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Macro Socio-Economic Factors that Affect the Happiness Index in Indonesia

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ABSTRACT

This study aims to determine the macro socio-economic factors that affect the Happiness Index in Indonesia. The data used comes from the publications of BPS-Statistics Indonesia. The data used is panel data with a research period of 2014, 2017, and 2021 according to the publication time of the Happiness Index. The analysis model used is panel data regression analysis. Of the three panel models tested Common, Fixed, and Random), the fixed effects model was the best. The classical assumption test was carried out on the selected model. The result was that there were violations of the heteroscedastic and autocorrelation assumptions. Because it violates assumptions, the selected fixed effect model is transformed into the white cross-section GLS model. The results obtained, Simultaneously, all independent variables can influence the happiness index with a coefficient of 95 per cent. The Gini ratio, the poor, and the open unemployment rate have a significant negative effect on the poverty index. In contrast, HDI, per capita/month expenditure, and economic growth positively impact the happiness index. A comprehensive policy is needed so that the level of happiness of the Indonesian people continues to increase.

INTRODUCTION

Happiness is considered necessary by society and one of the goals of human life. In addition to aiming to find happiness for oneself, one can also create happiness for others, and the government must create broader happiness for its people (Bentham, 1789).

One way to measure people's happiness is with the happiness index. The BPS-Statistics Indonesia calculates the happiness index in Indonesia. Until now, BPS has published three periods of the happiness index, namely 2014, 2017, and the latest in 2021.

Modelling of happiness has been done with various perspectives and analytical methods. Happiness can be examined in terms of individual characteristics by using the ordinal regression model (Rahayu, 2016). This study's income, education level, and health status affect happiness. The level of happiness of countries in the world can be studied with Moderated Regression Analysis (MRA)(Rahayu, 2016). The results obtained by population and net migration partially harm the happiness of countries in the world. In contrast, the corruption-free level partly impacts the happiness of countries in the world.

Amalia & Nurpita (2017) and Sodik, Febriantikaningrum & Purwiyanta (2021) studied related to the Happiness Index in Indonesia on socio-economic. In this study, data from 2014 and 2017. The modelling is carried out annually, using the Ordinary Least Square model. More about Rositawati and Budiantara (2019) conducted modelling of the provincial happiness index in Indonesia using nonparametric spline truncated regression. The results obtained show that the variables of the Human Development Index, Labor Force Participation Rate, and the number of poor people significantly affect the happiness index. Gross Regional Domestic Product (GRDP), School Participation Rate, and the ratio of hospitals per one million population also significantly affect the happiness index.

From various previous studies, there are still differences in the effect of potential variables on the happiness index. In addition, no one has used the panel regression method Based on the problems and various previous studies, this research is modelling the poverty index using macro socio-economic variables using the latest data, namely 2021. The method used is panel data regression analysis. This study aims to find out macro socio-economic factors that affect the happiness index in Indonesia.

METHODS

Data used in this study came from BPS-Statistics Indonesia publications in (2015), (2018) and (2022). This research focuses on all provinces in Indonesia with a research period of 2014, 2017, and 2021. This research period adjusts the publication period of the happiness index in Indonesia. The dependent and independent variables in this study can be seen in Table 1.

Dependent Variable	Unit	Data Scale
Happiness Index	Points	Ratio
Independent Variable	Unit	Data Scale
Gini Ratio	Points	Ratio
Number of Poor Population	Thousand Souls	Ratio
Open Unemployment Rate	%	Ratio
Human Development Index	Points	Ratio
Expenditure Per Capita/Month	Rupiah	Ratio
Economic growth	%	Ratio

Table 1: Research Variable

Model the regression used is panel data regression analysis. There are three types of modelling in panel data regression, namely the common/pooled model, fixed-effect model, and random effect model (Baltagi, 2005). The model selection test was conducted to determine the best model informing the relationship between variables. The panel selection test can be seen in Table 2.

Panel Test	Null Hypothesis	Alternative Hypothesis
LM BP test	Common model is better than a Fixed	Fixed Model is better than Common Model
Chow test	Common model is better than Random	Random Model is better than Common Model
Hausman test	Random Model is better than Fixed	Fixed model is better than Random

Table 2: Panel Model Selection Test

After selecting the best model, the classical assumption test is carried out. This test is carried out to ensure that the model can be used to see the influence between variables and predict the value of the dependent variable from the known value of the independent variable (Gujarati, 2004). The classical assumption test can be seen in Table 3.

