

S&P 500 Index as an Applied Intelligent System for Analyzing the Development of E-commerce

Solomiya Ohinok¹ Maryana Gvozd², Yaroslav Kis³ Yuriy Fedun⁴ and Galyna Kopets⁵

¹Lviv Polytechnic National University, Lviv, 79000, Ukraine

²Lviv Polytechnic National University, Lviv, 79000, Ukraine

³Lviv Polytechnic National University, Lviv, 79000, Ukraine

⁴Ivan Franko National University of Lviv, Lviv, 79000, Ukraine

⁵Lviv Polytechnic National University, Lviv, 79000, Ukraine

Abstract

The applied aspects of the S&P 500 index as an intelligent system for the development of e-commerce are revealed in the research. The four main e-commerce sectors included in the S&P 500 index have been identified and analyzed: online retail, interactive social networks, consumer goods stores and hypermarkets. It has been researched that online retail and interactive social networks are the most important areas for the S&P 500 index, as they are the most efficient and investment-attractive areas of e-commerce that are constantly being modernized. It has been determined that Amazon has the greatest impact on the S&P 500 index, contributing to the stable and gradually growing development of online retail. Recommendations have been developed to increase the value of the S&P 500 index for companies that are losing ground in the field of E-commerce.

Keywords

E-commerce, S&P 500 index, online retail, indicators of the S&P 500 index

1. Introduction

The active growth of the e-commerce market is caused by the rapid development of technology in the world, as well as the strengthening of the company's activities on the Internet, to establish a modern process of selling their services and goods. E-commerce is an activity aimed at the sale of goods and services using information technology based on network interactions between buyer and seller. At the present stage, the field of e-commerce has covered all types of business: from financial institutions, which conduct most of their financial transactions virtually via the Internet or smartphone applications [1], service organizations, such as travel companies, which allow the Internet to form tour with optimal parameters, book a hotel room, pay online, etc. [2], intermediary and logistics companies [3], industrial enterprises [4], etc. However, the 21st century is marked as the century of e-commerce, especially for information and communication and technology companies, whose level of presence in the e-environment determines their competitiveness in national and global markets. One of the most objective and rated such indicators is the S&P 500 index, the value of which determines the company's competitiveness in national and global markets. Such preconditions form the growing relevance of the development of theoretical and practical aspects of the S&P 500 index as an intelligent system for analyzing the development of e-commerce.

The S&P 500 is a stock index that lists the 500 largest companies in the United States. The S&P 500 index was created on March 4, 1957, by the company "Standard & Poor's", a rating society

COLINS-2022: 6th International Conference on Computational Linguistics and Intelligent Systems, May 12–13, 2022, Poland

EMAIL: solomiia.v.ohinok@lpnu.ua (S. Ohinok); mariana.y.hvozd@lpnu.ua (M. Gvozd); yaroslav.p.kis@lpnu.ua (Y. Kis); yuriy.fedun@lnu.edu.ua (Y. Fedun); halyna.r.kopets@lpnu.ua (G. Kopets)

ORCID: 0000-0001-5462-5362 (S. Ohinok); 0000-0001-7842-694X (M. Gvozd); 0000-0003-3421-2725 (Y. Kis); 0000-0003-4371-1841 (Y. Fedun); 0000-0003-4984-6448 (G. Kopets)



© 2022 Copyright for this paper by its authors.
Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).
CEUR Workshop Proceedings (CEUR-WS.org)

formed in 1941 as a result of the merger of two companies “Standard Statistics Company” and “Poor’s Publishing” [5].

The company “Standard Statistics” brought out the first stock market indicator in 1923, which introduced 233 companies. After the merger, this number increased to 416, and then to 500 in 1957. Since then, the S&P 500 index has surpassed the Dow Jones 30 and has become known as the most popular index of the US stock market, it is deservedly called the barometer of the American economy. The dynamics of the S&P 500 index for 2014 - 2022 is presented in Fig. 1.

