Article

Trends and Perspectives of Romanian E-Commerce Sector Based on Mathematical Simulation

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Abstract: The current economic environment characterized by the implementation of new ICT technologies, globalization, and the pandemic period has determined the growth of online communication, the development of the e-commerce sector, and the change in online consumer behavior. The research aims to analyze online Romanian consumer behavior trends and perspectives. In order to observe the current position of Romanian online commerce, a comparison was made between the Romanian e-commerce market and three other e-commerce groups: the average for EU-27 countries, the group of four countries with the highest e-commerce values (called 4gc—Denmark, the Netherlands, Germany, and Norway) and the country with the lowest values in e-commerce. A comparison was made using mathematical simulation to predict the potential of e-commerce in the future and identify possible risks. Based on the simulation, the results show that the Romanian e-commerce market can continue to grow, becoming mature, and will provide opportunities for sustainable growth. In order to observe and analyze a possible future for 2021–2026, the regression function, correlation matrix, time series analysis, variable maximization, and QM for the Windows program have been implemented. The graphical representation indicates a positive and growing forecasted future trend for Romanian e-commerce.

Keywords: e-commerce; customer relationship; online consumer behavior; e-commerce trends; mathematical simulation

1. Introduction

The pandemic generated by the COVID-19 virus led to a change in how most people's daily activities were carried out, with severe effects on all aspects of how people communicate, work, produce, market, consume and live [1].

The closure of economic activities and the imposition of measures necessary to minimize the transmission of the virus have led to the relocation of activities online and the use of telework and teleconferences, and have increased the use of social networks and sales through e-commerce sites. This migration to online has been significant in relatively high-income developed and developing economies with a robust ICT infrastructure, an e-commerce ecosystem, and an efficient distribution network [2]. The digital economy involves renovating business processes through technology innovation, government policies for growth, and digital entrepreneurship [3].

In this global context, e-commerce has become a significant pillar in the fight against COVID-19. It can reduce cases of new infections (by offering delivery of products online, helping customers avoid store visits, and online payments eliminate the need for physical cash transactions). It preserved jobs during the crisis or, in some cases, created new jobs during the crisis as consumers move towards online business. Additionally, it increased the acceptance of prolonged physical distancing measures among the population through the continued variability of online shopping and services [4].

At the same time, there have been changes in customers' consumption habits caused by the closure of physical stores and the need to supply essential items during the lockdown period [5,6]. In this context, sales increased for B2C and B2B through e-commerce. The B2C segment has seen an increase in online sales, mainly for food, medical supplies, and household items. Although there has been a significant migration to online commerce, the B2B and B2C e-commerce segments have been disrupted by measures put in place by governments to limit the spread of the virus. That has led to a decrease in the production of goods and has caused bottlenecks in supply chains, transport, and logistics services [7]. Virtual businesses became in the last period a profitable process [8]. Business processes based on using the Internet have evolved and continue to develop, from e-communication, e-recruitment, e-booking, e-banking, and e-learning to e-commerce. Business to Consumer (B2C) e-commerce involves the direct selling of a product from a business to many potential online consumers [9] and is gaining increasing importance in many countries—in both mature and emerging markets—and online initiatives [10]. Consumers increasingly rely on social commerce to make purchase decisions [11]. Electronic commerce (e-commerce) has been defined as the ensemble of activities to buy or sell a product or to exchange valuable data over an online platform [12].

E-commerce specialized websites, smartphone applications, and online auctions are probably the most used online platforms. Using e-commerce, the customers may order books, digital music files, and high-tech products [13], including food and spirits [14,15]. In its simplest form, E-commerce is about transactions between two or more individuals, using data and data control [16]. Specialists in the field characterize e-commerce as a procedure that: (i) is using electronic tools and technologies necessary to deploy the selling and buying processes, transferring or exchange of products and information [17]; (ii) is more than retail on Internet, is about production, promotion, selling and distribution using communication networks [18]; (iii) is connecting customers and communities on electronic platforms, which became an integral part of their lives [19]; (iv) is led by two forces which are sustaining each other [20]: a pull force—of the market, a push force—of the technologies; (v) made the organizations virtual and the production customized, and the tastes of customers became dynamic and segmented [21]; (vi) helped organizations to obtain profit using a platform [22]; (vii) made consumers more focused than ever on finding the best prices while shopping in the most convenient or satisfying manner, and e-commerce also offered the customer the comfort of doing their online shopping at home, making it easier, meaning they can spend their time with their families rather than wandering store aisles [23]; (viii) knew a significant growth by offering a broad product offer, best-in-class cost structure, and customer-driven logistics fine-tuning [24]; (ix) helps integrate regions across the world and can be a powerful force for economic development [25]; (x) is a transaction of buying or selling online, changing the current human life [26]; (xi) has become, according to digital transformation, increasingly dynamic [27]; (xii) help the business to enhance the customer satisfaction levels for their product offerings and services rendered [28]; (xiii) has faster speed and lower expenses for companies and customers [29].

E-commerce is increasing exponentially across the globe and is expected to grow more in the future. The digital business helped to obtain organization competitiveness through links between companies and customers using new technologies and websites. The website is a vital source of information for the prospective consumer, helping companies to promote their products or services and an avenue to generate profits by attracting many customers [30]. All electronically mediated information exchanges between an organization

and its external stakeholders build e-commerce, implying buy-side and sell-side. New positions in the companies have appeared, such as digital managers who develop and implement digital business and e-commerce strategies [31].

E-commerce facilitates cheap and easy international trade, and using the Internet is becoming part of globalization [32]. E-commerce offers many facilities and opportunities such as: development opportunities for payment services (using mobile payment) [33], e-promotion events in the world for e-customers (such as November 11 in China and Cyber Monday in US based on using optimal prices and the quantity) [34], and the appearance of new e-jobs and new opportunities in distribution strategy, by using indirect distribution to e-consumer: reselling (through e-tailer) and agency selling (through online agent's website) [35]. Time savings and lower competitive research shopping [36] bring great convenience and many challenges [37], hedonic value (happiness, relaxation and pleasure) [38], utilitarian and satisfying social needs [39]. The consumer may help to co-create the brand, market share or economic profitability [40], may help increase opportunities in marketing, customer service, and revenue [41], and create the opportunity to develop a two-sided platform where sellers and buyers are making online transactions and the price policy is adequate for both parts [42]. An important channel for markets and promotion of brands and products [43] redefined the way companies manage relations with their customers (before, the customers were passive receivers of messages, and now, due to new technologies, different channels and devices are active, receiving multidirectional information) [44]. It also helps develop customer engagement [45] using online brand/community [46], online platform [47], or social media [48,49], revolutionize the method of communication and interaction [50], improve shopping intention [51], and improve meetings and social life [52].

