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An Analysis of Urban Management in Zhejiang Province—Based on the Granger Causality Test and VAR Model Analysis

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Abstract

Based on granger causality test and VAR (the Vector autoregressive model, Vector autoregressive model (VAR) is usually used in related time series prediction and stochastic disturbance on the variable system) analysis, the article finds the relationship among labor transfer, residents' consumption and economic growth. On the one hand, the labor transfer is the granger reason of residents' consumption. On the other hand, economic growth is the granger reason of labor transfer at the 5% significant level. Finally the article puts forward some suggestions of urban management, such as promoting consumption, enhancing the level of industrial agglomeration and guiding the transfer of rural labors.

Keywords

Urban Management, Labor Transfer, Granger Causality Test, VEC Model

Subject Areas: **Managerial Economics**

1. Introduction

Zhejiang's economic development is balanced and the gap between city and country is also not serious. Private economy occupies important position in the developed service industry and as a result, Zhejiang province holds a better ability to absorb labor. The increasing in income will further increase consumer spending. Therefore, this article will be a link between the labor transfer, urban and rural residents' consumption and economic development adopted the method of granger causality tests.

2. Data Sources and Variable

According to the research and existing data, we select the proportion of non-agricultural population, residents'

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total consumption level and Zhejiang gross index respectively describe the division of labor, the residents' consumption and regional economic development. The data mainly comes from the official statistics yearbook (2014) in Zhejiang, the time from 1978 to 2012.

Lny1 represents the proportion of non-agricultural population, and Lny1 corresponds proportion of agricultural population. This division of labor engages in agriculture and non-agriculture and non-agricultural labors usually are associated with rural labors transfer. According to the views of Lewis, industry can take advantage of cheap labor price advantage to preempt the foreign market and industrialization before a first "lewis turning point" [1] [2] because of a large number of rural surplus labor. After over the first "lewis turning point", the development speed of industrialization will decline and non-agricultural labor division will also gradually stabilized due to the rising labor costs. As we know, division of labor is closely linked with and industrialization and industrialization is the important means to promote the development of regional economy, for which expecting a positive coefficient of variable is essential.

Lny2 represents resident's consumption level, data is from Zhejiang yearbook database. According to the theory of Keynes and John Maynard Keynes, total consumption is a function of total income, which is in the form of a linear function as: $C_t = a + b^*$, Y_t represents revenues, C_t represents total consumption, a and b are parameters, $0 \le b \le 1$, t is for the period. As you see, in Keynes's eyes, revenue is absolutely related with total consumption, the total consumption here, of course, including the urban and rural residents' consumption. In the consumption theory, James Stemble Duesenberry' relative income hypothesis and Friedman' (Milton Friedman) permanent income hypothesis are also influential ([3]-[5]. We see that several hypothesis are applicable in some conditions, but it remains to discover evidences.

Lny3 represents GDP in Zhejiang, which is to reflect the development level of the region. On the one hand, considering the other factors that affect the development of regional economy is too complex to be measured effectively, on the other hand, the economic growth is the main factor which affects the division of labor and urban and rural residents' consumption. A regional economic growth is conducive to further attract the surplus rural labor force to cities. The faster the economic growth, the stronger division of labor becomes. Yet when the first "lewis turning point" is crossed, the urban and rural labor transfer phenomena will be weaken and economic growth will be less and less impact on the non-agricultural population. Similarly, it is essential to apply the method of dynamic on the discussion of residents' consumption. At the beginning economic growth promotes the consumption of residents, which affect living necessities obviously, but later the influence starts to decline when the residents' income reaches a certain level. Therefore, an area's development degree of non-agricultural population has a positive influence on residents' consumption, but the influential strength will get smaller and smaller with the development of modernization.

3. Model Establishment and Stationarity Test

3.1. The VAR Model Is Set up

Vector autoregressive model (VAR) is usually used in related time series prediction and stochastic disturbance on the variable system, the general mathematical expression of vector autoregressive model is:

$$y_t = A_0 + A_1 y_{t-1} + A_2 y_{t-2} + \cdots + A_p y_{t-p} + B_1 x_t + \cdots + B_q x_{t-q} + \varepsilon_t$$

y_t is m, d endogenous variable vector, x_t for r, d exogenous variables vector, $A_0, A_1, A_2, \cdots, A_p$ and $B_1, \cdots, B_q$ are mean to estimate the parameters of the matrix, the endogenous variables and exogenous variables respectively.

3.2. Stationarity Test

Cointegration test was carried out on the three index sequence. Lny_1, lny_2 or lny_3 is smooth and discover there is only a co-integration relationship among them. In lny_1, lny_2 and lny_3 cointegration test, only 1 collaborator is confirmed in whole relationships under the test level of 5% (**Table 1**).

4. Granger Causality Test

At the 5% significant level, we can come to these conclusions. The proportion of non-agricultural population (y_1) is the granger cause of y_2, and the residents' total consumption level (y_2) is not the non-agricultural population

Table 1. Granger causality test results.

