Research on the Influence of Shaanxi Financial Development on Cultural Industry Based on VAR Model

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ABSTRACT: The added value of cultural industry in Shaanxi Province was selected as a measure of the overall development level of cultural industry in Shaanxi Province. The financial development scale, financial development structure, financial development efficiency and financial asset investment were selected to measure the level of financial development in Shaanxi Province. The cointegration test, the granger test, the variance decomposition and the pulse corresponding graph are used for empirical analysis. It is concluded that the financial development structure and the scale of financial development have a greater impact on the cultural industry, while the financial development efficiency and financial asset investment have not been significant, but there is still a certain impact.

1. INTRODUCTION

The process of China's economic reform and transformation is accelerating and accelerating. The cultural industry with high addedness and strong integration have developed into an important core part of adjusting China's industrial structure and transforming its economic development mode.The promotion of innovation and development in the cultural industry has also become an important task for accelerating economic development. In the strategic planning layout of the 13th Five-Year Plan for National Economic and Social Development of Shaanxi Province, it has clearly stated that by 2020, the added value of Shaanxi's cultural industry will be completed, accounting for 6% of the province's GDP.

And with the country's continuous deepening of the "The Belt and Road" strategic plan, the establishment of the Shaanxi Free Trade Pilot Zone, the development of the cultural industry also ushered in a better renewal of development opportunities, and expand and strengthen the development of cultural industries in Shaanxi Province, and finance Industry support is inseparable. Increasing the financial industry's support for the cultural industry is conducive to the prosperity and development of the cultural industry, the improvement of cultural soft power, the cultivation of new economic growth points and the promotion of high-quality development. Therefore, it is important to study the impact of financial development on cultural industries.

2. Indicator selection, data processing

2.1 Indicator selection

Select the financial correlation rate indicator to measure the scale of financial development in Shaanxi Province (L), select the balance of medium and long-term loans of financial institutions /

the balance of various loans of financial institutions at the end of the year to reflect the financial development structure of Shaanxi Province (T), select the whole society Fixed assets investment / financial institutions at the end of the year to measure the efficiency of financial development in Shaanxi Province (E) ，finally introduced a new indicator of financial asset investment (F), that is, fixed assets investment for culture and related industries, the indicator It is considered from the scale of investment in financial assets in the field of cultural industries, and it can be used as a control variable. The value added (Y) of cultural industry in Shaanxi Province was selected to reflect the scale of cultural industry development in Shaanxi Province.

2.2 Data processing and judgment

In order to avoid data heteroscedasticity, the cultural industry added value, financial development scale, financial development structure, financial development efficiency and financial asset investment are processed in logarithm, so as to reduce the impact of data fluctuation on model construction[1].

