

To cite this article: Tongam Sihol Nababan, Jusmer Sihotang and Elvis Fresly Purba (2023). Determinant Analysis of Per Capita Consumption Expenditures in North Sumatra. International Journal of Education, Business and Economics Research (IJEBER) 3 (3): 132-147

## DETERMINANT ANALYSIS OF PER CAPITA CONSUMPTION EXPENDITURES IN NORTH SUMATRA

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### ABSTRACT

This study aims to: (1) analyze the social, demographic, and economic characteristics that can affect consumption expenditure per capita in North Sumatra, (2) analyze the probability of each factor influencing consumption expenditure per capita in North Sumatra. The data used were secondary data from 33 districts/cities in North Sumatra and analyzed using binary logistic regression estimation. The results show that of the 10 identified variables that can affect per capita consumption expenditure, it turns out that only 5 variables can provide estimates with the goodness of fit, namely, per capita income, number of family members, labor force participation rate, population growth, and the status of the area. Binary logistic regression estimation shows that the variable of per capita income and the variable labor force participation rate have a positive but not a significant effect on consumption expenditure per capita, while the variable of the number of family members has a positive and significant effect ( $\alpha = 0.10$ ) per capita consumption expenditure. The population growth variable has a positive but not significant effect on per capita consumption expenditure. District/city areas with population growth above the average economic growth of North Sumatra tend to be 0.356 times lower in total consumption expenditure per capita compared to districts/cities with population growth below the average economic growth of North Sumatra. The regional status variable has a positive and significant effect ( $\alpha = 0.05$ ) on per capita consumption expenditure. Regions with district status tend to have 0.001 times lower consumption expenditure per capita above the North Sumatra average compared to urban areas.

**KEYWORDS:** consumption, capita income, labor force, members, population growth, area status.

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Published Online: June 2023

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## INTRODUCTION

Household consumption expenditure is one of the macroeconomic variables which is the expenditure made by households on final goods and services. According to Mankiw (2010), household consumption factors affect the overall behavior of the economy in both the long and short term. This is because aggregate consumption is the sum of the expenditures of all households in the economy. Consumption is influenced by several factors but the most important factor is household income after tax or disposable income. Dornbusch et al (2011). Therefore, consumption depends on income.

Changes in the level of welfare can be seen from the pattern of household expenditure, which is divided into two, namely expenditure on food and non-food. These changes in each year can show the development of household living standards (BPS Sumut, 2018). The increasing standard of living can be represented by per capita expenditure. BPS North Sumatra (2020) released the per capita expenditure of the people of North Sumatra in 2019 reached IDR 1,063,964 per month, (constant 2012 prices). This figure increased by IDR 395 thousand (3.7%) from the previous year. Meanwhile, during the 2010-2018 period, people's per capita expenditure increased by Rp 1.6 million or around 2%/year. The pattern of community consumption in North Sumatra over the past eight years has shown little change. In 2011 the percentage of expenditure on non-food items from total expenditure was 44.00 percent, rising to 44.62 percent in 2018. This shows that there has been no significant change in people's consumption patterns over the past eight years. The expenditure of North Sumatra residents is still mostly used for food consumption. Most of the population prioritizes fulfillment of primary needs (food).

In this study, consumption expenditure is focused on per capita consumption expenditure, where real per capita consumption expenditure can be found in households. Several studies show that many factors influence consumption expenditure, both economic and socio-demographic factors. Prabowo (2018) argues that income, the number of family dependents, and savings can affect household consumption expenditure. Firmansyah (2017) shows that per capita income, population, labor force participation rate, and average years of schooling have an influence on high and low household consumption expenditure. Guo & N'Diaye (2010) explored that the determinants of consumption consist of employment in services, real exchange rate, financial development and real interest rates, public consumption, demographics, the neglected role of pensions.

