**The role of distribution centres in the logistics infrastructure of Kazakhstan**
Zhanna Arynova, Gulmira Nakipova, Aigul Nurmaganbetova, Gulzhan Alina, Aigul Orazbayeva, Dinara Kemirkulova

# The role of distribution centres in the logistics infrastructure of Kazakhstan

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*Keywords:* warehouses, distribution centre, infrastructure, supply chain, logistics.
*Abstract:* Distribution centres play a key role in the supply chain and their insufficient number will entail supply chain disruptions —supply delays and problems, as well as lost profits. Currently, distribution centres in Kazakhstan are located only in large cities. However, the growth of e-commerce (from 11729.9 billion tenge to 15763.7 billion tenge in 2022 compared to 2020) determines the need to solve this problem. Our study establishes the dependence between the areas of distribution centres and the e-commerce volume. This analysis, unlike the existing ones, examines the effect of the growth of e-commerce volumes on the increasing number of distribution centres as a prerequisite for the development of the logistics infrastructure of Kazakhstan against the background of the increase in the volume of goods supplied from China in transit to Europe. The aim of the study was to analyse the role of distribution centres in the logistics infrastructure of Kazakhstan. We justify the need to increase the number of distribution centres due to the increase in both turnover in goods transit, wholesale, and retail trade. The introduction of distribution centres ensures the continuous movement of goods and strengthens the connection between suppliers and consumers. The emergence of new technologies and innovations, combined with favourable market conditions and political support, creates favourable conditions for the development of reliable distribution centres that can improve logistics efficiency and contribute to the overall economic development of Kazakhstan.

## 1    Introduction

Most countries pay attention to logistics issues, including joint inventory management, procurement coordination, marketing, and delivery of goods. These key tasks can be fulfilled with the help of distribution centres, which are warehouses for storing goods and products in both small and large centres. Distribution centres play the role of hubs that solve logistical tasks of storing goods in their warehouses on the way to retail networks.

The distribution centre is, first of all, a part of the logistics processes of the movement of goods. The distribution centre will allow the company to improve its work, striving to comply with the logistics rule 7R (right product, right quality, right quantity, right time, right place, right customer, right cost). It provides that the necessary goods of the required quality and in the required quantity will be delivered at the right time without delays, because the goods will be located in the consumer's region, in the right place, to the right consumer with the necessary cost level, as well as with the possibility of reducing delivery costs [1].

The COVID-19 pandemic has once again emphasized the importance of distribution centres in our daily lives. People are increasingly turning to online shopping in order to avoid crowded malls, which has become the new norm. This change in consumer behaviour has had a significant impact on distribution centres, as order volumes increase and customers expect fast delivery. Distribution centres have intensified their efforts to address this challenge. They have managed to cope with the increasing workload on staff and adhere to social distancing measures through the use of new technologies such as automation and robotics. They optimized their processes, ensuring fast delivery of goods and compliance with customer expectations.

Currently, distribution centres in Kazakhstan play a key role in supplying retailers and manufacturers not only throughout the country, but also in the neighbouring countries of Central Asia. This is determined by the fact that Kazakhstan is a transport and transit hub for cargo flows between Asia and Europe [2].

However, in general, the distribution centre sector of Kazakhstan does not fully meet the market needs. One

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problem is that many distribution centres in Kazakhstan are located right next to major cities, which makes it difficult to serve regional markets and incurs additional transportation costs. The situation with distribution centres in Kazakhstan is diverse and changing. Some of them operate at a high level, have modern equipment and highly qualified personnel, which enable them to effectively perform their functions and satisfy the customers' needs. But there are distribution centres that require additional investment and modernization of equipment, as well as personnel development. This can lead to poor performance and poor quality of service.

The local market also has prospects for the development of this sector. First of all, the government of Kazakhstan introduced changes to national legislation aimed at stimulating investment in the distribution centre sector. Steps are being taken in this direction to create new distribution centres in remote regions of Kazakhstan, which increases competition in the market and helps to reduce prices for services. The new distribution centres will be able to provide services to retailers in regions where this was previously impossible. In addition, the development of transport infrastructure, including the ports of Aktau and Kuryk, as well as the extensive railway network of Kazakhstan will make transit through Kazakhstan even more attractive for various companies.

