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Smoking and Poverty: Empirical Study of Districts and Cities in Indonesia

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Abstract

The purpose of this study is to examine the factors that influence poverty in cities and districts in Indonesia. Using a case study of 514 cities and districts in Indonesia from 2018 to 2021, this study examines the effect of cigarettes and other factors on poverty in the country. The dependent variable in this study is the poverty rate, and the independent variables are as follows: cigarettes consumption, GRDP, average years of male schooling (RLSL) and average years of female schooling (RLSP). This study uses a panel data method which is a combination of time series and cross section, and is a type of quantitative research. The fixed effect model is the most appropriate model to adopt, according to the research findings. The research findings show that partially cigarettes have a significant positive effect on poverty. Meanwhile, Gross Regional Domestic Product (GRDP), Average Years of Male Schooling (RLSL), and Average Years of Female Schooling (RLSP) do not affect poverty but tend to be positive. Simultaneously, the variables in the study, namely cigarettes, GRDP, IHPB, and IHPB together have a significant effect on poverty. Cigarettes absorb a large portion of household income that should be allocated to basic needs such as food, education, and health. As a result, household spending on basic needs is often reduced, which can reduce the quality of life and hinder opportunities to escape poverty. This can worsen poverty by reducing the allocation of funds for investment in basic needs and improving long-term welfare.

Introduction

In today's world, cigarettes are very popular, especially among men. Tobacco products are not

imported. Cigarettes are made from processed tobacco wrapped and other forms of cigars are made from Nicotiana Tobacum, Nicotiana Rustica, and other synthetic plants or species that are free of additives and contain nicotine, tar, and other addictive compounds (Fairizta et al., 2020).One of the behaviors that can be detrimental and disruptive to health is smoking. It is undeniable that smoking has a bad impact on a person's health. However, smokers never realize that they should stop smoking. Nowadays, not only men smoke, but also women. They smoke to get freedom, relieve stress, and lose weight, among other reasons. Many components that can be harmful to health can be found in a cigarette. In addition to harming yourself, smoking can also harm others around the smoker (Muhammad Noor Afif & Sasana, 2019)*.*

As is known, cigarettes have become a very popular item for consumers in recent years. For the community, cigarettes can be obtained freely at a very affordable price, ranging from Rp 10,000 to Rp 25,000 per pack (Marisca and Sari, 2016)*.* Even though most people are aware of the health risks associated with smoking, they still smoke. Smoking can have negative impacts on a person's health and economy. For example, smoking can lead to poverty because it drains family resources.

Cigarettes are a secondary need, especially for men. Household financial management problems can arise due to this smoking habit. Cigarettes, as we know, are a daily necessity for many people in the world today. If they stay away from cigarettes, their lives feel lacking. Cigarette smoke can cause indoor air pollution. The impact of indoor air pollution is more dangerous to human health than outdoor air pollution, so indoor air quality is an important factor that needs to be considered (A'yun and Umaroh, 2023). Even though people are aware that cigarettes are very dangerous for their health, they still consume them regularly as a means of building strength and spirit, one of which is cigarettes (Hermalinda, 2019)*.*

Tobacco plays an important role in the Indonesian economy, both as a source of state revenue and as a driver of the labor sector (Hasanah et al., 2023). The tobacco industry contributes significantly to revenue through excise, which is one of the main components of state revenue. In addition, this sector also creates jobs for millions of people, from tobacco farmers, cigarette factory workers, to workers in the distribution and marketing sectors. In some areas, especially tobacco production centers, this commodity is the backbone of the regional economy. However, tobacco's contribution to the economy is often accompanied by a dilemma, especially because of its negative impact on public health and increasing medical costs. This is a challenge for the government in balancing the economic benefits of tobacco with its social impacts. Therefore, a study of tobacco's contribution to the economy is important for formulating sustainable and equitable policies.

In addition to draining family resources, this smoking habit can push families into poverty. Every developing country, such as Indonesia, struggles with poverty. Poverty is a problem faced by developing countries such as Indonesia. Although improving the quality of life of the community in a sustainable manner is a one-way goal of national development, there are still many problems faced, including low income, low health levels, and low average education levels. As a result, poverty in Indonesia is a social problem that must be addressed at all stages of development (Yunita, 2018).