Assumption Test	Null Hypothesis	Alternative Hypothesis
Jarque Berra Uji test	Normal distributed data	Data is not normally distributed
White Test	Homoscedasticity Model	Heteroscedasticity Model
LM Correlation Test	Non-Autocorrelation Model	Autocorrelation Model

Table 3: Classic Assumption Test

After the best model is selected and meets the classical assumptions, the next step is to test the model's goodness (Walpole, 2012). The goodness of the model test can be seen in Table 4. After all criteria of the model testing are fulfilled, the interpretation of the formed regression equation is carried out.

Goodness of Fit Test	Null Hypothesis	Alternative Hypothesis	Reject Ho
Coefficient of Determination Test/ adjusted R square		R square > 0.5	
Simultaneous Test/ F Test	Incorrect Model/ All variables have no effect	The model fits / at least 1 variable has a significant effect	Prob. Value < 0.05
Partial Test/ T Test	The specific independent variable has no effect	The specific independent variable has an effect	Prob. Value < 0.05

Table 4: Model Goodness Test

RESULTS AND DISCUSSION

We use descriptive analysis to determine the characteristics of each variable in the study during the research period (2014, 2017, and 2021). Table 5 shows a descriptive analysis. On average, the happiness index value in Indonesia is 70.98 points. The highest happiness index value was 76.34 in North Maluku Province in 2021, and the lowest was 60.97 in Papua Province in 2014. On average, the Gini ratio in Indonesia is 0.36 points. The Gini ratio is the highest at 0.459 in Papua Province in 2014 and the lowest at 0.247 in Bangka Belitung Province in 2021. On average, the HDI in Indonesia is 69.75 points. The highest HDI value was 81.11 in Jakarta Province in 2021, and the lowest was 56.75 points in Papua Province in 2014. On average, economic growth in Indonesia is 4.99 per cent. The highest economic growth value was 16.4 per cent in North Maluku Province in 2021, and the lowest was -2.47 in Bali Province in 2021. The average open

unemployment rate is 5.35 per cent. The highest TPT value was 10.51 per cent in Maluku Province in 2014, and the lowest was 1.48 per cent in Bali Province in 2017.

Variable	Index Happiness	GINI	Total population Poor	Un-employment	HDI	Expenditure Per capita/ Month	Growth Economy
mean	70.98	0.360	794.78	5.35	69.75	1,051,966	4.99
median	71.01	0.360	357,365	5.025	69,875	1,048,160	5.08
Maximum	76.34	0.459	4748,42	10.51	81.11	2,336,429	16.4
Minimum	60.97	0.247	48.56	1.48	56.75	493,088	-2.47
Std. Dev	2.51	0.04	1130.63	1.91	4.27	326,908	2.46
Observations	102	102	102	102	102	102	102

Table 5: Descriptive Analysis

The requirement in the regression model is that there is no relationship/high multicollinearity between the independent variables, as seen from the Variant Inflation Factor (VIF) value of less than 10. In Table 6, all independent variables have a VIF value of less than ten in this study. It means all independent variables used in the model.

Variable	VIF
Gini Ratio	l.139487
Number of Poor Population	l.291191
Open Unemployment Rate	l.212004
Human Development Index	l.839242
Expenditure Per Capita/Month	l.980796
Economic Growth	l.109480

Table 6: Independent Variable Multicollinearity Test

Before further analyzing the modelling in panel data regression analysis, panel model selection is carried out. We use the tests mentioned in the methodology section through the three tests in Table 7. The fixed-effect model is considered the best to describe the relationship between research variables.

Test	Test Value	Prob. Value	Conclusion
LM BP Test	47.82	0.00	Random Model is better than Common/ Pooled Model
Chow Test	7.22	0.00	Fixed Model is better than Common/ Pooled Model
Hausman Test	50,19	0.00	Fixed Model is better than Random Model

Table 7: Panel Model Test

After the panel model is selected, then the selected panel model is not interpreted directly but is tested for classical assumptions. This test is intended so that the chosen model can be used to see the effect of predicting. The assumptions used are the assumptions of normality, heteroscedasticity, and autocorrelation. In Table 8, the assumption of normality is fulfilled. The probability value is more significant than 0.05. On the other hand, there are still violations of heteroscedasticity and autocorrelation assumptions. The probability value of each test is less than 0.05.

