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Happiness: An Approach to Measure Economics of Well-Being

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***Abstract*— Happiness is a psychological condition of a person related to the condition of well-being. This study aims to see and estimate the factors that cause someone to prosper by using the condition of happiness as a proxy. The data used is the data from the Indonesia Family Life Survey 5. In addition, we use spatial aspects to see the differences in the formation of the probability of someone to be happy. The findings of this study are that household income, education, health, marital status, gender, and religious level have a positive and significant effect on a person's probability of being happy.**

Keywords: happiness, well-being, probit

I. INTRODUCTION

A person's well-being is measured by how a person's needs are met in his daily life with a variety of determinants — psychologically, socially, environmentally, emotionally and spiritually as well as how an individual evaluates his own life and how the surrounding environment [11, 15). Measuring aggregate welfare can be done with the Gross Domestic Product (GDP) approach until 1944 at the Bretton Woods conference, GDP is more suitable for measuring economic progress, wealth, household production, and others [5].

Then a number of studies were conducted which used several other indicators to provide an alternative measure of well-being. The indicator that can be used is happiness, where economists try to focus their studies on the well-being of an individual in terms of happiness over the past decade. Economic happiness is an approach by combining techniques used by an economist and techniques used by a psychologist to assess or measure well-being [9]. The Central Statistics Agency (BPS) noted that the Indonesian Happiness Index in 2017 reached 70.69 on a scale of 0-100 on a survey measuring happiness.

Several factors that affect happiness are divided into two categories; factors that cannot be modified (for example age, genetic factors, and socioeconomic factors) and factors that can be modified (for example education, income, and social status) [1, 16]. In addition, other factors that can be modified by a person to achieve happiness are health factors, where health can affect a person's psychological condition which impacts on happiness itself. Indonesia itself is a very heterogeneous country, allowing its people to spread in urban and rural areas, then the distribution of this population will cause population density in some areas, especially areas of interest to be used as a residence. Graphically, population density in Indonesia can be classified as follows.

Fig. 1. Map of Population Density in Indonesia

Population density in Indonesia is only centered on the island of Java, with the capital city being the most densely populated region. Studies by social experts say that one's happiness and well-being will depend on where the place of residence is and how the conditions of residence are. Indonesia itself is divided into urban and rural areas wherein 258.2 million people with the majority of the population live in urban areas and is predicted to increase in urban areas in line with the development of rural areas and population movements, as shown in the table below.

Sander [20] conducted research on the relationship between the conditions of the area of residence in the welfare of the United States. The Central Statistics Agency states, the measurement of happiness in Indonesia includes several components, such as 1) Regional classification; 2) Gender; 3) Status in the Household; 4) Marital Status; 5) Age Group; 6) Education Level; 7) Number of Household Members; 8) Monthly Household Income. Based on the description above, research on measuring the level of happiness (welfare) in Indonesia has the potential to be further developed in terms of regional classification, where population density of an area can be considered. Furthermore, this paper will be structured as follows: section 2 provides an overview of the literature review and the results of previous empirical studies of the factors that influence happiness; section 3 presents the methodology and data source; Section 4 explains the results of the study and Section 5 summarizes the whole.

TABLE I. PERCENTAGE OF RURAL AND URBAN POPULATIONS IN INDONESIA

Population (%Total)	**1995**	**2000**	**2005**	**2010**	**2015**	**2050[1]**
Rural	64	58	52	50	46	33
Urban	36	42	48	50	54	67

Source: World Bank, 2016

II. LITERATURE REVIEW

Ed Glaeser explains how location affects one's happiness, where the results obtained are unhappy samples. Whereas rich countries living in cities will have a negative impact on happiness [17]. Indeed, the fact is happiness when living in urban areas in a large country is due to the advantages of the facilities provided by urban compared to rural areas such as transportation. In 2000, it was found in China that the reason people live happier cities is the opportunity to consume and higher-income [12].

Whereas some previous studies found conflicting results where life in the countryside gave higher happiness. Some previous studies are based on the location of the rural area [13]. Fuguitt & Brown [7] found that happiness was achieved higher in smaller areas, but other factors such as education, policies made and expectations that living in urban areas were known as better places to explain where housing made someone happier.