Distribution centres not only provide storage of goods, but also assemble batches of goods as quickly as possible for their delivery to the recipient, and also monitor the supply of quality goods. The function of distribution centres to track the supply of high-quality goods for the end consumer, especially in the context of e-commerce, when the consumer cannot physically check the quality of the goods before purchase, determines the relevance and importance of our research not only for Kazakhstan, but also for other countries. Especially for countries where e-commerce is growing rapidly.

The aim of the study is to analyse the role of distribution centres in the logistics infrastructure of Kazakhstan. The aim involved the fulfilment of the following research objective:
- Assess the impact of the development of e-commerce on the growth of the number of distribution centres.

## 2 Literature review

Much of the efficiency of logistics activities depends on how logistics distribution centres work in supply chains [3]. The term "distribution centre" has various definitions that reveal its essence. On the one hand, a distribution centre is a place created to distribute goods to different users in order to reduce production, inventory management, and transportation costs [4]. On the other hand, a distribution centre, also known as a fulfilment centre or warehouse, is a facility designed to efficiently store, sort, and distribute products [5]. A distribution centre is also defined as a specialized warehouse that acts as a central node in the supply chain, responsible for receiving, storing, and distributing products. It uses technology and automation to optimize inventory management, order processing, and logistics, enabling companies to efficiently meet customer demands [6].

Urban distribution activities account for a significant portion of total transportation spending and are expected to grow due to increased pickup and delivery requests [7]. For these reasons, companies must find logistics solutions in such a way as to reduce costs caused by inefficiency and irrationality [8].

Authors [9] studied the establishment of a logistics centre in the Turkish province of Sivas. The application of a multi-criteria decision-making method was proven to be necessary, as various qualitative and quantitative criteria must be taken into account when creating a logistics centre.

Edgar Hoover proposed three strategies for placing distribution warehouses: near the point of sale of goods, near production, at intermediate points. This has become a commonly accepted classifier. According to the researches of Atameken NEC Centre, trade and distribution centres make it possible to achieve efficiency in the following areas:
- prices for consumer goods will decrease by about 13% on average;
- product losses will decrease by 20%;
- the revenue of agricultural producers will increase by 10% [10].

The above definitions focus on the critical functions of the distribution centre, such as storage, processing, order fulfilment, and transportation management. This strategic component of the supply chain enables companies to effectively manage inventory, reduce costs and improve customer satisfaction.

Authors [11] note that the problem of logistics centres consists, first of all, in optimizing the location of the logistics distribution centre, and it is necessary to apply a special mathematical model to solve this problem. And the type of variables in the model must be taken into account when building a mathematical model. Some of these variables are defined and some are undefined. This model is also reflected in the work [12] in the form of introducing an additional time factor as an undefined variable. Authors [13] proposed that in addition to the uncertain variable of time, uncertainty should also be used in making a decision on the location of a logistics centre. This model is two-stage. Authors [14] studied the three-level optimal location problem in supply chain networks with uncertain transportation costs and uncertain customer demand.

The given analysis shows the influence of factors of time, location, as well as the analysis of variables in the proposed models. However, taking into account the peculiarities of the development of logistics centres in the period of the COVID-19 pandemic, the development of e-commerce is of particular importance. The main condition for the expansion of e-commerce is the use of the capacities

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of logistics centres. This is the basis for the importance of our research.

According to studies by domestic authors, the increase in the volume of traffic contributes to the development of distribution centres in Kazakhstan [15]. The development of distribution centres in Kazakhstan was driven by several factors, including the country's strategic geographical location, infrastructure investment, and a favourable business environment. The growth of the e-commerce and retail sectors has also stimulated demand for efficient distribution networks. Moreover, the emergence of new trade routes, such as the China-Kazakhstan-Europe railway connection, further increased the importance of Kazakhstan as a logistics hub. The development of distribution centres in Kazakhstan is mainly concentrated around Astana, Almaty and Atyrau region due to their strategically important location [16].

Based on the proposed methods presented by the above authors, our study proposes to build a regression model (applied by MEDRANO-GÓMEZ, X. D., and FERREIRA, D.) that analyses the relationship between the areas of distribution centres and the e-commerce volume.

In recent years, Kazakhstan has made significant progress in improving its logistics infrastructure. The country ranks 71 in the World Bank's Logistics Performance Index for 2018, which shows a positive trend compared to the previous ranking [17]. There is also an increase in the volume of transportation, the development of digitalization and logistics services in general. Competition in this area has led to the formation of strictly oriented logistics to meet the market needs. As logistics operators need to deliver a large number of individual orders on time, distribution centres are an

effective solution to this problem [18]. These researchers themselves propose to consider the relationship between the area of the distribution centres and the e-commerce volume, as such a relationship, in their opinion, is the most relevant for the logistics system of Kazakhstan.