（a）LNY   （b）LNL
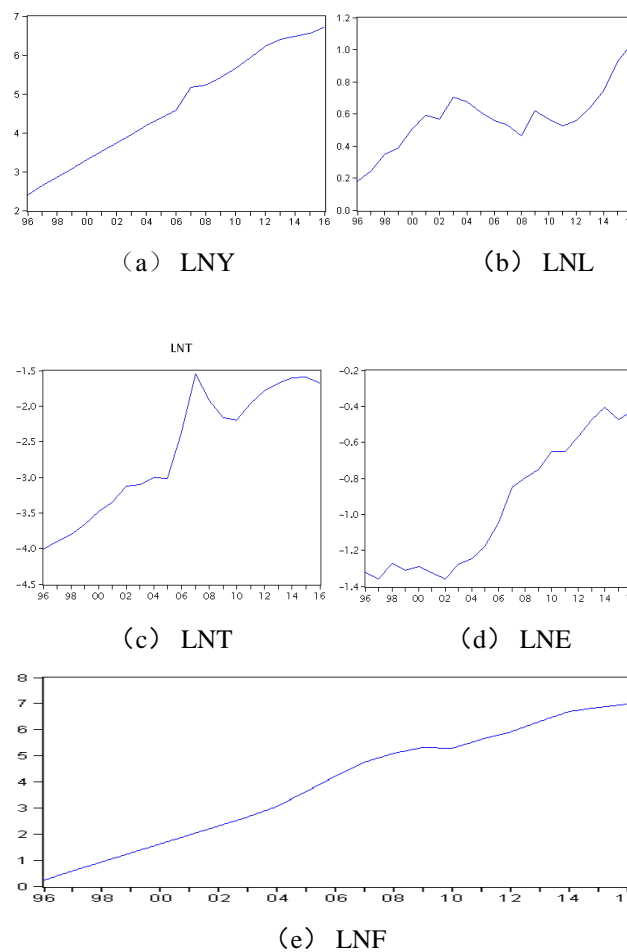
（c）LNT   （d）LNE

（e）LNF

Figure 1 Time series of each variable

It can be seen visually from the five figures in Figure 1. The five variables of LNL, LNT, LNE, LNF, and LNY show a clear upward trend, and the three variables of L, T, and E also have significant fluctuations. Their values show different trends over time.

3. Empirical test

3.1 Data stationarity test

The five logarithmic sequences of cultural industry added value, financial development scale, financial development structure, financial development efficiency and financial asset investment accept the null hypothesis H_0 at the significance level of 1%, 5% and 10%. The time series has a unit root, which is a non-stationary time series. Therefore, it is necessary to perform a first-order

difference on the original sequence before performing a unit root test. The differenced sequence rejects the null hypothesis H_0 at a level of 5% and 10% significance, and considers D(LNY), D(LNL), D(LNT), D(LNE), D(LNF) to be stable. That is to say, the LNY, LNL, LNT, LNE and LNF sequences are first-order single-integral processes, namely I(1).

Table 1. Results of unit root stationary test of original logarithmic sequence and first-order difference sequence

variable	ADF Statistic	1% threshold	5% threshold	10% threshold	P value	Conclusion
LNY	-1.502	-4.498	-3.658	-3.269	0.794	no
D(LNY)	-3.800	-4.728	-3.760	-3.325	0.047	yes
LNL	-1.095	-4.498	-3.658	-3.269	0.905	no
D(LNL)	-5.002	-4.616	-3.71	-3.298	0.005	yes
LNT	-1.242	-3.809	-3.02	-2.650	0.203	no
D(LNT)	-4.635	-3.887	-3.052	-2.667	0.013	yes
LNE	-2.075	-4.498	-3.658	-3.269	0.648	no
D(LNE)	-4.589	-4.616	-3.71	-3.298	0.011	yes
LNF	-1.730	-4.498	-3.658	-3.269	0.837	no
D(LNF)	-4.148	-4.668	-3.733	-3.310	0.005	yes

3.2 Cointegration test

Based on the previous research, this paper combines the actual characteristics of electronic commerce When establishing a vector autoregressive model (VAR model), the lag order must be determined first. The model lag order is determined according to the likelihood ratio (LR) test method. The test results are as follows:

Table 2.   Model lag order test results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	12.29	NA	3.20	-0.77	-0.52	-0.73
1	109.73	133.35	1.74	-8.39	-6.90	-8.14
2	186.06	64.27	1.59	-13.80	-11.06*	-13.33

The test results of Table 2 are obtained by Eviews6.0 statistical software. According to the likelihood ratio test method, the optimal lag order of the model can be determined as 2 orders[2] .

The stability of the VAR(2) model is further tested. According to the test of the AR root chart method, it can be verified whether the model is stable. If all the roots of the vector autoregressive model are in the unit circle, indicating that the model is stable, the results obtained are also valid, otherwise it is not valid. Using Eviews6.0 for AR root test, the test results are shown in Figure 2:
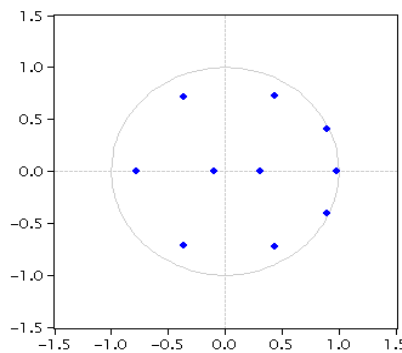

Figure 2 AR root test structure

All the roots of the model are in the unit circle, so this model is stable, indicating that the test results of the model are valid.

