

Clemson University

**TigerPrints**

---

All Theses

Theses

---

5-2023

## An Economic Perspective On Self-reported Happiness In Taiwan

Shih Yu Sung

shihyus@clemson.edu

Follow this and additional works at: [https://tigerprints.clemson.edu/all\\_theses](https://tigerprints.clemson.edu/all_theses)



Part of the [Other Economics Commons](#)

---

### Recommended Citation

Sung, Shih Yu, "An Economic Perspective On Self-reported Happiness In Taiwan" (2023). *All Theses*. 3983.  
[https://tigerprints.clemson.edu/all\\_theses/3983](https://tigerprints.clemson.edu/all_theses/3983)

This Thesis is brought to you for free and open access by the Theses at TigerPrints. It has been accepted for inclusion in All Theses by an authorized administrator of TigerPrints. For more information, please contact [kokeefe@clemson.edu](mailto:kokeefe@clemson.edu).

AN ECONOMIC PERSPECTIVE ON SELF-REPORTED HAPPINESS IN TAIWAN

---

A Thesis  
Presented to  
the Graduate School of  
Clemson University

---

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts  
Economics

---

by  
Shih Yu Sung  
May 2023

---

Accepted by:  
Dr. Scott Templeton, Committee Chair  
Dr. Jorge Luis Garcia  
Dr. Robert Fleck

## ABSTRACT

Happiness research has become a topic of interest in recent years. The OECD's "Better Life Index," the U.N.'s "World Happiness Report," and Taiwan's "National Happiness Indicator" are examples of initiatives to understand better and evaluate the well-being of people. After the well-known "Easterlin Paradox" was proposed, more and more economists started researching the economics of happiness. Economists studied the relationship between reported happiness and income and the relationship between reported happiness and socioeconomic factors and demographic factors. In this study, I use data from the Taiwan Social Change Survey of 1995, 2000, 2005, 2010, and 2015 to analyze potential factors affecting or at least correlated with people's reported happiness. To analyze these factors, I estimate an ordered logit model with data on reported happiness. Being female, having a higher educational level, believing in Western Religion, having a higher income, and being a student are statistically significant and positively correlated with a higher likelihood of reporting being very happy. This result is consistent with the Easterlin paradox. At a point in time, individuals with higher incomes in Taiwan are more likely to report being very happy. Also, while the Taiwanese GDP doubled from 1995 to 2015, there was no noticeable increase in the likelihood of reporting being fairly happy or very happy.

Keywords: Self-reported happiness, Ordered Logit Model, Easterlin Paradox, Taiwan

## TABLE OF CONTENTS

	Page
<a href="#"><u>TITLE PAGE</u></a> .....	1
<a href="#"><u>ABSTRACT</u></a> .....	2
<a href="#"><u>LIST OF TABLES</u></a> .....	4
<a href="#"><u>LIST OF FIGURES</u></a> .....	5
1. <a href="#"><u>INTRODUCTION</u></a> .....	6
2. <a href="#"><u>LITERATURE REVIEW</u></a> .....	9
3. <a href="#"><u>DATA SOURCES AND VARIABLE DESCRIPTIONS</u></a> .....	12
4. <a href="#"><u>ECONOMETRIC MODEL</u></a> .....	17
5. <a href="#"><u>RESULTS</u></a> .....	19
6. <a href="#"><u>DISCUSSION</u></a> .....	20
7. <a href="#"><u>CONCLUSION</u></a> .....	24
8. <a href="#"><u>REFERENCE</u></a> .....	33

## LIST OF TABLES

Table	Page
<a href="#"><u>Table 1. Variable Names and Description</u></a> .....	26
<a href="#"><u>Table 2. Descriptive Statistics of Independent and Dependent Variables</u></a> .....	28
<a href="#"><u>Table 3. Ordered Logit Model of Self-reported Degrees of Happiness</u></a> .....	29
<a href="#"><u>Table 4. Mean effects of the Respondent's Probability of Self-reported Happiness.</u></a> .....	31
<a href="#"><u>Table 5. Comparison of Taiwanese GDP per capita and Chinese GDP per capita</u></a> .....	32

## LIST OF FIGURES

Figure	Page
<a href="#"><u>Figure 1. Distribution of self-reported happiness by income</u></a> .....	16
<a href="#"><u>Figure 2. Distribution of self-reported happiness by survey year</u></a> .....	16

## 1. INTRODUCTION

Happiness is a positive or pleasant emotion, ranging from contentment to intense joy, subjectively experienced as feelings of pleasure, contentment, and satisfaction and contributes to overall well-being and quality of life. Research about self-reported happiness can inform policies, promote individual and societal well-being, and help policymakers understand the impact of economic, social, and environmental factors.

After World War II, economist Richard Easterlin discovered a puzzling phenomenon regarding the relationship between income and self-reported happiness, known as the Easterlin Paradox. At a certain point in time, self-reported happiness varies directly with income, both among and within nations, but over time the long-term growth rates of self-reported happiness and income do not exhibit a significantly related (Easterlin, 1974, p.118). Since the introduction of the Easterlin Paradox, researchers have been striving to understand the underlying reasons behind this phenomenon and the intricate relationship between economic performance and self-reported reported happiness levels.

In the 1970s, former King of Bhutan, Jigme Singye Wangchuck first introduced the term "Gross National Happiness". As he said, "Gross National Happiness is more important than Gross Domestic Product." (Centre for Bhutan Studies and GNH, 2015). Since then, countries and international organizations have begun to pay more attention to measuring individual happiness.

In May 2011, the Organization for Economic Cooperation and Development (OECD) released the "OECD Better Life Index," the first internationally comparable indicator of well-being to be proposed. "Measuring what we produce through Gross Domestic Product (GDP) or Gross National Product (GNP) is still important for economic policy. But these indicators are insufficient to assess our people's well-being and progress." says Angel Gurría, Secretary General of the OECD (OECD Your Better Life Index, 2011). The OECD Better Life Index measures well-being, including all dimensions of quality of life, e.g., housing, income, work, community, education, civic engagement, health, and life satisfaction.

