Financial Development, Human Capital and Economic Growth

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Abstract Financial development and human capital are the important driving forces of economic and social development in Shandong Province, and the level of them as well as the degree of coordination between the two not only affects the transformation of economic development pattern in Shandong Province, but also affects the implementation of leapfrog development strategy in Shandong Province. Through the study, it is found that there is a long-term stable dynamic equilibrium relationship among economic growth, human capital and financial development; the degree of coordination between financial development and human capital in Shandong Province is constantly improved, evolving from imbalance to balance. Obviously, the coordination between financial development and urbanization construction in Shandong Province continues to improve.

Key words Financial development, Urbanization construction, Entropy method, Coordinated development degree

1 Introduction

There are many factors affecting economic growth, and human capital and financial development have long been recognized as the factors which play a role in promoting economic growth. Human capital is an important source for scientific and technological progress, with dynamic features, and it has a long-term impact on economic development. Many areas have taken positive incentives in order to attract the best talents, such as providing housing subsidies for graduating students; at the same time, the financial development can promote the development of new industries, and thus increase the employment rate. Okun's law also proves this phenomenon: for each additional 2% of the employment rate, GDP will increase by 1% on the average, so the development of human capital to some extent can speed up economic development. Through the analysis of coordination between human capital and financial development in Shandong Province, we use cointegration theory and error correction model to explore the short and long term impact on the economy, respectively, and clarify the quantitative impact of human capital and financial development on the economy. The regional coordination problem is also affected by many factors, so we build the indicator system to evaluate the coordination between current human capital and economic growth, between financial development and economic growth in Shandong Province, and set forth the feasible improvement measures.

2 Empirical research on the impact of financial development and human capital on economic growth

2.1 Data sources In this paper, we select the time series data during 1990 -2011 in Shandong Province, and use the number of university students per 10000 people as human capital, the loan balance as the level of financial development, and the GDP converted by comparable prices to measure the level of economic development. In order to study the elasticity of human capital and financial development to economic growth, respectively, we take the logarithm of the above indicators. The data are from Shandong Statistical Yearbook in 2012.

2.2 Unit root test For time series data, in order to avoid spurious regression problem, we need to first check the stationarity of all series data, namely whether there is unit root in series. In this paper, we use Augmented Dickey - Fuller (ADF) method to test economic growth (LNGDP), financial development (LNJR) and human capital (LNRL). Test results are shown in the following table:

Table 1 Unit root test

Variables	*t* value	5% critical value	10% critical value	*P* value	Conclusions
LNGDP	-1.3446	-3.0207	-2.6504	0.5877	Non-stationary
DLNGDP	-3.6660	-3.0207	-2.6504	0.0135	Stationary
LNJR	-1.0684	-3.0005	-2.6422	0.7092	Non-stationary
DLNJR	-3.6191	-3.0124	-2.6461	0.0144	Stationary
LNRL	-0.5029	-3.0124	-2.6461	0.8772	Non-stationary
DLNRL	-3.2453	-3.0124	-2.6461	0.0429	Stationary

Note: Data are based on the regression results of Eviews 6.0.

According to the above test results, the original series LNGDP, LNJR and LNRL are non-stationary series, and after the first order difference, the derived DLNGDP, DLNJR and DLNRL are all stationary series, so economic growth, financial development and human capital are all integrated of 1 series, denoted as GDP - I(1), JR - I(1) and RL - I(1), respectively. In order to verify whether there is a long-term stable equilibrium relationship among human capital, financial development and economic growth, we need to further perform the cointegration test.

2.3 Cointegration test This part uses the classic EG two-step method to test LNGDP, LNJR and LNRL. First of all, we use the least square method for the linear regression of LNGDP, LNJR and LNRL, and the results are as follows:

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Table 2 Regression results

Variable	Coefficient	Std. Error	t – Statistic	Prob.
C	0.578 6	0.124 7	4.640 6	0.000 2
LNJR	0.898 7	0.044 8	20.081 5	0.000 0
LNRL	0.066 5	0.048 4	1.374 1	0.004 6

$R^2 = 0.9949$, corrected $R^2 = 0.9944$, F statistic = 1957.04. All the test parameters are significant, and the regression results are very good. The regression equation is as follows:

$$lngdp = 0.578\ 5 + 0.898\ 7 \times lnjr + 0.066\ 5 \times RL.$$

Therefore, the residual series is as follows:

$$e_t = LNGDP_t - 0.578\ 5 - 0.898\ 7LNJR_t - 0.006\ 5RL_t.$$

And then ADF method is used to perform the stationary test of residual series, and the test results are shown in Table 3.

