

DOES INFLATION ON ADMINISTERED PRICES AND VOLATILE FOODS COMMODITIES REDUCE THE HOUSEHOLDS WELFARE IN ACEH, INDONESIA?

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Abstract

High inflation is closely related to poverty. Inflation for volatile food is one of the causes of decreasing in household welfare. Volatile food commodities such as; rice, meat, fish, red chili, and shallot contributed to the inflation in the last three years. Likewise, administered price commodities such as LPG (liquefied petroleum gas), electricity, gasoline and water also contributed to high inflation. This study analyzes the effect of inflation on commodity-based welfare by analyzing the elasticity of demand for these commodities. The data used are cross section data obtained from the 2018 National Social Economic Survey (Susenas) of Aceh. The model used is the Almost Ideal Demand System (AIDS) model regressed with the Seemingly Unrelated Regression (SUR) approach. The results show that that most of the coefficient of the price has a negative and significant effect. The coefficient is used to calculate the elasticity of price variables, income elasticity, family size elasticity and education elasticity as control variables. The elasticity results indicates that prices greatly affect the decline in household welfare, displayed by the elastic value of demand for administrated and volatile food commodities while income elasticity, family size elasticity, and education elasticity shows an inelastic value. Therefore, it is recommended for Bank Indonesia and the government (in this case the Regional Inflation Control Team) to continue to pursue a commodity-based inflation control policy in Aceh. It is also necessary for the government to encourage more superior commodities, especially for volatile food commodities such as rice, meat, fish, red chili, and shallot. Producing more of the volatile food commodities will be important to maintain the price and quantity of food. In addition, the government must also provide symmetrical information about developments and plans to increase prices, thus not to cause excessive inflation expectations.

Keywords: Volatile Food Commodities, Administered Prices Commodities, inflation, and welfare, AIDS model.

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INTRODUCTION

Income is one of the indicator to measure the welfare level of a community. However, rising income will not rise the welfare if inflation also increases. Inflation can be a big problem in the economy caused by several things which are; Firstly, rising inflation will reduce the real income of the people. As a result, the welfare decreases and causes the poverty. Second, volatile inflation causes uncertainty for economic actors in making decisions, especially the decision to consume, invest and produce, which in turn will reduce economic growth. Third, the ratio of domestic inflation which is higher than foreign inflation will cause the real interest rate in the country to become uncompetitive, which then put pressure on the exchange rate (www.bi.go.id, 2020). Skoufias, et al (2011) argues that inflation will reduce the real income of the people, especially for low wage earner. The same resulted is examined by Achdud and Bigman (1991), Ravallion (2000) and Nakata, (2014), who find that high inflation is closely related to the increasing poverty.

The inflation rate in Aceh is quite fluctuated in the period 2013-2017. The inflation rate was approximately high especially in 2013 and 2014 by 7.31 percent and 8.09 percent respectively. This was in line with the high percentage of poverty which averaged of 17 percent in that period. Inflation decreased significantly in 2015 at the level of 1.53 percent, and the lowest in the last five years. The decline in inflation in this period was caused by the decline in people's purchasing power and low economic growth. In addition, the decline in global commodity prices also caused demand for export commodities to decline and hence the deflation was occurred in some commodities. As the economy improves, in 2016-2017, the inflation rate increased while the level of poverty in Aceh decreased. Inflation was mainly driven by increased demand for goods and services as a result of increased in public income.

This study is remarkable to be studied because Indonesia, especially Aceh experienced highly volatile price of agricultural product. The rising of prices of Volatile food and Administered Price Commodities can influence the purchasing

Administered prices, such as gasoline, LPG and electricity, are considered as the highest contributors to inflation, not only in Aceh but generally in Indonesia and several other developing countries. Naranpanawa and the Bandara (2012) stated that rising world oil price plays a major role in increasing the inflation in various countries which eventually led to increase in poverty in developing countries. Moshiri, et al (2018), found that changes in energy prices including the prices of oil, LPG and electricity greatly influenced the increase in inflation. Similarly, Taghizadeh-Hesary, et al (2019) and Husaini, et al (2019), who examined how the price changes due to changes in world oil prices and energy subsidy policies, concluded that the changes in oil prices greatly affect the changes in inflation both in the long term and short term.

