The Effect of Number of Population, Average Expenditure, Unemployment, and Number of Poor People in North Sumatra Province with Path Analysis Method

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Abstract. Poverty is an economic problem so that a person experiences the inability to meet the necessities of life caused by the economy not meeting the average standard of living of society in general. This research is to find out how much influence it has on population, average public expenditure, unemployment, and the number of poor people in the province of North Sumatra. Since the Covid-19 pandemic, there has been an increase in the poverty rate in 2021-2022. The percentage of poor people in September 2022 was 9.57 percent, an increase of 0.03 percent from March 2022 and a decrease of 0.14 percent from September 2021. Many people are experiencing unemployment due to reduced job opportunities. This research was conducted using the path analysis method and SPSS version 22 software. This research used quantitative data obtained from data from the Central Bureau of Statistics. Data were tested using the Classical Assumption Test, Hypothesis Test, and Correlation Coefficient Test. The research results obtained have a direct influence on the Independent Variables and Dependent Variables namely; Total Population (X1) and Average Spending (X2) on Unemployment (Y) where there is a significant value less than 0.05, which means it has a significant effect. The results obtained in the analysis model equation $Y = 0.385X1 + 0.117X2 + 0.233Z + 0.905$.

Keyword: Poverty, Path Analysis, Population, Economic Growth, Poor Population, Human Development Index

Abstrak. *Kemiskinan merupakan masalah ekonomi sehingga seseorang mengalami ketidakmampuan untuk memenuhi kebutuhan hidup yang disebabkan oleh ekonomi yang tidak memenuhi standar hidup rata-rata masyarakat umum. Penelitian ini dilakukan untuk mengetahui seberapa besar pengaruhnya terhadap jumlah penduduk, output masyarakat, pengangguran, dan jumlah penduduk miskin di Provinsi Sumatera Utara. Sejak pandemi COVID-19, terjadi peningkatan angka kemiskinan pada 2021-2022. Persentase penduduk miskin pada September 2022 sebesar 9,57 persen, meningkat 0,03 persen dibandingkan Maret 2022 dan turun 0,14 persen dibanding September 2021. Banyak orang mengalami*

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pengangguran karena berkurangnya pekerjaan. Penelitian ini dilakukan dengan metode analisis jalur dan Software SPSS versi 22. Penelitian ini menggunakan data kuantitatif yang diperoleh dari data Badan Pusat Statistik. Data diuji menggunakan uji asumsi klasik, u ji hipotesis, dan u ji kkoefisien korelasi. Hasil penelitian menunjukkan bahwa terdapat pengaruh langsung terhadap variabel dependen dan dependen, yaitu; Ada banyak masalah (X1) dan ratau output (X2) sehubungan dengan pengangguran (Y), di mana ada nilai signifikan lebih kecil dari 0,05 yang berarti memiliki efek yang signifikan. Model persamaan yang diperoleh adalah Y = 0,385X1 + 0,117X2 + 0,233Z + 0,905.

Kata Kunci: *Kemiskinan, Analisis Jalur, Populasi, Pengangguran, Jumlah Orang Miskin, Pengeluaran Rata-Rata*

1   Introduction

[1-2] found that poverty reduction policies should prioritize higher economic growth rates and emphasize the role of unemployment in explaining the relationship between economic growth and poverty because the poor tend to rely on their workforce. The negative impact of unemployment is to reduce people's income and reduce the level of prosperity that has been achieved. As a result of the increase in poverty, many people are laid off so that many experience unemployment and no income. The government has implemented a Poverty Alleviation Strategy by protecting people or families who are experiencing temporary poverty and providing assistance to people experiencing chronic poverty and preventing an increase in poverty. In addition, in alleviating poverty, the empowerment of Micro, Small and Medium Enterprises (MSMEs) can also be a solution to improve the community's economy [3]. Similarly, reducing poverty, encouraging national economic growth, reducing unemployment, and inequality between regions. The existence of micro, small and medium enterprises can help the community in increasing income and expanding employment. According to [4], poverty is always related to inequality and vulnerability because people who are not considered poor can become poor at any time if they experience problems, such as financial crises and declining agricultural business prices. Vulnerability is a basic dimension of well-being because it affects the behavior of each individual in terms of investment, patterns of production, and appropriate strategies. Based on data from the Central Statistics Agency (BPS), the number of poor people in North Sumatra Province in 2022 decreased by around 6.1 thousand people [5]. The poverty rate in North Sumatra decreased by 0.09 percent, from 8.42% in March 2022 to 8.33% in September 2022. The poverty rate is equivalent to 1.26 million people in September 2022, or reduced by 6.1 thousand people. The factor affecting the decline in poverty is due to the government's success in responding to a budget aimed at inflation control programs, so that in December 2022 the inflation rate remained at 6.12%. In September, inflation was raised to 1% on the fuel hike and the following month the government tried to contain inflation by providing social assistance, such as providing basic necessities, distributing cash to the poor, and implementing programs in the real sector, in the form of assistance for farmers, fishermen, and MSMEs by providing seeds, equipment, and equipment. Based on the description above , an analysis of the relationship of causation arising

