

# Research on the Influencing Factors of Rural Labor Transfer in China

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**Abstract:** Most of the existing literature studies the phenomenon of rural labor transfer in a specific province, city, or region in China, and rarely explores the overall rural labor transfer of China's overall rural labor force. In this paper, aiming at China's influencing factors of rural labor transfer and using several variables such as urban and rural consumption expenditure etc., the VAR model is constructed. Variance decomposition and the impulse response function are used to analyze and test its influence on rural labor force transfer rate. The results illustrate that the ratio of urban and rural consumption expenditure has extremely negative effect on the transfer rate of rural labor force after being impacted by external conditions. The urban unemployment rate has a very positive influence on the rural labor transfer rate after being impacted by external conditions. An impact of the income difference between urban and rural will bring positive effects to the rural labor transfer rate. A certain impact of the proportion of non-agricultural GDP to GDP will also bring significant positive effects to the rural labor transfer rate. Meanwhile, urban and rural consumption expenditure proportion has the most significant impact on the transfer rate of rural labor, while the proportion of non-agricultural GDP to GDP has the least impact on the transfer rate of rural labor.

**Keywords:** rural development; labor transfer; VAR model

**JEL Classification:** C10; E24; Q01

## 1. Introduction

After the New China established, China was poor and began to develop heavy industry, but it also neglected the development of light industry and agriculture, so there was a difficult period in the 20th century, people were unable to maintain food and clothing, and the problem of food and clothing became an urgent problem to be solved in New China. After the Reform and Opening-up, the household joint production contract responsibility system was vigorously implemented, and the problem of food rations for the people was solved, and then the central government vigorously developed the economy with economic construction as the center, and promoted China's urbanization process. The vigorous implementation of the household joint production contract responsibility system has greatly liberated the people's productive forces, and also made some peasants no longer bound to the land and began to move to areas outside the countryside. The process of urbanization is accelerating, increasing employment opportunities, expanding employment space, and gradually attracting rural labor to urban areas. On the one hand, the transfer of rural labor provides a large number of low-cost labor for urban construction, but it also induces a series of issues in

urbanization, simultaneously, the interests of migrant workers themselves are difficult to guarantee. In addition, rural areas have also encountered problems of unsustainable development due to rural labor transfer, and differences in income between urban and rural areas has been widening. At present, in rural development, many problems that have emerged are also related to rural labor transfer, such as industrial hollowing, the contradiction between village-to-village communication and no one in the village, etc., so studying the influencing factors of China's rural labor transfer can provide empirical evidence to solve the problems arising from the rural labor transfer in China.

As a large agricultural country, China's peasant issue has always been a social concern, and the socio-economic phenomenon of the transfer of rural labor in the process of urbanization has been favored by many scholars. Some scholars have explored the phenomenon of rural labor transfer in a specific province, city or region in China. Zhang and Wu studied the main factors of the transfer of rural surplus labor in Yibin, Sichuan Province, and analyzed these influencing factors by using Ling Regression (Zhang & Wu, 2010). Taking Gansu Province as a data sample, Su believes that the scale of regional economy, the absolute differences in income between urban and rural areas, the desired income level in urban, and the level of education are important factors for rural labor transfer to non-agricultural industries (Su, 2016). Based on the data of the 2007-2019 Weichuan County Statistical Yearbook, Dang and Liu studied the influencing factors of labor transfer in rural poor areas, and believed that the proportion of operating income would inhibit labor transfer (Dang & Liu, 2021). At the same time, some scholars have expanded their horizons to the country to study the labor transfer in China's rural area. Cheng and Shi believe that agricultural economic growth and rural reform have created conditions for the transfer of rural labor in China, and agricultural economy should be further developed (Cheng & Shi, 2007). You and Wu found that the transfer of farmland does not directly lead to the transfer of rural labor, and that unemployment or staying in farmland is the possible labor trend of farmers after transferring farmland (You & Wu, 2010). Qi quantitatively analyzed the contribution of non-agricultural transfer of rural labor to China's economic growth (Qi, 2014).

Vector autoregressive model (VAR) has not been used to analyze the influencing factors of the transfer of rural labor in China, and studying the influencing factors of the transfer of rural labor has reference significance for solving corresponding problems, so this paper constructs vector autoregressive model (VAR) to analyze the influencing factors of rural labor transfer in China.

