

THE DETERMINANTS OF HAPPINESS IN INDONESIA¹

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Abstract

Using cross-section data from IFLS, we obtain that determinants of happiness in Indonesia are income, health, education, and trust. Each determinant has positive impact on happiness. People with following demographic characteristics: woman, married, live in urban area, in Java-Bali islands, Islam and more religiosity tend to be the happiest. Meanwhile Java ethnicity and trust related faith or religion don't have significant effect on happiness. The study shows that there is no discrimination against particular ethnicity and faith or religion in Indonesia. In other words, Indonesian still welcome for diversities within its society. This fact is in accordance with Bhinneka Tunggal Ika as national slogan. This result is supported by robust estimations using models such as OLS, OPROBIT, OLOGIT, GOLOGIT, and OGLM.

Happiness-income relationship has non-linear function. The function takes shape as an inverted U-shaped curve. Increasing income will increase happiness, but in a diminishing rate of marginal happiness. Using regression coefficients we may estimate income threshold. The estimation shows that Rp 6 million per capita per month is the threshold income. Moreover, the income threshold is located on the tenth deciles of income. People with higher income tend to be happier than others.

Meanwhile, happiness-age relationship has the form of U-shaped curve. The lowest point is at 60. It means that as people grow old, they tend to be less and less happy until they are 60 years old. Descriptive statistics show that adolescents (15-19 years old) are most unhappy people and adults (25-29 years old) are most happy people. From GOLOGIT model we may predict probability on happiness. The model shows that probability to feel very unhappy is 0.002, unhappy is 0.064, happy is 0.880, and to feel very happy is 0.054. This result shows that Indonesian people are mostly happy. The government could conduct some policies to increase happiness such as public policies on income, health, education and social capital.

Keywords: Happiness, Income, Age, GOLOGIT

1. 1 Introduction

Gross Domestic Product (GDP) is progress measurement that has been used until today. GDP was introduced by Simon Kuznets in 1930s. It was used as economic progress measure, goods and services expenditures pattern and inflation impact on production (Constanza et al. 2009). Afterward, the concept of GDP also spread to England in 1940s and around the world since Bretton-Woods conference in 1944.

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The International Monetary Funds (IMF) and the International Bank for Reconstruction and Development (IBRD or World Bank) use GDP as important economic progress measurement in the country.

GDP has other roles than just for an economic progress measure. GDP became a welfare indicator since 1960s. Van den Bergh (2009) said that GDP has many shortcomings, such as that it doesn't count externality cost, non-market activities, environmental damages, income distribution, and social relation and so on. After that "Beyond GDP" became the alternative measure since 1970s and then we could find many measures such as Human Development Index (HDI), Green GDP (Costanza et al. 2009), Index of Social Progress, Well-Being Index.

Bhutan is the first country to use Gross National Happiness (GNH) to replace Gross Domestic Products (GDP) in 1970s. GNH has nine domains such as psychological well-being, health, time usage, education, cultural diversity and resilience, good governance, community vitality, ecological diversity and resilience, living standards (Ura et al, 2012). Since then, many countries give more attention on welfare index that covers more holistic components such as happiness index. It was begun in 2011 when General Assembly of United Nation invited its members to use an alternative measure of GDP. After that it spread to England, French, Australia, Malaysia and Thailand. Indonesia began with survey on happiness measurement which was conducted by *Badan Pusat Statistik* in 2013.

Easterlin (1974) conducted first study about connection between happiness and income. He found that there was income paradox (Easterlin paradox). The paradox says that increasing income doesn't increase welfare or happiness. Clark et al. (2008) figured out the happiness-income relationship in the United States as in Figure 1 below.

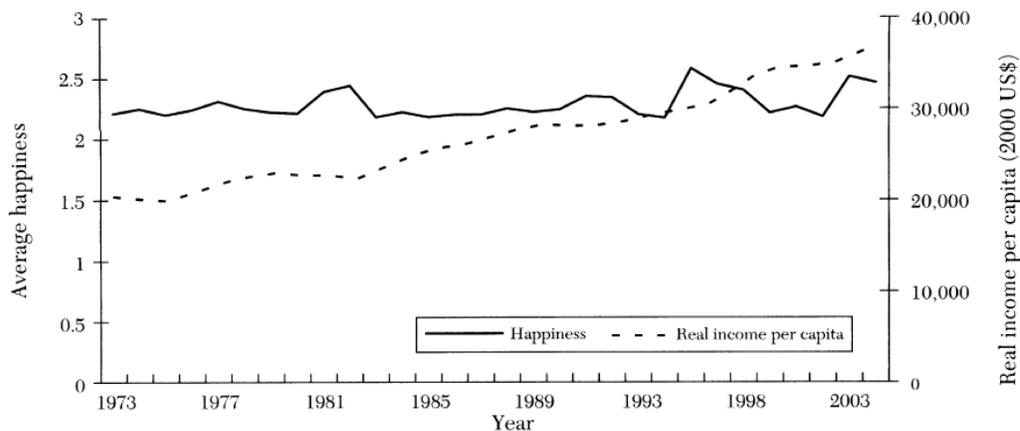


Figure 1. *Happiness*-real per capita income in United States 1973-2004 (Clark et al. 2008).

Figure 1 shows that there was increasing trend in real income per capita since 1973 to 2004 but average happiness almost did not change. It shows Easterlin Paradox in the United States economy in that period.

Easterlin Paradox implicitly informs us that income isn't the only matter for happiness. There are other factors such as relative income (Clark et al. 2008), income comparison (Clark and Senik, 2011), income aspirations (Stutzer and Frey, 2010), social dimensions of human well-being (Helliwell and Putnam, 2004).

1.2 Problems

Welfare or happiness has many aspects that can be summarized as income and non-income aspects. Income has important role in developing countries but not in developed countries to create welfare or happiness. After basic needs are fulfilled, human beings need more than material goods such as social needs, social relation (Diener and Seligman, 2004; Kesebir and Diener, 2008) esteem, self-actualization (Sirgy, 1986).