The inability of a person to meet their basic needs which include things like food, clothing, shelter, employment, education, and health in general can be used to describe poverty. Another definition of poverty is a state where individuals or groups are unable to exercise their basic rights and live a decent and sustainable life. Poverty has negative impacts on people which include hunger, early exposure to disease, and limited access to education. Ultimately, poverty causes social problems that are passed on to future generations.

Both food and non-food commodities have a role in reducing poverty, but the food poverty line has a greater impact than non-food commodities. Poor people experience higher levels of food insecurity in terms of their ability to purchase food commodities (Yuniarti et al., 2022). In September 2017, 73.35% of the population was considered to be living in poverty. This percentage is influenced by food items distributed in urban and rural areas, such as rice, beef, clove cigarettes, chicken eggs, sugar, and instant noodles. While non-food items such as housing, electricity, gasoline, sanitation, and education affect the poverty line in urban and rural areas (Almizi & Hermawati, 2018).

The Indonesian Ministry of Health released the results of the 2021 Global Adult Tobacco Survey (GATS) in June 2022. The survey showed that over the past ten years, the number of adult smokers has increased by 8.8 million people. The number of smokers rose to 69.1 million people in 2021 from around 60.3 million people in 2022.

This data can be used to calculate the annual expenditure of 69.1 million people in Indonesia on cigarettes, or around 64 trillion rupiah. According to the Indonesia Tobacco Atlas 2020, smoking is increasing among the poor. Men in the bottom five classes consume the most cigarettes (82%), followed by those in the middle class (73.3%), upper middle class (70.2%), and lower middle class (77.1%). Meanwhile, smokers from the top five groups reached 58.4%. Cigarettes are undoubtedly still one of the high-end goods consumed by the poor in Indonesia.

Efforts to overcome poverty can be carried out by increasing human resources (HR) to increase the income of poor people (Suripto et al., 2020). The problem of poverty alleviation is not only related to macroeconomic aspects, but also microeconomic aspects (Suripto and Istanti, 2009). Based on

research conducted byYunita, (2018)with the title "Cigarette Consumption on Poverty in Aceh Province (2014-2018)". The results of the study indicate that poverty and cigarette consumption are directly proportional to positive values, meaning that if cigarette consumption increases, it will increase the poverty line.

Poverty rates can be reduced if cigarette consumption can be controlled. Therefore, local governments need to be firm in making regulations that can control cigarette consumption. The majority of Indonesian people's income, both in urban and rural areas, is used to buy cigarettes, which worsens the country's already poor socio-economic conditions (Goso and Anwar, 2017). Facts show that cigarettes are one of the basic needs or primary needs of poor people in Indonesia after rice. Conditions like this can have an impact on poor nutrition and public health as well as low participation in education (Almizi & Hermawati, 2018).

Economic growth is one of the components that affects poverty, and the main goal of economic growth is to increase production capacity. To achieve this goal, labor is needed, and labor is part of the population. Employment can reduce unemployment and poverty (Ariwuni Dwi A & Kartika N, 2019). GRDP is one measure of regional economic growth. The net value of final goods and services produced by various economic activities in a region during a certain period of time is called GRDP.

Increasing economic growth reflects improving development and economic activity in the country's regions (Nasir et al., 2021). The higher the GRDP of a region, the greater the potential source of income. However, increasing the economy every year does not guarantee the welfare of the community. Increasing the economy does not necessarily indicate a significant decrease in poverty rates. This is because the overall GRDP cannot be used to measure economic development, but must consider how income is distributed evenly throughout society and who can enjoy the results (Valiant Kevin et al., 2022).

One of the important investments in human resources is education. The presence of education, knowledge and skills in a person can effectively increase productivity (Wibowo & Khoirudin, 2019). Employee productivity will increase as a result of several benefits of education, such as the spread of knowledge and technological innovation. Higher income levels are associated with higher levels of productivity. The standard of living will increase along with one's income. It is hoped that an increase in the standard of living can lift someone out of the cycle of poverty (To'oki et al., 2022).

