**The Influence of World Oil Prices and Inflation on Fuel Subsidies in Indonesia 2014-2022**

**Abstract**

This study aims to analyze the influence of world oil prices and inflation on fuel subsidies (BBM) in Indonesia. Given the importance of fuel subsidies in maintaining the purchasing power of the public, this research utilizes secondary data from a specific period and analyzes it using descriptive methods and linear regression. The results of the descriptive analysis indicate that inflation has a positive and significant influence on fuel subsidies, while world oil prices do not have a significant effect. The coefficient of determination shows that approximately 73.03% of the variation in fuel subsidies can be explained by changes in inflation and world oil prices. The F-test affirms that inflation and world oil prices collectively influence fuel subsidies, but the t-test shows that only inflation has a significant effect. This research concludes that adjustments in fuel subsidy policies must consider inflation rates to maintain economic stability and public welfare. Therefore, it is recommended that the government be more responsive in formulating policies that take into account inflationary factors and conduct comprehensive studies on other factors influencing subsidies.

**Keywords : Fuel subsidies, inflation, world oil prices, economic stability, Indonesia**

**INTRODUCTION**

Fuel subsidies are an essential policy implemented by the Indonesian government to assist low-income families and maintain energy affordability. In recent years, fluctuations in global oil prices have significantly impacted the economic landscape, and the rising inflation rates pose a challenge to the effectiveness of these subsidies. Understanding the dynamics between world oil prices, inflation, and fuel subsidies is crucial for efficient economic management and ensuring that support reaches those who need it most. the world crude oil price rises then the possibility of fuel prices will also rise, and vice versa. When the price of fuel price increases, it will have an impact on the distribution process. The distribution process requires costs, namely the cost of fuel, if the fuel rises, the goods will reach the community with a doubled increase. Reach the community with a twofold increase. When price of an item increases, it is inevitable that the purchasing power of the community will decrease. When fuel prices rise, inflation cannot be avoided (Menpan, 2023).

**Figure 1.1 Comparison of Fuel Subsidies and World Oil Price 2014-2022**

The year 2014 marked the highest peak in subsidies, which began to decline sharply in 2015 and continued to decrease until 2017. This decline reflects the government's policy of reducing subsidies and shifting toward fuel price adjustments. In 2018, subsidies surged again, likely linked to the spike in global oil prices. Since then, fuel subsidies have stabilized, ranging between 40-50 trillion rupiah in the following years. Global oil prices, represented by an orange line above the subsidy bars, experienced a significant decline from 2014 to 2016, with a peak in late 2018. Afterward, oil prices showed fluctuating recovery, particularly in 2021, when they rose sharply.

**LITERATURE REVIEW**

**Theory of Subsidies and Economy**

Subsidies can be interpreted as government interventions intended to lower the price of essential goods and services to support public welfare. Fuel subsidies have long been employed in many countries as part of economic policy to cushion the effects of volatile energy prices on consumers and businesses.

**Influence of Inflation on Subsidies**

Inflation refers to the rate at which the general level of prices for goods and services rises, eroding purchasing power. High inflation rates can diminish the effectiveness of subsidies by increasing the cost of living and ultimately reducing the real value of the support provided to consumers. Research has shown that inflation can significantly influence the demand for subsidies as households struggle to cope with rising expenses.

**Oil Prices and Economic Stability**

World oil prices are an essential determinant of national economic health. Increasing oil prices can lead to rising costs in transportation and manufacturing sectors, which may, in turn, lead to increased inflation. Understanding the relationship between oil prices and economic stability is vital for any economy reliant on fossil fuels, particularly in emerging markets like Indonesia.

**METHODOLOGY**

Based on the problem analyzed by the author in the study titled “Analysis of Fuel Subsidies on Economic Stability: A Case Study of 2014-2022”, this research examines the relationship between fuel subsidies and economic stability using the Ordinary Least Squares (OLS) method. Therefore, this study employs a descriptive quantitative research method with the Ordinary Least Squares (OLS) approach.

