with technology and the Internet and are the primary factors behind the expansion of e-commerce. Stafford et al. (2004) determine that youth are most likely to use the Internet and shop online. Therefore, the percentage of the youth population in the region should be considered a predictor to investigate in the study and to demonstrate causality between high regional per capita e-commerce sales and the percentage of the youth population in that region.

Control variables:

A recent study demonstrates that several industry structure characteristics may have an impact on the adoption of e-commerce (Gibbs, Kraemer & Dedrick, 2003). Reliable and fast Internet connectivity is essential for e-commerce to thrive, as it enables businesses to reach customers around the world and handle large amounts of data and transactions. The control variables considered in this study are significant factors that can impact the correlation between the independent and dependent variables under investigation. The control variables include the penetration rate of networks, the postal system, and the distribution level of bank cards.

Table2: Control variables descriptive statistics

(N=51)

	Internet penetration	Bank card distribution	Logistic
Mean	154.6314	2834.335	.8913
Sd	92.58495	3516.368	2.282678
Min	61.5	622.9	.015
Max	430.3	23505	9.357

Internet penetration: Network penetration is taken into consideration because it significantly affects the growth of regional e-commerce. Internet penetration refers to the number of people in a given population who have access to the Internet (Hamidi & Ariff, 2021). This is an important factor in the development of e-commerce because the more people who are online, the larger the potential customer base for online businesses. Internet users may either start e-commerce activities or participate in them as consumers. Therefore, the number of Internet users has a certain impact on e-commerce development. As an example, a study conducted on Taobao villages demonstrated a robust correlation between Internet penetration and the rise in regional e-commerce. (Chen & Sun, 2017).

A high Internet penetration rate allows more people to participate in online shopping, which drives demand for e-commerce businesses. This in turn creates opportunities for new businesses to enter the market and for existing businesses to grow and expand. Additionally, increased Internet penetration provides more opportunities for businesses to reach customers in new and innovative ways, such as through social media and mobile devices. Therefore, Internet penetration is used as a control variable. The more people who have access to the Internet, the greater the potential for e-commerce development and growth.

Logistics system: The area of the region divided by the length of the region's transportation line will be used to represent the logistics infrastructure factor.

The length of a region's transportation line is a crucial factor in its e-commerce development. A well-developed transportation network makes it easier for goods to be transported from one place to another, leading to an increase in the efficiency of e-commerce operations (UNCTAD, 2018). A longer transportation line means that a wider area can be covered, making it easier for businesses to reach more customers and expand their market reach.

Furthermore, a well-maintained and advanced transportation line can increase the speed of delivery, leading to faster and more reliable e-commerce services. This is crucial in the fast-paced digital world of today, where customers demand quick and efficient delivery times.

On the other hand, if a region has a limited or poorly developed transportation line, e-commerce businesses may face challenges in delivering goods to customers. This could result in longer delivery times, lower customer satisfaction, and ultimately, reduced sales. Therefore, it is crucial to add the length of the transportation line as a control variable.

The level of bank card distribution: Bank cards and e-commerce use go hand in hand. Bank cards provide a secure and convenient way for consumers to purchase goods and services online. With the rise of e-commerce platforms, more and more consumers are opting to shop online, and bank cards provide a safe and simple method of payment. The level of e-commerce is greatly influenced by the advancement of non-cash payment systems, primarily due to the widespread use of bank cards as the primary payment method for online purchases. Therefore, the study manages the distribution level of bank cards in various regions to control for its impact on the study's findings. The UNCTAD B2C E-commerce Index reported that the bank card penetration rate in Kazakhstan was estimated to be 64 out of 100 points in 2019. The study aims to evaluate the influence of bank card distribution on e-commerce growth, using panel data obtained from the

National Bank of Kazakhstan. The extent of bank card distribution will be represented by the number of bank cards within each region.

Table 3: Expected result:

Independent variables	**Definition**	**Expected sign**
Urban population	Percentage of the urban population in the regions	+
Education level	Regional gross enrollment ratio in high education	+
Income	Average per capita income is calculated by dividing total net income by the resident population	+
Gender	Percentage of the male and female population in the region	+
Youth population	Percentage of the population between 15-24 years old	+
Control variables	**Definition**	
Internet Penetration	Number of Internet users in the region	
Logistics system	The area of the region is divided by the length of the region's automobile transportation line.	

The level of bank card distribution	The number of bank cards in the regions	
Dependent variable	**Definition**	
Per capita regional e-commerce sales	The level of regional e-commerce retail sales is divided by the regional population.	

2.2. Methodological and Empirical Strategies

A statistical analysis method called regression analysis establishes relationships between independent and dependent variables in terms of quantitative analysis (Chen & Sun, 2017). The author will use multiple panel regression to test the correlation between these various factors to evaluate the five hypotheses, namely the correlation between urban population rate, income, education level, gender, youth population, and per capita e-commerce sales in the regions of Kazakhstan. As with Badircea et al. (2022), this paper employs the ordinary least squares (OLS) technique. According to the independent variable's reaction to a one-unit rise, OLS displays a coefficient that indicates an increase or decrease. Additionally, the study applies the Generalized method of moments (GMM) system. The GMM estimator performs better than the accumulated OLS estimator and conventional panel models with fixed and random effects. This is because the GMM estimator is a dynamic panel data estimator that takes into account both the cross-sectional and time-series dimensions of the data. The GMM estimator uses a system of equations to control for both individual and time-specific effects, leading to more accurate and robust results. This is in contrast to traditional panel models, such as OLS, which only control for cross-sectional effects and may not capture the dynamic nature of the data. Additionally, the GMM estimator is particularly

well-suited for datasets with endogeneity, such as e-commerce time series data, as it can correct for bias that may arise from omitted variables or reverse causality. This leads to more accurate and reliable estimates, making the GMM estimator a preferred method for analyzing e-commerce data.

