

Is Happiness Equal to Utility?

Beibei Shen^{1, a, *}

¹College of Economics, Jinan University, Guangzhou 510632, China

^aCorresponding author e-mail:229270944@qq.com

Abstract

Using panel data from Chinese General Social Survey (CGSS), this paper verifies that the variance of subject well being in different regions of China is high up to 23 percent. Further exploring indicate that the variance can not be explained by the offset effects of wage, rent and the expectation of higher social class, based on the spatial equilibrium theory framework. The reason of inter-region subject well being variance is up to be found.

Keywords

Happiness; utility; spatial equilibrium.

1. INTRODUCTION

There has been a long discussion about utility and happiness.

Bentham (1789) wrote: "Man is born to be governed by two masters, happiness and pain. It is they that tell us what we should do and also decide what we should do." Bentham believes that happiness is the goal and pursuit of people. The idea of a code of conduct had a profound impact on many 19th-century economists. For example, John Stuart Mill wrote: "The doctrine of the principle of maximum happiness is to be written into utility and morality. What makes people happier is right, and what makes people unhappy is wrong."

Some contemporary economics often confuses happiness with utility (Alesina, Di Tella, and MacCulloch, 2004), or at least with social welfare (Easterlin, 1995).

However, for nearly a century, mainstream economists have rarely equated happiness with utility. Fisher (1892) wrote: "Economists do not need to favor those who agree or disagree that happiness and suffering are the norms of people's behavior." Stigler (1950) wrote: "A major change that changed people's perceptions was the growing skepticism of hedonism in academia." Becker and Rayo (2008) wrote: "These examples show a different interpretation of happiness. Happiness is just a commodity in the utility function and it's no different from owning a car or staying healthy." One of the most powerful examples of supporting Becker and Rayo is the parents of young children in the family, whose subjective well-being is generally low (Baumeister, 1991). If utility and happiness are equal, then the birth of offspring will be a great punishment for parents, which is obviously not the case.

The main contribution of this article is to verify the relationship between happiness and utility by verifying whether there are differences in subjective well-being in various regions of China. At the same time, this difference is explained in the theoretical framework of spatial equilibrium (Rosen, 1976; Roback, 1982), and based on this, it is verified empirically that compensation effect can not be explained by wage and rent difference. We need to explore the in-depth reason of the variance of subject well being between regions of China.

The second part of the article is the source and description of the data. The third part is an empirical study of the differences in happiness in various regions of China. The fourth part is

the theoretical framework of spatial equilibrium and the effect of compensation. Section 6 is the conclusion.

2. DATA SOURCE AND DATA DESCRIPTION

The data used in this article are from the Chinese General Social Survey (CGSS). CGSS started in 2003 and is the earliest national, comprehensive and continuous academic survey project in China. The CGSS system comprehensively collects data from multiple levels of society, community, family, and individual, and summarizes the changing trend of society.

This article uses panel data from the China Comprehensive Social Survey 2003, 2008, 2011, and 2013 for research. These include individual subjective well-being, gender, age, ethnicity, education level, marital status, family income, personal annual income, perceptions and expectations of their own social grade and other project indicators.

3. DIFFERENCES IN HAPPINESS BY REGION

Subjective well-being comes from the answer to the question "Do you think your life is happy overall?" Among them, 1 is very unhappy, 2 is relatively unhappy, 3 is not happy or unhappy, 4 is relatively happy, and 5 is very happy. Table 1 shows the overall situation of the survey results.

It can be seen that more than half of the people are in a very happy or relatively happy state. However, the number of people who are relatively unhappy and very unhappy accounts for more than 20% of the total, which is a large proportion.

Table 1. Well-being distribution

	population	percentage
Very happy	3035	10.75%
relatively happy	12061	42.71%
not happy or unhappy	7102	25.15%
relatively unhappy	4365	15.46%
very unhappy	1675	5.93%
overall	28238	

Are there significant differences in happiness across regions? To answer this question, we make the following regression.

$$y_{ijt} = \alpha + x_{ijt}\beta + \gamma_t + \mu_j + \omega_{ij} \quad (1)$$

We estimate equation (1) at the individual level. The interpreted variables y_{ijt} represent the subjective happiness of the respondent, x_{ijt} represents the matrix of individual control variables, γ_t represents the time-fixed effect, μ_j represents the area-fixed utility, and ω_{ij} represents the random interference term. The regional variables include provinces and municipalities. Individual control variables include gender, age, whether they are Han nationality, 5 dummy variables that indicate education level, 3 dummy variables that indicate marital status, and whether the hukou has been transferred to a place of life. The regression results are as follows:

