Scientific Research Publishing

Relationship between Logistics and Economic Growth on the Silk Road Economic Belt

—Taking Xi'an as an Example

Tianshu Fang

Northwest Institute of Historical Environment and Socio-Economic Development, Shaanxi Normal University, Xi'an, China
Email: chocolatecake123@126.com

Abstract

The government attaches great importance to "The Silk Road Economic Belt", especially the role of logistics that influences economic growth. This paper selects the data of transportation investment and economic growth in Xi'an from 1993 to 2013. And I use the Unit root test, the VAR model and the Granger causality test. The research results show that the economic growth has caused the development of the logistics industry.

Keywords

"The Silk Road Economic Belt", Logistics, Economic Growth

1. Introduction

In September 2013, the President Xi Jinping visited to Kazakhstan, the first initiative to build a "Silk Road Economic Belt" during a speech at the Nazarbayev University [1]. The action reflected the bright future of opening up China to the west. In the concept of the "The Silk Road Economic Belt", the logistics industry is to promote economic growth with a breakthrough, especially in the recent years, government increases investment in central transportation infrastructure.

Xi'an is the construction of the Silk Road economic zone, which is expected to become the biggest beneficiary. At the same time, Xi'an is the well-known ancient Silk Road starting point and it can represent the gateway city at the Guanzhong-Tianshui Economic Zone. This paper focuses on the relationship between the logistics industry and economic growth of Xi'an. This paper provides suggestions for the government to develop the economy of Xi'an.

2. "The Silk Road Economic Belt"

2.1. The Concept of "The Silk Road Economic Belt"

Historic Silk Road refers to ancient China starting in the economic, political and cultural center-the ancient capital of Chang'an (now Xi'an) overland commercial channels. China's world-famous ancient silk, Silk Road, hence the name. 300 years BC, China's silk was transported to ancient India. In the Western Han Dynasty, Zhang Qian's diplomatic mission to the Western Regions, making the Chinese civilization and Central Asia, West Asia have a more intimate contact with civilization, and provide the dissemination of Chinese civilization. At the same time, Silk Road reached prosperous period. "Silk Road economic belt" in the "Silk Road" basis put forward. "Silk Road economic belt" points in Central Asia, South Asia, West Asia, Europe and Asia, especially in Central Asia.

Basic connotation "The Silk Road Economic Belt" is to strengthen the five parts [2]: policy communications, roads connection, trade flow, currency in circulation and the people connected. Policy communications for the construction of "The Silk Road economic belt" is very important that each country has its own economic policy. If the basic policy of communication do not go well, then it is difficult to continue the economic and cultural exchanges. In recent years, the efforts of China and the Central Asian countries, China-Central Asia along the transportation infrastructure segment improved greatly promoted bilateral and multilateral trade. Strengthen trade flow. "The Silk Road Economic Belt" The market potential is huge, the economic belt attached to the east of the Asia-Pacific Economic Circle, west attached developed European economic circle. China has become Kazakhstan's largest trading partner of Turkmenistan, Uzbekistan, Kyrgyzstan's second largest trading partner, third largest trading partner in Tajikistan. Strengthen the currency in circulation. The role of finance in modern economic development is becoming increasingly important to strengthen financial cooperation between countries is necessary. If countries achieve local currency settlement, then it can greatly reduce transaction costs, but also can enhance the ability to resist financial risks. Strengthen the people connected. "The Silk Road Economic Belt" must be supported by all peoples, in order to carry out a wide range of people is the starting point and goal of all our work.

2.2. Situation Analysis of "The Silk Road Economic Belt"

"The Silk Road Economic Belt" of the total population of nearly 30 million [3]. Based on the ancient Silk Road, the formation of regional economic cooperation between China and other countries in the Midwest, it is considered to be the world's longest, most development potential of the economy large corridor and a special economic zone area.

By the end of 2014, the total population of five northwestern provinces 98.42 million is which is located on the "The Silk Road Economic Belt", accounting for 7.2% of the total population; a total area of 3,079,000 square kilometers. According to statistics, in 2014 GDP of the five northwestern provinces reached 3.9 trillion yuan, as shown in Ta-

ble 1. Rapid economic growth benefited "The Silk Road Economic Belt" and the logistics industry has provided a broad space for economic development.