After the OECD began measuring well-being, the United Nations also took action to measure happiness. In July 2011, "the U.N. General Assembly adopted resolution 65/309 Happiness: Towards a Holistic Definition of Development, inviting member states to capture the happiness of their people and use the data to guide their public policies" (UN. General Assembly, 2011). In April 2012, the first World Happiness Report was released. It reviewed the state of happiness worldwide and showed how scientists explain the differences in self-reported happiness between individuals and countries (World Happiness Report, 2012). This is the first time the United Nations has used the term "happiness" as the theme of a report, and it aims to use the Happiness Index to examine the reported happiness of people in more than 150 countries. These trends indicate that governments have realized that GDP should not be the only



measure of citizen happiness. How reported happiness is measured and which topics should be included has become a hot topic among researchers. In Chapter 3 of the World Happiness Report 2022, Barrington-Leigh (2022) discusses an increasing trend of published academic papers on self-reported happiness.

Following the structure and statistical methodology of the OECD's Better Life Index, Taiwan completed its first National Happiness Indicator in 2013 (Department of Statistics, Directorate General of Budget, Accounting Statistics(DGBAS), 2013). The National Well-being Indicators in R.O.C Taiwan are based on the following indicators that provide a macro perspective on the subjective well-being of Taiwanese: housing conditions, income and wealth, work and income, social relations, education and skills, environmental quality, civic engagement and governance, health status, principal well-being, personal security, and work-life balance.

This study examines whether the self-reported happiness of Taiwanese citizens has changed after a series of major events by analyzing data over a longer time, from 1995 to 2015. For example, the first direct presidential election in 1996, the Taiwan Strait Crisis in 1996, the first political party change in 2000, the joining of the World Trade Organization in 2002, and the second political party change in 2008. This study looks at economic and demographic factors like income, employment, education, and marital status, as well people's national identity, to find out what might influence their reported happiness levels.

## 2. LITERATURE REVIEW

### *Income*

Easterlin observed a paradoxical relationship between individual income and happiness in the 1970s. Within a given country, individuals with higher incomes tend to report higher levels of happiness compared to those with lower incomes. However, the correlation between individual income and reported happiness does not exist if one examines the two variables across countries or over time within a country (Easterlin, 1974, p.118). The idea that higher individual income is associated with higher reported happiness or subjective well-being is supported by much research (e.g., Blanchflower and Oswald, 2004; Di Tella et al., 2003; Frey and Stutzer, 2000). However, contrary to the second part of Easterlin's results, a positive correlation between income and reported happiness exists across countries (Stevenson and Wolfers, 2013). Furthermore, although some evidence is consistent with Easterlin's result of a small positive correlation between higher income and higher reported happiness within a country across time (e.g., Oswald, 1997; Blanchflower and Oswald, 2004), other evidence is not consistent (e.g., Stevenson and Wolfers 2013). Finally, in addition to Easterlin's paradox and subsequent evidence for and against it, other factors, in addition to individual income, also affect or at least correlate with reported happiness.

### *Gender, Age, Religious Affiliation, and Marital Status*

Women report being slightly happier than men in some studies (e.g., Argyle, 1987; Frey and Stutzer, 2002) but not happier than men in other studies (e.g., Krueger, 2007; Stevenson and Wolfers, 2009). Reported happiness or life satisfaction follows a U shape with age, i.e., young adults and older adults report being happier than middle-aged adults (Blanchflower and Oswald, 2004; Blanchflower and Oswald, 2008). Easterlin, however, finds that reported happiness follows an inverse U shape with age, i.e., an individual's reported happiness increases moderately from age 18 to middle age and then decreases (Easterlin, 2006). Regular participation in church activities has distinct and positive impacts on reported life satisfaction, with these effects being consistent across all major faiths (Helliwell, 2003). Married people report being happier than single people. (e.g., Oswald, 1997; Stutzer and Oswald 2000; Helliwell, 2003).

### ***Educational level***

Research findings on the relationship between education and reported subjective well-being are mixed. Some researchers find a positive relationship (Blanchflower and Oswald, 2004; Di Tella et al., 2003; Tao and Chiu, 2009).

### ***Employment Status***

People do not like unemployment. Being jobless is negatively correlated with reported well-being. The unemployment result is the pure effect, while the income loss and other effects are constant (Clark and Oswald, 1994, p. 655). Another astonishing result is that even if a person

himself is not unemployed, he still reports being unhappy about unemployment (Tella et al., 2001, p. 812). A possible explanation is that people don't like recession, which causes large-scale unemployment. So, people report being unhappy even if he is not unemployed.

### *National Identity*

Some researchers argue that strong national identity increases reported happiness (Morrison et al., 2011), while others argue that a stronger national identity does not increase reported happiness (Grozdanovska, 2016).

### 3. DATA SOURCES AND VARIABLE DESCRIPTION

The data for this study were obtained from the Taiwan Social Change Survey (TWCS) conducted by the Institute of Sociology, Academia Sinica. The TWCS was initiated in 1983 by the Humanities and Social Sciences Development Division of the National Science Council, Executive Yuan, and was planned and conducted by researchers in the social sciences. The survey's main purpose is to collect data through a sample survey for academic research and analysis on social change. The basic design of the survey is based on the principle of a five-year interval, and the survey is conducted over time to collect data for comparative analysis at more than two points in time and to achieve the important goal of exploring social change.

In this study, I used "the 1995 Taiwan Social Change Survey (Round 3, Year 1)", "the 2000 Taiwan Social Change Survey (Round 4, Year 1)", "the 2005 Taiwan Social Change Survey (Round 5, Year 1)", "the 2010 Taiwan Social Change Survey (Round 6, Year 1)", and "the 2015 Taiwan Social Change Survey (Round 7, (7th round, 1st year)". These five surveys were face-to-face interviews. Except for the 2015 survey, which was conducted from early August to early November, all other surveys were conducted from early July to mid-September. The sample population was all Taiwanese citizens aged 20 to 75 for the 1995 survey, all Taiwanese citizens at least 20 for the 2000 survey, and all Taiwanese citizens aged 18 or older for the post-2000 surveys. The sampling method was a stratified multi-stage probability of proportional size

(P.P.S.), with samples gradually drawn from city or county to village to person. The samples are representative. The total sample size of the original data was 10,128 persons. After removing missing values and unclassifiable responses, the total sample size of the remaining data was 8281.

