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Impacts of Infrastructure on One Country's Trade --- An Analysis based on the "new Eurasian Continental Bridge Economic Corridor" along the "One Belt One Road"

[1]Hui He, [2]Qi Gao, [3]Weitao Liu, [4]Mingjie Hu and [5]Meng Wu

[1]Qingyuan polytechnic, Economic doctor, engaged in development economic research; [2]People's Bank of China Jiamusi Branch, Economic master, engaged in international financial research; [3]Harbin Insititute of Technology (ShenZhen), Management postdoctoral fellow, engaged in development economic research; [4]Nanjing University, Economic undergraduate, engaged in international trade research; [5]South China University of Technology, Economic master, engaged in public economic and public policy research.

ABSTRACT

In nowadays context of global economic integration, China has proposed the "One Belt One Road" Strategy in 2014, which fits into the new changes in global economy and finds us a new growth in economy development. This article has selected the panel data of 23 countries along the "new Eurasian Continental Bridge Economic Corridor" in 2002-2016 and analyzed the influences of one country's economic infrastructure and social infrastructure upon its national trades using the fixed effect model. The research result shows that the construction of energy infrastructure may produce less obvious negative effects on one country's national trade while the influences of the railway and aviation infrastructure will be varied because of the different natural endowments of the country. And one country's trade will increase as construction of communication infrastructure develops. For social infrastructure, the effects upon one country's trade are not obvious from education infrastructure construction, scientific research infrastructure construction, medical infrastructure construction and environmental infrastructure construction.

Keywords: infrastructure; "One Belt One Road"; Trade

***Correspondence to Author:**
Weitao Liu
Harbin Insititute of Technology (ShenZhen), Management postdoctoral fellow, engaged in development economic research.

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Introduction

In the trend of global economic integration, the economic growth and foreign trade of various countries have become the research focus for scholars. Some historical experiences of developing countries in the past also showed that the imperfect infrastructure construction is an important factor hindering economic growth and trade development. China has proposed the “One Belt One Road” Strategy in 2014. To analyze the influences of infrastructure construction upon national trades in this context, this research is significant in terms of economic and social responsibility.

“One Belt One Road” refers to the broad concept of mutual cooperation and mutual benefit of China with countries in Asia Pacific region, in northeast Africa and in Europe. “One Blet” is short for “the Economic Belt of the Silk Road”, referring to the regional economic cooperation of China with countries along the ancient “Silk Road” in central Asia and Europe. “One Road” is short for “the Silk Road on the Sea in the twenty-first Century” , covering China's cooperation with regions from Southeast Asia, the India ocean and the Mediterranean. Its range covers ASEAN, South Asia, West Asia, Central Asia, North Africa and Europe, involving the total population of around 4.4 billion and the total economic volume of 21 trillion dollars, respectively accounting for 63% and 29% of the world's total.

The “One Belt One Road” Strategy has been proposed in the context of global economy’s slow recovery. Strengthening regional cooperation has become an important driving force and a trend to promote the development of world economy. The idea of building a new pattern of muti-directional opening up, promoting the regional cooperation along the Silk Road Economic Belt and the Silk Road one the Sea in the twenty-first Century , and speeding up the construction of large scale passageway and international logistics corridor has become the key content of government report over times.

For the countries along the “One Belt One Road", the mutual exchange of needed national infrastructure will directly affect the trades among regions, and also constitute the main factors of the logistics cost, which will influence the trade flows and economic development of the countries involved. Well-constructed infrastructure provides a solid foundation for the country's trade. In term of this, for the vast number of developing countries along the “One Belt and One Road”, poor infrastructure is a key bottleneck for their economic growth. In such a context, this article has selected the panel data of 23 countries along the "new Eurasian Continental Bridge Economic Corridor" within 5 years and has done a in-depth analysis of the countries’ economy.

Literature Review

The mutual exchange of needed national infrastructure will directly affect the convenience of trades between regions, and also constitute the main factors of the logistics cost, which will affect the trade flows and economic development of the country involved. Well-constructed infrastructure provides a solid foundation for the country's trade.

First of all, the infrastructure can determine the cost of trades and the degree of determination can be quantified. For example, poor infrastructure can take up to 40% of the transportation cost in the coastal countries, and

60% of inland countries (Lima ˜o and Venables, 2001). Second, the impacts of basic infrastructure facilitation is so great that it even affects the export of a country (Wilson et al., 2004). For a common developing country, the logistics infrastructure improves by a standard unit then can increase the export volume by nearly 46% (Behar et al., 2009). In addition, the impacts of infrastructure on two-way trades are different in countries with different income levels. The trade volume of low income countries are less than 74% of the high income countries' , and the North-South trade volume less than 55% to 64% of the North-North trade volume.These results have shown that it is necessary to recognize the importance of developing the infrastructure if we aim to increase the trade volume of low income countries and promote the active participation of low-income countries in the global trade system (Joseph et al., 2013). In term of this, for the vast number of developing countries along the “One Belt and One Road”, poor infrastructure is a key bottleneck for their economic growth. The construction of infrastructure will help to find new economic growth and awaken the world economy.

In the trend of global economic integration, the economic growth and foreign trade of various countries have become the research focus for scholars. Some historical experiences of developing countries in the past also showed that the imperfect infrastructure construction is an important factor hindering economic growth and trade development. As the “One Belt One Road” Strategy has been proposed, to analyze the influences of infrastructure construction upon national trades is significant in terms of economic and social responsibility. Scholars aboard and at home has launched a series of related researches regarding the impacts of infrastructure construction on the development of national trade, the definition and characteristics of infrastructure, as well as different understandings of the mechanism of trade flows in different countries.

Early researches on infrastructure focused on the characteristics of the infrastructure itself and its impacts on a country’s economy as a non-key factor. After 1970s, scholars from various countries gradually began to use empirical analysis to study infrastructure’s impacts on economic growth as an independent capital. Since twenty-first Century, foreign scholars have begun to study the impacts of infrastructure on trade and investment and have carried out empirical analysis.