Research in this decade shows that living in cities with many migrants will reduce the level of happiness in China [10]. In line with Gilbert et al. [8] who found that remote and rural areas in Scotland significantly influence someone's happiness, after exercising some control on individual characteristics. Okulicz-Kozaryn [17] found that the probability of being unhappy increased significantly when a city has a higher population, which is related to population density. Based on the definition by BPS, population density is a comparison of the number of inhabitants in each kilometer. Population density is influenced by several factors such as physiographic, security, cultural, biological and psychological. Based on some previous studies, it shows that a population density that is not too dense where the population is small in the country will provide a better quality of life and refers to happiness [14].

While other factors that affect well-being are income, which influences over a long period time. Individuals are considered happy when they have high incomes because they can maximize utility in terms of consuming goods [6]. Clark et al. [4] also found that in the United States there are other factors besides income (material) that affect happiness. Non-material factors that play an important role are those that concern the social dimensions of individual welfare. More specifically, the quality and quantity of social relations factors are important factors that explain welfare growth [3].

The relationship between happiness and health is tested by controlling the impact of economic and social phenomena, such as employment status and education. Among the control variables, good health is influenced by social capital. Sabatini [19] examines health disparities that are influenced by social models and happiness. The research uses probit, ordered probit regression and instrumental variables. Happiness is the best predictor of health in each estimation stage. The effect of happiness on health can affect through two things: 1) Happiness has a positive impact on daily attitudes and reduces depression; 2) happy people will do activities related to health (such as a gym).

III. RESEARCH METHODOLOGY

The study uses data from the 5th wave of Indonesian Family Life Survey (IFLS) containing survey data in 2014. The data was collected using documentation techniques, using IFLS-5 longitudinal data in 2014, with stages:

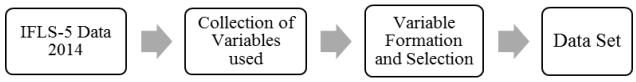

Fig. 2. Stages of variable formation from IFLS-5

The dependent variable of this study is happiness which reflects well-being, obtained from research subjects aged over 15 years. Happiness is obtained from the IFLS-5 question regarding consideration of a person's current condition, whether that person is very happy, happy, unhappy or very unhappy. Individuals who influenced the characteristics of the study there were approximately 18,000 samples. To analyze how one's happiness is influenced, individual characteristics such as marital status, sex, education, health, and household income are used in one month. Characteristics of urban and rural areas and population density are used to distinguish how the impact of independent variables on the dependent variable, happiness. The following statistics statistical descriptions for each variable.

TABLE II. STATISTIC DESCRIPTIVE

	Observation	**Mean**	**Std.Dev**	**Min**	**Max**
Happiness (value 1 if 'very happy and happy')	18.808	198,29	0,5101	0	1
Region Category (value 1 if urban area)	18.808	0,5538	0,4971	0	1
Population density	18.808	11.035	68.387,9	1	3
Education	18.808	8.248.511	4.357.968	0	22
Income	18.760	1.629.128	1.000.325	921.034	2.072.327
Health (value 1 if healthy)	18.808	0,7773	0,4161	0	1
Marital status (value 1 if 'married')	18.804	0,7050	0,4561	0	1
Gender (value 1 if 'female')	18.804	0,5381	0,4986	0	1
Beliefs (value 1 if 'is very religious and somewhat religious)	18.808	0,7800	0,4143	0	1

Dummy variables are used to help describe happiness, region, health, marital status, gender and beliefs (one's religious level). Then the education grouping is based on the level of education, namely elementary schools, junior high schools, senior high schools, and equivalent schools (for example, MTs). Appropriate research methods to be used in this study are logit and probit models because they are used to estimate models with dependent variables that are binary or dummy variables. Logit assumes that the error in this equation follows the standard logistic distribution while the error in probit follows the normal distribution. While the research method that will be used in research is the probit model, to see the probability of happiness of a person based on the region of residence and population density. The equation model in the analysis of this study is as follows.

$$happy_i = \alpha_0 + \alpha_1 educ_1 + \alpha_2 \ln_{income\ \ i} + \alpha_3 health_i + \alpha_4 married_i + \alpha_5 female_i + \alpha_6 religius_i + \varepsilon_i \quad (1)$$

Regional density will be categorized based on criteria from the Central Statistics Agency, where: Low-density level, if the population density is below 2500 people / km2 Medium density level, if the population density ranges from 2500-6000 people / km2 and high-density level if the population density is above 6000 people / km2.