Categorical responses to the question are the data source for the dependent variable in this study. The question is, "Taking all things together, how happy would you say you are recently?" However, this question's choices varied across five years of surveys. In 1995 and 2000 surveys, the choices are 1) very happy, 2) fairly happy, and 3) fairly unhappy. In the 2005 and 2015 surveys, the choices are 1) very happy, 2) fairly happy, 3) fairly unhappy, and 4) very unhappy. I combined responses 3) fairly unhappy and 4) very unhappy into unhappy in the 2005 and 2015 surveys. In the 2010 survey, the choices are: 1) very happy, 2) fairly happy, 3) neither happy nor unhappy, 4) fairly unhappy, and 5) very unhappy. In the 2010 survey, I combined responses 4) fairly unhappy and 5) very unhappy into an unhappy category and randomly assigned 3) neither happy nor unhappy into fairly happy or unhappy categories.

The educational level variable is determined by the respondent's highest completed level of education. There are six categories within this variable: ELEMENT (Elementary School), JUNIORHIGH (Junior High School), SENIORHIGH (Senior High School), JUNIORCOLL (Junior College), COLLEGE (College), and POSTGRAD (Graduate School). ELEMENT

represents that a respondent has completed six years of education at an elementary school. , Junior High School represents nine years of formal education, and Senior High School represents twelve years of formal education. A junior college degree typically requires two additional years of formal education after completing senior high school. A degree is earned upon completing Junior College, College, or Graduate School.

Five variables indicate a respondent's religious belief: BUDDHISM, TAOISM, FOLKRELI, WESTERNRELI, and NORELI. A respondent who believes Yiguan Dao, Xuanyuanjiao, or Cihui Tang is categorized as FOLKRELI. WESTERNRELI indicates that a respondent believes in Catholicism, Protestant Christianity, or Islam. NORELI indicates no religious belief.

The country identity variable is divided into three categories: TAIWANESE (Taiwanese), CHINESE (Chinese), and MIXCNTW (a Mix of Taiwanese and Chinese). A respondent who identifies themselves as Taiwanese is categorized as TAIWANESE. A respondent who identifies themselves as Chinese is categorized as CHINESE. A respondent identifying as Taiwanese and Chinese or Chinese and Taiwanese is categorized as MIXCNTW. Note that all the respondents are Taiwanese citizens. Those identifying as Chinese might be migrants or their offspring from Mainland China after 1945.

The income variable contains 12 categories (NOINCOME to INCOME11) that represent

respondents' monthly income ranges in NTD (New Taiwan Dollars) (see Table 1). Each variable is assigned a value of 1 if the respondent's monthly income falls within a specific range. For instance, if the respondent's monthly income is between 0 NTD to 9,999 NTD, the variable INCOME1 is assigned a value of 1. Similarly, if the respondent's monthly income is higher than 100,000 NTD, the variable INCOME11 is assigned a value of 1.

Figure 1 shows the distribution of self-reported happiness by income. We can tell that the fraction of reports being unhappy decreases as income goes up. Also, the fraction of reports being very happy in the highest income group (>80,000 NTD) is larger than in other groups. Figure 2 shows the distribution of self-reported happiness by survey year. We cannot tell if there is a significant change in self-reported happiness over time.



Figure 1. Distribution of self-reported happiness by income

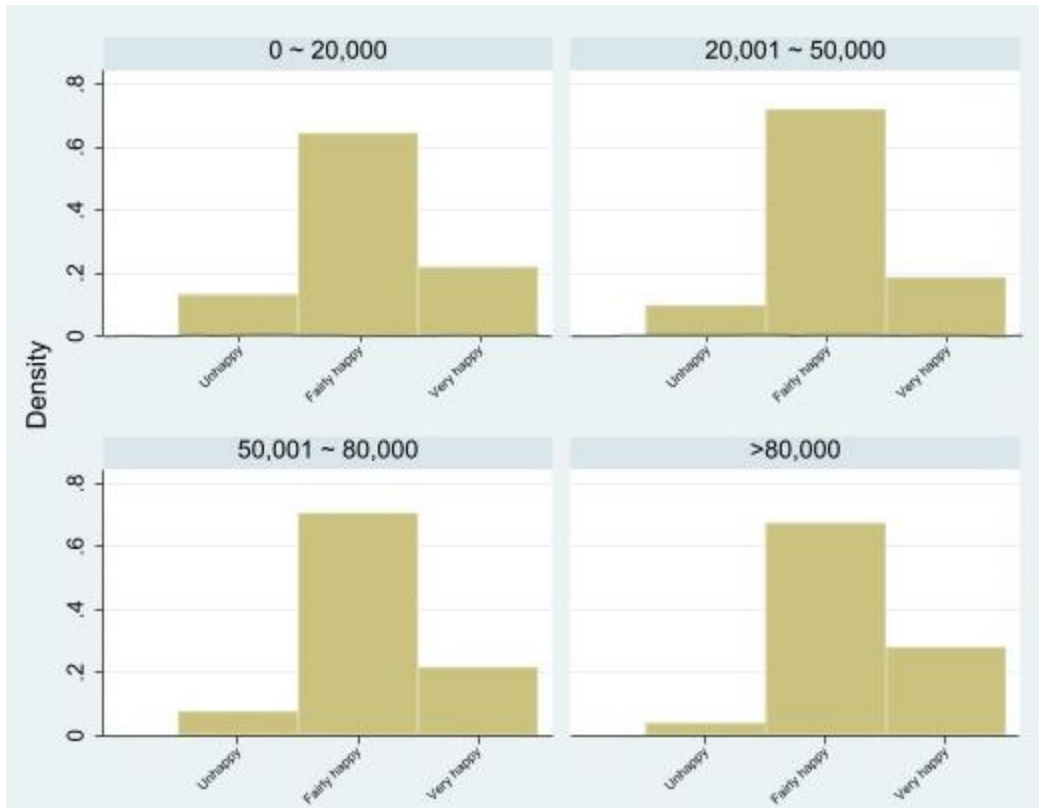
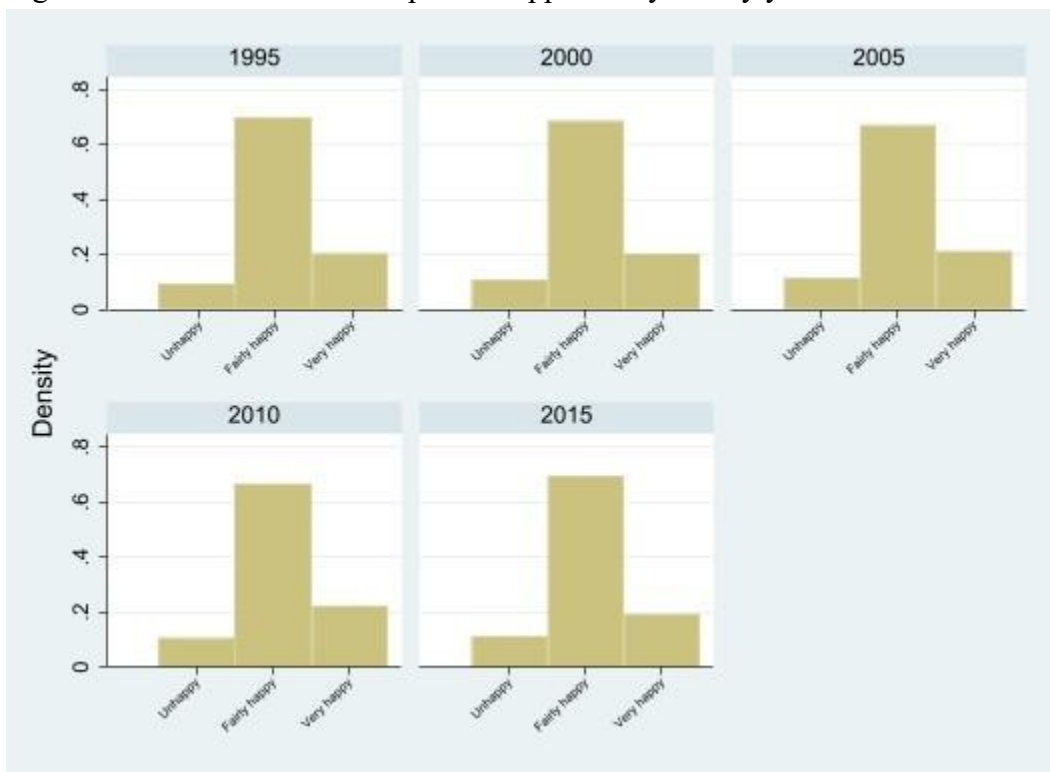


