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Invisible Hand activities Prediction With Analysis Protection Tax Loss and GDP Current Price in Indonesia State

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Abstract

Invisible Hand activities that have taken the world's attention enough through the news in the mass media, both print and electronic lately, including the activities of smuggling goods out of the country, such as wood, fuel oil, to endangered protected animals, as well as cases of the entry of goods from China to Indonesia without going through the customs gate. This phenomenon caused losses to the state in the event that the import tax was not collected and the unrestricted import of goods entering Indonesia. Invisible Hand is an integral part of the economic activities of most countries in the world. Invisible Hand itself is an economic activity both legally and illegally missed from the calculation of Gross Domestic Product (GDP), also known as other unofficially economy or black economy, which has now become a global issue. This study uses multiple linear regression analysis to predict and predict changes in the value of certain variables when other variables change. Correlation is one of the statistical analysis techniques used to find relationships between two or more quantitative variables. By using linearity test where f count > f table is 47.9676 > 2.98 So. Ho is rejected. Where multiple linear regression analysis can be used to analyze the effect of the Undergrown Economy on Indonesia's Gross Domestic Product. Obtaining a multiple linear regression equation is Y = 99835.53808 - 50667.7077X₁ + 215.7054395X₂. t1 count > t table = 118,485 ≤ 2,262; then Ho is rejected, that is, there is a large (significant) partial effect between the annual Indonesian Tax Loss Potential (X1) against the Economic Undergrown (Y) in Indonesia from 2003-2016. Interpretation of correlation (linkages) relationship between IDR-USD (Y) Variable Average lost tax revenue per year (X1) and Gross Domestic Product (X2) 0.960743936 with superior correlation interpretations ranging from 0.76 to 1.00.

Keywords: IDR-USD rupiah rate • Indonesian export-import value • Indonesian gross domestic product • Indonesian state • Multiple linear regression • Multiple linear correlation

Introduction

The increasing Invisible Hand activities resulted in economic performance which has been measured through the amount of Gross Domestic Product (GDP) being biased or under estimate. On the other hand, the development of Invisible Hand activities also contributed to losses to the State through the amount of potential tax losses. The Invisible Hand activities are generally separated from the supervision of the tax authority so that it eliminates the obligation to pay taxes from the Invisible Hand players which causes state losses. In Indonesia, a number of examples of Invisible Hand activities that are quite attention-grabbing through reporting to the mass media, both print and electronic include the activities of smuggling goods out of the country, such as wood, fuel oil, to endangered protected animals, and cases - the case of the entry of goods from China to Indonesia without going through the customs gate. This phenomenon caused losses to the state in the event that the import tax was not collected and there were no restrictions on imported goods entering Indonesia (Samuda. S.J.A. 2016).

Invisible Hand is an integral part of the economic activities of most countries. Invisible Hand, namely economic activities both legally and illegally missed from the calculation of Gross Domestic Product (GDP), also known as other unofficially economy or black economy, has now become a global issue. The amount of tax burden that must be borne by economic actors. The increase in Invisible Hand activity can be seen as a reaction from individuals

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who feel burdened by the government and choose "exit options" compared to "voice options". In this case, the increase in Invisible Hand activities is an indicator of the high tax burden that must be borne by economic actors. The development of Invisible Hand can cause inefficiencies in decision making by stakeholders because the measurement of several economic indicators such as unemployment, labor force, income and consumption becomes inaccurate.

Third, another effect that needs to be considered is the development of the Invisible Hand can attract domestic and foreign workers to switch from legal economic activities to illegal and create competition between the two. In an effort to measure the magnitude of the Invisible Hand activities, difficulties were encountered, including the different concepts of the Invisible Hand and the actors of the Invisible Hand who generally did not want to know. Some previous studies found that accurate data from several economic indicators can be used as a proxy in measuring Invisible Hand, one of which is by looking at the elasticity of demand for currency against the tax burden introduced by Tanzi V [1-13].

Literature Review

According to Smith H in Faal (2003) [12], Invisible Hand is the production of goods and services both legal and illegal that are missed from the calculation of Gross Domestic Product (GDP).

