

The Research of Population Cultural Quality and Economic Growth on VAR Model--A Case Study of Shanghai and Gansu

Shujuan Chen¹, Yongchong Wang²

1. Business School, University of Shanghai for Science and Technology, Shanghai, 200093, China

2. Business School, University of Shanghai for Science and Technology, Shanghai, 200093, China

Email: chenshujuan2007@126.com

Abstract-Population cultural quality has become more and more important source of national cohesion and creativity, and has increasingly become the important factor of the competition of comprehensive national power. Therefore the enhancement of the soft strength of culture and population cultural quality plays an important role for economic development. In this paper, through the establishment of VAR model we make an empirical research for the cultural quality of population and economic growth of developed and undeveloped areas, we come to conclusion that cultural quality of population and economic growth is positive correlation, The rate of illiteracy is negative correlation with the economic growth. While in the short time, the population illiteracy rate of the developed areas influence economic growth degree is increased, in the long term is gradually reduced. Underdeveloped area population illiterate on economic growth effect is gradually increased. According to the empirical conclusions we give the appropriate policy recommendations.

Key words: cultural quality of population; economic growth; developed and undeveloped areas; VAR model

1. Introduction

Population culture quality refers to the accumulation of labor production experience in the production practice and social practice, as well as the cultural knowledge of science and technology studied from the education and training. The individual's cultural quality depends largely on the family education, school education and individual effort. The population quality of a state is determined by the social economy development condition. The measure indicator of a country or a region's population culture

quality is mainly affected by the proportion of various education population in total population. The twenty-first Century international science and technology competition, in the final analysis is the competition of talents, China is a country with large population, the natural resources are relative shortage, human resources are very rich and it is a developing big country. If China wants in 2020 to achieve the goal of building a well-off society, we must pay high attention to the cultural qualities of population which plays an important role in economic development. Therefore, we should improve

the cultural quality of population in China, make the heavy population burden into abundant human resources advantages, make population country into a country rich in human resources and develop the education large country into a power of higher education.

Regional imbalance of our country economy development level leads to the regional imbalance of population culture quality development in China. Population culture quality of western area is lower than middle east area especially the eastern region. Although the western underdeveloped areas exist minority higher population culture quality, but the population culture quality relatively high population is mainly in East, middle developed areas. Inter-provincial population culture quality index difference has been larger and the difference is still increasing. Population culture quality of developed and undeveloped Middle East and the western region has respectively make different contributions to economic development.

2. Index selection and data description

(1) Index selection

This paper selects GDP per capita is used to describe the economic growth, in the respect of population culture quality, we chose the ordinary college student population and the illiteracy rate of Shanghai city and Gansu Province. (This quarter's per capita income Shanghai ranks first, Gansu ranked last, so we choose Shanghai as the representative of the developed area, underdeveloped area we choose Gansu Province as the object of study.)

(2) The data description`

The Y is the GDP of average per capita, used to describe the economic growth. X1 is Shanghai city high school student population; X2 is the illiteracy rate in Shanghai city. X3 is Gansu Province ordinary college student population; X4 is the illiteracy rate in Gansu province.

We use the data of 1996 - 2010 statistical data, the data are derived from the National Bureau of Statistics Yearbook, Shanghai Municipal Bureau of Statistics Yearbook and the Gansu Provincial Bureau of statistics yearbook.

2. The preliminary judgment of relation of cultural quality of population and economic growth.

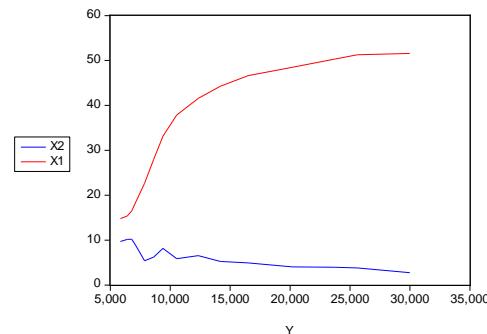


Figure1: X1,X2,Y trend graph

From Figure 1 we can directly find that the ordinary college student population is positively related with the change of economic growth. The illiteracy rate was negatively correlated with economic growth. But only depends on the trends we should not judge the relationship of them, we further test the relationship by Grainger causality test.