Test	Test Value	Prob. Value	Conclusion
Jarque Berra	0.87	0.64	Normality
White Test	45.83	0.013	Heteroscedasticity
LM Series Correlation	8.48	0.014	Autocorrelation

Table 8: Classic Assumption Test

Due to the violation of heteroscedasticity and autocorrelation assumptions, the fixed model was transformed using a white cross-sectional model. The final modelling used can be seen in Table 9.

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	-4.412787	6.654686	-0.663110	0.5097
Gini Ratio	-13.32076	1.203901	-11.06466	0.0000
Number of Poor Population	-1.288733	0.578759	-2.226719	0.0296
Open Unemployment Rate	-0.219340	0.021720	-10.09875	0.0000
Human Development Index	0.572659	0.036220	15.81057	0.0000
Expenditure Per Capita/Month	3.512755	0.386584	9.086651	0.0000
Economic growth	0.140169	0.043010	3.258989	0.0018
R-squared	0.969255	F-statistics		50.1168
Adjusted R-squared	0.949915	Prob(F-statistic)		0.00000

Table 9: Hypothesis test

From Table 9 above, the F test shows that all independent variables together affect the level of happiness. This result is identified by the probability value of the F statistic < 0.05. This result means that the modelling carried out is appropriate.

The coefficient of determination value is 0.9499. This coefficient means that all independent variables can explain the variation of the happiness index by 94.99 per cent; other variables outside the model influence the remaining 5.01 per cent. Partially, the Gini ratio, the poor, and the unemployed have a significant negative effect on the poverty index. In contrast, HDI, per capita/month expenditure, and economic growth positively impact the happiness index.

The regression equation formed:

Happiness Index = -4.41-13.32 Gini Ratio -1,288 Poor People-0.21 Unemployment +

0.57 HDI+3.51 Per capita Expenditure +0.14Economic Growth

The Gini Ratio has a significant negative effect on the happiness index. This result means that an increase in the Gini ratio of an area will reduce the happiness index of that area. The Gini ratio is a measure of the inequality of income distribution. This result means that when the distribution of income between regions increases, the chances of people's happiness will increase. This result is in line with Ohtake and Tomioka's research (2004). Their study states that there is a relationship between happiness and inequality.

The number of poor people has a significant negative effect on the happiness index. This result means that an increase in the number of poor people in an area will reduce the happiness index of that area (Rositawati & Budiantara, 2019).

The Open Unemployment Rate has a significant negative effect on the happiness index. This result means that an increase in the open unemployment rate of an area will reduce the happiness index of that area. TPT indicates that someone who does not have a job at all has an impact on someone who has no income at all so that they cannot support the activities and desires of someone. This can result in a decrease in one's happiness. This result is in line with the research of Rosiawati and Budiantara (2019).

The Human Development Index has a significant positive effect on the happiness index. This result means that an increase in the HDI of an area will increase the happiness index of that area. HDI indicates the quality of human resources in terms of health, education, and purchasing power/economics (Sodik, Febriantikaningrum, & Purwiyanta, 2021). With the increase in HDI, it will have an impact on improving the quality of human beings through their education (Chen, 2012) and the ability to access facilities and infrastructure both from an economic and social perspective so that it tends to increase happiness.

Expenditure per capita/month has a significant positive effect on the happiness index. This result means that an increase in the per capita expenditure of a region will increase the happiness index of the region. This result is in line with Rahayu's research (2016) and Mahadea's (2012). Increasing per capita expenditure means that the necessities of life will be fulfilled, thereby increasing the chances of happiness.

Economic growth has a significant positive effect on the happiness index. This result means that an increase in the economic growth of a region will increase the happiness index of the region. This result is in line with research with Bariyah (2015), Rositawati and Budiantara (2019), and Kumalasari and Yasa (2020). Economic growth indicates the economic output of a region. Increased economic growth also indirectly indicates the economic strength of the community.

CONCLUSION

The fixed-effects model was obtained as the best model based on the panel model testing (Chow, LM BP, and Hausman). There is still a violation of the classical assumption of heteroscedasticity and autocorrelation. The fixed model is transformed with the white cross-section GLS model. The results obtained that the Gini ratio, the poor, and the unemployed significantly affect the poverty index. In contrast, HDI, spending, and economic growth positively affect the happiness index.

Based on the results of this study, a comprehensive policy related to the macro-social economy is needed so that the level of happiness of the Indonesian people continues to increase. For further research, it is possible to add other potential independent variables that affect the happiness index and use another panel modelling by using random effects or spatial effects in panel modelling.

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