Lima˜o and Venables (2001) believes that infrastructure plays an important role in determining total transportation cost. He thinks that 40% of coastal countries’ transport cost can be explained by poor infrastructure, and for inland countries, the proportion is even as high as 60%. Bougheas et al. (1999) uses the gravity model and draws a conclusion that the infrastructure has a certain influence on the cost of trade transportation in European countries. Burn et al. (2005) also emphasizes the importance of infrastructure to trade, and thinks that the development of a country's foreign trade can be pushed forward by strengthening the infrastructure. Adopting different measures of infrastructure (railways, roads, telecommunications, ports and airports), NordAs and Piermartini (2004) considers that all these measures have a very important impact on trade. Portugal-Perez and Wilson(2012) also studies the influences of the so-called soft-and-hard infrastructure on the export performance of developing countries. All their

findings indicate that trade facilitation has a positive effect on the export performance of a country, and infrastructure plays an extremely important role among the factors of trade facilitation.

Some scholars use the export data of 57703 Chinese manufacturing enterprises from 1998-2001 , studies the impacts of infrastructure on the export behaviors of Chinese enterprises adopting the Heckman two stage model, and comes to the conclusion that the construction of infrastructure can promote the growth of trade, and is realized through the expansion of the marginal, rather than the intensive marginal, which has been neglected in previous studies. And some use the relevant data of provinces from 1988-2007, studies the influences of transportation, energy and information infrastructure on TFP by adopting the first-order differential GMM system and systematic GMM method, and concludes that the transportation infrastructure and information infrastructure has significant positive externalities on China's economic growth, while energy infrastructure has no significant positive externalities on China's economic growth.

In the context of the “One Belt and One Road " strategy, this article is a make-up to the existing researches which are conducted from a global level or a one-country perspective, studying the impacts of a country's infrastructure construction on its trade.

Analysis of the Current Situation of Countries along the New Eurasian Land Bridge Economic Corridor

Along the Belt and Road, a total of six economic corridors including the “New Eurasian Land Bridge Economic Corridor”, the “Chins-Iran-Turkey Economic Corridor", the “Sino-Singapore Economic Corridor”, the “Bangladesh-China-Myanmar Economic Corridor”, the “China-Pakistan Economic Corridor” and the “China-Mongolia-Russia Economic Corridor”, involves 61 countries and regions. Among them, the "New Eurasian Land Bridge Economic Corridor" as the one with the largest number of countries is the most extensive coverage of the six economic corridors across the Asia-Europe continent. Therefore, this paper selects 23 countries along the "New Eurasian Continental Bridge Economic Corridor" as the main research objects, including Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, the Republic of Croatia, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovak Republic, Slovenia and Ukraine. The per capita GDP level in these countries is shown in Table 1[1].

As can be seen from Table 1, the per capita GDP span of countries along the "New Eurasian Land Bridge Economic Corridor" and the standard deviation are suitable for constructing a panel model.

In this study, the infrastructure is divided into two types: economic infrastructure and social infrastructure. Among them, the economic infrastructure includes energy infrastructure, transportation infrastructure and communications infrastructure. The social infrastructure includes education infrastructure, research infrastructure, medical infrastructure and environmental protection infrastructure. Different infrastructure is briefly analyzed as below.

[1] Country GDP data comes from Penn World Table 9.0, population data comes from World Bank’s WDI database.

Table 1: The per capita GDP level in Countries along the New Eurasian Land Bridge Economic Corridor

Unit: 10,000 USD/ person

Country	Mean	Standard Deviation
Albania	0.775787	0.202993
Armenia	0.631687	0.208787
Azerbaijan	0.918316	0.562787
Bulgaria	1.31015	0.269943
Bosnia Herzegovina	0.781584	0.142382
Belarus	1.337014	0.430389
Czech Republic	2.447733	0.283179
Estonia	1.856974	0.46815
Georgia	0.695702	0.277402
Croatia	1.766592	0.248676
Hungary	1.889825	0.220153
Kazakstan	1.424423	0.654751
Lithuania	1.735273	0.433931
Latvia	1.628751	0.347018
Moldova	0.407885	0.12965
Macedonia, FYR	1.003503	0.186237
Montenegro	1.280841	0.315355
Poland	1.808222	0.402643
Romania	1.356592	0.424223
Serbia	1.062138	0.210857
Slovakia	1.933057	0.383463
Slovenia	2.44247	0.22884
Ukraine	0.799775	0.232872

First, a preliminary analysis of the energy infrastructure in the above-mentioned countries is shown in Figure 1.

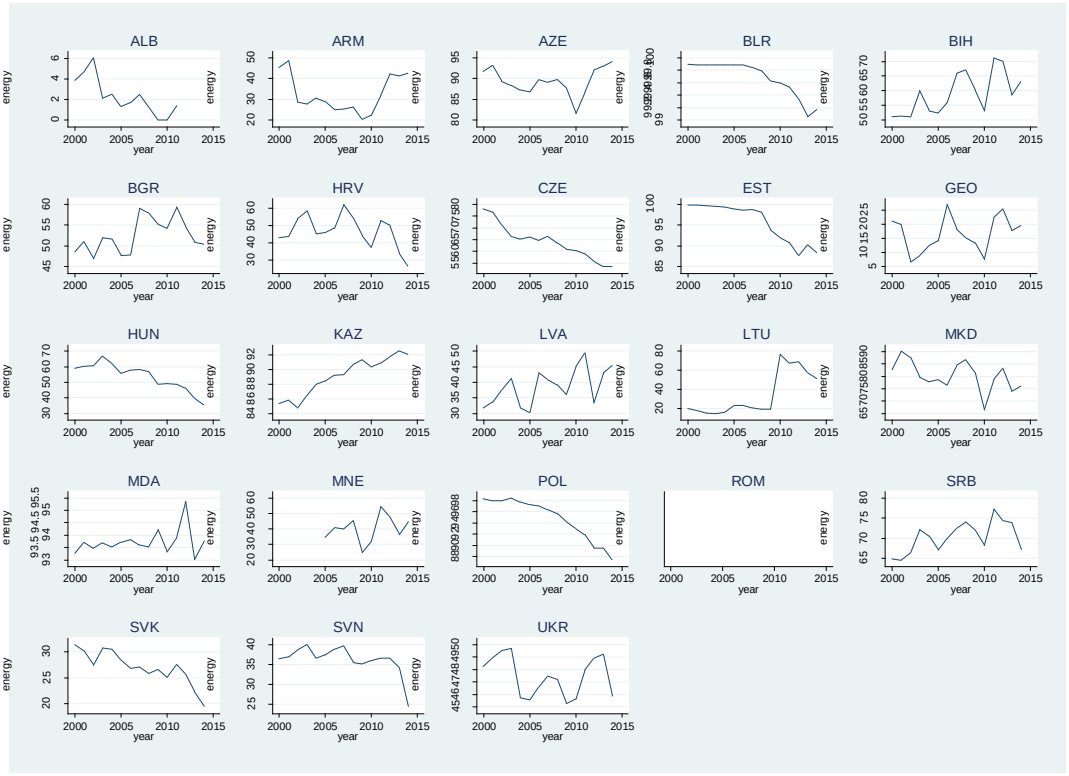

Figure 1: Energy Infrastructure Trends in Countries along the New Eurasian Land Bridge Economic Corridor