Table 1. GDP of five northwestern provinces during 2007-2014 (100 million).

Year Province	2007	2008	2009	2010	2011	2012	2013	2014
Shaanxi	5757.29	7314.58	8169.80	10123.48	12391.30	14453.68	16205.45	17689.94
Gansu	2702.40	3166.82	3387.56	4120.75	5020	5050.2	6330.69	6836.82
Qinghai	797.35	1018.62	1081.27	1350.43	1622	1893.54	2122.06	2303.32
Ningxia	919.11	1203.92	1353.31	1689.65	2060	2341.29	2577.57	2752.10
Xinjiang	3523.16	4183.21	4277.05	5437.47	6574.54	7505.31	8443.84	9273.46

Source: China Statistical Yearbook.

At the same time, the total social consumer goods retail sales of five northwestern provinces reached 1.04 trillion yuan in 2013, as shown in Table 2. Northwest consumer market activity, retail sales continued to grow steadily, which is good for the development of the logistics industry on "The Silk Road Economic Belt".

Table 2. The total social retail goods sales and nominal growth of five northwestern provinces.

Province	The total social retail goods sales (100 million)		Nominal growth (%)
	2012 year	2013 year	
Shaanxi	4383.8	4999.5	14.04
Gansu	1906.5	2173.8	14.02
Qinghai	476.0	544.1	14.3
Ningxia	548.8	610.5	11.24
Xinjiang	1858.6	2108.2	13.42
Total	9173.7	10436.1	13.76

Source: China Statistical Yearbook.

Xi'an is the largest city in the Northwest Province, which is the cultural history of the international metropolis. Xi'an connects the north and south of the "Grand Cross" rail network and Shaanxi Province, which shows "rice-shaped" an important hub for rail transport of the country and the national trunk road network one of the largest urban nodes. It is also the center of the Eurasian Continental Bridge, which is an important strategic position. In 2013, the total annual cargo transport Xi'an 50119 million tons, an increase of 11.6%; cargo transportation turnover 64,714,970 million tons km, an increase of 8.6%, as shown in Table 3.

Table 3. Highway, railway and civil aviation traffic growth in 2013.

Classification	Highway	Railway	Civil aviation	Total
Tonnage (million tons)	49243	858	18	50119
The proportion of tonnage	98.3%	1.7%	0.04%	100%
Tonnage growth	11.7%	4%	2.3%	11.6%
Tonnage turnover (million tons km)	4168694	2292497	10307	6471497
The proportion of tonnage turnover	64.4%	35.4%	0.2%	100%
Tonnage turnover growth	11.8%	3.2%	4.9%	8.6%

Source: Xi'an Statistical Yearbook.

3. Research Methodology

3.1. Data Selection

I select the Xi'an as the sample and the time span is 1993 to 2013 year. And the data source is Xi'an statistical yearbook. According to Xi'an domestic research literature on the logistics measure indicators, taking into account the diversity of logistics indicators, based on previous research [4], this paper choose transportation, storage and postal services as an indicator of investment in fixed assets of the logistics industry, denoted JCY, select gross domestic product (GDP) as a measure of economic growth indicator, denoted by GDP (Table 4, Figure 1).

Table 4. GDP and investment in transport infrastructure of Xi'an during 1993-2013.

