



## ANALYSIS OF MACROECONOMIC FACTORS AFFECTING INVESTMENT IN THE FISHERIES SECTOR IN CIREBON REGENCY

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### KeyWords

keywords: *Investment, Government spending, Economic growth, Inflation, Interest rates*

### ABSTRACT

*Research on the analysis of macroeconomic factors affecting investment in the fisheries sector in Cirebon regency is used to analyze how the relationship of government spending, interest rates, economic growth and inflation to investment in the fisheries sector in Cirebon Regency and what factors affect the level of investment in fisheries sector in Cirebon Regency as well. This research was conducted at the Dinas Kelautan dan Perikanan, Dinas Penanaman Modal dan Pelayanan Perizinan Terpadu Satu Pintu (DPMPTSP), Badan Perencanaan Pembangunan Penelitian dan Pengembangan Daerah (BPPPPD) and Badan Pusat Statistika (BPS) in Cirebon Regency, West Java. The implementation starts from May 15th, 2019 until October 7th, 2019. The method used in this study is to regress existing variables using the Ordinary Least Square (OLS) method. The variables used in this study are investment variables as the dependent variable (Y), government spending variables, economic growth, inflation and interest rates as the independent variable (X). The results of this study indicate that the coefficient of determination (R<sup>2</sup>) is 28 percent, which means that the variable government spending, economic growth, inflation and interest rates (X) affect investment in the fisheries sector in Cirebon Regency (Y) by 28 percent. F-test results show that variable government spending, economic growth, inflation, and interest rates do not influence together (simultaneously) significantly to investment in the fisheries sector in Cirebon Regency. The T-test also concluded that government expenditure variables, economic growth, inflation and interest rates (X) did not significantly influence investment in the fisheries sector in Cirebon (Y).*

## INTRODUCTION

Investment as an expending or financing the capital investment of a company to buy capital goods and also production equipment to increase the ability to produce capital goods and services available in the economy in the future (Sukirno 2013). Investment that increases from year to year will cause the absorption of the workforce to work will be even greater because with high investment the production process increases and the more workforces needed to be worked. Some economists consider that investment establishment is an important factor responsible for the growth and economic development of a country.

According to Sadono Sukirno (2013), economic growth can be defined as the development of activities in the economy which causes the goods and services produced in society increased. Economic growth can be defined as the development of activities in the economy which causes the goods and services produced in society to increase. Factors that influence economic growth include land and other natural wealth, the number and quality of the population and labor, capital goods and the level of technology, then there are social system factors and community attitudes.

Government spending is the entire purchase or payment of goods and services for the national interest, such as the purchase of weapons and equipment of government offices, construction of roads and dams, salaries of civil servants, armed forces, and others. Meanwhile, according to Suparmoko (2012), government expenditure can be classified as self liquidating, productive, non-self liquidating and productive, direct spending and nonproductive also an outcome which will be saving in the future.

Inflation is an economic phenomenon that related to its major impact on the macroeconomic. Inflation plays an important role in influencing the mobilization of funds through informal financial institutions. Inflation defined as a continuous and persistent increase in general prices of an economy (Susanti 2000).

Interest rate is the amount of interest paid per unit time. In other words, citizens have to pay for opportunities to borrow money. The cost to borrow money is measured in Rupiah or Dollar per year, for every Rupiah or Dollar borrowed is the Investment Interest. Interest can also be interpreted as a price to be paid to customers (who have deposits) with those to be paid by customers to banks (customers who get loans). Based on this understanding, interest rates are divided into two types, namely deposit interest and loan interest. Savings interest is the interest given as a stimulus or repayment for customers who keep their money in the bank. For example giro service, savings interest, and deposit interest. Meanwhile, lending interest is the interest given to the borrowers or the loan credit example price.

## METHOD

The method used in this research is descriptive qualitative and quantitative. The data used are primary data taken by interviewing the respondent and secondary data taken from the relevant department of the respondent used was selected by the purposive sampling method.

