THE IMPACT OF NON-FOOD COMMODITY INFLATION ON CHANGES OF HOUSEHOLD WELFARE IN ACEH PROVINCE

Yasrizal[1][*]

[1] Universitas Teuku Umar, Meulaboh, Indonesia

Abstract

The relations of inflation and poverty can be seen from the contribution commodities of poverty contributor. Increasing prices on the commodity of poverty contributor leads to declining real incomes and income loss in households causing poverty. The commodity of poverty contributor is dominated by fuel and LPG commodities. The AIDS model is a development of the Engel curve and Marshall equations derived from the theory of satisfaction maximization. This model uses the budget share of household on a selected commodity to represent demand variables. This study is an empirical study. The data used are primary and secondary data obtained from field research and literature. The study is located in Banda Aceh and Meulaboh. By using an almost ideal model of demand or an AIDS model, it will be seen that household behavior responds to changes in the price of the commodity of poverty contributor. From observation, inflation rate of non food commodity has a big effect on the welfare of Aceh Province community, both for Banda Aceh and Meulaboh households. The non-food commodity inflation has a huge influence to reduce household welfare in Meulaboh.

JEL Classification: *D10, D11, D12*

Keywords: *AIDS Model, Elasticity, Inflation, Non-food Commodity of Poverty Contributor.*

1. INTRODUCTION

Poverty is a problem that is often faced in developing countries. The main cause of poverty is the degree of difference in a region's economic resources. The areas with limited economic resources are identical with relatively slow economic growth and high poverty rates. On the other hand, the regions with abundant natural wealth, with supportive human capital can achieve high levels of economic growth and impact on low levels of poverty.

A country's poverty rate is measured through its per capita income. Household expenditure can be an appropriate approach to see the amount of income per capita society. Based on the concept, the poor are residents with average per capita spending per month below the poverty line. The level of poverty will increase especially when inflation occurs, namely the increase in prices of goods/services that cause the decline in real incomes of society (BPS 2014).

The seen from the comparison between regions, Aceh province is one of the provinces that have low welfare, this can be seen from the poverty rate is high enough. The poverty in Aceh mostly occurs in rural areas, as evidenced by the large percentage of rural poverty compared to urban areas. Table 1 showed that the poverty rate in Aceh is well above the national average.

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* Corresponding author. *Email address*: yasrizal@utu.ac.id

Table 1 The rural and urban poverty rates in Aceh Province

Year	Rural		Urban		Rural+Urban	
	Total	Percent	Total	Percent	Total	Percent
Mar-15	157,57	11,13	694,01	19,44	851,59	17,08
Sep-15	155,81	10,92	703,6	19,56	859,41	17,11
Mar-16	159,5	10,82	688,94	19,11	848,44	16,73
Sep-16	163,02	10,79	678,29	18,8	841,31	16,43
Mar-17	172,35	11,11	700,26	19,37	872,61	16,89

Source: BPS Aceh 2017

The condition of poverty has an impact on the economy of Aceh, considering Aceh is still has dependence on other areas in the fulfillment of food. In September 2016 and March 2017 there was an increase in poverty, this is in line with the policy of revoking fuel subsidies and policy of rising prices of household fuels by the government. This so-called administered price policy leads increased inflation in various commodities and leads to an increase in household poverty rates, especially in urban areas.

There is a close relationship between inflation and poverty. According to Wood et al. (2012), food inflation will lower the economic welfare of low-income households in both urban and rural areas, where the percentage of household expenditure on food will increase. Rising prices will lead to income loss in households. In line with that, Skoufias et al. (2011) argue that rising prices will have the direct impact on rising poverty.

The relations of inflation and poverty can be seen from the contribution commodities of poverty contributor. The commodity of poverty contributor is a household basic commodity which is consumptive. Increasing prices on the commodity of poverty contributor leads to declining real incomes and income loss in households causing the poverty. The commodity of poverty contributor is dominated by the food commodities. Based on the data from Central Bureau of Statistics of Aceh Province in 2017 is contained on Table 2.