In order to verify whether there is a long-term stable relationship between the variables of financial development and the development variables of cultural industry, this paper mainly uses the Johansen cointegration test method to test the cointegration between variables.

Table 3.   Characteristic root mark test results

Hypothesized No.of CE(S)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob*
None*	0.975149	156.9592	69.81889	0.0000
At most 1*	0.848775	86.75706	47.85613	0.0000
At most 2*	0.806577	50.86633	29.79707	0.0001
At most 3*	0.526461	19.65167	15.49471	0.0111
At most 4*	0.249321	5.448754	3.841466	0.0196

The characteristic root mark test results in Table 3 show that under the 5% significance level, there is a cointegration relationship between financial development scale, financial development structure, financial development efficiency, and financial asset investment and cultural industry added value, namely financial development. There is a long-term stable cointegration relationship between financial development scale, financial development structure, financial development efficiency, and financial asset investment and cultural industry added value[3].

3.3 Granger causality test

The Granger causality test is mainly to examine whether there is a causal relationship between variables or single or two-way effects. The inspection principle is as follows :

For the two variables Y and X, the Granger causality test requires estimating the following regression models:

$$Y_t = \beta_0 + \sum_{i=1}^{m} \beta_i Y_{t-i} + \sum_{i=1}^{m} \alpha_i X_{t-i} + \mu_t \quad （1）$$

$$X_t = \delta_0 + \sum_{i=1}^{m} \delta_i X_{t-i} + \sum_{i=1}^{m} \lambda_i Y_{t-i} + \nu_t \quad （2）$$

Through the Granger causality test between the scale of financial development, the structure of financial development, the efficiency of financial development, and the added value of financial assets and the value added of cultural industries, it is investigated whether the indicators are the Granger reasons that affect the development of cultural industries in Shaanxi Province. Identify key variables that affect the development of cultural industries in Shaanxi Province[4].

The financial development structure, financial development efficiency and financial asset investment have different effects on the development of cultural industries in Shaanxi Province during different lag periods. The scale of financial development has never been the Granger reason for the added value of cultural industries in Shaanxi Province. This shows that the scale of financial development plays an important role in the development of cultural industries in Shaanxi Province. However, due to the imperfect financial system, the relationship between financial scale and cultural industry in Shaanxi Province is not significant. At the same time, the development of cultural industry in Shaanxi Province is still in the growth stage, and the development is not very mature, so the impact of the increase in the total amount of financial assets on the development of cultural industries has not been revealed. Except for the fourth-order lag, the financial development structure is the Granger cause of the added value of the cultural industry in Shaanxi Province, and the rest are not.The main reason is that in the process of cultural industry development, the financial structure in the financial system has an imbalance. The funds needed for the development of the cultural industry mainly come from financial intermediaries. However, financial institutions mainly invest funds in large and medium-sized high-tech enterprises, which have a certain inhibitory effect on the promotion of cultural industry development in Shaanxi Province; The role of resource allocation in the capital market has not yet been exerted, and the development of capital market in Shaanxi Province is relatively slow, and the total amount of direct financing development is relatively small, making the financial development structure less significant for the development of cultural industries in Shaanxi Province.The efficiency of financial development is the reason for the growth of the cultural industry in Shaanxi Province. The reason may be that the current financial institutions are fiercely competitive. In order to cope with fierce competition and enhance their respective profitability, financial institutions need to continuously innovate financial products,

continuously optimize credit processes, and significantly improve financial efficiency. At the same time, under the protection and guidance of national policies, it has increased financial support for the cultural industry and has become an important force in promoting the development of cultural industries in China and Shaanxi Province. In the lag phase 1 and 4, financial asset investment is not the Granger cause of the added value of cultural industry in Shaanxi Province; the lag period 2 and 3 is the Granger reason for the added value of cultural industry in Shaanxi Province, indicating financial assets Investment has a certain impact on the development of cultural industries in Shaanxi Province, and increasing investment in fixed assets of cultural industries has a certain role in promoting the development of cultural industries[5].

