

# Economic Analysis of the Impact of Residents' Income on Happiness Based on the Data of China Family Panel Studies

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## Abstract

The definition of happiness in mainstream economics has always been linked to utility. The positive correlation between income and utility sets income and happiness in the economics as positive correlation. This conclusion was questioned after the rise of municipal economics. Based on the household survey data from Guangdong Province, this paper introduces the absolute and relative measures of income variables. Using the orderly logistic regression model, empirical research on the relationship between income and happiness is achieved by adding the most appropriate control variables. The results show that the absolute level of income has no significant effect on happiness, while the relative level of income has a significant positive impact on happiness. This conclusion is of great significance to the formulation of government revenue policy and fiscal policy.

## Keywords

Income; Subjective well-being; Easterlin paradox; Absolute income; Relative income.

## 1. INTRODUCTION

### 1.1. Research Background

What is the relationship between income and happiness? The higher the income of residents, the more happiness they mean? The problem was first raised in 1974. When Professor Easterlin of the University of California, USA studied economic growth and people's well-being, through research on the United States, in the last few decades, the US economy has grown rapidly and has grown. The development, as well as the apparent increase in per capita income, did not bring about an increase in people's happiness during the same period. This is the famous "Easterlin Paradox" in economics, or "Happiness Paradox". Since then, economists have begun to study the relationship between income and happiness, and then derived an important branch of economics - happiness economics.

According to data released by the Chinese Academy of Social Sciences, the Easterlin paradox also exists partly in China. Since 2005, the economy has continued to grow and per capita income has continued to increase. However, it has not brought about a continuous improvement in the sense of well-being of residents, and even more years have been at a year-on-year decline. In the past decade or so, scholars and the media have paid more attention to economic growth and per capita income. However, a large number of empirical facts also show that the increase in income caused by economic growth is not necessarily in sync with the improvement of residents' happiness. With the deepening of the understanding of the people-oriented concept of sustainable development, we gradually realize that economic development has always been a means, and the ultimate goal is to return to the improvement of people's living standards and the promotion of happiness.

In recent years, with the further development of globalization and the constant impact of the aftermath of the economic crisis in the Western countries, the Chinese economy has entered the "new normal" since 2014, and the impact of income on the happiness of residents during the transition period is bound to become more complicated and more People's attention. Therefore, based on the above academic and contemporary backgrounds, this paper explores the mechanism of the impact of residents' income on happiness during the transition period.

## 2. LITERATURE REVIEW

Since the introduction of the "Esterlin Paradox" in 1974, economists have interpreted this phenomenon from the perspective of economics. These documents are summarized, and the research directions and influences are The following three:

The impact of non-economic factors. It can also be considered that this theory denies the existence of the "Esterlin Paradox" from the source. For example, the theory put forward by Seligman and Diener (2004) [2] believes that although absolute income increases, other variables affecting happiness also change. For example, education, marriage, and socialization also affect residents' happiness. The Esterlin paradox is the result of the omission of important variables. However, MacCulloch and Di Tella (2006) [3] subsequently found that some non-economic factors have not changed in the past. This greatly weakens the credibility of interpretation from the perspective of missing variables, indicating that even if there are no missing variables, income does affect residents' well-being.

Expectation theory, also known as adaptive theory. Briekman and Campbell (1971) [1] and Kahneman (2003) [6] believe that people will adjust their expectations to adapt to changes in the external environment. When income rises, people expect their income levels. The adjustment, and quickly formed an automatic adaptation to the increased income, happiness will return to the original level after this adaptive acquisition, resulting in increased income has no significant impact on the improvement of subjective well-being.

Relative income hypothesis theory. This theory is proposed by scholars such as Esterlin (2001) [4] and Senik (2004) [5], who believe that if the income of all people is raised at the same time, the level of happiness remains the same, Wood ( The social comparison theory of 1996) [8] also holds the same view. People are more concerned with relative position than absolute position. Economic research scholars mostly agree with this view, and since then the empirical research related to happiness economics has been gradually deepened and refined based on the theory of relative income hypothesis. Ravallion and Lokshin (2001) [7] used data from the United States and several other developed countries to find that relative income has a significant impact on happiness.