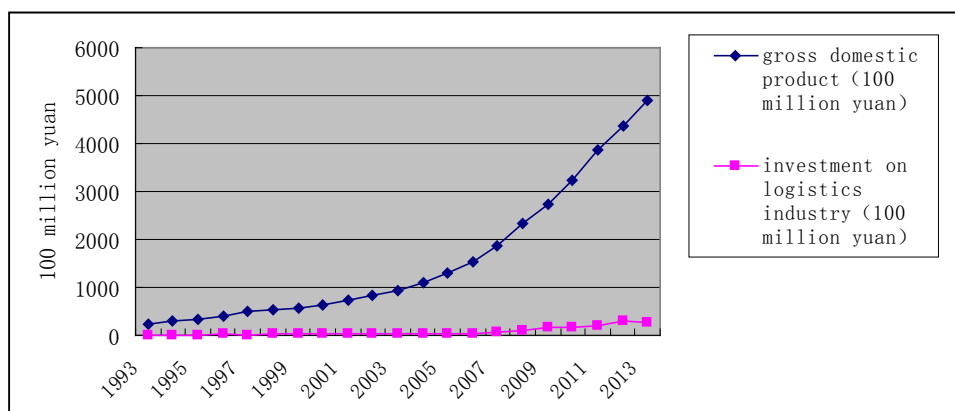| Year	GDP (100 million yuan)	JCY (100 million yuan)	Log (GDP)	Log (JCY)
1993	229.56	10.22	2.36	1.01
1994	289.82	8.43	2.46	0.93
1995	330.35	13.48	2.52	1.13
1996	406.95	21.36	2.61	1.33
1997	488.82	16.16	2.69	1.21
1998	525.85	22.25	2.72	1.35
1999	577.29	38.43	2.76	1.58
2000	646.13	36.12	2.81	1.56
2001	734.86	47.44	2.87	1.68
2002	826.68	37.98	2.92	1.58
2003	946.66	43.18	2.98	1.64
2004	1102.39	41.45	3.04	1.62
2005	1313.93	19.25	3.12	1.28
2006	1538.94	43.54	3.19	1.64
2007	1856.63	58.37	3.27	1.77
2008	2318.14	112.36	3.37	2.05
2009	2724.08	150.54	3.44	2.18
2010	3241.69	175.09	3.51	2.24
2011	3862.58	205.37	3.59	2.31
2012	4366.10	292.83	3.64	2.47
2013	4884.13	282.98	3.69	2.45

Source: Xi'an Statistical Yearbook.

Figure 1. GDP and investment in transport infrastructure in Xi'an from 1993 to 2013.

3.2. Methodology

This paper built VAR model to analyze the relationship between the logistics industry and economic growth. And I use E-Views econometric software.

VAR models are a number of variables on the current period lagged variable regression, and consider the impact of their endogenous lagged variable for the current variable. VAR model characteristics: It needn't strict economic theory basis; VAR model is applied to the zero bound on the parameter; explanatory variables; VAR model does not include any profit or variables, all with the simultaneous equations model related the problem does not exist in the VAR model; VAR model is applied to predict.

4. Results and Discussion of the Study

4.1. Stability Test

Stationary time series refers to the mean of a time series, whether the variance and auto covariance is stable. If a time series with a stable mean, variance and auto covariance, then this sequence is stable, or is unsteady.

In order to reduce the volatility of the data, the data processing logarithmic, LGDP = log (GDP), LJCY = log (JCY).

With E-Views econometric software analysis, the results obtained are as follows (Table 5).

Table 5. ADF unit root test.

Variables	ADF test value	The 5% level of confidence	The 10% level of confidence	Conclusion
LGDP	0.553385	−3.029970	−2.655194	unstable
LJCY	−0.466096	−3.020686	−2.650413	unstable
DLGDP	−3.250449	−3.029970	−2.655194	stable
DLJCY	−5.226985	−3.029970	−2.655194	stable

Table 5 shows that, ADF value of LGDP equal to 0.553385, ADF value of LJCY equal to −0.466096, are greater than the critical value of 5% confidence level, indicating that in 1993-2013 years, the logistics industry and economic growth in Xi'an sequence is not smooth, so it is non-stationary nature sequence. So I have to do first-order differential. Then we know that DLGDP equal to −3.250449, DLJCY equal to −5.226985, and they are less than the critical value under the 5% level. So these two time series after the first difference stationary series are stable. So they can be used in the Granger causality test.

4.2. VAR Model

Vector autoregression model called VAR model, is a commonly used econometric models, 1980 by Christopher Sims proposed. VAR model is the model which including number of all the income variables lagged regression variables for all variables.