According to the test results of stationarity of residual series in the above table, it is found that P value of residual series is less than 0.05, so at the 5% significance level, the null hypothesis that there is one unit root is rejected, that is, the residual series is stationary, $e_t - I(0)$. Therefore, there is a long-term dynamic equilibrium relationship between LNGDP and LNJR, LNRL.

2.4 Granger causality test The Granger causality test results of financial development, human capital and economic growth are shown in Table 4.

Table 3 Unit root test results of residual series

Residual series	t-statistic	5% critical value	10% critical value	P value	Conclusions
e_t	-3.448 2	-3.012 4	-2.646 1	0.020 6	Stationary

Table 4 Granger causality test of financial development, human capital and economic growth

The null hypothesis	Number of samples	F statistic	P value	Conclusions
Financial development does not Granger cause economic growth	19	3.5322	0.0485	Rejected
Human capital does not Granger cause economic growth	18	4.6375	0.0262	Rejected

From the Granger test, when the lag period is 3, it is found that under the null hypothesis that financial development does not Granger cause economic growth, P value is 0.0485, less than the critical value 0.05 at the 5% significance level, so the null hypothesis is rejected, and it is believed that financial development does Granger cause economic growth; similarly, when the lag period is 4, it is found that under the null hypothesis that human capital does not Granger cause economic growth, P value is 0.026 2, less than the critical value of 0.05 at 5% significance level, so the null hypothesis is rejected, and it is believed that human capital does Granger cause economic growth. Overall, both financial development and human capital Granger cause economic growth. Based on regression results, it is found that for each additional 1% of level of financial development, GDP will increase by 0.8987% on the average; for each additional 1% of human capital, GDP will increase by 0.0665% on the average, so improving the level of financial development and increasing the human capital can accelerate economic development to some extent.

3 Conclusions and recommendations

3.1 Conclusions Based on the current situation of Shandong Province, through the study of coordination between financial industry and human capital as well as the impact on economy, we draw the following conclusions: (i) Through the empirical research on the impact of financial development and human capital on economic growth, it is found that financial development and human capital have a significant impact on economic growth, and the elasticity of impact factor is 0.8987 and 0.0665, respectively. Improving the level of financial development and increasing the human capital will play a role in boosting the economic growth to a certain extent. (ii) Through the cointegration test, it is found that there is a long-term stable dynamic equilibrium relationship between the level of economic growth and financial development, human capital. (iii) Through the Granger causality test results, it is found that both financial development and human capital Granger cause economic growth.

3.2 Recommendations To further enhance the degree of coordination between financial development and human capital to reach the high-quality coordination phase, we put forth the following recommendations for optimizing the coordination between human capital and financial development from macro, meso and micro levels: (i) From the macro level, it is necessary to actively introduce policies conducive to the absorption of talent, and increase the investment in personnel training, such as increasing funding for education, science and technology, giving housing and living allowance and other incentives to the talents and increasing the number of research institutions, to achieve the virtuous circle of "developing education, science and technology – cultivating talents – re-developing education, science and technology – re-cultivating talents", which can improve the degree of coordination between financial development and human capital to some extent, in favor of economic development. (ii) From the meso level, adjusting the structure of talent training, innovating upon the exam-oriented education, cultivating the applied talents and improving the quality of labor, directly affect financial efficiency and competitiveness of the financial sector. It is necessary to promote the human capital to adapt to the high level financial innovation, to reach the mutual promotion and coordination between human capital and financial development. (iii) From the micro level, the quality of financial products directly affects the development of the financial sector. It is necessary to encourage the development of competitive and innovative financial products. Whether it is the product exported abroad, or the product for solving domestic financing problems for small and medium-sized enterprises, they must be researched and developed based on customer needs, thereby creating diversified financial products, and promoting the rapid development of the financial industry.

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agricultural landscape and also unique vivid element of Yunnan flatland area. Design and build of agricultural landscape can combine large area of farmland and agricultural production and living system. It is recommended to make scientific arrangement and artistic design of characteristic farmland landscape, build proper farmland landscape with high sci-tech content and economic benefits and sightseeing and recreation functions, and also value reasonable protection and development of traditional building landscape.

2.4 Attaching importance to reasonable influence of urbanization process and change on agriculture Long-term dual urban and rural system leads to urban and rural separation and deteriorates urban and rural conflict, while the "urban and rural integration" and "five overall arrangements" are intended to realize integrated development of urban and rural areas. Urban and rural space is a complex huge system, the ideal state of mutual integration can eliminate urban and rural opposition and realize harmonious development of urban and rural living environment. In the process of urban and rural integration, human factor plays a leading role in formation of new urban and rural landscape, thus we must attach great importance to reasonable transformation of urbanization for agricultural landscape. With rapid economic development of China, increase of income and extension of holidays, people have more leisure time. In this situation, short-term and recreational suburban tourism develops rapidly. These provide great opportunity for development of leisure agriculture in cities of Yunnan Province, particularly suburban areas of the capital Kunming City. All areas should combine local urbanization level and development trend, take full advantage of superior natural and cultural resources, and actively explore different scale and levels of the landscape agriculture.

