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# BEHAVIORAL ECONOMIC ANALYSIS ON PSYCHOLOGICAL MECHANISM OF FARMERS' MIGRATION CHOICES

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## Abstract

*This paper aims to reveal the impacts of mental accounting and endowment effect on farmers' migration choices. Based on the data from 2016 China Laborforce Dynamics Survey (CLDS), the principal component analysis (PCA) was introduced to determine the indices the endowment effect in each community. The indices were then applied to the individual data from the perspective of behavioral economics. After that, the binary logistic regression model was adopted to investigate how mental accounting, especially cognitive labelling and emotional labelling, and endowment effect influence farmers' migration choices. The results show that emotional labelling has no impact, while cognitive labelling has a significant impact on farmers' migration choices; mental accounting has a greater impact on farmers' migration choices than endowment effect. Therefore, the following policies should be developed to encourage farmers to stay in rural areas: guide the income to flow into the mental accounting of recurrent income, and strengthen the endowment effect of the farmers. The research results can greatly promote the sustainable and healthy development of the rural economy in China.*

**Key words:** Mental Accounting, Endowment Effect, Population Migration, Boost.

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## INTRODUCTION

Since the reform and opening up, a large amount of rural population has moved to urban areas and become an important driving force for China's urbanization along with the acceleration of China's marketization and urbanization. Compared with rural areas, cities have unique advantages such as a better social security system, higher per capita income, and greater education and medical care. These are all important reasons for attracting farmers to migrate and work in cities. However, the urban prosperity may lead to the decline of the rural areas to a certain extent. The unbalanced marketization development further widens the gap of economic development gap between urban and rural areas, which causes a series of social problems such as rural hollowing and left-behind

children. For this, the government should take the initiative to propose a strategy for rural revitalization, which provides more choices for farmers to return to their hometowns for employment and entrepreneurship, and also important solutions to the problems of uneven development between urban and rural areas.

So far, the rural revitalization strategy has achieved remarkable results. The gap between urban and rural areas has gradually narrowed, and in the choice of rural-urban migration, some farmers have preferred to choose staying in rural areas rather than the city blindly. The 2016 CLDS shows that among the selected 13,935 data, the number of stay-behind farmers in rural communities was 8,438, and the number of people who choose to migrate was 5,497. According to the theory of behavioural economics, the farmers choose to stay in rural communities based on their own psychological mechanism and endowment effects. This study focuses on analysing the one with a higher significant effect on farmers' choices

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between the psychological mechanism and endowment effects. The research findings are of great significance for the sustainable and health development of rural economy and formulation of rural population policies.

## THEORETICAL BASIS AND LITERATURE REVIEW

### Population migration theory

The large rural-urban population migration is a very significant reason for the imbalance between urban and rural economic development, because human capital is an important factor of productivity. For this, the factors affecting population migration have attracted great attention from scholars in the field of economics. Karemera, Oguledo, & Davis (2000) found that the decisive factors of population migration are the population size of the emigrated area and the income of the immigrated area; Henry, Boyle, & Lambin (2003) concluded that social demographic factors such as the population percentage, illiteracy rate, and economic activity rate etc. have a more significant impact on population migration compared to environmental factors such as land and climate changes etc. Crozet (2004) applied the gravity model to find that regional affluence and industrial price index effects have a positive impact on migration choices. Ortega & Peri (2013) discovered that international immigration control policies reduce population migration at an accelerating rate. Most of the above scholars have studied the factors affecting population migration, such as population, environment, society, economy. However, some scholars also conduct research on the factors of migration population themselves. For instance, Grogger & Hanson (2011) proved in his study that some factors of the workers themselves such as age and gender have a selective impact on population migration; Stark & Levhari (1982) found that individual risk attitudes in family decision-making of the developing countries have an impact on population migration; Bertoli, Moraga, & Ortega, (2011) confirmed that the main reason for the higher proportion of college graduates in US immigration is the difference in income; Grogger & Hanson (2011) also affirmed the impact of education: the more educated people are more likely to migrate and move to the destination with higher returns. But individuals mainly follow their own psychological activities when making migration decisions, considering the gained economic benefits and lost opportunity costs from migration at the micro level, rather than some factors at the macro level,

which are often ignored by decision makers. Therefore, the innovation of this paper is to introduce the principle of endowment effect and mental accounting from the micro level, and study the psychological mechanism of decision-making on migration.

