

Indonesian Happiness Factor: A Panel Data Analysis

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Abstract

The measurement of welfare level is one of the success benchmarks of a country's developmental program. Welfare assessments in the form of subjective well-being (SWB) can complement the objective measures. In assessing SWB, economists use happiness and life satisfaction questions. Therefore, this study aims to analyze the factors that influence individual happiness in Indonesia. The panel data from the last two waves of the Indonesia Family Life Survey (IFLS), namely IFLS 4 (2007) and IFLS 5 (2014) were used. The analytical tool was panel data regression with a fixed effect approach. The results showed religiosity, generalized trust, altruism, and education-age interaction significantly affected happiness levels. This study implies the higher the year of education, the more positive the effect of age on happiness level. Furthermore, the control variables, namely marital status, subjective health, perceived safety, and per capita expenditure are significant, while unemployment affected the happiness level of only the male sample. The government and public figures in Indonesia may promote initiatives that facilitate religiosity, trust, and altruism development, for instance, promoting activities that require involvement from different stakeholders in the community. They also should become role models showing altruism and religiosity.

Keywords: *Well-Being, Happiness, Indonesian Family Life Survey*

JEL Classification: I390, I310, O100

INTRODUCTION

The Gross Domestic Product (GDP) has been an indicator of a country's economic progress for decades. However, economists have emphasized since the introduction of GDP in the 1930s not to use GDP as an indicator of general well-being (Costanza & Talberth, 2009). As candidates for welfare measures, economists and psychologists conducted surveys to assess subjective well-being (SWB). In this assessment, the focus is on questions about happiness and life satisfaction (Benjamin et al., 2014).

The Kingdom of Bhutan has measured happiness nationally since 1972, and is referred to as Gross National Happiness (GNH). In 2011, the United Nations proposed happiness as a new measure in making developmental policies. Meanwhile, in 2012, a meeting was held on the theme of happiness and prosperity led by the Bhutanese prime minister. This momentum enhances the integration of happiness into the 2015-2030 Sustainable Development Goals (Beseiso, 2016).

The Central Statistics Agency of Indonesia constructed a happiness index through the Happiness Measurement Survey in 2014, 2017, and 2021. The Index assessment which started in 2017 consists of three dimensions, but was measured with one dimension in the previous year. Based on the three dimensions, namely life satisfaction, feeling, and meaning of life, Indonesia's happiness index has increased slightly from 70.69 in 2017 to 71.49 in 2021 (BPS, 2021). Also, the happiness index is one measure of developmental outcomes that complements other assessments. Sujarwoto (2021) used panel data and found that happier individuals in 2007 had a lower chance of being divorced, unemployed, and had better health conditions in 2014.

Study on individual happiness factors were conducted by (Purwanti et al., 1997) and (Jaafar et al., 2012) using primary data with hundreds of samples. Another survey used samples from various regions, namely the Indonesian Family Life Survey (IFLS) data. Study that used cross-sectional data of IFLS was conducted by (Landiyanto et al., 2011), (Rahayu, 2016), (Sohn, 2017), (Anna et al., 2019), (Jatmiko & Hajrina, 2015), (Kharisma et al., 2020), (Putri & Prasetyani, 2021), and (Purwaningsih, 2021).

Several studies on individual happiness in Indonesia used cross-sectional data, however, this study used IFLS panel data which minimized the endogeneity of unobserved heterogeneity. Study on happiness using two-wave IFLS panel data has been carried out by (Anna et al., 2019), which focuses on seafarers' happiness using IFLS EAST (2012) and IFLS 5 (2014) data. (Hardini & Wasiaturrahma, 2020) analyzed the effect of social capital on happiness. Furthermore, (Utama et al., 2021) studied the effect of pro-social spending such as donations/charities on happiness and used the IFLS 4 and 5 panel data..

This study aims to analyze the factors of individual happiness in Indonesia using IFLS panel data. The difference between this study and Hardini & Wasiaturrahma (2020) and Utama et al. (2021) is the focus of the variables and the analytical tools. Their survey focused on social capital and expenditure on donation as the independent variables. Meanwhile, this study used religiosity, altruism, trust, age*education interaction, and some control variables. The analytical tool used is the OLS regression with a fixed effect approach. According to (Wooldridge, 2001), the main issue in selecting random or fixed effects is whether there is a correlation between the unobserved and the explanatory variables. The unobserved variables are assumed to correlate with the explanatory in the model, hence, the fixed-effect approach is more appropriate than the random-effect. The response variable is an ordinal scale, but this study does not use the logit/probit model. (Riedl & Geishecker, 2014) made a simulation and found that the OLS fixed effect regression is an efficient and easier method than binary and ordinal regressions to model the ordinal response variables. In addition, it provides unbiased estimates. This research contributes to the previous literature on how the interaction effect of age with education on the happiness of Indonesian people.