Table 2 The List of Commodities on Contributing Greatly to Poverty Line and Its Contribution (%) in Aceh Province, March 2017

Type of Commodity	Urban	Type of Commodity	Rural
-1	-2	-3	-4
Not Food	27,92		22,19
Housing	6,76	Housing	5,13
Fuel	3,69	Fuel	3,27
Electricity	2,54	Electricity	1,51
Education	2,25	Education	1,4
Adult men's clothing	1,58	Adult men's clothing	1,24
Adult women's clothing	1,53	Adult women's clothing	1,2

Source: BPS Aceh 2017

The non-food ingredients provide the highest poverty contribution in urban households when compared to rural households in Aceh Province, the government policy to provide home subsidies with five percent interest installment has not been

able to reduce the poverty rate in urban and rural communities in Aceh Province,
further reductions in Premium fuels and the transfer to other types of fuel also
contributed to poverty due to substitution to non-premium types of higher prices and
ever-increasing price changes.

From the problems that occur above, then the problem in this study is any non-
food commodities that affect the welfare of households in Aceh province and how
changes in household welfare due to price changes.

Research Purposes

This study aims to examine the changes in household welfare in Aceh Province
which is seen from the coefficients of each variable, namely the non-food commodity
of poverty contributor, price and income elasticity, and elasticity of social
demographic variables. The change in the coefficient and the value of elasticity can
see how changes in the level of household welfare due to rising prices the commodity
of poverty contributor and changes in other variables included in the model of demand
for the commodity of poverty contributor.

2. LITERATURE REVIEW
Demand Theory and Almost Ideal Demand System (AIDS) Model

The demand theory explains the nature of buyer demand on a commodity (goods
and services) and also explains the relationship between the quantity demanded and
the price and the formation of the demand curve. The proportion of spending as a
proxy of demand was developed by Deaton and Muelbauer (1980), known as the
Almost Ideal Demand System (AIDS) Model . This model develops a demand
function by including revenue and prices together. Commodity demand is the share
of commodity expenditure under study in the model of total expenditure of all
commodities in the system. According to Pusposari (2012), the advantages of this
model is that it can include other variables representing real household conditions,
such as demographic social variables, among others; level of education, number of
family members, income class, and others.

Price Elasticity of Demand and Measure of Welfare

The relations between inflation, income and welfare can be seen from Skoufias
et. al. (2011), namely; inflation will have a direct impact on rising poverty. In the
short run, rising prices will be a serious problem where the poor will spend more
money to buy food. The rising prices will lower their real income so they get poorer.
On the other hand, producers do not have time to increase their production as response
from the price changes. In the long run, the rising prices will lower the welfare of
middle-class households.

Price elasticity of demand is an indicator that measures consumer welfare,
namely how much the number of demands is changing as the price changes. The
measurement of price elasticity of demand is by looking at the percentage change in
the number of requests divided by price percentage changes. The income elasticity is
a measure of the magnitude of the response to the amount of demand for an item to
the change in consumer income, which is calculated as the percentage change in the
number of demand divided by the percentage of income change (Kelana et al., 2005)

The Inflation and Commodity of Poverty Contributor
The inflation is an increase in the prices of goods in general and constantly in a certain period. Inflation in general can be clarified into two types, namely demand-pull inflation and cost-push inflation. To calculate the inflation rate is usually the basis of calculation is the Consumer Price Index (CPI). There are two patterns of the inflation calculation in Indonesia, first, the calculation of inflation groups on seven types of expenditures, namely; foodstuffs, finished food, beverage and tobacco, housing, clothing, health, education and sports, and transport and communications groups. The commodities of poverty contributor is entered to the seven expenditure groups. There is even a close relationship, where the commodity of poverty contributor is also included in the commodity of inflation contributor.