Table 2. Verification of regional differences

Explained variable	Subjective well-being	Subjective well-being	Subjective well-being
male	-0.0801125*** (0.0126755)	-0.08172559*** (0.01254063)	-0.0439795*** (0.0104794)
age	0.0091620*** (0.0004887)	0.00888163*** (0.00049146)	0.0020297*** (0.0004240)
Han nationality	-0.173297*** (0.0242266)	-0.18345043*** (0.0267028)	-0.1167657*** (0.0232741)
primary school	0.2836296*** (0.0188148)	0.26353314*** (0.01898665)	0.0644164*** (0.0170955)
junior high school	0.4076958*** (0.0193597)	0.38676594*** (0.01987402)	0.1031137*** (0.0183754)
High school	0.3660368*** (0.0194861)	0.36484373*** (0.02009195)	0.1501043*** (0.0181534)
University	0.4856657*** (0.0229342)	0.47638432*** (0.02405531)	0.1682469*** (0.0222754)
graduated	0.6369258*** (0.0852692)	0.61280194*** (0.08486951)	0.1304748 (0.0720394)
unmarried	-0.0267675 (0.0318347)	-0.01284046 (0.03162296)	0.0607555* (0.0306854)
married	-0.0899277** (0.0282988)	-0.08608995 (0.02792693)	0.0534924* (0.0234423)
divorced	-0.3266859*** (0.0557148)	-0.29849471*** (0.05500380)	-0.2108242*** (0.0459480)
Whether the account is relocated	-0.0178719 (0.014687)	-0.01461936 (0.01454778)	0.0137760 (0.0126969)
Time fixed utility	No	No	Yes
Regional fixed effect	No	No	Yes
R^2	0.03	0.03	0.006
F value	78.74	68.8892	14.1068
sample	28238	28238	28238

Note: The standard deviation is in parentheses. *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.01.

As can be seen from Table 2, males have significantly lower subjective well-being than females, and Han people have significantly lower happiness than ethnic minorities. Education can increase people's happiness, whether it is primary or undergraduate education. The divorced respondents' happiness decreased significantly.

To verify whether there are regional differences in happiness, we perform the following two-step test. First, the t-significance test is performed on the region's fixed effect coefficient in the regression, and the result is obtained that the region does affect the subjective well-being of the respondent. Secondly, calculate $sd(\hat{\mu}_j)$ and perform chi-square test on it to obtain the result that the standard deviation of the fixed effects in each region is significantly different from zero, that

is, there are indeed differences in subjective well-being in the regions. In fact, $sd(\hat{\mu}_j) = 0.2294$, which indicates that there are nearly 23% differences in subjective well-being in various regions. This difference is almost equivalent to the pain caused by divorce, and it is a difference that cannot be ignored.

Therefore, from the above empirical evidence, we can know that there are significant differences in subjective well-being in various places. In microeconomics theory, the preferred option can bring higher utility. If utility and happiness are equal, then why don't people in lower happiness areas migrate to higher happiness areas? So this difference can only be interpreted as happiness and utility are not equal. In other words, the pursuit of happiness can only be part of people's pursuit of utility.

4. UTILITY, HAPPINESS, AND SPATIAL EQUILIBRIUM

People do not seek happiness. Rosen (1976) and Roback (1982) proposed the concept of spatial equilibrium, which means that factors such as wages and prices will be adjusted so that there is no arbitrage opportunity in space. In other words, people can't improve their overall utility level by moving in space. People's current position is to maximize their utility.