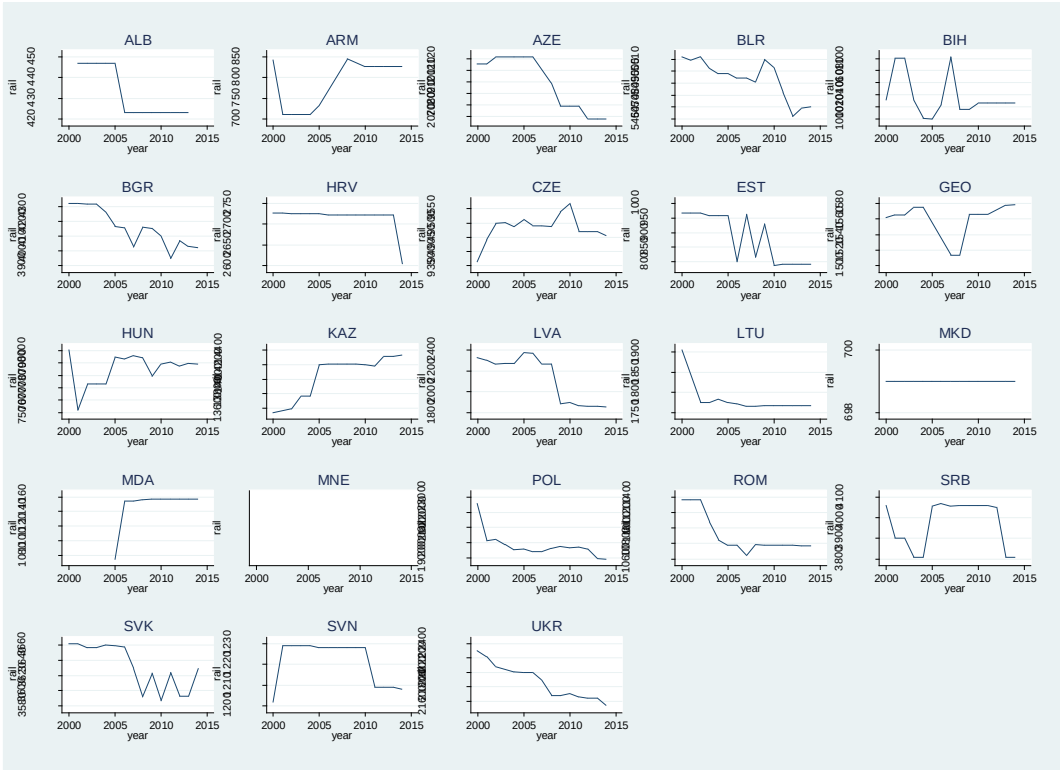

Figure 2: Railway Infrastructure Trends in Countries along the New Eurasian Land Bridge Economic Corridor

As can be seen from Figure 1, the countries along the "New Eurasian Land Bridge Economic Corridor" do not seem to pay much attention to the construction of energy infrastructure. The

trend of change in most countries is not obvious. However, the construction of energy infrastructure in Albania, Belarus, the Czech Republic, Estonia, Hungary, the Republic of Poland and the Republic of Slovenia show a downward trend, only Kazakhstan's energy infrastructure construction shows a consistent upward trend.

Figure 2 shows the status of railway infrastructure in those countries mentioned above.

From Figure 2, the railway construction in Armenia, Hungary, Kazakhstan and Georgia is on the rise, while other countries' investment in railway infrastructure construction is gradually reduced. Large countries seem to be more inclined to build rail infrastructure. Does the rest prioritize air transport as their main transport mode? Figure 3 shows the status of aviation infrastructure in those countries along the New Eurasian Land Bridge Economic Corridor.