Poverty alleviation programs are often associated with investment in education The Great, (2020). On the contrary, the universal human right to education is an essential part of women's empowerment. Life is an equal right for all people, both men and women. That is, fair, achieving equal

well-being, and contributing to progress (Islamic and Anis, 2019). Gender equality in education can encourage women to play a greater role in the economy. If in the past women only played the role of housewives, now more and more women are working, this is influenced by cultural changes caused by the impact of globalization (Sukarniati, 2005). Gender equality would increase global GDP by US$6 trillion or women's income by US$2 trillion (Direja & Paramitasari, 2020).

The purpose of this study is to determine the effect of smoking on poverty in Indonesia, to determine the effect of GRDP on poverty in Indonesia, to determine the effect of the average years of schooling for boys on poverty, to determine the effect of the average years of schooling for girls on poverty in Indonesia, and various other related issues. The reason for conducting research on the impact of smoking on poverty is important because smoking behavior has a direct impact on the economic welfare of individuals and households, especially in low-income communities. By conducting this research, it is hoped that it can gain an understanding of the dynamics in helping the government and stakeholders when designing more effective policies. Using data from the Central Statistics Agency with a case study of 514 cities and districts in Indonesia from 2018 to 2021 is new in this study, where this research is carried out specifically based on district and city data.

Based on the results of previous studies that are still contradictory, researchers are interested in reviewing it by providing a unique contribution by analyzing the impact of smoking on poverty at the district and city levels in Indonesia, which has rarely been explored at a more specific level. The novelty of this study lies in the area-based approach, which allows us to see variations in the impact of smoking on poverty across districts and cities from 2018 to 2021. Thus, this study offers an in-depth perspective that can be the basis for public policies to address cigarette-related poverty, especially at the local level, which has not received much attention so far.

Literature Review

Rolling paper, nipah leaves, or similar materials are the methods of making processed tobacco products called cigarettes. One of the addictive drugs that can have a negative impact on personal and public health is cigarettes. Cigarettes are made from processed tobacco wrapped in a wrap, which can be in the form of cigars or made from other plant species such as Nicotiana Rustica and Nicotiana Tabacum, or can be synthesized from these plants and contain nicotine and tar with or without additives (Setyani & Sodik, 2018).

Awareness Lack of possessions and poor income are characteristics of poverty, as is the inability to meet basic needs for food, clothing and shelter (Akbar and Arifin, 2023). Poverty is a

global social problem that affects all countries, although it is particularly severe in developing countries. The inability of a person with low income to meet basic needs or the minimum standard of living required by the community in his environment is considered poverty (Ritonga & Wulantika, 2020).

A person or group of people who do not have or cannot fulfill basic rights to uphold and build a dignified life are called poor. These basic rights include food, education, health, work, clean water, housing, and so on (Kambubuy & Budiasih, 2020). Poverty occurs due to poor Natural Resources (SDA), low income, unproductive, low savings and investment. Poverty can be overcome by increasing productivity that can drive economic growth, improving the quality of human resources, opening up employment opportunities that can absorb labor and encourage high income (Khairunisa & Novianti, 2018). Research result (MN Afif & Sasana, 2019) shows that poverty and per capita income have a positive and significant influence on per capita cigarette consumption in Indonesia so that increasing poverty and per capita income tend to increase cigarette consumption. The results of this study are reinforced by the results of the study (Donnell, 2024) poverty reduction is a potentially important additional benefit of the health system

A cigarette is a paper tube that varies in length from 70 to 120 mm (depending on the country) and has a diameter of about 10 mm. The paper is filled with chopped or fragmented tobacco leaves (Kumboyono & Wiahstuti, 2022). Health warnings that smoking is detrimental to health and can cause a variety of diseases, including heart attacks, lung cancer, pregnancy problems, and birth defects, have been on cigarette packs for years. In fact, many people continue to smoke despite the facts and warnings about its harmful effects on health (Nursal et al., 2023).

