Effect of Education Level, Income, Inflation on Community Consumption Pattern in North Sumatera Province

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***Abstract*—The level of life or prosperity of society is generally reflected in their level and pattern of consumption. This study to examined the determinants of Education Level, Income, Inflation to consumption of society in North Sumatera. For this purpose study, the secondary data were used. Secondary data for the year 2001 to 2015 was obtained from Bank Indonesia and Badan Pusat Statistik in North Sumatera. The method analysis used is Ordinary Least Square (OLS). Findings are in line with the Keynes economic theory, which suggests that the income variable has a positive effect on household consumption. There are positive relationships between income, college education, they are statistically significant. And Variables of senior high school education and inflation are not significant to consumption of society in North Sumatra. The study recommends that in order to enhance the purchasing power of the people, increase in salaries, wages, reduction in personal taxes and subsidy**

Keywords—education level; income; inflation; consumption; ordinary least square(OLS)

I. INTRODUCTION

Consumption is the total outlay for the received goods and services in an economy in a given period. Consumption accounts for two - thirds of GDP in most countries and is the most important determinant of welfare. In addition, consumer attitudes to saving which is based on consumption decision are very important for capital accumulation, the process of investment, growth, and development. The higher the household income or society as a whole it will be increasingly higher levels of consumption. These facts make consumption and saving among most popular Research areas both in macroeconomics and microeconomics [2].

Consumption is the most important single element in aggregate demand so that its accurate estimation is essential to the management of the economy. Keynes related consumption to current disposable income [1], and for many years this was widely accepted. In 1950s evidence was recorded for a discrepancy between the consumption function estimated from long-run time series data, and the much flatter consumption function estimated from short-run time series and cross-section data. The Keynesian consumption function, therefore, could not resolve this discrepancy, and it was together with the need for more accurate forecasts of consumption, that led to the development of the permanent income, life cycle, and relative income hypotheses.

Over the years economists are varied in their opinions on the variability of income and consumption relationship. For instance scholars like Alfred Marshall on the income elasticity of demand, Ernest Engel on Engel curve, J.M. Keynes on Absolute Income Hypothesis, Duesenberry J.S. on Relative Income Hypothesis, Modigliani F. on Life Cycle Income Hypothesis, Milton Friedman on Permanent Income Hypothesis, etc. According to Alan and Angus (2012), the relationship between consumer spendings and income is one of the oldest statistical analysis of macroeconomics and one of the sturdiest. Like the aging movie star, it needs a little touching now and again but always seems to be bouncing back. Within all the countries of the world, there are significant numbers of socio-economic and demographic influences which affect the consumer's income and consumption patterns. Among these factors includes population, number of households and associated data, Gross Domestic Product, annual inflation, and employment indicators [3].

The development of public consumption expenditure of the province of North Sumatra from 2001 to 2015 has increased from year to year, In 2001 consumption expenditure amounted to 41,924,741.68 billion rupiah. In 2014, consumption expenditures were 87,380,540 billion rupiah and 2015 consumption expenditures were 93,967,640 billion rupiah. This happens because the condition of the economy affected by economic growth that is high enough. However, in terms of growth rate, the consumption growth in North Sumatra province experienced a very fluctuating trend of increase from 2001 to 2015.

The follows the well-known Engel's law which states that the proportion of expenditure on food with respect to the total expenditure declines with the rise in income, a useful indicator of relative consumption patterns is derived by comparing the income elasticity. The main advantage of

following this approach is that income elasticity does depend on the units of measurement of income and consumption, and is, therefore, directly comparable between countries and commodities [2].

Other studies on consumption such as Nanang and Hadi Irawan (2011), Selfia and Putri (2015), Akekere. J and Yousuo P.O.J (2012), Dian and Ariani (2014) and Cilasum S.M (2009) have identified income, unanticipated shocks, and attitude of consumers and presence of liquidity constraints as important determinations of consumption.