METHOD

Data

This is a correlational study because it analyzes the relationship between the independent and the dependent variables. The secondary data from IFLS waves 4 (2007) and 5 (2014) were used, which were downloaded from <http://www.rand.org>. IFLS is a household socio-economic survey that was first conducted in 1993 by Rand and the Demographic Institute of the University of Indonesia. At that time, the IFLS sample was 7200 households covering 83% of the Indonesian population. The households were sampled in layers at the provincial level and then randomized within the province.

Out of the five waves of IFLS surveys that have been conducted, questions related to happiness have existed since wave 4 (2007). The total respondents of IFLS 4 were 29,060 individuals aged 15 years or older from 12,688 households. In wave 5, the respondents were 31,403 from 15,160 households in 24 Provinces.

The total number of respondents who were analyzed in this study was 11,885. This number is smaller than in IFLS 4 and 5 because not all units of analysis have complete data on all variables. The variables in the IFLS can be divided into those at the individual, household, and community levels. The variables at the household level in this study are income per capita..

Variables and Model Specification

The dependent variable is subjective happiness, which has an ordinal scale with categories (1) very unhappy, (2) unhappy, (3) happy, and (4) very happy. The independent variables are demographic characteristics, religiosity, altruism, health, age, and trust which are at the individual level. There is one variable at the household level, namely non-food per capita expenditure. Non-food per capita expenditure is chosen instead of total (food+non-food) per capita expenditure. The multicollinearity problem arises with the inclusion of total expenditure as the independent variable. However, using non-food expenditure will capture the expenditure for nonprimary needs. The lower expenditure for nonprimary needs means a lower economic status. The non-food per capita expenditure is in nominal value.

The model in this study is presented in and there is one interaction variable, namely age-education. (Nikolaev & Rusakov, 2016) found that the effect of education on happiness depends on age. In other words, there is an interaction between the education variable and age.

$$\begin{aligned}
 H_{it} = & \beta_{0i} + \beta_{1a}Tr_gen_{it} + \beta_{1b}Tr_part_{it} + \beta_{1c}Tr_police_{it} + \beta_2Altr_{it} + \beta_3Relig_{it} + \beta_4PCE_{it} + \\
 & \beta_5Educ_{it} + \beta_6Married_{it} + \beta_7Health_{it} + \beta_8City_{it} + \beta_9Safe_{it} + \beta_{10}Unemp_{it} + \\
 & \beta_{11}Age_{it} + \beta_{12}Educ * Age_{it} + e_{it}
 \end{aligned} \tag{1}$$

Description

- H_{it} : subjective happiness level of individual i in year t
 β_{0i} : intercept (unobserved) individual i
 Tr_gen_{it} : dummy trust of individual i to a foreigner in year t (1=yes)
 Tr_part_{it} : dummy trust of individual i to neighbors in year t (1=yes)
 Tr_police_{it} : dummy trust of individual i to the police in year t (1=yes)

$Altr_{it}$: altruistic dummy of individual i in year t (1=very eager to help)
$Relig_{it}$: individual religiosity dummy i in year t (1= religious & very religious)
PCE_{it}	: non-food expenditure/capita/month in individual household i in year t
$Educ_{it}$: length of schooling in years of individual i in year t
Age_{it}	: age of individual i in year t
$Married_{it}$: dummy married status of individual i in year t (1=married)
$City_{it}$: dummy where individual i lives in year t (1=lives in the city)
$Health_{it}$: subjective health dummy of individual i in year t (1=healthy)
$Safe_{it}$: dummy level of security felt by individual i in year t (1= very safe)
$Unemp_{it}$: dummy unemployment status of individual i in year t (1=unemployed)

Estimation Method

This study uses the panel data OLS regression with a fixed effect approach as an estimation method. A panel data set (sometimes called longitudinal data) differs in some aspects from an independently pooled cross-section. People are re-interviewed at subsequent points in time. Policy analysis is greatly enhanced by using panel data sets (Wooldridge, 2012). We can control sample selectivity and biases due to omitted variables if we use panel data (Andreß, 2017). According to (Xiao et al., 2021), cross-sectional estimates are likely to generate biased estimates because lack of control of individual-level heterogeneity. The individual-level heterogeneity is unobservable. It cannot be eliminated in the cross-sectional setting. Nikolaev & Rusakov (2016) stated that the panel nature of the data allows within-individual variation and thus removes the individual-specific effect. The individual-specific effect captures time-invariant unobservable characteristics such as ability, motivation, or family upbringing that are likely correlated with subjective well-being and other explanatory variables.