E-commerce also offers many risks or threats such as latency impact on website performance [53], issues about trust label of the website, security, and privacy [54], and higher risks and uncertainties [38]. It may influence trust, confidence, and credibility in online transactions [55], depending on the decision-making, information-seeking behavior of each e-customer, and personality [56], with electronic fraud appearing [57]. The e-customers are subjected to digital piracy [58], and the risk is high, especially in developing countries [59]. It can be observed that there are more benefits and importance for individuals, companies, and the entire society.

The research aims to analyze online Romanian consumer behavior trends and perspectives. In order to observe the current position of Romanian online commerce, a comparison was made between the Romanian e-commerce market and three other e-commerce groups: the average for EU-27 countries, the group of four countries with the highest e-commerce values (called 4gc—Denmark, the Netherlands, Germany, and Norway) and the country with the lowest values in e-commerce. The comparison made using simulation and modeling contributes to the identification of the position of e-commerce in Romania, the forecast of the potential of e-commerce in the future, and the identification of possible risks. The research originality results from the simulations performed and from the fact that, during the COVID-19 pandemic, the e-commerce trade became an instrument that contributed to the continuation of the activity of numerous economic entities. This article's novelty consists of the analysis made at the Romanian level, making a regional comparison. However, the results could be used at the interregional level, global level, or on fields, branches, or products and using simulation methods and models such as regression function, time series analysis, constraint function, forecasting method—linear programming, and a set of improvement measures. Additionally, the forecasting method—linear programming was implemented to analyze a possible future for 2021–2026. The graphical representation offers a positive and increasing forecasted future trend for e-commerce. The article is structured as follows: introduction, an analysis of the e-commerce field at the international and national level, development of a SWOT analysis of this field, materials, methods, research hypothesis, results, discussions, and conclusions.

2. Analysis of the E-Commerce System at the International and National Level in Pandemic Time

2.1. E-Commerce—A Source of Competitive Advantage for International Markets in Pandemic Time

The pandemic period accelerated the change and challenges. Internet use allowed people to be updated with real-time information, and digital innovations, e-products, and e-services helped customers and organizations. Changes in personal and organizational behavior took place due to restrictions and lockdowns. Thus, books and literature e-commerce platforms have undergone a 16 percent global traffic increase between January and March 2020 [60]. Before the COVID-19 pandemic, online commerce grew at a relatively steady pace of 4.5%. Year-on-year restrictions contributed to a boom in e-commerce and, thus, the growth of digital financial services [61].

Since March 2020, online commerce has not been an option but a necessity for both economic entities and consumers. With the COVID-19 pandemic, many online commerce economic entities began to experience short-term changes. Many online retailers have started to develop new product and service offerings and have adopted new sales strategies due to the COVID-19 pandemic. However, the evolution of e-commerce has manifested itself differently from country to country [62]. In the first quarter of 2020, online orders increased by 70% in Asia-Pacific compared to the same period of the previous year, while in North America, online orders at the end of May 2020 increased by 120% compared to 2019, and in Europe, increased on average by 50% [63].

According to information provided by the United States Census Bureau, online sales have increased steadily in the US over the past two decades, but after the COVID-19 restrictions, the growth rate has increased substantially; thus, online sales increased by 31.80% in the second quarter of 2020 compared to the first quarter, and by 44.50% compared to 2019 [64]. As expected, some sectors grew much faster and more than others. For example, in the first few days after the pandemic declaration, food sales tripled, according to an IMF report—Food Retailing Industry Speaks [65]. Restaurant delivery, due to COVID-19, on 31 March 2019, was at 16% in Germany and at 31% in the USA. For clothing, it was almost the same (25 vs. 26%), for household cleaning products it was 9% for Germany and 26% for the USA [66]. COVID-19 has led to a drastic change in consumer demand outside restaurants. Restaurant bookings dropped dramatically in early March 2020, reaching zero at some point with the final closure of restaurants and hotels [67]. The global pandemic period is affecting consumer behavior worldwide. In October 2020 vs. January 2020, online traffic in the supermarket segment increased by 34.8%, sports equipment increased by 23.6%, and cosmetics by 3.7%. Online visits in the tourism sector decreased by 43.7%, and for media by 13.2% [68]. As can be observed, e-commerce is not trying to exclude traditional commerce but is trying to help organizations to adapt to change and to environmental conditions, being an extension of it, a solution for customers and organizations with actual results. Even small businesses had the opportunity to reach international markets due to the use of the Internet, IT capabilities (outside-in, inside-out, or spanning) [69], and e-commerce. E-commerce worldwide has expanded, its sales growing from 1336 bill US $ in 2014 to 4206 bill US $ in 2020 [70]. The COVID-19 pandemic has made it clear that e-commerce can be an instrument, an essential solution for consumers in times of crisis, and is also an economic engine for small economic entities.

Compared to the offline market, B2C e-commerce opens new challenges for companies, which must manage additional issues [10]. Millions of online customers change their behavior simultaneously to save time and the comfort of online shopping at home. In 2018, global e-retail sales grew 22.9% compared to 2017, accounting for 12.2% of global retail sales [71]. Thus, as may be observed, e-commerce may find opportunities to grow. Internet users can choose from different online platforms to browse, compare, and buy the items or services they need. While some websites specifically target Business-to-Business (B2B) customers, individual consumers are also offered many digital possibilities.

In 2019, the first two ranked companies in e-commerce were Alibaba, with 15% and a 538 bill US $ gross value [72], and Amazon, with 13% of global e-commerce [73]. Online

retail sites have recorded substantial traffic gains due to the global coronavirus pandemic because a large part of the population stayed at home and ordered online items they would usually buy in the store. Amazon.com had a monthly traffic average of nearly 3.68 billion visitors in 2020, followed by eBay.com with an average of 1.01 billion visits each month [74]. In 2020, global retail e-commerce sales reached 3.9 trillion US $ (with Asia Pacific generating 2.45 trillion US $- due to China's impact, second-ranked North America with 749 billion US $ in retail e-commerce revenues [75]. Before the crisis generated by the SARS-CoV-2 virus, the research recalled a positive behavior of online commerce, online sales being predominant for products that can be classified as "hobby or entertainment" [76,77]. During the pandemic, consumer behavior changed dramatically. Thus, the fears of infection and the restrictions imposed by isolation have increased online commerce [78]. International studies have shown that the pandemic has significantly impacted consumer behaviors that have led to the growth of online shopping [79,80]. Among the factors that influence the behavior of online consumers, it can be noted that several researchers mention the influences of the media [81,82] but also the advantages brought by e-commerce [83]. Studies show that consumer behavior will also be focused on online commerce in 2021. Even if the growth of e-commerce will not be as significant as in 2020, online sales are still expected to increase by 14.30% this year [84].