Table1: The granger causality test of Shanghai city cultural quality of population and economic growth

Lag phase	Null hypothesis	F	P	decision
1	Y is not the Granger reason of X1	6.82455	0.0242	refuse
3	X1 is not the Granger reason of Y	5.87310	0.0429	refuse

Table 2: The granger causality test of Gansu Province cultural quality of population and economic growth.

Lag phase	Null hypothesis	F	P	Decision
1	Y is not the Granger reason of X3	6.27518	0.0292	refuse

Through the Grainger test, economic growth is reason of the ordinary higher school number, Shanghai ordinary higher school are the reason for economic growth. The increasing of the number of receiving higher education is able to bring more social contribution to promote the economic growth, on the contrary, the economic growth will promote the people of Shanghai to accept higher education and promote whole society population culture quality.

No matter developed area or underdeveloped area, the increase of cultural quality of population all can promote economic growth development.

3. The time series of data characteristics

Because we use time series data, the direct model empirical research may appear to be spurious regression phenomenon, in order to avoid the occurrence of this phenomenon, make the research results more convincing, so we must check sequence stability, we also want to understand the variables between whether have long-term and stable relationship exists. Therefore, we need to sequence test unit root and co-integration analysis.

(1)The unit root test

The variable ADF test result:

Table 3: The unit root test of Shanghai cultural quality of population and economic growth

	Variable quantity	ADF	1%	5%	10%	conclusion
			level	level	level	
Ind different level	X3	-2.896 058	-4.1219 90*	-3.1449 20*	-2.71375 1**	smoot h
	X4	-1.865 546	-2.7406 13*	-1.9684 30*	-1.60439 2**	smoot h

Table 4: The unit root test of Gansu cultural quality of population and economic growth

	Variable quantity	ADF	1% level	5% level	10%	conclusion
			level	level	level	
Level	X1	-4.432 278	-4.05791 0**	-3.11991 0**	-2.70110 3**	smoot h
	X2	-4.859 437	-5.12487 5*	-3.93336 4**	-3.42003 0**	smoot h

*indicates the significant level under variable is non-stationary, ** indicate the significant level under variable is smooth

Table 3 is the result of unit root test of all Shanghai city population culture quality. For X1 at any level refuse the exist under the hypothesis of unit root, so X1 at the level of 100% may be smooth. For X2 in 5%, 10% levels refuse the presence of unit root test the hypothesis, so X2 at least 90% possibilities is smooth, therefore, X2 is stable. So, X1 and X2 are smooth.

Table 4 is the results of unit root test of the all Gansu province population culture quality. For the X3 first order single whole, at the level of 10% refused the exist unit root hypothesis, therefore, X3 order all 90% possibilities is smooth. Similarly, for X4 at 10% level rejected the hypothesis of unit root, therefore, X4 is also

10% possibility smooth. So, X4 is stable, X3 is a first-order single whole, I (1).

(2)The cointegration analysis

The variable smoothness cannot reach the VAR model requirement and it needs to be further carried on the cointegration analysis between variables, examine whether if it exists a long and stable relationship.

Through the empirical analysis, Shanghai in 5% significant level exists 2 co-integration relationship, Gansu province in 5% levels exists at least 1 cointegration relationship. When a group of variables is co-integration, according to the level of variables to

establish the VAR model is not the error identification, and least square number in this case is the consistent estimation, so nonstationarity is no longer a problem need to be paid attention.

4. The establishment of VAR model

The per capita GDP, ordinary higher school student number and the illiteracy rate have a long-term equilibrium relationship between each other, interaction,

restrict each other. Therefore we can establish VAR autoregressive model, and on the basis we can carry impulse response function and variance decomposition analysis.

