THE INFLUENCE OF INVENTORY AND DISTRIBUTION TOWARD LPG SALES VOLUME IN PT OPTIMA SINERGI COMVESTAMA SEMARANG

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ABSTRACT

The purposes of this study were to analyze the influence of Inventory (X_1) and Distribution (X_2) as independent variables on LPG Sales Volume (Y) as dependent variable individually and to find out how many contributions of all independent variables to dependent variable. Multiple Linear Regression Analysis method by IBM SPSS 23 was used in this study equipped with the Classic Assumption Test and Coefficient of Determination. Data used in this study were secondary data collected from PT. Optima Sinergi Comvestama from January 2016 to December 2018. The result of F-test in this study showed that simultaneously and significantly, all of independent variables influenced dependent variable even though T-test result showed that partially, Inventory and Distribution have a positive significant influence on LPG Sales Volume. However, based on the coefficient of determination test, it was found that Inventory and Distribution have a high contribution in explaining LPG Sales Volume that is 93,2%. In addition, the multiple linear regression analysis result with the model Y= -6793558,110 + 1,004 + 1,015 showed that if there were an increase in Inventory and Distribution then LPG Sales Volume would also increase.

Key words*: Inventory, Distribution and Sales Volume.*

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PENGARUH PERSEDIAAN DAN DISTRIBUSI TERHADAP VOLUME PENJUALAN LPG DI PT OPTIMA SINERGI COMVESTAMA SEMARANG

ABSTRAK

Tujuan dari penelitian ini adalah untuk menganalisis pengaruh Persediaan (X1) dan Distribusi (X2) sebagai variabel independen terhadap Volume Penjualan LPG (Y) sebagai variabel dependen secara individual dan untuk mengetahui berapa banyak kontribusi semua variabel independen terhadap variabel dependen. Metode Analisis Regresi Linier Berganda oleh IBM SPSS 23 digunakan dalam penelitian ini yang dilengkapi dengan Uji Asumsi Klasik dan Koefisien Determinasi. Data yang digunakan dalam penelitian ini adalah data sekunder yang dikumpulkan dari PT. Optima Sinergi Comvestama dari Januari 2016 hingga Desember 2018. Hasil uji-F dalam penelitian ini menunjukkan bahwa secara simultan dan signifikan, semua variabel independen memengaruhi variabel dependen meskipun hasil uji-T menunjukkan bahwa secara parsial, Persediaan dan Distribusi memiliki pengaruh signifikan positif positif. pada Volume Penjualan LPG. Namun, berdasarkan uji koefisien determinasi, ditemukan bahwa Persediaan dan Distribusi memiliki kontribusi tinggi dalam menjelaskan Volume Penjualan LPG yaitu 93,2%. Selain itu, hasil analisis regresi linier berganda dengan model Y = -6793558.110 + 1.004 + 1.015 menunjukkan bahwa jika ada peningkatan Persediaan dan Distribusi maka Volume Penjualan LPG juga akan meningkat.

Kata kunci: Persediaan, Distribusi dan Volume Penjualan.

INTRODUCTION

Household is responsible for about 15 to 25 percent of primary energy use in many developing countries. Average per capital household energy use in developed countries is about nine times higher than in developing countries, even though in developing countries a large share is provided by non-commercial fuels that are often not reflected in official statistics. It is estimated that approximately 2.5 billion people in developing countries rely on biomass fuels to meet their cooking needs (Mekonnen and Kohlin 2008). Cooking in a household involve the use of solid fuel and nonsolid fuel. The solid fuel consists of coal which is a fossil fuel and biomass fuel (BMF) like wood, charcoal, dung and crop residues. Worldwide, more than three billion people depend on solid fuels, including biomass (wood, dung and agricultural residues) and coal, to meet their most basic energy needs: cooking, boiling water and heating. The nonsolid fuel consists of kerosene, liquefied petroleum gas (LPG), gas and electricity.

Oil and natural gas each year accounted for more than a quarter of revenue Indonesia. On the other hand, the oil and gas sector is also a sector that dominate the lives of many people as it is written in the 1945 Constitution, particularly Article 33, where one of the commodities in this sector which is interesting to observe is the Liquefied Petroleum Gas (LPG). At first the LPG marketed by Pertamina for a limited circle with the product tube 12 kg and 50 kg, where the product is known by the brand "LPG". However, along with the problems faced in the provision of energy, where kerosene fuel subsidies are significantly increased and the existance of a new direction from national energy policy, that since 2007 the Government undertake a program to change kerosene to LPG in the form of LPG 3 kg. The government enforces the policy of conversion program from the use of kerosene to LPG due to its wide range of advantages such as better and evenly heating, practical and easy to use, easy to adjust the combustion, and environmentally friendly.