This multiple linear regression analysis is used to predict changes in the value of certain variables when other variables change. Multiple regression is said, because the number of independent variables as more than one predictor, multiple linear regression equations are used. Regression analysis is a relationship that is obtained and expressed in the form of mathematical equations which state functional relationships between variables.

According to Draper N and Smith H [12] regression analysis is an analytical method that can be used to analyze data and draw meaningful conclusions about the relationship of variable dependence to other variables. Regression is divided into 2, namely, simple linear regression analysis is used to obtain mathematical relationships in the form of an equation between non-independent variables with a single independent variable. Multiple linear

regression analysis is a linear relationship between two or more independent variables (X1, X2,.... Xn) with the dependent variable (Y). This analysis is to determine the direction of the relationship between the independent variable and the dependent variable whether each independent variable is positively or negatively related and to predict the value of the dependent variable if the value of the independent variable increases or decreases. The data used is usually interval or ratio scale.

The multiple linear regression equation is as follows:

 $Y = a + b_1 X_1 + b_2 X_2 + \dots + b_n X_n$

Information:

Y = Dependent variable (predicted value)

 X_1 and X_2 = Variabel independent

a = Constanta (Y value if $X_1, X_2, \dots, X_n = 0$)

b = Regression coefficient (value of increase or decrease).

The method that can be used to estimate the parameters of simple linear regression models as well as multiple linear regression models is the ordinary least square/OLS method and maximum likelihood estimation (MLE) [6].

Multiple Linear Correlation

Correlation coefficient is a number that states the strength of the relationship between two or more variables, can also determine the direction of the relationship of the two variables, the correlation value is (r) = (-1 ≤ 0 ≤ 1).

Multiple correlation analysis is an extension of simple correlation analysis. In the analysis of multiple correlation aims to find out how the degree of relationship between several independent variables (Variables X1, X2,....., Xk) with the dependent variable (Variable Y) together. For the strength of the relationship, the value of the correlation coefficient is between -1 to 1, while the direction is expressed in the form of positive (+) and negative (-). The multiple linear correlation coefficients are calculated using the following formula:

a. Simultaneous correlation X1, X2 to Y (RX1X2Y)

Formula: $R_{x_1x_2y} = \sqrt{(b_1 \cdot \Sigma x_1 y + b_2 \cdot \Sigma x_2 y)/\Sigma y^2}$

b. Korelasi parsial X $_1$ terhadap Y bila X $_2$ konstan (r $_{X1,Y}$) dirumuskan sebagai berikut :

 $r_{X_{1}Y} = n(\Sigma X_{1}Y) - (\Sigma X_{1})(\Sigma Y) / \sqrt{\{n(\Sigma X_{1}^{2})\}\{n(\Sigma Y^{2}) - (\Sigma Y)^{2}\}}$

 c. Korelasi parsial X₂ terhadap Y bila X₁ konstan (r_{x2,Y}) dirumuskan sebagai berikut :

 $r_{x_{2}y} = n(\Sigma X_{2}Y) - (\Sigma X_{2})(\Sigma Y) / \sqrt{\{n(\Sigma X_{2}^{2})\}\{n(\Sigma Y^{2}) - (\Sigma Y)^{2}\}}$

Where,

Ry12: Correlation of dependent variables on independent variables 1 and 2

ry1: Correlation of dependent variables with independent variables 1

ry2: Correlation of dependent variables with independent variables 2

n: Many samples

X1: Independent variable 1

X2: Independent variable 2

Table 1. Pearson correlation value.

Value of Correlation (r)	Interpretation (r)
0,00 - 0,25	Doubful Correlation
0,26 - 0,50	Fair Correlation
0,51-0,75	Good Correlation
0,76 - 1,00	Superior Correlation
Source: Kelley, W. D., and Jr. Ratliff, T.A., No	enadic, C. 1992.

