

STUDY ON THE EFFICIENCY OF LOGISTICS INDUSTRY AND ITS INFLUENCING FACTORS IN THE "CORE AREA" OF THE SILK ROAD ECONOMIC BELT

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Abstract

Using the DEA model from the overall efficiency, pure technical efficiency and scale efficiency of three aspects: the overall and points of provinces and autonomous regions, national evaluation of the silk road economic belt "core" (including the five northwestern provinces in China and the five central Asian countries) efficiency of 2004-2014's logistics industry, and establish the Tobit regression model empirically between general, special factors affecting the efficiency of the logistics industry and its relevance. The results show that the logistics efficiency of the "core zone" of the silk road economic belt is low and the main reason is that the scale efficiency is low. Economic belt on the whole, the silk road "core" logistics industry have significant effect of logistics resource utilization efficiency, industrial structure, the difference of transportation, the Internet penetration and population density. Among them, the efficiency of logistics industry is positively influenced by the utilization ratio of logistics resources, transportation differences and Internet penetration, while the industrial structure and population density have negative influence on the efficiency of logistics industry. The influence factors of logistics efficiency in various countries and provinces are different, but the utilization rate of logistics resources is the factor that affects the efficiency of logistics industry in various countries and provinces.

Keywords: core area, the silk road economic belt, logistics industry efficiency, influence factors

JEL code: L9, R4

1. Introduction

In 2016, prime minister Li Keqiang pointed out in government work report that one of "the 13th Five-Year Plan" 's important task is solidly pushing forward the construction of the "the Belt and Road", coordinate domestic regional development

and international economic cooperation, jointly create economic corridor on land and sea cooperation fulcrum, and promote connectivity, economic and trade cooperation, cultural exchanges. In recent years, the rapid development of logistics, known as the economic development accelerator, is a necessary condition for the realization of "interconnection", which is of great significance to the construction of the silk road economic belt. And development level of the logistics industry is measured through the discretion of the efficiency of the logistics industry, so the analysis of the silk road economic belt along the countries and regions of the province of the present situation of the logistics efficiency and its influencing factors, to our country building along the main customs cooperation mechanism, the construction of international logistics channel, to achieve the prosperity and development of the silk road economic belt is particularly important.

2. Literature Review and Question

Through the search of Chinese journal net and China knowledge network, the research on the efficiency of logistics and its influencing factors since 1980 can be divided into the following aspects:

2.1 Study on Efficiency Evaluation of Logistics Industry.

(1) To evaluate the efficiency of logistics enterprises.

Schinnar (1980) adopted the DEA model to evaluate enterprise efficiency to select third-party logistics companies. Zhou (2003) made a study on the competitiveness of the third-party logistics enterprise to establish evaluation system and the quantitative analysis. Wang (2003) at uniform two-phase DEA model and AHP model to evaluate the system efficiency of logistics enterprises.

(2) To evaluate the efficiency of various industries within the logistics industry. Martinez-Budria (1999) evaluated the efficiency of Spanish main ports. Gillen and Lall (1997) have evaluated the efficiency of the Airport in 1997. Liu (2008) study on the analysis and dynamic evaluation of road transportation operation efficiency in China.

(3) To evaluate the efficiency of logistics in the region.

Guo (2007) using improved DEA method the provinces in China the development of logistics industry and the competitiveness level is evaluated. Liu (2010) makes evaluation of logistics efficiency in 31 provinces of China. Zhuang (2013) has made the overall efficiency evaluation of the logistics industry in China.

(4) Research on the efficiency evaluation method of logistics industry.

Tian (2000) has carried on the detailed discussion to the activity-based cost method, index tree method, analytic hierarchy process (AHP) and data envelopment analysis method the advantages and disadvantages of four kinds of logistics efficiency

evaluation method. Liu (2001) specially discusses the superiority of DEA method to evaluate the benefits of logistics enterprises. Shuai (2006) combines DEA and PCA two methods of comprehensive to evaluate the efficiency of the logistics industry.

2.2 Research on Factors Affecting the Efficiency of Logistics Industry.

Some scholars believe that, in the case of logistics output, the improvement of logistics efficiency depends on the decrease of logistics cost. On the logistics cost, Mr Krugman (1991) argues that logistics costs mainly include transport costs. Wang (2013) think yard storage cost is an important part of logistics cost. Gu (2005) thinks about logistics management costs. Others scholars believe that the improvement of logistics efficiency depends on the improvement of logistics output. Liu (2010), through empirical analysis it is concluded that the improvement of logistics output depends on the resource utilization of logistics to improve. Ren (2012) put forward the logistics industry informational level and the rate of technological progress and the influence factors of logistics production.