Figure 2. Distribution of self-reported happiness by survey year



#### 4. ECONOMETRIC MODEL

##### *Ordered logistic regression*

I choose to use ordered logistic regression because the dependent variable is categorical and ordered, and the order has intrinsic meaning. The dependent variable of the dataset is VHAPPY, which has three ranked orders— UNHAPPY (Very unhappy or fairly unhappy), FHAPPY (Fairly happy), and VHAPPY (Very happy).

For my model, let  $Y$  be an ordered response taking on the values  $\{1, 2, \text{ and } 3\}$ . The ordered logit model for  $y$  can be derived from a latent variable model. Assume the latent variable  $Y^*$  is determined by

$$Y_i^* = X_i\beta + \varepsilon_i, \varepsilon_i \sim \text{Logistic}(0, 1)$$

Where the latent variable,  $Y^*$ , is unmeasured, but we can estimate the probability of  $Y^*$  by observing  $Y_i$ . The  $1 \times 32$  vector  $X_i$  consists of 30 characteristics of respondents and two number ones. The  $32 \times 1$  vector  $\beta$  consists of 30 parametric effects of the characteristics of reported happiness and two constant  $c_1$  and  $c_2$ , called cutoffs. The  $\varepsilon_i$  is the unknown term that includes other unobserved factors.

In the model, the respondent  $r$  is, respectively, 1) unhappy or fairly unhappy, 2) fairly happy, or 3) very happy with the survey question about how happy the respondents are recently. Because ( $Y^*$ ) is unmeasured, we observe that

$$Y_i = 1 \text{ if } Y_i^* \leq c_1$$

$$Y_i = 2 \text{ if } c_1 \leq Y_i^* \leq c_2$$

$$Y_i = 3 \text{ if } Y_i^* \geq c_2$$

Where the cutoffs  $c_1$  and  $c_2$  are unknown parameters, we cannot observe them from the dataset. They are estimated simultaneously with  $\beta$  in the model. By using cutoffs  $c_1$  and  $c_2$ , we can measure the probability distribution

$$P_{Y1_r} = \Pr(Y1_r = 1) = \frac{1}{1 + \exp(X_r\beta - c_1)}$$

$$P_{Y2_r} = \Pr(Y2_r = 1) = \frac{1}{1 + \exp(X_r\beta - c_2)} - \frac{1}{1 + \exp(X_r\beta - c_1)}$$

$$P_{Y3_r} = \Pr(Y3_r = 1) = 1 - \frac{1}{1 + \exp(X_r\beta - c_2)}$$

The unconstrained likelihood function is

$$L_Y = \prod_{r=1}^{8128} (P_{Y1_r})^{Y1_r} (P_{Y2_r})^{Y2_r} (P_{Y3_r})^{Y3_r}$$

The discrete effect of the  $k$ th indicator variable on the estimated probability that respondent  $r$  indicates that the respondent is happy is

$$\hat{P}_{Y1_r}^k - \hat{P}_{Y1_r}^{\sim k} = \frac{1}{1 + \exp(X_r^{\sim k} \hat{\beta}^{\sim k} + \hat{\beta}_k - c_1)} - \frac{1}{1 + \exp(X_r^{\sim k} \hat{\beta}^{\sim k} - c_1)}$$

$$\text{The Scaled } R^2 = 1 - \left(\frac{\ln L_u}{\ln L_c}\right)^{-\left(\frac{2}{N}\right) \ln L_c} = 0.0326$$

Standard errors are clustered by the zip codes since some unobserved effects of zip codes affect reported happiness, e.g., newer buildings, safer neighborhoods, better scenery, etc.