2.5 Taking new and characteristic development road After entry to the 21st century, rural tourism has become a prosperous development period. Scenic spots become more, their size is enlarging and functions are extending, and their distribution is also expanding. At the same time of rapid development of rural tourism, selecting proper development mode suitable for self characteristics is of utmost importance. Yunnan Province has superior natural resources and unique cultural landscape. Its tourism industry is in the ascendant, characteristic resource advantage of the landscape agriculture is outstanding, and the development potential is huge. However, it is still restricted by many unfavorable factors, including less developed economy, vulnerable ecological environment, and low agricultural industrialization level. At present, with the support of national policy of building Yunnan into a gateway in China's opening up to the Southwest, and the opportunity for the second time of starting an undertaking for tourism, the landscape agriculture of Yunnan Province should avoid homogeneous competition in construction methods, fully use advantages of existing mountain and water resources and characteristic agricultural products, raise competitiveness of characteristic landscape, realize scientific and harmonious development of the landscape agriculture, and take the road of sustainable development.

3 Conclusions

Yunnan Province is a large agricultural province in China. Vast area, beautiful natural landscape and long farming development history have created diversified agricultural operating types and colorful farming culture. Thus, Yunnan Province has significant comparative advantage in developing the landscape agriculture[6]. Especially in the global range, ecological civilization has realized rational return. Besides, Yunnan Province is faced with development opportunities, including transformation of social economic structure, new industrialization, new round of urbanization, and agricultural modernization. Therefore, the practical approaches for development of the landscape agriculture are strengthening rural social security conditions, adhering to local characteristics, and taking the new ecological and characteristic road. In conclusion, the new landscape agriculture has huge development potential and broad prospect in Yunnan Province.

References

[1] ZHAO Y, GUO XD. Landscape agriculture and its practical meaning[J]. Chinese Journal of Ecology,2000,19(4):67 -71. (in Chinese).
[2] LI HC. A study about Shaoyang agricultural sustainable development in Hunan Province[D]. Chongqing Normal University,2010. (in Chinese).
[3] LIAO X. Discussion on the esthetic value of contemporary agricultural landscape[J]. Theory Monthly,2007(10):162 -165. (in Chinese).
[4] LUO SM. Landscape design, circulation system design and biological relationship design in ecoagriculturai systems[J]. Journal of Shanxi Agricultural University:Social Science Edition,2008,7(5):463 -467. (in Chinese).
[5] QIU Y, ZHANG JT, ZHENG FY. The kernel of landscape ecology: Spatial and temporal heterogeneity in ecological systems[J]. Chinese Journal of Ecology,2000,19(2):42 -49. (in Chinese).
[6] ZENG XL. A study on the development route of Yunnan Plateau featured agriculture[J]. Journal of Yunnan Agricultural University(Social Science), 2013,7(6):17 -21. (in Chinese).

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References

[1] YANG SH. Urban eco-environment[M]. Beijing: Science Press, 2001. (in Chinese).
[2] MA XH. On evaluation index of sustainable development[J]. Theoretical Exploration, 2006(4): 32 -36. (in Chinese).
[3] LIU Y. Study on comprehensive coordination degree assessment of regional PRED system[J]. Statistics and Decision, 2009(12): 54 -55. (in Chinese).
[4] HUANG Y. Study on coordination between technology progress and economic development in railway[D]. Beijing: Beijing Jiaotong University, 2009. (in Chinese).
[5] XU S, JIANG CW. Inquiry on financial industrial development[J]. Finance and Economy, 2009(2): 13 -16. (in Chinese).
[6] YOU HJ. Analysis on the coordination of industrial structure and employment structure——Taking Shanxi Province as an example[J]. Sci-tech Information Development & Economy, 2010(15): 123 -125. (in Chinese).
[7] LU J, YANG JJ. The analysis of coordinated development evaluation of economy and ecological environment in Baoying County[J]. Inner Mongolia Environmental Protection, 2010(3): 46 -49. (in Chinese).
[8] GAO Y, DING YS. Study on comprehensive evaluation on land resource based on entropy[J]. Academic Forum, 2010(1)122 -125. (in Chinese).
[9] SUN PJ. Analysis of the coordination of population - economy - space in Beijing[J]. City Planning Review, 2012(5): 38 -45. (in Chinese).
[10] Leland H, D Pyle. Information asymmetries, financial structure and financial intermediation[J]. Journal of Finance, 1977, 32(2): 371 -387.