In North Sumatra Province, the study by Rinanda and Teja (1978) showed a positive correlation between consumption expenditure and per capita income. On the other hand, Nanang and Hadi Irawan (2011) related consumption in North Sumatra Province to Friedman's permanent income Hypothesis and his findings showed that consumption is a function of current and permanent income

If viewed from the development of Income starting in North Sumatra Province 2001-2015 increase. In 2001, revenue in North Sumatera reached 71,908.36 billion rupiahs, relatively increased significantly in 2015 by 440,955.85 billion rupiahs. According to the theory of consumption of Keynes said if the revenue increase consumption will also increase but with a smaller amount of [2]. It is stated that consumption is not only influenced by income but also affected by other factors.

The purpose of this study is as follows: To analysis the influence of education level, income, inflation on consumption of the people of North Sumatra province.

II. LITERATURE REVIEW

A. Consumption

This section highlights some of the important literature reviews which are conducted by different researchers. Keynes (1936) reported that whatever is not consumed is saved. In the studies of Latin American countries show increased capital formation and increase in income with fall is saving from 23% to 8.8%. It indicates that the shift of 14.2% of income must have gone to increase the consumption rate. Total income (Y) being equal to 1. MPC is always positive showing increased consumption with a proportionate the increase in income and will lie between 0 and 1 [1].

The coefficient of household size comprises of two types of effects, such as specific effects and income effects. The specific effect resulting from an increase in the need for various commodities as household size increases, whereas, the income effect arises because a family becomes relatively poorer with an increase in the household size. The specific effect does not move proportionately with household size because of economies of scale in consumption, which exist in the large households [2].

A different approach used by [2] to define consumption. Theory of consumption titled "Lifecycle hypothesis'' distinguishes between two types of wealth. The net worth of one's stock of assets and the present value of one's expected labor income stream. According to this theory, consumption of any time depends both on the flow of expected labor income and on the stock of wealth.

The relative income hypothesis postulated that consumption depends on current income and past peak income. If income exceeds the previous peak level of income no downward adjustment in living standards is necessary and consumption will adjust to income according to one set of relation if, however, income falls below previous peak income than consumption will react more gradually to change in income [2].

B. Level Education

According to Schultz (1960) observes that the development of the education sector with humans as its core focus has contributed directly to the economic growth of a region, through the enhancement of skills and production capabilities of the labor force. According to the theory of human capital, education affects economic growth in a country or region through increased skills and labor productivity. Humans with a high level of education have a greater chance of getting a job and better income compared to lower education. The higher the level of the community education the higher the level of consumption. Because when a higher education, they no longer just meet the needs of food and drink but also to meet the needs of information, the better society, and the need for recognition of others to its existence (existence). And often the cost required to meet this need is much greater than the cost of the fulfillment of a need to eat and drink.

Other studies on consumption such as M. Ali Uddin Khan, Israr Ahmad (2014) have identified education as determinants of consumption.

C. Income

Revenue is the most important factor and the main determinant of consumption. The theory put forward by Keynes is called the absolute income hypothesis or the absolute income hypothesis based on the underlying psychological law of consumption which states that if income is increased then consumption will also increase [14]. Milton Friedman (1957) propounded the permanent income hypothesis which says that consumption is a function of permanent income rather than current disposable income. The permanent income is the income an individual is expected to receive over a long period of time. Friedman believes that transitory income or temporary unexpected income does not affect consumption [4].

D. Inflation

According to Boediono, inflation as a tendency of prices to rise in general and continuously. An increase in the price of one or two goods cannot be called inflation unless the increase extends to or causes an increase in the bulk of other goods. The Classical theory holds that the price level is primarily determined by the money supply, which can be

explained by the relationship between the value of money and the amount of money, as well as the value of money and price. If the amount of money increases faster than the increase in goods than the value of money will decline and this equals the price increase. So according to Classical, inflation means too much money in circulation or too much credit compared to the volume of transactions than the medicine is to limit the money supply and credit [15].