(1)The impulse response function

Impulse response function is a description of the specific variables for various shock response locus. Fig 3. 4 are responses for each variable on the corresponding variables impact

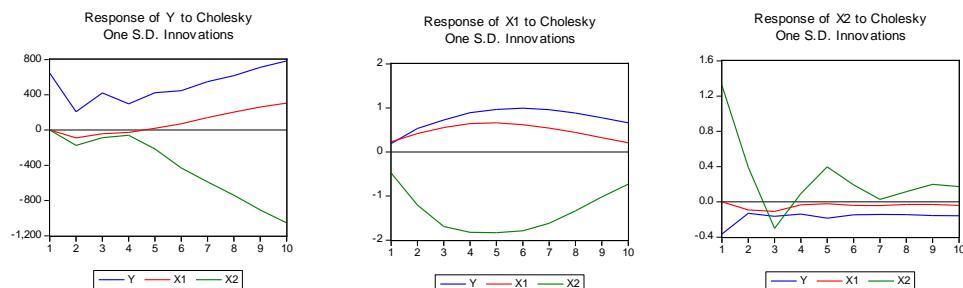


Figure 3: The impulse response function analysis of Shanghai cultural quality of population and economic growth

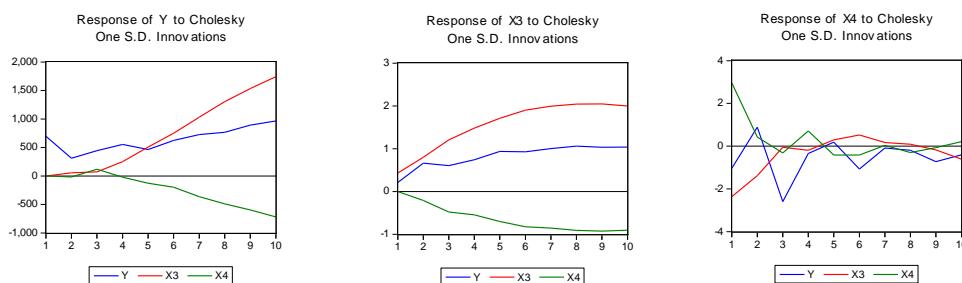


Figure 4: The impulse response function analysis of Gansu cultural quality of population and economic growth

The horizontal axis represents the number of lag period (unit: years), the longitudinal axis of said each variable Y, X1, X2, X3, X4

Through the Shanghai impulse response function, when give Y a shock, the reactions of X2 and Y are opposite, X1 and Y response are consistent. As shown in Figure 2, when give Y a shock in one or two period, X2 and Y responses are consistent, but in the next period, X2 and Y responses are opposite, and during the third period, the reaction of X1 and Y is the opposite, in one or two and the following period, response is consistent. This shows that, in the long term, X1 has a positive effect on Y. X2 has negative effect on Y.

Through the impulse response function of Gansu province, when give Y a shock, in the first period, Y and X3 reactions are opposite. In the next few periods, Y and X3 responses are consistent. But in the first period, the

responses of Y and X4 are consistent. In the next period, the reaction is opposite. This shows that, in the long term, Y positively correlated with X3, Y was negatively correlated with X4.

The test results and the front of the cointegration analysis results are consistent with each other.

5. Conclusion and policy suggest

(1) The conclusion

Through Granger test, co-integration analysis and impulse response function of the economic growth, ordinary college student population and the illiteracy rate

of Shanghai and Gansu Province, We draw the following conclusions:

1.1. Through the Granger causality test, Shanghai and Gansu province receive higher education ,in other words, the change of the number of population culture quality is a cause of economic growth.

1.2. In the long run, economic growth has a long and stable relationship with the number of receiving higher education of Shanghai Gansu province. And the number of accepting higher education has a more obvious effect on the economic growth, The number of higher education of Shanghai and Gansu province is positively related to economic growth.