The other biggest contributor to inflation was volatile food. Ivancic, et al (2012), examined the impact of inflation on agricultural products on poverty using consumption and production data in 28 countries. Increasing of inflation in food commodities caused an increase in the number of poor people. Likewise, Ramaand and Thomas (2011) found that rising prices on non-subsidized commodities would greatly affect the decline in demand for these commodities. In detail, Fujii (2013) saw that food is often the main caused of inflation and has an impact on increasing poverty in the Philippines.

Additionally, inflation tends to be caused by rising in non-core inflation. BPS (2018) explained that commodities that mainly contribute to the inflation are Volatile Food and Administered Prices. Volatile Food and Administered Price commodities are largely contributed to total inflation in the last five years. Volatile food commodities were dominated by rice, meat, fresh fish, vegetables, and spices. Whereas the administered price commodities were still dominated by increase in LPG (gas), electricity, gasoline and PAM water tariffs (BPS, 2018).

power of Aceh people. Besides, there are still not many researchers studying about Volatile food and Administered Price Commodities impact on welfare using the AIDS method in Aceh. The poverty rates are very high in Aceh, this study is

urgently needed to add some recommendations for the government to control the inflation and influence the poverty rate. Thus, this study will examine how the influence of volatile food commodity prices and administered prices on the level of welfare from the amount of household elasticity of demand for these commodities.

LITERATURE REVIEW

Inflation in volatile food usually occurs due to crop failure, climate change, distribution challenge, and global food price inflation. While, the inflation in administered prices is caused by changes in government policies, such as rising the fuel prices, gas, piped water, transportation costs, and electricity tariffs. Inflation significantly impacts the welfare through changes in household expenditure (Susenas, 2012).

Several empirical studies in developing countries show a close relationship between inflation in food commodities and welfare. Nakata (2014), examined the impact of inflation on welfare in the perspective of the new Keynesian Economy. The increase in several types of shock in inflation has resulted in a decline in welfare, not only because of an increase in consumption volatility and leisure, but also a decrease in the average level of consumption. Similarly, Ravallion (2000), found that high inflation in India is closely related to rising in poverty and falling in wages for workers in the agricultural sector. Tule, et al (2019), found the relationship between agricultural commodity prices and inflation in Nigeria. It was assumed that rising prices for agricultural commodities were highly influenced the expected inflation, both in the period of 2 months, 4 months and up to 6 months.

Furthermore, Ivanic, et al (2012), examined the impact of changing prices of 38 agricultural commodities on poverty using consumption and production data in 28 countries. Increasing in inflation in food commodities led to an increase in the number of poor people by 44 million people, besides that 68 million people fell into poverty traps and 24 million people fell below the poverty line.

In addition, Ramaand and Thomas (2011), examined the food subsidy program in Egypt. This study used a demand approach to analyze the structure of household consumption. The commodities consisted of 12 subsidized commodities, including fish and meat, flour, bread, and others. The mixed demand model was estimated by nonlinear SUR (Seemingly Unrelated Equation). Estimation results showed that subsidized commodities are more inelastic, while non-subsidized commodities are more elastic. This condition shows that rising prices on commodities that are not subsidized will heavily impacted on decrease in demand for these products as well.

Gelos and Ustyugova (2017), showed how shocks in commodity prices can affect inflation in some countries. The response of inflation in each country was different due to changes in commodity prices. Higher food commodity would be more responded to shock than commodity prices causing an increase in inflation.

Administered prices also contribute to inflation through cost push inflation. Moshiri, et al (2018), examined the effects of changes in welfare due to changes in energy prices related to energy market reforms in Mexico. Using QUAIDS model method with the non-linear SURE method household budget data in Mexico in 2002-2012, the results showed that the effect of energy prices on the welfare of low-income households was 9 times stronger than in middle-class households, and 18 times stronger than in high-income households. Demand for energy was also very elastic towards income. This finding was supported by Naranpanawa and Bandara (2012) who found that inflation on the price of fuel contributed to rising in poverty in some countries.

A similar study was conducted by Husaini, et al (2019), who examined how the price reacted to the changes in world oil

prices and energy subsidy policies using the ARDL model from 1981 to 2015. Energy subsidy policies and changes in oil prices greatly affect changes in prices in the long term and short term. In addition, Taghizadeh-Hesary, et al (2019), also examined the relationship between energy prices and food prices over the period 2000-2016 using the Panel-VAR model in countries in Asia. The results found that energy prices, in this case oil prices, had a significant effect on food prices. The food price responded positively of an increase in oil prices.