According to Wooldridge (2001) the main issue in selecting between random and fixed effects is whether there is a correlation between the unobserved and the explanatory variables. The unobserved is a unique factor in each individual such as ability and intelligence. These factors are not measured as explanatory variables but are correlated. This fixed effect approach was selected based on the assumption that unobserved variables correlate with the explanatory variables in the model.

The dependent variable is the level of individual happiness on an ordinal scale of 1 to 4. Conceptually, the regression used for the dependent variable on an ordinal scale is the logit or probit regression. This study used the OLS regression because, for panel data, ordinal regression can only be carried out using a random-effects approach. Based on the assumptions related to unobserved, it is more relevant to use a fixed effect approach. (Riedl & Geishecker, 2014) conducted a Monte Carlo simulation to compare the consistency and efficiency of the estimation results from the OLS fixed effect, as well as binary and ordinal response regressions in the ordinal model. The unobserved heterogeneity of individuals who are not controlled will cause a large bias in the estimation results. Based on the simulation, OLS fixed effect regression to model the ordinal response is an efficient and easier method and provides an unbiased estimate.

RESULTS AND DISCUSSION

Demographic Character

Table 1 shows the demographic characteristics of respondents for IFLS 4 and 5. The total respondents were 11,885 who had complete data in IFLS 4 and 5 for all the variables, and the majority were males. Meanwhile, education, as measured by the length of schooling has an average of 7 years. In 2014, the average length was higher than in 2007 with a 4 months increase. Compared to 2007, more people got married (119 individuals) in 2014. However, divorce cases increased by 80 which is a rise of 25.80% from 2007.

Table 1. Demographic Character

	IFLS 4 (2007)	IFLS 5 (2014)
	Percentage or Mean	Percentage or Mean
Gender		
Male	55,03 %	55,03 %
Female	44,97 %	44,97 %
Marital Status		
Single	14,76 %	9,24 %
Married	77,32 %	78,34 %
Separated/divorced alive	2,60 %	3,27 %
Death divorce	5,32 %	9,15 %
Job Status		
Have a job	74,70 %	78,77 %
Pension	1,32 %	3,01 %
Unemployed	23,97 %	18,22 %
Years of schooling	7,14	7,48
Age	39,03	45,88
Per capita expenditure	482.172	997.488
N = 11.885		

Source: IFLS 4 & IFLS 5 (data processed)

Economic conditions seen from employment status and household expenditure per capita were positive. The unemployed category decreased by almost 700 individuals and household expenditure per capita increased nominally from IFLS 4 to IFLS 5. This increase occurred over 7 years and was also influenced by changes in general living standards, inflation, and other factors.

Regression Result

Table 2 shows the factors affecting happiness from fixed-effect OLS regression. The estimation results in column (a) do not include the interaction effect between age and education. The next column (b) is the estimation result of the Equation 1 regression. The difference between (a) and (b) lies in the significance of the altruism and education variables. When seen from the sign of the regression coefficient, the difference is in the education and age variables. Furthermore, columns (c) and (d) are estimation results from Equation 1 regression with male and female samples. The significant variables in (b), (c), and (d) are religiosity, marital status, subjective health, and perceived safety.

When we have statistically significant interaction effects, we can not interpret the main effects without considering the interaction (Frost, 2019). Column (b) shows that age and also education have negative coefficients.

Table 2. Estimation Result OLS FE

	Happiness			
	(a) All sample	(b) All sample	(c) Male	(d) Female
Religiosity	0.0396**	0.0409***	0.0386**	0.0441**
Generalized trust	0.0238*	0.0233**	0.0319**	0.0170
Particularized trust	0.0173	0.0161	0.0335**	0.00287
Institutional trust	0.00870	0.00824	0.0118	0.00524
Altruism	0.0219**	0.0208*	0.0122	0.0290*
Ln(per cap expenditure)	0.0134**	0.0136***	0.0115	0.0158**
Education	0.00651	-0.0188**	-0.00643	-0.0324**
Age	0.00104	-0.00316*	-0.00210	-0.0046**
Education*Age		0.00058***	0.00037	0.00082***
Married	0.116***	0.110***	0.146***	0.0853***
Subjective health	0.0752***	0.0735***	0.0690***	0.0769***
Live in the city	-0.00652	-0.0049	-0.0302	0.0171
Unemployed	-0.0232*	-0.022*	-0.0623**	-0.00825
Perceived safety	0.0614***	0.0606***	0.0481***	0.0725***
Constant	2.518***	2.717***	2.620***	2.813***
<i>N</i>	11885	11885	5343	6542
<i>F statistic</i>	11.85***	13.18***	6.78***	7.15***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Source: IFLS 4 & IFLS 5 (data processed)

Since the interaction effect between age and education is significant, we can not just interpret it. The Nonparallelness of the lines in Figure 1 shows that interaction between education and age exists. The effect of age on happiness depends on education.