Therefore, the analysis of literature proves that there is currently a gap in the study of the relationship between the dynamics of the expansion of logistics centres and the dynamics of the increase in the e-commerce volume. This issue is especially important for the logistics system of Kazakhstan, in particular because of the significant sanctions for the Russian Federation. Due to the introduction of sanctions against the aggressor country, Kazakhstan became a transit point between the supply of goods from China to Europe, on the one hand, and the supply of sanctioned goods from Kazakhstan to the Russian Federation, on the other hand, which is carried out using electronic systems. All this indicates that Kazakhstan has become a powerful logistics hub and needs additional research into the role of distribution centres in the logistics infrastructure.

# 3 Methodology
## 3.1 Research design
The study includes an analysis of the dynamics of transportation volumes and retail sales, an analysis of the possibility of applying the concept of wholesale distribution centres in large cities, an assessment of the impact of the growth of e-commerce on the growth of the number of distribution centres. Figure 1 illustrates the research procedure.
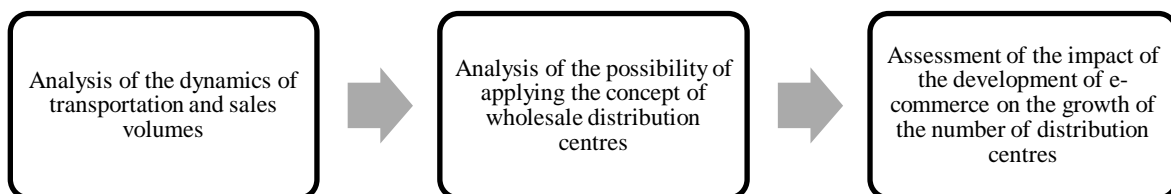


*Figure 1 Research design*

## 3.2 Information base
The basis consists of analytical analysis, state programs, statistical data, official information, periodic scientific publications. In addition, in order to study the level of logistics activities, the international LPI (Logistic Performance Index) rating was considered.

The evaluation period is 2020-2022, because it the rapid growth in retail trade is observed during this period, as well as an increase in the volume of retail trade (from 11,729.9 billion tenge to 15,763.7 billion tenge), and an increase in warehouse space by 20% in 2022 compared to in 2020 across the country.

## 3.3 Methods
The assessment of the impact of the increase in the volume of e-commerce on the increase in the number of distribution centres was carried out using correlation and regression analysis. The choice of such a method is determined by the rapid growth of the volume of e-commerce, which determines the extension of the available distribution centres. The method of paired regression was chosen for the study, where the resulting factor Y is the distribution centre areas, and the independent variable X is the volume of retail e-commerce.

The two-way regression method is used to visualize the relationship between the studied economic indicators. A graph is built for this purpose in a rectangular coordinate system. The values of the resulting characteristic Y are

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plotted on the vertical axis, the values of the factor characteristic X — on the horizontal axis.

The set of points of the resulting and factor features is called the correlation area.

The correlation space gives grounds to assume that the relationship between all possible values of X and Y is linear (for the general population).

Linear regression equation y = bx + a

The estimated regression equation (based on sample data) has the form y = bx + a + ε, where ei is the observed (estimated) value of the error εi, a and b are the estimated values of the regression model parameters α and β, respectively.

Here, ε is a random error (deviation, disturbance).

The reasons for the existence of random errors:

1. The regression model does not include important explanatory variables.

2. Aggregation of variables. For example, the aggregate consumption function attempts to represent the sum of individual consumption decisions. This is only an approximation of individual relationships with various parameters.

3. Incorrect specification of the model structure, for example, the model structure is not a model of individual consumer decisions;

4. Incorrect function specification;

5. Measurement error.

For each observation i, the deviation εi is random and its value in the sample is unknown.

1) Only estimates of parameters α and β were obtained from observations xi and yi.

2) Estimates of parameters α and β in the regression model are the values of α and b, respectively, and are random because they correspond to a random sample.

The least squares method (LSM) is used to estimate parameters α and β.

The least squares method provides the best (reliable, efficient, and unbiased) estimates of the parameters of the regression equation only if certain assumptions about the probability term (ε) and the independent variable (x) are met.

