

## Cigarette Consumer and Poverty in Indonesia

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### Abstract

*Poverty is still a social phenomenon that always exists in every developing country, including Indonesia. The purpose of this study is to describe the condition of cigarette consumers and poverty in Indonesia and to analyze the factors that influence poverty in Indonesia. The method used is descriptive analysis and panel data analysis with 18 provinces in Indonesia in 2015-2019. The results of this study indicate that NTT Province is the province with the highest poverty rate. The variable of cigarette consumers has a negative influence on poverty which is dominated by the Province of Lampung. However, this study contradicts the research of Supriadi and Rusyiana (2018) where poor households that have household members who smoke consume relatively less rice on average than households that do not have household members who smoke, whether they are in the poor category or not. The results of the static panel data show that the factors that affect poverty in Indonesia are income per capita (PDRB per capita), unemployment (TPT), mean years school (RLS), while the dynamic panel shows that the factors that influence poverty are cigarette consumer (PMP) and mean years school (RLS).*

### Keywords

poverty; cigarette consumer; mean years school



## I. Introduction

Indonesia is a developing country that has poverty problems (Renggapratiwi 2009). In 2019, the Central Statistics Agency (BPS) stated that poverty had decreased from 11.96 percent to 9.22 percent. Kuncoro (2003) states that poverty arises as a result of differences in the quality of human resources because the quality of human resources is low, productivity will also be low so wages are low. World Bank (2004) in Ferezegia (2018) stating the cause of poverty is the lack of income and assets (lack of income and assets), to meet basic needs such as food, clothing, housing, health, and education levels are acceptable (acceptable).

Another cause of poverty in the research of Supriyadi and Rusyiana (2018) states that poor households that have household members who smoke consume relatively less rice on average than households that do not have household members who smoke, whether they are in the poor category or not. This is reinforced by the 2018 Basic Health Research (Riskesdas) explaining that the prevalence of smoking in adolescents aged 10-18 years has increased by 1.9 percent from 2013 which is 7.20 percent to 9.10 percent in 2018.

Meanwhile, Carlson (2009) stated that related to smoking behavior, people who have a strong economic capacity have a greater chance of consuming cigarettes than those who are less well off. Poverty is not only related to limited employment opportunities, where they usually do not have a job (unemployment), it is also related to inadequate levels of education and health (Azizah and Kusuma 2018). The Central Statistics Agency (2019) explained that the open unemployment rate (TPT) was dominated by Vocational High School (SMK) graduates at 10.42 percent. SMA ranks second with a percentage of 7.92

percent followed by diploma I/II/III 5.99 percent, universities 5.67 percent, junior high schools at 4.75 percent, and elementary school at 2.41 percent.

Hidayatullah and Arianti (2019) stated that the open unemployment rate had a positive and significant effect on the poverty rate. In 2018 the Central Statistics Agency stated that there was still an imbalance between the average length of schooling for residents of urban and rural areas. The average urban population has completed 9 years of basic education, while the rural population has an average of up to 7th grade of junior high school/equivalent ( $\leq 7$  years). Hadi (2019) stated that the average length of schooling affects the percentage of the poor.

Based on the background and problems described previously, the research objectives are:

1. Describing cigarette consumers and poverty in Indonesia.
2. Analyzing the factors that influence poverty in Indonesia

## II. Research Method

### 2.1 Data Types and Sources

The type of data used in this study is secondary data inform the time series data and cross-section provincial (18 provinces) in Indonesia in 2015-2019 obtained from the Central Statistics Agency (BPS). The variables used are the percentage of the poor (PPM), income per capita (PDRB Per Capita), cigarette consumers (PMP), unemployment (TPT), and the average length of schooling (RLS).

### 2.2 Methods of Analysis

The method used in this research is descriptive and quantitative analysis methods. Descriptive analysis is used to describe cigarette consumers and poverty in Indonesia. Quantitative analysis is used to analyze the determinants of poverty in Indonesia. The quantitative analysis used is static panel data analysis and dynamic panel analysis.

Descriptive Analysis statistics describe data seen from the average value (mean), standard deviation, variance, maximum, minimum, sum, range, kurtosis, and skewness (Ghozali 2018).