The above is a study by foreign scholars based on data from developed countries. With the concern for happiness economics, domestic scholars also have literature research on happiness paradox. In terms of theoretical research, Tian Guoqiang and Yang Liyan (2006)[13] combined the theory of comparison with the theory of "ignoring variables" to construct a threshold model to explain happiness paradox. Wu Limin and Chen Huixiong (2010) [14] constructed the "income-intermediate variable-happiness" model, stating that income indirectly affects happiness through direct and intermediate variables (individual status, social status, etc.). In empirical research, the literature based on data and econometric analysis gives inconsistent conclusions on the relationship between income and happiness in China. Some scholars believe that income and happiness have a strong correlation. For example, Cao Dayu (2009) [9], Zhang Xuezhi, Cai Guowei (2011) [18], and Ma Liping (2012) [12] used some provincial and municipal data to verify that absolute income and residents' happiness are "U". Type relationship; Zhao Xinyu, Fan Xin, Jiang Yang (2013) [17] using an ordered probability model for empirical analysis, found that relative income has a significant effect on the public's subjective well-being, and its

effect is stronger than absolute income; bureaucrats (2010) [10] and Zhao Taomin (2014) [19], both use binary probit regression analysis method to analyze the relationship between various factors and residents' happiness and the importance of the impact on residents' happiness. The results show that relative income is beneficial to residents. The impact of sensation is more pronounced than absolute income. After adding the relative income variable, the impact of absolute income on happiness is not significant. Luo Chuliang (2009) [11] conducted an empirical study of urban and rural household survey data in China and found that even under the control of relative income levels, the impact of absolute income on residents' happiness is still very significant. Other scholars have concluded that income and happiness are very weak. For example, Xie Zhiyu, Zhu, Zhu Hongxin (2010) [15] and Xing Zhanjun (2011) [16] have shown that although income has a positive impact on happiness But whether it is the absolute level or relative level of income, this effect is small.

This paper is based on the differences between previous studies on the impact of income on subjective well-being, verifying the impact of income on subjective well-being, and comprehensively studying the relationship between absolute level of income and relative measure and happiness. Compared with the previous literature, after analyzing the reasons for the inconsistency between the scholars and the reasons other than the data source, the main points raised in this paper are as follows. In the measurement of the main explanatory variable, ie relative income, due to the availability of data, the indirect measurement methods of the predecessors are different. There are comparisons between current income and previous income, and the current income is compared with the national poverty line. To measure the relative income level, it can be said that these two methods are not satisfactory. The relative income should be the personal income compared with the surrounding people, and it is best to correspond to the subjective well-being of the residents to the income level. Self-evaluation. Therefore, this paper uses the relative income evaluation of residents directly in the questionnaire (1-5 grades), and this can directly eliminate the income index disputes caused by regional differences and urban-rural differences.

### **3. EMPIRICAL ANALYSIS OF THE IMPACT OF INCOME FACTORS ON SUBJECTIVE WELL-BEING**

#### **3.1. Data Source**

Since happiness comes from people's subjective feelings, each person's criteria are more or less different. With reference to current international and domestic research, it can be found that the form of questionnaires is the most accurate way to obtain people's subjective well-being. Therefore, after comprehensively surveying the questionnaire data in the current large-scale visit and examining the content of the questionnaire, the paper selects the 2014 CFPS China Family Tracking Questionnaire data as the original data source of the empirical part. In order to avoid excessive regional differences, the control did not consider the influence of the incoming factors on the empirical results. This paper selected the data of Guangdong Province, and a total of 1332 valid questionnaires. After eliminating the missing data and the obvious false data, the valid samples were finally collected. 918 data.

#### **3.2. Model Variable Selection**

Refer to the existing theory and current international and domestic empirical research, combined with the data characteristics of the 2014 CFPS China Family Tracking Questionnaire. The variables selected in the empirical part of this paper and their meanings are as follows:

(1) Interpreted variables: subjective well-being (HAPPINESS). The self-reported happiness of the petitioners, the data is defined by the numbers 1-5 "very unhappy, not happy, general, happy,

very happy." It is currently the internationally recognized five-level happiness stratification standard.

(2) Explanatory variables: income (INCOME). The data represents the total annual income of the petitioners. It is further divided into: 1. Absolute income (absinc), which is the absolute amount of total annual income. We use the logarithmic form of absolute income in the model. 2. The relative income (relainc) is the level at which the income of the petitioners is local, and is self-assessment data. Use the numbers 1-7 to define relative income levels from "very low" to "very high".