## 2. Theoretical Model Construction

This paper constructs a theoretical model about the transfer of rural labor to urban through the cost-utility analysis of non-farm employment.

Hypothesis 1: There are two farmers, farmer 1 and farmer 2, and the utility of both is expressed as  $U_1$  and  $U_2$ , respectively.

Hypothesis 2: There are two kinds of income, agricultural and non-agricultural income, simultaneously, agricultural income in rural and non-agricultural income in cities.

Assumption 3: Farmer 1 can have two incomes,  $Y_{a1}$  and  $Y_{i1}$ , and Farmer 2 can have both  $Y_{a2}$  and  $Y_{i2}$  incomes, both of which bring utility, expressed as  $U_1(Y_{a1}, Y_{i1})$  and  $U_2(Y_{a2}, Y_{i2})$ , respectively.

Assumption 4: The cost input rate for obtaining agricultural income is  $\lambda_a$ , the cost input rate for obtaining non-farm income is  $\lambda_i$ , the cost paid by farmer 1 for obtaining agricultural income and non-farm income is  $\lambda_{a1}Y_{a1} + \lambda_{i1}Y_{i1} = C_1$ , and the cost paid by farmer 2 for obtaining agricultural income and non-farm income is  $\lambda_{a2}Y_{a2} + \lambda_{i2}Y_{i2} = C_2$ .

When the sum of the utilities of Farmer 1 and Farmer 2 is maximum, the distribution of the two incomes is optimal, so that it is obtained:

$$\max(U_1 + U_2) = \max[U_1(Y_{a1}, Y_{i1}) + U_2(Y_{a2}, Y_{i2})]$$

$$\lambda_{a1}Y_{a1} + \lambda_{i1}Y_{i1} = C_1$$

$$\lambda_{a2}Y_{a2} + \lambda_{i2}Y_{i2} = C_2$$

To build the Lagrange function:

$$L = U_1(Y_{a1}, Y_{i1}) + U_2(Y_{a2}, Y_{i2}) - W(\lambda_{a1}Y_{a1} + \lambda_{i1}Y_{i1} - C_1) - M(\lambda_{a2}Y_{a2} + \lambda_{i2}Y_{i2} - C_2)$$

Differentiating  $Y_{a1}$ ,  $Y_{a2}$ ,  $Y_{i1}$ , and  $Y_{i2}$  respectively yields:

$$\partial L / \partial Y_{a1} = \partial U_1 / \partial y_{a1} - W\lambda_{a1} = 0 \quad (1)$$

$$\partial L / \partial Y_{a2} = \partial U_2 / \partial y_{a2} - M\lambda_{a2} = 0 \quad (2)$$

$$\partial L / \partial Y_{i1} = \partial U_1 / \partial y_{i1} - W\lambda_{i1} = 0 \quad (3)$$

$$\partial L / \partial Y_{i2} = \partial U_2 / \partial y_{i2} - M\lambda_{i2} = 0 \quad (4)$$

According to (1) and (2), you can first find  $W$  and  $M$ , substitute (3) and (4), and sort out:

$$\partial U_1 / \partial Y_{i1} = (\lambda_{i1} / \lambda_{a1})(\partial U_1 / \partial Y_{a1})$$

$$\partial U_2 / \partial Y_{i2} = (\lambda_{i2} / \lambda_{a2})(\partial U_2 / \partial Y_{a2})$$

$$(\partial U_1 / \partial Y_{i1}) / \lambda_{i1} = (\partial U_1 / \partial Y_{a1}) / \lambda_{a1} \quad (5)$$

$$(\partial U_2 / \partial Y_{i2}) / \lambda_{i2} = (\partial U_2 / \partial Y_{a2}) / \lambda_{a2} \quad (6)$$

Namely:

$$\text{Marginal utility of non-farm income} / \text{Cost rate of non-farm income} = \text{Marginal utility of agricultural income} / \text{Cost rate of agricultural income} \quad (7)$$

When satisfied, labor transfer from rural to the city can achieve an optimal state.