The relationship between urban population, education level, income, youth population, and e-commerce was empirically examined by the author, based on panel data for 14 regions and 3 cities in Kazakhstan countries from 2019 to 2021. It is because data for regional e-commerce were available only for the 2019–2021 period. The Kazakhstan National Bureau of Statistics served as the source of all data.

To test the hypotheses for this study, the following regression equation is used:

$$EI(F)i,t = a + \beta\,1EI(F)i,t–1 + \beta 2X1i,t + \beta 3X2i,t + \beta 4X3i,t +$$

$$+ \beta 5X4i,t + \beta 6X5i,t + \beta 7X6i,t + \epsilon i,t,$$

where:

EI(F) - e-commerce development index;

X1 -per capita disposable income,

X2 - urban population,

X3- education level,

X4 - gender,

X5 - the ratio of the youth population

X6- dependent variables

i to index the regions

t to index time

Chapter 3: Results

Table 4: Descriptive statistics

(N=51)

	Ecom	Urban	Education	Income	Female	Youth
Mean	15.573	59.347	63.392	117694.6	51.322	11.955
Median	3.61	54.34	49.8	107202	51.46	12.03
Sd	30.672	24.428	47.729	42071.54	1.236	2.367
Min	0.27	20.09	12.76	52650	49.25	3.77
Max	159.14	100	204.64	251597	54.32	15.13
Skewness	3.444	0.333	1.515	1.117	0.320	-2.201
Kurtosis	14.924	2.243	4.788	4.068	2.764	8.882

Descriptive statistics were used in the analysis to determine each variable's statistics. The descriptive statistics of variables utilized in this study are presented in Table 2. It included the standard deviation squared of the mean as well as the mean of the data for the variable. This method of analyzing the mean and standard deviation of the data allowed us to gain a deeper understanding of the distribution of e-commerce usage. The mean represents the average value of e-commerce usage and gives us an idea of the typical level of e-commerce engagement among individuals. The standard deviation, on the other hand, provides information about the variability in the data. The square root of the mean is used to measure the standard error, which is a measure of the variability of the mean of the data. This information is important as it helps us understand how much the mean might differ from the actual population mean and allows us to make more informed conclusions about e-commerce usage patterns.

In our data, youth is negatively skewed, while all others are positively skewed. The distribution is right-skewed because it's longer on the right side of its peak and similarly left-skewed. Kurtosis is predicted to have a value of 3. A negative kurtosis will be indicated by a kurtosis of less than three. A negative kurtosis can have a value anywhere between -2 and infinity.

It is important to note that a negative kurtosis indicates that the distribution of the data is more platykurtic, meaning it has a flatter shape compared to the normal distribution, which has a kurtosis value of 3. This means that the data is spread out, with fewer extreme values and a larger proportion of data near the mean. On the other hand, a positive kurtosis indicates a leptokurtic distribution, meaning the data is more peaked, with a larger proportion of extreme values and a smaller proportion of data near the mean. So, the findings indicated that urban areas were extremely volatile during the study period.

Table 5: Correlation matrix results

	Ecom	Urban	Education	Income	Female	Youth
Ecom	1.0000					
Urban	0.5400	1.0000				
Education	0.7891	0.8661	1.0000			
Income	0.4054	0.3721	0.2919	1.0000		
Female	0.6321	0.6527	0.7104	0.2727	1.0000	
Youth	-0.1367	-0.2870	-0.1291	-0.2635	-0.0370	1.0000

Lastly, the correlation matrix revealed that except for Youth all variables correlate positively. With values above 0.5, the outcome demonstrates a strong correlation between the variables. So, a correlation of 0.78 and 0.63 between education and e-commerce usage and the female ratio and e-commerce usage, respectively, is considered a high correlation. A correlation coefficient of 0.78 and 0.63 means that there is a strong relationship between the two variables. In this case, it is proposed that individuals possessing advanced levels of education, as well as areas

with a larger percentage of women in the population, are more inclined to participate in e-commerce activities.