LPG, initially, was produced to meet the fuel needs of the household gas. However, LPG also developed for the fulfillment of other needs such as industry and transportation needs in the future. Broadly speaking, the use of LPG as an energy source used to meet the needs of heat –cooking, heating, and water heaters-, light and power source. The need is then dominated by the Indonesian LPG consumption patterns.

Literature Review

According to Schroeder (2000: 4), Inventory is the stock of materials used to facilitate production or to satisfy customer demand. Meanwhile, according to Rangkuti (2004: 1), Inventory is an asset that includes the company's goods with the intention to be sold in a certain period of business, or the inventory that still work on production process, or inventory of raw materials awaiting their use in a production process. In addition, Munandar (2005: 50) stated Inventory are stock of goods or materials that become an object of the company's main business.

According to Tjiptono (2014: 295), Distribution channel is a series of organizational participants who perform all the functions needed to deliver the products or services from the seller to the final purchaser. However, according to Etzel cited by Sunyoto (2013: 172) stated Distribution channels consist of a series of institutions that carry out all activities used to channel the product and its ownership status from producers to consumers or business users. Meanwhile, according to Daryanto (2011: 63), An organizational device that interdependent in providing a single product for use or consumption by consumers/ users.

According to Stapelton (2005:185) stated Sales volume is a sales achievement expressed in quantitative form in terms of physical or volume. However, according to Horngren, Foster and Datar cited by Swastha

(2005:58), The sales volume is the size of the company's activities related to capacity in the money unit or the unit of product where management will strive to maintain the best possible volume using existing capacity. In addition, Rangkuti (2009: 207) stated Sales volume is an achievement expressed quantitatively in terms of physical or volume or unit of a product. The sales Volume is an indication of the ups and downs of sales and can be expressed in the form of units, kilos, tons or liters.

RESEARCH METHODS

Data used in this research were time series data in the period of January 2016-December 2018. Data used consisted of data of Inventory, and Distribution as independent variables on LPG Sales Volume as dependent variable. Data used in this study were secondary data collected from PT. Optima Sinergi Comvestama Semarang.

The purposes of this study were to determine the influence of the influence of International Inventory (X_1) and Distribution (X_2) on LPG Sales Volume (Y) and to find out how many contributions of all independent variables to dependent variable. Multiple Linear Regression Analysis method was used in this study equipped with the Classic Assumption Test and Coefficient of Determination.

RESULTS AND DISCUSSION
Classic Assumption Test

The classic assumption test aims to determine whether the variables are required as BLUE (Best Linear Unbiased Estimator) in using multiple regression analysis. They are:

1. **Normality Test**

A normality test is used to detect whether the data has a normal distribution or not. The way to test normality is by seeing a normal P-Plot. If the spread of the points is close to the diagonal line, it means data is normally distributed. Meanwhile, if the distribution of the points is away from the diagonal line, then it is not normally distributed. The result of normal p-plot test can be seen in Figure 1.

FIGURE 1
NORMAL P-PLOT
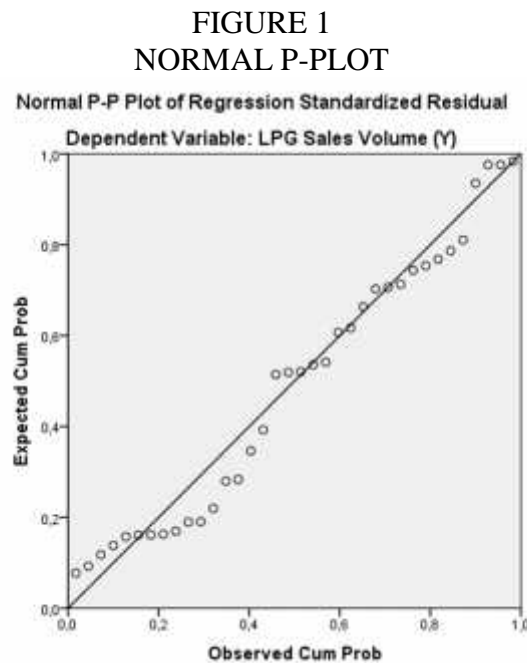
Source: Data Processing Output IBM SPSS Statistics 23, 2019

According to Figure 1, it can be concluded that the residual data were normally distributed because the spread of the points was close to the diagonal line.