### 3. Econometric Models and Empirical Analysis

#### 3.1. Data Sources

In this paper, China was selected as a research sample, and the research period was from 1990 to 2020, and all data were obtained from the Statistical Yearbook in China.

### 3.2. Factors Influencing Rural Labor Transfer

Studying China's factors of rural labor transfer can help solve the problems in urbanization of China. However, in the complex economic environment, there are many factors that affect the transfer of rural labor force, and the importance of each factor can't be directly drawn. Therefore, before the test and analysis, it is necessary to discuss the cost and utility of the transfer of rural labor. This paper selects the following representative factors: rural labor transfer's cost includes monetary cost (the cost of food, clothing, housing and transportation, the cost of finding a job) and non-monetary cost (the time cost of finding a job, the psychological cost of leaving home). The ratio of urban and rural consumption expenditure is regarded as the monetary cost of rural labor transfer; Urban unemployment rate is a non-monetary cost reflecting the transfer of rural labor. The utility of rural labor transfer can be divided into monetary utility (income increase) and non-monetary utility (welfare improvement brought by urbanization). The income difference between urban and rural can be regarded as the monetary utility of rural labor force transfer; Because non-agricultural industries provide employment space for rural labor transfer, the proportion of non-agricultural industries' GDP is selected to reflect the non-monetary utility of rural labor transfer.

### 3.3. Selection of Indicators

Although the following indicators do not fully cover the factors of rural labor force transfer, they are representative and can be quantified. Through the statistical yearbooks of relevant provinces in China, we can find the per capita consumption expenditure of urban and rural residents in China from 1990 to 2020, and then calculate the ratio of urban and rural consumption expenditure, with the following formula:

$$\text{Urban-rural consumption expenditure ratio} = \text{per capita consumption expenditure of urban and rural residents} / \text{per capita consumption expenditure of rural residents}.$$

Secondly, we can find the urban unemployment rate in China from 1990 to 2020; Find the per capita disposable income of urban residents and rural residents in China from 1990 to 2020, and then calculate the income gap ratio between urban and rural. The calculation formula is:

$$\text{Urban-rural income gap ratio} = \text{per capita disposable income of urban residents} / \text{per capita disposable income of rural residents}.$$

Find the ratio of non-agricultural GDP to GDP in China from 1990 to 2020; From 1990 to 2020, the rural employees and the primary industry employees in China were found, and the transfer rate of rural labor was obtained by calculation. The calculation formula is:

$$\text{Rural labor transfer rate} = (\text{rural employees} - \text{primary industry employees}) / \text{rural employees}.$$

Therefore, this paper selects urban-rural consumption expenditure ratio (consumption), urban unemployment rate (unemployment), urban-rural income gap ratio (igap) and the ratio of nonagriculture industrial gross product to GDP (nonagriculture) as explanatory variables of rural labor transfer rate (Y), and makes an empirical analysis by composing time series data from the above explanatory variables and explained variables.

### 3.4. Model Explanation

The model of lag order  $f$  is:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \dots + A_n Y_{t-n} + U_t,$$

where  $Y_t$  is the vector of variables to be tested in  $K$  dimension;  $U_t$  is the random error, also known as pulse value;  $A_1, A_2, \dots, A_n$  are the matrix of parameters to be estimated.

### 3.5. Smoothness Test

Direct regression of non-stationary series will cause "pseudo-regression", so the unit root test of each variable data is carried out first. ADF test is used to test the unit root of time series data. This demonstration is given by EVIEWS10.0 software. As shown in the table1, through ADF test of variables  $Y$ , consumption, unemployment, igap and nonagriculture,  $Y$ , consumption, unemployment, igap and nonagriculture are all non-stationary sequences, and the second-order difference rejects the original hypothesis at 1% significant level. Therefore,  $Y$ , consumption, employment, igap, nonagriculture are second-order integers, i.e.  $I(2)$ , at the unit root.

Table 1. Stationarity test

Variable	Type	ADF	P	Conclusion
Y	Trend and intercept	-4.570193	0.0057	stable
consumption	Trend and intercept	-6.311867	0.0001	stable
unemployment	Trend and intercept	-4.895536	0.0026	stable
igap	Trend and intercept	-4.511610	0.0068	stable
nonagriculture	Trend and intercept	-4.630586	0.0052	stable

According to the results shown in Figure 1, all eigenvalues of the established VAR model are in the unit circle, indicating that the established model is stable.

