Research on Interaction Between Financial Structure and Industrial Structure Based on Data of Liaoning Province

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Abstract.
The relationship between finance and industry has been a hot issue for scholars at home and abroad in recent years. In the study of the relationship between the two, the general scholars believe that there is an interaction between them. However, there is a problem that the development of financial structure lags behind the upgrading of industrial structure. This paper selected Liaoning Province to further study the relationship between financial structure and industrial structure. The study found that the financial structure and industrial structure of Liaoning Province are mutually causal, but there was an inconsistency between the two in the process of mutual promotion.
Keywords: financial structure, industrial structure, Grey relation, VAR model

1. Introduction

At present, as the gradual slowdown or even negative growth of Liaoning's economic growth, how to improve the economic environment and stimulate economic growth of Liaoning Province have become two crucial issues. The level of economic quality is mainly reflected in the industrial structure, that is, the proportion of the three industries in the national economy. The financial structure of a region will further affect the upgrading of the industrial structure while affecting the mode of economic growth, the change of industrial structure will affect the quality of economic growth. Therefore, it has a great practical significance to study the interaction between financial structure and industrial structure in Liaoning Province.

At present, there are many scholars on the development of financial development and economic growth by scholars at home and abroad, but there is not much research on financial structure and industrial structure. It is rare to study the interaction between financial structure and industrial structure. By analyzing the current development and problems of the financial structure and industrial structure in Liaoning Province, it is a great significance to optimize the economic growth model and improve the quality of economic growth of Liaoning Province. The main focus of this paper is to analyze the interaction between financial structure and industrial structure in Liaoning Province, and then to derive the relationship between financial restructuring and industrial structure optimization. This paper firstly explores the relationship between financial structure and industrial structure from a theoretical perspective. Secondly, it empirically analyzes the financial structure and industrial structure of Liaoning Province according to the Grey relational analysis model and VAR model, and finally draws conclusions based on the empirical results.

2. Theoretical analysis and research hypothesis

Sun et al. (2016) proposed that small rural financial institutions are developing rapidly, it has improved the overall strength of the financial industry and promoted the improvement of the financial environment. Li (2005) pointed out that the sub-markets of China's financial market have problems such as single function and unbalanced development in the process of development, which affects the exertion of financial functions directly and inhibits economic development. The proportion of the three industries in the national economy will change with the continuous progress of the social economy. In general, it will show an upward trend. According to the law of Clarke, along with the continuous development of the economy, the proportion of the primary industry will gradually decline, and the proportion of the secondary industry will increase. The proportion of the tertiary industry has also begun to rise (Chi, 2015).

Liu (2013) proposed that the adjustment of financial structure will affect the development of capital market and monetary market, and the development of capital market and monetary market will affect the proportion of direct financing and indirect financing. Luo (2016) pointed out that the optimization of financial structure will accelerate the development of capital market and credit market, thus affecting the allocation of funds in resources, and adjusting the investment and exit of funds in the financial market, which will enable some emerging small and medium enterprises with development potential to receive strong financial support, thereby promoting the development of leading industries and high-tech industries. Moreover, with the continuous increase of people's wealth, the

consumption structure of residents will inevitably be gradually upgraded, which will promote the development of the real economy. The continuous upgrading of product structure will accelerate the upgrading of industrial structure (Feng, 2016). The industrial structure needs a lot of financial support in the process of optimization and upgrading, so the optimization of the industrial structure will promote the adjustment of the financial structure (Gong, 2014).

In summary, we can use Liaoning Province as an example to make assumptions: the industrial structure of Liaoning Province will affect the demand for funds in the process of adjustment, and the transformation of financial structure will also make the funds flow to industries with higher returns, this cyclical flow of funds has a close interaction between the financial structure and the industrial structure.

3. SAMPLE ANDVARIABLE SELECTION

Through the analysis of the current financial structure of Liaoning Province, banks, insurance, and securities account for a large proportion. Therefore, this paper considers these three representative data. In the selection of industrial structure indicators, as the proportion of the primary industry is declining year by year, this paper does not consider the proportion of the primary industry in gross domestic product (GDP) in the selection of industrial structure data.