IV. Empirical Result

TABLE III. HAPPINESS BY REGION

	Rural	Urban	Total
Not happy	871	942	1.813
Happy	7.521	9.474	16.995
Total	**8.392**	**10.416**	**18.808**

By region, the number of happy observations lived more in cities compared to those living in villages. This finding supports the results of research from Knight, Shi, & Song, [12] in China. Not only because the majority of Indonesia's population lives more in cities (approximately 54 percent live in cities), but also due to the availability of facilities, infrastructure, entertainment facilities and social activities that are more diverse when compared to villages. These things can be a reference for someone to be happy when he lives in urban areas. While the factors that influence happiness by region are as follows.

TABLE IV. PROBIT REGRESSION RESULTS FOR INDIVIDUAL HAPPINESS BY REGION

	Coeff.		
happy	**Urban & Rural**	**Urban**	**Rural**
educ	0,05908*** (0,00342)	0,05813*** (0,00473)	0,06128*** (0,00518)
ln_income	0,11633*** (0,01253)	0,13513*** (0,01732)	0,09826*** (0,01826)
health	0,58360*** (0,02848)	0,55242*** (0,03908)	0,62089*** (0,04173)
married	0,22581*** (0,03041)	0,22472*** (0,04003)	0,22828*** (0,04719)
female	0,158017*** (0,02804)	0,19381*** (0,03885)	0,12201*** (0,04073)
religius	0,25782*** (0,03182)	0,25734*** (0,04232)	0,25505*** (0,04851)
_cons	-1,66202*** (0,21013)	-1,93438*** (0,28826)	-1,41741*** (0,31001)
N	18.756	10.384	8.372
Pseudo R2	0,1092	0,1118	0,1061
Prob LR	1296,79	704,36	590,06
Statistic	0.0000	0.0000	0.0000

Dependent Variable: Happiness (happy)
Note: The sign () indicates a robust standard error
* Significant at α = 10%, ** Significant at α = 5%, *** Significant at α = 1%

Urban & Rural is a regression result for both regions simultaneously, then each urban and rural regression result shows the regression results for urban and rural areas. There are no differences in the factors that affect individual happiness where the level of education has a positive and significant effect on happiness in rural and urban areas. This indicates that the level of education will affect happiness in an individual's life. Peiró [18] explains the positive relationship between education and happiness as ease of access to knowledge will bring individuals to intellectual satisfaction.

Individual income per month influences positively and significantly happiness. As a major determinant of happiness, income influences the ability to consume goods and services, and this consumption is a full projection of an individual's desire for satisfaction (happiness in his life. These results support previous research by Frey and Stutzer [6]. Health also influences happiness positively and significantly, where health will provide the possibility for individuals to actively undergo their daily activities and routines Sabatini [19] describes a person with high health activities, will reduce depression and increase happiness.

The status of an individual has a positive and significant effect on happiness, where marriage gives the possibility for an individual to be happy, as well as belief in the beliefs (religion) of the individual. People who are religious, or hold beliefs in their religion tend to have a positive effect on the happiness of the individual. For sex shows happiness has a

positive and significant effect where women are shown to be happier than men from the regression results. The observational values of urban and rural regressions show the same amount as the overall regional regressions, while the Pseudo R2 values describe how much the independent variables explain happiness. Regression results show that the independent variable explains happiness by 10-11 percent, and together there is an effect when viewed from the LR statistical probability value.