Formally, the LSM criterion can be written as follows

$S = \sum(y_i - y^*_i)^2 \rightarrow min$

Normal system of equations

$a \cdot n + b \cdot \sum x = \sum y$

$a \cdot \sum x + b \cdot \sum x^2 = \sum y \cdot x$

The closeness of the relationship is estimated based on correlation and covariance coefficients [19]. The linear correlation coefficient takes on values from -1 to +1. Relationships between signs can be weak and strong (close). Their criteria are evaluated according to the Chaddock scale:

0.1 < rxy < 0.3: weak;

0.3 < rxy < 0.5: moderate;

0.5 < rxy < 0.7: noticeable;

0.7 < rxy < 0.9: high;

0.9 < rxy < 1: very high.

## 4 Results

The increase in sales, transportation, infrastructure development and e-commerce are the basis for the formation of distribution centers. After all, these factors require a more optimized distribution network for economic growth.

Gross output in the category "Transport and warehousing" for January-February 2023 exceeded 2 483 206.7 million tenge (Ifo 106.7%). This is 57% more than in this period of 2022 (1076470.8 million tenge).

Let us consider the dynamics of the volume of cargo transportation by all modes of transport (Figure 2):
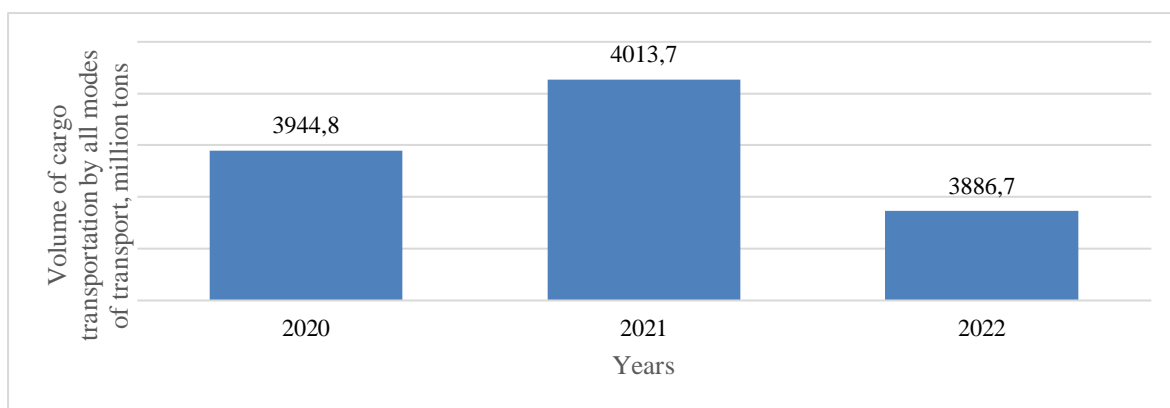


*Figure 2 The volume of cargo transportation by all modes of transport, million tons*
*Note – according to [20]*

January-April 2023. transport of the republic transported 307.8 million tons of cargo. Cargo turnover for January-April of this year increased by 1.6% from the level of the corresponding period of the previous year.

In addition, there is a dynamic of increasing the volume of retail trade in the Republic of Kazakhstan (Figure 3).

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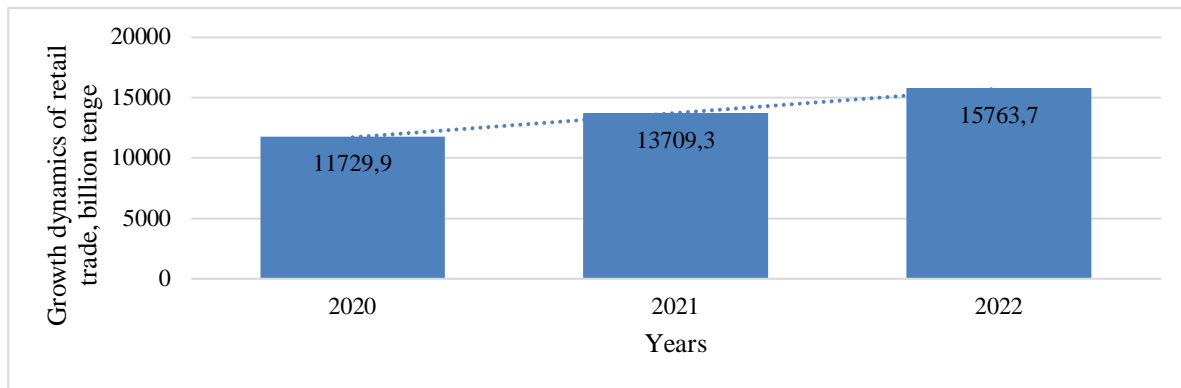Zhanna Arynova, Gulmira Nakipova, Aigul Nurmaganbetova, Gulzhan Alina, Aigul Orazbayeva, Dinara Kemirkulova



*Figure 3 Dynamics of retail trade growth, billion tenge*
*Note – according to [21]*

The volume of retail trade in January-April 2023 amounted to 4825.9 billion tenge, this is 10.5% more than the level of the corresponding period of 2022. Retail sales of goods by trading enterprises increased by 14% compared to January-April 2022.