2.2. B2C E-Commerce in Romania—A Market in Continuous Increasing

E-commerce sales in Romania have registered a significant increase in 2019 of 4.68 billion euros (meaning an increase of 3.54 billion euros compared to the turnover recorded in 2013) [85]. In 2020, due to the pandemic, social distancing measures, lack of mobility, and teleworking, e-commerce sales achieved 5.5 billion euros [86].

In Romania, 2020 brought an increase of 38.4% for online commerce [87]. The first position in Romanian e-commerce buyers' wishes is fashion products, followed by electronics and media. Bucharest, the Romanian capital, was the city with the highest share of online payments: this happened due to a few delivery apps, such as Glovo, Food Panda, or UberEats [88]. The fashion segment generated the largest revenue between 2017 and 2020. In 2020, it generated approximately 943 million US dollars and was set to exceed one billion US dollars for the first time in 2021. Electronics and media generated 607 million US dollars in revenue in 2020 [89]. In Romania, the e-commerce market generated an average revenue per user of 283 US dollars in 2020. By 2025, this will increase to an estimated 380 US dollars, according to the Digital Market Outlook [90]. In Romania, the number of e-commerce users increased every year. In 2017 there were 5.2 million users, and in 2018 this increased up to 8.3 million. By 2025, e-commerce use will increase to an estimated 10.7 million people [91,92].

In the context of the pandemic, the number of Romanians buying online has increased by 13% this year compared to 2019, and the average amount spent on online shopping has increased by 41% compared to 2019. The fastest development in online sales was recorded by catering services (delivery of cooked food), an increase of 124% compared to 2019 [93]. Moreover, the number of people who pay online by card has increased by 14% this year compared to 2019, according to market research conducted by iSense Solutions for GpeC [94]. The most significant sales through e-commerce during the COVID-19 pandemic in Romania were recorded in the beauty sector (an increase of 309.5% in April 2020 compared to 2019). At the same time, books, movies, and music saw an increase in online sales of 22.4% [95]. Even though Romania is in the top 10 areas of high-speed internet, more than 10 million Romanians use the Internet every day, and about 300,000 buy one or more products daily, it is still at the bottom of the ranking in average online shopping (45%) only downgraded by Bulgaria by 42% of internet users who have bought online at least once in the last 12 months [96,97]. Even the penetration rate of e-commerce grew in Romania, from 26.5% in 2017 to 43.4% in 2020. By 2025, user penetration will increase to nearly 57 percent, according to the Digital Market Outlook [98].

The share of Romanian e-commerce in the total turnover of enterprises increased in the last few years. In 2009, the share was 2%, in 2013 it was 6% and in 2018 it was 9% [99]. At the conference organized by the Romanian Association of Online Stores on the first edition of the National E-Commerce Day, Luca Cassetti, Secretary General of Ecommerce Europe, stated that in the most challenging year for modern trade, Romania will manage to maintain its top position among the countries with the most significant increases in e-commerce throughout the EU [100]. E-commerce has become the most tempting business for entrepreneurs. This sector grew by 31% in 2020, and advanced development is expected for 2021 [101]. E-commerce in Romania is affected by the lack of trust in paying online (the highest share of online payments in 2019 was registered in Bucharest—43%, Cluj—11%, and Timis—7.5%) [102]. Lack of interest in buying online also affects e-commerce (the customers are still interested in buying from the shop). The reduced interaction with e-sellers and the lack of individuals' digital skills (for a clear image, in 2019 Romania's level of this was 31%, EU-27 56%, Denmark and Germany 78%, Netherlands 79%, and Norway 83%; only Bulgaria had the level of 29%) are causal factors [103]. The reduced number of PCs means reduced penetration of internet users—Romania has a rate of 73.8%, compared to Europe's 87.8%, Denmark has 97.8%, Germany has 96%, the Netherlands has 95.6%, and Norway has 98.4%. Only Bulgaria has a lower rate of 66.7% on the 31 December 2020) also affects e-commerce [104].

2.3. SWOT Analysis of Using E-Commerce

E-commerce, also known as the online shopping industry, has dramatically evolved recently. As a result of technological developments, the rapid development of IT devices, and internet access, more and more buyers are choosing to use online commerce. The success of e-commerce is due to various social, technological, cultural, and psychological factors that have contributed to the development of online shopping mechanisms over classic commerce. A SWOT analysis of e-commerce allows us to know the strengths and weaknesses of this phenomenon but also to identify opportunities and possible threats that could affect businesses in this field in the future (Table 1).

Table 1. SWOT analysis.

Strengths	Weaknesses
-provide more appealing shopping experiences than traditional environments [105];	-evolves a transactional (asking information, buying just occasionally), or relational (buying many times, writing some opinion about its satisfaction or dissatisfaction, asking questions, benefit some bonuses, obtaining value due to its loyalty) link [106,107];
-easy to apply, increase profits for organizations, sales and decrease costs [108]; -offers to consumers to participate in social-media-enabled commercial activities such as customer review, sharing, recommendations, may see product information posted by their friends on Facebook and decide to purchase the product later; social commerce consists of various facets including people, management, technology, and information [11];	-tangibility is missing for customers [106]; -using technologies, some products cannot be traded or delivered in certain zones [106];
-save time and money for customers and employees [109];	-using this new form of buying, supposes having e-skills, Internet access, and an electronic device to order [109];
-assumes some consumer dependence on the Web vendor [110]; -more products than physical stores in settings similar to e-commerce; (ii) the potential integration of other communication tools, such as traditional advertising, online media, and eWOM; and (iii) real-time interaction with products, the ability to view them realistically and to request personalized information likely to influence purchasing decisions [112,113]; -satisfy the consumer's needs faster and cheaper, using information, images, and advertising [115,116]; -helped organizations to get to customers at large distances, having a relationship of 24 h a day and improving companies' image [118]; -it involves some risks, that is why e-commerce is suffering due to the lack of consumer trust and fear of paying online [120,121]; -the organizations can offer customized goods [123]; -improve relationships along the supply chain due to the warehousing. Even if the orders are small from e-commerce, the relationship exists [125];	-security of using the online payment to buy products [111]; -Fake websites and mobile apps [114]; -abusive use of customers' financial and personal data [117]; -high costs for products delivery, longer terms for products delivery [119]; -lack of customized services for customers assistance [122]; -lack of systems standardization in e-commerce [124]; -difficulty in managing the return products process [126].