### Endowment effect

In 1984, Knetsch & Sinden (1980) found through the lottery random experiment that most of the experimenters preferred the lottery in their hands rather than the lottery exchange to obtain higher benefits, which is called the endowment effect. Endowment effect means that an individual who owns an item, resource, or right tends to overestimate its value. Thaler (1980) believes that people will value their own resources more and think that theirs will bring more utility. Kahneman, Knetsch, & Thaler (1990) then conducted behavioural experiments and found that the endowment effect is the main reason that the experimenter's willingness to accept (WTA) to the willingness to pay (WTP) was greater than 1; Carmon & Ariely (2000) proposed that the cognitive differences between the two parties affect the strength of the endowment effect; List (2003) and Lerner, Small, & Loewenstein (2004) proved the stability and universality of the endowment effect through repeated experiments. Based on these literatures, it can be seen that the endowment effect plays a very important role in people's decision-making process; it's also one of the reasons for bounded rationality. In rural communities, farmers are more willing to stay in the country than to migrate, mainly because of the endowment effect (Banczyk, Laban, & Potts, 2018; Clark & Lisowski, 2017).

### Mental accounting theory

Both economics and psychology involve the study on choice, and economics started earlier. The father of economics, Smith (2002) put forward the "economic man" assumption in his book *The Wealth of Nations*, that is, human beings are infinitely rational, and "economic man" has complete information, who can sort their choices, and then make the best choice with the impeccable Logic and computing power. But the real economic world is contrary to the "economic man" assumption, which has been criticized by many economists. First, Moser (1990) proposed the "limited rationality" hypothesis that people are "managers" rather than "economic man", and "manager" is limited by perception, values, and

knowledge; the decision is based on the most satisfied choice rather than the best choice; secondly, Kahneman & Tversky (1979) put forward a prospect theory that truly links psychology and economics, and finds that when the investors are making risk decisions, it is more risk-averse than benefit, and there exist "irrational" deviations and deviations from "optimal" solutions. For this, the psychology and economics should be combined to explore the psychological mechanism of human beings in the decision-making process, thus providing a theoretical basis for human scientific decision-making and avoiding irrational deviations. Currently, behavioural economics is on the rise.

Following the prospect theory, Richard Thaler, known as "the master of behavioural economics" (Barberis, 2018; Thaler, 1985; 1999) proposed the concept of mental accounting. The mental accounting phenomenon refers to the fact that enterprises, families or individuals divide economic events into different mental accounts in decision-making. Thaler pointed out that the utility of market micro-subjects should be a utility superposition of mental accounting:

$$U(x) = U_1(x) + U_2(x) \quad (1)$$

where,  $U(x)$  is the total utility,  $U_1(x)$  is acquisition utility, and  $U_2(x)$  is transaction utility. The decision maker has the acquisition utility  $U_1(x)$  after the decision choice, and the transaction utility  $U_2(x)$  is the difference between the actual payment cost and the psychological expected cost.

The transaction utility  $U_2(x)$  is specifically expressed as:

$$U_2(x) = \begin{cases} (|X|)^\alpha - (X_0)^\alpha, & x \geq 0 \\ -\mu[ (|X|)^\beta - (X_0)^\beta ], & x < 0 \end{cases} \quad (2)$$

where,  $X_0$  represents the expected cost of each mental account,  $X \geq 0$  represents the income value,  $X < 0$  represents the loss values  $\alpha$  and  $\beta$ , i.e., the degree of preference, and  $\mu$  is the proportional coefficient. Thaler found that individuals often put income from different sources into different mental accounting, and these incomes generally do not flow to each other, due to the barrier effect of different mental accounting. For instance, in real life, people will use the money in the gasoline budget account to buy high-grade gasoline that is cheaper due to falling prices when oil prices fall, instead of using

the money to buy necessities.