(3) Control variables. Because people's subjective well-being has many influencing factors, in addition to our main explanatory variable income, combined with the 2014 CFPS data availability, the addition of personal natural characteristics (NATURAL), personal social characteristics (SOCIAL) and expectations (EXPECTATION) These three control variables. Descriptive statistics for specific variable definitions and data are shown in the following table:

**Table 1.** Variable definitions and descriptive statistics

Symbol	variable	mean	min	max
y	HAPPINESS	3.408	1	5
INCOME				
X <sub>1</sub>	ln(absinc)	9.4995	1.2045	18.3019
X <sub>2</sub>	relainc	2.827	1	5
NATURAL				
X <sub>3</sub>	gender	0.573	0	1
X <sub>4</sub>	age	42.83	16	87
X <sub>5</sub>	health	5.558	1	7
SOCIAL				
X <sub>6</sub>	edu	2.78	1	7
X <sub>7</sub>	maritus	0.7974	0	1
X <sub>8</sub>	family	3.608	1	5
X <sub>9</sub>	socrelation	7.195	0	10
X <sub>10</sub>	status	3.366	1	5
EXPECTATION				
X <sub>11</sub>	confidence	3.812	1	5
X <sub>12</sub>	life	2.73	1	5

Source: 2014 CFPS China Family Tracking Survey

### 3.3. Model Construction

#### 3.3.1 Ordered logistic regression model

We know that linear regression models are probably the most popular method in empirical research of quantitative analysis. However, in many cases, when the interpreted variable is a categorical variable rather than a continuous variable, the linear regression model does not apply. Logistic regression analysis should be used at this time. The interpreted variables of the Logistic regression model are often classified into two categories, and there are also multiple classifications. The subjective well-being of the five-category happiness index is used as the explanatory variable, which belongs to the ordered classification logistic model. This is exactly where the text is more progressive than the predecessors' subjective well-being.

#### 3.3.2 Construction of an ordered logistic regression model

Specifically, the model for studying the impact of income on subjective well-being is set as follows:

$$\text{HAPPINESS} = f(\text{INCOME}, \text{NATURAL}, \text{SOCIAL}, \text{EXPECTATION})$$

And because the ordered logistic regression model is defined as follows:

$$\ln\left(\frac{P(y \leq j)}{1 - p(y \leq j)}\right) = \alpha_j + \sum_{k=1}^K \beta_k X_k$$

The variable  $y$  in the formula represents people's subjective well-being ( $y=1$  is not happy,  $y=2$  is not happy,  $y=3$  is normal,  $y=4$  is happy,  $y=5$  is very happy), and  $X$  means subjective happiness  $y$ . The factors,  $\alpha$ ,  $\beta$  are the parameters to be estimated of the model. Since the interpreted variable is a sequential multi-classification variable with respect to the degree of subjective well-being, there are 5 levels. Therefore, the ordered logistic regression model used in the estimation of the model includes four cumulative logit functions, and the four models simultaneously perform parameters. Estimate:

$$\ln\left(\frac{P_1}{P_2 + P_3 + P_4 + P_5}\right) = \alpha_1 + \sum_{k=1}^K \beta_k X_k \tag{1}$$

$$\ln\left(\frac{P_1 + P_2}{P_3 + P_4 + P_5}\right) = \alpha_2 + \sum_{k=1}^K \beta_k X_k \tag{2}$$

$$\ln\left(\frac{P_1 + P_2 + P_3}{P_4 + P_5}\right) = \alpha_3 + \sum_{k=1}^K \beta_k X_k \tag{3}$$

$$\ln\left(\frac{P_1 + P_2 + P_3 + P_4}{P_5}\right) = \alpha_4 + \sum_{k=1}^K \beta_k X_k \tag{4}$$

$P_1, P_2, P_3, P_4,$  and  $P_5$  in the model represent the probability of "very unhappy", "unhappy", "general", "happiness", "very happy", and satisfy  $P_1+P_2+P_3+P_4+ P_5=1$ . Then define:

$$H1 = \frac{P_1}{P_2 + P_3 + P_4 + P_5}, \quad H2 = \frac{P_1 + P_2}{P_3 + P_4 + P_5}$$

$$H3 = \frac{P_1 + P_2 + P_3}{P_4 + P_5}, \quad H4 = \frac{P_1 + P_2 + P_3 + P_4}{P_5}$$

Then the logistic regression model can be regarded as the simultaneous regression of the four equations  $\ln(H_j) = \alpha_j + (j=1, 2, 3, 4)$ , and the slope coefficient of each equation is assumed in the usual regression process. The same, the difference is the intercept term  $\alpha_j$ .