Table 6: Regression analysis

(N=51)

Variables	**E-commerce index Simple Regression without control (Model 1)**	**E-commerce index Simple Regression with control (Model 2)**	**E-commerce index Multiple Regression without control (Model 3)**	**E-commerce index Multiple Regression with control (Model 4)**
Urban	0.678** (0.236)	0.0624 (0.114)	-1.024*** (0.271)	-0.644** (0.215)
Education	0.507** (0.123)	0.305*** (0.073)	0.817*** (0.165)	0.518*** (0.142)
Income	0.000296* (0.0000135)	0.0000811* (0.0000317)	0.000183*** (0.0000495)	0.000105** (0.0000367)
Female	15.683** (4.999)	4.225* (1.584)	4.655* (2.041)	1.882 (2.035)
Youth	-1.771 (1.521)	-0.153 (0.434)	-1.727* (0.784)	-0.729 (0.615)
Control	No	Yes	No	Yes
R-Squared	0.060	0.270	0.510	0.640

*** p<0.01, ** p<0.05, * p<0.1

Note: Robust standard errors are given in parentheses. The control variables include Internet penetration rate, the level of bank card distribution, and logistic systems. Models 1 and 2 rely on simple regression analysis, with Model 2 incorporating control variables. Models 3 and 4 utilize multiple regression analysis, with Model 3 including regression analysis and Model 4 not including one.

Table 5 provides the results of the four regression models used to analyze the determinants of the development of e-commerce in the regions of Kazakhstan. Table 5 presents the regression results. Model 3 is a multiple regression with control variables. Model 1 model is a simple

regression without control variables, using only one independent variable. Model 4 is a simple regression with control variables. Model 4 is a multiple regression without control variables, which uses e-commerce index as dependent variable and the percentage of urban residents, the percentage of young people, education, population income, and the percentage of women in the regions as independent variables.

Model 4 represents a multiple regression analysis without control variables, utilizing the e-commerce index as the dependent variable as well as independent variables: the percentage of urban residents, young people, and women, education level, population income in each region. The table shows that the R-squared for the first model (simple regression without control variables) is 0.060, for the second model (simple regression with control variables) is 0.270, and for the third model (multiple regression without control variables) is 0.510, for the fourth model (multiple regression with control variables) is 0.640. This suggests that incorporating control variables enhances the explanatory capacity of the model. Overall, the R2 increased from 0.060 (Model 1) to 0.640, a significant improvement (Model 4).

The relationship between urban population and per capita e-commerce sales:

Table 5 shows that relationships between per capita e-commerce sales and the percentage of the urban population are significant when using simple linear regression (model 1). However, the results after adding control variables and using multiple regression instead of simple regression were different and showed a negative correlation between urban population and e-commerce development (model 4). This implies that e-commerce per capita sales are negatively impacted by urbanization. The outcome disproves earlier expectations, that regions with high urban populations should have more per capita e-commerce sales. Nevertheless, this outcome is in line with other research that determines that geographically remote consumers appear to benefit significantly from e-commerce because e-commerce adoption can provide consumers with access to a wider range of stores that may not be available locally (Farag, Weltevreden & Oort, 2006). In the case of

Kazakhstan, one explanation for the outcome is that Kazakhstan cities are known for their dense distribution network of effective supermarket chains and specialty shops. The dense distribution network of effective supermarket chains and specialty shops in the cities of Kazakhstan may provide individuals with easy access to a full range of retailers, making it less necessary for them to purchase goods online.

The relationship between education and per capita e-commerce sales:

According to the findings, a noteworthy positive correlation exists between high levels of education and e-commerce development. The regression coefficient reported a positive sign, indicating that an increase in the percentage of people with high education in the regions is linked to a rise in per capita e-commerce sales level. The regression coefficient of .51 indicates that per capita e-commerce sales in the region are expected to increase by .51 if the percentage of the population with high education increases by one per cent. This result supports the prior expectation, that regions with a high percentage of the population with high education should have a higher e-commerce development index. This result is supported by the study of Taobao Villages in China, where the heads of e-households in Taobao Villages have higher levels of education than those of non-e-households (Luo & Niu, 2019). This study indicates that high education correlates with e-commerce development. There are several reasons why this may be the case. Higher education levels are often associated with increased technological literacy, making individuals more comfortable and confident with using the Internet and technology for commerce purposes. Individuals with higher levels of education may also be more aware of the benefits and convenience of e-commerce, and therefore be more likely to adopt it.

The relationship between income and per capita e-commerce sales:

Surprisingly, Table 5 demonstrates that the growth of e-commerce is positively impacted by income, but this effect is not as strong as was expected before. This suggests that income level is not the primary determinant of e-commerce use in Kazakhstan's regions. This result does not

change even after adding control variables (model 4). The prior expectations were not fully confirmed by the result, according to which the regions with high incomes are more likely to use e-commerce than the regions with low incomes. A recent study showed that e-commerce growth is being driven by low-income consumers (Clarke, Thompson & Birkin, 2015). According to this study, 46% of e-consumers said that their household income or financial situations have gotten worse, and they are now consciously watching their spending and shopping online. As a result, this limited consumer group accounts for the majority of online shopping. This could be because the larger variety of products sold online today should have made e-commerce more appealing to low-income households. After all, online shopping reduces customer costs. Individuals with lower to middle incomes tend to utilize e-commerce platforms as a means of obtaining goods and services at a more affordable price. Online shopping provides customers with the convenience of comparing prices and finding the most attractive deals from the comfort of their own homes. With e-commerce, there are no transportation costs, no need to spend time and money traveling to physical stores, and a wider variety of products available to choose from. In addition, many e-commerce platforms offer promotions, discounts, and deals specifically targeted toward low- to mid-income consumers. Due to its affordability, e-commerce has gained popularity among low- to mid-income individuals who may face difficulties in accessing goods and services through traditional retail channels. This study indicates that a high-income level has a positive correlation with regional per capita e-commerce sales, but this correlation is not as strong as other variables.