Putnam (1995) defined social capital as features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit. Social capital consists of networks, norms, trust, and social relationship from which we can get benefit (Burt, 1992); or, of community involvement, trustworthiness, neighborhood (Helliwell and Putnam, 2004). Indonesian culture, as part of Eastern culture, has strong social interdependency in daily life which called *budaya gotong royong*.

This research identifies the impact of income per capita, health, education, social capital and demographic variables over happiness in Indonesia.

1.3 Research Objectives

This study aims to examine:

1. How do income per capita, education level, health and social capital impact on happiness in Indonesia?
2. How much is the income threshold that makes Indonesian people most happy?

1.4 Research Contribution

Up to now, there are few researches on happiness in Indonesia. Only two publications can be found namely by Sohn (2010) and by Landiyanto et al. (2011).

Potential contributions from this study are:

1. Research Methodology

This is the first happiness study in Indonesia that conduct Generalized Ordered Logit (GOLOGIT) model.

2. Measuring income threshold.

2. Literature Review

2.1 Happiness Concept

Happiness doesn't have single definition. In Sociology happiness is not different from life satisfaction (Veenhoven, 1988). Happiness is overall appreciation of one's life as a whole (Veenhoven, 2008), which makes human beings feel positive and pleasure. These definitions are in line with Bentham's concept of happiness, that is, the sum of pleasures and pains. In Psychology, happiness is different from life satisfaction. Happiness is part of subjective well-being. Subjective well-being is well-being condition within long duration that has affective and cognitive aspects. Kahneman (1999) said that well-being consisted of pleasure or happiness. However, in Economics, happiness is not different from subjective well-being, satisfaction, utility, well-being, or welfare (Easterlin, 1995).

According to Kamus Besar Bahasa Indonesia, happiness is pleasure and tranquility within body and soul, luck, fortune. This definition is in line with the happiness concept in Javanese culture. Suryomentaram, a famous Javanese philosopher, stated that happiness was the circumstances with tranquility, intimate, harmonious, free from improper wants.

2.2 From Utility to Happiness

Harsanyi (1997) mentioned there were two different concepts of utility. First, is the happiness theory of well-being and utility from the utilitarian concept of Jeremy Bentham. Well-being is happiness

concept which balance in pleasure and pain. Someone's utility shows her well-being and happiness in the same time. Utility maximization is same as well-being and happiness maximization. Second, is the preference theory of well-being and utility, which is more preferred than the first theory by most economists.

Bentham's idea about utility had been followed by economist until before 1930s. Ordinalist revolution in 1930s made significant change for utility concept. Pareto and Hicks said that utility was preference index that could not be measured and interpersonally non-comparable. Samuelson (1938) argued that revealed preference informed someone's preferences from her choices. Ng (1997) stated since 1930s economists view on utility have become more objective, ordinal and interpersonal non-comparability.

2.3 Happiness Theory

Veenhoven (2006) classified theories on happiness into three groups:

a. Set-point Theory

Happiness is something programmed by someone and doesn't connect with her life. This is because happiness is affected by personal trait, genetic and culture.

b. Cognitive Theory

Happiness is a product of thinking and human reflection towards differences between true life and what should she could have. Happiness is uncountable but recognizable.

c. Affective Theory

Happiness is human reflection about how good his life is. If someone feels fine in most of his life he must be happy.

Seligman (2003) and Huang (2008) stated 3 traditional theories and one modern theory.

a. Hedonism Theory

Happiness is about how to maximize pleasure and minimize pain. It's about a person's positive experience. This theory is modern version of Utilitarianism of Bentham.

b. Desire Theory

Happiness links with fulfillment of personal desires. It is better than hedonism.

c. Objective List Theory

Happiness will come from fulfillment of objectives of life such as material needs, freedom, health, education, knowledge and friendship.

d. Authentic Theory

Happiness connects with pleasant life or pleasure, good life and meaningful of life. This theory combines 3 previous theories, namely, pleasant life of hedonism, good life of the desire theory and meaningful life of the objective list theory.

2.4 Happiness-Income relationship

Happiness-income relationship can be seen in figure below :

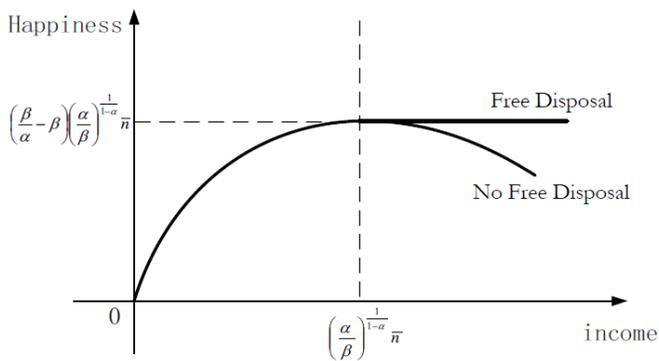


Figure 2. Happiness - income relationship (Tian and Yang, 2007).

Figure 2 above shows that increase in income will increase happiness until maximum level of happiness is reached. When income reaches critical point, $\bar{m} = \left(\frac{\alpha}{\beta}\right)^{\frac{1}{1-\alpha}} \bar{n}$, income increase will not increase happiness level. In order to raise happiness level non-income should be extended.

2.5 Social Capital Definition

There were many social capital definitions. Here I provide some examples. According to Coleman (1990), social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common which consist of some aspect of social structure and facilitate certain actions of individuals who are within the structure. Like other forms of capital, social capital is productive,

making possible the achievement of certain ends that would not be attainable in its absence. Putnam (2000) defined social capital as features of social organization, such as trust, norms and social networks that can improve the efficiency of society by facilitating coordinated actions". In other words social capital is features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit (Putnam, 1995). Another definition, social capital is a culture of trust and tolerance in which extensive networks of voluntary associations emerge (Inglehart, 1997).

Social capital - happiness relationship

Figure 3 depicts social capital-happiness relationship according to Lin (1999).