from several variables will be carried out on the level of poverty in North Sumatra Province using the path analysis method [6]. The aim is to determine the influence of population, average expenditure, and number of poor people on unemployment in North Sumatra. The data to be used is data on the effect of poverty in North Sumatra Province in 2021-2022 . The results of this research are expected to be material for the government in formulating new policies to deal with poverty problems in North Sumatra Province and become an illustration to the community so that Society is better able to control the factors that affect economic growth [7].

2   Research Methods

This research uses datacollected through data from the North Sumatra Provincial Statistics Center from the website of the Central Statistics Agency, namely: https://sumut.bps.go.id/. The data obtained is data for 2021-2022. The variables used in this study are the number of population (X 1) and average expenditure (X2) as independent variables, unemployment (Y) as the dependent variable, and the number of poor people (Z) as intervening variables [8].

The methods used are literature research methods, data collection methods, and data analysis. In conducting this research, books and journals related to the object of research are read and studied to obtain information [9]. The data taken is secondary data from BPS North Sumatra Province. For data analysis, the stages carried out are collecting research data, determining exogenous variables and endogenous variables, determining the use of path diagram models , formulating equations structural, calculate the correlation matrix, calculate the path coefficient, determine the magnitude of the direct and indirect influence of exogenous variables on endogenous variables and make conclusions [10-11].

3   Research Results and Discussion

3.1.   Observation Data and Variables

Data obtained from the survey results of the Central Bureau of Statistics North Sumatra. The data taken are data on Average Length of Schooling (RLS), Life Expectancy (AHH), Percentage of Poor People (PPM), and Human Development Index (HDI) for 2021-2022.

3.2.   Classical Assumption Test

The classical assumption tests to be carried out are normality tests, multicolonicity tests, autocorrelation tests, and heteroscedasticity tests [12].

3.2.1. Normality Test

Based on the Kolmogrov-Smirnov ormalitas test, the data obtained showed results on Asymp. Sig of 0.200. This means that the research data is normally distributed because the significant value is greater than 0.05.

3.2.2. Multicollinearity Test

From the results of data processing, there is a value of tolerance, in Total Population (X_1) of 0.113, Average Expenditure (X_2) of 0.711, and Number of Poor People (Z) of 0.125. The value of tolerance on each variable is greater than 0.10. Meanwhile, the VIF value between variables is not more than 10. Thus, it can be interpreted that there is no ulceration between independent variables.

3.2.3. Autocorrelation Test

There is a Durbin Watson test result where the value is 1.845. This value will be compared with the value of the durbin Watson table at a significant 5%. The value is 1.686 and the value is 1.469. The value is greater thandudlddu so it can be concluded that there is no autochrecorrelation.

3.2.4. Heteroscedascticity Test

Based on the Glejser test table, the significant value of Total Population ($X1$) is 0.766 and Number of Poor People (Z) is 0.254.   Itcan be concluded that this variable does not experience heteroskedasticity because the independent variable is greater than 0.05. Meanwhile, the significant value of Average Expenditure ($X2$) is 0.000 which means that there is aneteroskedasticity because the variable is smaller than 0.05.

3.3.   Correlation Coefficient Test

Thecalculation can be calculated from the results of the correlation test which obtained a significant value between variables $0.00 < 0.05$. This can be interpreted as a significant relationship. The value of koefficient of correlation between variables has a positive relationship [13].

3.4.   Test the hypothesis

3.4.1 Structure Analysis 1

The effect contained in the calculation of the analysis of structure 1 is significant between the variables Number of Population (X_1) and Average Expenditure ($X2$) on Unemployment (Y) [14-15]. The coefficient of determination for substructural equation 1 is 0.429, where the effect of the variables Number of Population (X_1) and Average Expenditure (X_2) simultaneously on Unemployment (Y) is 42.9%. Other variables that did not occur in the study also affected the