The relationship between female ratio and per capita e-commerce sales:

To analyze the influence of gender, the paper used the ratio of the female population in the regions of Kazakhstan. The regression result in Table 5 reveals a strong positive correlation between the high female ratio and per capita e-commerce sales. When other factors are constant, a 1% increase in the proportion of women is predicted to result in a 1.88 increase in regional per capita sales.

The study findings support the prior hypothesis that gender positively impacts e-commerce development in the regions of Kazakhstan. Moreover, this result is consistent with some literature that shows that, while it has long been known that men use technology the most frequently, recent trends indicate that more women are utilizing online services like e-commerce platforms (Hernandez, Jimenez & Martın, 2010). In the case of Kazakhstan, it could be explained by traditions, women in Kazakhstan spend more time on domestic tasks than men. Nevertheless, most women are also economically active, thus leaving them with very little free time for shopping. So, women tend to have busier schedules and may not have time to physically go to a store. Online shopping allows them to purchase items at any time, from anywhere.

The relationship between the youth population and per capita e-commerce sales:

The paper uses the percentage of youth to analyze the impact of youth on e-commerce development in the regions of Kazakhstan. Even though the youth population chooses to interact, learn, have fun, and even date online, the expectation of our study that the region with a high youth population has a positive correlation with per capita e-commerce sales does not hold up to regression analysis. Table 5 shows that there is a negative correlation between the youth population ratio and per capita e-commerce sales in the regions. This suggests that the increase in the youth population by 1 per cent is expected to decrease the e-commerce index by 0.72.

There are some reasons why youth negatively affect e-commerce in the case of Kazakhstan: First, lack of spending power: youth in Kazakhstan are typically students or have low-income jobs and therefore have limited financial resources to spend on e-commerce. Additionally, most of the youth population is unable to make purchases on their own, and most purchases of goods or services are made with an adult present. Third, disinterest: some young people may not be as interested in e-commerce as older generations and may prefer to shop in physical stores or not at all. This lack of interest can negatively impact e-commerce revenue. Additionally, younger people may

be less likely to have credit cards or other payment methods that are commonly used for online transactions.

Table 6: Determinants of per capita e-commerce using one-step difference GMM

Cons	-213.1** (105.8)
Urban	-0.997*** (0.279)
Education	0.800*** (0.181)
Income	0.000190*** (4.81e-05)
Female ratio	4.585*** (2.186)
Youth	-1.721** (0.842)
Observations	51
AR(1)	0.298
Hansen	0.048

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

One-step GMM rather than two-step GMM is used in this study. One-step GMM is a method of estimating parameters in a Generalized Method of Moments (GMM) model using a single optimization step. In contrast, two-step GMM uses two optimization steps. One-step GMM is faster and simpler to implement compared to two-step GMM. Hence, the one-step GMM is preferred for its simplicity and speed of implementation.

According to Table 6, the female ratio (Female) is 4.585, and a favorable correlation exists between per capita e-commerce sales and the proportion of females. This suggests that there is a significant relationship between the proportion of females in a population and per capita e-commerce sales. Higher female ratios are positively correlated with increased e-commerce sales, indicating that women may be more likely to engage in online shopping than men. This could be

due to a variety of factors, such as a greater interest in shopping and convenience, access to technology, or more flexible lifestyles that allow for online shopping. Additionally, the result shows a high correlation between high education and per capita e-commerce sales, with a value of 0.800, suggesting that higher education levels increase a person's probability of participating in e-commerce activities and are therefore contributing to the growth of e-commerce sales in the regions of Kazakhstan. This highlights the importance of education in driving the adoption of technology and digital commerce. The result supports previous findings and reinforces the validity of the methodology used in the OLS analysis.

Chapter 4. Conclusion and Implications

4.1. Summary

Demographic determinants play a significant role in shaping the growth and development of e-commerce. The following are some of the key demographic determinants affecting e-commerce development: Location (urban or rural): the location of the users affects their purchasing behavior and preferences, as well as their access to technology and Internet connectivity. Income: income levels impact the spending capacity and purchasing behavior of the target audience and help e-commerce businesses determine the price range of their products. Education: education level affects purchasing behavior and the ability to understand and use technology, which is crucial in e-commerce. Gender: due to its impact on the intended audience's purchasing habits and preferences, gender is important in e-commerce. Age: the age of the target audience plays a crucial role in e-commerce development as it determines their buying habits, preferences, and technology usage patterns. Therefore, demographic determinants contribute significantly to the development of e-commerce by providing valuable information for market segmentation, consumer trends, targeted advertising, personalized experiences, and product development. This study sets out to analyze the demographic determinants of e-commerce development in the regions of Kazakhstan. It also focuses on the main question: Do demographic characteristics affect e-commerce development among different regions in Kazakhstan?