3. RESEARCH METHOD
Analysis of the Data
Almost Ideal Demand System (AIDS) of Model
The commodities of poverty contributor in this research is the commodity that causes the highest poverty. The commodities consist of four commodities, namely: **Fuel, Electricity, Education, and Health Service.**
Using the Stone price index, the equation becomes linear and easy to estimate. The general model is then modified with demographic social variables such as the number of family members, and the level of education. The following AIDS of model used in this study.

$$w_i = a\,\partial_{i0} + \sum_j \gamma_{ij}\log P_j + \beta_i \log (x/p*) + \partial_{i1} \log \text{Family} + \partial_{i2} \log \text{Edu} + \mu_i \; ....(1)$$

There are :

w_i	: Share of commodity expenditure i to total of commodity expenditure j
$i = j$	: 1,2...6 (6 The commodities of overty contributor)
$\log P_j$	: Commodity prices of j (where j=1,2...7)
$\log (x/p*)$	: Log total of income that is deflated by a stone index
log Family	: The number of family members in the household i
log Edu	: The education level of the head of household i
μ_i	: Error term

Furthermore, this model is elaborated into a new equation
Equation 1:
w_smoke = c(1) + c(2)*logp_smoke + c(3)*logp_electricity + c(4)*log7/p_l/pg

Equation 2:
w_electricity = c(1) + c(2)*logp_electricity + c(3)*logp_lpg + c(4)*logyperp_electricity

Equation 3:
w_lpg = c(1) + c(2)*logp_lpg + c(3)*logp_smoke + c(4)*logp_electricity + c(5)*logyperp_lpg

Two Step of Heckman Model

The problem of selectivity bias occurs because there are sample households that do not consume any of the particular commodities studied, for example, there are households that do not consume cigarettes. The model to overcome the problem is a two step estimation model from Heckman, which adds IMR free variable (Inverse Mills Ratio) to the main model. The value of IMR is obtained by performing logistic regression to estimate household chances in consuming each commodity (Pusposari, 2012).

The first stage, the model is regressioned with logistics, and then from the estimation results will get IMR value.

$$Z_i = a\,\partial_{i0} + \sum_j \gamma_{ij}\log P_j + \beta_i \log (x/p *) + \partial_{i1} \log \text{Family} + \partial_{i2} \text{Class} + (2)$$

There are:
Z_i : The opportunity of consumption, 0 = not consuming, dan 1=consume

The Calculation of Elasticity to See Welfare

From the estimation results of the AIDS demand model, it will then be used to calculate the elasticity. This elasticity calculation uses the budget share of average of the commodity group *i*. Here is the elasticity calculation formula based on the estimation results of AIDS model (Seftarita et al., 2013):

1. Own price of elasticity : $E_{ii} = 1$

2. Cross Price of Elasticity : $E_{ij} = \dfrac{(\gamma_{ij} - \beta_i.w_j)}{w_i}$

3. Income of Elasticity : $E_{iy} = \dfrac{\beta_i}{w_i} + 1$

4. Demography Social of Elasticity : $E_{ik} = \dfrac{\partial_i}{w_i}$

4. RESULTS AND DISCUSSION

The Relations Number of Income and Number of Responsibilities to Energy Consumption

The consumption is a function of income, as high as income is high consumption and savings, further demand is a function of the price of goods when the price of goods is rises then the demand for goods will change negatively delivered according to the demand curve. Human needs consist of primary and secondary needs. Primary needs consist of food needs and non-food needs for human survival. The following table 3. Below is the consumption of non-food in Aceh taken from 100 respondents.

Table 3 Total of Income, Dependency on Non-Food Consumption in Aceh

Income/Month	NR	FM	Electricity	Municipal Waterworks	Fuel	
			Cost	Cost	Liter	Cost
< 1000000	40	3	68.850	35.000	13	103.650
1000000 - 2000000	40	4	136.050	35.000	18	138.463
2000000 - 3000000	12	3	223.583	37.500	16	125.750
3000000 - 4000000	2	6	285.000	40.000	15	127.500
4000000 - 5000000	3	3	206.667	50.000	32	258.333
> 5000000	3	3	316.667	66.667	19	153.333

Source: Primary data processed in 2017

Explanation:
NR : Number of Respondents
FM : Family Members

From table 3 showed that expenditure of household for non-food affects the income level of the population as high as income levels, so as much as non-food commodity consumption, the number of dependents affects the consumption of non-food commodities. As at the time of income below 1 million IDR, the average amount of electricity consumption 68.850 IDR, water consumption 35.000 IDR, fuel consumption 103,650 IDR and cigarette consumption amounted to 242,250 IDR. Furthermore, on the level of community income amounted to more 5 million IDR then the average consumption amount of electricity 316,667 IDR, total of water consumption 66.667 IDR, the amount of fuel consumption 153,333 IDR, and total of cigarette consumption 666.667 IDR.