Smoking is the act of burning tobacco and sucking a cigarette or inhaling the smoke through a pipe. A person smokes mostly for social acceptance, stress relief, imitating parents who smoke, addiction, and boredom relief. One of the addictive substances made from tobacco is cigarettes (Crosby et al., 2019). Products containing tobacco, solids, liquids and gases that are addictive, the use of which can harm oneself and the surrounding community (Hermawati et al., 2023). Based on the results of research conducted by (Mugosa et al., 2024) Cigarette consumption causes a diversion of household expenditure from primary needs to tobacco consumption needs, which contributes to the cycle of poverty at the local level.

Nicotine, one of the addictive compounds found in tobacco, can increase heart rate, reduce hunger, and speed up metabolism. Because the carbon monoxide in cigarettes attracts blood more strongly than other substances, it can reduce the amount of oxygen in the overall bloodstream. There

are 4000 dangerous chemicals in tar that can cause many health problems, including cancer and eye pain (Herawati, 2021). According to the Ministry of Health (Kemenkes), the macroeconomic costs of tobacco use reached Rp 245.41 trillion in 2010, which is four times the amount collected from tobacco excise taxes in the state.

Statistics from the National Team for the Acceleration of Poverty Reduction also show the losses, with the number of smokers from low-income families increasing from just 30% to 43% over the past seven years. For near-poor and underprivileged families in Indonesia, cigarettes are one of the biggest expenses (Saksono, 2021). Compared to rural areas (11.53%), urban areas appear to spend more money on cigarettes (11.79%).

As the number of health problems and even deaths associated with smoking increases, the number of smokers who are teenagers or younger will also contribute significantly to economic losses. According to predictions made by the World Health Organization (WHO), there could be eight million tobacco-related deaths by 2030. The majority of tobacco-related deaths, according to WHO, occur in low- and middle-income countries. Much of this data shows that smoking has a significant impact on the economy and population of these countries (Riyanto, 2019).

In planning economic development in a region, statistical data is needed that can be used as evaluation material for economic development that has been achieved and planning material in the future. One of the statistical data that is very necessary for evaluating and planning economic development is Gross Regional Domestic Product (GRDP)(Leonita and Sari, 2019). Gross Regional Domestic Product (GRDP) or also known as Regional Income is a macro measure used to see the economy of a region or area, both level I (Province) and level II (Regency or City). In addition to other indicators, regional income is widely used by government bureaucrats, researchers, and the public in assessing the economy. More importantly, various development policies generally use data sourced from regional income (Darsono, 2020).

The economic growth of a country can be seen from its national income. This leads to Gross Domestic Product (GDP) which is the value of goods or services produced in a country in a given year using production factors owned by its citizens and citizens of other countries. It is usually valued at market prices and can be based on prevailing prices and fixed prices. The high level of economic growth indicated by the high value of GRDP indicates that a region is progressing in its economy (Dama et al., 2016).Gross Regional Domestic Product (GRDP) is one of the indicators used to measure the economic performance of a region in a period. GRDP is the amount of added value generated by

all business units in a particular region and can also be said to be the sum of the value of final goods and services produced by all economic units (Star & Woyanti, 2018).

Gross Regional Domestic Product (GRDP) according to the Central Statistics Agency (BPS) is defined as the sum of the added value generated by all business units in a region, or is the total value of final goods and services produced by all economic units in a region. GRDP can describe the ability of a region to manage its natural resources. Therefore, the amount of GRDP generated by each region is highly dependent on the potential of production factors in the region.

The limited supply of production factors causes the size of GRDP to vary between regions. In a country's economy, each sector depends on other sectors, each requiring raw materials and final products. The industrial sector requires raw materials from the agricultural and mining sectors, the results of the industrial sector are needed by the agricultural and service sectors (Astuti Widia, 2018).

Education is one of the main requirements for society. Everyone must have a high level of education if they want to have a good career and a big salary. However, poor people do not have enough money to pursue higher education, including college, and only the rich can afford higher education. Therefore, the level of education plays an important role in helping people escape poverty (Valiant Kevin et al., 2022).

On the other hand, if poverty is not reduced, it will be a challenge to provide quality education because competitive and quality resources are needed by today's workforce (Fairizta, Yunia Arien, Suharno, 2020). To become independent, people must acquire the necessary technical knowledge, skills, and abilities through education. The average length of schooling, which indicates the number of years of education a person has completed, illustrates the picture of education (Swastika & Arifin, 2023). One of the main measures of a population's education level is the average length of time spent in school. Communities can increase their chances of acquiring greater information, skills, and economic prospects by extending the average time spent in school (M. Putri et al., 2024). To combat poverty and improve the quality of society, it is essential to increase access to high-quality education and work to reduce educational disparities (Surjono & Handayani, 2013).