2.3 Study on the Logistics Efficiency of The Silk Road Economic Belt.

In recent years, with the development of the silk road economic belt strategy in 2013, the research on the logistics efficiency of the silk road economic belt has gradually increased. Li (2014) think silk road economic belt in last decade period of domestic logistics transportation infrastructure efficiency is declining. Nie (2015) pointed out that the development of silk road economic belt of the logistics industry can deepen regional cooperation and promote economic growth. Gao (2014) believes that the construction of the silk road economic belt should develop the channel economy.

So you can see that, there are many achievements in study of efficiency of the logistics industry at home and abroad, and from the micro level (a company or a link in the process of logistics) gradually extended to the macro level (regional or national), but there are also inadequate: (1) the domestic research on the efficiency of the logistics industry is still in its initial stage, most of the studies did not clearly define the scope of logistics, the logistics industry and its, so when specific studies are based on their understanding of a given evaluation index, evaluation index system of the efficiency of the logistics industry is not perfect. (2) the comprehensive theoretical analysis and empirical test of the evaluation and general and special influencing factors of the logistics efficiency of the silk road economic belt are lacking. Based on this, this article mainly follow these three steps of the silk road economic belt "core" - the five northwestern provinces in China and the five central Asian countries to study the efficiency of the logistics industry status and its influencing factors: first, to define logistics, the logistics industry and logistics efficiency, on the basis of related concepts, such as for input and output of the logistics, established in accordance with the principle of a certain logistics efficiency evaluation index system, collecting and organizing economic belt in the "core" of the

various provinces and regions, nations since 2004 multiple logistics input and output data, using the selected DEA method from the overall efficiency, pure technical efficiency and scale efficiency of three aspects: the overall and provinces and national logistics efficiency evaluation, analysis and comparison with the result of evaluation and compared with the world bank issued logistics performance index LPI validation; Secondly, analyze the influence of the silk road economic belt "core" generality and particularity influence factors of the efficiency of the logistics industry and factor of influence on the measured respectively, and in combination with the results of the evaluation of the efficiency of the logistics industry, establish Tobit regression model, the empirical test the correlation between influence factors and the efficiency of the logistics industry, according to the relevance ranking, and analyze the influencing factors of the cause of the size and the differences and similarities between the provinces and countries; Finally based on the regression test results and analysis, using the basic principle of the related from the various provinces and regions, countries, promote efficiency of the logistics industry and promote the mutual cooperation between provinces and regions and countries to coordinate the two aspects put forward policy suggestions.

3. Theoretical Analysis of the Efficiency of Logistics and its Influencing Factors

3.1 Definition of Logistics, Logistics Industry and Logistics Efficiency

Logistics directly determines the concept and definition of the research object and content of science and technology, so define requirements accurately, refining, comprehensively describes the essence of logistics. China began to implement the logistics terminology national standard from August 1, 2001, and then revised it in 2006. Professional term of "logistics" is changed to: "entity flow process of the item. Including transportation, storage, loading and unloading, handling, packaging, circulation processing, distribution, the implementation of the basic function such as information processing and management."

Promulgated by the state council of the medium and long-term development of logistics industry planning (2014-2020) "in the definition of logistics:" logistics is the integration of industries such as transportation, warehousing, freight forwarders, information complex services, is a basic and strategic industry in supporting national economic development." It can be seen from the definition, the logistics industry is a contains a wide range of comprehensive industry, the relevant studies of the logistics industry in the current literature, are basically with transportation, warehousing and postal service statistics data instead of the logistics industry. China's 2006-2012 "statistical yearbook of China's third industry is the logistics industry as a separate category for statistics, from the yearbook of statistics to calculate the transport, storage and output value of the postal service is basically of the logistics industry output value of more than 83% of the share. Based on this, this paper defines the scope of logistics industry as three parts: transportation, storage and postal services.

For the efficiency of the logistics industry, also is the evaluation for the logistics industry development level, the world's general indicators are: logistics cost/GDP, the proportion of the logistics cost in GDP, but the index has certain limitations, it is suitable for measure relatively mature development of logistics industry in developed countries, for the purpose of this article object of study, the five northwestern provinces of China and the five central Asian countries the logistics industry is still in the bud of countries and regions, logistics costs as a percentage of GDP are small, so the index also failed. Because the logistics is a production activity, can have input and output, and the logistics efficiency is on the investigation to the whole production activities, therefore, can use logistics output and input ratio to measure the efficiency of the logistics industry.