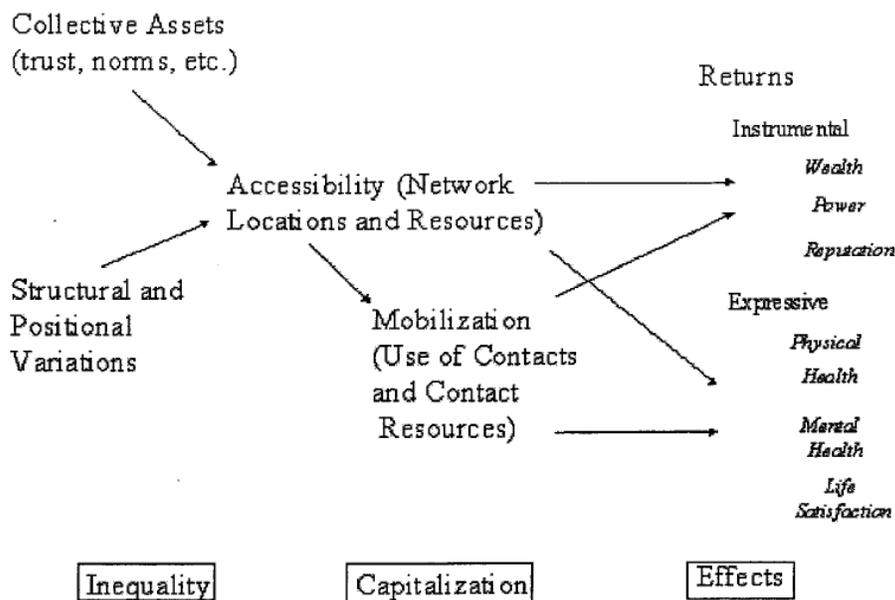


Figure 3. Social Capital – Life Satisfaction relationship (Lin, 1999)

Social capital-happiness relationship could be inferred from social relationship returns. Lin (1999) argued that someone may use social capital to access and use embedded resources on social network for gaining some returns. Social capital is same as human capital which can be invested for gaining some returns or benefits. Outcomes or returns from social relations could be as some returns to instrumental action and returns to expressive action. Returns to instrumental action consist of economic, political and social return. Meanwhile returns to expressive action could be in physical health, mental health and life satisfaction.

2.6 Empirical Review

Happiness-income relationship first explored by Easterlin (1974). His study has shown that income-happiness had positive relation in one point of time but not for over time. It is called happiness paradox or Easterlin paradox. One possible source of Easterlin Paradox is income aspiration (Easterlin, 2001) or relative income (Blanchflower and Oswald, 2004; Clark et al. 2008) or income comparison (Clark and Senik, 2011). Some researchers found that there is happiness-income positive relationship (Blanchflower and Oswald, 2004); Stevenson and Wolfers, 2008). On the other side, some researchers argued that income will continue raise until a certain level and then tends to decrease or remain unchanged. Stevenson and Wolfers (2013) said that the existence of threshold income is widely claimed although there is no statistical evidence presented. They have summarized some threshold income from some articles which between range \$8,000 - \$25,000 (Di Tella and McCulloch, 2008), \$15,000 (Layard, 2003), \$ 20,000(Layard, 2005), \$10,000 (Frey and Stutzer, 2002).

Usually education-happiness and health-happiness have positive relationship. Michalos (2008), Chen (2012) and Cunado and Garcia (2012) show that education level does not affect happiness directly. It has indirect channel through network (social capital) or through self-confidence and self-estimation. Health-happiness relationship found by Green and Elliot (2009) through intermediate variable. They found that higher religiosity makes people healthier and happier. Singer, Hopman and McKenzie (1999) said that decreasing in health with increasing age don't make someone unhappy because of mental maturity. Someone that became unemployed may have decrease in health and it becomes worst for non-volunteer (Dave, Rashad, Spasojephic, 2008).

Social capital-happiness relationship could be seen from trust within community. Helliwell (2007) found that higher social capital lowers suicide and higher subjective well-being. Interpersonal mistrust made unhappiness (Tokuda and Inoguchi, 2008). Non-market relational goods such as trust in individual, membership, trust in institutions can help to achieve higher life satisfaction (Sarracino, 2012).

3. Research Method

3.1 Data

This research utilized the data from Indonesia Family Life Survey (IFLS) wave 4 published by RAND-Corporation Santa Monica USA, 2007. The cross-section data is part of longitudinal survey on 13.535 household in 13 provinces in Indonesia with 26,217 observations. The provinces are North Sumatera, West

Sumatera, South Sumatera, Lampung, DKI Jakarta, West Java, Middle Java, Yogyakarta, East Java, Bali, West Nusa Tenggara, South Kalimantan and South Sulawesi.

3.2 Empirical Strategy

Happiness was measured with question “Considering current situation do you feel very happy, happy, unhappy, very unhappy?”. The ordered answers are 1. Very unhappy; 2. Unhappy; 3. Happy; 4. Very happy. Household per capita expenditures is proxy for income per capita. It includes expenditure for food, non-food, education, own produced goods in real term (constant price in 2000). Education level is highest education level had ever attended. We classify the education data into 3 groups i.e. Dikdas, Dikmen and Dikti which stands for Basic Education, Middle-Level Education, and Higher-Level Education respectively. Therefore, we have 2 dummy variables for education level. Health level measured by 3 questions (1) How is your health? (2) Compared to 12 months ago, how is your health now? (3) Compared to others, how is your health now? Each of them is in dummy variable. In order to get threshold income, we include income square as predictor variable. In order to address income endogeneity, we conduct 2SLS regression with two instrumental variables namely side job and job status.

One aspect of social capital used in this study is trust. There are many components in trust aspect so we divide them into two groups with factor analysis e.g. general trust & religious trust, and we made index for each of the two. General Trust consist of willingness to help other people, be aware for other people, trust more people in the same ethnic group, willingness to trust the children with the neighbours, safety feeling in the village and willingness to walk alone at night. Religious Trust consists of more trust in the same religious group, willing to accept people in the same village with their own belief, willing to accept people with different belief to stay in houses next to their own, willing to accept people with different belief to stay at home, allowing their brother or sister to marry people with different belief, allowing other believers to build their house of worship. Accept any kind of candidate’s belief in state election.