In Roback's model, she elaborates the relationship between the attributes and wages of a region and the rent of a house in an equilibrium state through both consumers and producers. The following briefly describes this model:

Suppose that consumers and producers in all regions consume and produce only one kind of commodity X . The price of X is fixed in all regions and can be regarded as a monetary measurement. Let S be the livability index of each area, which can include temperature, precipitation, infrastructure construction, and population factors. It can change continuously in the interval (S_1, S_2) . L is for all land in a region, $L = l^c + l^p$, where l^c is the land used by consumers and the land used by producers.

consumer

The consumer's utility function is, under the budget constraint of. Among them is wages, non-professional income and has nothing to do with the area, is rent. The consumer's goals are:

$$\max U(x, l^c; s) \quad (2)$$

$$\text{s.t } w + I = x + l^c r$$

Solve the formula (2) to get the indirect utility function of the consumer:

$$V(w, r; s) = k \quad (3)$$

k is the level of utility under market equilibrium. Obviously, $\frac{\partial V}{\partial s} > 0$, because more livable areas must bring higher happiness and thus higher utility. Wages and rents must meet consumers' utility maximization goals, or consumers will have the willingness to migrate.

Producer

Assume that the producer has constant returns to scale, and its production function is $f(l^p, N; s)$, N is the total number of workers in a region, that is, all consumers. The producer obtains the unit cost function according to the cost minimization goal:

$$C(w, r; s) = 1 \tag{4}$$

Assume the unit cost is 1. According to the envelope theorem, $C_w = N/X$, $C_r = l^p/X$, C_w is a shorthand for $\partial C/\partial w$ and C_r is a shorthand for $\partial C/\partial r$. If the livable environment is not suitable for production, such as fresh air (manufacturers need to pay more for production with non-polluting technology), then $C_s < 0$.

Balanced

Given that and can be functions of. The combination of (3) and (4) can be solved as follows:

$$\begin{aligned} \frac{dr}{ds} &= \frac{C_w V_s - C_s V_w}{\Delta} \\ \frac{dw}{ds} &= \frac{C_s V_r - C_r V_s}{\Delta} \end{aligned} \tag{5}$$

Obviously, $C_w > 0$, $C_r > 0$, $V_w > 0$, $V_r < 0$, $V_s > 0$, $C_s > 0$. Where $\Delta = V_w C_r - V_r C_w$, according to Roy's identity, $\Delta = \frac{LV_w}{X} > 0$. So, $\frac{dw}{ds} < 0$, and the sign of $\frac{dr}{ds}$ depends on the relative strength between the degree of livability that increases the utility of the consumer and the cost that increases the producer.

According to this model, we can know that in areas where happiness is relatively lacking, consumers in that area will at least get more income. This effect can be called the make-up effect.

5. VERIFICATION OF MAKE-UP EFFECTS

Table 3.

Explained variable	Subjective well-being	Subjective well-being	Subjective well-being
<25000	-0.05505*** (0.01904)	-0.080057 *** (0.019208)	-0.11692578*** (0.01909707)
25000-50000	0.21992*** (0.02480)	0.195385*** (0.025737)	0.18808556*** (0.02575672)
50000-75000	0.39694*** (0.04911)	0.390625*** (0.049675)	0.42380724*** (0.04913288)
75000-100000	0.31044*** (0.05815)	0.327122*** (0.058578)	0.38866159*** (0.05803722)
100000-150000	0.54324 *** (0.12219)	0.560115*** (0.121067)	0.61819668*** (0.11890463)
>150000	0.33527*** (0.09813)	0.355339*** (0.098236)	0.4050852*** (0.0968179)
Individual control variable	No	Yes	Yes
Fixed effect	No	No	No
R^2	0.013	0.04	0.04
F vaule	50.12	57.55	51.77
Sample	22344	22344	22344

Note: The standard deviation is in parentheses. *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.01.

Therefore, we added 5 dummy variables about the income level of the respondent based on equation (1) to verify whether income will make up for happiness, that is, people would rather settle in cities with less happiness because they will be compensated by higher incomes. Since there is no data on personal annual income in the 2003 survey, we use data from 2008, 2011, and 2013 to stratify the respondents' income and express them in the form of dummy variables for verification. The results are shown in Table 3.

From the results in Table 3, it can be seen that, regardless of whether individual control variables or fixed effects are added, the effect of income on the subjective well-being of the households with annual income less than 25,000 is significantly negative, indicating a lower year income reduces subjective well-being of respondents. On the contrary, as income increases, the coefficient of the variable changes from negative to positive, and as income increases, the value of the positive coefficient also becomes larger. This leads to the conclusion that our argument is not only that income does not make up for the lack of happiness, but shows a positive correlation with happiness, that is, the subjective happiness of members of families with more income is higher. Of course, it can also be seen that after the year's income is greater than 150,000, the size of the coefficient decreases, which confirms the diminishing marginal income. In general, more income will have a positive correlation with people's subjective well-being, and the effect of too low income on the reduction of subjective well-being is significant.