## 5. RESULTS

The parameter estimates, standard errors, z statistics, and p values for the variables of the ordered logistic model of the probability that a respondent is happy or not are presented in Table 3. The scaled  $R^2$  is 0.0326. These variables examine the effects of different characteristics on Taiwanese citizens. Most of the characteristics of the respondent significantly affect their probability of reporting being very happy, fairly happy, or unhappy, except for some religious beliefs (BUDDISOM and TAOISM), country identity, NOINCOME, some employment status (RETIREE and HOMEMAKER), and all survey years except for 2015.

The mean effect of the probability that a respondent reports being very happy is 6.9 percentage points more if they have a graduate degree. The mean effect of the probability that a respondent reports being very happy is 6.1 percentage points more if their average monthly income ranges from 10,000 NTD to 19,999 NTD. The probability is 19.5 percentage points more if their average monthly income is more than 100,000 NTD.

## 6. DISCUSSION

Although statistically significant results were obtained in my study, identification and comparison of the relative happiness of two groups of people can only be valid under restrictive assumptions about the data on their reported happiness, assumptions that are unlikely to hold (Bond and Lang, 2019). The interpretation of results from this study's estimated ordered logit model is accurate for only certain particular cardinalization of reported happiness.

In Taiwan, males are more likely to report being unhappy or unhappy and less likely to report being happy (Table 4). A possible interpretation is that males are trained to show a tough image and suppress their feelings when distressed (Bem, 1975). Males might also refrain from seeking when they need it (Lu, 1995). Due to these reasons, males are more likely to feel pressured and more likely to report being unhappy.

Young adults and elders are more likely to report being happy than middle-aged people (Table 3). This result of reported happiness being U-shaped through life is consistent with the literature (e.g., Blanchflower and Oswald, 2008). A possible explanation for this is that middle-aged people in Taiwan face the most pressure from the workplace (Cheng, 2001) while carrying the responsibility for raising their children and caring for their parents (Lin, 2003). All of these reasons result in that middle-aged people are the least group to report being fairly happy to very happy.

People with higher educational levels are likelier to report being very happy and less likely to report being unhappy (Table 4). The result shows an increasing trend of reported happiness when educational level increases, except for junior college, where the reported happiness is slightly less than in senior high school. Research has shown that individuals with higher educational levels in Taiwan are more favored and respected (Tsai and Shavit, 2007). Moreover, studies suggest that those with higher education tend to be more satisfied with various life domains (Nicolaev, 2018). This satisfaction could be attributed to the increased opportunities, respect, and social standing that higher education affords them, which may lead to fewer difficulties and challenges. Consequently, with fewer difficulties and greater satisfaction in multiple aspects of their lives, people with higher education are more likely to experience happiness.

In Taiwan, people who believe in Western religions and Buddhism are more likely to report being very happy and less likely to report being very unhappy or unhappy compared to people who have no religious beliefs (Table 4). People who believe in Taoism and Folk Religion are less likely to report being happy than people with no religious beliefs. The results of Buddhism and Folk Religion are not statistically significant. Previous studies have shown that religious involvement and subject well-being are positively correlated (Helliwell, 2003; Lelkes, 2006).

People who identify themselves as Chinese or mixed Taiwanese Chinese are less likely to

report being very happy than those who identify as Taiwanese. However, the results are not statistically significant (Table 3). My interpretation is that while being a Taiwanese citizens, those who identify as Chinese might think they are Chinese citizens, so they might feel they don't belong in this place.

People with higher incomes are likelier to report being very happy and less likely to report being unhappy (Table 4). This result is consistent with many other researchers (Di Tella et al., 2003; Blanchflower and Oswald, 2004; Frey & Stutzer, 2000). This result is also similar to the Easterlin paradox. At a point in time, individuals with higher incomes in Taiwan are more likely to report being very happy. Also, while the Taiwanese GDP doubled from 1995 to 2015 (Table 5), there was no noticeable increase in the likelihood of reporting being fairly happy or very happy. A simple interpretation is that higher income allows an individual to consume more goods and services so that more desires can be fulfilled.

An unemployed person is less likely to report being very happy and more likely to report being very unhappy or unhappy than an employed person (Table 4). A student, a homemaker, and a retiree have a higher chance to report being very happy than an employed person (Table 4). However, the result of the homemaker and the retiree is not statistically significant (Table 3). A possible interpretation for the reported unhappiness of unemployment is that unemployment lowers overall satisfaction with life (Gerlach and Stephan, 1996; Winkelmann and Winkelmann,

1998). In Taiwan, an unemployed person is more or less treated differently by their family or friends, so they feel more pressure than those with a job. A possible interpretation for the reported happiness of students, homemakers, and retirees is that those people have less pressure than people who have to work.

Married people are more likely to report being very happy and less likely to report being very unhappy or unhappy (Table 4). This result is similar to what other researchers have found (e.g., Stack, S., and Eshleman, J. R. 1998; Orden, S. R., and Bradburn, N. M. 1968).

People are less likely to report being very happy and more likely to report being very unhappy or unhappy over time (Table 4). However, the only statistically significant result is the year variable 2015 (Table 3). This result is consistent with the Easterlin Paradox that the growth of self-reported happiness does not accompany economic growth over time. The real GDP per capita in Taiwan doubled from 1995 to 2015 (Table 5), while the reported happiness of Taiwanese people did not grow. A possible explanation for this result is that people in Taiwan feel threatened by fast-growing China. While the real GDP per capita in Taiwan doubled from 1995 to 2015, the real GDP per capita in China in 2015 is five times greater than the real GDP per capita in China in 1995 (Table 5). The faster income growth of the hostile neighboring country offsets the joy of income growth.



## 7. CONCLUSION

People in Taiwan with higher incomes are likelier to report being very happy, holding other variables constant. Also, there is no noticeable relationship between the time variable and self-reported happiness. These results are similar to Easterlin's results. Moreover, other characteristics of people in Taiwan are also statistically significant and positively correlated with reporting to be very happy: being a female, being a young adult or an elder, having a higher educational level, believing in Western religion, and being a student, employed, or married. The following characteristics of people in Taiwan are positively correlated with reporting being fairly unhappy or very unhappy: being a male, believing in folk religion, and being unemployed. However, my analysis did not find a statistically significant relationship between national identity and self-reported happiness.