3.2 Analysis of the Influence Factors of Logistics Efficiency

In the accurate definition of the concept of logistics, the logistics industry and logistics efficiency, based on the comprehensive consideration of the characteristics of the research object and data availability, etc, in this paper, factors affecting the efficiency of the logistics industry can be divided into general and special factors. General factor is affecting a country or a region the normal factors, efficiency of the logistics industry and the particularity factors according to the characteristics of the economic belt "core", focuses on the analysis between countries, between provinces and regions due to the different national conditions and the system the effects on the efficiency of the logistics industry, in order to better analysis between countries and the efficiency of the logistics industry differences between provinces and regions.

(1) General factors

The utilization rate of logistics resources. Logistics resources embodied in the logistics industry on the inputs of Labour and capital, to measure the development of logistics industry the production activities, not only to consider logistics infrastructure, logistics industry investment in fixed assets such as the amount of inputs, more to ensure that these inputs are fully used, so as to realize the most effective output, and then improve the efficiency of the logistics industry. In this paper, the utilization ratio of the average road resource is measured by the average road and rail freight volume.

Economic development level. Generally speaking, the more developed the economy, the greater the demand for logistics, the better the logistics infrastructure, the more the development of the logistics industry in the region. At the same time, the logistics industry is also the accelerator of economic development, so the efficiency of logistics and the economic development of a country or region are mutually complementary. The GDP growth rate of various countries and regions is used as a measure of economic development level.

The degree of logistics specialization. The degree of logistics specialization also affects the efficiency of logistics industry. The higher the specialization degree, the higher the efficiency of logistics industry. In this paper, the value of logistics industry in different countries and regions is used as the proportion of the total output value of the country or region to indicate the degree of logistics specialization.

Industrial structure. Logistics industry is an important part of the third industry and the tertiary industry in the development of most of the production activities also need the support of the logistics industry, so a country or a region of the third industry in GDP proportion to the size you can indirectly measure the importance of logistics industry in the region economy.

(2) Special factors

Trade differences between China and foreign countries. Differences between Chinese and foreign trade can be measured by the Chinese and foreign import and export the difference, this indicator reflects the level of opening to the outside world, a region or country at the same time, the increase of import and export trade will lead to the development of logistics industry. In this paper, the balance of trade is represented by the percentage of GDP of the country or region.

Transport differences. Transportation difference gauge differences reflected in our country and the five central Asian countries, most areas in China adopt international standard gauge is 1435 mm, and the five central Asian countries as the commonwealth of independent states, use is 1520 mm width gauge, gauge different will influence the development of transnational international logistics, which affects the efficiency of the logistics industry.

Internet penetration. With the constant progress of science and technology, the world together as a whole can be done via the Internet, the development of many industries will be linked with the Internet, the logistics industry is no exception, a region of Internet penetration will influence the development of logistics industry in the region, and then affect the efficiency of the logistics industry. This paper selects the number of Internet users in each country or region as the measure of Internet penetration.

Population density. The geographical environment of a country or region directly affects the size of its logistics industry, which also affects its industrial structure and indirectly affects the efficiency of logistics industry. In countries or regions with smaller land areas, the efficiency of logistics is also different from that of a country or region that is sparsely populated. Therefore, in this paper, population density is also a factor affecting the efficiency of logistics industry.