Demographic characteristics of this study are age, sex, marital status, culture that indicate ethnicity, residential location, religion or faith, and religiosity. We use dummy variable for sex, marital status, ethnicity, residential location and religion. In order to acquire the happiness-age relationship, we utilised age square as the predictor variable.

Empirical Model

The empirical model is below :

$$SWB_i = f(X_{1i}, X_{2i}, X_{3i}, X_{4i}, X_{5i}) \quad (1)$$

Where

SWB_i is subjective well-being or happiness, X_{1i} is real income per capita, X_{2i} is health, X_{3i} is education level, X_{4i} is trust index, X_{5i} is vector of demographic characteristics. Subscript i shows data for i^{th} person.

3.2.1 Ordered Logit (OLOGIT)

We utilized Ordered Logit or Ordinal Logit model for ordered categorical response variable. We can not use Ordinary Least Square (OLS) because (1) OLS generates predicted value which can be either higher or lower than the real data (2) OLS ignores variation in response variable which is not constant (3) OLS could be misleading because of correlation between residual and explanatory variable.

Ordered Logit estimates cumulative probability within one category versus all lower or higher categories. For instance Y_i is ordinal response variable with C categories for subject i and covariates vector X_i . Therefore we have relationship probability of category and covariates of $p_{ci} = Pr(Y_i = y_c | X_i)$ $c = 1, \dots, C$

With the cumulative probability of:

$$g_{ci} = Pr(Y_i \leq y_c | X_i), \quad c = 1, \dots, C \quad (2)$$

With linear predictor of:

$$\beta' X_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots \quad (3)$$

Logit function is:

$$\text{Logit}(g_{ci}) = \log \left(\frac{g_{ci}}{1 - g_{ci}} \right) = \alpha c - \beta' X_i \quad (4)$$

where $c = 1, 2, \dots, C - 1$

Parameter α_c is threshold or cut-points with increasing nature ($\alpha_1 < \alpha_2 < \dots < \alpha_{c-1}$).

Cumulative probability for c category is:

$$g_{ci} = \frac{\exp(\alpha_c - \beta'X_i)}{(1 + \exp(\alpha_c - \beta'X_i))} = 1/(1 + \exp(-\alpha_c + \beta'X_i)) \quad (5)$$

Ordered logit also known as proportional odds. Odds is $c_i = \frac{g_{ci}}{(1-g_{ci})}$.

Proportional odds are assumed constant, $\frac{odds_{c_i}}{odds_{c_j}} = \exp(\beta'(x_j - x_i))$, which is not dependent on c and therefore constant between all response categories. This is known as Parallel Regression assumption.

3.2.2 Generalized Ordered Logit (GOLOGIT)

Ordered Logit (OLOGIT) model is special case of Generalized Ordered Logit (GOLOGIT) (Williams, 2006).

$$P(Y_i > j) = g(X\beta) = \frac{\exp(\alpha_j + X_i\beta)}{1 + \{\exp(\alpha_j + X_i\beta)\}} \quad j = 1, 2, \dots, M - 1 \quad (6)$$

OLOGIT Model is based on the assumption where β is constant for all j but is actually different on intercept α which is known as proportional odds or parallel regression or parallel line.

If parallel line assumption is violated, β could be a variable within j equations. Partial Proportional Odds model could accommodate this matter:

$$P(Y_i > j) = \frac{\exp(\alpha_j X_1 \beta_1 + X_2 \beta_2 + X_3 \beta_3)}{1 + \{\exp(\alpha_j + X_1 \beta_1 + X_2 \beta_2 + X_3 \beta_3)\}} \quad (7)$$

$$j = 1, 2, \dots, M - 1$$

Parallel line violation can make the regression model being unable to reflect true relationship between X and Y (Williams, 2013). Variability in β within GOLOGIT model could be from (1) effect X on Y being asymmetric (2) state-dependent reporting bias (Doorslaer, 2004; Schneider, 2012) (3) multi dimension in response variable.

Empirical issues on GOLOGIT model are (1) if there are a few violations on parallel line assumptions we could apply Partial Proportional Odds and multinomial logit for many violations (2) for larger sample, the

violation on parallel line assumption could have significant statistics effect (3) Williams (2010) suggested Heterogeneous Choice Model for alternative model address variability in proportional odds.

3.2.3 Heterogeneous Choice Model or Ordinal Generalized Model (OGLM)

Williams (2010) said that Heterogeneous Choice Model or Ordinal Generalized Model (OGLM) is able to address heteroscedasticity in logistic regression.

For latent model

$$Y_i^* = \alpha_0 + \alpha_1 X_{i1} + \dots + \alpha_k X_{ik} + \sigma \varepsilon_i \quad (8)$$

ε_i is residual with either logistic or normal distribution. Then σ is residual variance which equal to $\frac{\pi^2}{3}$ for Logit and 1 for Probit model.

Because Y^* is latent variable that cannot be observed, therefore the true estimation is more toward β rather than α . Allison (1999, in Williams, 2010) said that $\beta_k = \alpha_k / \sigma$ where $k : 1, 2, \dots, K$.

If σ is the same for all cases, the residual will be homoscedastic, and β / α ratio is not different for all cases. But if there is variability in σ , we could apply Heterogeneous Choice Model.

The model solved next two equation simultaneously:

1. Outcome or choice equation:

$$Y_i^* = \sum_k X_{ik} \beta_k + \varepsilon_i \quad (9)$$

2. Variance equation:

$$\sigma_i = \exp(\sum_j z_{ij} \gamma_j) \quad (10)$$

4. Empirical Findings

4.1 Estimation Method

After the endogeneity test for income with 2SLS regression was conducted, we concluded that there is no income endogeneity. Here is the result:

Table 1.
Endogeneity Test

| | Statistik uji | p-value |
|-----------------------------------|--------------------|---------|
| Wu-Hausman F Test | 1.79476 F(1.18232) | 0.18036 |
| Durbin-Wu-Hausman chi-square test | 1.79655 Chi-sq(1) | 0.18013 |

Source : Estimation result

From the table 1 we can see that p-value for both tests are insignificant. Hence, we could say that income is exogeneous.