The nature of the data limits this study. The wording of the survey questions should be consistent over time to enhance the comparability of reported happiness over time. Also, according to Bond and Lang, comparing the relative happiness of two groups of people can only be valid under restrictive assumptions about the data on their reported happiness. This makes the comparison of happiness extremely difficult. Also, we cannot compare one person's reported happiness to another, nor do we know if people's understanding of "very happy," "fairly happy,"

or “unhappy” stay constant over time within themselves. Thus, we must take great care in interpreting my results.

Future researchers could further explore the underlying mechanisms that explain why certain individual characteristics influence self-reported happiness. For example, studies have found that marital status and higher levels of education are positively associated with a higher likelihood of reporting to be very happy. However, the reasons behind these associations are not fully understood. Therefore, future studies could investigate whether social support, economic resources, or psychological well-being mediate these relationships. Therefore, future research could examine the complex interplay between these factors and their effects on self-reported happiness.

Table 1. Variable Names and Description

Name	Description
VHAPPY	= 1 if the respondent reports being very happy
FHAPPY	= 1 if the respondent reports being fairly happy
UNHAPPY	= 1 if the respondent reports being fairly unhappy or very unhappy
INCOME1	= 1 if respondent's monthly income is between 1 NTD to 9,999 NTD
INCOME2	= 1 if respondent's monthly income is between 10,000 NTD to 19,999 NTD
INCOME3	= 1 if respondent's monthly income is between 20,000 NTD to 29,999 NTD
INCOME4	= 1 if respondent's monthly income is between 30,000 NTD to 39,999 NTD
INCOME5	= 1 if respondent's monthly income is between 40,000 NTD to 49,999 NTD
INCOME6	= 1 if respondent's monthly income is between 50,000 NTD to 59,999 NTD
INCOME7	= 1 if respondent's monthly income is between 60,000 NTD to 69,999 NTD
INCOME8	= 1 if respondent's monthly income is between 70,000 NTD to 79,999 NTD
INCOME9	= 1 if respondent's monthly income is between 80,000 NTD to 89,999 NTD
INCOME10	= 1 if respondent's monthly income is between 90,000 NTD to 99,999 NTD
INCOME11	= 1 if respondent's monthly income is higher than 100,000 NTD
NOINCOME	= 1 if respondent's monthly income is zero
ELEMENT	= 1 if the respondent completes six years of elementary-school education
JUNIORHIGH	= 1 if the respondent completes nine years of education through junior high
SENIORHIGH	= 1 if the respondent completes senior high school education (twelve years)
JUNIORCOLL	= 1 if the respondent's highest degree is from a junior college
COLLEGE	= 1 if the respondent's highest degree is from a four-year college
POSTGRAD	= 1 if the respondent's highest degree is a postgraduate degree

*Descriptive statistics are continued on the next page.*

*Note:* The exchange rate of NTD (New Taiwan Dollar) to USD (U.S. Dollar) has varied over the years, with an average of around 30 NTD to 1 USD. Retrieved from <https://www.ceicdata.com/en/indicator/taiwan/exchange-rate-against-usd>

Table 1. Variable Names and Description (*continued*)

Variables	Description and definition
AGE	The respondent's age (years)
MALE	= 1 if respondent is male
BUDDHISM	= 1 if respondent's religious belief is Buddhism
TAOISM	= 1 if respondent's religious belief is Taoism
FOLKRELI	= 1 if respondent's religious belief is folk religion
WESTERNRELI	= 1 if respondent's religious belief is Christianity and Islam
NORELI	= 1 if respondent has no religious belief
CHINESE	= 1 if respondent identifies as Chinese
MIXCNTW	= 1 if respondent identifies as Chinese and Taiwanese or Taiwanese and Chinese
TAIWANESE	= 1 if respondent identifies as Taiwanese
STUDENT	= 1 if respondent is a student
RETIRED	= 1 if respondent is retired
HOMEMAKER	= 1 if respondent is a homemaker
UNEMPLOYED	= 1 if respondent is unemployed at the time of the survey
EMPLOYED	= 1 if respondent is employed at the time of the survey
MARRIED	= 1 if respondent is married or cohabiting
NOT MARRIED	= 1 if respondent is single, separated, or the spouse passed away
SURVEY95	= 1 if the survey was taken in 1995
SURVEY00	= 1 if the survey was taken in 2000
SURVEY05	= 1 if the survey was taken in 2005
SURVEY10	= 1 if the survey was taken in 2010
SURVEY15	= 1 if the survey was taken in 2015

Table 2. Descriptive Statistics of Independent and Dependent Variables (n = 8281)

Variables	Sample Mean (Standard Deviation)	Variables	Sample Mean
VHAPPY	0.106	MALE	0.520
FHAPPY	0.683	FEMALE	0.480
UNHAPPY	0.211	BUDDHISM	0.238
INCOME1	0.084	TAOISM	0.157
INCOME2	0.123	FOLKRELI	0.356
INCOME3	0.158	WESTERNRELI	0.053
INCOME4	0.139	NORELI	0.197
INCOME5	0.100	CHINESE	0.083
INCOME6	0.071	MIXCNTW	0.362
INCOME7	0.038	TAIWANESE	0.556
INCOME8	0.021	EMPLOYED	0.709
INCOME9	0.012	STUDENT	0.089
INCOME10	0.015	RETIREE	0.033
INCOME11	0.028	HOMEMAKER	0.118
NOINCOME	0.211	UNEMPLOYED	0.051
ELEMENT	0.240	MARRIED	0.655
JUNIORHIGH	0.133	NOT MARRIED	0.345
SENIORHIGH	0.285	SURVEY95	0.217
JUNIORCOLL	0.141	SURVEY00	0.216
COLLEGE	0.161	SURVEY05	0.230
POSTGRAD	0.040	SURVEY10	0.194
AGE	44.099 (15.439)	SURVEY15	0.143