In the conditions of the developing economy, it is important to pay attention to the creation of effective distribution centres [22]. As companies expand their operations to go global markets, the importance of having a well-planned distribution centre cannot be overemphasized.

According to the National Statistical Service of Kazakhstan, at the end of 2019, the number of distribution centres in Kazakhstan was 27 units, which is 9.1% more than in the previous year. Most of the storage facilities (approximately 60%) are located in the three main cities of the country - Astana, Almaty and Shymkent.

Currently, Kazakhstan has modern distribution centres serving various industries, including retail, manufacturing, pharmaceuticals and consumer goods. These hubs are strategically located near major transportation hubs such as highways, railways and airports, making it easier to deliver goods to various destinations.

The concept of distribution centres in large cities involves the creation of a new system (Figure 4).
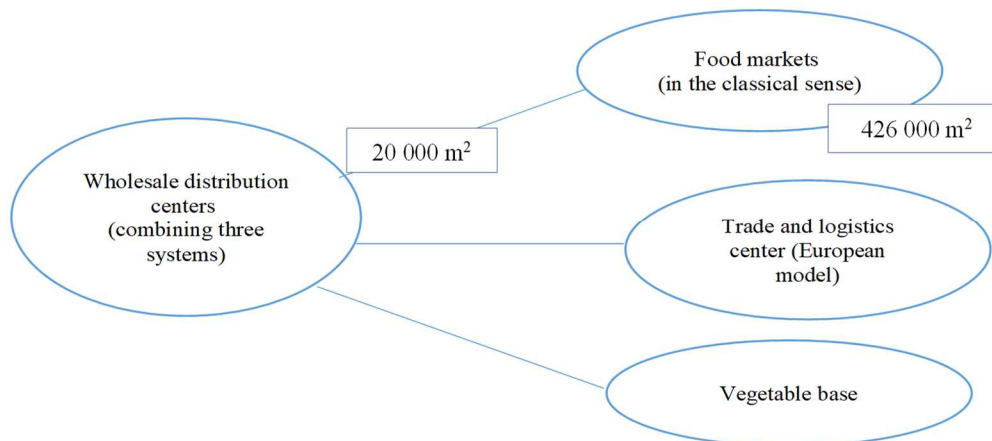


*Figure 4 Formation of wholesale distribution centres in large cities*
*Note – compiled by the authors on the basis of [23]*

The presence of a distribution centre allows to reduce the storage area in retail outlets to 30% of the total area of retail premises and exclude intermediaries that can lead to higher prices for goods. In addition, it solves the problem of limited storage space for various types of goods.

Figure 3 gives grounds to note that such wholesale distribution centres focus their activities on three main groups — giant enterprises (a turnover of 100-1000 tons per month), wholesale companies, and retail companies with an average turnover of 10-1000 tons per month. Each of these target groups determines special conditions of cooperation based on the logistics rule 7R (right product, right quality, right quantity, right time, right place, right customer, right cost). One of the examples of the practical implementation of the strategy is the Wildberries marketplace. Wildberries is a leading operator in the field of import, logistics, distribution and promotion of everyday goods from the largest global and Russian manufacturers. The strategic advantage that distinguishes the company from its competitors is that it is able to offer its partner the

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entire range of services for the delivery of goods from the manufacturer's warehouse to the final point of sale. Wildberries has opened a new distribution centre in Almaty, thanks to which the Kazakh businesses will be able to increase its presence on the largest Russian marketplace, increase sales, and create new jobs. The distribution centre is managed using the WBPoint mobile application, where entrepreneurs have all the necessary functions for working with orders and customers.