Y: Dependent variable (free)

Based on multiple correlation, given the $R_{Y,12...n}$ notation calculated through the path of the occurrence of the relationship between several independent variables (X1, X2,...,Xn) with one dependent variable (Y), which is in the form of multiple linear regression Y = a + b1.X1 + b2.X2 + ... + bn.Xn. The strength interval of a number of statistical authors makes the interval categorization of the strength of the correlation relationship. Jonathan Sarwono, for example, makes the strength intervals of relations as follows: (Table 1).

Multiple Correlation is a correlation that intends to see the relationship between 3 or more variables (two or more dependent variables and one independent variable). Multiple correlations are related to the inter-isolation of independent variables as their correlation with the dependent variable. In addition, according to Akdon and Ridwan [1] multiple correlation is a value that gives strong influence or the relationship of two or more variables together with other variables.

The assumptions related to the multiple regression analysis are:

- 1. Independent variables and dependent variables have a linear relationship
- 2. All variables, both independent and dependent variables, are continuous random variables.
- Conditional distribution of the value of each variable is normally distributed (multivariate normal distribution).
- For various combinations of variable values with one another, the variance of the conditional distribution of each variable is homogeneous (asumsu homoscedasticity applies to all variables)

For each variable, the value of observations from one another, is not related. Multiple correlation is a correlation consisting of two independent variables (X1, X2) or more, and one dependent variable (Y). the relationship between variables can be described as follows: (Figure 1).

From the picture above the formulation of the problem consists of three or more problems, then multiple linear correlation is used.

Research Methodology

This research includes Explanatory Research with a Quantitative approach, using multiple linear analysis methods due to more than one independent variable. The variables that influence are called independent variables and the variables that are affected are called dependent variables (dependent variables).

Variables in measurement

This study consists of two independent variables, namely the GDP per capita current price (X1) and the prevailing Gross Domestic Income (X2), while the dependent variable is the Undergrown Economic abbreviated by the Variable (Y).

Data source

Data sources used are secondary data sources, namely research data sources obtained indirectly through intermediary media or related agencies/ agencies [4]. In this case the researcher takes data from the 2017 Central Bureau of Statistics concerning Gross Domestic Product (GDP) per Capita Current Price, Current Domestic Gross Price (GDP) in Indonesia and Economic Undergrown Data in Indonesia through the Bulletin of Monetary and Banking Economics.

Data collection technique

Data collection techniques carried out to obtain relevant data from the problems studied are through library research (Library Research), namely by reading and studying the literature contained in the library, with the intention to put a theoretical foundation on the main problems being discussed (Table 2).

Gross Domestic Product is defined as the overall value of all goods and services produced in the area within a certain period of time (usually per year). In this case, the increase in Invisible Hand activities is an indicator of the high tax burden that must be borne by economic actors (Table 3).

Results and Discussion

This research predicts and predicts the Undergrown position in the future by processing and analyzing past data, as dependent variable, is the average tax revenue lost per year and gross domestic income as an independent variable (free) by predicting these variables using multiple linear regression equations. Multiple linear regression analysis with dependent variables is the Undergrown Economic (Y), the average tax revenue lost per year (X1) and Gross Domestic Product to the prevailing price (X2). The data from the variables above are as follows: (Table 4).

In a study at the stage of analyzing data, multiple linear regression is the development of simple linear regression, which can be used to predict future demand based on past data analysis or to determine the effect of one or more independent variables on one variable dependent is used. The

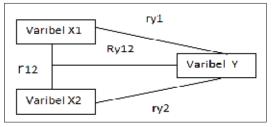


Figure 1. Multiple linear correlation.

Table 2. Data on GDP per capita current price 2003-2013.

application of multiple methods for the number of independent variables used more than one affects independent non-independent variables [11]. From the table of independent and bound variable data above, we obtain multiple linear regression equations with two predictors. Start by creating a helper table as follows: (Table 5).