With the change of the lag order from 1 to 4, the added value of Shaanxi's cultural industry is the Granger reason for the scale of financial development, financial development structure and financial asset investment. It shows that the development of cultural industry in Shaanxi Province has led to an increase in the total financial scale of Shaanxi Province, which has promoted a more rational optimization of the financial structure and promoted the increase of fixed investment in the cultural industry, thus enabling the Shaanxi financial industry to develop more orderly and healthier.However, the added value of Shaanxi's cultural industry is not the Granger reason for the financial development efficiency (E).It shows that the improvement of the financial development efficiency of Shaanxi Province has not promoted the development of cultural industry in Shaanxi Province. It is necessary to further strengthen the financial support for the cultural industry, and promote the conversion of more savings into investment in the cultural industry, thus promoting the cultural industry to develop better.

3.4 Impulse response function

The Impulse Response Function (IRF) mainly describes the magnitude of the error variation of endogenous variables. The analysis is carried out by using Eviews6.0 software. The analysis results are shown in Figure 3. The horizontal axis represents the number of lag periods of impact (unit: year), the vertical axis represents the added value of cultural industry in Shaanxi Province (unit: 100 million yuan).The solid line represents the impulse response function, which represents the response of the cultural industry added value of Shaanxi Province to the impact of each variable, and the dotted line shows the deviation band of positive or negative twice standard deviations[6].

(a) Y response to L shock   （b）Y response to T shock

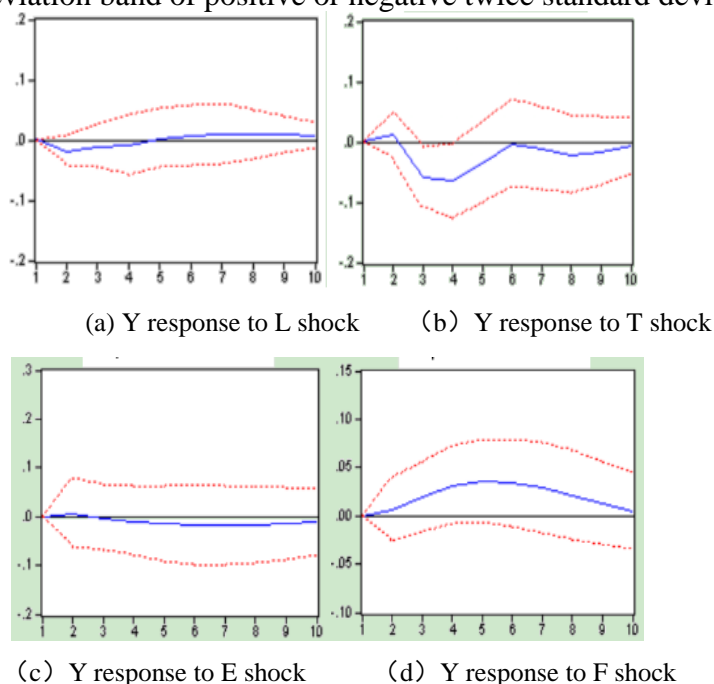(c) Y response to E shock   （d）Y response to F shock

Figure 3 Impulse response diagram

The stochastic fluctuations in the scale of financial development and the efficiency of financial development have little impact on the added value of cultural industries in Shaanxi Province, while

the stochastic fluctuations in financial development structure and financial asset investment have a greater impact on the added value of cultural industries in Shaanxi Province, and the financial development structure is negative for its impact, which shows that the volatility of the direct financing market in Shaanxi Province is relatively large, the financial development and the optimization of the financial structure are not perfect, and it also shows that the financing method of cultural industry in Shaanxi Province is more based on indirect financing.The impact of financial asset investment is positive, indicating that the development of cultural industry in Shaanxi Province is still in the period of growth and development, and the expansion of credit investment has a positive effect on promoting the development of cultural industries in Shaanxi Province[7].