This study is aimed at investigating the socio-demographic and economic characteristics that are thought to influence per capita consumption expenditure in North Sumatra Province. Based data from the Central Bureau of Statistics (BPS, 2020), characteristics may include family size, type of business/employment, regional status, labor force participation rate, minimum wage, economic growth, population growth, and per capita income. The data used will be different from the data used by previous studies which tend to use quantitative data with multiple regression estimation. Whereas in this study, the data on socio-demographic and economic characteristics are categorical qualitative data and are estimated by logistic regression.

Based on the above description, the research questions to be answered are: (1) which social, demographic and economic characteristics are determinants of per capita consumption expenditure

in North Sumatra? (2) What is the probability of each factor affecting per capita consumption expenditure in North Sumatra?

## 1. Literature Review

### 2.1. Household Expenditure and Consumption

Consumption is the spending on goods and services by households in order to fulfill the needs of the person making the expenditure. Spending on food, clothing, and other necessities is classified as spending or consumption. Goods produced to be used to fulfill needs are called consumption goods (Illahi et al., 2019). According to Goldsmith (1996) as reported by Bakri et al (2017), household consumption expenditure patterns change over time. Planning household expenditure is essential to meet the needs of purchasing goods or services available in the market. Thus, the goal of every household is to meet its basic needs such as food, clothing, shelter, vehicles, transportation and education. These consumption expenditures can be financed by savings made in the past or by borrowing (dissaving). Besides being influenced by the amount of savings in the past, autonomous consumption is also influenced by several other factors such as taxes levied by the government, expectations of the state of the economy, price levels and interest rates (Sukirno, 2012). According to the Organization for Economic Co-operation and Development (Economico, 2013), Consumption Expenditure is the value of consumer goods and services used or paid for directly by households to meet their needs.

Furthermore, the average expenditure per capita is the cost incurred for the consumption of all household members during the month either from purchases, gifts or own production divided by the number of household members in the household. Household consumption is distinguished from food and non-food consumption regardless of the origin of the goods and is limited to expenditure for household needs only, excluding consumption/expenditure for business purposes or those given to other parties. The average per capita consumption/expenditure figures presented in this study are obtained from the quotient of the total consumption of all households (both consuming food and not) to the total population, or by formula (BPS, 2020):

$$\frac{\text{Total expenditure of all household members in a month}}{\text{Number of household members}} \times 100\%$$

In theory, there are many factors that influence people's consumption expenditure. As cited by Arapova (2018) the determinants of consumption expenditure have been the object of extensive research since the emergence of economic literature written by Keynes (1936), Duesenberry (1949), and Friedman (1957). According to them, the factors affecting consumption can be seen from the demand and supply side, such as income, wealth (measured in various ways), interest rates (credit and deposits), capital, profits, assets, etc. Keynes (1936) laid the foundation of modern consumption theory by emphasizing that "the level of income determines the consumption of individuals and society" and introduced the theory of absolute income. Duesenberry (1946) emphasized the interdependence of consumption patterns among individuals, then this theory was developed by Modigliani and Ando (1957) with the "life cycle hypothesis". Furthermore, Friedman (1957) proposed the permanent income hypothesis and emphasized that consumption is more influenced by long-term income expectations than current income levels (Arapova, 2018).

## 2.2. The Previous Studies

Gholipour Fereidouni & Tajaddini (2017) conducted research in the United States on consumption expenditure. The results showed that wealth has a positive impact on household consumption expenditure. The wealth depends on the income earned each month as well as other sources of income, such as investment. Then high-income households will make larger consumption expenditures each month. Du & Wang (2011) have also conducted a study in China on household consumption expenditure. The results of the study revealed that income positively affects consumption expenditure for high-income groups in China.

Chen et al (2010) conducted a study in China on the effect of wealth on people's consumption expenditure. The findings revealed that there is a long-term relationship between disposable income and consumption expenditure. The increase in income and assets has increased consumption in China, and income is the biggest contributor to the increase in consumption in China. This finding is consistent with the results of Nuritz et al (1985) as cited by Bakri et al (2017). They also found that socioeconomic factors, namely, income, education and residence, play an important role in household consumption expenditure. Income was found to be the main factor affecting household consumption expenditure. Increased household income leads to increased household expenditure on goods and services. Likewise, Li et al (2016) in a study on the effect of credit limit on household consumption expenditure in China have used Modigliani's Life Cycle Theory and Friedman's Permanent Income Hypothesis. They validated that household consumption expenditure in China is affected by income, family size, and health status and credit constraints.