In addition to income, housing is also an important factor, so based on Table 3, we add rent variables to verify whether lower subjective well-being will be compensated by lower rents. Since only rents reported by respondents in 2011, we used cross-section data from 2011 for regression. At the same time, standardize rents so that the mean is 0 and the standard deviation is 1 to make the results more reasonable.

The results are shown in Table 4.

Table 4.

Explained variable	Subjective well-being	Subjective well-being
House rental	0.04590 (0.03507)	0.02480 (0.03.783)
Individual control variable	No	Yes
R^2	0.0002	0.03
F value	1.713	1.751
sample	708	708

Note: The standard deviation is in parentheses. *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.01.

From Table 4, there is no significant relationship between rent and subjective well-being. Of course, even if owning a lower rent may lead to higher happiness, the quality of the house may be worse. In addition, too small a sample size also leads to unreliable regression results. Therefore, the compensatory relationship between house rent and subjective well-being is difficult to define.

We know that expectations for the future are important to many people, and sometimes people are willing to endure the current lack of happiness for such future expectations. For example, to live in a city where the living environment is not comfortable in order to obtain a

doctorate degree; to work in a first-tier city far from home in order to obtain more income to improve the future situation of the family or to seek career development and social improvement Wait.

We use data from 2011 and 2013 to verify this expected effect. This two-year questionnaire will ask respondents such questions: "What social class do you think you were 10 years ago?", "What social class do you think you are currently in?", "Do you think you are in 10 years?" What social class will be in the future? ".

Table 5.

Explained variable	Subjective well-being	Subjective well-being	Subjective well-being	Subjective well-being
Social class is higher	0.04062080** (0.01373700)	0.07140308*** (0.01425769)	0.02657878* (0.01385898)	0.0563502*** (0.0143934)
The expected social class is higher			0.10144483*** (0.01432719)	0.1015586*** (0.0143166)
Time-fixed effect	No	Yes	No	Yes
Regional fixed effect	Yes	Yes	Yes	Yes
R^2	0.02	0.02	0.02	0.02
F value	27.96	23.938	25.77	25.76
sample	16344	16344	16344	16344

Note: The standard deviation is in parentheses. *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.01.

From the results in Table 5, it can be seen that compared with 10 years ago, the current rise in social class will increase the happiness of the respondents. It is expected that the social rank will be improved after 10 years and it has a significant positive correlation with subjective well-being. The expectation of social grade improvement does not make up for the lack of happiness as expected. On the contrary, the positive correlation between the two shows that people with a higher sense of happiness have higher expectations of future social grade improvement. In order to make the results more reliable, we use whether we expect the future social rank to rise as the explanatory variable, and use the standardized annual personal income as the explanatory variable for regression. The results are shown in Table 6.

Table 6.

Explained variable	The expected social class is higher	The expected social class is higher
Income	-0.0098494* (0.0038935)	-0.00088754 (0.00397460)
fixed effect	No	Yes
R^2	0.09	0.09
F value	125.1	120.646
sample	16344	16344

Note: The standard deviation is in parentheses. *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.01.

From the first column of Table 6, it can be seen that the income level has a weak negative correlation with whether to expect future changes in social class, indicating that people with lower incomes may have more expectations for improvement in the future, which can to some extent As a compensation effect for the lack of happiness, people with lower incomes have lower subjective well-being and therefore have higher expectations for the future. However, in the second column of Table 6, when the fixed effect is added, the coefficient of income level is no longer significant, so the relationship between income and expectations for the future is not clear and cannot be used as valid evidence for the existence of a compensation effect.

6. CONCLUSION

Based on the empirical results from the CGSS's 2003, 2008, 2011, and 2013 data, we can draw the following two conclusions.

First of all, there are indeed significant differences in subjective well-being in various provinces in China. Under the theoretical framework of pursuing a spatial equilibrium that maximizes utility, this difference is a strong evidence to support a not directly equal relationship between subjective well-being and utility. In addition to happiness, many other factors such as family success, career development, life ideals, parenting, etc. can be counted as part of the utility.

Secondly, we did not find clear factors to compensate for the lack of happiness, such as higher incomes, lower rents, or higher expectations for social upgrading. So how should we explain this phenomenon? We should study its deeper level.

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