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THE EFFECT OF GROSS REGIONAL DOMESTIC PRODUCTS, BI RATE, AND BUDGET ON INFLATION IN ACEH PROVINCE

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Abstract

This study aims analyse the effect of gross regional domestic product, BI rate, and unemployment to inflation in Aceh province. The data used are secondary data sourced from Central Bureau of Statistics Republic of Indonesia the years 2000-2015. Data analysis method used is the Error Correction Model and analysis tools using statistical software E views 8. The results of research showed that: (1) All variables are stationary at the level of the first difference and have a long-term equilibrium relationship or co-integrated. (2) the independent variables positive and significant to inflation, but only variable GRDP is not significant. (3) Model specifications ECM used in the study are valid, denoted by the ECT significant probability coefficient. The local government must be provide comprehensive employment and provide access to capital for society to develop or build the business as well as the monetary authority which is conducted by Bank Indonesia and obliging routine monitoring to the prices of goods and services on the market and control the interest rates to be kept stable and low.

Keywords: *Gross regional domestic product, BI rate, unemployment, inflation, error correction model*

Abstrak

Penelitian ini bertujuan menganalisis pengaruh Produk Domestik Regional Bruto, BI rate, dan pengangguran terhadap inflasi di Provinsi Aceh. Data yang digunakan adalah data sekunder yang bersumber dari Badan Pusat Statistik Republik Indonesia tahun 2000-2015. Metode analisis data yang digunakan adalah Error Correction Model dan alat analisisnya menggunakan software statistik E dilihat 8. Hasil penelitian menunjukkan bahwa: (1) Semua variabel stasioner pada level first difference dan memiliki hubungan ekuilibrium jangka panjang atau co. -terintegrasi. (2) variabel independen positif dan signifikan terhadap inflasi, tetapi hanya variabel PDRB yang tidak signifikan. (3) Spesifikasi model ECM yang digunakan dalam penelitian ini valid, dilambangkan dengan koefisien probabilitas signifikan ECT. Pemerintah daerah harus menyediakan lapangan kerja yang komprehensif dan memberikan akses permodalan bagi masyarakat untuk mengembangkan atau membangun usaha serta otoritas moneter yang dilakukan oleh Bank Indonesia dan mewajibkan pemantauan rutin terhadap harga barang dan jasa di pasar dan pengendalian suku bunga tetap stabil dan rendah..

Kata Kunci: *Produk Domestik Regional Bruto, BI rate, pengangguran, inflasi, model koreksi kesalahan*

INTRODUCTION

Aceh is one of the most endless provinces on the west coast of Indonesia. Aceh Province is still struggling in two main problems that are very worrying, namely high unemployment and unstable prices in the market. Price stability is a barometer of inflation stability, because real economic growth that can be controlled will guarantee an increase in people's purchasing power. Inflation is a continuous increase in prices and price increases that occur in all groups of goods and services, maybe even the increase cannot occur simultaneously, which is important to increase the general price of goods continuously for a certain period(Utama, Wijaya, & Lim, 2017).

Inflation is one of the important economic indicators, the rate of change is always sought to be stable so as not to cause the effects of instability in the economy. High and unstable inflation is a reflection of the tendency to increase the level of prices of goods and services in general continuously over a certain period of time, causing people's purchasing power to decline and goods produced will not be sold out, so that investment in these products will decrease . If investment is reduced, it will cause national income to decline and economic growth will also decline and economic instability in a region will be disrupted (Martin & Sunley, 2015). The following is the development of inflation data, GDP, BI Rate and Unemployment Rate in Aceh Province.