Religiosity. The higher the religiosity level, the more the happiness. This effect is statistically significant. Based on gender, the analysis showed the influence of religiosity on happiness was greater in the female group than in the male. The findings of religiosity on happiness support the results of previous studies. According to (Rahayu, 2016), religious individuals are happier and more satisfied with their lives (Sujarwoto et al., 2018). With another proxy of religiosity, based on longitudinal data in the US, attending religious event influence positive behavior and happiness (Mohanty, 2015).

Trust. As one of the core concepts in social capital, trust is important in influencing economic development (Doh & McNeely, 2012). Of the three types of trust, generalized trust affects happiness level except for the female sample. The significance of general trust on happiness is also concluded by (Lane, 2017) and (Conzo et al., 2017). Meanwhile, particularized trust is not significant. Similar to other types, the coefficient of institutional trust for the male sample is higher compared to the overall and female. Institutional trust as measured by trust in police is not significant. This is different from the results of (Sabatini, 2011) which found that institutional trust is one of significant factors affecting happiness.

Altruism. This is measured by the willingness to help, and it significantly affects happiness level except in the male sample. The regression coefficient is positive and previous studies concluded a positive relationship between altruism and happiness Rahayu (2016), (Meng et al., 2015), and (Pareek & Jain, 2012). (Konow & Earley, 2008) and (Helliwell et al., 2017) supported this positive relationship where altruism's proxy is money spent for donation. With the same data (4th and 5th IFLS), pro-social expenditure had a positive correlation with probability being happy (Utama et al., 2021).

Interaction Effect of Age and Education. Education increases networking opportunities, more job choices, and improves the chances of earning more income. This ultimately correlates with happiness levels. This indicates that people who are better educated are more likely to be happier with age. This study showed the interaction effect between age and education does exist. However, the coefficient of education-age is very small.

(Utama et al., 2021) found that using 4th and 5th IFLS, education level affect happiness. The other studies using cross-sectional data of one wave IFLS data showed the same result. Sujarwoto, Tampubolon, & Pierewan (2018) stated that year of education has a significant effect but with a very small marginal effect (one percent). Rahayu (2016) and Landiyanto et al (2011) used dummy of basic education as a measure of education. With the different analysis tools, both studies concluded that education significantly affects happiness.

(Nikolaev & Rusakov, 2016) used the panel data of Household Income and Labour Dynamics in Australia (HILDA) survey 1st -13th wave to analyze the effect of education on happiness. The results showed the effect depends on age. People with higher education levels are more likely to be happier than their less-educated counterparts starting in the early to mid-30s. This study showed that interaction effect of age-education is significant. However, it is not significant for male (column c Table 2).

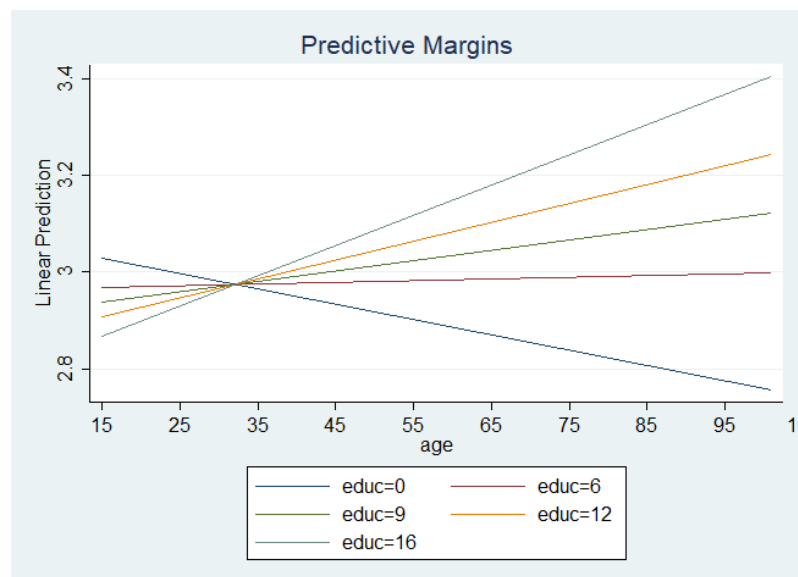


Figure 1. Interaction Effect between Education and Age
 Source: IFLS 4 & IFLS 5 (processed)

Figure 1 illustrates the interaction between age and education. When the year of education is low, age negatively affects happiness level. This implies the higher the year of education, the more positive the effect of age on happiness level. Figure 1 shows people with 9 years of education and more have a positive relationship between age and happiness. However, a previous study with IFLS data did not analyze this interaction effect.