When the maximum value of lag equals to 1, the value of SC (Schwartz criterion) arrives to minimum (-6.201996). At the same time, AIC (Akaike information criterion) is −6.481256. VAR model are as follows:

$$LJCY_t = -0.8662 + 0.4601LJCY_{t-1} - 0.0954LGDP_{t-1}$$

$$LGDP_t = -0.0376 + 0.0071LJCY_{t-1} + 1.2577LGDP_{t-1}$$

From the VAR model, we know that LJCY is positively affected by the previous period, but also by LGDP negative impact of the previous period. LGDP is positively affected by its previous period and it also positively affected by the previous period of LJCY.

4.3. Granger Causality Test

If the variable X helps to predict Y, that is to say, the regression of Y is based on past values of Y. If coupled with past values of X, the results can significantly enhance the explanatory power of regression. Then X is the Granger cause of Y, otherwise known as non Granger reasons.

With E-Views econometric software analysis, the results obtained are as follows (Table 6).

Table 6. Granger causality test.

Null Hypothesis:	Obs	F-Statistic	Prob.
LGDP does not Granger Cause LJCY	20	7.30154	0.0151
LJCY does not Granger Cause LGDP		0.73450	0.4033

When the lag period is 1, the probability of Granger cause is 0.0151 when LGDP is not the cause of LJCY, less than the significance level of 0.05. So it is need to reject the null hypothesis of LGDP is not the reason of LJCY, that's to say, LGDP is the Granger cause of LJCY. Similarly, the probability of Granger cause is 0.73450 when LJCY is not

the cause of LGDP, greater than the significance level of 0.05. So we need to accept the null hypothesis that LJCY is not the Granger cause of LGDP.

5. Conclusion

There is a strong correction between logistics industry and economic growth on the "Silk Road Economic Belt". By Granger causality test, it shows that the economic growth of Xi'an promotes the development of the logistics industry, and the development of the logistics industry does not play a significant role in promoting economic growth. For the reason why development of the logistics industry in Xi'an does not play a significant role in promoting economic growth, we can interpret from the following aspects.

5.1. Lack of Unified Planning and Layout of Logistics

Currently, Xi'an is short of logistics network construction planning, more not been coordinated, resulting in that a fragmented district logistics basic state become a serious obstacle to the scientific development of the logistics industry in Xi'an. And this situation leads to the logistics enterprise generated internally huge waste and loss.

5.2. Low Degree of Logistics Socialization

At present, the business reached more than 500 million is few among the medium-sized enterprises logistics companies in Xi'an. There are much fewer logistics enterprises that can provide two or more logistics functions and information services, not to mention carrying out a third-party logistics business. The majority enterprises are small-scale logistics enterprises and their business is single.

5.3. Enterprise Information Level and Technology Equipment Are Low

The level of technical equipment is lower logistics companies in Xi'an [5]. Many companies still use the traditional mode of operation, not adopting MIS, GPS systems, bar code identification system, EDI technology, RFID technology and other advanced logistics technology. The traditional mode greatly reduces the information transmission speed and accuracy resistance, and it cannot provide logistics information service and electronic documents in time.

In conclusion, Xi'an should make full use of the geographical advantages, strengthen exchanges and cooperation with the countries and regions which on the "Silk Road Economic Belt". Xi'an has become an important comprehensive hub on the "Silk Road Economic Belt".

References

[1] Sun, Z.Z. (2014) "Silk-Road Economic Belt": New Model of Regional Cooperation to Be Constructed. *Journal of Xinjiang Normal University* (*Edition of Philosophy and Social Sciences*), **35**, 36-41.

[2] Zhao, H.S. (2014) Focus and View of "Silk-Road Economic Belt". *Journal of Xinjiang Nor-*

mal University (*Edition of Philosophy and Social Sciences*), **35**, 27-35.

[3] Li, Y.F. and Tong, J. (2014) Analysis of Constructing a Logistics Hub on the Silk Road Economic Zone—A Case Study of Xi'an. *Discussion and Research*, 118-121. http://www.chinachuyun.com

[4] Liu, Y.H. (2012) The Research on Dynamic Relationship between Transportation Infra-structure Investment and Economic Growth of the New Silk Road Economic Belt. *Statistics & Information Forum*, **27**, 64-70.

[5] Liu, Y.R. (2010) Research on Logistics Present Situation and Countermeasure of Xi'an. *Logistics Engineering and Management*, **32**, 60-61.