### 2.3 Static Panel Data Regression Analysis

This analysis is used to measure the strength of the relationship between two variables (Ghozali 2018).

The following is the model used in the static panel data analysis research:

$$PPM_{it} = \beta_0 + \beta_1 \text{LnPDRB}_{it} + \beta_2 \text{PMP}_{it} + \beta_3 \text{TPT}_{it} + \beta_4 \text{RLS}_{it} + \varepsilon_{it}$$

Tests carried out on a static panel are Chow Test, Hausman Test, Lagrange Multiplier Test, and Classical Assumption Test.

#### a. Chow Test

Ghozali (2013) states the Chow test to choose whether to use the model common effect or fixed effect. Hypotheses are formed,  $H_0$ : Model CommonEffect,  $H_1$ : Model. Fixed EffectIf the results of the Chow test use a fixed-effect model, then proceed to the Hausman test. However, if the results of the Chow test use the common effect model, there is no need to proceed to the Hausman test.

### **b. Hausman Test**

Widarjono (2018) states that the Hausman test is to choose whether to use a model fixed effect or random effect. If we reject the null hypothesis, when the Hausman statistic is greater than the critical value, the correct model is the model, fixed effect whereas if we fail to reject the null hypothesis, when the Hausman statistic is less than the critical value, the right model is the method random effect.

### **c. Lagrange Multiplier Test**

Widarjono (2018) The LM test aims to find out whether the Random Effect model is better than the OLS method. If the statistical LM value is greater than the Chi-Squared critical value, it rejects the null hypothesis, meaning that the appropriate model for panel data regression is the Random Effects model rather than the OLS method. And conversely, if the value of the statistical LM is smaller than the value of the statistic chi-squares as a critical value, then we fail to reject the null hypothesis. estimates random effect Thus, cannot be used for panel data regression, but the OLS method with the model is used Common Effect.

## **2.4 Classic Assumption Test**

### **a. Normality Test**

According to Ghazali (2018), the normality test aims to test whether, in the regression model, the confounding or residual variables have a normal distribution. The basis for decision making is by looking at the probability value of Jarque-Bera with the following criteria: if the probability of Jarque-Bera  $> 0.05$ , it can be concluded that the data is normally distributed, if the probability of Jarque-Bera is  $< 0.05$ , it can be concluded that the data is not normally distributed.

### **b. Multicollinearity Test**

According to Ghazali (2018), the multicollinearity test aims to test whether the regression model finds a correlation between independent (independent) variables. The absence of correlation between the independent variables (independent) indicates that the regression model is good. If there is a fairly high correlation between independent variables (generally above 0.90), then this is an indication of a multicollinear problem.

### **c. Heteroscedasticity Test**

According to Ghazali (2018), the heteroscedasticity test aims to measure whether in the regression model there is an inequality of variance from the residuals or observations to other observations. A good regression model is a homoscedasticity or there is no heteroscedasticity. One of the tests used is the Park Test by looking at the probability coefficients of each independent variable. With the test criteria that  $H_0$  is accepted if the Chi-Square probability value is  $> 0.05$  but if  $H_a$  is accepted then the Chi-Square probability value is  $< 0.05$ .

### **d. Autocorrelation Test**

According to Ghazali (2018), the autocorrelation test aims to test whether in the linear regression model there is a correlation between the confounding error in period  $t$  and the confounding error in period  $t-1$  (previous). The provision in this test is that if  $d$  is between 1.54 and 2.46, then there is no autocorrelation. If the value of  $d$  is found below 1.54 or above 2.46, it can be concluded that the model contains symptoms of autocorrelation (Winarno 2011).

## 2.5 Dynamic Panel Analysis

This dynamic relationship is characterized by the presence of lag a dependent variable between the regressor variables (Baltagi 2005).

### a. First-differences GMM (FD-GMM or AB-GMM)

Estimates consistent  $\delta$  where  $N \rightarrow \infty$  with  $T$  specific can be obtained using transformation the first difference to eliminate the influence of individual( $\mu$ ). (Blundell and Bond 1998).

$$PPM_{it} = \beta_0 + \delta PPM_{it-1} + \beta_1 \ln PDRB_{it} + \beta_2 PMP_{it} + \beta_3 TPT_{it} + \beta_4 RLS_{it} + \varepsilon_{it}$$

Description:

$\beta_0$  : Intercept

$\beta_1 - \beta_4$  : The coefficient of each variable.