Guta (2012) analyzed energy consumption of households in rural Ethiopia by using the Almost Ideal Demand System (AIDS) model. The results showed that low income households have an effect on the elasticity of expenditure on fuel. The expenditures on fuels are elastic, which mean that using the fuels will reduce consumption of other commodities. Similarly, Irfan, et al (2018) also investigated the elasticity of fuel prices in Pakistan using the Linear Approximate Almost Ideal Demand System (LA-AIDS) model. The results showed that all fuels except natural gas are inelastic in urban households. Whereas in rural areas, natural gas and LPG are elastic.

Moreover, Lacheheb and Sirag (2019) examined the relationship between oil prices and inflation rates in Algeria from 1970 to 2014 using a non-linear autoregressive distributed lags (NARDL) model. The results showed that there was a significant relationship between rising oil prices and inflation while there is no relationship between falling oil prices and inflation. In addition, Nusair (2019), found that rising and falling oil prices have different effects on inflation. In the long run, the increase in oil prices has a positive effect on inflation while the decline in oil prices has a negative effect on inflation. The result also showed that positive changes in oil prices have more shocks in the long run than in the short run.

Furthermore, Iddrisu and Alagidede (2020) found that rising food prices are weakened by restraining monetary policy in South Africa. This is the result of implementation of inflation targeting, especially given that a quarter of the country's population is food poor. The same research regarding the inflation targeting by Baharuddin (2018) also suggested that suggest inflation targeting model is appropriate for Malaysia's economy since real output the negative response negatively to shocks in consumer prices.

Woo and Kun (2019) examined the effects of increasing and falling oil price changes on the sectoral stock returns in Malaysia using the Non-linear Autoregressive Distributed Lags (NARDL) model from 2000 to 2017. The results showed that there is asymmetric effects of change in oil prices on stock return. However, the main causes are exchange rate, Malaysia and world stock market return and spillover effect of sectoral.

Research Methods

This study analyzes the effect of volatile food commodities and administered prices on the decreasing in household welfare in Aceh Province. In addition, it also examined the influence of control variables, namely income and education level on changes in household welfare in Aceh province.

The data used are secondary data taken from the household survey data Susenas (National Socio-Economic Survey) of Aceh Province from Central Bureau of Statistics with 11462 household sample in Aceh.

Model Analysis

The model used in this study is the Almost Ideal Demand System (AIDS) model. In the AIDS model, the estimation is measured in 2 stages. Firstly, the regression stage, which regress the AIDS model in equation 1 using the Seemingly Unrelated Regression (SUR) method. Secondly, elasticity is calculated by the regression coefficient which is in equation 2-5. The following AIDS models used in this study is:

$$W_i = a \delta_{i0} + \sum_j \gamma_{ij} \log P_j + \beta_i \log (x/p^*) + \delta_i \log VC + \mu_i \dots \dots \dots (1)$$

Where:

- w_{ij} : share of expenditure in commodities to total expenditure j
- $i = j$: 1,2...n (total commodities)
- $\log P_j$: Prices for commodities j (where $j=1,2...dst$)
- $\log (x/p^*)$: log of total expenditure deflated by the Stone index
- $\log VC$: Control variables which are education level and number of household members
- μ_i : error term.

The AIDS model in equation 1 will be divided into two groups and estimated separately. The commodities used are volatile food commodities such as; rice, purebred meat, fresh fish, red chili, and shallots contributed to the highest inflation in the three years. Whereas administered prices commodities include; LPG (Liquefied Petroleum Gas), electricity, gasoline and water tariffs.

Measured the Demand Elasticity

The AIDS Model regression coefficient in equation 1 is used to calculate the elasticity as a proxy for measuring household welfare (Aliasuddin, 2003).

1. Income Elasticity $\eta_i = 1 + \frac{\beta_i}{w_i}$ (2)
2. Price Elasticity (Marshallian) $\epsilon_{ii} = -1 + \frac{y_{ii}}{w_i} - \beta_i$ (3)
3. Price Elasticity (Hicksian) $\delta_{ii} = -1 + \frac{y_{ii}}{w_i} + W_i$ (4)
4. Control Variable Elasticity $EiVc = \frac{\partial i}{w_i}$ (5)

Table 1. Price Elasticity, Income Elasticity, and Control Variables

Demand For Commodity	Marshallian Prices Elasticity	Hicksian Prices Elasticity	Income Elasticitu	Family Size Elasticity	Education Elasticity
Gasoline	1,708	1,693	0,287	0,032	0,018
Water	0,283	0,289	0,601	0,004	0,002
Electricity	1,307	1,313	0,277	0,007	0,020
LPG	2,177	2,173	0,400	0,036	0,00

Source: Regression Results with the AIDS Model

Furthermore, the income elasticity results show that the elasticity of administered prices commodity revenues is inelastic. This condition shows that increase in income will have an impact on increase the demand for administered price commodities in small amounts. This is because these commodities are primary commodities and relatively limited. Thus, the increase in income will not have a significant effect to the commodity. Similarly, the elasticity of the control variables

which are the number of family members and the level of education also has an inelastic value, for LPG commodities, the elasticity of education is perfectly inelastic. Increasing family members does not significantly affect demand for these commodities.