In the first half of 2022, Wildberries increased turnover by 94% compared to the same period last year, reaching 628.7 billion tenge (net turnover from the sale of goods and services to buyers and sellers, including returns). In terms of units, the growth in sales of goods amounted to 77%. In the second quarter, the company's turnover reached 340.1 billion tenge (+92%), which became a new historical maximum. The marketplace has distribution centres in Astana and Almaty. It is planned to open new sorting centres in the cities of Aktobe and Semey. An example of a modern distribution centre is Khorgos located on the border of China and Kazakhstan, which is considered one of the largest dry ports. This terminal provides a full range of cargo handling, storage, and transhipment services. In 2020, traffic volume reached 200,000 twenty-foot equivalent units (DFEs). The main goods transported between the two countries are consumer goods, metals, chemicals, oversized goods, subway cars, and electric vehicles.

Statistics show that the distribution centre sector in Kazakhstan has great economic potential. According to the National Bank of Kazakhstan, the volume of services related to logistics and storage is about $900 million per year. Moreover, the value of trade handled in distribution centres is about $6 billion per year.

Productivity in this field is also high. About 60,000 people work in the distribution centres of Kazakhstan, which is about 2% of the total number of people employed in the economy. In 2019, labour costs in this industry increased by 12.9%.

It is worth noting that Kazakhstan has been actively developing the digital economy in recent years, including in the field of distribution centres. This encourages the adoption of new technologies such as warehouse management systems, e-commerce, etc., which increases production efficiency, shortens delivery time, and facilitates better customer service. The impact of digitalization in distribution centres includes the introduction of automated warehouse management systems, space optimization, real-time inventory tracking and monitoring, greater use of robotics and automation, integration of Internet of Things (IoT) devices, and improved data analytics capabilities.

The volume of storage of goods in distribution centres at the end of 2019 amounted to 14.5 million tons, which is 9.6% higher than the previous year. The main types of storage used in distribution centres include indoor storage warehouses, refrigerated warehouses and warehouses for dangerous and technically complex goods. Distribution centres provide a wide range of services, including storage, shipment, sorting and transportation of various goods, such as food, beverages, body care, household goods, medicines and machinery.

In 2021, the volume of online retail trade amounted to 482 billion tenge. The majority are cell phones or other wireless devices (19%), electrical household appliances (12.6%) and cosmetics and toiletries (11.3%). The volume of wholesale trade through the Internet amounted to 209.8 billion tenge. The share of e-commerce in the total retail trade is 3.6%, and in the volume of wholesale trade this figure is 0.7%. For the period 2016-2021 the volume of e-commerce showed an increase of 84% (Figure 5).
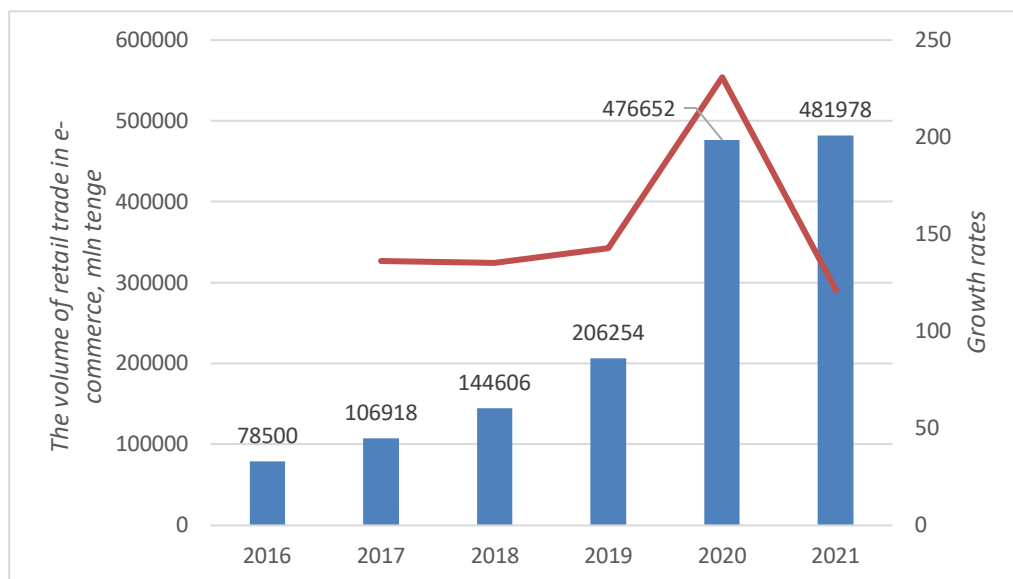


*Figure 5 Volume of retail sales in e-commerce for 2016-2021, million tenge*
*Note – according to [24]*

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The distribution centre sector in Kazakhstan is also actively developing in the field of e-commerce, where it provides services for the delivery and storage of goods ordered in online stores. The final stage of the research design is a correlation and regression analysis conducted in order to determine the relationship between the need to increase the area of distribution centres, as an indicator of the presence of a distribution centre, and the volume of e-commerce.