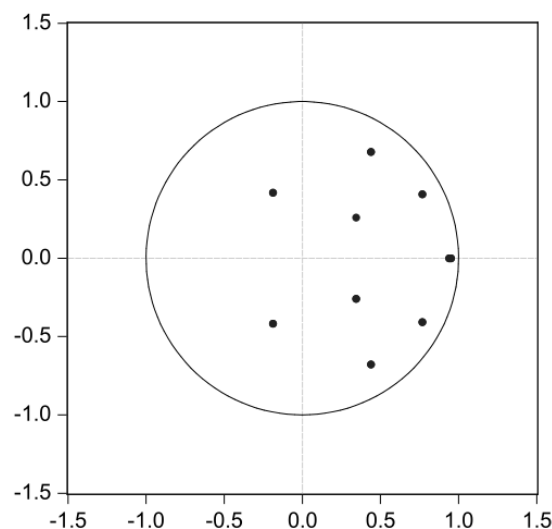


Figure 1. Inverse roots of AR characteristic polynomial

### 3.6. Impulse Response Function

Impulse response function refers to the influence of one variable on another variable. First of all, to test the stability of VAR model, it can be seen from the data (see Figure 1) that the reciprocal of AR eigenvalue is less than 1, that is, VAR model is stable and impulse response analysis can be conducted. The results of impulse response analysis are seen in Figures 2-4. The vertical axis indicates the change of the growth rate of response variables, the horizontal axis indicates the number of tracking periods of impact, the dotted line indicates the deviation band of plus or minus two standard deviations, and the solid line indicates the impulse response function.

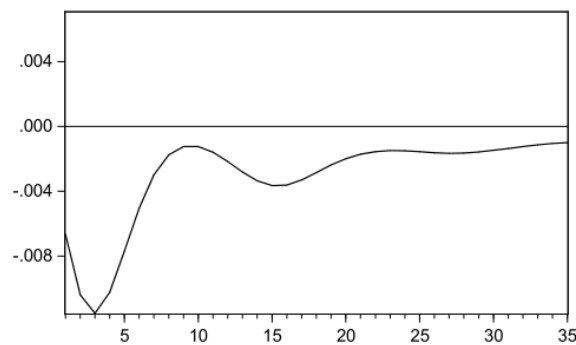


Figure 2. Response of y to consumption

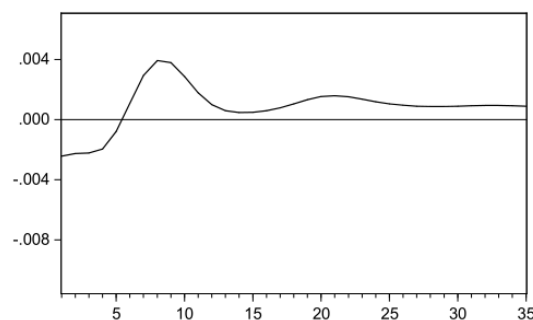


Figure 3. Response of y to unemployment

As can be seen from Figure 2, after a positive role on urban and rural consumption expenditure ratio in this period, the transfer rate of rural labor began to decrease in the first three periods, reached the minimum value in the third period (Y's response to consumption in the third period was -0.0115), then increased, and in the tenth period Y's response to consumption was -0.012, Then it decreased from the tenth period to the fifteenth period (in the fifteenth period, Y's response to consumption was -0.0037). After a big fluctuation in the early period, Y's response to consumption increased slightly from the fifteenth period, and reached a small peak in the twenty-third period (in the twenty-third period, Y's response to consumption was -0.0015), showing a small decreasing trend again, and in the twenty-eighth period, the response decreased to-. This shows that the ratio of consumption expenditure in urban and rural is impacted by external conditions, and then transmitted to the rural labor transfer rate through the market, which brings a certain degree of impact to the transfer rate of rural labor, and this impact has a long-lasting effect and a significant negative effect, and finally gradually converges.