This paper mainly selects the indicator data of Liaoning Province from 2000 to 2014. Firstly, the gray correlation method is used to measure the related indicators of financial structure and industrial structure. The descriptive statistics of the data are shown in Table 1, and the gray correlation coefficient matrix is shown in Table 2.

Table 1. The descriptive statistics of the data.

	Mean	Coefficient of skew	Kurtosis	Range	Maximum	Minimum
HB	0.8640179	-1.814	3.862	0.200565	0.916734	0.716169
ST	0.2188427	2.166	5.292	0.433952	0.554604	0.112115
in	0.0163465	1.258	1.276	0.006580	0.020924	0.014344
JY	0.8484986	0.280	-1.958	0.38849	1.069065	0.680577
KY	0.0934059	0.849	-0.826	0.02216	0.107823	0.085793
Y2	0.5147095	-0.049	-1.131	0.065902	0.546734	0.480832
Y3	0.392989	-0.148	-1.562	0.050580	0.41766	0.36708
f	0.0076943	0.608	-1.048	0.010189	0.014067	0.003878

Table 2. The gray correlation coefficient matrix.

	Y2	Y3	Y4	Row mean
X1	0.5063649	0.3340920	0.1672994	0.3359188
X2	0.2706363	1.3692956	0.5256691	0.72186702
X3	0.2093947	0.2588269	1.1286390	0.53228690
X4	0.6184073	0.3528850	0.1744432	0.38191187
X5	0.2314629	0.2929276	0.3642937	0.29622814
Column mean	0.3672532	0.5216054	0.4720689	

It can be seen from Table 2 that the monetary market has a significant correlation with the secondary industry; the securities market has a significant correlation with the tertiary industry and degree of foreign investment; the insurance market has a significant correlation with the degree of foreign investment; the level of higher education is significantly correlated with the secondary industry and weakly related to the tertiary industry.

4. EMPERICAL RESULTS AND ANALYSIS

In order to better prove the interaction between the gold structure and industrial structure in Liaoning Province, this paper uses the VAR model combined with Granger causality test and cointegration test to verify the relationship between the two. Make a stationarity test and the results allow doing the Granger causality test.

Table 3. Granger causality test.

Null hypothesis	F	P	Conclusion
LX1 is not for LY2	12.9048	0.0115	Reject
LY2 is not for LY1	2.64252	0.1552	Accept
LX1 is not for LY3	11.8241	0.0138	Reject
LY3 is not for LX1	2.17782	0.1905	Accept
LX2 is not for LY2	14.6670	0.0283	Reject
LY2 is not for LX2	6.09708	0.0877	Accept
LX2 is not for LY3	3.40414	0.1692	Accept
LY3 is not for LX2	6.82011	0.0365	Reject
LX3 is not for LY2	2.22342	0.2557	Accept
LY2 is not for LX3	9.44090	0.0488	Reject
LX3 is not for LY3	7.82075	0.0213	Reject
LY3 is not for LX3	2.22342	0.0365	Accept

It can be seen from the data in Table 3 that the changes in the monetary market (LX1) are the reasons for the structural adjustment of the secondary industry (LY2) and the tertiary industry (LY3); the changes in the securities market (LX2) are the reasons for the structural adjustment of the secondary industry. The changes in the structure of the tertiary industry are the reasons for the changes in the securities market; the changes in the insurance market (LX3) are the reasons for the structural adjustment of the tertiary industry. The changes in the structure of the secondary industry are the reasons for the changes in the insurance market. The reciprocal of the estimated root model of all indicator data is less than 1, it can be used for cointegration test. As can be seen in Table 4, the residual sequence of the indicator data is a stationary sequence

Table 4. Cointegration test.