The Commodity of Inflation Contributors

Table 4 showed that the expenditures of household for non-food basic commodities. The highest expenditure of basic commodities occurred to households in Banda Aceh. The amount of expenditure on electric commodities will reduce the expenditure of other basic commodities. This condition is very different when compared to households in Meulaboh, generally below the average spending of Banda Aceh, the households in Meulaboh are assumed to be rural household areas and Banda Aceh is an urban household. The expenditures of Education and health are low, not only in Meulaboh but also on households in Banda Aceh. This condition showed that the level of welfare is still low in this province. Furthermore, can be seen in the table below:

Table 4 The Commodity of Inflation Contributors in Aceh (Banda Aceh, Meulaboh)

The Commodity Group Of Expenditure Section	Meulaboh	Banda Aceh
Electricity	0,190	0,201
LPG	0,064	0,109
Educational Services	0,115	0,201
Health Services	0,016	0,021

The Changes of Public Welfare

Generally seen from the demand of non-food commodities, the elasticity value for households in Meulaboh is higher than the households in Banda Aceh. This indicates that non-food inflation has a major impact on the decrease in welfare for households in Meulaboh. This condition is mainly due to several factors, firstly: the rural households have lower incomes compared to the urban households so that the price changes such as electricity, LPG will affect the level of consumption by the rural households in Aceh Province. Further described in the table below:

Table 5 The Elasticity Changes of Non-Food Commodity Demand in Aceh Province 2017

Commodity	Region	March	April	May	June	July
Electricity	Meulaboh	-0.979	-0.843	-1.677	-1.250	-1.210
	Banda Aceh	0.353	-0.805	-1017	-0.855	-0.812
LPG	Meulaboh	-0.703	-1.414	-3.088	-1.173	-1.174
	Banda Aceh	2.914	-0.692	-0.925	-1.138	-1.102
Educational Services	Meulaboh	-2.068	-1.369	-0.980	-1.800	-0.738
	Banda Aceh	0.763	-1.339	-1.320	-1.105	-1.102
Health Services	Meulaboh	-4.133	-5.903	-5.449	-3.635	-1.467
	Banda Aceh	-0.771	-3.738	-1.026	-0.034	-2.430

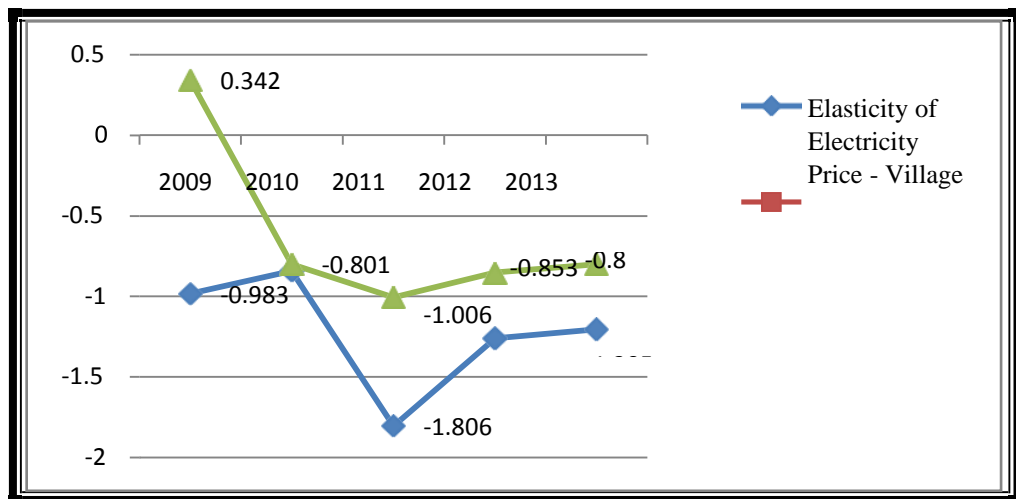*Source: Results of the Model of AIDS Regression*