The theory of mental accounting has laid a bridge between psychology and economics, extending psychology to many fields of economics. Stein (2017) reviewed the use of psychology and economics in international relations over the past three decades; Rodebaugh, Tonge, Weisman et al. (2017) conducted behavioural economics experiments to find individuals with social anxiety disorder (SAD) are more generous in interpersonal emergencies compared to Normal individuals; Benartzi, Beshears, Milkman (2017) and Hansen & Jespersen (2013) reflected on the "boosting" and "manipulating" behaviours in public policy. And psychology has made a major breakthrough in the field of consumer decision-making (Bevet, Niles, Pope, 2018; Carroll, Samek, & Zepeda, 2018).

Arkes, Joyner, Pezzo et al. (1994) found that people tend to use windfall gains for hedonic consumption; Kivetz (1999) categorized the mental accounting into regular income and windfall gains: the former is the expected income; the latter is the unexpected income. According to the degree of difficulty in obtaining the incomes, it's put into different mental accounting, and the windfall gain is easier to consume; Levav & McGraw (2018) classified the mental accounting into positive emotional accounting and negative emotional accounting, and the emotions in the acquiring process of income affect consumer decision-making. Chang & Pham (2013) found that people will regulate negative emotions through hedonic consumption. In this paper, the theory of mental accounting was expanded and used for the issue of population migration, in order to study the role of its psychological mechanism in migration selection.

## EMPIRICAL PROCESS AND ANALYSIS

### Measurement of endowment effect in rural communities

Endowment effect refers to the value of an item, resource, and right that people have and people tend to overestimate. Lee (1978), Diamond (1999). and other scholars have found that Chinese farmers generally do not easily leave their ancestral homes. It is this cultural habit that makes them highly repulsive to the migration city. The deterioration of the natural environment is the major cause of their migration. It can be seen that the endowment effect should have a more significant positive effect on the farmers' stay in rural community, and the natural environmental

factor is the key influencing factor of the endowment effect.

The most traditional measurement method is to measure the ratio of "WTA" and "WTP" for determining the size of the endowment effect. Despite of the accuracy of this method, it cannot take into account all related factors. However, in this paper, multiple factors were analysed to determine the value of the comprehensive endowment effect. Therefore, the principal component analysis method was adopted to assign various factors and calculate the comprehensive endowment effect.

#### *Data selection*

The China Workforce Dynamics Survey (CLDS) is China's first a labour-themed nationwide follow-up survey. Its purpose is to conduct the biennial dynamic follow-up surveys of households and labour individuals in rural areas in China, and systematically monitor their changes and interactions, which provides basic data for empirically-oriented high-quality theoretical research and policy research.

The farmers are most concerned about the factors such as environment, and infrastructure etc. In view of this, the paper selects 401 community-level data based on the 2016 CLDS data and also determines eight factors that influence the endowment effect, including: (1) air pollution; (2) water pollution; (3) noise pollution; (4) public security evaluation (5) financial institution service evaluation; (6) hospital service evaluation; (7) teaching quality; (8) enterprise contribution. They were measured by the Likert five-level scale, e.g., for the indicator "air pollution", when the respondent answers "very serious", the value is 1; and when the answer is "no pollution", the value is 5, indicating that the value is positively with the air quality in the community and endowment effect.

#### *Weight determination by principal component analysis*

To ensure objective and comprehensive results in the comprehensive evaluation of multiple indicators, it is necessary to measure with multiple indicators from various aspects, but this will cause problems such as overlapping information

between the observed indicators. Thus, the principal component analysis method can be used for concentrating the information and solving the weight problem.

This paper selects eight factors to calculate the endowment effect. KMO and Bartlett's tests determine whether the selected indicators are applicable to factor analysis. When the KMO value is between 0.5 and 1, or the Sig value is less than 0.05, indicating that the selected variable is capable of factor analysis. Table 1 above shows that the KMO value was 0.707, greater than 0.05, and the Sig value was less than 0.05 in this study. Therefore, the selected 8 factors were applicable to factor analysis.