III. METHODOLOGY

This study used secondary data sourced from the Central Bank of Indonesia (BI) and the Badan Pusat Statistik (BPS) of North Sumatra Province. The time series data covered a period of thirty years, from 2001 to 2015:

TABLE 1. Consumption, Senior High School, College Education, Income, Inflation Of North Sumatera In 2001-2015

Years	Consumption (Billion rupiah)	Senior High School (%)	College Education (%)	Income (Billion Rupiah)	Inflation (%)
2001	41.924.741,68	24.67	1.62	71.908,36	14.79
2002	43.510.947,36	26.71	2.44	75.189,14	9.59
2003	45.131.874,55	27.73	4.49	78.805,61	4.23
2004	47.217.507,64	27.73	4.49	83.328,95	6.8
2005	50.500.351,13	26.49	5.16	87.897,79	22.41
2006	53.771.629,72	32.9	5.4	93.347,40	6.11
2007	58.465.863,77	28.94	6.17	99.792,27	6.6
2008	63.566.633,01	29.27	6.37	106.172,36	10.72
2009	68.475.416,55	31.99	6.62	111.559,22	2.61
2010	74.120.391,29	32.26	7.32	118.640,90	8
2011	74.017.173,18	28.21	7.7	126.587,62	3.67
2012	79.721.334,01	28.89	7.87	134.460,10	3.86
2013	79.072.810	34.16	8.56	142.537,12	10.18
2014	87.380.540	35.48	9.27	419.573,31	8.17
2015	93.967.640	37.59	11.02	440.955,85	3.24

Source: Badan Pusat Statistik (BPS) Sumatera Utara

Here private consumption expenditure is the dependent variable while senior high school, college education, income, inflation is the independent variable.

Researchers adopted the simple linear regression analysis to examine the influence of Gross Domestic Product (income) on private consumption expenditure; the purpose of the regression analysis is to reveal the influence of the response (dependent) variable and the predictor (independent) variable.

Based on the Keynes (1936) consumption function, we then specify the model as follow;

$$C = f(Y) \quad (1)$$

where:

C is consumption expenditure,
Y is income,
f is the functional relationship between the two variables

Furthermore, the above functions are specified in the estimation model using OLS (Ordinary Least Square) with multiple linear regression models that are:

$$\text{Log}(Y) = a + b1\text{Log}(X1) + b2\text{Log}(X2) + ..+ bn\text{Log}(Xn) + \mu \quad (2)$$

where:
C is Consumption (measured in billions of Rupiah)
X2 is Senior High School (measured in units %)
X3 is College Education (measured in units %)
X4 is Income (measured in billions of Rupiah).
X5 is Inflation (measured in units %)
B0 is Konstanta
β1-β4 is Koefisien Regresi
μ is Error term

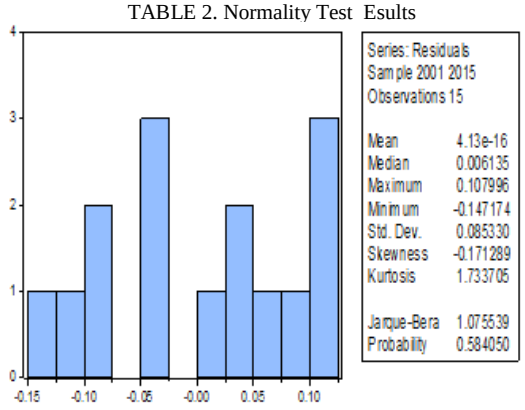
Statistical data in this research is processed by using Eviews 6.0 program which is made specifically to assist data processing while reducing human error, with 95% significance level or α 0.05. Test of Conformity (Test of Goodness of Fit) is a statistical test to find out how well the regression line explains the data. Data analysis in conformity test is done based on t-test that is an individual test (partial test), F test that tests all over and calculation of determinant coefficient value (R2).

IV. RESULT AND DISCUSSION

A. Analysis Prerequisite Test Results

From the results of the next model, the estimation will be tested in economic analysis, statistical analysis and econometric analysis with the model performed with the model performed with the estimation of multiple linear regression equations (OLS). Regression model must also meet the assumptions of normal classical linear regression models are often referred to as the test of normaly or test normality. Test normality for by using the Jarque-Bera (J-B) Test. A model considered Gaussian probability value when J-B count greater than $\alpha = 0.05$.

TABLE 2. Normality Test Esults



Based on the above table it can be seen that the data are normally distributed. We can see it in the Jarque Bera probability value of 0.584050 which is greater than the error rate of 0.05 (0.584050> 0.05).