Therefore, we could choose the estimation model. First, we conduct OLOGIT regression and the result is all predictor variables are significant except for Java and Religion Trust Index at 1% significance level. However, some predictors do not meet parallel line assumptions. Brant test inform that some predictors such as “Married, Java Bali, Islam, Religiosity, Healthy, Other Health, General Trust Index” violated the parallel line assumption. Therefore, we utilized alternative model i.e. GOLOGIT model (Williams, 2006). This GOLOGIT model estimated 11 constant parameters and 7 different parameters for 3 cumulative logit equations so that we have 32 parameters estimated. Unfortunately, the parameters violated parallel line assumptions because it has inconsistency in both sign and statistical significant. They made complexity in measuring effect of predictor variables toward the response variable.

Moreover, estimation model may have heteroscedasticity problem. It came from the violation in parallel line assumption. Hence, we could use alternative model i.e. Ordinal Generalized Linear Model (OGLM) to address heteroscedasticity. We give one example of output regression in table 2 below which is OGLM model:

Table 2.
Output of OGLM Model

Heteroskedastic Ordered Logistic Regression Number of obs = 26217
 LR chi2(25) = 1835.26
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.0657
 Log likelihood = -13042.375

| kebahagiaan | Coef. | Std. Err. | z | P> z | [95% Conf. Interval] | |
|------------------|-----------|-----------|--------|-------|----------------------|-----------|
| kebahagiaan | | | | | | |
| y | .2664634 | .0278772 | 9.56 | 0.000 | .2118251 | .3211018 |
| y2 | -.021905 | .004162 | -5.26 | 0.000 | -.0300624 | -.0137475 |
| umur | -.0309312 | .0033729 | -9.17 | 0.000 | -.0375419 | -.0243204 |
| umur2 | .0002571 | .0000348 | 7.40 | 0.000 | .000189 | .0003252 |
| wanita | .0619192 | .0143392 | 4.32 | 0.000 | .0338149 | .0900236 |
| menikah | .2951283 | .026877 | 10.98 | 0.000 | .2424503 | .3478064 |
| kota | .0851753 | .0157047 | 5.42 | 0.000 | .0543946 | .1159559 |
| Jawa | .0097166 | .0153518 | 0.63 | 0.527 | -.0203725 | .0398056 |
| JawaBali | -.1105959 | .0170367 | -6.49 | 0.000 | -.1439872 | -.0772046 |
| islam | .1259677 | .0261264 | 4.82 | 0.000 | .0747609 | .1771746 |
| religiositas | .1547311 | .0206311 | 7.50 | 0.000 | .114295 | .1951672 |
| sehat | .1607921 | .0255501 | 6.29 | 0.000 | .1107148 | .2108693 |
| sehatsekarang | .079851 | .0215345 | 3.71 | 0.000 | .0376442 | .1220579 |
| sehatlain | .174321 | .0327328 | 5.33 | 0.000 | .110166 | .2384761 |
| dikmen | .0521975 | .0158682 | 3.29 | 0.001 | .0210964 | .0832986 |
| dikti | .2622591 | .0296936 | 8.83 | 0.000 | .2040608 | .3204575 |
| indeksTRUSTUMUM | -.2331807 | .0336453 | -6.93 | 0.000 | -.2991242 | -.1672372 |
| indeksTRUSTAGAMA | .0049282 | .0119347 | 0.41 | 0.680 | -.0184633 | .0283197 |
| lnsigma | | | | | | |
| menikah | -.1133162 | .0152585 | -7.43 | 0.000 | -.1432222 | -.0834102 |
| JawaBali | -.0327078 | .0138064 | -2.37 | 0.018 | -.0597678 | -.0056478 |
| islam | -.0115311 | .0221734 | -0.52 | 0.603 | -.0549902 | .031928 |
| religiositas | -.0397369 | .0163779 | -2.43 | 0.015 | -.0718369 | -.0076369 |
| sehat | -.103246 | .0214928 | -4.80 | 0.000 | -.1453712 | -.0611209 |
| sehatlain | -.0924429 | .0301484 | -3.07 | 0.002 | -.1515326 | -.0333532 |
| indeksTRUSTUMUM | -.3144662 | .0256847 | -12.24 | 0.000 | -.3648073 | -.264125 |
| /cut1 | -2.536025 | .1982875 | -12.79 | 0.000 | -2.924661 | -2.147389 |
| /cut2 | -1.173195 | .1248366 | -9.40 | 0.000 | -1.41787 | -.9285194 |
| /cut3 | .8990424 | .1171511 | 7.67 | 0.000 | .6694304 | 1.128654 |

In order to convince which model is better than the other, we compared two criterions from GOLOGIT and OGLM model below:

Table 3.
 AIC, BIC for OGLM and GOLOGIT Model

| Model | AIC | BIC |
|---------|----------|----------|
| OGLM | 26140.75 | 26369.63 |
| GOLOGIT | 26122.64 | 26408.74 |

Source : Estimation result

After comparing Akaike Info Criterion (AIC) and Bayesian Info Criterion (BIC) for both OGLM and GOLOGIT, we were not able to determine which one is better, because both AIC and BIC are inconsistent. Therefore,

we may use either GOLOGIT or OGLM as the estimation method. For robustness we estimated empirical equation with some model i.e. OLS, OLOGIT, OPROBIT and OGLM (see appendix for detail). We may say that every single predictor variable has significant effect on happiness but not for “Jiwa, Religion Trust Index”.