**Table 1. KMO and Bartlett tests**

<b>KMO and Bartlett tests</b>	
Sampling sufficient Kaiser-Meyer-Olkin metric	0.707
The approximate chi-Square	586.235
Bartlett's sphericity test (d.f.)	28
Sig	.000

**Table 2. Total variance explained**

Ingredients	Initial Eigenvalue		
	Sum	Variance contribution rate (%)	Cumulative variance contribution rate (%)
F <sub>1</sub>	2.442	30.524	30.524
F <sub>2</sub>	1.344	16.800	47.323
F <sub>3</sub>	1.025	12.809	60.132
F <sub>4</sub>	.973	12.160	72.293
F <sub>5</sub>	.833	10.411	82.704
F <sub>6</sub>	.669	8.363	91.066
F <sub>7</sub>	.431	5.389	96.456
F <sub>8</sub>	.284	3.544	100.000

Note: 4 common factors were extracted using principal component analysis.

This study extracted four common factors. It can be seen from Table 2 that since the cumulative variance contribution rate of the first four principal components reached 72.293%, more than 70%, these four components can basically reflect all the index information, and replace the original eight factors with good representativeness.

Table 3. Component scores

factors	The principal component of Ingredients			
	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>
The air pollution	0.884	-0.054	-0.07	-0.019
The water pollution	0.828	0.098	0.002	-0.12
The noise pollution	0.83	-0.14	-0.122	0.055
public security evaluation	0.461	-0.062	0.383	0.303
financial institution service evaluation	-0.046	0.771	0.23	-0.018
hospital service evaluation	-0.025	0.828	-0.126	0.029
teaching quality	-0.148	0.089	0.895	-0.074
enterprise contribution	-0.055	0.025	-0.046	0.954
Principal component characteristic root	2.442	1.344	1.025	0.973

Note: The column of "Eigenvalue of principal component" was taken from Table 1.

First, the number of linear combinations of 8 factors among the 4 principal components was calculated as:

$$\alpha_{ij} = \frac{A_{ij}}{r_j^2} \quad (3)$$

$$F_j = \alpha_{1j}x_{1j} + \alpha_{2j}x_{2j} + \dots + \alpha_{ij}x_{ij} \dots + \alpha_{8j}x_{8j} \quad (4)$$

In equation (3),  $A_{ij}$  represents the number of loads for each factor under each principal component;  $r_j$  is the eigenvalue of each principal component;  $\alpha_{ij}$  is the coefficient of each factor in the principal component. According to the equation (3), the linear combination coefficient of each principal component was calculated in Equation (4). The results are shown in Table 4.

Table 4 indicates that the coefficients of the "air pollution", "water pollution" and "noise pollution" indicators in the main component F1 were much higher than other indicators, so F1 was used as an indicator of environmental factors; similarly, F2 was infrastructure construction indicators, F3 was teaching quality indicators, and

F4 was job opportunity indicators. Among them, the variance contribution rate of each principal component indicates that the value is positively correlated to the importance of the principal component. Therefore, the variance contribution rate can be regarded as the weights of different principal components. Considering that the original indicator can be replaced by four principal components, the variance contribution rates of these four principal components were regarded as the weights for the index coefficient, and the weighted average was made for the coefficients in the linear combination of the four principal components:

$$\beta_i = \frac{\sum \alpha_{ij} \rho_j}{\rho_1 + \rho_2 + \rho_3 + \rho_4} \quad (5)$$

$$\delta = \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i + \dots + \beta_8 x_8 \quad (6)$$

In Equation (5),  $\beta_i$  represents the coefficient of each factor in Equation (6);  $\rho_j$  represents the variance contribution rate of each principal component. In Equation (6),  $\delta$  represents the comprehensive index of endowment effect.

Table 4. Linear combination coefficient

factors	Linear combination coefficient			
	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>
The air pollution	0.566	-0.047	-0.069	-0.019
The water pollution	0.530	0.085	0.002	-0.122
The noise pollution	0.531	-0.121	-0.121	0.056
public security evaluation	0.295	-0.053	0.378	0.307
financial institution service evaluation	-0.029	0.665	0.227	-0.018
hospital service evaluation	-0.016	0.714	-0.124	0.029
teaching quality	-0.095	0.077	0.884	-0.075
enterprise contribution	-0.035	0.022	-0.045	0.967
Variance contribution rate (%)	30.524	16.800	12.809	12.160

Note: The column "Variance contribution" was taken from Table 1.