Level of multiple linear regression correlation

The Pearson Correlation Coefficient can be used to express the magnitude of the linear relationship between two or more variables when the data is quantitative data (interval or ratio scale data) and both variables are bivariate which are normally distributed. Then the multiple linear regression correlation is obtained as follows:

$$R_{x_1x_2,y} = \sqrt{(b_1 \cdot \Sigma x_1 y + b_2 \cdot \Sigma x_2 y)/\Sigma y^2} = 0.968197006$$

From the analysis of the level of multiple linear regression correlation Eonomic Undergrwon equation (Y), Average annual Tax Revenue (X1) and Gross Domestic Product Applicable Price (X2), the results of 0.968197006 obtained with the interpretation is Superior Correlation which ranges from 0.76 to 0.99.

Linearity Test (F_{-Test}) Multiple Regression

Make a hypothesis:

Ho: Linear regression analysis cannot be used in analyzing the influence of Bank Indonesia interest rates and Gross Domestic Product on Indonesia's Inflation Rate.

 $\mbox{H}\alpha$: Linear regression analysis can be used in analyzing the influence of Bank Indonesia interest rates and Gross Domestic Product on Indonesia's inflation rate.

Description	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	2	3	4	5	6	7	8	9	10	11	12
GDP per capita Current Price	9.4	10.6	12.7	15	17.4	21.4	23.9	28.8	32.4	35.1	38.4
Source: BPS Indonesia 2017.											

Table 3. Average tax revenue lost per year in 2003-2013.

Description	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Average tax revenue lost per year	14570.85	20611.44	21690.405	25833.07	31598.825	44885.74	31886.4025	34854.2	52593.2225	66400.5475	72266.63
Source: BPS Indonesia 2017.											

Table 4. Undergrown Economic (Y), Average lost tax revenue per year (X1) and Gross Domestic Product to current price (X2).

Years	Average lost tax revenue per year (X ₁)	GDP Current Price (X ₂)	Undergrown Economic (Y)
2003	14570.85	2013.7	39978.46
2004	20611.44	2295.8	58547.54
2005	21690.405	2774.3	57427.99
2006	25833.07	3339.2	70150.73
2007	31598.825	3950.9	80719.66
2008	44885.74	4948.7	109243.6
2009	31886.4025	5606.2	82109.99
2010	34854.2	6864.1	109652.5
2011	52593.2225	7831.7	137301.4
2012	66400.5475	8615.7	163252.9
2013	72266.63	9546.1	235991.8

Source: Indonesian BPS, 2017 and Indonesian Economic Bulletin 2016.

Table 5. Helper data to search for Multiple Linear Regression Equations, namely the values of constants b, and b,

Years	(X1)	(X2)	(Y)	X ₁ ²	X ₂ ²	Y ²	X,Y	X ₂ Y	$X_1 X_2$
2003	14570.85	2013.7	39978.46	212309669.7	4054987.69	1598277264	582520143.9	80504624.9	29341321
2004	20611.44	2295.8	58547.54	424831458.9	5270697.64	3427814440	1206749108	134413442	47319744
2005	21690.405	2774.3	57427.99	470473669.1	7696740.49	3297974035	1245636361	159322473	60175691
2006	25833.07	3339.2	70150.73	667347505.6	11150256.64	4921124920	1812208719	234247318	86261787
2007	31598.825	3950.9	80719.66	998485741.4	15609610.81	6515663511	2550646410	318915305	124843797.7
2008	44885.74	4948.7	109243.6	2014729655	24489631.69	11934164141	4903479826	540613803	222126061.5
2009	31886.4025	5606.2	82109.99	1016742664	31429478.44	6742050458	2618192190	460325026	178761549.7
2010	34854.2	6864.1	109652.5	1214815258	47115868.81	12023670756	3821850166	752665725	239242714.2
2011	52593.2225	7831.7	137301.4	2766047053	61335524.89	18851674442	7221123080	1075303374	411894340.7
2012	66400.5475	8615.7	163252.9	4409032708	74230286.49	26651509358	10840081941	1406538011	572087197.1
2013	72266.63	9546.1	235991.8	5222465812	91128025.21	55692129667	17054332094	2252801322	689864476.6
Σ	417191.3325	57786.4	1144376.57	19417281195	373511108.8	1.51656E+11	53856820039	7415650424	2661918680