（a） L response to Y shock （b） T response to Y shock

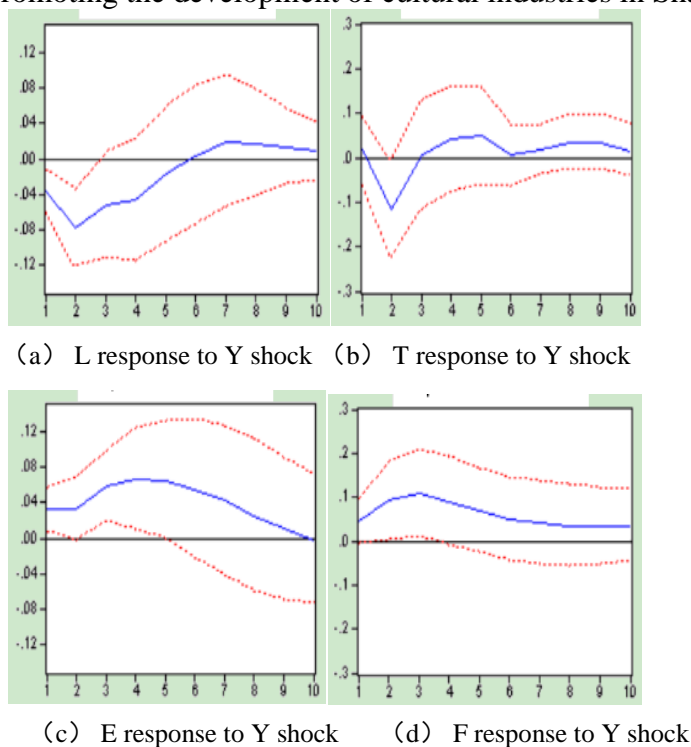（c） E response to Y shock （d） F response to Y shock

Figure 4 Impulse response diagram

When the cultural industry in Shaanxi Province is affected by certain impacts, its impact on the scale of financial development and the structure of financial development is relatively large, and the impact of this kind of shock is positive or negative.The investment has always had a positive impact on financial development efficiency and financial asset investment, and this effect is first increased and then decreased.This shows that the development of cultural industry in Shaanxi Province has a certain impact on the development of the financial industry .

3.5 Variance decomposition

In order to determine the contribution of the impact of these four variables on the value-added changes of cultural industries in Shaanxi Province, it can be analyzed by means of variance decomposition. It was analyzed by using Eviews 6.0 software, and the results are shown in Figure 5. The horizontal axis in the figure represents the number of lag periods (unit: year), and the vertical axis represents the contribution rate of financial development variables to the added value of cultural industries in Shaanxi Province (unit: percentage).