4.2 Discussion

There are many variables to determine happiness. From the estimation model we can find that real income per capita, education level, health and trust does have positive impact on happiness. They are all in line with theoretical framework. Increasing income may increase happiness but it has diminishing marginal happiness. Using variable “ γ_2 ” we know that there is non-linear relationship between happiness and income. From regression coefficient we may be able to measure the threshold of income. Here is the list of threshold income and critical age of happiness for some different models:

Table 4.
Threshold Income and Critical age of happiness

| | OLS | OLOGIT | OPROBIT | OGLM | GOLOGIT |
|-------------------------------|--------|--------|---------|--------|---------|
| Threshold of Income (million) | Rp 6.4 | Rp 6 | Rp 6.3 | Rp 6.1 | Rp 6.1 |
| Age (year) | 65 | 60 | 59 | 60 | 59 |

Source: estimation result

For Indonesian people income that maximize happiness is about Rp 6 million per capita per month or equivalent with US \$ 5,500 per year (using exchange rate US\$1=Rp 13,000). If we were to analyze more details with income decile, we know that this income threshold is located on decile 10.

Indonesian people are happy mostly. Table 5 shows descriptive statistics of happiness level for 10 quantiles of income.

Table 5.
Happiness Level within income classification

| 10 quintiles of Y | Happiness Level | | | | Total |
|----------------------|-----------------|---------|--------|------------|--------|
| | Very Unhappy | Unhappy | Happy | Very Happy | |
| 1 | 24 | 317 | 2.186 | 99 | 2.626 |
| 2 | 4 | 238 | 2.248 | 129 | 2.619 |
| 3 | 12 | 244 | 2.230 | 136 | 2.622 |
| 4 | 5 | 231 | 2.254 | 130 | 2.620 |
| 5 | 11 | 235 | 2.244 | 133 | 2.623 |
| 6 | 7 | 188 | 2.266 | 161 | 2.622 |
| 7 | 5 | 169 | 2.285 | 162 | 2.621 |
| 8 | 2 | 160 | 2.268 | 192 | 2.622 |
| 9 | 6 | 149 | 2.221 | 247 | 2.623 |
| 10 | 7 | 136 | 2.154 | 322 | 2.619 |
| Total | 83 | 2.067 | 22.356 | 1.711 | 26.217 |

Source: IFLS, 2007

Feeling very unhappy comes from people in 10%, 30% and 50% lowest income. Whereas feeling unhappy comes from poorest people i.e. 10% of lowest income. Feeling happy comes from 30% highest income people. Feeling very happy comes from rich people included in 10% of highest income. This statistic shows that income still matter for Indonesian people in reaching happiness. The government may conduct some policies that increases income. Income is second important things, after health, that have impact on happiness. In order to increase happiness related to consumption Hsee et al. (2008) recommended two policies. First, the government should invest resources to promote adaptation-resistant rather than adaptation-prone consumption to increase happiness within generations. Second, the government could invest resources to promote inherently - evaluable consumption to increase happiness across generations.

Happiness-age relationship seen in U-shaped curve with lowest point at 60. It means that people feel the lowest happiness at 60 years old. Possible sources of unhappiness are health problem when people are getting older and be poor (Nuegarten dan Nuegarten, 1989). Health cost is expensive enough for most of them. On the other hand, they may have limited income sources in older age. This problem potentially makes them unhappy. Moreover, from descriptive statistics we know that adolescents (15-19 years old) are most unhappy and the adults (25-29 years old) are most happy. The adolescents usually still have no mental stability yet. But the adults usually working, mature enough and are mentally stable. In order to increase old people's happiness, the government could conduct some policies for them through tax cutting for those who are taking care of their parents for example.

Happiness will increase if education level, health and trust increase as well. Higher education level will make broader networks to get into labor market (Chen, 2012). More over higher education level may increase the opportunity to get better job with higher income. These factors can turn into higher level of happiness (Cunado and Gracia, 2012). Feeling healthier makes happier. Without health problem people will be more productive so that they could earn more money or he could save more money for another things that makes him happier. From three health measures we find that feeling healthy has biggest impact on happiness. Health comparison between current and last year also have positive relationship with happiness. But there is no significant effect of health comparison with another person to happiness. Index of trust has positive relationship with happiness but not for index of trust related with religion. It shows that there is no faith discrimination. Government could conduct some policies to increase health and education quality. Social security such as BPJS or Kartu Indonesia Sehat or Kartu Indonesia Pintar must be distributed to the poor.

Elaborating the components of trust index will gain the following findings. The trust components that can make people happier are willingness to help others, wakefulness on others, secure feeling on village or hometown, welcoming belief diversity within the family, allowing the presence of churchs or mosques or temples etc, no excessive trust on people in the same ethnic groups. Nevertheless, people tend to not being welcoming for other believers to live near their houses. The trust components that have no significant effects are: able to entrusted the house or children, welcome for other different faith people live in his hometown or house, importance of candidate's religion or religiosity in the state election. The government could conduct some policies to empower social capital such as some activities in RT, RW, Kelurahan, Kecamatan etc. that involve all people in order to enhance happiness.

Women are happier than men. Akerlof and Kranton (2000) argued with gender identity hypothesis that every man or woman has self-concepts which one of them is about job characteristics. Men should not do domestic works and have to earn more money than women. The data shows that there are more working men than working women. 60% of men work in many occupations, 33% men are working as an employee, 20% work as an employer and 18% of men work with no payment. The data inform that men take much more role than women in financing family needs. This has made men to be unhappier than women.

Married people are happier than the unmarried ones (not married, dead or alive divorce). Marriage makes good interpersonal relationship between husband and wife and emotional supporting in facing daily problems. These are appropriate with protection support hypothesis (Coombs, 1991), through

emotional support or financial support and health improvement (Stack and Eshleman, 1998). It was called social causation or marriage protection hypothesis.

People living in urban area are happier than in rural area. This finding is different with others. People living in rural area usually happier than people in urban area. This is because of good environment quality, better social engagement and more peaceful life (Smyth et al, 2011). On the other hand, rural people may have worse life than urban people because of lower income, public transportation, and health quality (Youmans, 1977) that need much more public goods providing (Jongudomkarn and Camfield, 2006). The data shows that 73.24% of rural people have income lower than Rp 0.5 million per month but only 49.74% for urban people. It shows that income belongs to urban people higher than rural people do. This finding explains why rural people have lower happiness than urban people.