The study is based on pairwise regression, where:

Y - the area of distribution centres, million square meters;

X - volume of retail sales in e-commerce, million tenge.

The initial data for the correlation and regression analysis are given in Table 1.

*Table 1 Output data for a correlation and regression analysis*

| X | Y | $X^2$ | $Y^2$ | X x Y |
|---|---|---|---|---|
| 471324.3 | 3.7 | 222146595770.49 | 13.69 | 1743899.91 |
| 476651.5 | 4.2 | 227196652452.25 | 17.64 | 2001936.3 |
| 481978.7 | 4.5 | 232303467253.69 | 20.25 | 2168904.15 |
| 487305.9 | 5 | 237467040174.81 | 25 | 2436529.5 |
| 1917260.4 | 17.4 | 919113755651.24 | 76.58 | 8351269.86 |

Based on the data in Table 1, a system of equations is obtained:

$4a + 1917260.4 \cdot b = 17.4$
$1917260.4 \cdot a + 919113755651.24 \cdot b = 8351269.86$

The solution of the system is the following steps:

1)-1917260.4a -918971860352.04 b = -8340082.74
1917260.4*a + 919113755651.24*b = 8351269.86
2) 141895299.2*b = 11187.12
3) b = 7.8840666766742E-5
4) 4a + 1917260.4*b = 17.4

4a + 1917260.4*7.8840666766742E-5 = 17.4
4a = -133.758
a = -33.4395

We get the empirical regression coefficients after the presented calculation: b = 7.8840666766742E-5, a = -33.4395 and the regression equation: y = 7.8840666766742E-5 x -33.4395. Table 2 shows regression statistics based on the given calculation.

*Table 2 Regression statistics*

| Regression statistics | | | | | |
|---|---|---|---|---|---|
| Multiple R | 0.998417408 | | | | |
| R-squared | 0.99683732 | | | | |
| Normalized R-squared | 0.993674639 | | | | |
| Standard error | 0.032659863 | | | | |
| Analysis of variance | | | | | |
| | *df* | *SS* | *MS* | *F* | *Significance of F* |
| Regression | 1 | 0.3362 | 0.3362 | 315.1875 | 0.035820939 |
| Remainder | 1 | 0.001066667 | 0.001067 | | |
| Total | 2 | 0.337266667 | | | |

The calculation of the covariance coefficient indicates the closeness of the relationship: cov(x,y) = x·y - x·y = 2087817.465 - 479315.1·4.35 = 2796.78, and the correlation coefficient:

$$r_{x,y} = b \cdot \frac{s(x)}{s(y)} = 7.8840666766742E-5 \cdot \frac{5955.991}{0.472} = 0.995$$

Such indicators demonstrate a close linear relationship between dependent Y and independent X, according to the Chaddock scale, which is illustrated in Figure 6.
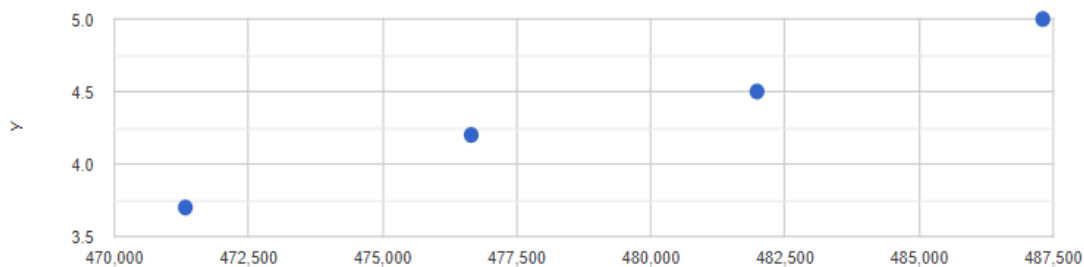


*Figure 6 Correlation distribution field*

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A rather high and direct linear dependence is visually determined between the factor feature x and the resulting feature Y. The regression coefficient b = 7.8840666766742E-5 shows the average change in the performance indicator (in units of measurement y) with an increase or decrease in the value of factor x per unit of its measurement. In this example, an increase of 1 unit in y increases by an average of 7.884066666766742E-5.