However, the weakness of the normality test with the Normal P-P Plot lies in the criteria of near or far of the spread points. There are no clear limits regarding the proximity and distance of points. Hence, it is possible to make conclusions. In addition, the second way to detect normality is using Shapiro-Wilk test because the number of the data are less than 50. The Table 1 is the table of Shapiro-Wilk test.

TABLE 1
NORMALITY TEST

Tests of Normality

	Shapiro-Wilk	
	Df	Sig.
LPG Stock (X1)	36	,342
LPG Distribution (X2)	36	,288
LPG Sales Volume (Y)	36	,374

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Source: Data Processing Output IBM SPSS Statistics 23, 2019

The term is if Sig. value > 0.05, then the data had a normal distribution. As a result of Table 1, it can be concluded that the data were normally distributed because the sig. value of each variable was higher than 0.05. Table 6 shows the sig. value of Stock was 0.342, Distribution was 0.288 and LPG Sales Volume was 0.374 which were greater than 0.05. Therefore, the assumption of normality was fulfilled.

2. Multicollinearity Test

Multicollinearity test is used to detect the correlation among independent variable. The ways to detect multicollinearity are using Variance Inflation Factor (VIF) and Tolerance. The result can be seen in Table 2.

TABLE 2
MULTICOLLINEARITY TEST

Coefficients

	Collinearity Statistics	
Model	Tolerance	VIF
1 (Constant)		
LPG Stock (X1)	,895	1,118
LPG Distribution (X2)	,895	1,118

a. Dependent Variable: LPG Sales Volume (Y)

Source: Data Processing Output IBM SPSS Statistics 23, 2019

Table 2 shows that the value of VIF was less than 10 for each variable, so it was found that there was no correlation among independent variables. In addition, every variable had a tolerance value greater than 0.10. So, it can be concluded that there was no presence of multicollinearity among independent variables and each variable was feasible to use in the regression model.

3. Heteroscedasticity Test

Heteroscedasticity means the relationship of residual and the entire range of the dependent variable is different and the best model if the relationship is the same or called homoscedasticity. The test of heteroscedasticity was determined by looking at the scatter plot in Figure 2.

FIGURE 2
HETEROSCESDATICITY PLOT
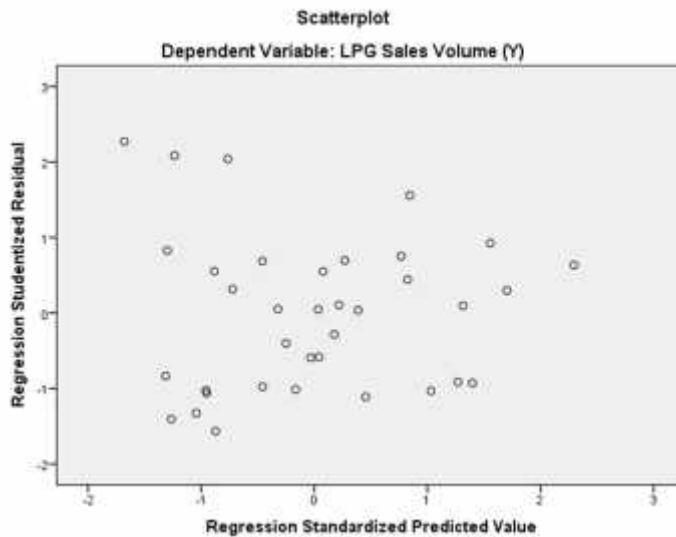
Source: Data Processing Output IBM SPSS Statistics 23, 2019

Figure 2 explains that the point distribution did not form a particular pattern. So, it can be concluded that heteroscedasticity did not occur in this analysis. In other words, this model is homoscedasticity. A classic assumption about heteroscedasticity was fulfilled.

4. Autocorrelation Test

The data used to estimate linear regression models were time series data. Hence, an autocorrelation test was needed in this research to detect that problem. Durbin-Watson was used in this research. The result is shown in Table 3.