Figure 1 The Changes Elasticity of Electricity Price Demand during March-July 2017
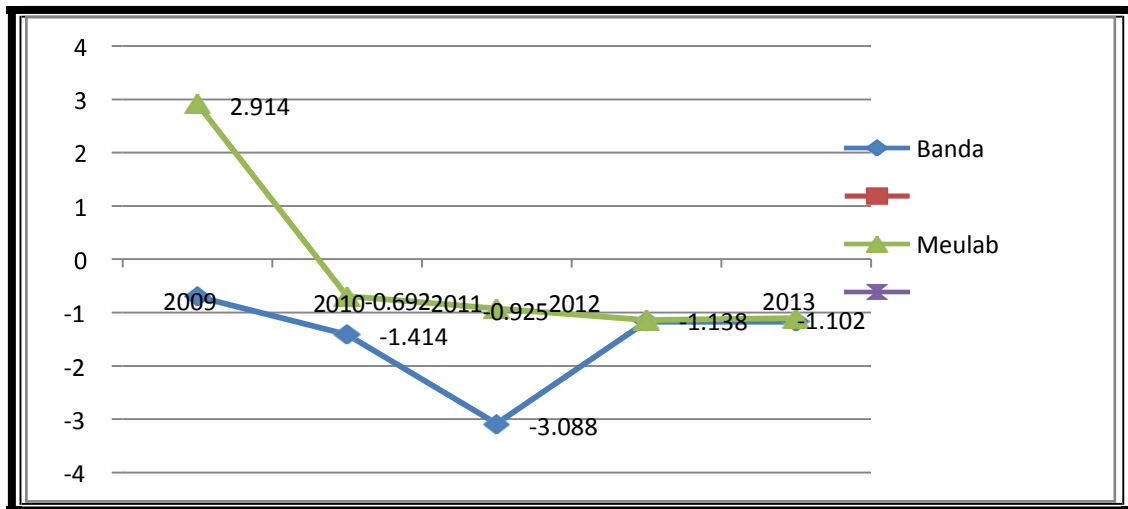
Figure 2 The Changes Elasticity of LPG Price Demand during March-July 2017

Pictures 1 and 2 showed the elasticity value of the goods itself for electricity and LPG. The price elasticity of the electricity and LPG demand on household in Meulaboh is higher than the households in Banda Aceh. The reason is that households in Banda Aceh routinely to consume electricity and LPG for their daily household needs; so that the budget share on these commodities is high in Banda Aceh area. The household income in Banda Aceh is higher, spent on electricity and LPG. Consequently, the rise in electricity tariffs and LPG prices has an effect on the welfare of households in Banda Aceh. This is seen from the average characteristic of changes in the level of elasticity. This condition differs from the households in Meulaboh, where increases in electricity tariffs and LPG prices have caused the households in Meulaboh to limit their electricity and LPG consumption, suggesting that increases in electricity tariffs and LPG prices have a major effect on reducing the household welfare in Meulaboh.
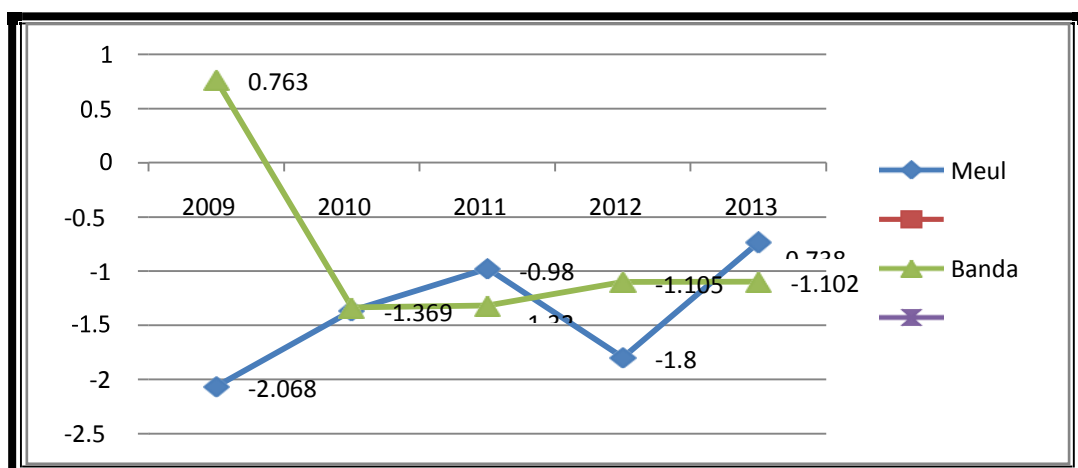