In another study, conducted by Goldberg (2017) in Malawi found that the consumption expenditure of this group of farmers increased dramatically to avoid sharing obligations. Furthermore, household consumption expenditure is strongly influenced by income. De Bonis & Silvestrini (2012) in their study showed that household financial factors and wealth affect consumption in 11 member countries of the Organization for Economic Cooperation and Development (OECD) using quarterly data from 1997 to 2008. Based on the unit root test results, income and the Consumer Price Index (CPI) positively affect household consumption expenditure in OECD countries. Their results are consistent with research findings by Chen et al (2010) where income is the most dominant factor in influencing household consumption when compared to CPI or inflation. Using cross-sectional data in 300 cities in the United States, Taylor et al (2010) also conducted a study on price and income elasticity in determining consumption expenditure. Based on a simple double-logarithmic demand function, he found that the price of goods positively affects consumption expenditure. This means that an increase in the price of goods leads to an increase in household consumption expenditure. Thus, the increase in consumption expenditure is not due to an increase in the quantity of consumption, but due to a relative increase in the price of goods.

In contrast to the study, Mok et al (2011) showed a difference in results between different characters among consumers. Using data from the 2004-2005 Household Expenditure Survey in Malaysia, the Ordinary Weighted Least Square (WOLS) results reveal that there are character differences between several groups according to the level of household expenditure. Households comprising the lowest expenditure group spent most of their income (39%) on food, while households with the highest expenditure group consumed 28% of their income on vehicles. Then

research conducted by Diacon & Maha (2015) generally shows that there is a relationship between income, consumption expenditure and gross domestic product. Income levels have a greater impact on household consumption in low and high income countries. Households in low-income countries will, in fact, allocate their income to purchase basic necessities. In contrast, households in high-income countries that have many sources of income as a result of investment tend to increase their consumption expenditure.

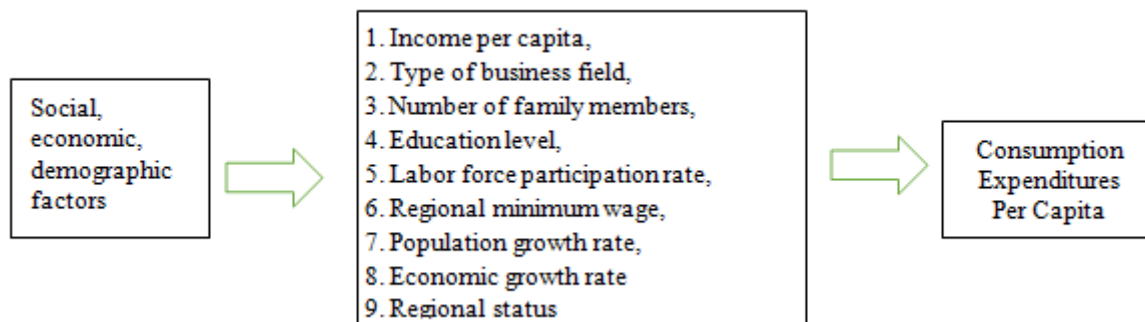
Furthermore, Varlamova & Larionova (2015) have examined the macroeconomic and demographic determinants of household consumption expenditure in OECD countries using time series data. Based on the analysis of household dynamics, disposable income, inflation, government spending, interest rates, population and education levels affect household consumption expenditure. Most household consumption expenditure is influenced by prices and related factors such as taxes, income levels and imports. Significantly, income level affects consumption expenditure. On the other hand, Huy (2012) using Tobit analysis has correlated consumption expenditure with human capital, such as work experience, education and training. Those who have a good stock of human capital will spend more on children's education, and those with higher education and income tend to spend more on children's education.