$\varepsilon_{it}$  : *Error Term*

$PPM_{it}$  : Percentage of Poor People (percent) province i in year t

$\delta PMP_{it-1}$  : Parameter of Smoking Percentage of Population of Province i targeted t previously

$\ln PDRB_{it}$  : Income Per Capita (US \$) province i in the year (the logarithm) natural

$PMP_{it}$  : Percentage of Smoking Population (percent) of province i in year t.

$TPT_{it}$  : Open Unemployment Rate (percent) of province i in year t.

$RLS_{it}$  : Average Years of Schooling (percent) for province i in year t.

### b. Sargan Test

The Sargan test is used to determine the validity of the use of instrument variables that have a number that exceeds the estimated number of parameters (conditions overidentifying restriction) (Arellano and Bond 1991).

## III. Results and Discussion

### 3.1 Descriptive Analysis

In general, descriptive statistics describe data seen from the average value (mean), standard deviation, variance, maximum, minimum, sum, range, kurtosis, and skewness (Ghozali 2018). This study describes, in general, the picture of poverty (PPM), income per capita (PDRB), cigarette consumers (PMP), unemployment (TPT), and education (RLS).

**Table 1.** Descriptive Analysis Test Results

Provincial	Average poverty % (PPM)	Average Annual GRDP Per Capita (Rp)	Average Cigarette Consumer % (PMP)	Average Unemployment % (TPT)	Average Length of School% (RLS)
Aceh	58.36	23.465,31	29.45	14.39	9.43
Sumut	38.85	34.265,14	28.81	11.91	9.53
Sumbar	29.85	70.790,46	32.15	11.37	9.03
Riau	35.40	38.908,3	30.38	12.67	9.07
Jambi	40.61	41.857,3	29.18	7.71	8.63
Sumsel	52.26	34.247,82	32.22	8.85	8.41
Lampung	39.39	44.013,8	34.32	8.57	8.19
Kep.Riau	31.68	80.631,97	29.13	14.48	9.97
DKI	7.32	3.279.282,9	27.05	12.58	10.99

Jakarta					
Jawa Barat	36.09	28.029,75	33.68	16.66	8.51
Jawa Timur	45.89	37.824,37	28.69	8.16	7.88
NTT	69.63	11.882,26	27.26	6.54	7.64
Kaltim	27.9	127.772,47	25.84	14.63	9.64
Sulut	31.97	32.320,14	29.8	13.91	9.4
Sulteng	51.06	32.709,6	32.76	6.78	8.65
Sulsel	33.84	33.314,55	26.23	10.63	8.42
Sultra	43.85	31.928,38	28.71	6.94	8.96
Gorontalo	59.00	21.512,36	33.8	7.49	7.8
Max	69.63	3.279.282,9	34.32	16.66	10.99
Min	7.32	11.882,26	25.84	6.54	7.64

Source: Output Eviews (processed)

Based on Table 1, it can be seen that the highest average poverty in Indonesia occurs in the Province of East Nusa Tenggara (NTT) of 69.63 percent. The cause of the high poverty rate in NTT Province is the lack of investment and the combination of the structural poverty trap and the individual poverty trap. Meanwhile, the lowest poverty occurred in DKI Jakarta Province at 7.32 percent.

Based on the average annual per capita income (PDRB Per Capita) it can be seen that the highest average per capita income occurs in DKI Jakarta Province at Rp. 3,279,282.90 and the lowest per capita income in East Nusa Tenggara (NTT) Province at Rp.11 .882.26. Based on the results of the analysis of cigarette consumers, the highest average of cigarette consumers occurred in Lampung Province at 34.32 percent. The reason is that in addition to the cheap price of cigarettes, cigarettes are also goods that are easily obtained.

Smoking habits and behavior are generally the influence of the social environment, lifestyle, lack of self-confidence. For average cigarette consumers, the lowest occurred in East Kalimantan Province at 25.84 percent. Cigarette consumption activities that are usually carried out by cigarette consumers are generally closely related to unemployment, West Java Province is the highest province with average unemployment of 16.66 percent. This is related to the number of industries in West Java Province that have moved to Central Java Province due to the high UMR of West Java Province, causing high average unemployment. The province of East Nusa Tenggara (NTT) is the province with the lowest unemployment rate with a value of 6.54 percent.