Although the results went as the author had initially predicted, more people engage in e-commerce in regions that have a high female ratio, a higher level of education, a high urbanization rate, and a higher salary. The study's findings indicate that regions with a greater percentage of females and higher levels of education have more advanced e-commerce implementation. This statement is accurate. The study's result shows that gender and education have a strong positive correlation with e-commerce adaptation in the regions of Kazakhstan. The possibility of using e-commerce in the regions has been found to increase as people's education levels rise. Our findings

show that the more educated a person is, the more likely they are to shop online because educated individuals are more likely to be tech-savvy and confident in their ability to navigate the online shopping experience. This measurement is used to analyze regional differences in e-commerce growth and patterns as well as consumer preferences and purchasing habits. Furthermore, the study has shown that regions with a higher ratio of women tend to have a higher adoption rate of e-commerce.

Infrastructure and e-commerce behavior are two significant but independent research themes, and this study builds a conceptual bridge between them. Although infrastructure and regulation are critical factors that shape the e-commerce industry, education directly influences individual behavior and decision-making processes when it comes to online shopping. It provides users with the knowledge and skills to effectively utilize the resources and opportunities available in the online world, leading to more confident and informed purchasing decisions. The study emphasized that these demographic attributes are equally crucial as infrastructure in encouraging consumer adoption of e-commerce. In addition, while infrastructure and regulation play an important role in establishing the foundations of a secure online shopping environment, they do not directly address the psychological barriers that prevent people from shopping online. It is well known, that people with low levels of education are known to be more cautious when sending sensitive information online (Ball, Ramim & Levy, 2015), which slows the growth of e-commerce. Thus, building trust in online shopping is crucial for its widespread adoption. If consumers perceive a sense of security and assurance in the digital shopping encounter, they are more prone to engage in online shopping. This trust can be developed through education, by providing information on how to securely transact online, the rights of consumers in online shopping, and how to identify and avoid scams. Moreover, education can also promote the benefits of online shopping, such as convenience, variety, and price competitiveness. Encouraging positive attitudes towards online shopping will further increase trust and drive adoption. From there, the author suggests that policies

intended to encourage people to shop online should focus on developing favorable socio-values in relation to online business, like trust through education, rather than external and tangible factors such as infrastructure and regulation.

4.2. Policy Implication

Policymakers, especially in the regions of Kazakhstan, should be aware that not all customers are utilizing e-commerce platforms to their full potential, but rather a specific type, namely those who are wealthier, educated, and female. In some ways, this profile suggests that it is true that residents of more developed countries tend to have higher levels of education and disposable income, which can influence their online shopping experiences. This ought to serve as a warning to local decision-makers and entrepreneurs to actively and persistently close the development gaps among the people who make up the nation. Policymakers can use this information to develop targeted policies aimed at promoting e-commerce adoption and use among other customer groups, such as lower-income individuals, those with less education, and males.
For example, policymakers could initiate consciousness-raising initiatives that enlighten the public on the advantages of e-commerce and how to utilize e-commerce platforms. They could also develop programs that provide training and support to individuals who may not be familiar with online shopping. Additionally, policymakers could consider initiatives that incentivize e-commerce adoption among underrepresented customer groups, such as providing subsidies for e-commerce transactions or reducing the costs of delivery.

By considering the demographic factors that influence e-commerce adoption and use, policymakers can develop policies that better address the needs of all customer groups and promote more widespread e-commerce development in the regions of Kazakhstan. Last but not least, efforts to encourage the use of e-commerce at the macro scale should not overlook the significance of

socio-cultural values. Local governments should work to promote positive values in society, such as trust and risk-taking.

4.3. Limitations of the study

Despite its contributions, it is important to consider this study's limitations and recommendations for future research. First, the data in this study only spans three years because e-commerce data collection in Kazakhstan only began in 2019. Even if it tested all 14 regions and three cities, it would still be considered a small sample size in comparison to other long-term periods of analysis. This restriction affects the applicability of our findings, especially since it prevents us from including a longer period of analysis. Second, our database only uses secondary data, which does not account for people's personalities. The fact that the study is based on secondary data means that it may not fully capture the individual experiences and perspectives of the people involved. Furthermore, personality can play a significant role in shaping a person's attitudes and behaviors toward technology and e-commerce. Incorporating personality traits in future investigations may lead to a more holistic comprehension of the elements that impact online shopping adoptation in these areas. Third, the study's sample size only includes individuals between the ages of 15 and 24, which is the youth population age range being considered. Nonetheless, according to other international studies, the typical e-commerce user is a young (aged 17–39), well-educated female, therefore, including this group in future research will provide a more comprehensive understanding of the current and future state of e-commerce and help businesses stay ahead of the curve in this rapidly changing industry. Next, household size, which is not included in the data set, may also have a big impact on e-commerce adaptation. Household size can play a crucial role in determining the level of e-commerce use in a household. A larger household size usually means that more people might have different needs and preferences, which might result in a higher demand for e-commerce services. So, by including household size in the data set, the

analysis could provide a more comprehensive view of the e-commerce market and the factors that influence its growth.

References

Awa, H. O., Baridam, D. M., & Nwibere, B. M. (2015). Demographic determinants of electronic commerce (EC) adoption by SMEs: A twist by location factors. *Journal of Enterprise Information Management*. 28(*3*), 326–345. *https://doi.org/10.1108/JEIM-10-2013-0073*

Ayob, A. H. (2021). E-commerce adoption in ASEAN: who and where?. *Future Business Journal*, *7*(1), 1-11. *https://doi.org/10.1186/s43093-020-00051-8*

Ball, A. L., Ramim, M. M., & Levy, Y. (2015). Examining users' personal information sharing awareness, habits, and practices in social networking sites and e-learning systems. *Online Journal of Applied Knowledge Management*, 3(*1*), 180-207.