**Ordinary Least Squares (OLS)**

Ordinary Least Squares (OLS), or Kuadrat Terkecil Biasa in Indonesian, is a subset of the least squares methods. OLS is one of the most commonly used linear regression methods for estimating the relationship between independent variables (X) and dependent variables (Y). In general, a multiple linear regression model involving k independent variables can be expressed by the following equation:

Y=β0​+β1​X1​+β2​X2​+⋯+βk​Xk​+ε

Y : Fuel Subsidies, X1 : World Oil Prices, X2 : Inflation, ε : Error term. Within the Ordinary Least Squares (OLS) method, several steps must be carried out, as outlined below:

**a. Descriptive Analysis**

Descriptive analysis is a method used to describe, summarize, and present data informatively. This method employs measures of central tendency, dispersion, and position to systematically and factually characterize the data without generalizing conclusions. Key descriptive statistics and their calculations include:

1. **Mean**
The mean is the most commonly used measure of central tendency, calculated by dividing the sum of all data values by the number of observations. The mean is computed differently for ungrouped and grouped data.
2. **Median**
The median is the middle value of data sorted in ascending or descending order.
3. **StandardDeviation**
Standard deviation measures how far data points deviate from the mean.

**b. Classical Assumption Tests**

Classical assumption tests are a series of evaluations to ensure that the linear regression model using the OLS approach produces Best Linear Unbiased Estimators (BLUE). The tests and their calculations are as follows:

1. **Normality Test**
A normality test assesses whether the distribution of data (or residuals) follows a normal distribution. Normality of residuals is a critical assumption in OLS. Common normality tests include Chi-Square, Kolmogorov-Smirnov, Lilliefors, Shapiro-Wilk, and Jarque-Bera.
2. **Heteroscedasticity Test**
This test detects whether the variance of residuals is constant (homoscedasticity) or varies across observations (heteroscedasticity). Detection methods include the Breusch-Pagan test and White test.
3. **Multicollinearity Test**
This test identifies strong correlations between independent variables in a regression model. A good regression model should have no multicollinearity. Detection is typically done using Tolerance and Variance Inflation Factor (VIF).
4. **Autocorrelation Test**
Autocorrelation tests examine whether residuals in a linear regression model are correlated across time periods (e.g., between error terms at time *t* and *t-1*). A common method is the Durbin-Watson test.

**c. Simple Linear Regression Test**

Simple linear regression models and investigates the effect of one independent variable on one dependent variable. The general equation for simple linear regression is:

Y=β0+β1X+ε*Y*=*β*0​+*β*1​*X*+*ε*

**d. Coefficient of Determination Test (R²)**

The coefficient of determination (R²) is a statistical measure that quantifies how well the regression model explains the variation in the dependent variable. R² values range from 0 to 1, where values closer to 1 indicate a better model fit in explaining the variability of the data.

**e. t-Test**

The t-test in the context of the OLS method is used to evaluate the statistical significance of the effect of an independent variable on the dependent variable. This test examines the null hypothesis that the regression coefficient equals zero, implying no significant influence of the independent variable on the dependent variable.

**RESULTS AND DISCUSSION**

**Descriptive Analysis**

**Table 1.2 Descriptive Statistics Test Results**

|  |  |  |  |
| --- | --- | --- | --- |
|  | HMD (X1) | INF(X2) | SBBM (Y) |
|  Mean |  862.9333 |  3.694444 |  79.07778 |
|  Median |  744.5000 |  3.130000 |  56.90000 |
|  Maximum |  1702.000 |  8.360000 |  240.0000 |
|  Minimum |  571.9000 |  1.680000 |  41.10000 |
|  Std. Dev. |  351.3735 |  2.070598 |  63.00103 |
|  Skewness |  1.623859 |  1.371621 |  2.117116 |
|  Kurtosis |  4.723214 |  3.928100 |  6.040724 |
|  Jarque-Bera |  5.068929 |  3.145030 |  10.19052 |
|  Probability |  0.079304 |  0.207523 |  0.006126 |
|  Sum |  7766.400 |  33.25000 |  711.7000 |
|  Sum Sq. Dev. |  987706.6 |  34.29902 |  31753.04 |
|  Observations |  9 | 9 |  9 |