Determining the Value of F-count

Formula:

Fcount = (Rx1x2,y)2(n - m - 1)/m(1 - Rx1,x2,y2)

Fcount = 55.671

Information :

 $R_{x_{1x_{2},y}}$ = Correlation of Multiple Linear Regression

n = Number of Research Samples

m = Number of Free Variables

Determine the Value of Ftabel

Formula:

 $F_{tabel} = F_{\{(\alpha)(dk \text{ penyebut = n-m-1}), (dk \text{ pembilang = m})\}}$

Where

m = 2, n = 14, α = 0,05

dk = 14 - 2 - 1 = 11

then;

 $F_{tabel} = F_{\{(0,05)(11,2)\}} = 4.459$

 f_{count} > f_{tabel} that is 55.671 > 4.459 then, Ho rejected. Thus, Linear Regression Analysis can be used in analyzing Economic Undergrwon with Average annual Tax Revenue of the Indonesian Domestic Gross Product valid price from 2003 to 2013.

Mencari nilai konstanta-konstanta

a. Nilai konstanta b1 dan b2 adalah:

 $\Sigma X_{1}^{2} = \Sigma X_{1}^{2} - (\Sigma X_{1})^{2}/n$ $\Sigma X_{2}^{2} = \Sigma X_{2}^{2} - (\Sigma X_{2})^{2}/n$

- $\Sigma y^2 = \Sigma Y^2 (\Sigma Y)^2/n$
- $\Sigma \mathbf{x}_1 \mathbf{y} = \Sigma \mathbf{X}_1 \mathbf{Y} (\Sigma \mathbf{X}_1)(\Sigma \mathbf{Y})/\mathbf{n}$
- $\Sigma \mathbf{x}_2 \mathbf{y} = \Sigma \mathbf{X}_2 \mathbf{Y} (\Sigma \mathbf{X}_2)(\Sigma \mathbf{Y})/\mathbf{n}$

 $\Sigma \mathbf{X}_1 \mathbf{X}_2 = \Sigma \mathbf{X}_1 \mathbf{X}_2 - (\Sigma \mathbf{X}_1)(\Sigma \mathbf{X}_2)/\mathbf{n}$

$$X_1 = \Sigma X_{1/r}$$

 $X_2 = \Sigma X_{2/} n$

 $Y = \Sigma Y_{l} n$

Formula of constants b,:

$$b_{1} = (\Sigma X_{2}^{2}) (\Sigma X 1 Y) - (\Sigma X_{1} X_{2}) (\Sigma X_{2} Y)_{-} (\Sigma X_{1}^{2}) (\Sigma X 2 2) - (\Sigma X_{1} X_{2})^{2}$$

= 2.346

Formula of constants b,:

$$b_{2} = (\Sigma X_{12}) (\Sigma X_{2} Y) - (\Sigma X_{1} X_{2}) (\Sigma X_{1} Y)$$
$$(\Sigma x_{12}) (\Sigma X_{22}) - (\Sigma x_{1} x_{2})_{2}$$
$$= 4.2934$$

b. The value of the constant α is :

 $\alpha = \Sigma Y/n - b_1(\Sigma X_1/n) - b_2(\Sigma X_2/n)$

= -7521.239709

From the results of multiple linear regression analysis, the equation with the formula is obtained as follows:

$$Y = \alpha + b_1 X_1 + b_2 X_2 + ... + bnXn$$

The results of multiple linear regression analysis obtained the Indonesian inflation level equation (Y) by analyzing the variable interest rate of Bank Indonesia (X1) on Gross Domestic Product (X2), so that the obtained multiple linear regression equation is as follows:

 $Y = -7521.239709 + 2.346X_1 + 4.2934X2$

By using the above equation, we can predict or predict the Indonesian Economic Undergrown in the future by analyzing the loss of annual tax revenues against the receipt of Gross Domestic Product of the prevailing price of Indonesia using the multiple linear regression equation.