### Data Analysis

The analysis used in this research was using the analysis of the Econometrics model, where this method is used to analyze the magnitude of the effects of independent variables on the dependent variable. This method is done by regressing existing variables using the Ordinary Least Square (OLS) method. The problem to be discussed is the extent to which macroeconomic factors such as government spending, interest rates, economic growth, and inflation affect the level of investment in the fisheries sector in Cirebon District using multiple linear analysis. According to Sugiyono (2014) multiple linear regression analysis means predicting how the circumstances (rise or decrease) variables (criterion), if two or more independent variables as predictors factor manipulated (the value). Then multiple linear regression analysis will be done if the minimum number of independent variable are two. According to Sugiyono (2014) the specified multiple linear regression equation is as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Description:

|                                      |  |
|--------------------------------------|--|
| Y                                    | = Fisheries Sector Investment (Rupiah) |
| $\alpha$                             | = Intercept / Konstanta                |
| $\beta_1, \beta_2, \beta_3, \beta_4$ | = Regression Coefficient               |
| X1                                   | = Government Spending (Rupiah)         |
| X2                                   | = Economic Growth (%)                  |
| X3                                   | = Inflation (%)                        |
| X4                                   | = Interest Rates (%)                   |
| $\mu$                                | = term of error                        |

### F-test or Simultaneous test

This test is carried out to find out simultaneously or at the same time as the independent variables significantly influence or not to the dependent variable.

$$F = \frac{R^2 (n - (k - 1))}{(1 - R^2)(K)}$$

Description:

R = Multiple correlation coefficient

K = Number of independent variables

n = Number of Samples

The significance level ( $\alpha$ ) used is 5%, F distribution with degrees of freedom ( $\alpha$ : K-1, n-K). Testing criteria:

If arithmetic  $F \leq F$  table then  $H_0$  is accepted, meaning that the independent variables simultaneously or simultaneously do not significantly affect the dependent variables.

### T-test or Partial test

T-test tests the regression coefficient partially, this test is conducted to determine the significance of the partial role between the independent variables on the dependent variable by assuming that the other independent variables are considered constant.

According to Sugiyono (2014), using the formula

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Description:

t = Distribution

r = Partial correlation coefficient

$r^2$  = Coefficient of determination

n = data amount

(t-test) the results of this calculation are then compared with t tables using an error rate of 0.05. The criteria used are as follows:

- accepted if the value of t arithmetic  $\leq$  t table or the value of sig  $> \alpha$
- rejected if the value of t arithmetic  $\geq$  t table or the value of sig  $< \alpha$

If the acceptance of  $H_0$  occurs, it can be concluded that there is no significant effect, whereas if  $H_0$  is rejected, it means that there is a significant influence.

## RESULTS AND DISCUSSION

The results of data processing with multiple linear regression analysis methods using Eviews software on macroeconomic variables that affect investment in the fisheries sector are as follows:

Dependent Variable: LOG(INVESTASI)  
Method: Least Squares  
Date: 08/24/19 Time: 16:37  
Sample: 2008 2017  
Included observations: 10

| Variable                 | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------------|-------------|-----------------------|-------------|-----------|
| LOG(BELANJA_PEMERINTAH)  | -2.269577   | 2.136613              | -1.062231   | 0.3367    |
| LOG(PERTUMBUHAN_EKONOMI) | -0.089613   | 0.115866              | -0.773419   | 0.4742    |
| LOG(INFLASI)             | -0.037598   | 0.105128              | -0.357637   | 0.7352    |
| LOG(SUKU_BUNGA)          | 0.409350    | 0.413727              | 0.989421    | 0.3679    |
| C                        | 7.569286    | 4.916339              | 1.539618    | 0.1843    |
| R-squared                | 0.282087    | Mean dependent var    |             | 2.320175  |
| Adjusted R-squared       | -0.292244   | S.D. dependent var    |             | 0.071402  |
| S.E. of regression       | 0.081168    | Akaike info criterion |             | -1.877738 |
| Sum squared resid        | 0.032941    | Schwarz criterion     |             | -1.726445 |
| Log likelihood           | 14.38869    | Hannan-Quinn criter.  |             | -2.043705 |
| F-statistic              | 0.491157    | Durbin-Watson stat    |             | 2.641174  |
| Prob(F-statistic)        | 0.744663    |                       |             |           |

**Tabel 1.** Interpretation of the Multiple Linear Regression Model

The results of the Multiple Linear Regression Test using Eviews obtained the regression equation model as follows:

$$\ln Y = \ln 7,56 - \ln 2,26X_1 - 0,08X_2 - 0,03X_3 + 0,40X_4$$

$$t = (1,53) \quad (-1,06) \quad (-0,77) \quad (-0,35) \quad (0,98)$$

$$R^2 = 0,28$$

From the test results above, it is obtained that the coefficient of determination ( $R^2$ ) of 0.28 or 28 percent of the figure means that independent variables such as government spending ( $X_1$ ), economic growth ( $X_2$ ), inflation ( $X_3$ ), and interest rates ( $X_4$ ) affect the investment in the fisheries sector ( $Y$ ) in Cirebon Regency by 28%.