According to Equation (5), the comprehensive index coefficient of endowment effect was calculated in equation (6); since the sum of the weights for each factor should be "1", the index weights were normalized to obtain the equation (7) below:

$$\delta = 0.148x_1 + 0.155x_2 + 0.128x_3 + 0.160x_4 + 0.125x_5 + 0.099x_6 + 0.085x_7 + 0.101x_8 \quad (7)$$

Equation (7) is the final comprehensive index model for endowment effect, and  $x_i$  means 8 factors such as "air pollution". It can be seen that environmental factors and social security factors have a more significant impact on endowment effects, indicating that people are most concerned about the beautiful environment of rural communities and good social security. By Equation (7), the endowment effect of 401 rural communities across the country were calculated.

#### Analysis of the migration selection mechanism of rural community residents

Crozet (2004), Bertoli, Moraga, & Ortega, (2011), Grogger & Hanson (2011) have confirmed that population migration is mainly affected by income, and people prefer moving to higher income areas; Arkes, Joyner, Pezzo et al. (1994) Kivetz (1999), Levav & Mcgraw (2018) found that people distribute different incomes into different mental accounting, and these mental accountings have different effects on people's choices. Therefore, this paper classifies the different incomes into different types of mental accounting. Then, combined with the endowment effects of each community, it studies the impact of various factors on migration choices.

#### Data selection

Based on the related research, mental accounting can be classified into "windfall gain" and "regular income" accounting, or into "positive emotion" and "negative emotion" accounting. This paper combines them into four different mental accounting: Negative Emotional Regular Income Account (C1), Negative Emotional Windfall Gain Account (C2), Positive Emotional Windfall Gain Account (C3), Positive Emotional Regular Income account (C4). "Wage income" is consistent with the definition of C1, because hard work has a negative utility, and wages are recurrent income; "debt-borrowing" is consistent with the definition of C2, and the debt borrowed is mostly the income borrowed when they cannot bear the economic

burden accidentally; "property income" is mostly the interest, rent, and patent income in line with the C3; similarly, "operating income" is in line with the C4.

Based on the 2016 CLDS Data, 13,935 individual-level data was selected after eliminating invalid data, and "salary income", "debt borrowing", "property income" and "operating income" were taken as the observational indicators of the four types of mental accounting; 401 community-level endowment effects were applied to the individual level, and the endowment effect comprehensive index was used as one of the observation indicators; the dependent variables were used for the selection of migration location: "1" means "stay-behind in rural community", "0" means "migration from rural communities".

#### Existence test of mental accounting

Mental accounting is a kind of psychological manifestation that the subject achieves potential self-control by classification and decision-making of budgets. In line with the account function of accounting, it has the functions of saving, high efficiency and coping with unknown events through the previous budget and control. In terms of income, people classify different income into different kinds of mental accounting which are independent and irrelevant. This paper first verifies the existence of mental accounting through relevant sample tests. The analysis results are as follows:

Table 5. Relevant test statistics

Wage income C <sub>1</sub>	Average rank		
	debt-borrowing C <sub>2</sub>	property income C <sub>3</sub>	operating income C <sub>4</sub>
3.11	2.54	2.11	2.24
$W^a$		0.242	
df		3	
Progressive		0.000	

Note: The Kendall-W test method was used.

Table 5 shows that  $P=0.000<0.001$ , and there are significant differences between the four kinds of wage income, that is, four different mental accounting, indicating that the mental accounting is significantly irrelevant, thus verifying the existence of the mental accounting, and also indicating that the four income observation indicators can better represent the four kinds of mental accounting. In addition, the average of "wage income C1" was 3.11, which is larger than the other four mental accounts, indicating that

people are most concerned about recurrent income.