TABLE 3. Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.953657	Prob. F(2,8)	0.1095
Obs*R-squared	6.371447	Prob. Chi-Square(2)	0.0413

In this study testing of autocorrelation symptoms is a condition where there is a correlation between residuals this year with the level of error the previous year. To know the presence or absence of autocorrelation disease in a model can be seen from the Durbin-Watson statistics. In addition to using the Durbin-Watson test, to see whether there is a problem of autocorrelation disease can also be used Lagrange multiplier test (LM Test) or so-called Breach-Godfrey test by comparing probability value Obs * R Squared with α = 5% (0.05). Based on the estimation of the Durbin-Watson (DW) model is 0.0413 and the probability value is 0.0602 which is greater than α = 5% (0,05) so it can be concluded that the data in this research there is not problem of autocorrelation

TABLE 4. Heteroscedasticity Test Results

Heteroskedasticity Test: Glejser

F-statistic	0.361899	Prob. F(4,10)	0.8303
Obs*R-squared	1.896810	Prob. Chi-Square(4)	0.7547
Scaled explained SS	0.739459	Prob. Chi-Square(4)	0.9464

The heteroscedasticity test was conducted to find out whether in the regression model there was a variance inequality of the residual one observation to another observation. If the variant of the residual one observation to another observation remains, it is called homoscedasticity and if the variant is not constant or changing it is called heteroscedasticity. The Good regression model is the homoskedasticity or does not occur heteroscedasticity Gujarati (2007). Based on estimation result of Glejser Test value model is 0,7547 bigger than α = 0,05. So it can be concluded this model does not contain Heteroscedasticity.

B. Test Statistics

To get the regression result between dependent variable Consumption (Y) with independent variable Senior High School (X1), College Education (X2), Income (X3), Inflation (X4) processed by using computer program Eviews 6.0 using Ordinary Least Square (OLS) which is shown in the following table:

The results of the regression analysis of consumption (C) can be written - in linear equations as follows

C = 2.154715+0.168895*SMA +0.285767*PT+0.186073*I-0.000622*INF

From the multiple linear regression equations above, it can be explained as follows:

a. The Constant value of 2,154 which indicate that if a variable of education of senior high school (SMA), college education (PT), income (I), inflation (INF) is 0, then consumption to 2,154.

b. The regression coefficient for senior high school variable (SMA) is 0,168. It means high school education has a positive effect on consumption. Every one increase in the variable of senior high school variable (SMA), then the variable of consumption will decrease by 0,168 assuming another variable remain.

c. The regression coefficient for college education variable (PT) is 0,285. It means college education has a positive effect on consumption. Every one increase in college education variables, then the variable of consumption will rise by 0,285 with the assumption that other variables remain.

d. The regression coefficient for income (I) is 0,186. It means college education has positive influence on consumption. Every one increase in college education variables, then the variable of consumption will rise by 0,186 with the consumption that other variables remain.

e. The regression coefficient for inflation variable (INF) is -0,0006.It means inflation has negative influence on consumption. Every one increase in inflation variables, then the variable of consumption will rise by is -0,0006 with the assumption that other variables remain.

TABLE 5. Consumption Model Test Results

Independent Variables	Coefficient	t-Statistic	Prob
LOG(SMA)	0.168895	0.377800	0.7135
LOG(PT)	0.285767	3.102549	0.0112
LOG(INCOME)	0.186073	2.170339	0.0451
LOG(INFLASI)	-0.000622	-0.012151	0.9905
C	2.154715	1.715197	0.1171

R-squared	0.893865
Adjusted R-squared	0.851412
F-statistic	21.05501
Prob(F-statistic)	0.000074
Durbin-Watson stat	0.671791

1. F Test (Simultaneous Test)

F test or simultaneous test is performed to see the effect of free variables simultaneously or together to the dependent variable. From the model estimation results for Consumption obtained F calculated value of 21.05501 with a probability level of 0.000074. This shows that the independent variables for Consumption such as Senior High School, College Education, Income, and Inflation simultaneously and significantly influence the dependent variable, Consumption at the degree of a confidence level of 95%.