Table 1. *Cont.*

Strengths	Weaknesses
-realistic images can display content or video in 360° or three-dimensional (3D) digital representation [127]; -offer home delivery and offer a wide variety of products [128]; -using new technologies, the companies may offer products and services across local, national, and international boundaries in real-time and at low cost [129]; -using the website for buying/selling online helps achieve loyalty in a virtual, digital, and electronic context, such as the world of e-commerce [92].	
Opportunities	**Threats**
-automation of data analysis generates an increased availability of data on purchases made [130]; -e-commerce is fast and efficient, overcoming geographical spatiality barriers; -excellent availability (24/7/365); -digital advertising contributes to promoting products and businesses to a much wider audience [132].	-competition (the fact that the launch of an online business is within reach of anyone is an adhering, especially to the business sector and not to the e-commerce industry as a whole) [105,125]; -frauds that may occur at the level of online payments [131]; -security and protection of personal data at the level of purchasers [114]; -low level of e-skills and working with new technologies [119]; -low degree of endowment with PCs [117]; -pandemic and economic crises which influence the income level [124].

3. Materials, Methods, and Research Hypothesis

The research analyzes the influence of some essential factors on e-commerce at Romanian levels, such as Internet purchases by individuals (X_1), digital single market—promoting e-commerce for individuals (X_2), the share of e-commerce in total turnover of enterprises (X_3), the share of enterprises that sell online (X_4), websites and functionalities (X_5).

To realize these the following objectives and the following research hypothesis were proposed:

-to analyze each influencing factor on Romanian e-commerce and their correlation; so, the following hypothesis was proposed:

Hypothesis 1 (H1). *The analyzed factors have a significant influence on the Romanian e-commerce market.*

-to analyze the evolution of the Romanian e-commerce market. Given the statistics for e-commerce, Romania is the 49th largest market, having a revenue of 3 billion US dollars in 2021 (being ahead of Singapore and behind Greece) [133] and is projected to reach 6.932 billion US dollars in 2022 [134], thus, the following hypothesis was proposed.

Hypothesis 2 (H2). *The E-commerce market for Romania is continuing to grow, becoming a mature market.*

-to forecast the value increase for analyzed variables to achieve at least the average for UE-27 or the average for 4gc. So, the following hypothesis was proposed:

Hypothesis 3 (H3). *Romanian e-commerce market will provide opportunities for sustainable growth.*

Data about the analyzed variables being not all registered in 2021 were used until 2020. The research relied on public information presented at the national and international level about the evolution of e-commerce and the comparison between the analyzed groups based on the graphical representation of each factor influencing e-commerce efficiency. Statistical analyses and graphical representations were made using Excel-Data Analysis, and the forecasts are based on QM for Windows. For the correlation between the chosen variables (data about e-commerce and its influence at the Romanian level), we used several techniques, including correlation coefficient modeling based on the correlation matrix,

simulation based on OLS, and Pearson coefficient. The research also uses modeling (Time series analysis, constraint function, and forecasting method—linear programming) to observe a possible trend of Romanian level for e-commerce values and make decisions over time, minimizing future problems and risks.

The analysis is made by comparing data referring to e-commerce and its influencing factors on Romania level, average EU-27 level, 4gc (Denmark (DK), Netherlands (NL), Germany (DE), Norway (NO)) as having the highest values on analyzed variables from the European Union, and the weakest value from European Union-Bulgaria (BG). The e-commerce market for developed countries is in the maturity phase, and the competition among e-players is intense and cost-intensive [135]. Romania has a market found in the growing phase (Table 2). Even if the revenue in the Romanian e-commerce market is growing (projected to reach 2837 m US $ in 2021) [92], it was still reduced in 2020 (18%), coming from behind the average for EU-27 (17%), but compared to 4gc (values between 18 and 38) it is still low. Only Bulgaria was overtaken, which has registered 8% of e-commerce sales.

Table 2. Data referring to e-commerce and its influencing factors on Romania level, average EU-27 level, 4gc.

Year	E-Commerce Sales							Internet Purchases by Individuals							Digital Single Market—Promoting E-Commerce for Individuals						
	RO	EU-27	DK	NL	DE	NO	BG	RO	EU-27	DK	NL	DE	NO	BG	RO	EU-27	DK	NL	DE	NO	BG
2011	4	13	23	19	20	31	3	4	29	57	53	54	57	5	6	39	70	69	64	73	7
2012	5	14	26	18	22	34	4	3	31	60	52	55	62	6	5	41	73	65	65	76	9
2013	9	14	27	13	22	25	5	5	33	65	55	60	56	8	8	43	77	69	69	73	12
2014	7	15	26	13	23	25	6	6	36	66	59	61	60	10	10	46	78	71	70	77	17
2015	8	16	26	17	25	26	6	8	38	67	59	64	61	12	11	49	79	71	73	76	18
2016	7	18	28	16	26	27	5	8	41	71	63	64	61	11	12	51	82	74	74	78	17
2017	8	17	29	16	24	29	7	11	44	69	68	66	62	11	16	54	80	79	75	77	18
2018	9	17	32	17	20	28	6	13	46	73	70	68	64	13	20	56	84	80	77	79	21
2019	12	17	34	22	18	27	7	15	49	74	70	71	67	14	23	60	84	81	79	82	22
2020	18	18	38	19	18	22	8	17	51	76	71	73	68	15	38	64	89	87	83	85	31

Year	Share of e-commerce in total turnover of enterprises							Share of enterprises that sell online							Websites and functionalities						
	RO	EU-27	DK	NL	DE	NO	BG	RO	EU-27	DK	NL	DE	NO	BG	RO	EU-27	DK	NL	DE	NO	BG
2011	3	14	17	11	15	18	3	4	13	23	19	20	31	3	34	68	89	82	81	78	45
2012	4	15	17	13	16	19	4	5	14	26	18	22	34	4	36	70	89	84	82	79	49
2013	6	14	17	13	17	19	5	9	14	27	13	22	25	5	42	72	92	84	84	79	47
2014	6	15	17	12	17	20	6	7	15	26	13	23	25	6	44	73	91	90	86	79	48
2015	8	17	20	13	18	24	6	8	17	26	17	25	26	6	45	74	92	90	87	80	48
2016	7	16	23	14	18	21	6	7	18	28	16	26	27	5	42	76	93	89	89	80	51
2017	8	18	23	15	19	25	8	8	18	29	16	24	29	7	45	76	95	86	87	80	51
2018	9	17	23	15	18	26	7	9	17	32	17	20	28	6	44	76	96	94	87	78	51
2019	10	18	24	16	19	27	7	10	18	33	18	21	29	7	47	77	94	92	88	78	51
2020	11	19	25	17	20	28	8	12	20	34	20	22	31	8	46	77	93	84	88	79	52

Source: [135–139].