Table 3. Ordered Logit Model (n = 8281) of Self-reported Degrees of Happiness

Variable	Parameter estimate	Standard error	z statistic	Two-sided p-value
INCOME2 (10,000 – 19,999)	0.384	0.118	3.24	0.001
INCOME3 (20,000 – 29,999)	0.247	0.124	1.99	0.047
INCOME4 (30,000 – 39,999)	0.361	0.126	2.85	0.004
INCOME5 (40,000 – 49,999)	0.412	0.122	3.38	0.001
INCOME6 (50,000 – 59,999)	0.417	0.141	2.95	0.003
INCOME7 (60,000 – 69,999)	0.600	0.158	3.81	0.000
INCOME8 (70,000 – 79,999)	0.658	0.180	3.66	0.000
INCOME9 (80,000 – 89,999)	0.651	0.240	2.72	0.007
INCOME10 (90,000 – 99,999)	0.907	0.189	4.79	0.000
INCOME11 (>100,000)	1.035	0.149	6.94	0.000
NOINCOME (0)	0.214	0.125	1.72	0.086
JUNIORHIGH	0.263	0.095	2.77	0.006
SENIORHIGH	0.318	0.088	3.57	0.000
JUNIORCOLL	0.295	0.095	3.10	0.002
COLLEGE	0.353	0.101	3.51	0.000
POSTGRAD	0.428	0.123	3.48	0.000

*continued on the next page*

Table 3. Ordered logit model (n = 8281) of reported degrees of happiness (*continued*)

Variable	Parameter estimate	Standard error	z statistic	Two-sided p-value
MALE	-0.282	0.055	-5.17	0.000
AGE	-0.065	0.012	-5.48	0.000
AGESQ	0.001	0.000	5.86	0.000
BUDDHISM	0.040	0.077	0.52	0.600
TAOISM	-0.029	0.085	-0.35	0.729
FOLKRELI	-0.146	0.067	-2.16	0.031
WESTERNRELI	0.328	0.108	3.05	0.002
CHINESE	-0.127	0.093	-1.37	0.172
MIXCNTW	-0.002	0.050	-0.03	0.972
RETIRED	0.171	0.143	1.20	0.231
STUDENT	0.552	0.153	3.61	0.000
HOMEMAKER	0.029	0.119	0.24	0.810
UNEMPLOYED	-0.448	0.140	-3.19	0.001
MARRIED	0.394	0.063	6.22	0.000
SURVEY00	-0.081	0.084	-0.96	0.336
SURVEY05	-0.107	0.084	-1.26	0.207
SURVEY10	-0.049	0.089	-0.06	0.585
SRUVEY15	-0.219	0.105	-2.08	0.038
Cutoff 1	-2.881	0.294		
Cutoff 2	0.671	0.295		

Table 4. Mean effects (n = 8281) of the Respondent's Probability of Self-reported Happiness.

1) Very unhappy or fairly unhappy, 2) Fairly happy, or 3) Very happy.

Variable (k)	$\overline{\hat{P}}_1^k - \overline{\hat{P}}_1^{\sim k}$	$\overline{\hat{P}}_2^k - \overline{\hat{P}}_2^{\sim k}$	$\overline{\hat{P}}_3^k - \overline{\hat{P}}_3^{\sim k}$
MALE	0.034	0.002	-0.036
JUNIORHIGH	-0.026	-0.014	0.040
POSTGRAD	-0.039	-0.030	0.069
FOLKRELI	0.015	0.006	-0.021
WESTERNRELI	-0.031	-0.020	0.051
INCOME2 (10,000 – 19,999)	-0.036	-0.025	0.061
INCOME11 (>100,000)	-0.075	-0.120	0.195
STUDENT	-0.048	-0.044	0.092
UNEMPLOYED	0.057	-0.003	-0.054
MARRIAGE	-0.049	0.001	0.048
SURVEY15	0.026	0.003	-0.029



Table 5. Comparison of Taiwanese GDP per capita and Chinese GDP per capita.

Year	Taiwanese GDP per capita, constant price (P.P.P.; 2011 international dollar)	Chinese GDP per capita, constant price (P.P.P.; 2011 international dollar)
1995	21,307.32	2,535.85
1996	22,446.54	2,758.03
1997	23,580.58	2,981.63
1998	24,365.38	3,184.96
1999	25,809.22	3,402.25
2000	27,239.09	3,664.33
2001	26,741.17	3,942.99
2002	28,087.46	4,275.99
2003	29,136.44	4,676.18
2004	30,916.39	5,120.75
2005	32,474.47	5,669.23
2006	34,141.51	6,356.77
2007	36,236.87	7,225.38
2008	36,367.41	7,882.51
2009	35,669.56	8,581.70
2010	39,389.44	9,442.82
2011	40,777.49	10,290.47
2012	41,456.76	11,048.56
2013	42,265.23	11,851.87
2014	43,851.73	12,651.05
2015	44,095.60	13,457.07

Source: International Monetary Fund. Retrieved from

<https://www.imf.org/external/datamapper/NGDPDPC@WEO/OEMDC/ADVEC/WEOWORLD/CHN/TWN>

## 8. REFERENCES

- Argyle, M. (1987). *The psychology of happiness*. Methuen.
- Barrington-Leigh, C. P. (2022). Trends in conceptions of progress and well-being. In J. F. Helliwell, R. Layard, J. D. Sachs, J.-E. De Neve, L. B. Aknin, & S. Wang (Eds.), *World Happiness Report 2022 (Chapter 3)*. New York: Sustainable Development Solutions Network.
- Bem, S. L., & Lewis, S. A. (1975). Sex role adaptability: One consequence of psychological androgyny. *Journal of Personality and Social Psychology*, 31(4), 634–643.
- Blanchflower, D., & Oswald, A. (2004). Well-being over time in Britain and the U.S.A. *Journal of Public Economics*, 88, 1359-1386.
- Bond, T. N., & Lang, K. (2019). The Sad Truth about Happiness Scales. *Journal of Political Economy*, 127(4), 1-32.
- Centre for Bhutan Studies and GNH. (2015). Press Release. Retrieved from <http://www.grossnationalhappiness.com/conference/2015-gnh-conference/press-release/>
- Cheng, Yawen et al. (2001). “A National Survey of Psychosocial Job Stressors and Their Implications for Health Among Working People in Taiwan.” *International Archives of Occupational and Environmental Health*, vol. 74, no. 7, pp. 495–504,
- Chiu, Hei-yuan (1999). 1995 Taiwan Social Change Survey (Round 3, Year 1): Politics, Communication, Estrangement, Economic Attitudes (C00007\_1) [data file]. Available from Survey Research Data Archive, Academia Sinica. DOI:10.6141/TW-SRDA-C00007\_1-1
- Clark, A., & Oswald, A. (1994). Unhappiness and Unemployment. *The Economic Journal*, 104(424), 648-659.
- DGBAS (Department of Statistics, Directorate General of Budget, Accounting Statistics). (2013). *The National Well-being Indicators in R.O.C. (Taiwan)*. Retrieved from [https://eng.stat.gov.tw/News\\_Content.aspx?n=2317&s=225285](https://eng.stat.gov.tw/News_Content.aspx?n=2317&s=225285)