TABLE V. HAPPINESS BY DENSITY LEVEL

Density Level	Not happy	Happy	Total
Low	1.151	10.129	11.279
Medium	299	2.893	3.192
High	363	3.973	4.336
Total	**1,813**	**16,995**	**18,808**

Low, medium and high density levels show a similar result in that happiness dominates more than the sample used. When referring to the characteristics of the Indonesian people, where social life is one important aspect of daily life, this is considered suitable. It is not uncommon to find densely populated areas providing opportunities for communication between households that can affect the psychological state of individuals in the region. Total observations were 18,808 similar to observations used in regional standards.

The population distribution in Indonesia also shows that the population is spread in areas with low density. Thus, the results show that most observations live in areas that are not densely populated. This can be seen in graph 1 in the introduction. While the effect of each variable on happiness shows consistent results as well as the regression results for probit urban and rural areas. The regression results are presented in the table below.

TABLE VI. PROBIT REGRESSION RESULTS FOR INDIVIDUAL HAPPINESS BY DENSITY LEVEL

	Coeff.			
happy	**Overall**	**Low**	**Medium**	**High**
educ	0,0591***	0,0630***	0,0535***	0,0513***
	(0,0034)	(0,0045)	(0,0083)	(0,0077)
ln_income	0,1163***	0,1091***	0,0882***	0,1741***
	(0,0125)	(0,0159)	(0,0298)	(0,0288)
health	0,5836***	0,6084***	0,5699***	0,5313***
	(0,0285)	(0,0363)	(0,0694)	(0,0620)
married	0,2258***	0,2468***	0,0237***	0,3060***
	(0,0304)	(0,0400)	(0,0781)	(0,0607)
female	0,1580***	0,1257***	0,1879***	0,2361***
	(0,0280)	(0,0356)	(0,0686)	(0,0621)
religius	0,2578***	0,2261***	0,2986***	0,3046***
	(0,0318)	(0,0421)	(0,0771)	(0,0640)
_cons	-1,6620	-1,6006	-0,8458	-2,6498
	(0,2101)	(0,2683)	(0,4962)	(0,4802)
N	18.756	11.247	3.185	4.324
Pseudo R2	0,1092	0,1102	0,1086	0,1125
Prob LR	1296,79	817,85	215,43	278,95
Statistic	0,0000	0,0000	0,0000	0,0000

Dependent Variable: Happiness (happy)
Note: The sign () indicates a robust standard error
* Significant at α = 10%, ** Significant at α = 5%, *** Significant at α = 1%

The higher the household income, the probability of being happy is positive and significant for all levels of regional density. Likewise with health and education variables that have a positive effect on happiness, the more the level of education, the probability of happiness is positive and significant. For other explanatory variables, the effect and significance are the same as in previous research results. For the results of Pseudo R2, these variables explain happiness by 10-11 percent and have a significant effect together.

This model can be said to be robust in explaining happiness in the region and population density of an area if it shows the consistency of the coefficient and significance signs of all models both analyzed by the logit and probit methods. In this study there is a consistency of the coefficient sign and the significance of the logit and probit models, this means that this model is robust in analyzing happiness in the region and population density of an area (attached).

V. CONCLUSION

Indonesia as a heterogeneous region with a diverse population distribution is an interesting research subject to study regarding the level of welfare of its population. This level of well-being is reflected in the happiness felt by the individual himself. Using 5th Indonesia Family Life Survey (IFLS) microdata, in 2014 a study was conducted on how happiness is in the region and based on its population density, then analyzed the factors that influence happiness itself. Happiness can be influenced by something that can be regulated or not, for example, individual status, namely gender. While other factors that influence are household income, education, health, marital status and religious level of a person. For happiness, more happy people live in cities and more happy people live in areas with high population density. This can occur because of the satisfaction of consumption and satisfaction in socializing and communicating - the true character of the Indonesian people. Estimation with probit shows that all explanatory variables (household income, education, health, marital status, gender, and religious level) have a positive and significant effect on a person's probability of being happy.