Lag length	Granger causality	Conclusion
2	Y_2 is not granger cause of y_1	no refusal
	Y_1 is not granger cause of y_2	refusal
3	Y_2 is not granger cause of y_1	no refusal
	Y_1 is not granger cause of y_2	no refusal
4	Y_2 is not granger cause of y_1	no refusal
	Y_1 is not granger cause of y_2	no refusal
5	Y_2 is not granger cause of y_1	no refusal
	Y_1 is not granger cause of y_2	refusal
6	Y_2 is not granger cause of y_1	no refusal
	Y_1 is not granger cause of y_2	refusal
2	Y_3 is not granger cause of y_1	refusal
	Y_1 is not granger cause of y_3	no refusal
3	Y_3 is not granger cause of y_1	refusal
	Y_1 is not granger cause of y_3	no refusal
4	Y_3 is not granger cause of y_1	refusal
	Y_1 is not granger cause of y_3	no refusal
5	Y_3 is not granger cause of y_1	refusal
	Y_1 is not granger cause of y_3	no refusal
6	Y_3 is not granger cause of y_1	refusal
	Y_1 is not granger cause of y_3	no refusal
2	Y_3 is not granger cause of y_2	no refusal
	Y_2 is not granger cause of y_3	no refusal
3	Y_3 is not granger cause of y_2	no refusal
	Y_2 is not granger cause of y_3	no refusal
4	Y_3 is not granger cause of y_2	no refusal
	Y_2 is not granger cause of y_3	no refusal
5	Y_3 is not granger cause of y_2	no refusal
	Y_2 is not granger cause of y_3	no refusal
6	Y_3 is not granger cause of y_2	no refusal
	Y_2 is not granger cause of y_3	no refusal

proportion (y_1) granger reason, y_3 is the granger reason of the agricultural population proportion (y_1), but the proportion of non-agricultural population (y_1) is not the granger cause of y_3. The provincial gross (y_3) is not the granger cause of y_2, y_2 is also not the granger cause of the whole province GDP (y_3).

The proportion of non-agricultural population is the total consumption level, the granger cause of the agricultural population in the process of into non-agricultural population, comes with the increase of residents' consumption level, the countryside surplus labor force in to cities at the same time, also will bring consumption habits

change, and through the interpersonal relationship will spread, such spending habits further raise the consumption level and quality of the whole population. The province's GDP is the granger reason of the proportion of agricultural population, explain economic growth affected the change of the proportion of non-agricultural population, economic development achievements are reflected in the city first, the rural development is relatively backward, rural surplus labor force under the high wages to attract to the urban employment, the employment process is a process from agriculture to non-agricultural, cause the non-agricultural population in the proportion of the total population.

5. VEC Model

The logarithm of VEC model is set up by three index sequence. We know that three sequence $\ln y_1$, $\ln y_2$, $\ln y_3$ is cointegration and there is only one collaborator by the test. VEC model output is made up of four main parts, the first part is the estimate of co-integration equation of parameter, error correction term is dependent on the variable lag issue in the form of this error correction model:

$$\text{vec}m_{t-1} = \ln y_{1t-1} - 0.361\ln y_{2t-1} + 1.341\ln y_{3t-1}$$

The second part is the VEC model parameter estimates, the corresponding numerical CointEql represents the equation coefficient estimate. Eviews 6.0 also gives the corresponding standard deviation and *t* test statistical quantity respectively under each parameter estimate. The estimate result could be written as following formula:

$$\begin{pmatrix} \Delta\ln y_{1t} \\ \Delta\ln y_{2t} \\ \Delta\ln y_{3t} \end{pmatrix} = \begin{pmatrix} 0.156 \\ 0.427 \\ -0.292 \end{pmatrix} \text{vec}m_{t-1} + \begin{pmatrix} 0.030 \\ 0.089 \\ -0.004 \end{pmatrix}$$

6. Countermeasures and Suggestions

Based on the above empirical analysis, we put forward three suggestions to better promote the city management of Zhejiang province.

It is essential to reform something to advance the consumption to promote consumption.

Firstly, it is good to maintain the market order, protecting the patent right. Secondly, we must improve the infrastructure construction, saving the cost of elements flow between urban and rural. Thirdly, we can introduce new products and improve service levels according to the market demand. Last but not the least, we ought to form a reasonable consumption idea and perfect the system of personal credit registration by strengthening supervision and improving the proportion of credit consumption.

Enhancing the industrial concentration level is the key to improve urbanization. Jointing industrial agglomeration by relevant enterprises and forming specialized production division of labor cooperation, sharing industry information, markets and infrastructure, it is advantageous to the cost saving and the accumulation of production experience. In the process of urbanization, the labor, capital, technology and other factors of production will be more and more concentrated, the service industry will be gathered and consumption can be also promoted simultaneously.

It is crucial for Zhejiang province's modernization and urbanization to lead the group of population in the course of transferring from agriculture. Division of labor in the agricultural and non-agricultural sector is not only beneficial to the optimal allocation among labors in various industries, but it can also help to narrow the economic development gap between urban and rural areas. In order to realize the integration of urban and rural development, new type of household registration system must be established according to the residents' occupation to achieve the free movement of people. The government should pay attention to the modern management system, to create a market environment to encourage the freedom of labor and accelerate the urbanization process, the coordinated development of industrialization and urbanization.

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