4. Evaluation of the Efficiency of Logistics in the "Core Area" of the Silk Road Economic Belt

4.1 Selection of Evaluation Methods

In economics, the method of evaluating the current state of logistics efficiency can be divided into two categories: one is the logistics efficiency evaluation method which considers only single factor input, such as the basic cost method of operation. Another category is the logistics efficiency evaluation method, such as index tree method, analytic hierarchy process and frontier analysis method, which comprehensively consider the multifactor input in various aspects. As the research object of this paper is the silk road economic belt "core" of the logistics efficiency, the ratio of total input and total output of the logistics, and logistics of input and output is not by a single measure, so want to input method is selected from many factors. Index tree method is the comprehensive logistics efficiency is decomposed into several sub indicators and give the corresponding weights, and each index can be decomposed into several next order son index, and so on, these all child indicators combined index system to reflect the logistics efficiency. Since this method only decomposes the logistics system into sub-indexes and simple weighted average, there is a certain one side. The analytic hierarchy process (AHP) has improved the index tree method, and it has added the thought of decision making to the logistics efficiency, and can reflect the speed change of logistics efficiency. First, the complex logistics efficiency problem is decomposed into a number of factors, according to some the interconnection of these factors can be divided into several groups, formed orderly hierarchical structure, the steps of the factors of every level two comparison to determine the relative importance of the decision factors relative to the total target of the importance of the order. But the judgment of importance is mainly from a subjective point of view, so this method is also unscientific. Since logistics is a general production activity with input and output, it is more accurate to evaluate the efficiency of logistics industry from the perspective of input and output. Frontier analysis method is established under the input-output can increase the capacity or in the output given input can reduce the ability of according to whether the production function in the form of specific parameters of the known method and non-parametric method, the former is represented by stochastic frontier analysis (SFA), which is represented by data envelopment analysis (DEA) . Advantages and disadvantages of these two methods are also various sales force automation (SFA) in the evaluation of concrete implementation of the basic assumptions is relatively complex, need to consider the production function, and DEA does not require prior assumption that a function of the input and output can be directly to envelope analysis, get the evaluation result has the characteristics of strong objectivity, so this paper adopts the DEA model to evaluate the efficiency of the logistics industry.

4.2 Establishment of Evaluation Index System

In the efficiency of logistics, the logistics industry, logistics industry and other relevant concept definition and determine the DEA evaluation method, considering the reliability of the evaluation index and data availability and other factors, this paper chose the following logistics industry output and input index (as shown in table 1).

Table 1 Output and input indicators of logistics industry

Index type	Index content
Output indicators	Output target logistics value (billion yuan)
	Rail freight turnover (100 million tons)
	Road freight volume (100 million tons)
Input indicators	Logistics practitioners (people)
	Railway transport length (km)
	Road transport length (km)

4.3 Analysis of Evaluation Results

This paper uses the Deap2.1 software to analyze the logistics efficiency of the five provinces and five central Asian countries. Because our country before 2003, the postal service is not independent, so the selection of sample interval is 2004-2004, the data source has a 2005-2015 China statistical yearbook statistical yearbook, the five central Asian countries, the Asian development bank, the world bank public database statistics database, EPS world economic development as well as the international labor organization database. Respectively from the silk road economic belt under the "core" and the whole province, country two evaluation results were analyzed, and the efficiency of the logistics industry in the view of logistics performance index and the evaluation results and the world LPI comparative verification.

(1) The overall evaluation of the "core zone" of the silk road economic belt

From the data of the following table 2, the calculation results mainly include three parts: overall efficiency, pure technical efficiency and scale efficiency. The pure technical efficiency reflects the output capacity achieved under the given input, and the scale efficiency reflects the scale of the development of the "core area" of the silk road economic belt. The total efficiency is equal to the product of pure technical efficiency and scale efficiency. From the time point of view, the 2004 - year - 2014 silk road economic belt "core" the overall efficiency of the logistics industry are less than 1 and the overall efficiency value is gradually reduced, DEA is invalid, explain the logistics industry in 2004-2014 the overall efficiency is low and the overall efficiency is decreasing. In 2004, the pure technical efficiency of the logistics

industry of the "core area" of the silk road economic belt was 1, indicating that the DEA was ineffective at that time because of inefficiency of scale efficiency. After the scale efficiency of 2005-2014 were less than that of pure technical efficiency, overall is invalid because size is invalid, what is the silk road economic belt "core" logistics industry is still in development period, the small size. On the whole, the silk road economic belt "core" the average efficiency of the logistics industry is 0.764, the average pure technical efficiency is 0.935, the average scale efficiency is 0.816, shows that silk road economic belt "core" the overall efficiency of the logistics industry is low, and is mainly due to smaller.

Table 2. Evaluation results of the logistics efficiency of the "core area" of the silk road economic belt from 2004 to 2014

	The overall efficiency	Pure technology efficiency	Scale efficiency
2004	0.838	1.000	0.838
2005	0.818	0.975	0.838
2006	0.809	0.967	0.836
2007	0.786	0.950	0.831
2008	0.727	0.951	0.769
2009	0.713	0.919	0.770
2010	0.791	0.911	0.867
2011	0.731	0.884	0.822
2012	0.726	0.907	0.801
2013	0.723	0.902	0.795
2014	0.738	0.920	0.804
The mean	0.764	0.935	0.816

(2) Provincial and country evaluation

Although on the whole, the silk road economic belt "core" logistics efficiency is low and gradually diminishing, but "cores" in each country and province logistics performance and how? Next, the efficiency of logistics industry in the "core zone" of the silk road economic belt is analyzed. The results are shown in table 3.