About the highest average length of schooling, DKI Jakarta Province is 10.99 percent and followed by the lowest average length of schooling in East Nusa Tenggara (NTT) of 7.64 percent. The low average length of schooling in the Province of East Nusa Tenggara (NTT) is limited to infrastructure, only 5.3 percent of the population graduated to tertiary education (BPS NTT 2015).

### 3.2 Panel Analysis of Static

Based on the results in Table 2 of the static panel analysis of test results, the R-Squared at 0.64. This matter shows that poverty research models can be explained by independent variables of 64.37 percent, the remaining 35.63 percent is explained by variables or other factors that are not included in the model. From the test results, it is known that the Prob value (F-Statistic) is 0.00 which indicates the research model is classified as a fit model. The results of the analysis explain that only the cigarette consumer variable (PMP) does not have a significant effect on poverty.



**Table 2.** Static Panel Analysis Test Results

Variables	Coefficient	t-Statistic	Probability
LNPDRB	-6.359743	-4.224935	0.0001
PMP	-0.151125	-0.441856	0.6597
TPT	-0.587106	-1.752265	0.0833
RLS	-7.287691	-4.132475	0.0001
C	183.6018	9.519685	0.0000
R-squared		0.643772	
Adjusted R-Squared		0.627009	
Prob(F-Statistic)		0.000000	
Sum square resid		6683.170	
Durbin-Watson stat		1.689672	

Source: Output Eviews (processed)

#### **a. Income Per Capita (GDP per Capita)**

The variable income per capita (GRDP per capita) has a probability of 0.01 for poverty. Based on these results indicate that a 1 percent increase in income will reduce poverty by minus 6.35 percent. In Table 2, the results of the static panel analysis test show that income per capita has a negative and significant effect on the poverty variable. The results of this study are in line with the research of Azizah et al. (2018) stating that per capita income has a negative and significant effect on poverty in districts and cities of East Java Province, if the income per capita of the community decreases, poverty will increase. Safuridar, Maya (2018) also stated the same thing, that GRDP per capita has a significant effect on the number of poor people in Aceh Province.

#### **b. Unemployment (TPT)**

The unemployment variable (TPT) has a probability of 0.08 to poverty. In Table 2, the results of the static panel data analysis test show that unemployment (TPT) has a negative and significant effect on the poverty variable. The results of this study indicate that a 1 percent increase in unemployment will reduce poverty by minus 0.58 percent. The results of Utami and Masjkuri's research (2018) state that the open unemployment rate shows a negative sign and has a significant effect on the number of poor people in East Java. There is a wrong assumption that everyone who does not have a job is poor, while those who work fully are rich. This is because sometimes there are workers in urban areas who do not work voluntarily. After all, they are looking for better jobs that are more in line with their level of education (Lincoln 1997). However, the results of this study are not in line with the initial hypothesis proposed (inversely proportional) namely unemployment has a positive effect on poverty. According to Dewi (2018) Structural poverty can be interpreted as the standard of living of the population. Only structural poverty is poverty that arises not because of the inability of the poor to work (lazy), but because of the inability of social systems and structures to provide opportunities that enable the poor to work.

#### **c. Education (RLS)**

The education variable (RLS) has a probability of 0.01 for poverty. These results indicate that a 1 percent increase in the average length of schooling will reduce poverty by minus 7.28 percent. Iskandar (2018) states that there is an effect of the average length of schooling on poverty. The same study was conducted by Agustina et al.in Antika (2019) states that education has a significant influence on poverty levels. That is, if the average length of schooling increases, poverty will also decrease, and vice versa if the average length of schooling decreases, the poverty rate will increase.

#### d. Dynamic Panel Analysis

Appropriate panel data analysis in describing dynamic conditions in economic problems is a dynamic panel. The R-Squared value corrected by the value is the standard error. In this study, the standard error of the regression model was 0.93 indicated by the label SE of regression. The results of the Dynamic Panel Analysis in Table 3 explain that the variables of income per capita and unemployment do not have a significant effect on poverty.