Bădîrcea, R. M., Manta, A. G., Florea, N. M., Popescu, J., Manta, F. L., & Puiu, S. (2021). E-commerce and the factors affecting its development in the age of digital technology: empirical evidence at EU–27 level. *Sustainability*, 14(*1*), 101. *https://doi.org/10.3390/ su14010101*

Berger A. (2008). Commerce and the supply chain. Supply chains: breaking down old boundaries. Managing Supply Chains Management / ed. by J.L. Gattorna. - M.: Infra-M, 670.

Berger, R. (2015). 97% of population growth to be in the developing world. Consultancy.uk., 2015, June 24. Retrieved from: *https://www.consultancy.uk/news/2191/97-percent-of-population-growth-to-be-in-developing-world*

Barykin, S. Y., Smirnova, E., Sharapaev, P., & Mottaeva, A. (2021). Development of the Kazakhstan digital retail chains within the EAEU e-commerce market. *Academy of Strategic Management Journal*, *20*, 1- 18.

De Blasio, G. (2008). Urban–rural differences in Internet usage, e-commerce, and e-banking: evidence from Italy. *Growth and change*, 39(*2*), 341-367. *https://doi.org/10.1016/j.ijinfomgt.2006.08.001*

Constantinescu, A. (2011). The potential of e-commerce in developing countries; study case: Romania. *Annals of the University of Craiova, Economic Sciences Series*, *2*.

Chen, X., & Sun, Y. (2017). A study on regional e-commerce development in China and its influencing factors. In Wuhan international conference on e-business. Retrieved from *http://aisel.aisnet.org/whiceb2017/16*

Chen,T., Fenyo,K., Yang, S., & Zhang, J. (2018). Thinking inside the subscription box: New research on e-commerce consumers.
https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/thinking-inside-the-subscription-box-new-research-on-ecommerce-consumers

Chou, C., Wu, H.-C., & Chen, C.-H. (2011). Re-visiting college students' attitudes toward the Internet-based on a 6-T model: Gender and grade level difference. *Computers & Education*, 56 (*4*), 939-947.
*https://*doi: 10.1016/j.compedu.2010.11.004

Clarke, G., Thompson, C., & Birkin, M. (2015). The emerging geography of e-commerce in British retailing. *Regional Studies, Regional Science*, 2(*1*), 371-391.
https://doi.org/10.1080/21681376.2015.1054420

Data Reportal. (2022). *Digital 2022: Kazakhstan*. Retrieved from *https://datareportal.com/reports/digital-2022-kazakhstan*

Deputatova, E. Y., & Ilyashenko, S. B. (2017). New trends in consumer behavior: Economic and social aspects. *European Journal of Humanities and Social Sciences*, (2), 78-81.
https://doi: 10.20534/EJHSS-17-2-78-81

Darian, J. C. (1987). In-home shopping: are there consumer segments?. *Journal of retailing*, 63(2), 163–186.

Espiritu, A. (2003). Digital divide and implications on growth: Cross-country analysis. *Journal of American Academy of Business*, 2(*2*), 450-454.

Eurostat. (2020). *E-Commerce Statistics for Individuals*. Retrieved from:
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=E-commerce_statistics_for_individuals#Positive_correlation_with_the_level_of_education_and_employment_status

Farag, S., Weltevreden, J., Van Rietbergen, T., Dijst, M., & van Oort, F. (2006). E-shopping in the Netherlands: Does geography matter?. *Environment and Planning B: Planning and Design*, 33 (*1*), 59-74.
https://doi/10.1068/b31083

Gibbs, J., Kraemer, K. L., & Dedrick, J. (2003). Environment and policy factors shaping global e-commerce diffusion: A cross-country comparison. *The information society*, 19 (*1*), 5-18.
https://doi: 10.1080/01972240390145661

Global Postal Development Report. (2021). Retrieved from:*https://www.upu.int/UPU/media/upu/publications/Postal-development-report-2021.pdf*

Hamidi, H., & Ariff, S. (2021). Factors influencing the adoption and use of e-commerce amongst small enterprises in Brunei. In *Handbook of Research on Disruptive Innovation and Digital Transformation in Asia* (pp. 439-461). IGI Global. *https://DOI: 10.4018/978-1-7998-6477-6.ch022*

Hasan, B. (2010). Exploring gender differences in online shopping attitude. *Computers in Human Behavior*, 26 (*4*), 597-601.

Hasyyati, A. N. (2017). *Demographic and socioeconomic characteristics of e-commerce users in Indonesia* (No. 776). Asian Development Bank Institute Working Paper, Tokyo. Retrieved from: *https://www.econstor.eu/bitstream/10419/179232/1/adbi-wp776.pdf*

Hernandez, B., Jiménez, J., & José Martín, M. (2011). Age, gender, and income: do they really moderate online shopping behavior? *Online information review*, 35 (*1*), 113-133. *https://doi:10.1108/14684521111113614*

International Finance Corporation. (2021). Women and E-commerce in Southeast Asia. World Bank. Retrieved from: *https://openknowledge.worldbank.org/bitstream/handle/10986/37837/IDU04129cba409d240473c0a1b4059d6687fc745.pdf?sequence=1&isAllowed=y*

Ibraimov, S. (2009, February). China-Central Asia Trade Relations: Economic and Social Patterns. *China & Eurasia Forum Quarterly* (Vol. 7, No. 1).