number of poor people, namely by $error(e) = \sqrt{1 - R^2{}_{zx_2x_1}} = \sqrt{(1 - 0,429)^2} = 0,903$ or by 90.3%. The results obtained contained $a_{calculated}$ F value = 22.378 and $_a$ table F value $_{(0.05;\ 2;56)}$ = 3.162. A significant value of 0.000 < 0.05 means that the variables Number of Population (X 1) and Average Expenditure (X2) together have a significant effect on Unemployment (Y). The effect of the Number of Population (X 1) on Unemployment (Y) is 0.611 which means that when one percent increase in the Number of Population (X1), the value of Unemployment (Y) will increase by 0.611. There is a value of t $_{hitung}$ = 5.209 > $t_{table(0.025;2;58)}$ = 2.003. There is a significant value of 0.00 < 0.05 which means that there is a significant and positive influence. Then, the variable Average Expenditure (X2) to Unemployment (Y) is 0.102. There is a value of t $_{hitung}$ = 0.871 < $t_{table(0.05;2;58)}$ = 2.003. There is a significant value of 0.388 > 0.05 which means that it does not have a significant influence and is positive.
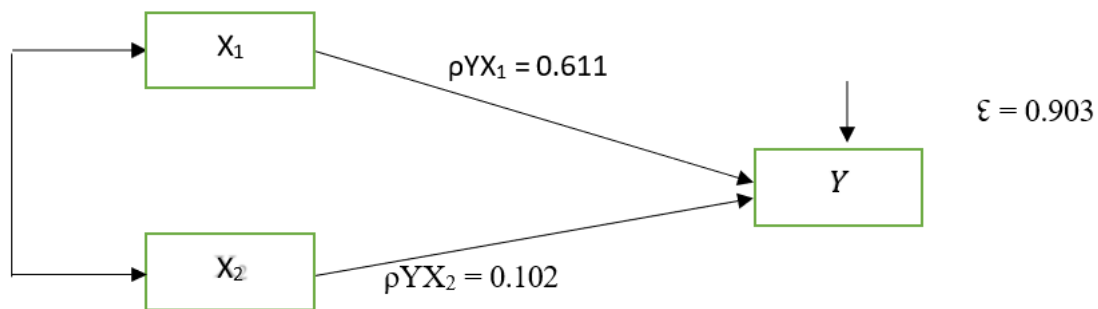

Figure 1. Substructure 1

The equation of substructure 1 is as follows:

$$Y = 0,611X1 + 0,102X2 + 0,903.$$

3.4.2 Structure Analysis 2

The effect contained in thecalculation of the analysis of structure 2 is significant between the variables Number of Population (X 1) and Average Expenditure (X2) on the Number of Human Population (Z) through Unemployment (Y).

The coefficient of determination for substructural equation 2 is 0.425, where the influence of the variables Number of Population (X 1), Average Expenditure (X2), and Number of Poor People (Z) on Unemployment (Y) is 42.5%. Other variables that did not occur in the study also affected the Number of Poor People (Z) by $error(e) = \sqrt{1 - R^2{}_{zx_2x_1}} = \sqrt{(1 - 0,425)^2} = 0,905$ or by 90.5%. The results obtained $F_{value\ count}$ = 15.057 and significant value 0.000 < 0.05 where F_{table} $_{(0.05;\ 3;\ 58)\ =\ 2.764}$ which means that the variables Number of Population (X 1) and Average Expenditure (X2), and Number of Poor people (Z) together have a significant effect on Unemployment (Y).

The effect of Population (X_1) on Unemployment (Y) is 0.385 which means that when one person increases the Number of Population (X_1), the value of Unemployment (Y) will increase by 0.385. There is a value of $t_{hitung} = 1.290 < t_{table(0.025;2;58)} = 2.003$. There is a significant value of $0.202 > 0.05$ which means that there is no significant influence. Then, on the variable Average Expenditure (X_2) to Unemployment (Y) of 0.117. There is a value of $t_{hitung} = 0.986 < t_{table(0.025;2;58)} = 2.003$. There is a significant value of $0.329 > 0.05$ which means that there is no significant influence. Then, on the variable Number of Poor People (Z) to Unemployment (Y) of 0.233. There is a value of $t_{hitung} = 0.823 < t_{table(0.025;2;58)} = 2.003$. There is a significant value of $0.414 < 0.05$ which means that there is no significant effect.
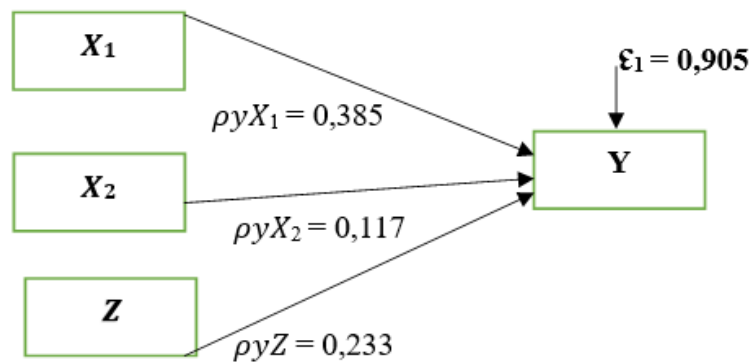