Tabel 1. Data on inflation, GDP, BI Rate, and Unemployment

Year	Inflation	PDRB ADHK (Rp)	BI Rate	unemployed
2000	9.59 %	19.626.690.000.000	14.53 %	4.80 %
2001	14.03 %	19.539.800.000.000	17.62 %	7.71 %
2002	10.55 %	21.095.270.000.000	12.93 %	9.34 %
2003	4.03 %	21.875.760.000.000	8.31 %	8.97 %
2004	7.08 %	22.260.700.000.000	7.43 %	9.35 %
2005	34.88 %	22.531.790.000.000	12.75 %	14.00 %
2006	9.98 %	24.267.800.000.000	9.75 %	10.43 %
2007	9.41 %	26.022.200.000.000	8.00 %	9.84 %
2008	11.92 %	26.523.090.000.000	9.25 %	9.56 %
2009	3.72 %	27.574.790.000.000	6.50 %	8.71 %
2010	5.86 %	29.072.030.000.000	6.50 %	8.37 %
2011	3.43 %	30.726.190.000.000	6.00 %	9.00 %
2012	0.22 %	32.591.170.000.000	5.75 %	9.06 %
2013	7.31 %	34.339.550.000.000	7.50 %	10.12 %
2014	8.09 %	35.720.250.000.000	7.75 %	9.02 %
2015	1.53 %	37.270.190.000.000	7.50 %	9.93 %

Source : Indonesian Central Bureau of Statistics, 2018

Table 1 explains that inflation in 2005 rose significantly to 34.88%, which was previously 7.08% in 2004. This increase in inflation was due to the earthquake and tsunami disaster at the end of 2004. According to Bank Indonesia Report 2015, The increase in the inflation rate was exactly a year after the earthquake and tsunami natural disasters, the economy of Aceh province experienced an increase along with the implementation of rehabilitation and reconstruction. The increase in economic activity cannot be separated from the large amount of cash flow that goes into the province of Aceh and has the potential to increase the inflation rate. The lowest inflation was shown in 2012 at 0.22%, the main factor causing the decline in the inflation rate in 2012 came from the control of volatile foods inflation, namely commodities of fresh fish, rice, red chilli peppers and shallots (Bank Indonesia, 2012). Aceh's inflation in 2015 fell significantly to 1.53% from 8.09% in 2014. This figure is also lower than the national inflation rate in 2015 which reached 3.35%.

One indicator that is often used to see the symptoms of economic growth in a country is gross domestic product or gross regional domestic product for the region, because it reflects economic activities carried out and achieved by the population for a certain period. Gross domestic product (GDP) is also commonly used to measure the level of prosperity and welfare of a nation or society (Fixler, Johnson, Craig, & Furlong, 2017).

Another factor influencing changes in inflation is the increase in the prices of goods and the increase in the benchmark interest rate of Bank Indonesia Rate which is a signal for banks to set interest rates such as savings, deposits and credit(Yolanda, 2017). changes in the BI Rate will affect several macroeconomic variables which are then passed on to inflation. Changes in the increase in the BI Rate level aim to reduce the rate of economic activity that can trigger inflation. When the BI Rate rises, interest rates on loans and deposits will increase. When deposit rates rise, people will tend to save their money in banks and the amount of money circulating in the community decreases, business people tend to reduce investment, because the cost of capital is higher. This will reduce economic activity and ultimately increase inflationary pressures(Semuel & Nurina, 2015).

Macroeconomic problems affecting humans directly are unemployment. Most people lose their jobs will reduce the standard of living and psychological. Unemployment is a topic that is often discussed in political debates and politicians often claim that the policies they offer will help create jobs, but they never materialize. unemployment is someone who has been classified in the workforce, who is actively looking for work at a certain wage level, but cannot get the desired job(Wanto et al., 2018).

LITERATURE REVIEW

Inflation is an increase in the price of goods and services in general where the goods and services are the basic needs of the community or the decline in the selling power of a country's currency (Central Statistics Agency, 2012). According to Latumaerissa (2011) inflation is a trend of increasing prices continuously, which is measured by the rise in the Consumer Price Index which represents the high movement of prices of goods and services as a whole which later affects the stock market or capital market(Hilscher & Raviv, 2014).