Karimov, F. P. (2011). Factors Influencing E-Commerce Growth: A Comparative Study of Central Asian Transition Economies. *International Journal of E-Adoption (IJEA)*, *3*(4), 29-43.

Kinda, M. T. (2019). E-commerce as a Potential New Engine for Growth in Asia. International Monetary Fund. Retrieved from *https://www.imf.org/-/media/Files/Publications/WP/2019/WPIEA2019135.ashx*

Information and Communication Technology. (2017). ICT Development Index. Retrieved from: *https://www.itu.int/net4/ITU-D/idi/2017/index.html*

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). Gender and the Internet: Women communicating and men searching. *Sex roles*, 44, 363-379.

Tie, J., Zhao, W., & Dai, Y. (2017). Correlation with Internet Finance and Residence Consumption. *Advances in Economics, Business and Management Research,* 42, 25–28.

Lawrence, J.E. (2002). The Use of Internet in Small to Medium-Sized Enterprises. *Information, Society and Justice*, 2 (*2*), 221-235.

Luo, X., & Niu, C. (2019). E-Commerce participation and household income growth in Taobao Villages. *World Bank Policy Research Working Paper*, (8811).

Li, W., Cai, Z., & Cao, S. (2021). What has caused regional income inequality in China? Effects of 10 socioeconomic factors on per capita income. *Environment, Development and Sustainability*, 23, 13403-13417. *https://doi.org/10.1007/s10668-020-01218-7*

McLaughlin, K. (2018). Kazakhstan country gender assessment. Asian Development Bank.

Miyazaki, A. D., & Fernandez, A. (2001). Consumer perceptions of privacy and security risks for online shopping. *Journal of Consumer Affairs*, 35 (*1*), 27-44.

Mills, B. F., & Whitacre, B. E. (2003). Understanding the Non-Metropolitan-Metropolitan Digital Divide. *Growth and Change*, 34(*2*), 219-243.

McKinsey. (2020). *Retail speaks. Seven imperatives for the industry.* Retrieved from: *https://www.mckinsey.com/~/media/McKinsey/Industries/Retail/Our%20Insights/retail%20speaks%20seven%20imperatives%20for%20the%20industry/ret ail-speaks-full-report.pdf*

Mbah, C. C., Akpan, A. O., & Odike, M. (2019). Effect of education on online shopping behavior in Nigeria. *Advance Journal of Economics and Marketing Research*, 4(*4*), 24–31.

McCloskey, D. W. (2006). The importance of ease of use, usefulness, and trust to online consumers: An examination of the technology acceptance model with older customers. *Journal of Organizational and End User Computing (JOEUC)*, *18*(3), 47-65.

OECD. (2020). Household disposable income (indicator). *https://doi: 10.1787/dd50eddd-en*

OECD. (2019). Green action task force sustainable infrastructure development for a low-carbon Transition in Central Asia and the Caucasus: mapping of Potentially high-impact infrastructure projects and needs assessment strategic infrastructure planning for sustainable development in Kazakhstan. *Env/Epoc/Eap(2019)8*. Retrieved from: *https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/EPOC/EAP(2019)8&docLanguage=En*

PricewaterhouseCoopers. (2022). Analysis of the retail e-commerce market in Kazakhstan. Retrieved from: *https://www.pwc.com/kz/en/publications/e-commerce/pdf/e-commerce-12m-2021-eng.pdf*

Parment, A. (2013). Generation Y vs. Baby Boomers: Shopping behavior, buyer involvement and implications for retailing. *Journal of Retailing and consumer services*, 20(*2*), 189-199. *https://doi.org/10.1016/j.jretconser.2012.12.001*

Popovic, A. (2018). Factors behind consumer behavior of online customers. Price 2 Spy. Retrieved from: *http://www.price2spy.com/blog/consumer-behavior-of-online-customers/*

Jiaqi, Q., Xiaoyong, Z., & Hongdong, G. (2018). The formation of Taobao villages in China. *China Economic Review,* 53, 106–27. *https://doi.org/10.1016/j.chieco.2018.08.010.*

Raymond, E. (2015). Online Shopping in Haiti: An Empirical Study of Students' Shopping Perceptions and Consumer Behavior (Doctoral dissertation, Université d'Ottawa/University of Ottawa).

Roussos, P. (2007). The Greek computer attitudes scale: construction and assessment of psychometric properties. *Computers in human behavior*, 23(*1*), 578-590.

Yol, S., Serenko, A., & Turel, O. (2006). Moderating roles of user demographics in the American customer satisfaction model within the context of mobile services. *Journal of InformationTechnology Management*, 17 (*4*), 20-32

Samadi, B., Gharleghi, B., & Syrymbetova, M. (2015). An analysis of consumers' trust, logistic infrastructure, and brand awareness towards e-commerce implementation in Kazakhstan. *International Journal of Business and Management*, *10*(10), 96.