A survey was taken in 2019 on ICT usage in households and by individuals in EU-27 [134], showing that customers still prefer shopping in person and loyalty to shop (73%). A total of 71% of e-buyers said that they encountered no problem when making an online purchase; the rest of them encountered problems such as slower delivery (17%), technical problems (8%) and damaged goods (8%). The most significant proportion of people buying online is those aged 55–74 (42%). Four in ten e-shoppers said they spent between 100 and 499 euros on online purchases. Data about registered values for individual e-purchases are below (Table 2). It can be observed that Romania and Bulgaria have registered low values between 2011 and 2020 for internet purchases by individuals. Compared to the group formed by the four European countries with the most significant values registered for e-commerce (noted as g4c), Romania (17%) is lower than these countries, which registered values between 68–76% in 2020, lower by 347% compared to the most significant value obtained by Denmark.

The European Digital Single Market (DSM) has become a priority for the European Commission; DSM is still immature for some goods and services. Big countries have a higher share of e-commerce, but small countries do not, a feature of the DSM that is still in its infancy. DSM concentrates on specific product categories (clothing, footwear, media products, and consumer electronics), representing 45% of sales [140]. Data about this characteristic are presented in countries analyzed between 2011 and 2020 (Table 2).

The 4gc is registering large values again for promoting e-commerce for individuals (between 83 and 89%). For Bulgaria (31%) and Romania (38%), participation in e-commerce is far below their population shares, even from the EU-27 average (64%). The turnover made through e-commerce was relatively low in Romania in 2009 (2%). In 2018, it amounted to 9%. In 2020, e-commerce accounted for 19% of total turnover in enterprises in EU-27. It has a minor increase from the prior year when e-commerce share was 18% of total turnover.

Romania (11%) and Bulgaria (8%) are in the last rank, compared to the average for EU-27 (19%) and the g4c with values between 17 and 28%. In 2020, the share of enterprises selling online was measured as 20% in all EU-27 countries (Table 2), and the highest point between 2011 and 2020. In 2011, only 13% of enterprises were selling online in EU-27 [141]. The most significant values were obtained by Denmark (34%) and Norway (31%); Romania obtained only 12% (being above Bulgaria with 8%).

From 1991, when the first website was developed, in 2014, the number reached 1 billion, and in 2021 there are 1.828 billion websites worldwide. Even if almost 2 billion websites exist worldwide, only 200 million are active [142]. The websites' percentages and functionalities are presented below (Table 2). As can be observed (Table 2), this is the only variable where the percentage is lower than the average for EU-27 and the analyzed group. It is lower even compared to the value registered for Bulgaria. In May 2020, YouTube was the first ranked, generating over 5.3 billion global visits via organic search traffic, Wikipedia accumulated 2.2 billion organic search visits, and Facebook registered with more than 1 billion organic search visits [143]. By collecting data about the influencing factors described above, a database was built (Table 3) and may be used in developing the necessary research to analyze the correlation between the analyzed variables.

Table 3. Data about e-commerce and its influence variable at the Romanian level.

Year	E-Commerce Sales (Y)	Internet Purchases by Individuals (X_1)	Digital Single Market— Promoting E-Commerce for Individuals (X_2)	Share of E-Commerce in Total Turnover of Enterprises (X_3)	Share of Enterprises That Sell online (X_4)	Websites and Functionalities (X_5)
2011	4	4	6	3	4	34
2012	5	3	5	4	5	36
2013	9	5	8	6	9	42
2014	7	6	10	6	7	44
2015	8	8	11	8	8	45
2016	7	8	12	7	7	42
2017	8	11	16	8	8	45
2018	9	13	20	9	9	44
2019	12	15	23	10	10	47
2020	18	17	38	11	12	46

Source: [99,137,139,141,144–147].

Data were collected from www.eurostat.com (accessed on 19 February 2022) between 2011 and 2020, and it was used as a correlation matrix and Excel-Data Analysis.

4. Results

4.1. Analyse the Correlation between the Chosen Variables

Using correlation matrix, objectives are: 1. To summarize the data and observe the patterns. In the example above, the observable pattern is that all the variables are highly correlated with each other: (a) the correlation between independent variables and e-commerce: Very high correlation (between 0.9–1.00): X_2 has the highest impact on e-commerce (0.94) and X_4 (0.93); High correlation (between 0.7–0.9): X_1 has a high impact on e-commerce (0.85), X_3 (0.86), and X_5 has a high impact on e-commerce (0.70); (b) the correlation between each independent variable: Very high correlation (0.9–1.00): between X_1 and X_2 (0.94), X_1 and X_3 (0.95), X_3 and X_4 (0.92), X_3 and X_5 (0.90); High correlation: between (0.7–0.9): between X_2 and X_5 (0.66), X_1 and X_5 (0.77), X_2 and X_4, X_1 and X_4, X_4 and X_5 (0.85), X_2 and X_3 (0.88) (Table 4).

Table 4. Correlation matrix.

Variable	Y	X_1	X_2	X_3	X_4	X_5
Y	1					
X_1	0.855	1				
X_2	0.94	0.94	1			
X_3	0.86	0.95	0.88	1		
X_4	0.93	0.85	0.85	0.92	1	
X_5	0.70	0.77	0.66	0.90	0.85	1

The correlation matrix revealed only positive, high, and very high correlations between independent variables and dependent variables. So, **Hypothesis 1 (H1)**—"The analyzed factors have an important influence on Romanian e-commerce markets" is wholly fulfilled. The most significant and positive influence is 0.94 (X_2–Digital single market—promoting e-commerce for individuals) and 0.93 (Share of enterprises that sell online–X_4). The most reduced influence, but also strong and positive, is 0.70, from Websites and functionalities–X_5.

4.2. Analyze the Relationship between the Chosen Variables and the Impact on E-Commerce

The Pearson coefficient (R squared and multiple R) and the regression function were calculated to observe the impact of the independent variables on the dependent variable (e-commerce) at the Romanian level (Table 5).

Table 5. Pearson coefficient.