Correlation between GRDP and Inflation Rate

Gross Regional Domestic Product (GRDP) is the total value of the final product and service product produced by all production units in a region or region for a certain period (usually one year) considering ownership., GDP is defined as national income and GDP as regional income, which has a positive influence on inflation. GDP can explain the increase in demand for goods and services produced. The increase in GDP and GDP shows an increase in national and regional demand. The increase will be followed by an increase in consumption of the entire community so that it will push up

prices of goods which result in inflation(Ahmad & Schreyer, 2016).

Correlation between Bank Indonesia Rate and Inflation Rate

The BI Rate is the benchmark interest rate of Bank Indonesia. The BI Rate is the main policy instrument for influencing economic activity with the ultimate goal of achieving low and stable inflation. Bank Indonesia (2013) states the BI-rate or reference interest rate is a policy interest rate that reflects the monetary policy stance or stance set by Bank Indonesia and announced to the public. In general, Bank Indonesia will raise the BI rate if future inflation is expected to exceed the set target, whereas Bank Indonesia will reduce the BI rate if future inflation is expected to be below the set target. Thus, the relationship between the BI rate and inflation has a negative relationship. If inflation is high, one way to reduce the inflation rate is to increase the BI rate because the increase in the BI rate will have an effect on decreasing the inflation rate (Havidz & Setiawan, 2015).

Correlation between Unemployment and Inflation

Unemployment is a condition in which a person belonging to the workforce category does not have a job and is actively not looking for work. The trade-off between wages and the unemployment rate, including having a negative relationship between wages and unemployment, if the wage rate rises sharply the unemployment rate is low, because if there are not many unemployed people the company will find it difficult to obtain labour . To attract workers, the company must set a high salary. High salaries reflect the creation of high inflation as well. Then, if many people are unemployed, then the wage rate will be lower, because the company is very easy to get employees, and people will want to work even with low salaries. Decreasing salaries reflects a decline in inflation(Blanchard, Cerutti, & Summers, 2015).

METHOD

This study uses the Error Correction Model (ECM) method, using program Eviews 8. The ECM is a technique for correcting long-term imbalances introduced by Sargan and popularized by Engle and Granger. The general models of ECM are as follows:

$$DY = \beta 0 + \beta 1DXt\text{-}I + \beta 2ECt\text{-}1 + ei$$

To find out the specification of the model with ECM is a valid model, it can be seen in the results of the statistical test of the residuals from the first regression, which will then be called the Error Correction Term (ECT). If the test results on the ECT coefficient are significant, the observed model specifications are valid. The ECM model in this study is:

$$DINF = \alpha + \beta 1DLOGPDRB + \beta 2DBIRATE + \beta 3DUN + \beta 4ECt\text{-}1 + ei$$

Where INF = Inflation, GRDP = Gross regional domestic product (in the form of logarithms), BIRATE = BI-Rate, UN = unemployment, ECt = Error Correction Term, D = stationary test at the level

of First Difference and e_i = error term.

Test Stationary Model

Regression that uses non-stationary time series data is likely to produce spurious regression. Direct regression occurs if the coefficient of determination is high enough but the relationship between the independent variable and the dependent variable has no meaning. To avoid this straight regression problem we must transform non-stationary data into stationary data (Gujarati, 2004). In this case the author will explain using the Augmented Dickey-Fuller (ADF) transformation method. Unit Root Test (Unit Root Test).To find out whether the time series data used is stationary or not stationary, unit roots test is used. Unit root test is carried out using the Augmented Dickey Fuller method (Basuki, 2014). A data can be said to be stationary if the absolute value of the ADF statistic is greater than the critical value of Mackinnon at the first differentiation level, then the data is said to be stationary at first degree. However, if the value is smaller than the degree of integration test needs to be continued at a higher differentiation so that the stationary data is obtained (Widarjono, 2013).