Partial influence test (t-test)

Namely, determine whether there is a partial influence between the Loss of Annual Tax Revenue (X1) and the Indonesian Undergrown Economic (Y) and whether there is a partial influence of Indonesia's GDP (X2) on the Indonesian Economic Undergrown (Y).

a. Partial influence test (t-test) between X1 and Y Determining the Hypothesis:

Ho: There is no partial significant effect between the Loss of Indonesia's Annual Tax Revenue to Indonesia's Economic Undergrown.

 ${\rm H}\alpha{\rm :}$ There is a partially significant influence between GDP Prices Applicable to Indonesian Economic Undergrown.

$$\begin{split} & S_{X1X2}^{\ 2} = \Sigma y^2 - [b^2(\Sigma x_1 y) + b_2(\Sigma x_2 y)]/n - m - 1 \\ & S_{X1X2}^{\ 2} = \sqrt{S_{X1X2}^{\ 2}} \\ & r_{_{X1X2}}^{\ 2} = n(\Sigma X_1 X_2) - (\Sigma X_1)(\Sigma X_2)/\sqrt{\{n, \Sigma X_1^{\ 2} - (\Sigma X_1)2\}} \{n, \Sigma X_2^{\ 2} - (\Sigma X_2)^2\} \\ & = 0.9379138 \\ & S_{b1}^{\ 2} = S_{_{X1X2}}/\sqrt{[\Sigma X_1^{\ 2} - n, X_1^{\ 2}]} [1 - (r_{_{X1X2}})^2] \\ & = 0.0198054 \\ & S_{b2}^{\ 2} = S_{_{X1X2}}/\sqrt{[\Sigma X_2^{\ 2} - n, X_2^{\ 2}]} [1 - (r_{_{X1X2}})^2] \\ & = 0.14198 \\ & Then, t_{_{Lount}} = b_1/S_{_{b1}} = -0.417287 \\ & t_{_{2count}} = b_2/S_{_{b2}} = 3.730872 \end{split}$$

Determine the value of ttabel

$$t_{tabel} = t_{(\alpha/2)(n-2)}$$

= t (0,025) (9)

= 2.262

- So, t₁ count ≤ t_{1 table} = 118,485 ≤ 2,262; then Ho accepted the meaning, There was no partial significant effect between the Loss of Annual Tax Revenue to the Indonesian Economic Undergrown.
- For t_{2 count} > t_{2 table} that is 30.2387 >2.262 then Ho is rejected meaning, There is a partially significant effect between the GDP of the Indonesian Applicable Price for the Indonesian Undergrown.

Conclusion

From the results of the study, it can be concluded that statistical data with the Undergrown Economic variables (Y), on the annual Tax Loss Potential (X1) and the prevailing Gross Domestic Product (X2) are as follows:

- f count > f table that is, 55,671 > 4,459 So, Ho is rejected. Thus, linear regression analysis can be used in analyzing the Undergrown Economic (Y) variable on the prevailing Gross Domestic Product (GDP) (X1) and the potential loss of tax revenue per year (X2) in Indonesia 2003-2016.
- 2. Multiple linear regression equations are as follows:

Y = -7521.239709 + 2.346X1 + 4.2934X2

 Correlation (linkages) between Undergrown Economic (Y) to Indonesia's annual Tax Loss Potential (X1) and the prevailing Gross Domestic Product (X2) results of 0.968197 with the interpretation of Superior Correlation which ranges from 0.76 to 0.99.

- 4. So, $t_{\perp count} > t_{table} = 118,485 \le 2,262$; then Ho is rejected, that is, there is a large (significant) partial effect between the annual Indonesian Tax Loss Potential (X1) against the Economic Underground (Y) in Indonesia 2003-2016.
- 5. To $t_{2 \text{ count}} > t_{\text{table}}$ is 30.2387 > 2.262 then Ho is rejected meaning, There is a large (partially) significant influence between the Indonesian current price GDP (X2) against the Economic Undergrown (Y) in Indonesia from 2003-2016.

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Conflict of Interest

No potential conflict of interest was reported by the authors.

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