Figure 2. Substructure path diagram 2

The Subs equation of structure 2 is as follows:

$$Y = 0,385X_1 + 0,117X_2 + 0,233Z + 0,905.$$

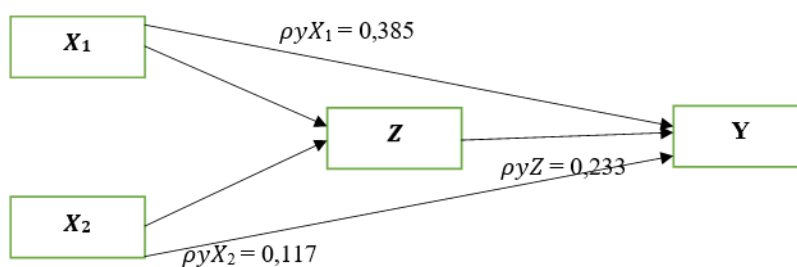Here are the results of structural equations 1 and 2 in the path analysis model:

Figure 3. Combination model path diagram

4   Conclusion

Based on uji hipotesis, a path analysis is obtained for the first p substructure, namely. The variables used in this analysis are Total Population ($X Y = 0,611X_1 + 0,102X_2 + 0,903_1$) and Average Expenditure (X_2) on Unemployment (Y) which has an influence of 42.9%. Variables

that were not contained in the study also affected the percentage of poor people (Z), which was 0.903 or 90.3%. In addition, path analysis was obtained for the Second substructure, namely. The variables used in this analysis are Number of Population (X $Y = 0,385X_1 + 0,117X_2 + 0,233Z + 0,905_1$) and Average Expenditure (X_2), and Number of Poor People (Z) to Unemployment (Y) which has an influence of 42.5%. Variables that were not contained in the study also affected the percentage of poor people (Z), which was 0.905 or 90.5%. Based on the results of the analysis, it can be concluded that there is a direct influence of the population and average expenditure on unemployment, which is 61.1% and 10.2%.   In addition, there is an indirect influence of the population and average expenditure on unemployment through the number of poor people, which is 8.97% and 2.72%. The total effect given by the population on unemployment through the number of poor people is 47.4% and the total effect given by the average expenditure on unemployment through the population poor is 14.4%. Suggestions that can be taken from the results of this study are so that the people of North Sumatra Province can cooperate with the government in increasing sources of income so that poverty does not increase, and the government makes efforts to expand employment opportunities so that the number of unemployed can be reduced so that the community can meet their respective needs.

REFERENCES

[1]   Osmani. The Employment Nexus between Growth and Poverty: *An Asian Perspective. SIDA-UNDP*. 2004

[2]   Haughton, J., and Khandker, Shahidur R. *Handbook on Poverty and Inequality*. Jakarta: Salemba Empat.(2012

[3]   Central Bureau of Statistics. *"City District Poverty Data and Information in 2021"*. North Sumatra Province in numbers. Badan Statistical Center. 2022

[4]   Central Bureau of Statistics. *"City District Poverty Data and Information 2022"*. North Sumatra Province in numbers. Badan Statistical Center. 2023

[5]   Sumodiningrat, Gunawan. *Realizing the welfare of the nation*. Jakarta: PT Elex Media Komputindo. 2017

[6]   Achmad, Kuncoro. *Cara Menggunakan dan Memaknai Analisis Asumsi Klasik*, Cetakan Pertama. Bandung: Alfabeta. 2001

[7]   Koentjaraningrat. *Culture of Mentality and Development*. Jakarta: PT. Gramedia Main Library. 2002

[8]   Sadono, Sukirno. *Introduction to Macroeconomics*. Jakarta: PT. King Grafindo Perseda. 1994

[9]   Todaro, M.P. *"Economic Development in the Third World"*. VI Edition. Jakarta: Erlangga. 1997

[10] Todaro, M.P. *"Economic Development in the Third World"*. VII Edition. Jakarta: Erlangga. 2000

[11] Usman, Sunyoto. *Community Development and Empowerment*. Yogyakarta: Student Library. 2004

[12] Sadono, Sukirno. *Macroeconomics. Third Edition*. Jakarta: PT. King Grafindo Perseda. 2004

[13] Kuntjoro, Dorodjatun. *Poverty in Indonesia*. Jakarta: Yayasan Obor Indonesia. 1986

[14] Ghozali, I. *Application of multivariate analysis with IBM SPSS 26 program 10th edition*. Diponegoro University Publishing Board. 2021

[15] Taufiq, Ahmad et al. *Poverty Reduction Efforts Based on Local Community Empowerment*. 2020