**Table 3.** Dynamic Panel Analysis Test Results

Variables	Coefficient	t-Statistic	Probability
PPM(-1)	0.387880	6.115772	0.0000
LNPDRB	-0.054291	-1.480444	0.1452
PMP	-0.132541	-5.117453	0.0000
TPT	-0.154503	-1.161597	0.2510
RLS	-7.066094	-10.80787	0.0000
Mean dependent var		-1.114444	
S.E. of regression		0.935312	
J-statistic		12.20660	
S.D dependent var		0.955496	
Sum squared resid		42.86559	
P-Value		0.967159	
Instrument rank		13	

Source: Output Eviews (processed)

The standard error value is smaller than the standard value of the deviation response indicated by the label, SD dependent var which is 0.95 which means that the regression model is valid. Thus, the value of the instrument rank (13) is greater than the estimated number of parameters (5) so that through the Sargan. test results in overidentification restrictions. The p-value using reviews 9 gets a result of 0.96 so that the result of  $p > 0.05$  then over-identification is validly accepted so that it is concluded that this study can be used.

**Table 4.** Arellano BondResults

Test order	m-Statistic	rho	SE(rho)	Prob.
AR(1)	-1.243362	-8.463931	6.807294	0.2137
AR(2)	1.547983	7.302277	4.717284	0.1216

Source: Output Eviews (processed)

Table 4 Arellano Bond test results explain that the independent variable used to measure the poverty level shows that the probability value of the m-statistics is more alpha greater than 0.05 with a value of 0.21 and 0.12, so decisions  $H_0$  accepted. So, the estimate can be said to be consistent and there is no autocorrelation in the first difference error in the second-order.

#### e. Cigarette Consumers (PMP)

The cigarette consumer variable has a probability of 0.00 against poverty. The results of the dynamic panel analysis test in Table 3 show that cigarette consumers have a negative and significant effect on poverty but the results of this study are not in line with the initial hypothesis proposed (inversely proportional). The results of this study indicate

that a 1 percent increase in cigarette consumers will reduce poverty by minus 13 percent. Research conducted by Widyaningrum and Yu (2018) states that reducing the prevalence of Indonesian tobacco through Muslim-majority communities by including religious interpretations of tobacco use, education about tobacco risks through the school system, and increasing access to health insurance that includes addiction prevention and recovery. The results of the same study by Toukan (2018) show that increasing tobacco tax tends to be effective in reducing smoking in Jordan, especially among men, has strength and long-term impact in fighting poverty in Jordan.

#### **f. Education (RLS)**

The variable mean length of school (RLS) has a probability of 0.00 to poverty. Then, seen in Table 3. The results of the dynamic panel data analysis test show that education (RLS) has a negative and significant effect on poverty. Based on the results of this study, it indicates that a 1 percent increase in the average length of schooling will reduce poverty by minus 7.06 percent. These findings are in line with the findings of Bintang and Nenik (2018) which states that the average length of schooling has a negative and significant effect on poverty levels. Wirawan (2015) education partially has a negative and significant effect on the number of poor people.

### **IV. Conclusion**

Based on the results of the study, it can be concluded as follows:

1. Lampung is a province with the highest level of cigarette consumers in Indonesia due to cheap cigarette prices, easy access, the influence of the social environment, lifestyle, and lack of self-confidence. Meanwhile, the highest poverty occurs in NTT Province, which is thought to be due to a lack of investment and a combination of structural poverty traps and individual poverty traps).
2. Based on the results of a static panel analysis, the factors that influence poverty in Indonesia are income per capita (GRDP per capita), unemployment (TPT), the average length of schooling (RLS). However, from the results of the dynamic panel, two variables affect poverty in Indonesia, namely cigarette consumers (PMP) and the average length of schooling (RLS).

#### **Suggestions**

Based on the results of the research that has been done, the following suggestions can be given:

1. The government should be able to make the right steps in overcoming the problem of poverty, especially cigarette consumers, including:
  - a) activating nicotine replacement therapy (Nicotine Replacement) therapy/NRT),
  - b) limiting the use of cigarettes.
2. For further researchers, to use different research methods and add other variables related to poverty in Indonesia.



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