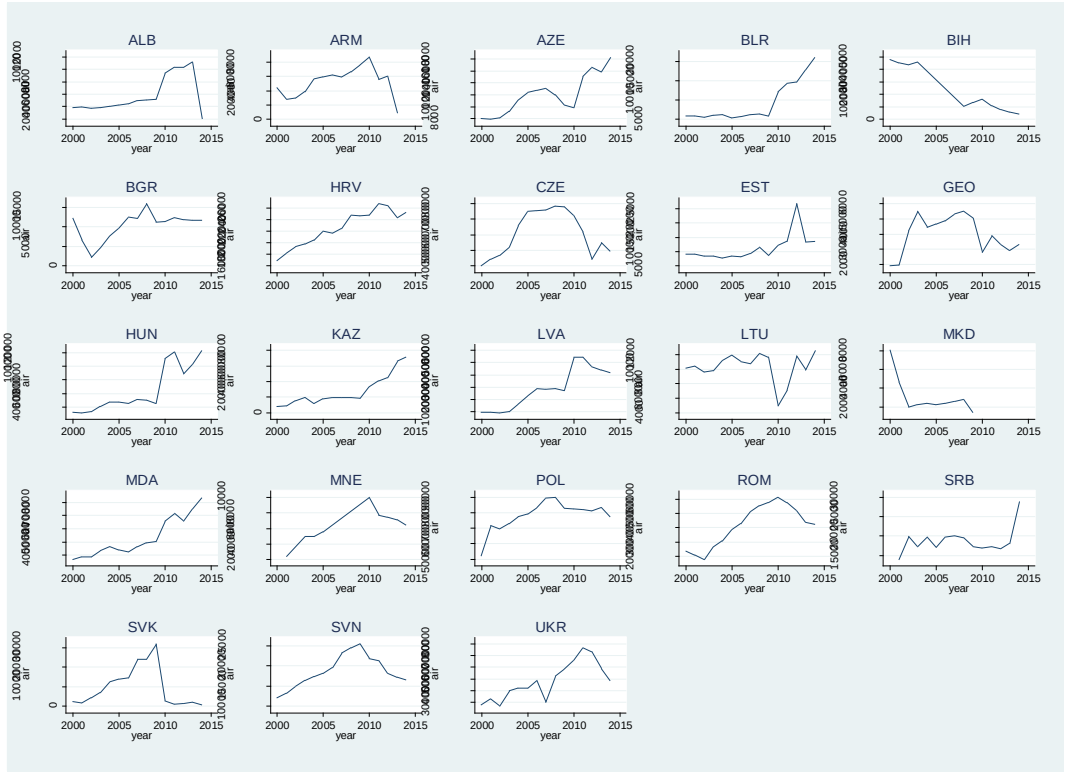

Figure 3: Aeronautical infrastructure trends in Countries along the New Eurasian Land Bridge Economic Corridor

In contrast to Figure 2, more countries were in favor of the development of aeronautical infrastructure than the development of rail infrastructure; and most of the countries that had previously invested less in rail infrastructure construction tended to spend more in the construction of aeronautical infrastructure, such as Azerbaijan, Republic of Croatia, Moldova, Poland and other countries.

Figure 4 shows the construction of communications infrastructure in countries along the New Eurasian Land Bridge Economic Corridor.

It can be seen from Figure 4 that all countries are in agreement on the construction of communications infrastructure. This is in line with the trend of the current Internet economy. It can also be seen that even though countries

may have their own comparative advantages, the development of the Internet make up for their own comparative disadvantages to a large extent.

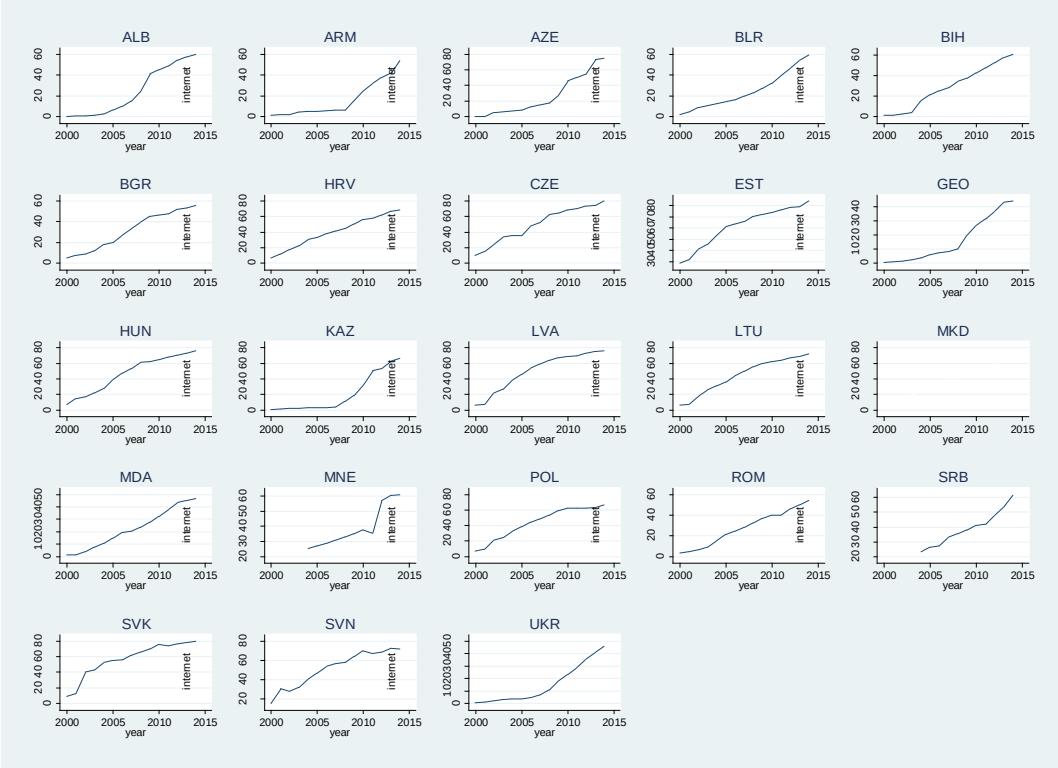

Figure 4: Communications Infrastructure Trends in Countries along the New Eurasian Land Bridge Economic Corridor

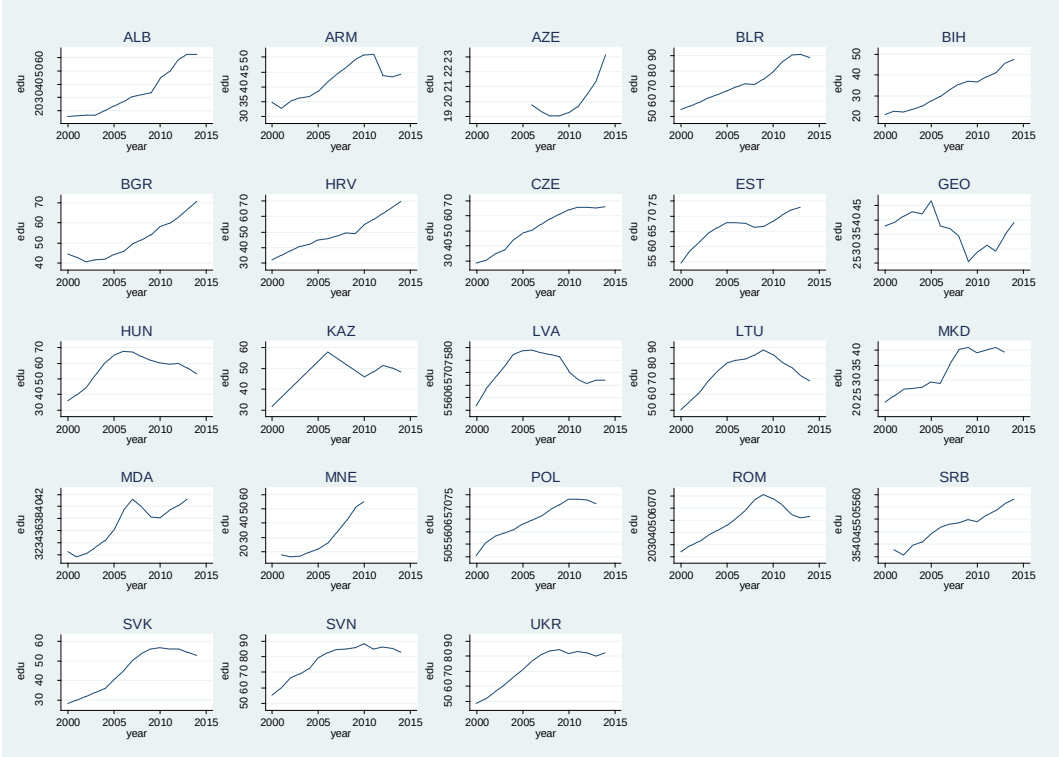

Figure 5: Education Infrastructure Trends in Countries along the New Eurasian Land Bridge Economic Corridor