People in Java-Bali islands are unhappier than others. One possible cause is population pressure in there. Most Indonesian people live in Java (57.5%) and Bali (5%)⁴. With highest population density is in DKI Jakarta i.e. 14.440 per km². Moreover, there are higher pressures on natural resources and ecosystem in Java (Repetto, 1986). These problems make people in Java-Bali islands have lower happiness than others.

Moslems are happier than others. This finding might not be telling the fact because there are very few sample data for non-Muslims (10%). Religion might matter for happiness but not for religiosity. Religious people are happier than others. The more religious someone is, the healthier their mental and the less depressed they are (Chamberlain and Zika, 1988; Green and Elliot, 2010). Religious people usually have tight engagement in religious activity therefore they get huge social support and network (Lim and Putnam, 2010).

Using GOLOGIT model we may predict probability for each happiness level. Table 6 depicts some examples for predicted probability of happiness in certain condition.

⁴ Sensus Penduduk 2010, Badan Pusat Statistik.

Table 6.
Predicted Probability for Each Level of Happiness

| Condition | Feelings | | | |
|------------------------------------|--------------|---------|-------|------------|
| | Very Unhappy | Unhappy | Happy | Very Happy |
| All predictors are at mean | 0.002 | 0.064 | 0.880 | 0.054 |
| Female, others are at mean | 0.002 | 0.058 | 0.88 | 0.059 |
| Male, other are at mean | 0.002 | 0.069 | 0.87 | 0.05 |
| Married, others are at mean | 0.001 | 0.048 | 0.888 | 0.062 |
| Unmarried, others are at mean | 0.004 | 0.119 | 0.837 | 0.039 |
| Urban, others are at mean | 0.002 | 0.058 | 0.88 | 0.06 |
| Rural, others are at mean | 0.002 | 0.071 | 0.878 | 0.048 |
| Java-Bali, others are at mean | 0.002 | 0.069 | 0.88 | 0.048 |
| Non Java-Bali, others are at mean | 0.002 | 0.055 | 0.875 | 0.068 |
| Java ethnicity, others are at mean | 0.002 | 0.063 | 0.88 | 0.056 |
| Non Java, others are at mean | 0.002 | 0.064 | 0.88 | 0.054 |
| Islam, others are at mean | 0.002 | 0.061 | 0.88 | 0.056 |
| Non Islam, others are at mean | 0.0009 | 0.09 | 0.87 | 0.043 |

Source : estimation result

Predicted probabilities of happiness of Indonesian people shows that they are mostly happy. When we predict probability of happiness with certain condition, we acquire the same result. Table 6 shows some examples for predicted probability of happiness. Most Indonesian people tend to be happy for every condition of his life. They seem to be having happy genes in their traits.

5. Conclusion

Using cross-section data from IFLS, we obtained the determinants of happiness in Indonesia are income, health, education, and trust. Each determinant has positive impact on happiness. People with following demographic characteristics tend to be the happiest: woman, married, live in urban area, in Java-Bali island, Islam and more religiosity . Meanwhile Java ethnicity and trust related faith or religion do not have significant effect on happiness. The study shows that there is no discrimination against particular ethnicity and faith or religion in Indonesia. In other words, Indonesian people still welcome for diversities within its society. This fact is in accordance with Bhinneka Tunggal Ika as national slogan. This result is supported by robust estimations using models such as OLS, OPROBIT, OLOGIT, GOLOGIT, and OGLM.

Happiness-income relationship has non-linear function. The function takes shape as an inverted U-shaped curve. Increasing income will increase happiness, but in a diminishing rate of marginal happiness. Using regression coefficients we may estimate income threshold. The estimation shows that Rp 6 million per capita per month is the income threshold. Moreover, the income threshold is located on the tenth deciles of income. People with higher income tend to be happier than others.

Meanwhile, happiness-age relationship has the form of U-shaped curve. The lowest point is at 60. It means that as people grow old, they tend to be less and less happy until they are 60 years old. Descriptive statistics show that adolescent (15-19 years old) are most unhappy people and adults (25-29 years old) are most happy people. From GOLOGIT model we may predict probability on happiness. The model shows that probability to feel very unhappy is 0.002, unhappy is 0.064, happy is 0.880, and to feel very happy is 0.054. This result shows that Indonesian people are mostly happy.

The government could conduct some policies to increase happiness such as public policies on income, health, education and social capital. The social security system such as BPJS and Kartu Indonesia Pintar should be distributed to the poor only. Moreover it is important to empower social capital that embeded within the society for increasing happiness.

The data limitation makes the study limited. For further research, if the complete data is already available, panel data can be used from longitudinal survey using more predictor variables and more advanced research methods.

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Appendix 1.