Murohman (2011) in his research on factors affecting household consumption expenditure in Indonesia (Period 2000-2010) shows that national income, savings interest rates, inflation, and investment growth in Indonesia together can affect household consumption expenditure. National income variables, savings interest rates, and investment growth have a significant effect on household consumption expenditure. Meanwhile, inflation has no significant effect on household consumption expenditure. The impact of fuel price increases did not affect household consumption expenditure during 2000-2010. Income is the main determinant that affects household consumption expenditure in Indonesia. To increase per capita income, the government should continue to increase people's income by maintaining stability and increasing economic growth, expanding employment opportunities, and mobilizing productive sectors that hone business skills (entrepreneurship).

### **2.3. Research Framework**

Factors that influence household consumption can be divided into three, namely economic factors, demographic factors and non-economic factors. In this study, in accordance with the availability of time-series data on consumption expenditure of North Sumatra Province, the dependent and independent variables were modified. The dependent variable is per capita consumption expenditure, while the independent variables include per capita income, type of business, and number of family members, education level, labor force participation rate, regional minimum wage, population growth rate, economic growth rate, and regional status. The relationship between the two types of variables will be estimated using binary logistic regression to determine the probability contribution of each factor affecting per capita consumption expenditure in North Sumatra.

Thus the research framework and variable relationships in the study can be shown in Figure 1.



**Figure 1.** Research Framework

### 3. Data, Model Specifications, Operational Definitions

The data used in this study are secondary data in the form of cross section data of all districts / cities in North Sumatra as many as 33 districts / cities. The data collected are average data related to per capita consumption expenditure and the factors that influence it during 2018, 2019, 2020. The research data was sourced from the Central Bureau of Statistics (BPS) of North Sumatra Province. To analyze the data, this study used a binary logistic regression model with the following model specification (Hosmer & Lameshow, 2000; Peng & So, 2002 ; Nababan, 2015) :

$$y = \ln \left[ \frac{p}{(1-p)} \right] = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n \quad (1)$$

Where:

y = probability of per capita consumption expenditure.

X<sub>1</sub>...<sub>n</sub> = independent variables, β<sub>0</sub>,1,n = model parameters, where n is the classification of each category of independent variables.

To facilitate the recognition of the variables in the model, both response variables and predictor variables, it is necessary to describe the operational definition and measurement of each variable as presented in Table 1.

**Table 1.** Variable Operational Definition

No	Variable and Definitions
1	Per capita consumption expenditure (Response Variable Y) is the cost incurred for the consumption of all household members during the month either from purchases, gifts or own production divided by the number of household members in the household (Rp).
2	Income per capita (X <sub>1</sub> ) is the amount of average income of the population per year (Rp)
3	Type of business field is the field of activity of a job or where a person works in the fields of industry (X <sub>2</sub> ), services (X <sub>3</sub> ), and agriculture (X <sub>4</sub> ).
4	The number of family members (X <sub>5</sub> ) is the number of people contained in the smallest unit of society consisting of a family head and several people who are gathered and live somewhere under a roof in a state of interdependence.
5	Labor force participation rate (TPAK) (X <sub>6</sub> ) is the ratio of the labor force to the total working-age population. TPAK measures the amount of labor force participation in the world of work. TPAK can be used as an indicator of the level of difficulty of the labor



	force to get a job.
6	City/district minimum wage ( $X_7$ ) is a minimum standard used by employers or industry players to provide wages to workers in their business or work environment in a city/district.
7	Population growth rate ( $X_8$ ) is a state of change that occurs at any time and can be calculated as a change in the number of individuals in a population using per unit time in its measurement (%).
8	Economic growth rate ( $X_9$ ) is a condition in which there is an increase in the GDP (Gross Domestic Product) of a region, there is an increase in per capita income, and there is an increase in the provision of community facilities and infrastructure (%)
9	Regional status ( $X_{10}$ ) is an autonomous region that is authorized to regulate and manage its own government affairs consisting of district or city status.