	T	P	10% level	5% level
LY2&LX1	-3.267413	0.0590	-2.841819	-3.404413
LY3&LX1	-2.905287	0.0106	-2.006292	-1.598068
LY2&LX2	-2.704262	0.0130	-1.600140	-1.988198
LY3&LX2	-5.010745	0.0229	-3.590496	-4.246503
LY2&LX3	-2.820243	0.005	-1.600140	-1.988198
LY3&LX3	-2.883418	0.0093	-1.600140	-1.988198

Table 5. Results of the LX1, LX2, LX3 to LY2, LY3 VAR models

LX1 and LY2, LY3 VAR models.				LX2 and LY2, LY3 VAR models.				LX3 and LY2, LY3 VAR models			
	LX1		LX1		LX2		LX2		LX3		LX3
LY2 (-1)	-0.094829	LX1 (-1)	-0.703143	LY2 (-1)	1.081395	LX2 (-1)	-0.449782	LY2 (-1)	-1.696263	LY3 (-1)	0.911850
LY2 (-2)	2.084291	LX1 (-2)	-0.516600	LY2 (-2)	0.062984	LX2 (-2)	-0.298616	LY2 (-2)	-0.046466	LY3 (-2)	-0.687730
LX1 (-1)	-0.637498	LY3 (-1)	-2.552321	LX2 (-1)	-0.070604	LY3 (-1)	-0.646115	LX3 (-1)	0.111348	LX3 (-1)	0.012860
LX1 (-2)	-0.371811	LY3 (-2)	0.391594	LX2 (-2)	-0.007866	LY3 (-2)	12.99278	LX3 (-2)	0.233874	LX3 (-2)	-0.187131
C	1.002507	C	-2.392971	C	0.094980	C	8.930325	C	-3.848914	C	-1.445993
R²	0.914970	R²	0.828973	R²	0.950240	R²	0.717404	R²	0.248209	R²	0.818027
Adj. R²	0.801596	Adj. R²	0.600937	Adj. R²	0.883893	Adj. R²	0.340610	Adj. R²	0.754180	Adj. R²	0.575395
S.E.	0.035780	S.E.	0.050744	S.E.	0.011524	S.E.	0.403297	S.E.	0.181604	S.E.	0.029477

It can be seen from the regression results in Table 5 that there is a linear relationship between LX1 and LY2, LY3, a linear relationship between LX2 and LY2, LY3 and a linear relationship between LX3 and LY2, LY3, the goodness of fit is good, and with the increase of the lag period, the impact of the monetary market on the secondary industry and the tertiary industry has gradually deepened. The improvement and development of the monetary market has

played an active role in the development of the tertiary industry in Liaoning Province; the impact of the securities market on the secondary industry has gradually deepened, and the securities market has direct interaction with the tertiary industry, but the interaction between the two needs to be improved; the impact of the insurance market on the secondary industry and the tertiary industry has gradually deepened. At the same time, it is necessary to improve the interaction with the second and third industries.

5. CONCLUSION AND RESEARCH PROSPECTS

This paper draws a causal relationship between the financial structure and industrial structure of Liaoning Province and the following conclusions according to the analysis: (1) The role of the monetary market in promoting the industrial structure is not significant, especially in the tertiary industry. At the same time, the development of the secondary and tertiary industries does not play a good role in the development of the money market; (2) Changes in the securities market will have an impact on the development of the secondary industry, and changes in the proportion of the secondary industry will also have an impact on the state of the securities market; (3) Changes in the insurance market will have an impact on the development of the tertiary industry, and changes in the proportion of the tertiary industry will also have an impact on the status of the insurance market; (4) The promotion of education and science and technology has little effect on the adjustment of industrial structure, and the tertiary industry needs further development.

In this paper, there are still many shortcomings in the interactive research on the financial structure and industrial structure of Liaoning Province. Due to the lack of relevant data in Liaoning Province, the indicators selected in this paper are limited by the missing data. In general, this paper concludes that there is an interaction between the two through theoretical research and empirical analysis. Therefore, we need to use this interaction between the two to promote the adjustment of the financial structure and the upgrading of the industrial structure, and further to promote the economic development of Liaoning Province.

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