Figure 5 shows the education infrastructure in countries along the New Eurasian Land Bridge Economic Corridor. As can be seen from the education infrastructure in all countries shown in Figure 5, the countries except Georgia, Hungary, Kazakhstan, Latvia, Lithuania and Romania all pay more attention to the education infrastructure, and their construction is basically on the rise.

Figure 6: Research Infrastructure Trends in countries along the New Eurasian Land Bridge Economic Corridor

Figure 6 shows the research infrastructure construction in various countries along the New Eurasian Land Bridge Economic Corridor. Combined with the per capita GDP of each country in Table 1, countries that invest more in research infrastructure often have higher per capita GDP which is also a reflection of a higher overall national strength, such as Bosnia, Herzegovina, Bulgaria, the Czech Republic, Hungary, Lithuania Poland, the Slovak Republic and the Republic of Slovenia.

Figure 7 shows the construction of medical infrastructure in various countries along the New Eurasian Land Bridge Economic Corridor. As can be seen from Figure 7, countries in Europe will pay more attention to the construction of their own medical infrastructure. Countries in Asia or countries with low per capita GDP do not show a good or consistent trend of medical infrastructure construction.

Figure 8 shows the construction of environmental protection infrastructure in various countries along the New Eurasian Land Bridge Economic Corridor. As can be seen from Figure 8, except for Albania and Armenia, the countries along the "New Eurasian Land Bridge Economic Corridor" do not attach much importance to the construction of environmental protection infrastructure, which is not conducive to the long-term goal of the country's economy. It is also a problem that all countries along this economic corridor need to pay attention to.

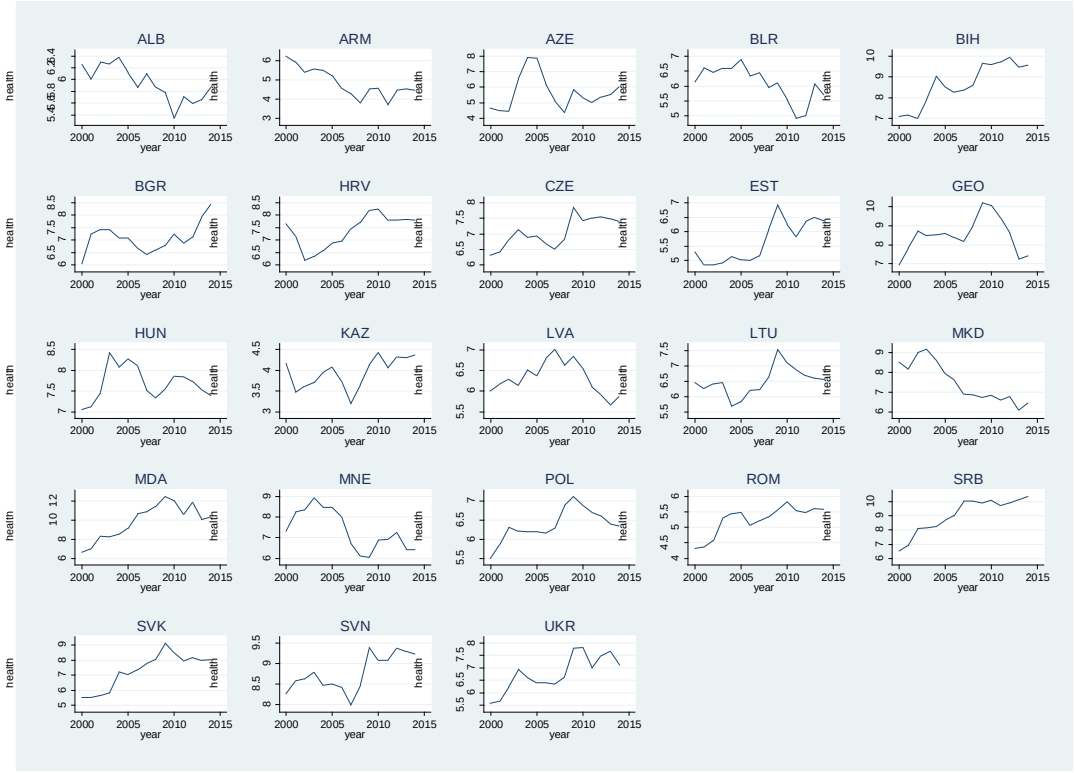

Figure 7: Medical Infrastructure Trends in Countries along the New Eurasian Land Bridge Economic Corridor