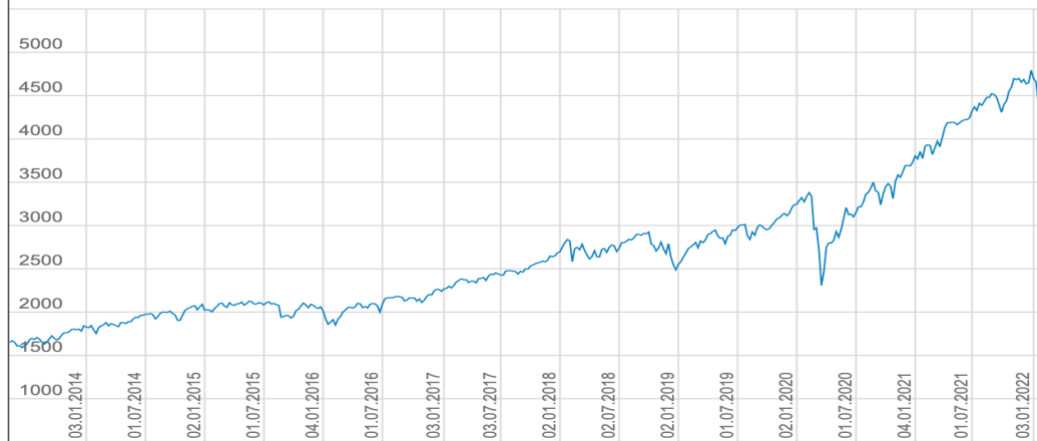


Fig. 1. Dynamics of the S&P 500 index for 2014–2022 [23]

Indeed, it includes more securities (505 values of the S&P 500 vs. 30 values of the Dow Jones). Besides, its value takes into account the market capitalization of the companies that make it up, while the value of Dow Jones is based only on stock market prices.

That is, a change in the dollar exchange per S&P 500 share of a large company will have a greater impact on the index than a smaller company’s share. That’s why the S&P 500 is a more informative indicator.

The S&P 500 index consists of 505 shares issued by 500 large companies listed on the US stock market.

This index S&P 500 covers about 80 % of the total volume of such companies. The shares of the S&P 500 equal to 505, because the index includes 2 categories of shares for 5 of its companies.

To be on the S&P500 list, a company must meet the following financial criteria [6]:

- market capitalization – 5 billion USD;
- high liquidity of shares - 250,000 shares per month for the last six months;
- listing on the NYSE or Nasdaq exchanges;
- share of shares in free circulation - not less than 50%.

E-commerce representatives need to trade their shares on stock markets, as they will have more opportunities to develop and increase profits. Therefore, thanks to such an index, it is possible to analyze the company’s efficiency, investment attractiveness, and future development. Conversely, by analyzing their operation and activity on stock exchanges through this indicator, companies can change the direction of their activity and apply other marketing strategies or management tools to expand the segment of the target audience, as well as increase investment attractiveness. Studies have shown that the information technology sector occupies the highest levels of the S&P 500 index, e-commerce companies are in the top twenty of this list, which is already a great success and sign of e-commerce importance in general.

The main task of this study is to analyze the indicators of the S&P 500 index and assess the weight of e-commerce representatives and the dynamics of companies’ influence on the index; identifying the company that plays the largest role for the index in the e-commerce sector.

Examining this issue in the professional literature and in sources that reflect the results of its practical activities, it is worth noting that in this area there are developments of both domestic and foreign scientists. In particular: N. Shpak, I. Bashynska, O. Prokopenko, Brianna, N. Chukhrai, O. Karyy, M. Subramani, E. Walden, M. Chen. Each of the authors reveals different vectors of this issue, but scientists do not pay attention to the study of the S&P 500 index as a tool for analyzing the development of e-commerce.

The study of theoretical and practical aspects of this issue made it possible to form a hypothesis of the study: when the value of a company's share increases by \$ 1, the value of the S&P 500 index increases.