Table 3 The results of the efficiency evaluation of the "core zone" of the silk road economic belt and the state logistics industry in 2004-2014

	The overall efficiency	Pure technology efficiency	Scale efficiency	The overall efficiency ranking
Shaanxi	0.926	0.963	0.961	6
Gansu	0.909	0.995	0.913	9
Qinghai	0.875	0.975	0.896	10
Ningxia	0.975	1.000	0.975	3
Xinjiang	0.959	0.991	0.968	5
Kazakhstan	0.915	0.999	0.916	8
Kyrgyzstan	0.916	1.000	0.916	7
Tajikistan	0.970	0.999	0.971	4
Turkmenistan	0.991	0.999	0.992	1
Uzbekistan	0.983	1.000	0.983	2

In 2004-2014, the total efficiency of the five provinces in northwest China and the five central Asian countries in the "core region" of the silk road economic belt was less than 1, and the DEA was ineffective, indicating that the logistics industry in these countries and regions was inefficient. Overall efficiency of logistics industry in the top four, respectively, and Tajikistan, Turkmenistan, Uzbekistan, Ningxia logistics performance has the same characteristics of these regions, pure technical efficiency is very high, close to 1, scale efficiency is insufficient, lead to lack of overall efficiency. In the fifth place, Xinjiang is far less efficient than pure technology, indicating that the logistics industry in Xinjiang is less efficient than the logistics industry. Sixth, the tenth of Shaanxi and Qinghai, pure technical efficiency and scale efficiency is low, not only shows the two provinces has the problem of logistics industry is small, and under certain conditions of logistics did not achieve maximum input-output, logistics resources are not reasonable configuration. Ranked seventh, eighth, ninth, Kazakhstan, Kyrgyzstan, and Gansu province, although the overall efficiency of the logistics industry is low, but the three areas of pure technical efficiency is very high, logistics resource configuration is more scientific, the logistics industry is the cause of the low level of development of logistics industry is small, there is still space for development.

(3) Comparison and verification of evaluation result and logistic performance index LPI

Logistics performance index (LPI) is a globally oriented freight representative company and express company on the basis of questionnaire survey, by the world bank published once every two years since 2007 the measure of a country of logistics supply chain performance of a benchmarking tool. In 2014 published "connecting to compete: trade logistics in the global economy," the report is on customs clearance efficiency of 160 countries, infrastructure, international transportation, logistics

ability and competition ability, cargo tracking, timeliness and other international logistics and logistics service level, core logistics process efficiency, significant delay charge source domestic logistics indexes such as comparison, help these countries found that challenges and opportunities, improve logistics performance. The LPI of the "core zone" of the silk road economic belt in 2012 and 2014 ranked as follows:

Table 4 National LPI ranking of the "core zone" of the silk road economic belt

	LPI 2012	LPI 2014	Logistics efficiency ranking
China	26	28	--
Kazakhstan	86	88	5
Kyrgyzstan	130	149	4
Tajikistan	136	114	3
Turkmenistan	--	140	1
Uzbekistan	117	129	2

Note: 2012 LPI is the rankings in 155 countries, Turkmenistan is not within the scope of the study, so there is no ranking, ranking 2014 LPI is 2014 countries (rankings are come from the world bank logistics performance index report); The efficiency evaluation ranking of logistics industry is based on the results of logistics efficiency evaluation of the five central Asian countries.

By the data in table 4, you can see that individual countries in 2014 LPI ranking change is bigger, compared with 2012 in China and Kazakhstan respectively two forward, Tajikistan ranked 22, forward progress quickly. Kyrgyzstan is 19 and Uzbekistan is eight. In this paper, the efficiency ranking of the countries in the "core zone" of the silk road economic zone and the LPI index are different because of the different evaluation indexes.