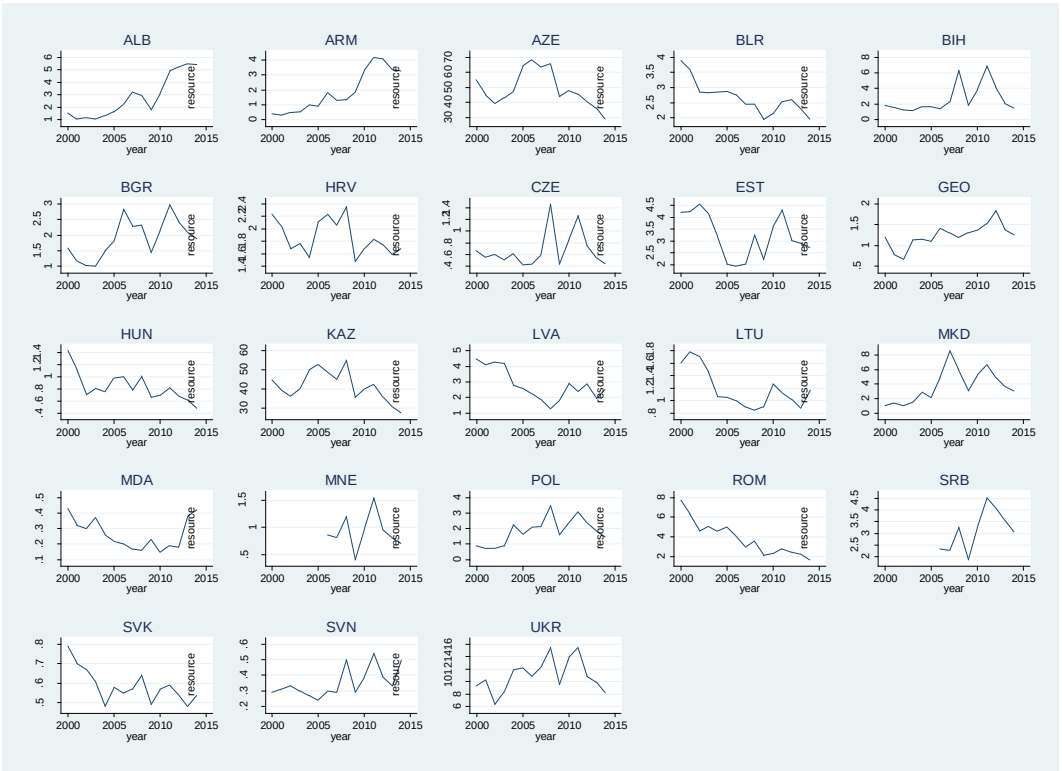

Figure 8: Environmental Protection Infrastructure Trends in Countries along the New Eurasian Land Bridge Economic Corridor

In summary, we can see that the economic level of all countries vary from high to low, which is in line with the basic principles of statistics. In addition, the preliminary description of economic infrastructure and social infrastructure also shows that the emphasis of economic infrastructure and social infrastructure varies from country to country. However, the construction of communications and education infrastructure in various countries attracts more attention, but the benefits of these two infrastructure's construction tend to lag behind. The above analysis provides the basis for further empirical analysis.

Empirical Analysis

The main object of this paper is the trade status of those 23 countries along the "New Eurasian Land Bridge Economic Corridor", so the explanatory variables are the annual total import and export volume of these 23 countries (*trade*).

According to the existing research on the classification of infrastructure construction, this paper mainly examines the impact on the trade of a country from the perspective of material infrastructure construction. Material infrastructure can be divided into economic infrastructure and social infrastructure. Among them, the economic infrastructure includes: construction of energy facilities (*energy*), measured by the ratio of electricity generation from oil, natural gas and coal to total power generation; construction of transportation facilities (*rail, air*) measured by the use of railway kilometers, air transport and registered carriers' departure worldwide; communication facilities (*internet*) measured by the number of Internet users (per 100 people). The construction of social infrastructure includes: construction of educational facilities (*edu*) measured by the gross enrollment rate of higher education; construction of scientific research facilities (*rd*) measured by R & D expenditure as a percentage of GDP; construction of medical facilities (health) measured by the ratio of total healthcare expenditure to GDP; environmental protection facilities (*resource*) measured by all natural resources rent as a percentage of GDP. In addition, a time variable (*year*) is also added to control the factors that do not change over time.

Data Sources and Data Processing

The infrastructure data for this study are derived from drcnet.com.cn, a strategic support platform for the "Belt and Road". The country's import and export trade data come from UN Comtrade. The GDP of the countries concerned is from Penn World Table 9.0 and the population data are from World Bank's WDI database. This paper mainly selects the panel data of 23 countries along the "New Eurasian Land Bridge Economic Corridor" from 2002 to 2016. All the data are adjusted based on the 2011 level. The adjusted price level data comes from the IMF. The 23 selected countries include Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, the Republic of Croatia, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, Ukraine.

The descriptive statistics of the data are shown in Table 1 as below.

Table 1: Descriptive Statistics of Variables

Variable	Observed	Mean	Standard Deviation	Minimum	Maximum
trade	334	5748680	7829453	103212.5	43116408
energy	321	58.42202	28.22795	0.01	99.9
rail	309	5495.963	6113.187	423	22560
air	328	22830.68	24344.21	420	123708
internet	332	35.74599	23.8043	0.11	84.24
edu	319	51.54329	18.66262	15.6	91.03
rd	306	0.6789869	0.4646959	0.02	2.6
health	345	6.937072	1.616406	3.19	12.49
resource	333	6.234414	12.93631	0.15	68.35

From the results shown in Table 1, it can be seen that for statistical reasons, some of the observed variables have no statistical value during our statistical period, and this paper treats this situation as a missing value. In addition, it can be seen that the 23 countries in the sample all have a low level of R & D expenditures (% of their GDP) and a large difference in energy infrastructure, transport infrastructure, communications infrastructure, education infrastructure and environmental protection infrastructure, and the maximum is even a hundred times of the minimum.

On this basis, the stata external commands are used to conduct a preliminary analysis of the correlation between variables, the results shown in Table 2,

Table2: Correlation between Variables

	trade	energy	rail	air	internet	edu	rd	health	resource
trade	1								
energy	0.164***	1							
rail	0.618***	0.267***	1						
air	0.793***	0.151***	0.695***	1					
internet	0.413***	0.056	-0.122**	0.308***	1				
edu	0.379***	0.062	0.284***	0.357***	0.503***	1			
rd	0.334***	-0.114*	0.05	0.306***	0.444***	0.531***	1		
health	-0.035	-0.104*	-0.272***	-0.089	0.169***	-0.063	0.231***	1	
resource	-0.063	0.348***	0.201***	-0.041	-0.203***	-0.211***	-0.318***	0.412***	1

From the correlation coefficient analysis of coefficients in Table 2, it can be seen that except the medical infrastructure and environmental protection infrastructure have little to do with the import and export trade of a country, all the other influencing factors have a significant positive impact on the trade volume. In addition, the linear correlation between variables is not obvious except for the possible linear correlation between traffic facilities.