The main objectives of this study are: analysis of the S&P 500 for companies representing different fields of activity; assessment of the weight of e-commerce representatives and the dynamics of companies' influence on the index; identifying the company that plays the largest role for the S&P 500 in the e-commerce sector.

2. Study methodology

Based on the formulated research hypothesis, it is necessary to determine how the S&P 500 index will change when the value of the company's shares changes. To do this, it is advisable to use the regression equation. The regression equation itself makes it possible to determine the influence of factors on the performance indicator (in absolute terms).

You can find the calculated values of the regression equation both by analytical method and with the help of special software packages, in particular: Exel, Eviews, STATISTICA and others.

In this study, the calculation of the regression equation will be carried out using the software package Eviews [24]. This econometric software package provides particularly sophisticated data processing tools, allows you to perform regression analysis and build forecasts in Windows-based software. The advantage of the Eviews software package is that its practical use makes it possible to quickly identify statistical dependencies of the analyzed data and, using the obtained dependencies, to build a forecast of the studied indicators. It is important to emphasize that a significant advantage of using this software package is a wide range of its capabilities in the analysis of data presented in time series, which is very important given the industry characteristics of companies in the field of e-commerce.

3. Study results

The four areas of activity of the companies that are directly related to e-commerce were selected for the study: online retail, interactive means of communications, consumer goods stores, and hypermarkets (Table 1).

Table 1 Companies that have a stake in the S&P 500 Index

Activity direction	Company's name	Formation year
Online retail	"AMAZON"	1994
	"BOOKING HOLDINGS"	1996
	"EBAY"	1995
Interactive means of communication	"ALPHABET"	2015
	"FACEBOOK"	2004
	"TWITTER"	2006
Consumer goods stores	"DOLAR TREE"	1986
	"DOLLAR GENERAL"	1939
	"TARGET"	1902
Hypermarkets	"WALMART"	1962
	"COSTCO"	1983

Source: compiled by the author based on the data [7-18]

In the table. 1 presents the companies to be analyzed. It should be noted that the start-up dates of companies are characterized by a large gap in the time range - 1902-2015. In such circumstances, starting point – the beginning of the S&P 500 in the stock market is 1950. Concerning the companies that were established earlier, 1950 was considered the first year, as it is necessary to estimate that they have increased their weight in the index. Therefore, adjustments were made.

Calculations were made to determine the change in the value of the S&P 500 index when the share price changes for the above companies using the Eviews software package.

The dependent variable in this regression equation is the S&P 500 index.

The regression equation shows how much the S&P 500 index will change if the company's shares rise by 1 USD. If the closing price of a company's stock increases, the index also increases. The index shows the importance of each company, what share of the indicator is occupied by each of them, thus reflecting the influence and attractiveness of each representative.

Let the authors consider these indicators in dynamics, dividing into three periods: by 2000; from 2001 to 2010; from 2011 to 2019.

Online retail: "Amazon" The regression equation for the first period (1994-2000). Dependent Variable: S&P 500. Method: Least Squares. Sample: 1/01/1994 1/01/2000. Included observations: 73

It can be seen from the results of the regression equation that if the closing price of the stock increases by 1 USD, this will increase the cost of the S&P 500 package by 9.54 USD. Therefore, by 2000, the cost of the package was 305 USD. The company was formed during that period.

"Amazon" and its innovations in e-commerce and marketing strategies [7].

The results of the calculations are presented in table.2.

Table 2. The results of the calculation of the impact of changes in the share price of Amazon in the first period (1994-2000) on the value of the S&P 500 package

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Amazon	9.549512	1.058383	22.25046	0.0000
C	305.5246	27.31888	11.18364	0.0000
R-squared	0.874577	Mean dependent var		837.1886
Adjusted R-squared	0.872810	S.D. dependent var		317.2611
S.E. of regression	113.1470	Akaike info criterion		12.32227
Sum squared resid	908959.6	Schwarz criterion		12.38502
Log likelihood	-447.7628	Hannan-Quinn criter.		12.34728
F-statistic	495.0828	Durbin-Watson stat		1.205854
Prob (F-statistic)	0.000000			