Multiple R	0.99
R Square	0.98
Adjusted R Square	0.96
Standard Error	0.69
Observations	10

As may be observed, R-squared is 0.98. Thus, R becomes 0.99 showing that between the analyzed variables, there is a positive and very high relation and that the evolution of chosen X factors explains 99.3% of the evolution of variable Y. Thus, the impact is very high, very close to 1, so the chosen influence factors are chosen well. However, even if the R squared is very close to 1, it does not mean that the situation at the Romanian level for e-commerce is good; the analysis made at the first point, based on the comparison, shows significantly lower values for e-commerce and also for the analyzed influencing factors.

Excel-Data Analysis obtained the following results for the OLS regression function (Table 6).

Table 6. Summary output for OLS regression function- RO level.

	Coefficients	Standard Error	t Stat	*p*-Value	Lower 95%
Intercept	0.20	5.20	0.04	0.96	−14.22
X_1	−0.42	0.28	−1.52	0.20	−1.21
X_2	0.37	0.09	3.77	0.01	0.09
X_3	−0.03	0.66	−0.05	0.96	−1.89
X_4	1.05	0.34	3.04	0.03	0.09
X_5	−0.02	0.18	−0.16	0.87	−0.54

Estimation equation and substituted coefficients:

$$Y = 0.209 - 0.42X_1 + 0.37X_2 - 0.03X_3 + 1.05X_4 - 0.02X_5 \tag{1}$$

To increase with a monetary unit, y will obtain a decrease of 0.42 monetary units of X_1, 0.03 m.u. of X_3, 0.02 m.u. of X_5, and an increase of 0.37 m.u. of X_2, and 1.05 m.u. of X_4. It is observed that the value of the free term (0.209) is not high, so the chosen factors have a significant impact on the evolution of Y (being positive). The positive value of the free term shows that the variables chosen for the econometric model positively affect the evolution of Y.

4.3. Forecasting E-Commerce in 2021 Using Time Series Analysis (Brown Method)

To estimate the value for e-commerce in 2021, the Time Series Analysis can be implemented, based on past data, in the hypothesis that a specific trend (cyclic or seasonal) in the evolution of the analyzed variable cannot be identified. The method uses the following formula of calculation:

$$F_{t-1} = a \times Y_t + (1 - a) \times F_t \tag{2}$$

In which Ft and F_{t-1} are the forecasted values for t and t − 1 moments, Y_t is the value for e-commerce registered in Romania for the analyzed period at t moment, and t is from 1, 2, ... , 10. A constant α, $\alpha \in [0,1]$ will be used. Values are now generated in this interval from [0,1]. Then, for each value, the squared errors will be determined and chosen for which this sum (MSE) is at a minimum. The error results with the calculation formula: et = F_t − Y_t, where t = 1, ... , 10, and e_2 is the analyzed sum (MSE) (Table 7).

Table 7. Forecasted values using Time Series Analysis.

Year	Actual Values	Forecasted Values								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
2011	4	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2012	5	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2013	9	4.10	4.20	4.30	4.40	4.50	4.60	4.70	4.80	4.90
2014	7	4.59	5.16	5.71	6.24	6.75	7.24	7.71	8.16	8.59
2015	8	4.83	5.52	6.09	6.54	6.87	7.09	7.21	7.23	7.15
2016	7	5.14	6.02	6.66	7.12	7.43	7.63	7.76	7.84	7.90
2017	8	5.33	6.21	6.76	7.07	7.21	7.25	7.22	7.16	7.09
2018	9	5.59	6.57	7.13	7.44	7.60	7.70	7.76	7.83	7.90
2019	12	5.93	7.05	7.69	8.06	8.30	8.48	8.63	8.76	8.89
2020	18	6.54	8.04	8.98	9.64	10.15	21.82	10.98	11.35	11.68
MSE (total)		230.88	167.01	133.22	113.49	100.55	91.13	83.81	77.97	73.39

Making the difference between actual and forecasted values obtains the errors; the squared errors and summing up will be obtained the sum of squared errors called MSE (Table 8). Looking to minimize MSE, we observe that alpha-0.9 is achieved at the minimum.

Table 8. Determining Bias, MAD, MSE, MAPE, and SE using Time Series Analysis.

	Forecasted Values (Alpha)								
	0.1	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**
Next period	7.69	10.03	11.69	12.98	14.07	15.03	15.89	16.67	17.36
Bias (average)	4.10	3.35	2.84	2.49	2.23	2.04	1.88	1.75	1.65
MAD (average)	4.10	3.35	2.84	2.52	2.33	2.23	2.21	2.20	2.20
MSE (average)	25.65	18.55	14.80	12.61	11.17	10.12	9.31	8.66	8.15
MAPE (average)	0.40	0.32	0.26	0.23	0.21	0.20	0.21	0.21	0.21
SE	5.74	4.88	4.36	4.02	3.79	3.60	3.46	3.33	3.23

Note: Bias—the mean forecast error, MAPE—Mean absolute percentage error, MAD—Mean absolute deviation, MSE—Mean squared error, SE—Standard error.

Using QM for Windows program, we could determine the forecasted value of e-commerce for 2021 (17.36) (Table 9). For a value of alpha of 0.9 are obtained: Bias—1.65, MAD—2.2, MSE—8.15, MAPE—0.21, and a SE—3.23.

Table 9. Determining Bias, MAD, MSE, MAPE, and SE for alpha 0.9.

Alpha			0.899			
Data			**Error Analysis**			
Period	**Actual Values**	**Forecast**	**Error**	**Absolute**	**Squared**	**% Error**
2011	4.00	4.00				
2012	5.00	4.00	1.00	1.00	1.00	0.20
2013	9.00	4.90	4.10	4.10	16.81	0.45
2014	7.00	8.59	−1.59	1.59	2.52	0.22
2015	8.00	7.15	0.84	0.84	0.70	0.10
2016	7.00	7.91	−0.91	0.91	0.83	0.13
2017	8.00	7.09	0.90	0.90	0.82	0.11
2018	9.00	7.90	1.09	1.09	1.18	0.12
2019	12.00	8.89	3.10	3.10	9.66	0.25
2020	18.00	11.68	6.31	6.31	39.82	0.35
	Total		14.85	19.86	73.39	1.96
	Average		1.65	2.20	8.15	0.21
			Bias	MAD	MSE	MAPE
				SE	3.23	
2021				17.36		

Being under the value from 2020, it is recommended to use another method to minimize the impact of some variables on e-commerce and to determine which variables may be increased to obtain a better value for e-commerce, at least the average of EU-27.