As can be seen from Figure 3, after a positive role on the urban unemployment rate in the current period, there is no change in the current period, but in the first period, Y's response to unemployment is -0.024, and then it starts to increase, and in the fourth period, it reaches -0.002, and it starts to increase all the way to the eighth period (Y's response to unemployment is 0.039), and then it shows a decreasing trend, reaching 0.0 in the fifteenth period. This shows that the registered unemployment rate in cities and towns is impacted by external conditions, and then transmitted to the transfer rate of rural labor through the market, which finally brings a positive impact to the rural labor transfer rate, and this impact has a significant promoting effect and a long-lasting effect.

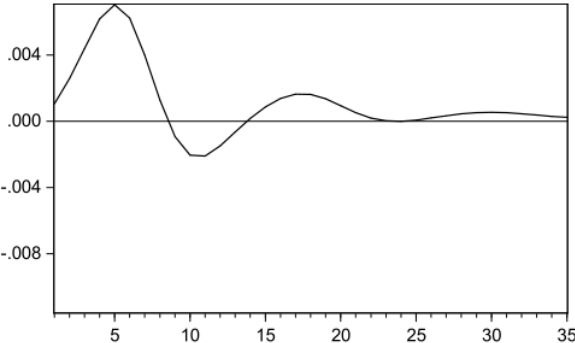


Figure 4. Response of y to igap

As can be seen from Figure 4, after giving a positive impact to the income difference between urban and rural areas in the current period, the transfer rate of rural labor did not respond in the current period, then increased to the maximum value in the fifth period (Y's response to igap was 0.007), and then gradually decreased, reaching the minimum value in the eleventh period (Y's impact on igap was -0.021), showing an increasing trend again, and after the eighteenth period reached 0.016, the rural labor transfer rate increased gradually. This shows that a certain impact of the urban-rural income gap ratio will bring significant positive effects to the rural labor transfer rate. As can be seen from Figure 4, after giving a positive impact to the income gap between urban and rural areas in the current period, the rural labor transfer rate did not respond in the current period, then gradually increased to the maximum value in the fifth period (Y's response to igap was 0.007), and then gradually decreased, reaching the minimum value in the eleventh period (Y's impact on igap was -0.021), showing an increasing trend again, and after the eighteenth period reached 0.016, the rural labor transfer rate increased gradually. This shows that a certain impact of the income gap ratio between rural and urban will bring significant positive effects to the rural labor transfer rate.

As can be seen from Figure 5, after giving a positive impact to the ratio of non-agricultural industrial GDP to GDP in the current period, the labor transfer rate of rural did not respond in the current period, and increased to the sixth period, reaching the maximum value (Y's response to nonagriculture was 0.0019). After that, it gradually decreased, regional stability, and finally converged to 0.007. This shows that a certain impact of the ratio of non-agricultural industrial GDP to GDP will also bring significant positive effects to the rural labor transfer rate.

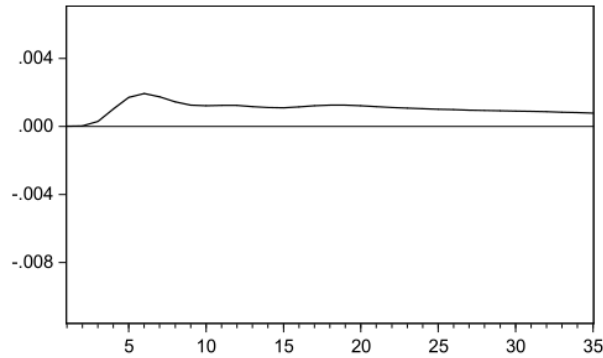


Figure 5. Response of y to nonagriculture

### 3.7. Variance Decomposition

As can be seen from Figure 6, according to the results of variance decomposition, the contribution degree of consumption to Y shows a trend of increasing at first and then decreasing. The influence degree of the first five periods is constantly increasing, reaching 59% in the fifth period. From the fifth period, the influence degree gradually weakens and finally tends to 49%. Unemployment's contribution to Y gradually decreased in the first six periods, and reached 3% in the sixth period, then began to increase, and increased to 7% in the tenth period. From the tenth period, it gradually increased, and its influence gradually stabilized at 8%. The contribution degree of igap to Y gradually increased from the first period to the maximum value of 19% in the seventh period, then decreased from the seventh period and finally stabilized at 16%. The contribution of nonagriculture to Y shows an increasing