Slyke, C. V., Bélanger, F., Johnson, R. D., & Hightower, R. (2010). Gender-based differences in consumer e-commerce adoption. *Communications of the Association for Information Systems*, 26(*1*), 2. *https://doi.org/10.17705/1CAIS.02602*

Smith, P., Smith, N., Sherman, K., Kripalani, K., Goodwin, I., Bell, A., & Crothers, C. (2008). The Internet: social and demographic impacts in Aotearoa New Zealand. *Observatorio*, *6*, 307-330.

Schimmel, K., Morris, R., & Nicholls, J. (2003). Gender differences and e-commerce behavior and perceptions. *The Journal of Internet Banking and Commerce*, 8(*1*).

Tao, C. R., & Wang, S. W. (2020, August). Investigation and study on students' online shopping consumption under the background of big data. In *Journal of Physics: Conference Series* (Vol. 1616, No. 1, p. 012009). IOP Publishing. *https://doi:10.1088/1742-6596/1616/1/012009*

Tang, X., & Wang, G. (2020). Design and analysis of e-commerce and modern logistics for regional economic integration in wireless networks. *EURASIP Journal on Wireless Communications and Networking*, *2020*, 1-15. *https://doi.org/10.1186/s13638-020-01816-z*

Toleuuly, A., Yessengeldin, B., Khussainova, Z., Yessengeldina, A., Zhanseitov, A., & Jumabaeva, S. (2020). Features of e-commerce risk management in modern conditions. *Academy of Strategic Management Journal*, *19*(1), 1-6.

Stafford, T. F., Stafford, M. R., & Schkade, L. L. (2004). Determining uses and gratifications for the Internet. *Decision sciences*, 35(*2*), 259-288. *https://doi.org/10.1111/j.00117315.2004.02524.x*

Shoham, A. & Dalakas, V. (2003). Family consumer decision making in Israel: the role of teens and parents. *Journal of Consumer Marketing*, Vol. 20 No. 3, pp. 238- 251. *https://doi.org/10.1108/07363760310472263*

Tarafdar, M., & Vaidya, S. D. (2006). Challenges in the adoption of E-Commerce technologies in India: The role of organizational factors. *International Journal of Information Management*, 26(*6*), 428-441. *https://doi.org/10.1016/j.ijinfomgt.2006.08.001*

Vicente, M. R. (2015). Determinants of C2C e-commerce: an empirical analysis of the use of online auction websites among Europeans. *Applied Economics Letters*, 22(*12*), 978-981. *https://doi.org/10.1080/13504851.2014.993127*

Wu, S. I. (2003). The relationship between consumer characteristics and attitude toward online shopping. *Marketing intelligence & planning*, 21(*1*), 37-44. *https://doi.org/10.1108/02634500310458135*

World Trade Organization. (2018). *World trade report 2018. The future of world trade: How digital technologies are transforming global commerce.* Retrieved from: *https://www.wto.org/english/res_e/publications_e/world_trade_report18_e.pdf*

World Bank. (2019). E-commerce Development: Experience from China. Retrieved from: *https://documents1.worldbank.org/curated/en/552791574361533437/pdf/E-commerce-Development-Experience-from-China.pdf*

World Bank. (2020). The World Bank in Kazakhstan. Retrieved from: *https://www.worldbank.org/en/country/kazakhstan/overview*

Waseem, A., Rashid, Y., Warraich, M. A., Sadiq, I., & Shaukat, Z. (2018). Factors affecting the E-commerce potential of any country using multiple regression analysis. *Journal of Internet Banking and Commerce*, 24(*2*), 1-28.

UNESCO Glossary. Retrieved from: *https://uis.unesco.org/en/glossary-term/gross-enrolment-ratio*

UNCTAD B2C E-COMMERCE INDEX. (2019). United Nations Conference on Trade And Development. Retrieved from: *https://unctad.org/system/files/official-document/tn_unctad_ict4d14_en.pdf*

UNCTAD. (2018). The role of transport and logistics in promoting e-commerce in developing countries. *UNCTAD Transport and Trade Facilitation Newsletter,* 77 (*17*). *Retrieved from: https://etradeforall.org/news/unctad-the-role-of-transport-and-logistics-in-promoting-e-commerce-in-developing-countries/*

UNCTAD. (2004). *E-commerce and Development Report 2004*. Retrieved from: *https://unctad.org/press-material/Internet-use-rising-among-developing-country-firms-e-business-lags-behind*

United Nations. (2021). Enabling e-commerce in Central Africa: The role of mobile services and policy implications.

Ünver, Ş., & Alkan, Ö. (2021). Determinants of E-Commerce Use at Different Educational Levels: Empirical Evidence from Turkey e-Commerce Use at Different Educational Levels. *International Journal of Advanced Computer Science and Applications*, 12(*3*).

Zhanbozova, A.B., Azatbek, T.A., Valieva, S.N., Tuzelbaeva, I.N., & K.B. Zhumanazarov, K.B. (2021). The e-commerce market in Kazakhstan: analysis of the state and development directions. *Economics: Strategy and Practice*, No 1 (*16*), 2021 / 34-48 (in Russian).

Zhang, Y. (2005). Age, gender, and Internet attitudes among employees in the business world. *Computers in Human Behavior*, 21(*1*), 1-10.