The regression equation for the second period (2001- 2010) Dependent Variable: S&P500. Method: Least Squares

Sample: 1/01/2001 1/01/2010. Included observations: 121

Table 3. Results of the calculation of the impact of the change in the value of Amazon's share in the second period (2001-2010) on the value of the S&P 500 package

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Amazon	12.08341	1.238718	7.332914	0.0000
C	911.1394	40.27255	22.62433	0.0000
R-squared	0.311229	Mean dependent var		1185.458
Adjusted R-squared	0.305442	S.D. dependent var		196.8506
S.E. of regression	164.0556	Akaike info criterion		13.05468
Sum squared resid	3202795.	Schwarz criterion		13.10089
Log likelihood	-787.8081	Hannan-Quinn criter.		13.07345
F-statistic	53.77163	Durbin-Watson stat		1.184125
Prob (F-statistic)	0.000000			

It can be seen from the results of the next regression equation that if the closing price of the stock increases by 1 USD, this will increase the cost of the S&P 500 package by 12.08 USD. Thus, the

reason for this growth is primarily due to the introduction of the company's active operation, attracting investors to expand the scope of activities, a direct development of e-commerce, so the weight of "Amazon" has increased in the S&P 500 index [7].

The regression equation for the third period (2011-2019) Dependent Variable: S&P 500 Method: Least Squares. Sample: 1/01/2011 1/01/2019. Included observations: 97

Table 4. Results of the calculation of the impact of the change in the value of Amazon's share price in the third period (2011-2019) on the value of the S&P 500 package

Variable	Coefficient	Std. Error	t-Statistic	Prob.
amazon	13.89844	0.460621	30.17324	0.0000
C	998.2157	35.31765	28.26393	0.0000
R-squared	0.905513	Mean dependent var		1960.260
Adjusted R-squared	0.904518	S.D. dependent var		484.1631
S.E. of regression	149.6072	Akaike info criterion		12.87431
Sum squared resid	2126320.	Schwarz criterion		12.92739
Log likelihood	-622.4039	Hannan-Quinn criter.		12.89577
F-statistic	910.4246	Durbin-Watson stat		1.230097
Prob (F-statistic)	0.000000			

It can be concluded from the results of the regression equation for the third period that if the closing price of the stock increases by 1 USD, this will increase the cost of the package by 13.89 USD. The share of the S&P 500 index is also growing, so "Amazon" is gradually but steadily evolving, thanks to its unique marketing strategies, attracting more and more investors, thereby increasing profits and importance in e-commerce [7].

It is worth noting that the study has found that the company "Amazon" has shown the greatest impact on the index, contributing to the stable and gradually growing development of online retail.

As mentioned above, Amazon's share in the S & P500 index is growing steadily, gradually but steadily, thanks to its unique marketing strategies, attracting more and more investors, thus increasing its profits and importance in e-commerce. As of 2019, Amazon ranks third on the S & P500 list. This, in turn, confirms our theory that e-commerce companies are becoming increasingly important every year and becoming significant players in the international arena.

Similarly, the authors analyze the other selected representatives of e-commerce, which are included in the S&P 500 list. The results of the calculations are presented in table. 5.

This table shows the study results of how the importance of companies for the S&P 500 index and their dynamics of development in the e-commerce field changed during the three identified periods. It is worth considering the results of each representative of the 4 selected areas in detail (Table 5).

Table 5 Dynamics of development of the company's significance in the S&P 500 Index

	Value by 2000	2001-2010	2010-2019
"AMAZON"	9,549512	12,08341	13,89844
"BOOKING HOLDINGS"	29,00654	28,00600	28,15858
"EBAY"	95,11289	4,554335	20,11649
"ALPHABET"	-	-	20,71500
"FACEBOOK"	-	3,532339	12,97112
"TWITTER"	-	30,55583	1,378310
"DOLAR TREE"	59,96111	27,93661	15,73459
"DOLLAR GENERAL"	40,20753	18,32432	20,43257
"TARGET"	30,05732	4,113455	14,32800