The coefficient a = -33.44 formally shows the predicted level of y, but only if x=0 is close to the sample values.

But if x=0 is far from the sample values of x, a literal interpretation can lead to false results, and even if the regression line describes the observed sample value quite accurately, there is no guarantee that it will also be so when extrapolating to the left or right.

By substituting the appropriate values of x into the regression equation, it is possible to determine the adjusted (predicted) values of the performance indicator y(x) for each observation. The relationship between y and x determines the sign of the regression coefficient b (if > 0 - direct relationship, otherwise - inverse). The relationship is direct in this example. The study shows that distribution centres are an important sector of Kazakhstan's economy. A large number of distribution centres, their high productivity, and significant economic potential confirm the importance of continued development of this industry in the future. It has also been proven that the relationship between the need to increase the number of distribution centres is directly proportional to the growth in the e-retail trade volume.

## 5 Discussion

The conducted analysis illustrates the steady growth of the need to extend wholesale distribution centres, especially in large cities, including through the increase in retail sales in the area of e-commerce. This research substantiates such a relationship. In a developing economy, the creation of efficient distribution centres is of great importance. Having a well-planned distribution centre becomes incredibly important, as companies seek to expand into global markets. The situation with distribution centres in Kazakhstan is diverse and changing. At the same time, there are prospects for the development of this sector on the local market. However, if the matter is about the influence of the availability of infrastructure in the municipality, the availability of an airport, port or railway station in the city has a positive effect on the number of stations within the municipality and a positive effect on the number of facilities [24]. The coefficients in the study [25] show that if a municipality has a port, the probability of having more warehouses is higher than if the municipality has an airport or a railway station or a train station. And we did not examine such factors in our analysis, so the absence of the infrastructure factor in our study can be considered an element of limitation.

The factor of location, influence of the ecosystem is investigated in most studies [26]. The researchers [27] propose a complex model that takes into account the total emissions and the costs of disposal of emissions into the atmosphere. A study of the relationship between the increase in domestic e-commerce and the need for increased distribution centres is considered in the context of cost reduction [28] and does not specifically address the closeness of correlation.

The difference between our study and the existing ones is the application of the methodology. For example, the qualitative method includes the method of analysis of hierarchies, expert selection, the method of comparative analysis and fuzzy evaluation [29]. These methods can partially solve the research problem but contain some subjective factors. Quantitative methods include the gravity method, mixed integer programming, and two-level programming. Heuristic optimizations [30], such as the genetic algorithm and the tabu algorithm, are widely used in the complex optimization combined problem, which provides a new vision for the problem of increasing the number of distribution centres [31]. Summing up, it should be noted that the delivery of goods from the place of production is accompanied by large costs for the enterprise, and consumers wait a long time for the goods [32,33]. It is important to note that distribution logistics centres are highly efficient. The introduction of such centres ensures the continuous movement of goods, strengthening the connection between suppliers and end consumers.

## 6 Conclusions

Distribution centres are an integral part of the success of any business because they are an important link between producers and consumers. Without them, it would be difficult for enterprises to maintain adequate stocks and deliver products to consumers in a timely manner. The success of distribution centres is vital to the entire supply chain. This determines the relevance of the chosen research issue. The state of distribution centres in Kazakhstan can be characterized as developing. The introduction of new technologies and innovations, combined with favourable market conditions and political support, creates the basis for the development of reliable distribution centres that can increase the efficiency of logistics and contribute to the stable economic development of Kazakhstan.

The conducted research, based on the dynamics of cargo transportation by all modes of transport and the dynamics of retail trade growth, indicates an average growth of 10.5% in 2023 only for January-April, compared to the same period in 2022. Achieving the greatest efficiency requires the creation of logistics trade and distribution centres. The main idea of the organization of logistics centres in intra-city logistics is to connect a certain number of commodity flows entering the city before the city border and create effective forms of distribution through purposeful cooperation of all participants in the movement of goods. A strong direct correlation between the growth of e-commerce volume and the need to increase the number of distribution centres (correlation coefficient 0.995) is also proven.

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It was established that distribution centres are a strategically important branch of Kazakhstan's economy and they need to be modernized and combined into wholesale distribution centres or new wholesale distribution canters shall be created. The development of this sector will contribute to the increase in the import and export of goods, as well as the improvement of the transport infrastructure, and further research is possible in this field. The introduction of incentive measures and innovative technologies will contribute to the development and growth of the distribution centre sector in Kazakhstan in accordance with international standards.

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