Table 1.1
Robustness with OLS, OLOGIT, OPROBIT, OGLM Models

| Predictors | OLS | OLOGIT | OPROBIT | OGLM |
|------------------|------------------------|------------------------|------------------------|-----------------------|
| y | 0.0955*** (12.85) | 0.705*** (12.72) | 0.345*** (12.96) | 0.266*** (9.56) |
| y2 | -0.00749*** (-5.52) | -0.0586*** (-5.66) | -0.0272*** (-5.85) | -0.0219*** (-5.26) |
| umur | -0.0112*** (-12.10) | -0.0828*** (-12.26) | -0.0409*** (-12.19) | -0.0309*** (-9.17) |
| Umur2 | 0.0000944*** (8.83) | 0.000694*** (9.02) | 0.000344*** (8.96) | 0.000257*** (7.40) |
| Wanita | 0.0204*** (4.23) | 0.165*** (4.63) | 0.0780*** (4.42) | 0.0619*** (4.32) |
| Menikah | 0.109*** (17.22) | 0.784*** (17.04) | 0.390*** (16.96) | 0.295*** (10.98) |
| Kota | 0.0307*** (6.04) | 0.232*** (6.13) | 0.110*** (5.91) | 0.0852*** (5.42) |
| Java | 0.00459 (0.85) | 0.0298 (0.75) | 0.0157 (0.79) | 0.00972 (0.63) |
| JavaBali | -0.0360*** (-6.69) | -0.288*** (-7.23) | -0.130*** (-6.58) | -0.111*** (-6.49) |
| Islam | 0.0499*** (5.23) | 0.348*** (5.55) | 0.165*** (5.28) | 0.126*** (4.82) |
| Religiositas | 0.0561*** (9.26) | 0.428*** (9.54) | 0.202*** (9.14) | 0.155*** (7.50) |
| Sehat | 0.0702*** (8.78) | 0.428*** (8.50) | 0.236*** (8.23) | 0.161*** (6.29) |
| Sehatsekarang | 0.0291*** (3.90) | 0.201*** (3.73) | 0.104*** (3.86) | 0.0799*** (3.71) |
| Sehatlain | 0.0781*** (7.35) | 0.509*** (0.702) | 0.240*** (6.47) | 0.174*** (5.33) |
| Dikmen | 0.0171*** (3.18) | 0.133*** (0.30) | 0.0620** (3.14) | 0.0522*** (3.29) |
| Dikti | 0.0881*** (10.26) | 0.667*** (10.57) | 0.328*** (10.39) | 0.262*** (8.83) |
| Indekstrustumum | -0.0741*** (-7.32) | -0.622*** (-8.20) | -0.275*** (-7.62) | -0.233*** (-6.93) |
| Indekstrustagama | 0.00226 (0.54) | 0.0190 (0.61) | 0.00710 (0.47) | 0.00493 (0.41) |
| Cut1 | | -6.371*** (-23.46) | -3.027*** (-24.12) | -2.536*** (-12.79) |
| Cut2 | | -2.976*** (-11.92) | -1.611*** (-13.35) | -1.173*** (-9.40) |
| Cut3 | | 2.504*** (10.07) | 1.457*** (12.10) | 0.399*** (7.67) |

Source: Estimation Result

In parentheses are Z statistics.

** p<0.01 ; *** p<0.001

Appendix 2.

Table 1.2
Regression Coefficients and Marginal Effects

| No | Predictors | Regression Coefficients | Marginal Effects |
|-----|------------------|-------------------------|------------------------|
| 1. | y | 0.705*** (12.72) | 0.7117*** (12.61) |
| 2. | y2 | -0.0586*** (-5.66) | -0.0528*** (-5.42) |
| 3. | umur | -0.0828*** (-12.26) | -0.0809*** (-12.01) |
| 4. | Umur2 | 0.000694*** (9.02) | 0.00068*** (8.88) |
| 5. | Wanita | 0.165*** (4.63) | 0.1804*** (5.02) |
| 6. | Menikah | 0.784*** (17.04) | 1.0754*** (4.57) |
| 7. | Kota | 0.232*** (6.13) | 0.2294*** (6.03) |
| 8. | Java | 0.0298 (0.75) | 0.0304 (0.73) |
| 9. | JavaBali | -0.288*** (-7.23) | 0.3267 (1.47) |
| 10. | Islam | 0.345*** (5.55) | -0.9148 (-1.77) |
| 11. | Religiositas | 0.428*** (9.54) | 0.2687 (1.06) |
| 12. | Sehat | 0.489*** (8.50) | 0.8658*** (3.25) |
| 13. | Sehatsekarang | 0.201*** (3.73) | 0.1953*** (3.65) |
| 14. | Sehatlain | 0.509*** (7.02) | 0.3410 (1.02) |
| 15. | Dikmen | 0.133*** (3.30) | 0.1312*** (3.23) |
| 16. | Dikti | 0.667*** (10.57) | 0.6966*** (3.20) |
| 17. | Indekstrustumum | -0.622*** (-8.20) | 1.2044*** (3.20) |
| 18. | Indekstrustagama | 0.0190 (0.61) | 0.0197 (0.64) |
| | Cut1 | -6.371*** (-23.46) | |
| | Cut2 | -2.976*** (-11.92) | |
| | Cut3 | 2.504*** (10.07) | |

Source : Estimation Result
In parentheses are Z statistics.
*** p<0.001

Appendix 3.

Tabel 1.3
Trust-Happiness Relationship

| Trust Components | With all predictors | | Without all predictors | |
|------------------|------------------------|----------|------------------------|----------|
| | Regression coefficient | p-value | Regression coefficient | p-value |
| tr01 | -0.125 (-2.52) | 0.012* | -0.111 (-2.28) | 0.023* |
| tr02 | -0.193 (-4.71) | 0.000*** | -0.270 (-6.66) | 0.000*** |
| tr03 | 0.141 (4.00) | 0.000*** | 0.208 (6.03) | 0.000*** |
| tr04 | 0.022 (1.61) | 0.107 | 0.017 (1.66) | 0.097 |
| tr05 | -0.007 (-0.19) | 0.849 | 0.067 (1.73) | 0.084 |
| tr06 | -0.379 (-6.81) | 0.000*** | -0.390 (-7.08) | 0.000*** |
| tr07 | -0.130 (-2.40) | 0.016** | -0.035 (-0.66) | 0.509 |
| tr23 | -0.021 (-0.59) | 0.556 | 0.019 (0.53) | 0.593 |
| tr24 | 0.016 (0.27) | 0.790 | 0.031 (0.51) | 0.608 |
| tr25 | 0.113 (1.83) | 0.067 | 0.174 (2.88) | 0.004** |
| tr26 | -0.012 (-0.36) | 0.721 | -0.042 (-1.23) | 0.220 |
| tr27 | -0.109 (-4.10) | 0.000*** | -0.188 (-7.43) | 0.000*** |
| tr28 | -0.073 (-2.72) | 0.007** | -0.105 (-4.02) | 0.000*** |
| tr29 | -0.052 (-1.51) | 0.131 | -0.072 (-2.12) | 0.034* |
| tr30 | -0.009 (-0.25) | 0.800 | -0.034 (-1.01) | 0.314 |

Source : Estimation result

In parentheses are Z statistics.

*p<0.05 ; **p<0.01 ; ***p<0.001