“WALMART”	31,99007	30,93699	16,06292
“COSTCO”	28,14562	20,57188	5,251475

Source: compiled by the author based on the data [7-18]

The authors can draw the following conclusions: the theory of theirs that e-commerce companies-representatives are becoming increasingly important every year, as well as becoming major players in the international arena, is correct. If to make a more detailed analysis of each of the companies, it can be said that the authors’ hypothesis is true for “Amazon”, “Booking Holdings” (Looking at the results, it can be concluded that in the second period there was a slight decrease in the share of weight in the S&P 500 index, but the hypothesis of the study is true for this company), “eBay Inc.”, “Alphabet”, “Facebook”. However, this study showed that some of the selected companies, on the contrary, reduced their weight in the S&P 500 index. Such companies either experienced a crisis or become less efficient and attractive to investors for some reasons. Let the authors consider each case in detail.

“Twitter” – according to the study, it can be seen that this company has reduced its weight as sharply as possible in the S&P 500 index [18]. Unfortunately, “Twitter” is becoming more and more irrelevant, as this social network does not invest enough in its innovation and marketing development; their concept is outdated, ineffective, and unattractive to users and is criticized from all sides, in addition to having many conflicts related to celebrities throughout its history. “Twitter” also tried to expand its business, but strong competitors in the field of interactive communications, such as “Facebook” and “Instagram” do not give the company any chance to stabilize in the electronic services market.

Facebook is the world's largest social network, and the company of the same name (Facebook Inc.) owns it. It was founded on February 4, 2004, by Mark Zuckerberg and his roommates while studying at Harvard University. Facebook Inc. is the owner of other popular services such as Instagram, WhatsApp, workplace (corporate messenger), and Oculus VR, leading the company's rapid development in the e-commerce sector.

Facebook traffic has been growing steadily since 2009. On March 13, 2010, Facebook was visited by more people than Google. Facebook also became the best social network in eight markets in the Philippines, Australia, Indonesia, Malaysia, Singapore, New Zealand, Hong Kong, and Vietnam. At the same time, other brands held leading positions only in selected markets, including Google Orkut in India, Mixi.jp in Japan, Cyworld in South Korea, and Yahoo! Wretch. Cc in Taiwan.

The results obtained during the two periods covered by the study confirm that the hypothesis is valid for the company and demonstrates the effective development of interactive social networks as one of the areas of e-commerce, which is becoming more and more an integral part of everyone's life.

However, our study showed that some of the selected companies, on the contrary, reduced their weight in the S & P500 index. Such companies have either survived the crisis or become less efficient and attractive to investors. Let's look at each case in more detail.

“Dollar Tree, Inc.” is an American chain of fixed-price stores that sells for \$ 1. USA. The company is headquartered in Chesapeake, Virginia, and the chain itself is on the Fortune 500 list with 13,600 stores in 48 states and Canada.

According to its strategy, “Dollar Tree” offers goods at the lowest prices. The company claims to have been able to achieve this because their buyers work hard to find the best deals with them, and has great control over the huge purchasing power of one dollar. Network prices are primarily designed to attract low-income people, but they have also become popular among wealthier customers. However, according to the study results, during the rapid development of e-commerce, “Dollar Tree” cannot maintain a high share in the S&P 500 index due to strong competition in the e-commerce market [13]. Therefore, the hypothesis of this study does not come true for “Dollar Tree”.

Dollar General Corporation is an American chain of consumer stores headquartered in Goodlettsville, Tennessee. As of January 2020, Dollar General operates 16,278 stores in the continental United States. Dollar General entered the food market with its establishment of Dollar General Market in 2003.

In 2004, Dollar General expanded into low-cost Asian markets, opening a source in Hong Kong. However, a turning point for the company was that on June 21, 2007, CEO David Purdue announced his resignation, leaving David Beret as interim CEO. This, in turn, led to a decrease in the efficiency of the company and a drop in the share in the S & P500 index. In addition, the company suffers from the same problems as Dollar Tree, namely as representatives of e-commerce.