5. Correlation Analysis of Influencing Factors of the Logistics Efficiency of the "Core Area" of the Silk Road Economic Belt

5.1 Construction of the Tobit Model

In this paper, the silk road economic belt "cores" in each country and region overall efficiency of the logistics industry as the dependent variable Y, further analysis of the silk road economic belt in 2004-2014 "core" factors that affect the efficiency of the logistics industry. Combined with the previous theoretical analysis, selection of logistics resource utilization, economic development level, degree of logistics specialization, industrial structure, trade, transportation, differences, the Internet popularity and population density and so on eight general and specific factors that influence efficiency of the logistics industry as the independent variable for correlation analysis. Because the efficiency values calculated by the DEA are discrete, the Tobit regression model is selected. Tobit model limited, also known as the dependent variable, is a kind of measuring correlation between multiple variables

regression model, when the value of the dependent variable is cut or fragments, the model is estimated regression coefficients a good choice. The Tobit regression model was established as follows:

$$Y_{it} = \beta_0 + \beta_1 U_{it} + \beta_2 GDP_{it} + \beta_3 S_{it} + \beta_4 IS_{it} + \beta_5 T_{it} + \beta_6 R_{it} + \beta_7 I_{it} + \beta_8 P + \mu \quad (1)$$

In equation (1), i represents the year; t represents the provinces and states of the "core zone" of the silk road economic belt; β_0 Represents a constant term;

$\beta_1, \beta_2 \dots \beta_8$ is the coefficients of each independent variable; μ represents the error term

of the regression equation; U represents the resource utilization rate of logistics industry, GDP indicates the level of economic development, that is, the growth rate; S indicates the degree of logistics specialization; IS represents the industrial structure, i.e. the proportion of the output value of the tertiary industry in the region or the GDP of the country; T represents trade differences, i.e. the proportion of imports and exports; R represents the difference of gauge; I means Internet popularity; P represents population density. The data sources are the China statistical yearbook from 2005 to 2015, the statistical yearbook of the five central Asian countries, the world bank's open database and the Asian development bank statistics database.

5.2 Empirical Results and Analysis

Based on Eviews7.0, the Tobit model of the "core zone" of the silk road economic belt and the provinces and regions of China were carried out. The results were as follows:

(1) Overall analysis of the "core zone" of the silk road economic belt

The regression results in Table 5 show that: (1) the influence of logistics resource utilization on the logistics efficiency is significant and the coefficient is positive 0.027002. To show that the utilization ratio of logistics resources in the "core area" of the silk road increases by one unit, it will improve the overall efficiency of the logistics industry by 0.027002 units. (2) the regression coefficient of economic development level is positive 0.000758, but it is not statistically significant. It is not obvious that the national and regional economic development level of the "core zone" of the silk road has a significant impact on the efficiency of the logistics industry. (3) the positive impact of logistics specialization is not statistically significant. The overall development of the logistics industry of the "core zone" of the silk road is low and the scale is too small. (4) the influence of industrial structure on logistics efficiency is significant, but the coefficient is negative. The development of the tertiary industry in the industrial structure of the "core zone" of the silk road failed to improve the efficiency of the logistics industry. Perhaps the reason is that in the

national and regional industrial structure of the "core zone" of the silk road, agriculture accounts for a greater proportion and the tertiary industry accounts for a small proportion. (5) the negative impact of trade differences is not statistically significant. The import and export of the "core area" of the silk road is small. (6) the impact of the gauge difference on the logistics efficiency is significant and the coefficient is positive 0.000688. Compared with narrow gauge, the wide gauge can improve the efficiency of logistics. Because the wide gauge not only guarantees the stability of the train but also improves the capacity. However, the current international standard gauge is 1435 mm, and the difference between China and the five central Asian countries will inevitably affect the efficiency of transnational logistics. (7) the influence of Internet penetration on logistics efficiency is significant, but the coefficient is positive 5.16E-05. It is indicated that Internet penetration and logistics efficiency are positively correlated, but the correlation is not very high. (8) the effect of population density on the efficiency of the logistics industry is significant and the coefficient is negative. Instructions for "core" of the silk road economic belt, the greater the population density will not necessarily improve the efficiency of the logistics industry, on the contrary, if the population density is too large, logistics infrastructure can't keep up with, and possibly results in lower efficiency of the logistics industry.

Table 5. The overall Tobit regression results of the "core zone" of the silk road economic belt

Independent variables	The coefficient	The standard deviation	Z- statistics	Significant level
Logistics resources utilization ratio	0.027002	0.010374	2.602868	0.0092***
Economic development level	0.000758	0.001069	0.708665	0.4785
Logistics specialization level	0.002281	0.002346	0.972302	0.3309
Industrial structure	-0.002855	0.001861	-1.534293	0.0250**
Trade differences	-0.000713	0.000512	-1.392534	0.1638
Transportation differences	0.000688	5.10E-05	13.47627	0.0001***
Internet penetration	5.16E-05	1.87E-05	2.761694	0.0058***
Population density	-0.000312	0.000180	-1.729563	0.0837*
Constant term	0.068189	0.004597	14.83380	0.0001***

Note: * indicates a significant level of 10%, * * represents a significant level of 5% and * * * represents a significant level of 1%.