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Appendix 1. Logit and Probit Regression Results for Urban and Rural Areas

	Coeff.					
happy	**Urban & Rural**		**Urban**		**Rural**	
	Logit	**Probit**	**Logit**	**Probit**	**Logit**	**Ptobit**
educ	0,1136*** (0,0669)	0,05908*** (0,00342)	0,1112 (0,00921)	0,05813*** (0,00473)	0,11801 (0,01017)	0,06128*** (0,00518)
ln_income	0,21691*** (0,02290)	0,11633*** (0,01253)	0,2507 (0,03172)	0,13513*** (0,01732)	0,18646 (0,03318)	0,09826*** (0,01826)
health	1,09797*** (0,05311)	0,58360*** (0,02848)	1,06103 0,0735	0,55242*** (0,03908)	1,1432 (0,07703)	0,62089*** (0,04173)
married	0,42581*** (0,05943)	0,22581*** (0,03041)	0,4271 (0,0786)	0,22472*** (0,04003)	0,42808 (0,09152)	0,22828*** (0,04719)
female	0,30738*** (0,0545)	0,158017*** (0,02804)	0,3956 (0,0767)	0,19381*** (0,03885)	0,21967 (0,07831)	0,12201*** (0,04073)
religius	0,49599*** (0,0606)	0,25782*** (0,03182)	0,4904 (0,0815)	0,25734*** (0,04232)	0,49769 (0,09099)	0,25505*** (0,04851)
_cons	-3,3323*** (0,38369)	-1,66202*** (0,21013)	-3,821 (0,5265)	-1,93438*** (0,28826)	-2,92487 (0,56463	-1,41741*** (0,31001)
N	18.756	18.756	10.384	10.384	8.372	8.372
Pseudo R2	0,1078	0,1092	0,1106	0,1118	0,1045	0,1061
Prob LR	1280,03	1296,79	696,68	704,36	581,20	590,06
Statistic	0,0000	0.0000	0,0000	0.0000	0,0000	0.0000

Appendix 2. Logit and Probit Regression Results for Population Density Areas

	Coeff.							
happy	**Overall**		**Low**		**Medium**		**High**	
	Logit	**Probit**	**Logit**	**Probit**	**Logit**	**Probit**	**Logit**	**Probit**
educ	0,1136*** (0,0066)	0,0591*** (0,0034)	0,1211*** (0,0087)	0,0630*** (0,0045)	0,1032*** (0,0162)	0,0535*** (0,0083)	0,0977*** (0,0015)	0,0513*** (0,0077)
ln_income	0,2169*** (0,0229)	0,1163*** (0,0125)	0,2048*** (0,2888)	0,1091*** (0,0159)	0,1573*** (0,0552)	0,0882*** (0,0298)	0,3314*** (0,0525)	0,1741*** (0,0288)
health	1,0979*** (0,0531)	0,5836*** (0,0285)	1,1322*** (0,0673)	0,6084*** (0,0363)	1,0714*** (0,1301)	0,5699*** (0,0694)	1,0378*** (0,1185)	0,5313*** (0,0620)
married	0,4258*** 0,0594	0,2258*** (0,0304)	0,4630*** (0,0776)	0,2468*** (0,0400)	0,0038*** (0,1571)	0,0237*** (0,0781)	0,6122*** (0,1196)	0,3060*** (0,0607)
female	0,3073*** (0,0545)	0,1580*** (0,0280)	0,2330*** (0,0685)	0,1257*** (0,0356)	0,3871*** (0,1335)	0,1879*** (0,0686)	0,4775*** (0,1232)	0,2361*** (0,0621)
religius	0,4959*** 0,0606	0,2578*** (0,0318)	0,4392*** (0,7944)	0,2261*** (0,0421)	0,5668*** (0,1481)	0,2986*** (0,0771)	0,5988*** 0,1243	0,3046*** (0,0640)
_cons	-3,3323 (0,3836	-1,6620 (0,2101)	-3,2344 (0,4888)	-1,6006 (0,2683)	-1,6536 (0,9136)	-0,8458 (0,4962)	-5,3078 (0,8742)	-2,6498 (0,4802)
N	18.756	18.756	11.247	11.247	3.185	3.185	4.324	4.324
Pseudo R2	0,1078	0,1092	0,1092	0,1102	0,1066	0,1086	0,1121	0,1125
Prob LR	1280,03	1296,79	807,95	817,85	211,51	215,43	278,01	278,95
Statistic	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000