Analyzing the study data, it can be seen that “Target” company experienced the same situation as “Dollar Tree” and “Dollar General”, both a financial crisis and increased competition, as well as the inability to surpass the online giants of the e-commerce industry [14].

However, in the third period, there was an increase in the company’s share in the S&P 500 index. In 2012, the company “Apple Inc.” signed a contract to open 25 separate mini-markets existing on a “shop-in-store” basis in “Target” stores with a full range of “Apple” products and a staff consultant. Besides, all “Target” stores have been selling popular “Apple” products such as the iPhone, iPad, and iPod for many years, “Walmart” [16]. As it can be seen from the study findings, the company was able to maintain a relatively high share of significance in the S&P 500 index during the two studied periods, but in the third period, there was a decrease in the index twice. The main reason was that on August 8, 2016, “Walmart” announced a purchase for \$ 3 billion by “Jet.com”, one of the fastest-growing online marketplace companies, and under the agreement terms, the founder and CEO Mark Lore and the “Jet.com” top management will join “Walmart” team and lead the retailer’s online sales department for several years [16]. On May 9, 2018, “Walmart” announced the purchase of 77% from the leader of the Indian e-commerce market “Flipkart” for \$ 16 billion. It was the largest acquisition in “Walmart” history and the largest deal in the history of e-commerce. Investors reacted negatively to “Walmart” announcement of the deal with “Flipkart” being skeptical of the company’s prospects in the Indian market. The shares of “Walmart” fell by 3.1% after the transaction, which led to a decrease in the share, besides the same reasons as in “Dollar Tree” and the others.

“Costco Wholesale Corporation” is the world's largest network of club-type self-service warehouses. The fifth largest retailer in the United States. In general, Costco focuses on selling products from a limited number of manufacturers at minimum prices [48]. Focusing on a small circle of manufacturers maximizes the sale of certain brands, which allows you to receive additional discounts from manufacturers. “Costco Wholesale Corporation” gradually lost its share in the S&P 500 index, but in the third period, there was a sharp decline due to the death of the founder Jeffrey Brotman and a change of the management at “Costco” in 2017 [17].

The above companies have been on the market since the 1960s and they are stable, so investors will not particularly invest in them. As competition grows, innovative breakthroughs attract investors more, so the areas such as consumer goods stores and hypermarkets as e-commerce representatives have no opportunity to develop an effective strategy to increase competitiveness in the era of on-line platforms and online shopping. These companies have survived all the crises, but their investment attractiveness is still declining, as for e-commerce. Therefore, the hypothesis of this study is not confirmed for the companies such as “Twitter”, “Dollar Tree”, “Dollar General”, “Target”, “Walmart”, “Costco” [12-18].

So that these companies also develop and become more attractive or at least remain at the same level, it is necessary to make comprehensive changes within each company. For these reasons, the authors developed recommendations for increasing the attractiveness of companies – representative that reduce their weight in the S&P 500:

- acceptance for implementation of such investment projects that allow realizing the economic potential of the enterprise [19];
- formation of a set of marketing tools to promote their services and the formation of consumer demand by influencing consumers who are key users of the services of the surveyed companies. The right choice of marketing tools makes it possible to change consumer behavior in the desired direction of the seller and ensure the competitiveness of companies in the global market [20-21];
- development of an investment strategy of the enterprise, integrated into the general strategy [22];
- providing information transparency of the enterprise;
- stabilization of the financial state;
- creating a credit history by obtaining a rating of investment reliability;
- organization of accounting checks by audit companies;
- legal examination and bringing the documents that establish law under legislation;
- implementation of measures to avoid certain risks, limit the concentration of risks, hedging, diversification, risk insurance, and the creation of special reserve funds;
- creation of intangible competitive advantages through the development of intangible assets of the enterprise such as brand, image, reputation;
- diversification of the enterprise, development of new products;
- increasing the level of product competitiveness;
- increasing the scale of production, the introduction of new technologies that increase productivity, reduce material consumption, and improve product quality.