Table 2. Price Elasticity, Income Elasticity, and Control Variables

Demand For Commodity	Marshallian Prices Elasticity	Hicksian Prices Elasticity	Income Elasticitu	Family Size Elasticity	Education Elasticity
Rice	1,283	1,297	0,153	0,122	9,06E-04
Chili	1,350	1,348	0,197	0,031	8,87E-04
Fish	2,353	2,338	0,730	0,058	2,94E-03
Shallot	0,863	0,865	0,301	0,018	5,11E-03
Chicken	4,707	4,688	1,86	0,009	9,24E-04

Source: Regression Results with the AIDS Model

Rising commodity prices cause the proportion of income for these needs to increase and will reduce spending on other commodities, for example for health, education, and others. The elasticity value of volatile food commodity income is inelastic. This condition shows that rising in incomes will increase demand for volatile food commodities but in small

RESULTS AND DISCUSSION

Estimation results with the AIDS model show that the commodity price has a negative and significant effect on poverty. It shows that an increase in administered and volatile food commodity prices has contributed to a decline in welfare. The estimation results are in line as findings of Ivanic, et al (2012), Ramaand and Thomas (2011), Guta (2012) and Irfan, et al (2018). After we get the regression results using the AIDS model, the next step is to calculate price elasticity, income elasticity, and elasticity of control variables, namely; education elasticity and family size elasticity (equation 2-5). The results of the elasticity calculations can be seen in Table 1 and Table 2.

The results of the elasticity value of food commodities price in Table 1 shows the absolute numbers of price elasticity, income elasticity, and elasticity of control variables. Both the Marshallian and Hicksian elasticity calculations conclude that the demand price elasticity for gasoline, electricity and LPG commodities is elastic, where the price elasticity value is greater than one (> 1). For example, LPG commodities have an elasticity of 2,177 which means that rising prices for LPG will double the demand for LPG. This condition also shows that rising prices for gasoline, LPG, and electricity tariffs will greatly affect the decline in household welfare. Nevertheless, the elasticity demand for water is inelastic. This means that rising water commodity prices will reduce water demand by a small amount (<1). Thus, raising the PAM water tariff will slightly affect household welfare.

Table 2 shows the demand price elasticity, income elasticity, and elasticity of control variables in volatile food commodities. The results of the Marshallian and Hicksian elasticity calculations show that the price demand elasticity for rice, chilli, fish, chicken meat is elastic. The highest price elasticity is from chicken with a value 4.707 which means that increasing chicken prices will reduce demand for chicken meat by almost 5 times. Chicken is one of a commodity that has a lot of substitute items. The results of the price elasticity show that rising prices on volatile food commodities greatly affect the decline in household welfare. Some of the volatile food commodities studied here are basic needs that must be met, for example rice, chili and fish.

amounts. Slightly different from the others, chicken has an elastic value. This is because chicken is considered a luxury food and is substituted commodities, so that the demand for this commodity will be increase when the income is increasing. The elasticity of education and the number of family members also inelastic. With a small income level, the

increase in the number of family members and the level of education does not greatly affect the increased demand for volatile food commodities. This is supported by the average size of the large family and the level of education of the head of the family who is classified as low.

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CONCLUSION AND RECOMMENDATION

It can be concluded that rising prices on administered prices and volatile food commodities have a major effect on reducing the level of household welfare in Aceh. This condition is in line with previous findings, especially in developing countries, that inflation in energy and food commodities will greatly affect poverty and welfare. Low level of income, low level of education and size of the family member that is quite large in Aceh cause the demand for administered prices and volatile food commodities to slightly change even though the income is increase.

Therefore, it is recommended for Bank Indonesia and the government (in this case the Regional Inflation Control Team) to continue to pursue a commodity-based inflation control policy in Aceh. This is because rising commodity prices, especially for basic commodities are significantly influence the household welfare.

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