### Classic assumption test

#### Multicollinearity Test

The results of the Multicollinearity Test using Eviews software are as follows:

Variance Inflation Factors  
Date: 08/24/19 Time: 16:42  
Sample: 2008 2017  
Included observations: 10

| Variable                 | Coefficient Variance | Uncentered VIF | Centered VIF |
|--------------------------|----------------------|----------------|--------------|
| LOG(BELANJA_PEMERINTAH)  | 4.565115             | 36675.63       | 1.163854     |
| LOG(PERTUMBUHAN_EKONOMI) | 0.013425             | 5.676147       | 1.648087     |
| LOG(INFLASI)             | 0.011052             | 5.074780       | 1.680385     |
| LOG(SUKU_BUNGA)          | 0.171170             | 13.32266       | 2.257755     |
| C                        | 24.17039             | 36687.12       | NA           |

**Tabel 2.** Multicollinearity Test

Multicollinearity test results can be seen in the centered VIF table. VIF values for variables of government expenditure, economic growth, inflation, and interest rates are respectively 1.16, 1.64, 1.68 and 2.25. This value shows that there is no multicollinearity in the variables of economic growth, government spending, inflation, and interest rates. Based on the classical linear regression

assumption test requirements with the Ordinary Least Square (OLS) method, the terms of a good linear regression model are those that are free from the presence of multicollinearity.

### Autocorrelation Test

The autocorrelation test aims to test whether in the linear regression model there is a correlation between the error of the intruder in the t period and the error of the intruder in the t-1 period (before). If there is a correlation, then it is called an autocorrelation problem (Ghozali 2011).

Breusch-Godfrey Serial Correlation LM Test:

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 1.307941 | Prob. F(2,3)        | 0.3904 |
| Obs*R-squared | 4.658007 | Prob. Chi-Square(2) | 0.0974 |

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 08/24/19 Time: 16:46

Sample: 2008 2017

Included observations: 10

Presample missing value lagged residuals set to zero.

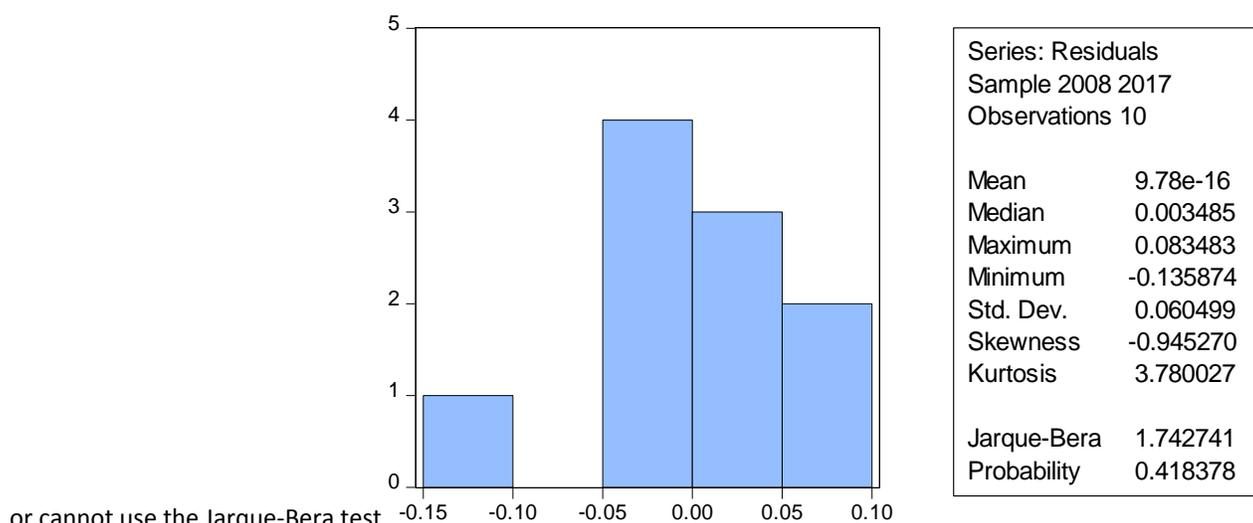
| Variable                 | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------------|-------------|-----------------------|-------------|--------|
| LOG(BELANJA_PEMERINTAH)  | 0.083555    | 2.055992              | 0.040640    | 0.9701 |
| LOG(PERTUMBUHAN_EKONOMI) | -0.022864   | 0.110304              | -0.207278   | 0.8491 |
| LOG(INFLASI)             | 0.101961    | 0.162821              | 0.626217    | 0.5756 |
| LOG(SUKU_BUNGA)          | 0.170570    | 0.639589              | 0.266686    | 0.8070 |
| C                        | -0.117229   | 4.740037              | -0.024732   | 0.9818 |
| RESID(-1)                | -1.009432   | 0.686480              | -1.470447   | 0.2378 |
| RESID(-2)                | -0.709688   | 0.862795              | -0.822545   | 0.4711 |
| R-squared                | 0.465801    | Mean dependent var    | 9.78E-16    |        |
| Adjusted R-squared       | -0.602598   | S.D. dependent var    | 0.060499    |        |
| S.E. of regression       | 0.076588    | Akaike info criterion | -2.104724   |        |
| Sum squared resid        | 0.017597    | Schwarz criterion     | -1.892914   |        |
| Log likelihood           | 17.52362    | Hannan-Quinn criter.  | -2.337079   |        |
| F-statistic              | 0.435980    | Durbin-Watson stat    | 2.231069    |        |
| Prob(F-statistic)        | 0.822081    |                       |             |        |