2. T-Test (Partial Test)

a. The Effect of Education Level on Consumption

In this study, senior high school (SMA) did not have a significant influence on consumption and College Education (PT) had a positive and significant influence on the coefficient level of 0.285767,which means College Education contributed 0.285% change or increase in consumption. This could mean that the change of income 1% responded with changes in consumption of 0.285%. This is in accordance with the theory of human capital education influence on economic growth in a country or region through increased skills and labor productivity. Humans with a high level of education have a greater chance of getting a job and better income compared to lower education. The higher the level of community education the higher the level of consumption.

Because at a time when the higher education, they no longer just meet the needs of food and drink but also to meet the needs of information, a social community better, and the need for recognition of others to its existence. And often the cost required to meet these needs is far greater than the cost of fulfilling the need to eat and drink.

Other studies on consumption such as M. Ali Uddin Khan, Israr Ahmad (2014) have identified education as determinants of consumption

b. The Effect of Income on Consumption

In this research, community income has a positive and significant influence on the coefficient of 0.186073 which means the income of the community contributed to changes or increase in consumption by 0.186%. This can be interpreted that the change in income by 1% responded with a change in consumption of 0.186%. It indicates that people are careful enough to use or spend their money. Although the income of the community has increased, it does not necessarily make the people spend their income with a large percentage, it is one of them caused by the increase of community activity to save, because the interest rate is relatively rising.

From the data analysis results obtained that the real income has a positive and significant influence, this is in accordance with economic theory of consumption functions as proposed by Keynes who put forward a law known as the Psychological Law of Consumption which discusses the behavior of society regarding consumption when connected with the level of income "When income rises, consumption will increase but not as much as income increase". It can be explained that income is a determinant factor of high-low consumption of people but the increase in consumption will not be greater than the increase in income, meaning the additional income is not or not necessarily spent all for consumption for low-income people.

Other studies on consumption such as Nanang and Hadi Irawan (2011), Selfia and Putri (2015), Akekere. J and Yousuo P.O.J (2012), Dian and Ariani (2014) and Cilasum S.M (2009) have identified income, unanticipated shocks, and attitude of consumers and presence of liquidity constraints as important determinations of consumption

c. The Effect of Inflation on Consumption

In this study, the inflation rate did not have a significant effect on consumption at a coefficient rate of -0.000622, which means inflation contributes to a change or increase in consumption by 0.0006%. This can be interpreted that the inflation change of 1% responded with a change in consumption of 0.0006%. This is not in accordance with economic theory, that economic theory is mentioned that Inflation has a strong relationship where, if the price of goods and services rise and inflation, it will cause a decline in the real value of income so that weaken the purchasing power of people, especially on domestic production so that can have an impact on the decline in public consumption.

The Inflation rate has a negative effect, if the inflation rate increases then it will lead to a decrease in consumption level. This is obviously due to circumstances, where people still have to consume because it must be done to meet the needs that cannot be negotiable, especially for basic needs / basic needs

3. Goodness of Fit Test

Test coefficient determination (R^2) is used to see how big the variation of free variables may explain the variables bound. From the results obtained for consumption estimation value R2 of 0.893865. It gives a meaning that 89,38% Consumption variable can be explained by the variable of senior high school, college education, income, and inflation. While the rest of 10.62% is explained by other variables outside the model.

V. RESULT AND DISCUSSION

The results of the study reveal that College Education (PT) and Income (I) have a positive and significant effect on consumption and Senior High School (SMA) and Inflation (INF) have not effect significant to consumption in North Sumatera Province. The policy recommendation of this study is that government should induce private expenditure toward

human capital development which will enhance macroeconomic stability. The consumption income causal relation seems to be almost proportional to the period under investigation with respect to the coefficient of determination, the government needs to increase savings and investment inventories, diversify the economy to improve the service sector. Measures should also be taken to address the high rate of the marginal propensity to import of goods by the household sector. Researchers believe that if savings increase, the economic status will improve, therefore North Sumatera Province needs to adjust their expenditure on imported goods and invest domestically if there must be a change in any unit, the starting point is proper and coordinate strategies in policy implementation.

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