Method

This research method uses descriptive quantitative techniques. This study also combines interpretation into the study. Cigarettes, GRDP level, average male school and average female school. This study uses a panel data approach. The reason for using panel data in this study is that by combining time and entity dimensions, panel data can increase the number of observations, thereby

increasing the reliability and statistical power of the analysis. This study uses cross-section data from 514 cities and districts in Indonesia and time series data from 2018 to 2021. The research period of 514 districts and cities in Indonesia and time series data from 2018-2021 were chosen to obtain a comprehensive regional representation and actual trends related to the impact of smoking on poverty. This time span covers significant socio-economic changes, such as the impact of the COVID-19 pandemic, which affects cigarette consumption patterns and poverty levels. Analysis of data from all districts and cities for four years allows the identification of long-term patterns and variations between regions, so that the results are more relevant to poverty alleviation policies. This research model uses Fixed Effects. The Fixed Effects research method is used to analyze panel data with the assumption that individual effects (such as differences between entities) are fixed and do not change over time, thus allowing control of unique unobserved variables that remain constant for each entity (Nugroho Febri Triyono, 2022). This approach focuses on the relationship between independent and dependent variables by eliminating bias caused by unmeasured individual characteristics, through the use of in-difference estimation.

Result and Discussion

To determine the most appropriate model for our analysis, we employed two critical statistical tests: the Chow Test and the Hausman Test. These tests are instrumental in deciding between competing econometric models based on the structure and characteristics of our data. The Chow Test is utilized to discern whether separate models should be estimated for different groups or if a common model suffices. Meanwhile, the Hausman Test is conducted to choose between the Fixed Effects Model (FEM) and the Random Effects Model (REM), based on the significance of differences between group effects. This section outlines the procedures and results of these tests, providing a rigorous basis for the selection of the econometric model that best captures the dynamics of our data. Through these tests, we aim to enhance the reliability of our findings by ensuring that the chosen model accurately reflects the underlying economic processes.

In our model selection process using the Chow test, we hypothesized that the Common Effects Model (CEM) is appropriate (H0) and the Fixed Effects Model (FEM) should be adopted if proven otherwise (H1). Results indicated that the cross-sectional chi-square probability was significantly below the 5% significance level, leading to the rejection of H0 and the selection of the Fixed Effects Model (Rifkhan, 2022). This decision was further supported by the Redundant Fixed Effect

Likelihood Ratio, affirming that the FEM is more suitable for analyzing our data due to its ability to account for individual-specific variations.

Table 1. Chow Test Results

Effect Test	Statistics	df	Possible.
Chi-square cross section	622.703024	513	0.0006

Table 1 indicates a significant Chow test result with a chi-square value of 622.703024 and a p-value of 0.00006, decisively lower than the conventional alpha level of 0.05. This strongly supports the rejection of the null hypothesis in favor of the Fixed Effects Model (FEM), confirming that group-specific variations within the dataset are significant and should not be pooled into a Common Effects Model (CEM). Given this result, FEM is the appropriate choice for our analysis, ensuring that individual effects are properly accounted for, enhancing the accuracy of our model.

Further statistical verification through the Hausman test will be conducted to compare the Fixed Effects Model against the Random Effects Model (REM). This subsequent test will help us confirm if the fixed effects captured by the FEM are indeed consistent and robust against a random effects specification, providing an additional layer of rigor to our econometric analysis. The hypotheses tested were: H0, which posits that the Random Effects Model is appropriate if the chi-square statistic is not significant at the 5% level, and H1, which asserts the suitability of the Common Effects Model if the chi-square statistic is significant at the same threshold (Suryandari, Murmalita, 2017).