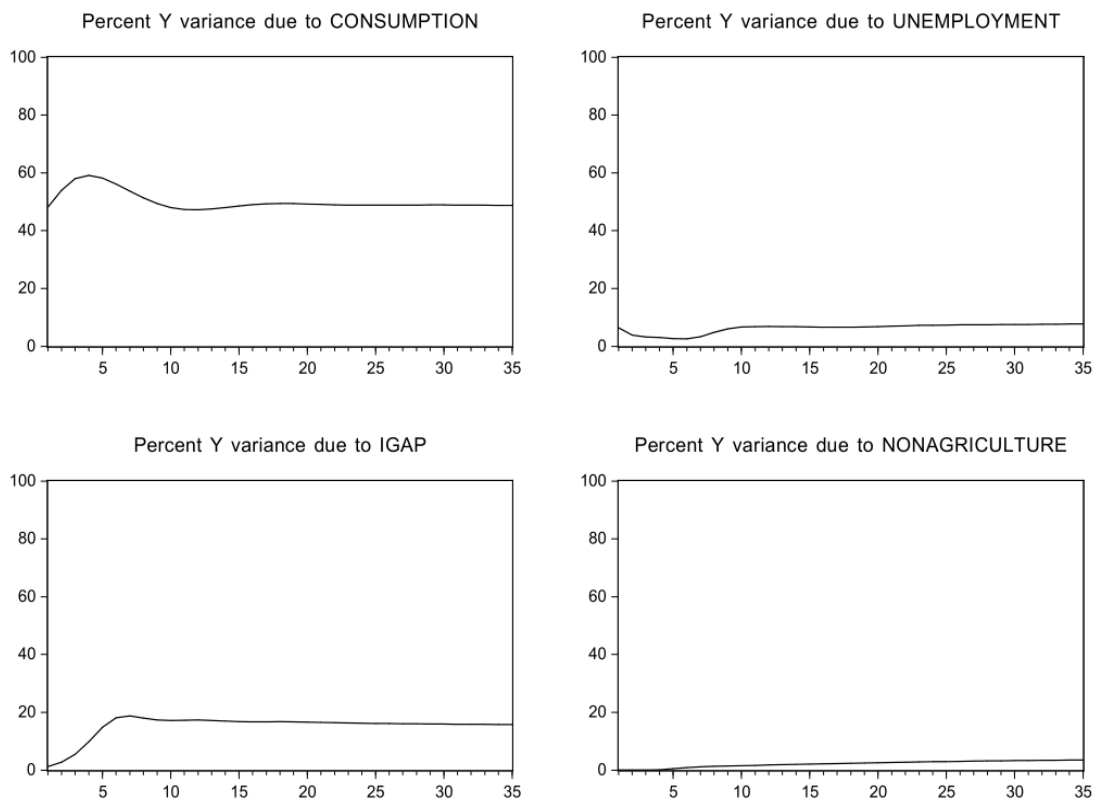


Figure 6. Variance decomposition using Cholesky (d. f. adjusted) factors



trend, and finally tends to 4%. According to the influence degree of the transfer rate of rural labor force from big to small, the influencing factors are ranked as consumption, igap, unemployment and nonagriculture. It can be seen that among all the influencing factors, the ratio of consumption expenditure in urban and rural has the most important impact on the rural labor transfer rate, while the proportion of non-agricultural GDP to GDP has the least impact on the rate of rural labor transfer.