#### 4. Results

##### 4.1. Data Reduction and Coding of Research Variables

Data reduction or independent variable values aims to select independent variable data, assign coding, classification, test goodness of fit, and to determine the significance of the independent variables. In the initial logistic regression estimation, all independent variable values were classified with a nominal measure, i.e. dummy 1 for mean value above North Sumatra and 0 for mean value below North Sumatra, but the estimation showed poor results. In the next estimation, following the coding of SPSS version 25, three independent variables were specified as scale measures: income per capita/year, number of family members, and LFPR. The remaining independent variables are nominal (dummy 1 and 0).

Based on these estimates, the coding of the independent variables in the logistic regression is presented in Table 2 below:

**Table 2. Operational Coding of Research Variables**

No	Variable	Classification for District/City Observations	Cod e	Measure s
1	Per capita consumption expenditure (Y)	<ul style="list-style-type: none"> <li>• North Sumatra average: IDR 1,124,253,-</li> <li>- Above average</li> <li>- Below average</li> </ul>	1 0	Nominal
2	Income per capita ( $X_1$ )	<ul style="list-style-type: none"> <li>• North Sumatra average: IDR 36,300,554,-</li> <li>(constant for year of 2010)</li> </ul>	-	Scale
3	Types of business fields: 1. agriculture ( $X_2$ ), 2. industrial ( $X_3$ ), 3. services ( $X_4$ ).	1. Agriculture: North Sumatra average: 35.43% - Above average - Below average 2. Industrial: North Sumatra average: 16.35% - Above average - Below average 3. Services: North Sumatra average: 48.23%	1 0  1 0	Nominal  Nominal  Nominal

		- Above average - Below average	1 0	
4	The number of family members ( $X_5$ )	• North Sumatra average: 4.28 peoples	-	Scale
5	The labor force participation rate (LFPR) ( $X_6$ )	• North Sumatra average: 68.67 %	-	Scale
6	The city/district minimum wage ( $X_7$ )	• North Sumatra average: IDR 2,767,875. - Above average - Below average	1 0	Nominal
7	The population growth rate ( $X_8$ )	• North Sumatra average: 1.28 % - Above average - Below average	1 0	Nominal
8	The rate of economic growth ( $X_9$ )	• North Sumatra average: 3.17 % - Above average - Below average	1 0	Nominal
9	Regional status ( $X_{10}$ )	- District - City	1 0	Nominal

**Source:** Data processed from BPS Sumut (2020)

#### 4.2. The Estimation Results of Logistic Regression

In this study, to obtain good estimation results, various scenarios were made. The best scenario is if the model has met the goodness of fit requirements. The scenarios are described as follows:

**Scenario 1:** In scenario 1, all independent variables are included in the logistic regression, but the logistic regression results show that there is one 'missing' variable, namely variable  $X_3$  (Industrial Business Field). It turns out that in the logistic regression estimation results above there are symptoms of multicollinearity indicated by the very high value of  $R^2$  (Nagelkerke R Square = 1.000) and no significant variables. The standard error (SE) value is also very high (SE value > 2.000).

According to Woro (2011) in the logistic regression model if there is an SE value of more than 2.000, then there is a multicollinearity problem. Thus the model in scenario 1 is considered not good enough to be interpreted. Therefore, the model must be improved. One way to improve multicollinearity symptoms is by dropping one or more variables that have very high SE values Gujarati (2000).

**Scenario 2:** In Scenario 2, there are two variables dropped where the SE is very high, namely the variable "Agricultural Business Field ( $X_2$ )" and the variable "The city/district minimum wage ( $X_7$ )". It turns out that the logistic regression estimation results above also have symptoms of multicollinearity as indicated by the very high  $R^2$  value (Nagelkerke R Square = 1.000), SE value > 2.000, and no significant variables.