4.4. Forecast the Value for Analyzed Variables to Achieve at Least the Average for UE-27 or 4gc

To maximize the analyzed variables, two conditions were chosen: to increase the values existent at the Romanian level compared to the average for EU-27 at least and the average existing at the 4gc group (Table 10). Linear programming is imposed, and the chosen tool is QM for Windows.

Table 10. Data necessary for establishing the QM for the Windows model.

2020	**Y**	**X₁**	**X₂**	**X₃**	**X₄**	**X₅**
RO	18	17	38	11	12	46
average for EU-27	18	51	64	19	20	77
average for 4gc	24	72	86	23	27	86

Two constraints were chosen, and five variables were analyzed in the OLS analysis. The goal is to maximize the values using the equation (as an average for the two constraints):

$$\max 3X_1 + 2X_2 + 2X_3 + 2X_4 + 2X_5 + 2X_5 \qquad (3)$$

The two constraints are:

$$1.\ \max 3X_1 + 1.7X_2 + 1.7X_3 + 1.7X_4 + 1.7X_5 \leq 18 \qquad (4)$$

$$2.\ \max 4X_1 + 2.3X_2 + 2.1X_3 + 2.3X_4 + 1.9X_5 \leq 24 \qquad (5)$$

They were built starting from the proportion between RO values and EU-27 and average 4gc group values. Making the proportions, the two constraints developed above were obtained. The Solve menu was chosen to determine the solutions to the problem (the results are presented in Table 11).

Table 11. Linear programming results.

Variable	Status	Value
X_1	NonBasic	0
X_2	Basic	9.70
X_3	NonBasic	0
X_4	NonBasic	0
X_5	Basic	0.88
Optimal value (Z)		21.17

As can be observed, the value for y at the RO level was 18%. For EU-27 it was 18%, and the average for 4gc was 24. To maximize the value for Romania and obtain high-performance e-commerce, X2 must increase by 9.70% and X_5 by 0.88% to obtain a value for Y of 21, 17.

According to this calculation (Table 12): X_1 may range between Infinity and 3.52, X_2 between 2 and 2.42, X_3 and X_4 between Infinity and 2, and X_5 may remain constant. The values for y—in the first case—that of achieving the average value for EU-27—the new Y for RO may range between 17.73 and 21.47 and on average for 4gc may range between 20.11 and 24.35. According to the calculation and constraints, a few measures are imposed to increase X_2 and X_5. Measures to increase X_2- Digital single market—promoting e-commerce for individuals: Romania must access the EU space of e-commerce, sustained by The European Commission, as part of its strategy. It plans to have a single online market without borders, eliminate geo-discrimination and geo-blocking, increase price transparency, transparent access to multi-lateral cross-border agreements, and align national rules to EU regulations, and to obtain better cooperation, better shared resources, faster financial flows, and more accessible websites. Measures to increase X_5-Websites and functionalities: Starting from the idea of from local to general, the local websites must have a few characteristics to improve the use of a website and increase the value of e-commerce at the national level. Measures to increase X5-Websites and functionalities: the local websites must have a few characteristics to improve the use of a website and increase the value of e-commerce at the national level. The characteristics are simple but may help e-customers to use websites and improve the mutual relationship, according to a win-win relationship. Trust in using a website, security, dynamic content, interactivity, consistency, the time to open a website, an attractive design, according to the audience needs, a clear description, the easy navigation, offered help, testimonials, and information from other customers (built according to the principle of storytelling), using images.

Table 12. Ranging constraints.

Variable	Value	Reduced Cost	Original Val.	Lower Bound	Upper Bound
X_1	0.00	0.52	3.00	-Infinity	3.52
X_2	9.70	0.00	2.00	2.00	2.42
X_3	0.00	0.00	2.00	-Infinity	2.00
X_4	0.00	0.00	2.00	-Infinity	2.00
X_5	0.88	0.00	2.00	2.00	2.00

Constraint	Dual Value	Slack/Surplus	Original Val.	Lower Bound	Upper Bound
Constraint 1	1.17	0.00	18.00	17.73	21.47
Constraint 2	0.00	0.00	24.00	20.11	24.35

From the results above, we can conclude **Hypothesis 2 (H2)**. The E-commerce market for Romania is continuing to grow, and becoming a mature market is wholly fulfilled.

4.5. Forecasting E-Commerce Values for Romania between 2022–2026

As was noticed, between 2011 and 2020 official data for e-commerce at the Romania level were registered. For 2021–2026, the possible future value was obtained using the forecasting method—linear programming.

$$PC_t = \frac{(Y_n - Y_0)}{(n-1)} \tag{6}$$

$$Y_{t+1} = Y_0 + (t+1) \times MMP_t \tag{7}$$

where: PC_t—the average of percentual change for the first t periods, Y_0—observed value from the first period of the forecasted variable, Y_t—observed values in the last period of the forecasted variable.

$$PC = \frac{(21-4)}{(12-1)} = \frac{17}{11} = 1.54 \tag{8}$$

$$Y_{12} = 4 + 12 \times 1.54 = 22.54 \tag{9}$$

$$Y_{13} = 5 + 13 \times 1.54 = 25.08 \tag{10}$$

$$Y_{14} = 9 + 14 \times 1.54 = 30.63 \tag{11}$$

$$Y_{15} = 7 + 15 \times 1.54 = 30.17 \tag{12}$$

$$Y_{16} = 8 + 16 \times 1.54 = 32.72 \tag{13}$$

An increased trend is observed in e-commerce values at the Romanian level, using simulation for the following 6 years (Table 13).

Table 13. Forecasting e-commerce in Romania (2011–2026).

Year	E-Commerce Values at the RO Level
2011	4
2012	5
2013	9
2014	7
2015	8
2016	7
2017	8
2018	9
2019	12
2020	18
2021	21
2022	22.54
2023	25.08
2024	30.63
2025	30.175
2026	32.72