(2)Policy recommendations

From the above analysis, the increasing of the cultural qualities of population (the increase of higher education school enrollment, the decrease of the illiteracy rate) plays a very important role on the growth of China's economy. Therefore, from the overall the improving of population culture quality and the reducing of China's cultural qualities of the population's spatial disparity are the important guarantee for economic development. Due to the impact on economic growth of different regions are different, therefore, we put forward the corresponding policy suggestions according to the cultural quality of population characteristics of various regions.

2.1. As a modern international metropolis, the sixth national census shows, Shanghai population culture quality is improving constantly, but it still has a certain gap with internationalized metropolis.

To improve the population culture quality of developed area (taking Shanghai as an example), we make the following recommendations:

Improve the foreign population culture quality. Shanghai is city which migrant population accounts for the majority of the city population, cultural degree present that two sides are big and the middle is small. Population proportion of did not going to school, going to primary school, high school, technical secondary school and above degree is small. The majority of population of rate is junior high school. In recent years, although the foreign population culture quality rise somewhat, especially migrant youth culture quality,

however, this still exists a certain gap for Shanghai will build four centers and the international metropolis.

Increase average education years of new labor. The educational level of population is an important indicator to measure the level of education development of a country. The sixth national census data shows, 2010 from the age of 15 years old to 59 years old , Shanghai the main labor age population average years of education is 11.22 years, it has increased slightly than 2000, but compared with developed countries, it still has a slight gap.

Cultivate professional high-quality cultural talents. At present, the structural unemployment in Shanghai is the main problem. Professional high-quality cultural talent is shortage. Such as, Shanghai in 2015 will be the international financial center, this is a very good strategy opportunity. The construction of international financial center will need a large number of financial professionals, therefore, we should establish a number of professional schools to cultivate professional high cultural quality talents.

2.2. In recent years, Gansu province population culture quality is improving constantly, but there is still a large gap compare with the eastern developed areas. And the empirical study results show that its illiteracy rate has played a serious hindrance role on the national economic development. The enhancement of Population culture quality is essential for local economic development, therefore, improving the cultural quality of population in Gansu province should be the province priority among priorities for development of Gansu.

To improve the population culture quality of underdeveloped area (taking Gansu province for example), we put forward the following suggestions:

(1) Improve cultural quality of population education. promote the people to realize the important role of education in science and technology and economic development. Correctly handle the relationship between economic development and the improvement of education and science and technology level, make economy, society, resource, population coordinately develop.

(2) Increase the investment in education funding, focus on basic education, deepen the reform of education system, establish multi level, multi forms of education structure. Strengthen the construction of the teacher team,

improve the teaching quality.

For Gansu Province whose economy is not developed, education funds is serious lack, educational facilities are poor, teachers are shortage, the teachers are relatively low quality. Due to high tuition fee and many students cannot afford to go to school, so they dropped out of school. These are the important reasons affecting Gansu province population culture quality. Therefore, the government should give special preferential in economy.

(3) Make the talent as the main line, formulate and implement the talent strategy. Renewing the concept of talent, introduce all-round talents, actively develop higher education, accelerate the training of qualified personnel. Establishing and improving the socialist market economy development needs of talent cultivation, the mechanism of using and management. Respect knowledge, respect talent.

(4) Improve rural population's cultural quality. The rural population accounts for a large proportion in total population, due to culture quality awareness is not deep enough, they can't understand that the cultural quality plays an important role for economic growth and development, therefore, improving the rural population's cultural quality education and making them understand that the population's cultural quality plays an important role for the economic development is very necessary.

(5) Reduce the illiteracy rate, especially the female illiteracy rate. For the underdeveloped area, people's thought is not very open, especially the thought of men are superior to women is quite heavy, while women beared the main role is housewife, there are few female who accepted education, therefore, reducing the female illiteracy rate is an important way to reduced the illiteracy rate.

In short, whether in developed regions or underdeveloped area, improve overall population culture quality is essential for economy development. withal, we

must take corresponding measures according to the situations of different regions. We should improve population culture quality and promote the continuous development of the economy beneficially and knobby.

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