**Scenario 3:** In Scenario 3, one variable was discarded "Service Business Field (X4) " because the SE was still very high ( $SE > 2.000$ ). In the logistic regression estimation results above, the regression estimation results have generally shown better results, where  $R^2$  is already below 1 (Nagelkerke R Square = 0.836), the high SE value has been reduced but there is still a very high SE, namely the variable "Economic Growth (X9)", so there are still symptoms of multicollinearity. There is already one significant independent variable, namely the variable "Regional status (X10)" (at  $\alpha = 0.05$ ).

**Scenario 4:** In Scenario 4, there is one variable discarded where the SE is still very high, namely the variable "Economic growth (X9)". The logistic regression results of Scenario 4 are presented in the following SPSS output (Table 3):

**Table 3.** SPSS Output of Logistic Regression

<b>Omnibus Tests of Model Coefficients</b>				
		Chi-square	df	Sig.
Step 1	Step	23.807	5	.000
	Block	23.807	5	.000
	Model	23.807	5	.000

<b>Model Summary</b>			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	14.217 <sup>a</sup>	.525	.755
a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.			

<b>Hosmer and Lemeshow Test</b>			
Step	Chi-square	df	Sig.
1	1.483	8	.993

Classification Table <sup>a</sup>					
	Observed	Predicted			
		Per capita consumption expenditure (Y)		Percentage Correct	
		Below average of North Sumatra	Above average of North Sumatra		
Step 1	Per capita consumption expenditure (Y)	Above average of North Sumatra	21	2	91.3
		Below average of North Sumatra	2	7	77.8
	Overall Percentage				87.5

a. The cut value is .500

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	Income Per Capita (X <sub>1</sub> )	.000	.000	.389	1	.533	1.000
	Family members (X <sub>5</sub> )	.099	.051	3.722	1	.054	.906
	LFPR (X <sub>6</sub> )	.002	.002	1.331	1	.249	1.002
	Population Growth Rate (1) (X <sub>8</sub> )	-1.033	1.857	.309	1	.578	.356
	Regional Status (1) (X <sub>10</sub> )	-7.350	2.901	6.420	1	.011	.001
	Constant	32.778	21.801	2.261	1	.133	171987055150196.300

a. Variable(s) entered on step 1: Income Per Capita (X<sub>1</sub>), Family members (X<sub>5</sub>), LFPR (X<sub>6</sub>), Population Growth Rate (X<sub>8</sub>), Regional Status (X<sub>10</sub>)

#### 4.3. Validation of the Best Model: Scenario 4

The best logistic regression estimation is Scenario 4. The analysis of determining the relationship between the dependent variable and the independent variables in the model as well as the feasibility of the model in stating the relationship between the dependent variable and the independent variable can be seen in the Omnibus Tests of Model Coefficients table. The table shows that the Per capita consumption expenditure (Y) model has a chi-square chance of 23.807 with a significance level of 0.000 or the Per capita consumption expenditure (Y) model has significance at the 5% level. This shows that the model compiled has a significant relationship between the dependent variable and the independent variable.

The Nagelkerke R<sup>2</sup> value of 0.755 can be interpreted as the coefficient of determination in multiple linear regressions, which means that the proportion of variance of Per capita consumption expenditure (Y) can be explained by the model by 75.50%. Referring to Washington et al. (2003) explained that in the choice model with a logistic model, the higher the value of pseudo R<sup>2</sup>

(goodness of fit), the better the model. However, this is not always appropriate. O'Donnell and Connor (2002) as cited by Woro (2011) state that practically this value can be ignored because for this logistic regression model there is no standard value of pseudo R<sup>2</sup> which can be used as a reference for model feasibility. This value has an upper limit both theoretically and empirically which is always less than one. Therefore, another way is used to determine the feasibility of the model, namely the Hosmer and Lemeshow test (H-L test).