From the definition of the above ordered logistic model, in the model, the coefficient of the explanatory variable measures not the marginal influence of the variable on the probability of the explanatory variable, but the deformation of the interpreted variable after the mathematical transformation. Marginal influence. To be precise, it should be the marginal effect of the invisible variable HAPPINESS, but this can't be seen intuitively, it can only be restored by the mathematical logic behind it. Therefore, what we are more concerned about is actually the sign of the explanatory variable, which directly reflects the direction of the subject's influence on subjective well-being.

### 3.3.3 Model fitting

In this paper, the ordered logistic regression is performed using the `porl` function in the MASS package of R language. What we need to verify is the extent to which the absolute and relative metrics in the income variable affect each subjective well-being. Therefore, in the construction



### 3.4. Model Test

#### 3.4.1 Robustness test

In order to test the robustness of the conclusion, this paper will divide the sample into male and female groups according to the gender variables in the individual's natural attributes, and each group will perform two regressions. Then compare the regression results of Model 1 and Model 2 under the overall sample to see if the conclusions obtained in this paper are robust. The results of the group robustness test are shown in the following table:

**Table 4.** Ordered logistic model regression results by subsamples by gender

变量	男组		女组			
	模型4	模型5	模型6	模型7		
Log_absinc	0.07099	—	0.20406*	—		
relainc	—	0.38931***	—	0.80128***		
age	0.00899	0.00718*	0.01828*	0.00976*		
health	0.27114***	0.25202***	0.16610**	0.19202**		
family	0.65688***	0.60692***	0.78845***	0.73580***		
socrelation	0.59420***	0.57956***	0.65241***	0.62965***		
status	0.30961**	0.30121**	0.03470	-0.01455		
confidence	0.12519***	0.12650***	0.34639***	0.35862***		
Signif. codes:	0.01	'***'	0.05	'**'	0.1	'*'

It can be seen from the above table that the regression results of the two subsamples grouped by gender show that the relative measure of income has a more significant influence on the subjective well-being of residents than the absolute measure, which is related to the regression results under the total sample (model 1 and model). 2) The conclusions reached are consistent, indicating that our conclusions are robust.

#### 3.4.2 Test of statistical significance of the model

Since the test of the ordered logistic regression model is different from the general linear regression model, its fitting test is tested by comparing the difference between the model prediction number and the actual observation number. If the predicted value is closer to the actual observed value, Explain that the fit of the model is better. The model test method is mainly the likelihood ratio test, which is carried out by comparing the log likelihood function changes of two models with nested relations. The test statistic is  $G = -2\ln(L2/L1)$ , where L2 For the logarithm of the maximum likelihood function of model 3, L1 is the logarithm of the maximum likelihood function of the null model to be tested. The model fit test for model 3 is shown in the following table:

**Table 5.** Model 3 fit test output

Resid. df	Resid. Dev	Test	Df	LR stat.	Pr(Chi)
914	2615.568				
905	2026.298	1 vs 2	8	9588.9866	0

### 3.5. Analysis of Empirical Results

It can be seen from Table 5 that the value of the test statistic G is 9588.9866, and the card distribution with a degree of freedom of 8 is obtained, and the P value is approximately equal to 0, and the model has statistical significance. Moreover, as shown in Table 2, after the redundant control variables are removed by the AIC value method, the overall coefficient of each variable is significantly higher. Therefore, according to the maximum likelihood estimation of the intercept term and the regression coefficient in the output result of the model 3 in Table 3, the regression equation set in this paper can be determined as:

$$\begin{aligned} \text{Ln}(H1) = & 5.8669 + 0.59340X2 - 0.22360X3 + 0.00989X4 + 0.21962X5 \\ & + 0.67432X8 + 0.60126X9 + 0.15854X10 + 0.24264X11 \end{aligned} \quad (5)$$