- Di Tella, R., MacCulloch, R., & Oswald, A. (2003). The Macroeconomics of Happiness. *The Review of Economics and Statistics*, 85(4), 809-827.
- Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. In *Nations and households in economic growth: Essays in honor of Moses Abramovitz* (pp. 89-125). New York: Academic Press.
- Easterlin, R. A. (2006). Life cycle happiness and its sources: Intersections of psychology, economics, and demography. *Journal of Economic Psychology*, 27(4), 463-482.
- Frey B., Stutzer A. (2000). Happiness, Economy and Institution, *The Economic Journal*, Vol 110, Issue 466, Pages 918-938.
- Frey B., Stutzer A. (2002). The Economics of Happiness, *WORLD ECONOMICS*, Vol. 3, No. 1
- Gerlach, K., & Stephan, G. (1996). A paper on unhappiness and unemployment in Germany. *Economics Letters*, 52(3), 325-330. ISSN 0165-1765.
- Grozdanovska, E. (2016). The relationship between national identity, subjective well-being, and meaning in life. *Suvremena psihologija*, 19(1), 91-99.
- Gurría, A. (2011). OECD Your Better Life Index. Retrieved from <https://www.oecd.org/social/yourbetterlifeindex.htm>
- Helliwell, J., F. (2003). How's Life? Combining Individual and National Variables to Explain Subjective Well-being, *Economic Modelling*, vol. 20, issue 2, pp. 331-360.
- Helliwell, J. F., Layard, R., & Sachs, J. (Eds.). (2012). *World happiness report 2012*. New York: U.N. Sustainable Development Solutions Network.
- Krueger A. (2007). Are we having more fun yet? Categorizing and evaluating changes in time allocation, *Brookings Papers on Economic Activity* (2), pp. 193-215
- Lelkes, O. (2006). Tasting freedom: Happiness, Religion, and economic transition. *Journal of Economic Behavior & Organization*, 59(2), 173-194.

- Lin, I-Fen, Goldman, N., Weinstein, M., Lin, Y.-H., Gorrindo, T., & Seeman, T. (2003). Gender Differences in Adult Children's Support of Their Parents in Taiwan. *Journal of Marriage and Family*, 65(1), 184–200.
- Luo Lu (1995) Correlates of social support: Personal characteristics and social resources, *Counselling Psychology Quarterly*, 8:2, 173-181
- Morrison, M., Tay, L., & Diener, E. (2011). Subjective well-being and national satisfaction: Findings from a worldwide survey. *Psychological Science*, 22(6), 471-482.
- Nikolaev, B. (2018). Does Higher Education Increase Hedonic and Eudaimonic Happiness? *Journal of Happiness Studies*, 19, 483–504.
- Orden, S. R., & Bradburn, N. M. (1968). Dimensions of marriage happiness. *American Journal of Sociology*, 73(6), 715-731.
- Stack, S., & Eshleman, J. R. (1998). Marital status and happiness: A 17-nation study. *Journal of Marriage and Family*, 60(2), 527-536.
- Stevenson, B., & Wolfers, J. (2008). Economic Growth and Subjective Well-Being: Reassessing the Easterlin Paradox. *Brookings Papers on Economic Activity*, 1-87.
- Stevenson, B., & Wolfers, J. (2013). Subjective Well-Being and Income: Is There Any Evidence of Satiation? *American Economic Review: Papers & Proceedings*, 103(3), 598–604.
- Stutzer, A. (2004). The role of income aspirations in individual happiness. *Journal of Economic Behavior & Organization*, 54(1), 89-109.
- Tao, H. L., & Chiu, S. Y. (2009). The effects of relative income and absolute income on happiness. *Review of Development Economics*, 13(1), 164–174.
- Tsai, Shu-Ling & Shavit, Yossi (2007). "Taiwan: Higher Education--Expansion and Equality of Education Opportunity," editor(s): Yossi Shavit, Richard Arum, Adam Gamoran, *Stratification in Higher Education: A Comparative Study*, pp. 140-164, Stanford: Stanford University Press.

Winkelmann, L., and Winkelmann, R. (1998). Why are the unemployed so unhappy? Evidence from panel data. *Economica*, 65(257), 1-15.

World Happiness Report 2012. [Available online at <https://worldhappiness.report/ed/2012/>]

Ying-hwa Chang (2001). 2000 Taiwan Social Change Survey (Round 4, Year 1): Communication Behaviors, Economic Attitudes, Political Participation, Globalization (C00108\_1) [data file]. Available from Survey Research Data Archive, Academia Sinica. DOI:10.6141/TW-SRDA-C00108\_1-1

Ying-hwa Chang (2016). 2005 Taiwan Social Change Survey (Round 5, Year 1): Globalization, Work, Family, Mental Health (C00153\_1) [data file]. Available from Survey Research Data Archive, Academia Sinica. DOI:10.6141/TW-SRDA-C00153\_1-1

Ying-hwa Chang (2016). 2010 Taiwan Social Change Survey (Round 6, Year 1): Globalization, Work, Family, Mental Health, Religion, Mass Communication, Political Participation, Leisure (C00221\_1) [data file]. Available from Survey Research Data Archive, Academia Sinica. DOI:10.6141/TW-SRDA-C00221\_1-1

Yang-chih Fu (2016). 2015 Taiwan Social Change Survey (Round 7, Year 1): Globalization, Work, Family, Mental Health, Religion, Mass Communication, Political Participation, Leisure (C00315\_1) [data file]. Available from Survey Research Data Archive, Academia Sinica. DOI:10.6141/TW-SRDA-C00315\_1-1