This experience will be beneficial for Ukraine as well, as our e-commerce market is just beginning to develop, but some online stores have won the championship as of today. Let's evaluate the activities of Ukrainian online retailers on four key marketing aspects: purchasing goods, registering on the site, interaction, and conversion. We can identify the leading players who occupy a significant share of the Ukrainian Internet market. As for the leaders of the Ukrainian e-commerce market at the moment, as in the 2018 study, none of the representatives of e-commerce is a leader in marketing efficiency. The leadership position is provided by a high level of interaction between the consumer and the company. The registration of users on the site should be as high as possible. Then their consumers receive more value in the long run, and the company itself demonstrates a higher return on investment.

Among the highly efficient companies in 2018 were such as: "Rozetka.com.ua", "Lamoda.ua" and "Hotline.ua". They all show the same characteristics today: they show a high level of user registration on the site, but the interaction rate is slightly lower than the level of registration. Such representatives receive a better return on investment in the short term, but the level of consumer value in the long run may decline.

The development of e-commerce in Ukraine directly depends on the stability of the economic and political situation. Therefore, such factors as the lack of legal support for this type of economic activity, a slight increase in the cost of Internet shopping due to Ukrainians' low level of solvency, and the lack of necessary information and logistics infrastructure fully affect the status and development of e-commerce.

The main positive factors influencing the development of e-commerce in Ukraine are:

- the development of e-commerce does not have certain material restrictions and does not require consolidation in a particular territory;
- buying and selling via the Internet significantly reduces the time and physical movement of market participants;
- e-commerce has no time limits, i.e., can place all orders at any time;
- fast exchange of information between suppliers and consumers;
- flexible market segmentation, i.e., the market segment can be changed by the company at its discretion depending on the availability of the necessary resources.

The share of online trade in Ukraine is still tiny compared to developed countries. Online stores are not fighting with each other but to increase market share in online sales. In these conditions, the consolidation of efforts and experience brings the best results.

Thus, e-commerce, the leading Internet representative in Ukraine, has significant potential for development. Among the main trends are increasing the volume of trade via the Internet, increasing the number of e-commerce enterprises, increasing the number of consumers of online stores and increasing their loyalty to purchasing goods online, expanding the range of enterprises, and more. However, among the main problems of further development of e-commerce for Ukrainian companies is the lack of the necessary legislative regulation of their activities, stimulating and regulating rules. Among the problems is the lack of the necessary legislative regulation of their activities and incentives and regulations, which becomes the main task of the state to improve e-commerce. The main trends are the increase in the volume of trade via the Internet, increasing the number of e-commerce enterprises, increasing the number of consumers of online stores and increasing their loyalty to purchasing goods online, expanding the range of enterprises, and more.

The main task of the state for the near future is to adapt the legal framework to world standards to increase the efficiency of not only e-commerce but also e-commerce in general.

3.1. Conclusions and recommendations

In summary, it is worth noting that the paper reveals the main practical aspects of the S & P500 index is an intelligent system for analyzing the development of e-commerce.

Much attention is focused on the S & P500 index since it shows the market importance of each company, thus reflecting its impact and investment attractiveness.

This quantitative study identified and analyzed four main e-commerce sectors listed in the S & P500 index: online retail, interactive social networks, consumer goods stores, and hypermarkets. According to the results, we can say that the most important for the S & P500 index and the most efficient, investment-attractive, and constantly modernizing e-commerce are retail on the Internet and interactive social networks.

In practice, the S & P500 is often compared to the Dow Jones index. However, the S & P500 index includes more securities (505 S&P 500 vs. 30 Dow Jones). In addition, its value takes into account the market capitalization of its member companies, while the value of Dow Jones is based only on stock market prices.

The results of the research allow us to conclude the impact of the rising share price on the S & P500 index and this shows that, in general, the hypothesis put forward in the work is proven.