Starting from these values was implemented the Percentual method, which showed us new possible future values necessary to make the decisions above from time: increase the values for X_2 and X_5 to have at least the average between the EU-27 value and the average of 4gc. Starting from the simulated value for 2021 were obtained new simulated values for 2022–2026 (Figure 1).
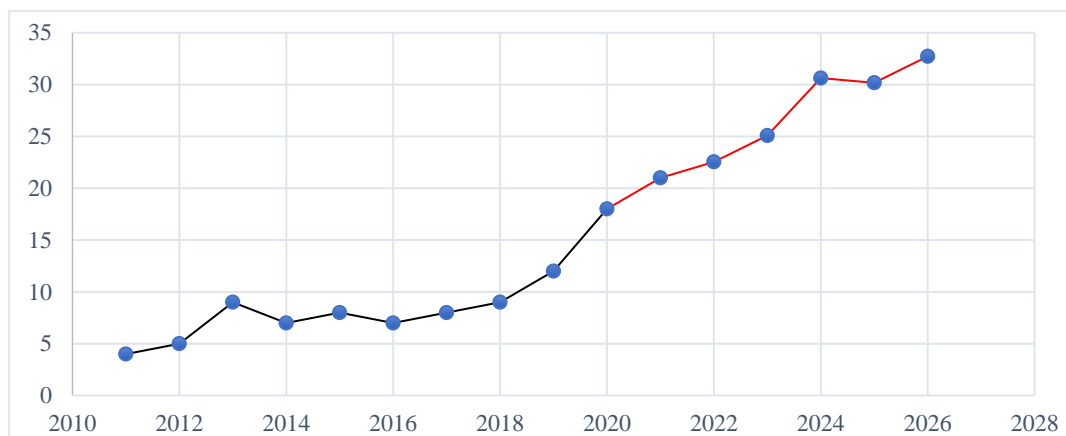

Figure 1. Simulated values for e-commerce at RO level (2022–2026).

This analysis shows an increase in e-commerce values, so **Hypothesis 3 (H3)**—The Romanian e-commerce market will provide opportunities for sustainable growth—is fulfilled. The pandemic time will be only the trigger for increased values for the 2022–2026 period. By using e-commerce, the companies will have better results, better interactions with customers based on personalization and customization, and for customers and the entire society.

5. Discussion

E-commerce, as may be observed, has evolved so much in the world, being a real solution during COVID-19. E-commerce is not trying to exclude traditional commerce but is trying to help customers and organizations survive, offer new solutions to obtain performance due to lockdowns, and keep distance. The trends indicated increased trends for countries worldwide and categories of products. Romania is following this trend, this period offering the opportunity for people to buy or to pay online.

The essential findings of this study indicate future possibilities for organizations. Therefore, the comparison analysis between Romania and some groups formed from European countries and the application of a model that considers some factors influencing e-commerce efficiency can be used to predict the direct relation between the analyzed variables and the correlation matrix from the perspective of knowing from the time the possible risks and issues that could appear.

Future possibilities for societies and at the international level—a future extension for this research could be focused on the relationship between these new variables: trust, attitude, behavior, and payment type. The analysis could be implemented on local, regional, or global levels to make objective comparisons, improve processes, and obtain performance. Using simulation and modeling and simple forecasting programs, the situation for e-commerce could improve for individuals, companies, and society. Knowing possible problems and risks could be developed objectives, measures, and regulations that may help improve performance. E-commerce knew an increased evolution globally, is very active (also due to the COVID-19 period), and being without borders brought multiple advantages for individuals, society, organizations, and their processes (delivery and logistics, communication, relationship with customers, programming language), for the environment, bringing sustainable competitive advantage for personal and business development [148–153]. Obtained results using simulation and modeling indicate that

the Romanian e-commerce market still can grow; obtaining increased possible trends and becoming mature will offer opportunities, and the resources will be a real investment, not a cost in the long term.

6. Conclusions

Using a comparison method between Romania, average EU-27, 4gc, and the weakest value, gaps over time were observed and measures were taken, such as better policies for e-activities, improved e-work, e-skills, and increasing the number of PCs. Additionally, using the analysis of relation and correlation between the analyzed variables and Excel-Data Analysis, the specialists could use the results and apply this model to other countries and regions to observe the differences and make a comparison. Even if this limitation exists, the results will help at the local, regional, or global level and to use this data for future prediction and better decisions. Thus, the research could form a better solution for different researchers, experts in the field, or managers, or even better for the macroeconomic level to make better forecasts and predictions. This knowledge should allow some processes to improve performance, trust, attitudes, and behaviors facing e-commerce and its real results. Analyzing the variables, as factors with great influence on e-commerce, it was observed that comparing Romania with the EU-27 average and the two groups (the greater and the weakest values), for e-commerce, from 2017, Romania grew achieving the value of EU-27; at the same time, Germany and the Netherlands reduced their values, approaching from the same value. As for internet purchases of individuals, from Romania's low level (17), all the other countries from the strong group (values from 68 to 76) and the EU-27 average (51), a significant difference was observed. More reasons presented in the paper indicate why Romanian people buy so little online: lack of trust, reduced number of PCs, or reduced access to the Internet. The difference for the single digital market is not significant (38 compared to 64 for EU-27 average) and 83–89 for the 4gc. The share of e-commerce in total turnover does not indicate increased values (11 for Romania, 19 for EU-27 average, and 4gc values between 17 and 28). All these are happening due to the reduced share of enterprises that sell online (12 for Romanian, 20 for EU-27, and between 20 and 34 for 4gb). As for websites and their functionalities, the analysis shows no difference from other variables. Romania (46), EU-27 (77), and for 4gc, the values are between 79 and 93. Calculating the correlation between the analyzed variables, positive and strong correlations between 0.64 and 0.94 are observed. As we may observe, they are all positive and above the average, tending to the maximum. R is 0.993 showing that between the analyzed variables, there is a positive and very high relation and that the evolution of chosen independent variables explains 99.3% of the evolution of e-commerce. Even though there is a strong and positive relationship between variables because the values are below the EU-27 average, a model was proposed (for better measures) to increase the Romanian values to at least equal the EU-27 average or the average for 4gc. Using regression function to analyze the influence that each analyzed independent variable could have on the dependent variable (e-commerce), results that the influence of all factors is positive and strong (between 0.7 and 0.94), so the first research hypothesis-H1 was fulfilled. After using the regression function, a simulation model was implemented to observe whether using Time series analysis could obtain a better simulated future value for e-commerce in 2021. Calculated for alpha between 0.1 and 0.9, it can be observed that the new forecasted value is under the value for 2020. Thus, QM was implemented for Windows program, which helped to indicate that, growing the second variable with 9.7% and the fifth variable with 0.88%, the proposed value could be obtained. Thereby, the second research hypothesis-H2 is fulfilled. A set of measures for the two variables proposed for increasing was developed. To observe and analyze a possible future for 2021–2026, forecasting method- linear programming was implemented. The graphical representation offers a positive and increasing forecasted future trend for e-commerce, so the third research hypothesis was completely fulfilled—H3. To conclude, it may be added that at the Romanian level, e-commerce is not at the beginning, but it can improve its values very much, bringing performance for individual e-customers, e-

companies, and the entire society. The forecasted future trend shows interest from many involved parties, and the pandemic period was only the trigger for better results.

Conflicts of Interest: The authors declare no conflict of interest.

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