（a）Y to L change percentage　（b）Y to T change percentage

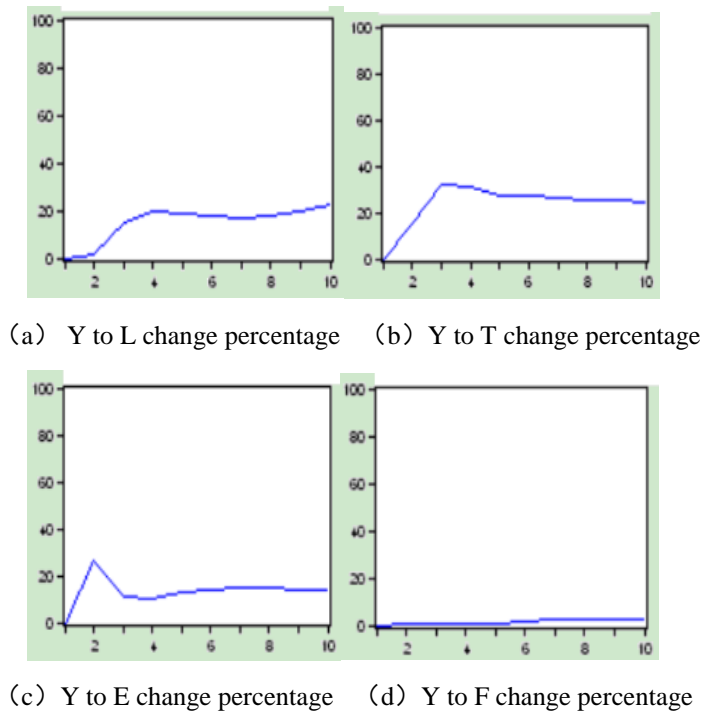（c）Y to E change percentage　（d）Y to F change percentage

Figure 5 Variance decomposition diagram

It can be seen from the variance decomposition diagram of Figure 5 that the contribution rate of the financial development structure to the change of the value added of cultural industry in Shaanxi Province is the largest, which is 32.01%, and as the lag period increases, its contribution rate increases rapidly and then slowly declines.The scale of financial development has an impact on the value-added of cultural industries in Shaanxi Province. The maximum contribution rate is 22.21%, and as the lag period increases, its contribution rate increases rapidly and then increases slowly.The efficiency of financial development affects the change of value-added of cultural industry in Shaanxi Province, and its maximum contribution rate is 26.21%. With the increase of lag period, its contribution rate increases first and then decreases to the final level.The contribution rate of financial asset investment to the change of value-added of cultural industry in Shaanxi Province is the smallest, and its contribution rate increases by 2.43% with the lag period.The overall growth rate is slow. It shows that in the process of cultural industry development, bank loans and financing in the capital market are the most important for the development of cultural industries, and the impact of cultural industry fixed assets investment on the development of cultural industries is also increasing[8].

4. Conclusions and policy recommendations

This paper studies the impact of financial development on cultural industries in Shaanxi Province, and concludes the following conclusions:

First, according to the Granger causality test and the order of the optimal lag order is 2,the scale of financial development and the structure of financial development are not the Granger cause of the development of cultural industry in Shaanxi Province. The financial development efficiency and financial asset investment are the Granger cause of the development of cultural industry in Shaanxi Province.The added value of cultural industry in Shaanxi Province is the Granger cause of financial scale,financial structure and financial asset investment, but it is not the Granger cause of financial efficiency.

Second, the impulse response diagram shows that the interaction between financial development structure and financial asset investment in Shaanxi Province and the cultural industry in Shaanxi Province is relatively severe. The impact of financial development structure on the development of cultural industries in Shaanxi Province is negative. The impact of financial asset investment on the development of cultural industries in Shaanxi Province is positive. The impact of cultural industry

development on the structure of financial development is positive or negative, and the impact on financial asset investment is positive.The stochastic fluctuations in the scale of financial development and the efficiency of financial development have little impact on the cultural industry in Shaanxi Province. The development of cultural industries in Shaanxi Province has a greater impact on the scale of financial development and the efficiency of financial development.

Third, the variance decomposition map shows that the contribution of Shaanxi's financial development to the development of cultural industry from large to small is: financial development structure, financial development scale, financial development efficiency and financial asset investment.

Based on the above research, policy recommendations can be proposed in three aspects. First, financial institutions, expand the scale of financial development, improve the financial system; optimize the financial structure, improve the supporting system for financial support; and actively develop financial products and services for innovative cultural industries. Secondly, the government departments actively improve the relevant policies of the cultural industry; consolidate the cultural industry infrastructure construction, improve the investment environment; and play the role of the capital market in the allocation of cultural industry resources. Finally, in terms of cultural enterprises, strengthen the construction of cultural enterprises themselves; increase the development and innovation of cultural resources.

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