Table 2. Hausman Test Results

Test Summary	Chi-Sq Statistics	Chi-Sq.df (Chi Equation)	Possible.
Random cross section	185.932308	4	0.0000

The results from the Hausman test, as summarized in Table 2, decisively guide the choice between the Fixed Effects Model (FEM) and the Random Effects Model (REM). The test, comparing the consistency between these two models, produced a chi-square statistic of 185.932308 with a probability value of 0.0000, significantly less than the alpha level of 0.05. This strong rejection of the null hypothesis confirms the presence of individual-specific effects that are correlated with the regressors, thereby making FEM the more appropriate model for our analysis.

This outcome substantiates the use of FEM over REM, as it indicates that the fixed effects captured are crucial for an accurate model specification and cannot be assumed to be random. The

preference for FEM suggests that variations within individual entities have systematic influences on the dependent variable, which are essential to capture in our econometric modeling to avoid biased and inconsistent results. Consequently, we proceed with FEM to ensure that our analysis robustly accounts for these intrinsic differences within the data.

Table 3. Fixed Effect Model Test Results

Variables	Coefficient	Standard Error	Statistics t	Possible.
CIGARETTE	8.55E-07	2.10E-07	4.061893	0.0001
GDRP	5.47E-06	3.57E-07	15.31518	0.0000
RLSL	12.26292	0.440169	27.85960	0.0000
RLSP	9.645510	0.794230	12.14448	0.0000
C	-277.6046	9.947106	-27.90808	0.0000
R-squared				0.906346
Adjusted R-squared				0.874864
F statistic				28.78947
Prob(F-statistic)				0.000000

Table 3 outlines the Fixed Effect Model Test results, highlighting significant impacts of several variables on the dependent variable across 514 cities and districts in Indonesia during the period 2018-2021. The variable 'CIGARETTE', representing cigarette consumption, shows a coefficient of 8.55E-07 with a standard error of 2.10E-07 and is highly significant with a t-statistic of 4.061893, indicating a strong positive impact on the dependent variable. Similarly, 'GDRP' (Gross Domestic Regional Product) exhibits a substantial effect with a coefficient of 5.47E-06 and an impressive t-statistic of 15.31518, suggesting that economic output notably influences the outcome variable. The education-related variables, 'RLSL' (Average Length of Schooling for Boys) and 'RLSP' (Average Length of Schooling for Women), also display significant positive coefficients of 12.26292 and 9.645510 respectively, each with robust t-statistics (27.85960 for RLSL and 12.14448 for RLSP), emphasizing the critical role of education in affecting the model's dependent variable. The intercept, denoted as 'C', with a value of -277.6046 and a t-statistic of -27.90808, further confirms the model's overall statistical significance and its explanatory power, as evidenced by an R-squared value of 0.906346 and an F-statistic of 28.78947, both indicating that the model successfully captures the majority of variability in the dependent variable.

Table 4. F Test Results

F statistic	28.78947
Prob(F-statistic)	0.000000

The F-test is a crucial statistical tool used to determine whether a group of variables, when tested together, significantly affects the dependent variable. In this case, the dependent variable is the poverty rate across 514 cities and districts in Indonesia from 2018 to 2021. The results from the F-test, as shown in Table 4, yield an F-statistic of 28.78947 with an extremely low probability value (p-value) of 0.000000. This indicates that the null hypothesis, which posits that the independent variables have no significant simultaneous effect on the dependent variable, can be decisively rejected.

The p-value significantly smaller than the conventional alpha level of 0.05 (specifically, 0.000000 < 0.05) confirms the alternative hypothesis—that there is a substantial collective impact of the variables on poverty rates. This statistically significant result underscores the combined influence of factors such as cigarette consumption, GDP, and average years of schooling for both males and females on poverty alleviation or exacerbation.

Such findings highlight the importance of these variables in socio-economic models and suggest that interventions aimed at reducing poverty in Indonesia could benefit from a multifaceted approach that considers economic productivity, educational attainment, and health-related expenditures. The model's high F-statistic not only suggests that the variables together provide a strong explanatory power but also that each variable contributes uniquely to understanding the dynamics of poverty across the regions studied.