#### Binary logistic regression analysis

Considering that the dependent variables of this study are "stay-behind" and "migration", only a limited number of discrete variables were taken, which was consistent with the binomial distribution. Therefore, this paper uses the binary logistic model for regression analysis to study the effects of four mental accounts and endowment effects on migration choices. The formula is as follows:

$$P(y_i = 1|X_i, \beta) = \frac{1}{1 + \text{EXP}(-\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n)} \quad (8)$$

where,  $X_i$  is the vector formed by all explanatory variables such as the constant term etc.;  $p_i$  is the probability of rural residents staying in rural communities,  $i$  is the sample number;  $j$  is the influencing factor number, and  $\beta_n$  is the regression coefficient of each independent variable. The regression results are shown in Table 6 below.

From Table 6, it can be found that: for the coefficient of "debt borrowing C2" was -0.0011, which indicates that the negative emotional windfall gain accounting (C2) has a reverse effect on the behaviour of rural residents staying in rural communities; the probability of C2 was  $P=0.4719$  and that of property income C3 was  $P=0.1442$ , both greater than 0.05, indicating that the impact of these two mental accounting on the dependent variable Y is not significant, that is, the rainfall gain accounting under the negative emotion and positive emotions have a non-significant impact. This means that people are more inclined to rely on the regular income accounting to make choices on migration issues, and the emotional labelling (positive emotion, negative emotions) have no effect on people's migration choices. There is no difference in the coefficient of wage income C1 and operating income C4, indicating little difference in the effect of the regular income accounting under negative emotions and positive

emotions on the dependent variable Y. Also, it is proved once again that the emotional label (positive mood, negative emotion) has no effect on people's migration choice. The coefficient of regular income accounting was far greater than the endowment effect coefficient of 1.59E-06, and its impact on Y was much stronger than the endowment effect, indicating that people mainly consider the regular income accounting when making the migration choice, but not the endowment effect. This further means that the main factor affecting the migration choice of people is the regular income mental accounting, because the persistence of regular income is the basis for the continuation and growth of individuals and families.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the 2016 CLDS data, this paper conducts the factor analysis of rural residents' migration choice. From the above empirical analysis, it's concluded that: (1) the emotional labelling (positive emotion, negative emotion) has no effect on people's migration choices; (2) cognitive labelling (regular income, rainfall gain) has a significant impact on people's migration choices, and people are more inclined to make choices through regular income mental accounting; (3) the impact of mental accounting on migration choices is more significant than the endowment effect; (4) people are most concerned about environmental factors and social security factors for the endowment effects. Based on the above conclusions, this paper gives the following policy recommendations:

### Nudging migration choice by mental accounting

Due to various factors, the expected behaviour in people's minds is often inconsistent with the actual actions. At this time, a selection mechanism should be designed to "boost" people to make choices that meet their psychological expectations. The word "boost" comes from the

Table 6. Variables in the regression equation (n=13,935)

Variables	B	S.E.	Wals	df	Sig.	Exp (B)
Wage income C <sub>1</sub>	0.0090	0.002840	10.189	1	0.0015	1.009
debt-borrowing C <sub>2</sub>	-0.0011	0.001480	0.535	1	0.4719	0.999
property income C <sub>3</sub>	0.0153	0.010471	2.091	1	0.1442	1.015
operating income C <sub>4</sub>	0.0091	0.004041	4.507	1	0.0238	1.009
endowment effect $\delta$	1.59E-06	8.03E-07	3.926	1	0.0472	1.000
The constant	0.4079	0.019922	420.614	1	0.0000	1.504

classic book *Nudge: Improving decisions about health, wealth, and happiness* by the father of behavioural economics, Thaler, which details that the mechanism design can better help the government and social groups develop and implement public policies, optimize public goods, and then serve the society more effectively; only a simple and low-cost selection framework can bring human behaviour to the desired direction. For example, people who want to stop drinking and quit smoking can apply for an account that needs to deposit \$1 a day. After 6 months, if the customer passes the urine test, they can take the money. This mechanism has been quite effective (Thaler & Sunstein, 2018). In recent years, many scholars have also confirmed that even a slight “nudge” can achieve greater policy effects, such as: Friis, Skov, Olsen et al., (2017), can improve people's personal hygiene by changing the eating environment and vegetable ingredients; Torma, Aschemann-Witzel, & Thøgersen (2018) studied the role of environmental labeling to “nudge” people's sustainable consumption; Gowayed (2018) studied the role of cash transfer programs in “nudge” the improvement of the educational level of the poor. Some scholars have also studied the effect of “nudge” from a macro level. They believe that “nudge” is mainly a policy intervention and a psychological counseling tool to help people improve their health, wealth and well-being (Lin, Osman, & Ashcroft, 2017; Mongin, & Cozic, 2017).