TABLE 3
AUTOCCORRELATION TEST

Model Summary[b]	
Model	Durbin-Watson
1	1,977

a. Predictors: (Constant), LPG Distribution (X2), LPG Stock (X1)

b. Dependent Variable: LPG Sales Volume (Y)

Source: Data Processing Output IBM SPSS Statistics 23, 2019

The value of dL and dU was determined by the number of independent variables (k) and the number of data (n) used in this research with a significance level (error) 5% (α = 0,05). Durbin-Watson used in this research is presented in Table 4.
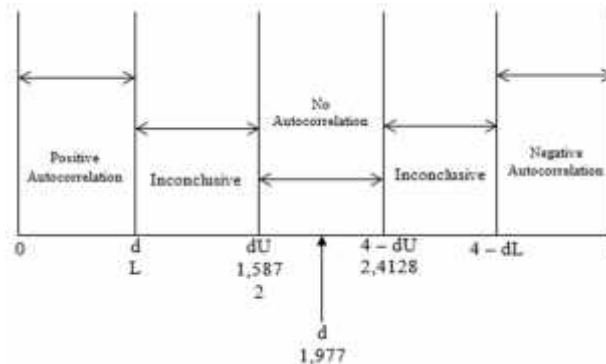
TABLE 4
DURBIN-WATSON

n	k=1		k=2		k=3	
	dL	dU	dL	dU	dL	dU
34	1,3929	1,5136	1,3325	1,5805	1,2707	1,6519
35	1,4019	1,5191	1,3433	1,5838	1,2833	1,6528
36	1,4107	1,5245	1,3537	1,5872	1,2953	1,6539
37	1,4190	1,5297	1,3635	1,5904	1,3068	1,6550
38	1,4270	1,5348	1,3730	1,5937	1,3177	1,6563

Durbin-Watson (DW) Table, α= 5%

Source: Junaidi, 2019

The total of independent variables (k) was 2 and the number of data (n) was 36. Based on Table 4, it can be explained that the value of dL was 1,3537 and the value of dU was 1,5872. After that, determining a criterion of autocorrelation by the following Table 5:

TABLE 5
DURBIN-WATSON INTERPRETATION

Source: Processed secondary data, 2019

Based on the Table 5, the Durbin-Watson value of 1,977 is between the upper limit of dU (1,5872) and 4 – dU (4 – 1,5872 = 2,4128). Therefore, the result of the autocorrelation test is 1,5872 < 1,977 < 2,4128 (dU < d < 4-dU) and can be concluded that there is no autocorrelation in the regression model of this research.

5. Linearity Test

The purpose of linearity test is to test whether the used model specification is correct or not. The linear model is the right model to test the variables. Linearity test can be done using Lagrange Multiplier test by see the value of C^2value that can be obtained from the formula of n x R^2. The decision making of Lagrange Multiplier test are as follows:

a. C^2value < C^2table, the model is linear.
b. C^2value > C^2table, the model is linear.

The result of linearity test is presented by Table 6.

TABLE 6
LINEARITY TEST

Model Summary^b

Model	R Square
1	,936

a. Predictors: (Constant), LPG Distribution (X2), LPG Stock (X1)

b. Dependent Variable: LPG Sales Volume (Y)

Source: Data Processing Output IBM SPSS Statistics 23, 2019

Based on the result of Table 6, showed that the R^2 value is 0,936 with the amount of data N = 36, C^2 value = 36 x 0,936 = 33,696. The C^2 value then compared to the C^2 table of 48,60237 that obtained from df = 36 – 2 = 34, and significance level of 0,05. The result of this test is that C^2 value is lower than C^2 table (33,696< 48,60237). Therefore, the model in this research is linear.

Based on the several tests completing the classical assumption, it was found that all variables were fulfilled the requirements of classic assumption test.

Hypothesis Test
1. F-Test (simultaneous)

F test is used to identify the influence of independent variables simultaneously on the dependent variable. The F-Test result can be seen in Table 7.

TABLE 7
F-TEST

ANOVA^a

Model		Sig.
1	Regression	,000^b

a. Dependent Variable: LPG Sales Volume (Y)

b. Predictors: (Constant), LPG Distribution (X2), LPG Stock (X1)

Source: Data Processing Output IBM SPSS Statistics 23, 2019

Based on table 7, it can be explained that significance was 0,000 or less than 0,05 which can be determined that H0 is rejected and Ha is accepted. Therefore, the F-test result showed that both variables of Inventory (X_1) and Distribution (X_2) simultaneously have influence on LPG Sales Volume.