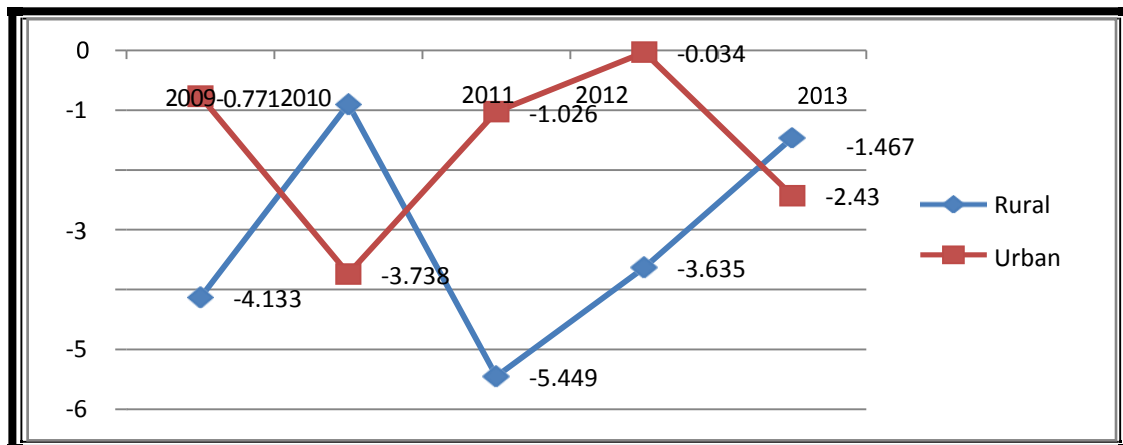Figure 3 The Changes Elasticity of Health Services Prices Demand during March-July 2017

Figure 4 The Changes Elasticity of Health Services Prices Demand during March-
July 2017

Pictures 3 and 4 showed that the shift in price elasticity of the goods themselves for education and health services. The price elasticity value of the goods itself for both regions is very elastic. This suggests that inflation has a major effect on the declining levels of health and education public, especially the households in Meulaboh. The price elasticity value of the goods itself for commodities of the health care and education in the households in Meulaboh is higher than the households in Banda Aceh. In the period from March to July, The price elasticity value of the goods itself has decreased, cause the household welfare on both of the cities is better. In July, the price elasticity value of the goods itself for health services is more elasticity, in Meulaboh was lower than Banda Aceh.

5. CONCLUSION

From observation, the inflation level of non-food commodity has great effect on the public welfare in Aceh Province, both for the households in Banda Aceh and Meulaboh. The non-food commodity inflation has great effect to reduce the household welfare in Meulaboh. The differences in income levels caused the households in Meulaboh to be very sensitive to rising inflation. The cost of education services in Aceh Province is still very low, in this case indicates that the welfare occurring in public in Aceh Province is still very low compared to other provinces. Therefore, the Government should regulate the smooth distribution of each commodity for the vital needs of the community, including LPG. Because the different prices between regions are caused by the poor distribution

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