(2) Provincial and country analysis

Table 6 The results of Tobit regression in the "core zone" of the silk road economic belt

Independent variables	Shaanxi	Gansu,	Qinghai	Ningxia	Xinjiang
Logistics resources utilization ratio	0.370814	0.203377	0.611182	0.046388	0.566706
	0.0001***	0.0001***	0.0061***	0.0760*	0.0001***
Economic development level	-0.002519	0.003248	-0.002992	0.002756	0.000299
	0.1301	0.0407**	0.4187	0.2255	0.5788
Logistics specialization level	-0.033554	0.073345	0.361394	-0.666695	0.006086
	0.7743	0.1894	0.8137	0.1420	0.0922*
Industrial structure	0.021820	0.004241	0.003823	0.017107	0.027089
	0.0004***	0.3599	0.7607	0.1085	0.5288
Trade differences	-0.007394	-0.001750	0.019588	0.001237	0.002956
	0.4866	0.5586	0.1286	0.9432	0.0001***
Internet penetration	0.000169	0.000189	-0.000118	0.000497	0.000171
	0.0019***	0.0001***	0.8170	0.4752	0.0001***
Population density	0.007841	0.002926	0.047188	0.004024	0.055940
	0.0001***	0.3002	0.4058	0.2021	0.0001***
The constant term	0.017512	0.016251	0.052532	0.025154	0.010940
	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***

Note: * indicates a significant level of 10%, * * represents a significant level of 5% and * * * represents a significant level of 1%. In the corresponding table, the above represents the coefficient, and the following one represents the significance level.

The regression results show that: (1) the influence of the logistics efficiency of Shaanxi province is significantly influenced by the utilization of logistics resources, industrial structure, Internet penetration and population density. The correlation size is: the resource utilization rate of logistics industry > industrial structure > population density > Internet penetration. (2) the influence of logistics efficiency in Gansu province is significantly influenced by the utilization of logistics resources, the level of economic development and the popularity of Internet. The correlation size is in turn: the utilization rate of logistics resources > economic development level > Internet penetration (3) the resource utilization rate of logistics industry is a significant influence on the efficiency of logistics in Qinghai province. (4) the resource utilization rate of logistics industry is a significant influence on the efficiency of logistics in Ningxia province. (5) the influence of the logistics efficiency of Xinjiang province is significantly influenced by the utilization of logistics resources, the degree of logistics specialization, trade differences, Internet penetration and population density. The correlation size is: the resource utilization rate of the logistics industry > population density > logistics specialization degree > trade

difference > Internet penetration.

Table 7 The results of the national Tobit regression of the "core zone" of the silk road economic belt

Independent variables	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Logistics resources utilization ratio	0.176875	10.91364	0.631319	0.246261	0.072713
	0.0478**	0.0001***	0.0191**	0.0001***	0.0805*
Economic development level	-0.014560	-0.000302	-0.006081	0.002044	-0.037503
	0.0839*	0.8739	0.5990	0.0409**	0.0014***
Logistics specialization level	0.024862	0.033183	0.007701	-0.039356	0.017108
	0.2358	0.0001***	0.5623	0.0006***	0.1221
Industrial structure	0.011777	-0.008668	0.006067	0.008493	0.019373
	0.0429**	0.1810	0.5480	0.0001***	0.0318**
Trade differences	0.014040	-0.002434	-0.000715	-0.001656	0.000623
	0.0001***	0.0596*	0.7561	0.0001***	0.9029
Internet penetration	0.000137	0.000555	-0.001691	-0.000253	-4.36E-05
	0.0245**	0.1343	0.1845	0.2857	0.3917
Population density	0.049458	0.014243	0.011470	0.076603	0.002994
	0.4972	0.1026	0.3698	0.0001***	0.5419
The constant term	0.021569	0.017448	0.044266	0.005696	0.014335
	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***

Note: * indicates a significant level of 10%, * * represents a significant level of 5% and * * * represents a significant level of 1%. In the corresponding table, the above represents the coefficient, and the following one represents the significance level.