Under the background of rural revitalization strategy, in order to solve the unbalanced and inadequate realities and contradictions between urban and rural development, it is an urgent issue to be solved for rural residents staying in rural areas and returning to work in employment. Human capital is the most important production factor, so it needs to design a simple, low-cost selection mechanism that boosts rural residents to stay in the village and return home. In this paper, the following selection mechanism was designed:

1) Appropriately increase the approval process for the extraction of urban central provident fund (CPF) and reduce the approval process in rural areas. In the city, it requires more approval process for the funds in the CPF account, and the cost of the funds raised by the farmers will increase; while the approval process for extracting the CPF in the countryside is greatly simplified, with the advantage of quick arrival. Farmers who want to stay in the city will naturally not leave the city because of the withdrawing the provident fund, but this

mechanism design can “boost” the farmers who want to return to the countryside but still in the city to return home;

- 2) Work punch-in and tax cuts. Employees working in township enterprises can receive a tax deduction of 30 yuan from the government tax reduction department once a month on the basis of the daily work punch-in record. This design virtually increases the regular income of rural residents and helps the enterprises in attendance-checking, enhancing their willingness to stay in rural communities, and improving their enthusiasm for work. Also, the government does not have too much fiscal and tax burden;
- 3) Design a savings account of fixed deposits by installation. The account requires people to deposit 1 yuan or two yuan each day, and withdraw the money after a period of time, such as 1 year, but it can only be taken out in financial institutions in rural communities. This mechanism design can also “boost” the residents who want to return home. The residents who want to stay in the city can pick it up by mail or when visiting relatives at home, while those who are willing to return home prefer to withdraw funds when they return home;
- 4) Deposit more income in the recurrent account. It has been shown above that people are most concerned about recurring income accounts on migration choices. Governments and enterprises can distribute unexpected incomes such as compensation, bonuses, interest, etc. in fixed amount, and rural residents will deposit them into recurrent income mental accounts according to the way they are issued. Under the premise that the rural economy has not yet grown rapidly, the choice of mechanisms should be designed to increase people's recurrent income and enhance their willingness to stay in rural communities.

#### **Nudging migration choice with endowment effect**

It can be seen from the above that although the endowment effect has a positive effect on the migration choice, it is less effective than the recurrent income mental accounting. The reason may be that the recurring income account is a real property and property interest, and it is the basis for the survival of individuals and families, while the endowment effect is mainly environmental and social factors, mainly playing the auxiliary role,



and people also relatively neglect the endowment effect in the choice of migration. However, the endowment effect still has a certain effect. In this paper, starting with environmental and social factors, the selection mechanism was designed to boost the endowment effect, thus indirectly boosting the migration choices:

- 1) Free garbage bags and rewards. Rural residents receive a certain amount of garbage bags every month, and only when the garbage is thrown to the designated location, the same amount of garbage bags can be obtained next month. This mechanism is designed to “boost” the residents’ willingness to throw garbage according to regulations. Besides, the residents can be given a bonus of 3 yuan per day, if they can clean up poultry excretions in a timely manner, and house poultry in a certain range without causing environmental pollution, which is checked on a daily basis by the village cadres;
- 2) Improve the evaluation mechanism of service organizations and social institutions. An evaluation mechanism should be designed for evaluating each diagnosis, class, and service of hospital doctors, school teachers, and bank employees respectively: reward 1 yuan for each positive comment and deduct 1.5 yuan for each negative comment, in order to “boost” relevant personnel to improve the quality of services, schooling and treatment;
- 3) Increase employment opportunities for environmental protection, such as garbage sorters, river chiefs, etc. Residents who are willing to protect the environment can be employed daily to protect the environment, complete related work, and be paid daily. Such measures can not only protect the environment, improve endowment effects, but also increase employment opportunities and residents' income.

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