$$\begin{aligned} \text{Ln}(H2) = & 9.3088 + 0.59340X2 - 0.22360X3 + 0.00989X4 + 0.21962X5 \\ & + 0.67432X8 + 0.60126X9 + 0.15854X10 + 0.24264X11 \end{aligned} \quad (6)$$

$$\begin{aligned} \text{Ln}(H3) = & 11.0705 + 0.59340X2 - 0.22360X3 + 0.00989X4 + 0.21962X5 \\ & + 0.67432X8 + 0.60126X9 + 0.15854X10 + 0.24264X11 \end{aligned} \quad (7)$$

$$\begin{aligned} \text{Ln}(H4) = & 13.6807 + 0.59340X2 - 0.22360X3 + 0.00989X4 + 0.21962X5 \\ & + 0.67432X8 + 0.60126X9 + 0.15854X10 + 0.24264X11 \end{aligned} \quad (8)$$

$$\begin{aligned} \text{Among them, } H1 = & \frac{P_1}{P_2 + P_3 + P_4 + P_5}, \quad H2 = \frac{P_1 + P_2}{P_3 + P_4 + P_5} \\ H3 = & \frac{P_1 + P_2 + P_3}{P_4 + P_5}, \quad H4 = \frac{P_1 + P_2 + P_3 + P_4}{P_5} \end{aligned}$$

### 3.6. Basic Conclusions

In examining the relationship between income and subjective well-being, this paper divides the income variable into two measures, absolute income and relative income, and refers to the superiority and inferiority of the relative income index in previous studies, and finally chooses the most appropriate subjective judgment. The indicator uses an ordered logistic regression model to verify the extent to which the two measures of income each affect the subjective well-being of the resident by gradually adding absolute income and relative income variables to the model. Finally, using the gender variables of the individual's natural attributes will total The sample is divided into two subsamples for regression to explore the robustness of our conclusions. From the regression results, the following conclusions were drawn:

First, the focus of this paper is to study the effect of income variables on subjective well-being. Model 1 verifies the marginal impact of absolute income on subjective well-being in the context of control variables. It can be seen that absolute income does exist for subjective well-being. A certain positive impact, although the coefficient is not significant enough. After adding the relative income variable in Model 2, the relative income variable has a significant influence on subjective well-being, and the statistically significant coefficient is significantly stronger than the absolute income-subjective happiness coefficient. This shows that subjective well-being depends only to a low extent on the absolute value of income, and to a greater extent on the relative level of income at the local level, and that the relative level referred to here is not based on objective and de facto relative levels. It is the subjective judgment of residents on the relative level of their income. In fact, this conclusion is also a test of the theoretical conclusions of social comparison: although absolute income is indeed the economic basis for people to get happiness,

compared with the absolute amount of income earned, people are more concerned with others around them. The change in relative position under comparison.

Second, when we conducted the robustness test of the conclusions, we grouped the samples by gender. We can get a lot of interesting male and female similarities in subjective well-being from the regression results in Table 3-4. And the differences: (1) Both men and women regard the relative position of income as an important indicator when considering happiness, and relatively reduce the absolute value of income, but compared with men, absolute income starts from the consideration of women's happiness. It has played a certain role. (2) Health status, family relationship, social network, self-confidence, etc. play an important role in the self-evaluation of subjective well-being of both men and women. (3) The biggest difference between male and female in subjective well-being is the social status. The influence of social status on male happiness is significant, but the significant effect on female happiness is not statistically tested. This is basically in line with our usual cognition. Men will pay more attention to their careers, and they will pay more attention to their social status. Women are more focused on the family and put more thoughts on the internal affairs of the family. Therefore, the degree of significance of social status on the subjective well-being of men and women will be quite different.

#### **4. POLICY RECOMMENDATIONS TO ENHANCE CITIZENS' WELL-BEING**

With the development of happiness economics research and the widespread promotion of internationally promoted sustainable development theory, human society is at the heart of exploring a new development path. It coincides with the historical moment when China is in a period of economic transformation and building a well-off society in an all-round way and building a harmonious society. It has continuously introduced guidelines and policies for economic development and improvement of people's livelihood. Under such national conditions and the background of the times, the empirical research on the impact of the happiness of the residents in China's transition period not only has certain theoretical significance, but more importantly, it has certain reality for the government to formulate the policy objectives of improving residents' happiness and building a harmonious society. significance.