(Hardini & Wasiaturrehman, 2020) and (Utama et al., 2021) used age and squared age in their model. The squared age was used to capture the long-run effect. The coefficient for age is negative and for squared age is positive. There is a decrease in individuals' happiness level with increasing age. The positive coefficient of squared age showed there will be an increase in happiness. In addition, age and happiness have a U-shaped relationship.

Per Capita Expenditure (PCE). Household per capita expenditure is less biased than income to measure the economic condition in developing countries (Graham, 2009). This is because the majority of the population in developing countries works in an informal sector whose monthly income is unknown. This study showed expenditure per capita has a significant effect on happiness. However, it is not significant in the male sample.

Sohn (2013) in a cross-sectional analysis found a positive relationship between income and happiness. This relationship may not be found in panel data analysis. Also, income may increase over time but SWB is unchanged. This study showed that using panel data, the regression coefficient is positive and significant although the variable used is per capital expenditure instead of income.

Marital status. Marriage has significant role in happiness level. Married individuals have 11% higher happiness than those who are unmarried. The magnitude of the effect of marriage on individual happiness is greater in male than female. Furthermore, married men are 14.6% happier than unmarried ones. (Utama et al., 2021) also shows that marriage increases the probability of being happy.

Using cross-sectional data, Sujarwoto, Tampubolon, dan Pierewan (2018) found a similar result. The effect of being married on happiness is higher (9%) than its effect on life satisfaction (5%). Moreover, living separately from the husband/wife lowers the probability of being happy by 8-9%.

(Frey & Stutzer, 2005) stated that individuals who are married have a higher level of subjective well-being than the unmarried, separated, or divorced. Marriage may support individual self-esteem, for instance, by providing an escape from stress. Married people also have a better chance of benefiting from a lasting and supportive intimate relationship and suffer less from loneliness.

Subjective Health. . This consists of four categories, namely (1) very unhealthy, (2) unhealthy, (3) healthy, and (4) very healthy. In this study, it was categorized as becoming a dummy (1= healthy, very healthy, 0=otherwise), which significantly affects happiness level. Healthy people have a 7% higher level of happiness than those who are not. All the previous studies with IFLS data of panel or cross-sectional showed the same result (Utama et al., 2021), (Hardini & Wasiaturrehman, 2020) (Landiyanto et al., 2011), (Rahayu, 2016).

Dwelling place. The settlement of an individual either urban or rural does not significantly affect happiness level. However, it is interesting that the regression coefficient between the male and female samples is not similar. The estimation result of the male sample showed a negative effect, where female is happier when

living in the city (the coefficient is positive). Females living in cities have 8% higher happiness than those in rural areas.

Unemployment. This status has a negative effect on happiness and is only significant in the male sample. The happiness is 6% lower than those who are employed. The negative effect of unemployment on happiness was also stated by Sujarwoto, Tampubolon, dan Pierewan (2018).). Not having a job affects happiness significantly and is 8% more likely to cause unhappiness. IFLS 5 cross-section data showed that having a job has a significant effect on the happiness of fathers (Putri & Prasetyani, 2021).

Perception of Security. Individuals' perception of security in the residential area significantly affects happiness. Those who felt their surroundings were 'very safe' had a 6% higher happiness rate. The influence of the sense of security is higher in females than in males. These results support the findings of Sujarwoto, Tampubolon, dan Pierewan (2018) dan Daffon (2017). Security in those studies is objectively proxied by conflict and violence, which have a negative effect on the probability of happiness with a value of 7%.

CONCLUSION

Religiosity, marital status, health, and feeling safe significantly affect happiness. Furthermore, general trust affects happiness levels except for the female sample. The government should consider religiosity as an aspect to be maintained besides other developmental aspects in the country. Schools and parents also need to pay attention to maintaining religiosity for all members. The government can support generalized trust by consistently and indiscriminately enforcing the rule of law.

It was shown that the effect of age on happiness interacts with education. Therefore, future study could extensively examine this relationship. This study used per capita expenditure for non-food commodities, instead of income. (Toshkov, 2022) found that income has an important role in moderating the relationship between age and happiness. This could be a consideration for future research.

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