2. T-test (Partial)

The t-test is used to test whether each independent variable influences the dependent variable or not. The T-Test result is displayed in Table 8.

TABLE 8
T-TEST

Coefficients[a]

Model	Unstandardized Coefficients B	Sig.
1 (Constant)	-6793558,110	,000
LPG Stock (X1)	1,004	,000
LPG Distribution (X2)	1,015	,000

a. Dependent Variable: LPG Sales Volume (Y)

Source: Data Processing Output IBM SPSS Statistics 23, 2019

Based on Table 8, the variable of Inventory (X_1) has significance value of 0,000 whereas lower than the significance level value of 0,05 hence H0 is rejected and Ha is accepted. Therefore, it can be concluded that partialy LPG Sales Volume is positively and significantly influenced by the independent variable of Inventory (X_1).

The other variable of Distribution (X_2) has significance value of 0,000 which is lower than the significance level value of 0,05 then H0 is rejected and Ha is accepted. Therefore,

it can be concluded that partialy LPG Sales Volume is positively and significantly influenced by the independent variable of Distribution (X_2).

3. Coefficient of Determination

The value of the coefficient of determination (R^2) depicts the ability of the influence of independent variable toward dependent variable. The result of R^2 test can be seen on Table 9.

TABLE 9
COEFFICIENT OF DETERMINATION

Model	Adjusted R Square
1	,932

Source: Data Processing Output IBM SPSS Statistics 23, 2019

As resulted in Table 9, the value of the adjusted R^2 is 0,932 or 93,2%. Furthermore, it can be determined that the independent variables in this research which are Inventory (X_1) and Distribution (X_2) are able to explain the changes of LPG Sales Volume (Y) for 93,2%. While the rest percentage of 6,8% is

explained by other variables outside the analyzed regression model.

Multiple Linear Regression

The last step was interpretation of model. The table of regression coefficient can be seen on Table 10.

TABLE 10
MULTIPLE LINEAR REGRESSION

Model	Unstandardized Coefficients
	B
1 (Constant)	-6793558,110
LPG Stock (X1)	1,004
LPG Distribution (X2)	1,015

Source: Data Processing Output IBM SPSS Statistics 23, 2019

Based on table 10, the regression model of this research was:

$$Y = -6793558{,}110 + 1{,}004\, X_1 + 1{,}015\, X_2$$

With:
Y $\quad$ = LPG Sales Volume
X_1 $\quad$ = Inventory
X_2 $\quad$ = Distribution

Because both independent variable influenced the dependent variable, so Inventory (X_1) and Distribution (X_2) were written in this interpretation model. Table 15 shows that every addition of 1 Kg of LPG Inventory, it could cause an increase in LPG Sales Volume about 1004 Kg and every addition of 1 Kg of LPG Distribution, it could an increase in LPG Sales Volume about 1015 Kg at PT. Optima Sinergi Comvestama with an assumption if the other variables were constant. It means that there were a positive effect occurred between Inventory, Distribution and LPG Sales Volume.

CONCLUSION AND RECOMMENDATION
Conclusion

Based on the analysis result, there were several conclusions obtained that can be described below:

1. According to F-test, it was found that simultaneously, Inventory and Distribution had a significant influence on LPG Sales Volume in PT. Optima Sinergi Comvestama.

2. Meanwhile, based on t-test result, it is showed that partially all of the independent variables influenced LPG Sales Volume. Partially, Inventory and Distribution positively and significantly influenced LPG Sales Volume.

3. In addition, Adjusted R^2 value shows Inventory and Distribution are able to explain the variance of LPG Sales Volume for 93,2%, the rest of 6,8% are explained by other variables outside of this research.

4. In accordance with these results, the interpretation of multiple regression linear explains that if LPG Inventory is increasing, then LPG Sales Volume will increse. Whereas, if LPG Distribution is increasing, then LPG Sales Volume will also increase.

Recommendation

Based on the result of the analysis, it is recommended for PT. Optima Sinergi Comvestama to increase the Inventory capacity. Therefore, PT. Optima Sinergi Comvestama can hoard more LPG in the future. Moreover, PT. Optima Sinergi Comvestama also need to increase more LPG distribution from PT. Pertamina, due to need of LPG is increasing every year in the community. It is expected that PT. Optima Sinergi Comvestama can increase their sales volume to gain more profit and still be a trusted partner of PT. Pertamina in the future through this recommendations.

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