The model feasibility test or goodness of fit model is carried out using the Hosmer and Lemeshow principle (H-L test). If the H-L test value is equal to or less than 5%, it means that there is a significant difference between the model and its observation value, where the model feasibility is not good because the model is considered unable to predict its observation value. If the value of Hosmer and Lemeshow's goodness of fit statistic is greater than 5%, it means that the model is able to predict its observation value with 95% confidence. The Hosmer and Lemeshow test (H-L test) shows that the value is 0.993 (>5%), so the logistic regression model can be used to predict the value of observations with 95% confidence level.

The accuracy of the model with logistic regression (full model) shown by Step 1 (Classification Table: Overall Percentage) is 87.50% and greater than the accuracy of the proportion of data shown by Step 0 (Classification Table: Overall Percentage) of 71.90%, but there is one observation that is eliminated (terminated) so that the number of predicted observations becomes 32 observations. Therefore, the 'full model' of Per capita consumption expenditure (Y) is better than the null model. From the comparison of model accuracy, it can be seen that the addition of independent variables in both models provides more accurate results than the model without independent variables so that it can be used as a prediction in per capita consumption expenditure in North Sumatra in the future.

Based on the test criteria above, it can be concluded that in general the model is suitable for interpretation as described in the model calibration.

#### **4.4. Model Calibration**

Calibration is the determination of parameter values (constants and coefficients) of a model. Model calibration and interpretation can be seen in Table 3 (Variables in the Equation). The table shows the independent variables that are able to provide significant expected values. Based on Table 5 a logistic regression model can be formed using the following estimated values:

$$\ln(p/p-1) = 32.778 + 0.000000052X_1 + 0.099X_5 + 0.002X_6 - 1.033X_8(1) - 7.350X_{10}(1)$$

The effect of each variable can be described by looking at the expected value of the independent variable (Exp(B)) or odds ratio as follows:

#### **Variable of Income Per Capita (X<sub>1</sub>)**

The income variable (X<sub>1</sub>) has an odds ratio of 1.000, meaning that if the total income per capita of North Sumatra residents rises by Rp 1, the tendency to increase their consumption expenditure per capita by one fold (100%). However, the income variable (X<sub>1</sub>) has a positive but insignificant effect on per capita consumption expenditure.

The results of this study reinforce the findings of Mallik & Pradhan (2012) in India which shows that there is an increase in per capita consumption expenditure of 16 percent due to an increase in per capita income by one percent. It also shows that there is a high convergence between per capita personal income and consumption expenditure. This finding is also in line with the Environment New Zealand (2007) publication which states that the higher the income, the greater the freedom to spend on both basic and other needs. This occurs due to changes in lifestyle, advancing technology, marketing campaigns, and also due to changes in the style and taste of products produced. Arapova (2018) also states that policies that stimulate income increases can boost household final consumption expenditure.

Another interesting finding is the research conducted by Guo & N'Diaye (2010) in China. Using a non-linear regression model they found that household income, GDP per capita, and real GDP growth had a positive and highly significant effect on consumption expenditure. Furthermore, research by Puspita & Agustina (2019) found that household consumption expenditure is more responsive to changes in household income and household characteristics have a significant effect on the proportion of consumption expenditure on several food and non-food commodities.

#### **Variable of Family Member ( $X_5$ )**

The variable family members ( $X_5$ ) has an odds ratio of 0.906, meaning that if the number of family members in a family in North Sumatra increases by one person, the tendency to increase per capita consumption expenditure is 0.906 or 90.60%. The variable of family members ( $X_5$ ) has a positive and significant effect ( $\alpha = 0.10$ ) on per capita consumption expenditure, meaning that the more the number of household members the greater the amount of per capita consumption expenditure.

The results of this study are in accordance with the research of Prabowo (2018) which states that the number of family members has a positive and significant effect on household consumption expenditure. This finding also strengthens the opinion of the Environment New Zealand (2007) which describes that the number of households and the size/number of family members can affect consumption expenditure, the more the number of households and household members the higher the consumption expenditure. The results of this study are also in accordance with the research of Rahma (2010) which used logistic regression to show that the average consumption expenditure is greater in households with more than 5 family members compared to households with less than 5 family members.