## 4. Research Conclusions and Policy Recommendations

### 4.1. *Research Conclusions*

In this paper, aiming at the influencing factors about rural labor transfer in China, the VAR model is constructed by using the ratio of urban-rural consumption expenditure, urban unemployment rate, urban-rural income difference ratio, the ratio of non-agricultural GDP to GDP and the indicators of rural labor transfer rate. Impulse response function and variance decomposition are used to analyze and test the influence degree of urban-rural consumption expenditure ratio, urban unemployment rate, urban-rural income gap ratio and the ratio of non-agricultural GDP to GDP on rural labor transfer rate. The empirical research results of VAR model show that: according to impulse response function, the ratio of consumption expenditure in urban and rural has a significant negative effect on rural labor transfer rate after being impacted by external conditions; The urban unemployment rate has a positive role on the rural labor transfer rate after being impacted by external conditions; A certain impact of the income difference ratio between urban and rural will bring significant positive effects to the rural labor transfer rate; A certain impact of the proportion of non-agricultural GDP to GDP will also bring significant positive effects to the rate of rural labor transfer. From the results of variance decomposition, it can be seen that among all the influencing factors, the ratio of consumption expenditure in urban and rural has the most significant role on the rural labor transfer rate, while the proportion of non-agricultural GDP to GDP has the least impact on the rural labor transfer rate.

### 4.2. *Policy Recommendations*

Based on the results of the above empirical analysis, combined with the reality of the transfer of rural labor in China, this paper puts forward the following countermeasures for reference:

Promoting the effective transfer of labor force from rural to cities by improving the marginal utility of urban non-agricultural income and reducing the cost rate of urban non-agricultural income.

First of all, to improve the marginal utility of urban non-agricultural income, we can discuss it from the perspectives of wage system, social security system, urban construction and urban acceptance of the transfer of rural labor. Improve the wage guarantee system of the transferred labor force, severely punish the behaviors such as wage arrears, delayed payment, etc., and standardize the production and operation behavior of the main person in charge, so that every transferred labor force can receive his or her own wages on schedule. In

addition, most rural laborers will transfer with their families, the most important of which is the problem of transferring rural laborers' children to school, simplifying the school registration procedures in various places, so that the problem of going to school will no longer become the worry of rural laborers' transfer. At the same time, the medical security system should be constantly improved to facilitate rural labor transfer. Furthermore, we can increase local public investment and infrastructure construction, so that rural migrant workers can enjoy the benefits brought by urbanization. The government should give preferential policies to rural migrant workers in all aspects of food, clothing, housing and transportation, so that these groups have a sense of belonging to the city and no longer feel excluded.

To reduce the cost rate of non-agricultural income, it is important to imagine from the perspective of rural labor transfer. Most of these groups have no help from social contacts, and it is hard to solve the overall employment problem of rural labor transfer simply by relying on "local", that is, blood relationship. Therefore, it is necessary to control the information price, optimize the information structure of market search, cooperate with towns and villages, form a complete job information chain from information promulgation to job training, reduce the job search cost of rural migrant workers, and at the same time, reduce the possibility that some rural migrant workers are deceived by black intermediaries. The government should also improve the market competitiveness of migrant workers in rural from the aspect of education, adjust the training content of migrant workers in rural in time according to the changes of supply and demand in labor market, better meet the market demand, and solve the problem of difficult employment of migrant workers in rural area. In short, the above policies are given from two aspects: increasing the marginal utility of non-agricultural income in urban and reducing the cost rate of urban non-agricultural income. Finally, the marginal utility of non-agricultural income in urban is equal to the cost rate of urban non-agricultural income, and the optimal state of the transfer of rural labor to cities and towns is realized.

Under the strategy of rural revitalization, villages can also cultivate their own industries and realize local urbanization.

On-the-spot urbanization can promote the modernization of agriculture and rural. While accommodating the transferred labor force, it attracts a lots of labor to return, and the countryside will no longer decline. This not only solves the homesickness problem of the transferred labor force, but also solves all kinds of problems brought by the transfer of rural labor to urban construction. At present, big cities are getting bigger and bigger, and "urban diseases" such as blocking, haze and waterlogging are increasingly challenging people's tolerance limits. Contradictions and conflicts in urban management are becoming more and more prominent, urban land resources are increasingly scarce, but the demand for construction land is increasingly strong. Social conflicts and even confrontations caused by land requisition and demolition are becoming more and more difficult to resolve. Most importantly, the gap between agricultural and rural modernization and industrialization and urbanization is not narrowing, but further widening. If the above-mentioned contradictions are not resolved, the rural revitalization strategy will not be realized, and the urbanization

transformation will not be completed. However, local urbanization is just a solution, giving play to the functions of the villages themselves, realizing that the villages are the bottom of the urban economy and injecting new vitality into the economic development of China.

Conflict of interest: none.

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