Research by companies in various fields of activity has shown that a change in the dollar's exchange rate per share of a large company will have a greater impact on the S&P 500 index than a smaller company. It is worth noting that Amazon has shown the greatest impact on the S&P 500 index, contributing to the stable and gradually growing development of online retail. That is why the S&P 500 is the most informative indicator.

4. References

- [1] N. Shpak, I. Kulyniak, M. Gvozd, Y. Malynovska, and W. Sroka, "Estimation of the Marketing Activity of Banking Structures," *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, vol. 68(1), 2020, pp. 229-242. DOI: <https://doi.org/10.11118/actaun202068010229>.
- [2] I. Bashynska, I. Lytovchenko, D. Kharenko, "Sales tunnels in messengers as new technologies for effective Internet-marketing in tourism and hospitality," *International Journal of Innovative Technology and Exploring Engineering*, vol. 8(12), October 2019, pp. 594-598. DOI: <https://doi.org/10.35940/ijitee.L3470.1081219>.
- [3] O. V. Prokopenko, V. V. Bozhkova, and Ya. S. Romanyuk, "Modern Internet platforms in the field of logistic services in the Republic of Poland and Ukraine," *Marketing and Management of Innovation*, no. 3, 2016, pp. 54-65.
- [4] I. O. Bashynska, "Models of integrated marketing communications forming for innovatively active machine engineering enterprises," *Economic Annals-XXI*, Issue 11/12, 2012, pp. 52-54.
- [5] Brianna. 15 Ecommerce Marketing Strategies to Increase Your Online Sales. Available at: <https://www.lyfemarketing.com/blog/ecommerce-marketing-strategies>.
- [6] Interesting facts about online trade in the world Available at: <http://lemarbet.com/ua/razvitie-internet-magazina/interesnye-fakty-ob-internet-torgovle>.
- [7] Amazon Official Page. Available at: <https://www.amazon.com>.
- [8] Booking Holdings Official Page. Available at: <https://www.bookingholdings.com>.
- [9] eBay Official Page. Available at: <https://www.ebay.com>.
- [10] Alphabet Official Page Available at: <https://abc.xyz>.
- [11] Facebook Official Page Available at: <https://www.facebook.com>.
- [12] Twitter Official Page. Available at: <https://twitter.com>.
- [13] Dollar Tree Official Page. Available at: <https://www.dollartree.com>.
- [14] Dollar General Official Page. Available at: <https://www.dollargeneral.com>.
- [15] Target Official Page Available at: <https://www.target.com>.
- [16] Walmart Official Page. Available at: <https://www.walmart.com>.
- [17] Costco Official Page. Available at: <https://www.costco.com>.
- [18] Twitter, Inc. (TWTR) Historical Data. Available at: <https://finance.yahoo.com/quote/TWTR/history?p=TWTR>.
- [19] N. I. Chukhrai, I. Y. Kulyniak, O. I. Hliantseva, "Methodological approaches to justification of improvement measures for using components of industrial enterprises potential," *Marketing and Management of Innovation*, no. 2, 2017, pp. 233-247. DOI: <https://doi.org/10.21272/mmi.2017.2-22>.
- [20] B. Sheremeta, N. Chukhrai, and O. Karyy, "Marketing tools as the competitiveness enhancer of the ukrainian film distribution market entities," *Innovative Marketing*, vol. 15(4), 2019, pp. 88-101. DOI: [https://doi.org/10.21511/im.15\(4\).2019.08](https://doi.org/10.21511/im.15(4).2019.08).
- [21] O. V. Prokopenko, "Consumer choice types in marketing of ecological innovations," *Actual Problems of Economics*, vol. 16(2), 2011, pp. 109-116.
- [22] V. Lagodiienko, O. Karyy, M. Ohiienko, O. Kalaman, I. Lorvi, and T. Herasimchuk, "Choosing effective internet marketing tools in strategic management," *International Journal of Recent*

Technology and Engineering, vol. 8(3), 2019, pp. 5220-5225. DOI:
<https://doi.org/10.35940/ijrte.C5868.098319>.