The regression results show that: (1) the influence of the logistics efficiency of Kazakhstan is significantly influenced by the utilization of logistics resources, economic development level, industrial structure, trade balance and Internet penetration. The correlation size is in turn: resource utilization rate of logistics industry > economic development level > trade differences > industrial structure > Internet penetration. (2) there is a significant impact on the efficiency of the logistics industry in Kyrgyzstan, such as resource utilization, logistics specialization and trade differences. The correlation size is in turn; resource utilization rate of logistics industry > logistics specialization degree > trade difference. (3) the influence of the logistics efficiency of Tajikistan is significantly influenced by the utilization of logistics resources. (4) there are six effecting factors on the efficiency of the logistics industry of Turkmenistan, such as the logistics industry of resource utilization, logistics specialization degree and level of economic development, industrial structure, trade difference and population density. The correlation size is in turn: resource utilization rate of logistics industry > population density > logistics specialization degree > industrial structure > economic development level > trade

differences. (5) there is a significant impact on the efficiency of the logistics industry in Uzbekistan, such as resource utilization rate, economic development level and industrial structure. The correlation size is: the resource utilization rate of logistics industry > economy development level > industrial structure.

6. Summary and Policy Recommendations

In this paper, DEA model is used to evaluate the logistics efficiency of the "core zone" of the silk road economic belt "core zone" from 2004 to 2014, and then the evaluation results are analyzed and compared. Based on Tobit model from the silk road economic belt "core" and the whole province, country two angles to analyses the factors affecting the overall efficiency of the logistics industry, the main conclusions are as follows: Firstly, the logistics efficiency of the core area of the silk road economic belt is low and decreasing in 2004 and 2014. In particular, scale efficiency is less than pure technical efficiency. Second, province, country, the efficiency of the logistics industry in the five provinces of northwestern China are relatively low, high efficiency of the logistics industry in Ningxia province, ranked third, followed by Xinjiang, Shanxi, Gansu and Qinghai. The logistics and logistics resources of these provinces need to be improved. Third, the silk road economic belt "core" logistics industry has a significant positive role of logistics resource utilization efficiency, the difference of transportation and the Internet popularity, and the industrial structure and population density is a negative influence on the efficiency of the logistics industry. Fourth, for the five provinces of northwest China, the most impact on the logistics efficiency is the utilization rate of logistics resources and the positive impact. There are also industrial structure, population density and Internet penetration to the logistics efficiency of Shaanxi. The economic development level and the popularity of Internet are also affected by the logistics efficiency of Gansu. There are also population density, logistics specialization, trade balance and Internet penetration. Fifth, for the five countries of central Asia, the most impact on logistics efficiency is also the resource utilization ratio of logistics industry, and the positive influence. Economic development level, trade balance, industrial structure and Internet penetration are also affected by the logistics efficiency of Kazakhstan. The logistics specialization and trade balance are also affected by the logistics efficiency of Kyrgyzstan. There are also population density, logistics specialization, industrial structure, economic development level and trade balance of the logistics efficiency of Turkmenistan. The economic development level and industrial structure are also affected by the logistics efficiency of Uzbekistan.

Accordingly, in order to further enhance the efficiency of logistics industry in the "core region" of the silk road economic belt and promote the coordination and cooperation between the provinces and regions of the "core region", the following Suggestions are proposed: Firstly, the logistics industry of the "core area" of the silk road economic belt should be expanded while improving the utilization ratio of the logistics industry. "Much starker choices-and graver consequences-in planning about

the specific objectives of the logistics industry development and the characteristics of the northwest, expand the scale of logistics and the optimize allocation of logistics resources, made under the given input, to achieve the optimal output. Second, to strengthen the cooperation and exchange between China and the five central Asian countries, not only can save resources, but also improve the efficiency of logistics. Due to the northwest five provinces and the five central Asian countries are belong to inland areas, by road, rail and air as the main way of transportation, can build the international railway, and further widen the scale of the international routes, it is beneficial to the development of logistics industry. Third, increase the investment in the logistics industry in northwest regions, promote the development of logistics industry in the northwest provinces, so through the silk road economic belt "core" developed logistics industry, is more advantageous to our country construction direction of logistics channel, the growth of the economy further. Fourth, attach importance to the development of Internet plus, take advantage of high technology to promote the development of international trade between China and the five central Asian countries, so as to promote the development of logistics industry and further promote economic development.

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