According to the relevant research conclusions of this paper, especially the conclusion that relative income has more significant impact on residents' happiness than absolute income, it can be introduced that social fairness plays an important role in improving residents' happiness, and thus some policy implications are obtained:

(1) Increasing income is still the main means to improve the quality of life of residents and improve their sense of well-being. Income has always been the most basic guarantee for the material conditions of residents. Only when the economy develops, per capita income rises, and the level of happiness of the whole nation can be further enhanced on this basis. Therefore, under the new normal, the government still has to work hard to find new economic growth points and keep the entire national economy at a medium and high speed. In combination with the main tasks of building a well-off society in an all-round way, special attention should be paid to the support of areas and people with poor conditions, weak foundations, and deeper poverty, and to achieve the goal of "two guarantees" for poverty alleviation. The "hematopoiesis" of poor households, which allows poor households to have stable income, is an effective way to increase the happiness of this type of residents.

(2) Optimize the income distribution system and narrow the income gap of residents. The data released in 2016 shows that China's Gini coefficient is 0.465, which is higher than the internationally recognized Gini coefficient standard, and there is an expanding trend, indicating that China's income gap is too large, and the disparity between the rich and the poor is serious. Combined with the research in this paper, since relative income is an important factor that can

affect citizens' happiness more than absolute income, then when formulating income distribution policy, under the premise that the initial distribution is played by the market mechanism, it is necessary to pay more attention to the government's income redistribution. The role of ensuring that the income gap is within reasonable limits. And on this basis, this paper proposes an innovative policy point of view, that is, the control of the income gap cannot implement unified standards across the country. After all, the development status and cost of living in different regions are different. The policy of "one size fits all" does not make the parties Are satisfied. Therefore, it is necessary to adjust the local conditions to make the income gap within a certain region and maintain a reasonable gap in the local area. According to the significant impact of relative income on the subjective well-being of residents, this method can achieve better results in improving citizens' happiness.

(3) Establish a fair and efficient social security system. The overall happiness of residents in Western countries is higher than ours. A large part of the reason is that Western countries have established a relatively complete social security system after more than 100 years of exploration and practice, whether it is rescue, insurance, welfare or Savings-type social security has given support to residents' income issues to a certain extent, alleviating social contradictions, safeguarding the basic life of the public and embodying social equity. Combining the great role of the social security system in Western countries on the improvement of residents' happiness, the enlightenment to China is: First, China should establish a basic social security system based on social insurance covering the whole society, to achieve social justice and promote social stability. The basic goal of achieving sustainable economic and social development. Second, establish a social security system that balances fairness and efficiency. Judging from the experience of social security development in western developed countries in recent years, the welfare-based social security model will cause social efficiency to be reduced, and the social security system will lose its economic support and will be difficult to sustain. At the same time, social security, as the main means of regulating social income gap and maintaining social equity and stability, is not only related to the level of economic development of the country, but also rigid, can only rise and not fall, and maintain a moderate level of social security. It is a long-term solution to coordinate development with the economy. At the same time, the issue of the disconnection of social security funds has been mentioned more frequently in recent years. Therefore, it is necessary to make rational use of social resources to participate in the construction of social security systems and improve the efficiency of social security management. Only in this way can we give full play to the important role of the social security system for the national economy and the people's livelihood. On the other hand, the transfer of fiscal policy must also be tilted towards the goal of maintaining overall social equity. "Good steel is used in the cutting edge", in order to achieve a greater increase in the level of citizen happiness with smaller government expenditures.

(4) Establish a sound medical insurance and public health policy. Since health is a significant factor affecting residents' happiness, in China's national conditions of accelerating aging, medical insurance will be a key factor in increasing residents' happiness, especially the happiness of the elderly. For the middle-aged and elderly groups, the establishment of a sound medical insurance system is an important means to improve the happiness of residents in addition to social pension insurance. The current overall income level and the level of medical conditions obtained by the elderly in China are not high, and their health status is not optimistic. As the proportion of the elderly population increases further, the government needs to pay more attention in this regard.

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