Model Building

Based on the above analysis, this paper establishes the following empirical equation:

$$\ln trade_{it} = \alpha_0 + \alpha_1 energy_{it} + \alpha_2 \ln rail_{it} + \alpha_3 \ln air_{it} + \alpha_4 \ln \text{int} ernet_{it} + \alpha_5 edu_{it}$$

$$+\alpha_6 rd_{it} + \alpha_7 health_{it} + \alpha_8 resource_{it} + \alpha_9 year_{it} + \varepsilon_{it} \quad (1)$$

In equation (1), the data are used and processed as follows: Due to the actual usage of the transport infrastructure and the communications infrastructure, a logarithmic form is used to measure the elastic effect of variables; as for the energy infrastructure, education infrastructure, research infrastructure, healthcare infrastructure and environmental protection infrastructure do not require logarithmic adjustments because of their own indicator of the proportion of infrastructure to GDP.

Empirical Analysis

The data used in this paper is a panel containing 345 observations over 15 years in 23 countries. The lack of certain values of some variables may lead to the missing of some values of certain individual variables in some samples, but this does not affect the analysis of this article. This article will use the panel model for empirical test. In general, panel model estimation includes mixed cross-section model, fixed-effect model and random-effect model. These three models have their own advantages and disadvantages: the drawback of the mixed cross-section model is that individual effects which do not change over time cannot be observed; while the fixed and the random effects models can recognize individual effects that do not change over time, but there are differences on whether the variables are endogenous or exogenous, thus a better solution is to perform Hausman test.

The idea of Hausman test is as follows: Suppose the model is $y_{it} = \alpha_0 + \alpha_1 x_{it} + \varphi_i + \varepsilon_{it}$, if $E\left(\varphi_i / x_{it}\right) \neq 0$ Then the individual effects of the cross section are related to the explanatory variables; if $E\left(\varphi_i / x_{it}\right) = 0$,then the individual effect of the cross section is irrelevant to the explanatory variables, and the correlation exists in the fixed effects, so we can set Hausman's hypothesis as:

$H_0 : E\left(\varphi_i / x_{it}\right) = 0$ Random effects model

$H_1 : E\left(\varphi_i / x_{it}\right) \neq 0$ Fixed effects model

Set $u = \alpha_{OLS} - \alpha_{GLS}$, then

$\text{cov}(u) = \text{cov}(\alpha_{OLS}) - \text{cov}(\alpha_{GLS})$, the

statistics $N = u' \operatorname{cov}(u')u$ gradually follow the χ^2 distribution of the degree of freedom for the K. If the Hausman value is not significant, then the null hypothesis is established, the random effects model is used; if the Hausman value is significant, the null hypothesis is rejected and the fixed effects model is used.

the method of stepwise regression is adopted to carry on the test of mixed cross-section model, the result is as follows.

Table 3: Mixed Cross-sectional Model Test

	(1)	(2)	(3)	(4)
Variables	lntrade	lntrade	lntrade	lntrade
Energy	-0.00173	-0.00205*	-0.00164	-0.00207**
	(0.00120)	(0.00119)	(0.00101)	(0.000956)
Lnrail	0.863***	0.864***	1.010***	1.037***
	(0.0426)	(0.0425)	(0.0350)	(0.0329)
Lnair	0.123***	0.118***	-0.115***	-0.145***
	(0.0406)	(0.0407)	(0.0345)	(0.0328)
lninternet	0.584***	0.576***	0.674***	0.693***
	(0.0280)	(0.0395)	(0.0275)	(0.0371)
Edu			-0.00270	-0.00392**
			(0.00189)	(0.00189)
Rd			0.824***	0.876***
			(0.0691)	(0.0670)
Health			-0.0753***	-0.0784***
			(0.0181)	(0.0179)
Resource			0.00579**	0.00518*
			(0.00283)	(0.00293)
Year		YES		YES
Constant	5.023***	5.225***	5.852***	6.098***
	(0.282)	(0.302)	(0.281)	(0.276)
Observations	272	272	236	236
R-squared	0.855	0.866	0.921	0.937

Note: Values in parentheses are standard errors, "*", "**" and "***" indicate significant at 10%, 5% and 1% respectively.

Table 3 shows the results of the mixed-effects model, that is, the individual effects that do not change over time are not examined. Among them, columns 1 and 2 are the effects of economic infrastructure construction on the national trade volume, and Column 2 is the result of controlling the time effect on the basis of column one. As can be seen from Table 3, the impact of the construction of energy infrastructure on a country's trade will have a less obvious negative effect, which may be related to the relative lack of energy resources in countries along the "New Eurasian land Bridge Economic Corridor" The substantial construction of energy infrastructure may not bring about an increase in the trade volume of a country because its marginal cost is too high to offset the marginal benefit of importing energy from abroad. The construction of transport facilities, such as the construction of railways and aviation infrastructure, will all bring about an increase in the trade volume of the countries. For the countries along the "New Eurasian Land Bridge Economic Corridor" located in the inland areas, the main modes of transportation are mainly rail transport and air transport, while the benefits of developing air transport are far from being as high as that of developing rail transport because rail transport can be expanded, constructed and rebuilt on the existing basis. In the air transport system infrastructure in columns 1 and 2, the coefficient of construction is lower than that of railway infrastructure construction. In the models listed in columns 3 and 4, we have included social infrastructure such as education infrastructure, research infrastructure, healthcare infrastructure and environmental protection infrastructure.

In contrast to Columns 1 and 2, it is found that the coefficients for economic infrastructure in Columns 1 and 2 have not changed. From the social infrastructure shown in Columns 3 and 4, it can be seen that the construction of education infrastructure does not seem to contribute much to the growth of the trade volume of a country, on the contrary it may reduce its trade volume, which shows the comparative advantage of countries along the "New Eurasian Land Bridge Economic Corridor" may remain in the labor-intensive industries on the other hand. This can also be reflected in the coefficient of research infrastructure construction which is significantly and positively correlated. The greater the development of its research infrastructure, there is a very significant positive effect on the country's trade volume. Similarly, the construction of the resource infrastructure can also bring a relatively weak positive effect while the construction of healthcare infrastructure can only reduce the trade volume of a country.

However, the results presented in Table 3 are the result of a mixed cross-sectional regression model. Some factors that do not change over time need to be controlled, such as the geographical location of a country, the climatic conditions it faces, etc. Therefore, the fixed effects model and the random effects model are tested on this basis. The Hausman test shows that the P value is 0.000, and the results of the fixed effects model are as follows.