#### **Variable of Labor Force Participation Rate (LFP R) ( $X_6$ )**

The LFPR variable has an odds ratio of 1.002, meaning that if LFPR in North Sumatra increases by 1%, the tendency to increase consumption expenditure is 1.002 times. The LFPR variable has a positive but insignificant effect on per capita consumption expenditure. Firmansyah (2017) has also estimated a positive relationship between LFPR and consumption expenditure but the effect is not significant.

#### **Variable of Population Growth ( $X_8$ )**

The population growth variable ( $X_8$ ) has an odds ratio of 0.356, meaning that districts/cities with population growth above the average economic growth of North Sumatra tend to be 0.356 times

lower in per capita consumption expenditure than districts/cities with population growth below the average economic growth of North Sumatra. Or if the population growth of the region/district tends to be below the population growth of North Sumatra, the per capita consumption expenditure is 2.81 (or  $1/0.356$ ) times higher than the district/city with population growth above the average economic growth of North Sumatra. Population growth variable ( $X_8$ ) has a positive but insignificant effect on per capita consumption expenditure. This is in accordance with research of Arapova (2018) in Asian countries which states that the increasing population of a country will increase household consumption growth as is the case in China and India. Aji & Nasriyah (2022) also stated the variable that population significantly increases the growth of household consumption expenditure. The findings of Firmansyah (2017) in Riau also state that any increase in the population of districts / cities in Riau Province will increase district / city household consumption expenditure.

#### **Variable of Regional Status ( $X_{10}$ )**

The regional status variable ( $X_{10}$ ) has an odds ratio of 0.001, meaning that regions with district status tend to be 0.001 times lower in per capita consumption expenditure above the North Sumatra average compared to city status. The regional status variable ( $X_{10}$ ) has a significant effect ( $\alpha = 0.05$ ) on per capita consumption expenditure. There are 23 districts and 8 cities status in North Sumatra. The average per capita consumption expenditure for the 23 districts was Rp 942,929.40, lower than the average per capita consumption expenditure for the 8 cities of Rp 1,228,933. The average income for the 23 kabupaten of Rp 27,832,432 is lower than the average capita income for the 8 cities of Rp 33,438,030.

### **5. Conclusion and Suggestions**

#### **5.1. Conclusion**

Based on the analysis of several logistic regression scenarios, of the 10 variables identified as influencing per capita consumption expenditure, only 5 variables can provide estimates with good goodness of fit, namely per capita income, number of family members, labor force participation rate, population growth, and regional status. The per capita income variable has a positive effect on per capita consumption expenditure, but is not significant for per capita consumption expenditure. If the total per capita income of North Sumatra residents increases by Rp 1, the tendency to increase per capita consumption expenditure by one fold (100%). The variable number of family members has a positive and significant effect ( $\alpha = 0.10$ ) on per capita consumption expenditure. If the number of family members in a family in North Sumatra increases by one person, the tendency to increase per capita consumption expenditure is 0.906 or 90.60%. The TPAK variable has a positive but insignificant effect on per capita consumption expenditure. If TPAK in North Sumatra increases by 1%, the tendency to increase consumption expenditure is 1.002 times. Population growth variable has a positive but insignificant effect on per capita consumption expenditure. Districts/cities with population growth above the average economic growth of North Sumatra tend to be 0.356 times lower in per capita consumption expenditure than districts/cities with population growth below the average economic growth of North Sumatra. Regional status variable has a positive and significant ( $\alpha = 0.05$ ) effect on per capita consumption expenditure. Regions with regency status tend to be 0.001 times lower per capita consumption expenditure above the average of North Sumatra compared to the status of the city.

## 5.2 Suggestions

The research can be developed by analyzing a wider study area and by exploring more complete independent variable data, for example by using panel data. It also can be developed by exploring variables that emphasize other socioeconomic characteristics that can affect per capita consumption expenditure, for example: age, education level, lifestyle, type of consumption expenditure, and others.

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