Degree of Integration Test

The degree of integration test is a continuation of the unit root test and is only needed if all the data is not stationary at zero or 1 (0). Integration degree test is used to find out at what degree the data will be stationary. If the data is not stationary at first degree, then the test must continue until each variable is stationary (Shochrul, 2011). According to Siagian (2003) if the observed data is not stationary at the unit root test, then the integration degree test is carried out to find out at what degree of integration the data will be stationary. This test is also carried out with an ADF with a 5% confidence level until the data generated is stationary.

Cointegration Test

Time series data often shows conditions that are not stationary at the level (Widarjono, 20013), but often indicate stationary through the process of differentiation. Therefore, it is necessary to do a cointegration test to determine whether the independent and bound variables are cointegrated so that there is a long-term relationship between variables. Cointegration tests are carried out to determine long-run equilibrium among the observed variables. This test was developed based on the perception of a data model even though it is individually not stationary but a linear combination between two or more time series data will be stationary (Gujarati, 2004).The cointegration test in this study used the Engle Granger method with the Augmented Dick Fuller Test approach. If the statistical value is greater than the critical value, the observed variables are co-integrated or have a long-term relationship and vice versa then the observed variables are not cointegrated (Baltagi, 2008 and Gujarati, 2004).

Error Correction Model (ECM)

Error correction model (ECM) known as error correction model is a model used to see the long-term and short-term effects of each independent variable on the dependent variable (Satria, 2004). The existence of cointegration means that there is a relationship or long-term balance between variables. In the short term there may be an imbalance. This imbalance (disequilibrium) is often encountered in economic behavior. This means that what is desired by economic actors is not necessarily the same as what actually happens, so adjustments are needed. The model that incorporates adjustments to correct for imbalances is called the Error Correction Model and if the ECT (Error Correction Term) imbalance error coefficient is statistically significant it means the ECM specification model used in the study is valid (Wooldridge, 2002, Baltagi, 2008 and Gujarati, 2012).

RESULT AND ANALYSIS

A good model if the criteria of goodness of fit are fulfilled and the resulting parameters are as possible as possible to describe the actual conditions appropriately and unbiasedly. Criteria that must be fulfilled include Autocorrelation Test. The presence or absence of autocorrelation can be seen from the Chi-Square probability value (χ ^ 2) (Gujarati, 2004). The result looks like this:

F-statistic	0.069259	Prob. F (4,8)	0.9336
Obs*R-squared	0.255301	Prob. Chi-Square(2)	0.8802

Based on the table above, it can be explained that the Obs * R-squared value is 0.255 compared to the Chi-Square value (2) at α = 5% which is 5.99. This result shows 0.255 <5.99, meaning that this model has been freed from the indication of autocorrelation. This can also be seen from Prob.Chi-Square (χ ^ 2) of 0.88> 0.05 ..

Next is the multicollinearity test is a condition where there is a strong correlation between the free variables (X) that are included in the formation of a linear regression model. Multicollinearity in this study was tested by looking at the tolerance value and the variance inflation factor (VIF) and tolerance value. If the VIF value is <10, then there is no multicollinearity and tolerance value that approaches one can be concluded that there is also no multicollinearity problem (Gujarati, 2012). The test results can be seen below:

Variable	R-Squared	VIF	Tolerance
LOGPDRB	0.204739	1.257449	0.795261
BIRATE	0.344966	1.526638	0.655034
UN	0.304290	1.437381	0.695710

Based on the results above the VIF value of all variables is below or smaller than 10 which means that the ECM model is free from multicollinearity. Likewise tolerance value is close to one, which means avoiding multicollinearity.

Furthermore, seeing the Heteroscedacity test is a condition where the variance of each disorder is not constant. Heteroscedacity test can be done using White Heteroskedasticity Baltagi (2008) and Gujarati (2004), the results as shown in Table 4 below:

Heteroskedasticity Test: White			
F-statistic	0.514951	Prob. F(4,10)	0.7268
Obs*R-squared	2.561985	Prob. Chi-Square(4)	0.6336
Scaled explained SS	0.432724	Prob. Chi-Square(4)	0.9797

Stationarity Test

In applying the time series test, the stationarity of the series used is required, it is necessary to test stationarity first on the data used, so that the stable average value and random error are zero, so the regression models obtained have predictive abilities. reliable and avoid the emergence of lancung regression (Gujarati, 2004 and Baltagi, 2008).