Table 4: Fixed Effects Model Test

	(5)	(6)	(7)	(8)
Variables	lntrade	lntrade	lntrade	lntrade
energy	0.00337	0.00432***	0.00721***	0.00367***
	(0.00259)	(0.00132)	(0.00206)	(0.00125)
lnrail	-1.519***	-0.0689	-0.943**	-0.0965
	(0.470)	(0.246)	(0.391)	(0.242)
lnair	0.0789*	0.0234	0.0877***	0.0220
	(0.0411)	(0.0206)	(0.0319)	(0.0193)
lninternet	0.490***	0.130***	0.438***	0.101***
	(0.0197)	(0.0193)	(0.0258)	(0.0315)
edu			0.0158***	-0.00172
			(0.00261)	(0.00187)
rd			0.428***	-0.0120
			(0.0779)	(0.0585)
health			-0.0686***	-0.0257
			(0.0258)	(0.0158)
resource			0.0162***	0.00220
			(0.00555)	(0.00343)
		YES		YES
Constant	24.55***	13.72***	19.11***	14.41***
	(3.866)	(2.023)	(3.285)	(2.000)
Observations	272	272	236	236
R-squared	0.764	0.947	0.856	0.955
Number of id	21	21	21	21

Note: Values in parentheses are standard errors, "*", "**" and "***" indicate significant at 10%, 5% and 1% respectively.

Table 4 is a model of fixed effects that controls individual effects that do not change over time. By comparing Table 4 and Table 3, several interesting places can be found. First of all, the result is basically the same in communications infrastructure, healthcare infrastructure and

environmental protection infrastructure. It can be seen that the construction of healthcare infrastructure may have a negative impact on the growth of trade volume in countries along the "New Eurasian Land Bridge Economic Corridor", but the construction of communications and protection environmental infrastructure can indeed further expand the country's import and export trade. This is basically logical, too. Against the current backdrop of "Internet Plus" and in the era of more emphasis placed on environmental awareness, strengthening communications infrastructure and environmental protection infrastructure construction not only can make its products more attractive in the international market, but also can further attract foreign direct investment, making there a better environment for business investment, which will also further expand the trade volume of a country.

Second, the result of energy infrastructure construction is opposite to the result of the previous mixed cross-section regression, which shows that there are some differences in the energy endowments of countries along the "New Eurasian Land Bridge Economic Corridor". After controlling this difference, the development of energy infrastructure will contribute to the country's import and export trade, of course, this is only limited to countries with comparative energy advantages. In addition, it appears that the development of transport infrastructure seems to be more favorable for the development of air transport. The reason for the difference between the mixed cross-section model and the previous results may be that the trade volume of those countries with large land area accounts for a larger proportion of the overall sample. It can be found that countries such as Kazakhstan and Ukraine may be responsible for this phenomenon. Therefore, the development of aviation infrastructure will be conducive to the improvement of the volume of import and export trade in small-land-area countries. However, the development of railway transport infrastructure will benefit large-land-area countries increasing their trade volume. After adding the fixed effect of time, both the construction of education infrastructure and the construction of research infrastructure become insignificantly negatively correlated from the previous significantly positive correlation. In our opinion, this may be due to the fact that some factors that do not change over time are controlled and that the impact of the research infrastructure and the education infrastructure are all related to the "silent" investment of the previous year or even years ago, so the expenditure or investment in that year may not be effective immediately, it takes a certain amount of time to affect the economy of a country.

Conclusion and policy recommendations

This paper examines the mixed cross-section test and the fixed-effect model by selecting 15-year panel data from 23 countries along the "New Eurasian land Bridge Economic Corridor" and finds that the construction of energy infrastructure in the economic infrastructure may have a less obvious negative effect on the trade of a country, which may be related to the different geographical locations of countries along the "New Eurasian Land Bridge Economic Corridor", suggesting that the impact of energy infrastructure development on different countries is not the same as the marginal cost is too high to offset the marginal benefit of importing energy from abroad. In respect of the

construction of transport infrastructure, two different modes of transport, namely railway and aviation infrastructure, will also be affected by the different endowments of the country. In addition, the trade volume of a country will further expand with the construction of communications infrastructure. The construction of education infrastructure, research infrastructure, healthcare infrastructure and environmental infrastructure in social infrastructure has not obvious impact on the country's trade. Except that the environmental infrastructure has a positive impact on a country's import and export trade, the other three types of social infrastructure have a negative impact on a country's trade. In addition, it is noted that the impact of the construction of research infrastructure and education infrastructure on its macro economy is lagging behind, so its effect will take some time to be reflected.

Based on the above conclusions, some policy recommendations are proposed as follows:

First, as far as economic infrastructure is concerned, all countries should make full use of their own comparative advantages and make greater efforts to build infrastructure that can enhance their own trade. For example, some countries with energy endowments should vigorously develop energy infrastructure. As for those countries with larger territories, developing rail transport infrastructure will enjoy greater advantages than developing air transport infrastructure. In the current environment of network economy, the development of communications infrastructure will undoubtedly bring very high benefits to every country.

Second, as far as social infrastructure is concerned, full consideration should be given to the possible lag in the economic impact of various social infrastructure, thus the construction period be shorten in accordingly. As for those infrastructure subject to obvious time effects, construction should be planned ahead and early execution should also be implemented. For infrastructure that is temporarily accessible in neighboring countries, the convenience of "free-riding" can be enjoyed; therefore, such construction can be suspended with limited funding.

Third, both economic infrastructure and social infrastructure should complement each other to promote their trade and economic development in more efficient and reasonable ways.

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Appendix：

Country Code	English
ALB	Albania
ARM	Armenia
AZE	Azerbaijan
BLR	Belarus
BIH	Bosnia Herzegovina
BGR	Bulgaria
HRV	Croatia
CZE	Czech Republic
EST	Estonia
GEO	Georgia
HUN	Hungary
KAZ	Kazakstan
LVA	Latvia
LTU	Lithuania
MKD	Macedonia, FYR
MDA	Moldova
MNE	Montenegro
POL	Poland
ROM	Romania
SRB	Serbia
SVK	Slovakia
SVN	Slovenia
UKR	Ukraine