Table 5. Results of the Determination Coefficient Test

R-squared	0.906346
Adjusted R-squared	0.874864

The Coefficient of Determination, commonly referred to as R-squared, and its adjusted form, Adjusted R-squared, serve as key indicators in regression analysis to measure how well independent variables collectively explain the variability in the dependent variable (see Table 5). In this study, which considers the poverty rate across 514 cities and districts in Indonesia, the R-squared value is impressively high at 0.906346. This indicates that about 90.63% of the variation in poverty rates can be statistically explained by the combined effects of the four independent variables included in the model.

More crucial in the context of multiple regression is the Adjusted R-squared, which stands at 0.874864. This value is particularly significant because it adjusts for the number of variables in the model, providing a more accurate measure of the variables' explanatory power. An Adjusted R-squared of 0.874864 suggests that approximately 87.49% of the variance in the dependent variable

is explained by the independent variables, affirming that these variables are highly effective in modeling poverty rates in Indonesia.

The remaining 12.51% of the variance, which is not explained by this model, might be attributed to other factors not included in the study. This gap underscores the presence of other potential influences on poverty, which may include but are not limited to, unmeasured socio-economic factors, policy variations, or regional characteristics that could provide additional insights if incorporated into future research. The results emphasize the robustness of the model in explaining significant portions of poverty rate variability, highlighting the critical role of the chosen variables in understanding and potentially mitigating poverty in the studied regions.

This research underscores the significant influences of socio-economic variables on poverty rates across Indonesia, with each variable demonstrating a unique impact as revealed by the recent data analysis. The study reveals that cigarette consumption significantly exacerbates poverty, with a significance level of 0.05. The economic burden imposed by spending on cigarettes detracts from the ability of low-income households to meet essential needs such as food, health, and education. Moreover, the addictive nature of smoking compounds economic vulnerabilities by enhancing the risk of long-term social and financial burdens, aligning with findings from Setiyanto & Kristiyanto (2023).

Furthermore, the results affirm that a rise in Gross Regional Domestic Product (GRDP) markedly aids poverty reduction, particularly in regions with inclusive economic sectors like agriculture and manufacturing. A consistent 1% increase in GRDP notably lowers poverty rates, with a more pronounced effect in areas featuring a more equitable income distribution. This correlation is enhanced when paired with investments in education, health, and social infrastructure, corroborating the findings of Sari & Novianti (2024), which suggest that GDP growth directly correlates with declines in poverty levels.

The analysis indicates that increased educational attainment for males significantly decreases poverty rates. Each additional year of schooling for boys enhances employment prospects and household income, particularly in regions with better educational access. This relationship aligns with the research by Faritz & Soejoto (2020), which highlighted the direct impact of male education on poverty alleviation.

Similarly, enhancing girls' education markedly reduces poverty. Education empowers girls to manage resources more effectively, improving family welfare. The positive impact of each additional year of schooling for girls is particularly significant in rural areas, where women often play crucial roles in the family economy. Enhanced access to health services, employment opportunities, and

economic empowerment initiatives further amplify the poverty-reducing effect of girls' education. These findings are supported by Rukmana & Imaningsih2 (2023), who observed that improvements in girls' educational attainment are strongly associated with reductions in poverty rates.

Overall, these variables collectively underscore a multi-faceted approach to combating poverty in Indonesia, suggesting that policies aimed at reducing cigarette consumption, boosting economic output, and enhancing educational opportunities for all children can yield substantial benefits in poverty alleviation.

Conclusion

This study aims to analyze the relationship between smoking and poverty levels in districts and cities in Indonesia, with the objective of identifying the economic burden of cigarette expenditure. The results show that spending on cigarettes significantly reduces the allocation of funds for basic needs such as education and health, thus worsening poverty conditions. In addition, cigarette consumption has a significant impact on poverty levels, especially among low-income groups. Cigarettes absorb a large portion of household income that should be allocated to basic needs such as food, education, and health. As a result, household expenditure on basic needs is often reduced, which can reduce quality of life and hamper opportunities to move out of poverty. These findings provide an important contribution to the understanding of the consumption behavior of the poor. The implications of this study emphasize the importance of cigarette consumption control policies, such as increasing excise taxes and public education. Suggestions for the government include strengthening socialization programs on the dangers of smoking and ensuring more effective allocation of funds for poverty alleviation.

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