Unit Root Test

To find out whether the time series data used is stationary or not stationary, unit roots test is used. Unit root test is carried out using the Augmented Dickey Fuller method (Basuki, 2014). The results of the test can be seen in the table below:

Variabel	ADF Test Statistic	5% Critical Value	Keterangan
INF	-3.185324	-3.081002	Stasioner
LOGPDRB	1.978910	-3.144920	Tidak Stasioner
BIRATE	-2.002496	-3.081002	Tidak Stasioner
UN	-3.679253	-3.081002	Stasioner

Based on the table above it can be concluded that the inflation variable (INF) has an ADF value> 5% critical value, namely -3.185324> -3.081002 meaning that this data is stationary at the level level. The GDP variable (LOGPDRB) has an ADF value <5% critical value which is 1.978910 <-3.144920 means that this data is not stationary at the level level. The BI Rate (BIRATE) variable has an ADF value <5% critical value which is -2.002496 <-3.081002 meaning that this data is not stationary at the level level. The unemployment variable (UN) has an ADF value > 5% critical value which is -3.679253> -3.081002 meaning that this data is stationary at the level level. These results indicate that at the level level not all variables are stationary with a critical value of 5%, therefore further testing must be carried out, namely the degree of integration test to find out at what level of differentiation are all stationary variables.

Degree of Integration Test

According to Gujarati (2003) if the observed data is not stationary at the unit root test, then the integration degree test is carried out to find out at what degree of integration the data will be stationary. The results of the test can be seen in the table below.

Variabel	ADF Test Statistic	5% Critical Value	Keterangan
INF	-4.630622	-3.119910	Stasioner
LOGPDRB	-3.805657	-3.119910	Stasioner
BIRATE	-4.079938	-3.119910	Stasioner
UN	-4.720284	-3.098896	Stasioner

Based on the table above the inflation variable (INF) has an ADF value> critical value which is -4.630622> -3.119910 means that this data is stationary at the first differentiation. The GDP variable (LOGPDRB) has an ADF value> critical value which is -3.805657> -3.119910 means that this data is stationary at the first differentiation. The BI Rate (BIRATE) variable has an ADF value> critical value which is -4.079938> -3.119910 meaning that this data is stationary at the first differentiation level. The unemployment variable (UN) has an ADF value> critical value which is -4.720284> -3.098896 meaning that this data is stationary at the first differentiation level. These results indicate that all stationary variables at the level of the first differentiation (First Difference), so it can be continued in cointegration analysis and Error Correction Model.

Error Correction Model

The existence of cointegration means that there is a relationship or long-term balance between variables. In the short term there may be an imbalance (disequilibrium). The model that incorporates adjustments to make corrections to imbalances is called the error correction model (Widarjono, 2013). The following results are the Error Correction Model test:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGPDRB)	5.265416	41.53252	0.126778	0.9016
D(BIRATE)	2.680066	0.431998	6.203885	0.0001
D(UN)	2.105540	0.567905	3.707555	0.0041
ECT(-1)	-1.436130	0.245373	-5.852852	0.0002
Adjusted R-squared	0.934300	F-statistic		50.77236
		Prob(F-statistic)		0.000001

Based on the results in Table 9 above the Error Correction Model research model is:

DINF = 0.260 + 5.265DLOGPDRB + 2.680DBIRATE + 2.105DUN - 1.436ECT

From the equation of the ECM model above, the results of the study can be stated as follows: Constants of 0.260 if the variable GDP, BI Rate, and unemployment are constant (zero), then the inflation variable will also be constant at 0.260. Then the GDP variable of 5.265, illustrates that in the short term the GDP variable has a positive effect on inflation of 5.27%, which means that if the GDP changes increase by 1%, the change in inflation will increase by 5.27%. This result is in accordance with the hypothesis and theory proposed by Dornbusch and Fischer (2008), that GDP is defined as national income, which has a positive influence on inflation. GDP can explain the increase in demand for goods and services produced. The increase in GDP shows an increase in national demand. The increase will be followed by an increase in consumption of the entire community so that it will push up the prices of goods resulting in inflation. The results of this study are strengthened based on facts and data that the GRDP from 2000-2015 continued to increase so that inflation also increased due to the improving economic condition of Aceh and people tending to save their money in the form of investments, savings, deposits and government roles in the economy.

Next, the BI Rate variable has a positive effect on inflation of 2.68%, which means that if the change in the BI Rate increases by 1%, the change in inflation will increase by 2.68%. This result is not in accordance with the hypothesis and theory which says that if inflation pressures increase, Bank Indonesia responds by raising the BI Rate to brake economic activity that is too fast, thereby reducing inflationary pressures (Bank Indonesia, 2013). This research is supported by the results of Langi's (2014)

and Wahyudi (2014) research that the BI Rate has a positive effect on inflation. The results of this study were strengthened based on facts and data that the BI Rate from 2000-2015 continued to increase so that inflation also increased due to the unstable economic conditions of Aceh and the impact of the Federal Reserve policy that raised interest rates and low food productivity.

Seen Unemployment variable illustrates that in the short term the unemployment variable has a positive effect on inflation of 2.11%, which means that if unemployment changes increase by 1%, then changes in inflation will increase by 2.11%. This result is not in accordance with the hypothesis and the theory put forward by A.W. Philips is a trade-off between wages and the unemployment rate. According to his empirical research from 1861 to 1957 in England, a negative relationship was found between wages and the unemployment rate. Phillips's research results are also supported by Tejvan Pettinger (2008) in his empirical study. The results of this study are strengthened based on facts and data that unemployment from 2000-2015 continued to increase so that inflation also increased due to the deteriorating economic condition of Aceh and the results of the agricultural sector could not be absorbed properly into other sectors and the number of working-age population entering the labor market is not able to be absorbed properly, thus causing an increase in the number of unemployed.

Based on short-term equations using the ECM method produces the ECT coefficient which is useful for measuring the response response every period that deviates from the balance (Basuki, 2014). As stated by Gujarati (2004) if the error coefficient of imbalance ECT (Error Correction Term) is statistically significant, it means that the ECM specification model used in the study is valid. ECT probability value = 0.0002 significant at alpha 5% means that the research model is valid, while the negative sign on the ECT coefficient is -1.44% giving an explanation that inflation indicates an adjustment to the instability that occurs in the short term and the speed of error correction to correct the behavior of each variable in the short term in order to reach a new balance (long term) is -1.44%. Therefore if ECT = 0, of course the independent and dependent variables are in equilibrium conditions (Wooldridge, 2002, Baltagi, 2008 Asteriou and Hall, 2011).

CONCLUSION

Based on the results of the research that has been done, it can be concluded that the Gross Regional Domestic Product (GRDP) variable has a positive and not significant effect on inflation in Aceh Province, if the GRDP rises, it will encourage an increase in the inflation rate. Next is the positive and significant variable BI Rate movement towards inflation in Aceh Province. and the unemployment variable has a positive and significant effect on inflation in Aceh Province. This research has stationary and cointegrated data and the model specifications used are accurate and valid, so as to explain the long-term and short-term balance relationships.

Recommendations, people should be wise in spending their money on productive posts such as

investments and deposits, so that the money is not circulated in consumptive places. Bank Indonesia should be able to maintain the stability of interest rates, so that it can withstand the inflation rate and carry out routine supervision of the prices of goods and services on the market. Entrepreneurs can set wages in accordance with prevailing laws and regulations, so that they do not trigger inflation and cause counter-labor and the local government is expected to provide extensive employment and special guidance to sharpen skills or provide capital access for the community to develop or build their businesses.

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