The descriptive analysis revealed the following statistics for the variables:

* **World Oil Prices (X1)**: An average price of $862.93 per barrel, with fluctuations posing significant economic implications.
* **Inflation Rates (X2)**: An average inflation rate of 3.69%, indicating pressure on consumer prices.
* **Fuel Subsidies (Y)**: An average subsidy amounting to 79.08 IDR, demonstrating how government support has been pivotal for public assistance.

**Coefficient of Determination Test**

The regression analysis' R-squared coefficient was found to be 0.7303, indicating that approximately 73.03% of the variability in fuel subsidies can be explained by world oil prices and inflation, while 26.97% is attributed to other factors not included in this model.

**F-Test and T-Test**

The F-test yielded a significant result (p < 0.05), indicating that the model established a significant relationship between the independent variables and the dependent variable. The t-test results showed:

* **World Oil Prices (X1)**: t-value of -1.022 and p-value of 0.3463 (not significant).
* **Inflation (X2)**: t-value of 4.8612 and p-value of 0.0028 (significant).

This highlights that inflation has a greater impact on fuel subsidies compared to world oil prices.

**Economic Implications**

The findings emphasize the need for the government to adopt a flexible approach in subsidy policies, particularly considering inflation's significant influence. While maintaining fuel subsidies is crucial, adjustments should be made to align public support with the prevailing inflationary context to ensure effectiveness.

**Conclusion**

The study concludes that inflation significantly influences fuel subsidies in Indonesia, while world oil prices do not exhibit significant effects. Therefore, it is crucial for government policymakers to adjust subsidy mechanisms to reflect current inflation trends and emerging economic conditions. Implementing responsive policies would promote public welfare and contribute to overall economic stability.

**Suggestions**

1. **Government Action**: The government should actively monitor inflation rates and be prepared to adjust fuel subsidy policies in response.
2. **Further Research**: Future studies should incorporate other influential variables, such as taxation, market regulations, and income levels, to provide a more comprehensive understanding of the factors affecting fuel subsidies.

**REFERENCES**

Badan Pusat Statistik. (2023). Statistik Energi dan Sumber Daya Mineral 2022. Jakarta: BPS.

Kementerian Energi dan Sumber Daya Mineral Republik Indonesia. (2023). Laporan Tahunan Kinerja Energi 2022. Jakarta: Kementerian ESDM.

International Energy Agency. (2023). World Energy Outlook 2022. Paris: IEA.

Mankiw, N. G. (2016). Principles of Economics. 7th edition. Cengage Learning.

Hill, R. C., Griffiths, W. E., & Lim, G. C. (2018). Principles of Econometrics. 5th edition. Wiley.

Gujarati, D. N. & Porter, D. C. (2009). Basic Econometrics. 5th edition. McGraw-Hill.

Kuncoro, M. (2015). Metode Penelitian untuk Bisnis dan Ekonomi. Yogyakarta: UPP STIM YKPN.

Breusch, T. S., & Pagan, A. R. (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation. Econometrica, 47(5), 1287-1294.

Durbin, J., & Watson, G. S. (1950). Testing for Serial Correlation in Least Squares Regression. Biometrika, 37(3/4), 409-428.

Shapiro, S. S., & Wilk, M. B. (1965). An Analysis of Variance Test for Normality (Complete Samples). Biometrika, 52(3/4), 591-611.

World Bank. (2023). Indonesia Economic Prospects: Enhancing Economic Recovery Post-Pandemic. Washington, D.C.: World Bank Publications.