**Tabel 3.** Autocorrelation Test

Breusch Godfrey Serial Correlation LM Test results, we know that the value of Prob. F (2.3) of 0.39 can also be called the calculated F probability value. Prob value F count is greater than the alpha level of 0.05 (5%) so based on the hypothesis test,  $H_0$  is accepted, which means no autocorrelation.

### Normality Test

The normality test is used to test whether in the regression model the confounding variable has a normal distribution. The normality test referred to in the classical assumption of the Ordinary Least Square (OLS) approach is the residual data formed by the normal linear regression model, not the independent variable or the dependent variable. Testing of residuals is normally distributed



or cannot use the Jarque-Bera test.

Grafik 1. Normality Test

Decisions are distributed whether or not normally residuals are simple by comparing the JB Probability (Jarque-Bera) count with an alpha level of 0.05 (5%). If Prob. JB count is greater than 0.05, it can be concluded that the residuals are normally distributed and vice versa, if the value is smaller then there is not enough evidence to state that the residuals are normally distributed. Prob value JB count is  $1.74 > 0.05$  so it can be concluded that the residuals are normally distributed which means the classical assumptions about normality have been fulfilled.

### Heteroscedasticity Test

According to Ghozali (2013) Heteroscedasticity Test aims to test whether in the regression model there is an unequal variance from the residuals of one observation to another, if the variance of the residuals of one observation to another is different then it is called heteroscedasticity. Heteroscedasticity test can be seen in table 4. As follows:

Heteroskedasticity Test: Glejser

|                     |          |                     |        |
|---------------------|----------|---------------------|--------|
| F-statistic         | 3.612175 | Prob. F(4,5)        | 0.0958 |
| Obs*R-squared       | 7.429134 | Prob. Chi-Square(4) | 0.1149 |
| Scaled explained SS | 5.157388 | Prob. Chi-Square(4) | 0.2715 |

Test Equation:  
Dependent Variable: ARESID  
Method: Least Squares  
Date: 08/24/19 Time: 16:49  
Sample: 2008 2017  
Included observations: 10

| Variable                 | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------------------|-------------|------------|-------------|--------|
| C                        | -4.430394   | 1.770610   | -2.502184   | 0.0543 |
| LOG(BELANJA_PEMERINTAH)  | 1.944480    | 0.769497   | 2.526949    | 0.0527 |
| LOG(PERTUMBUHAN_EKONOMI) | 0.109327    | 0.041729   | 2.619927    | 0.0471 |
| LOG(INFLASI)             | -0.007825   | 0.037862   | -0.206663   | 0.8444 |
| LOG(SUKU_BUNGA)          | -0.205511   | 0.149003   | -1.379241   | 0.2263 |

|                    |          |                       |           |
|--------------------|----------|-----------------------|-----------|
| R-squared          | 0.742913 | Mean dependent var    | 0.040400  |
| Adjusted R-squared | 0.537244 | S.D. dependent var    | 0.042972  |
| S.E. of regression | 0.029233 | Akaike info criterion | -3.920217 |
| Sum squared resid  | 0.004273 | Schwarz criterion     | -3.768925 |
| Log likelihood     | 24.60109 | Hannan-Quinn criter.  | -4.086185 |
| F-statistic        | 3.612175 | Durbin-Watson stat    | 3.071044  |
| Prob(F-statistic)  | 0.095753 |                       |           |

Tabel 4. Heteroscedasticity Test

The decision whether or not heteroscedasticity occurs in the linear regression model is by looking at the value of Prob. F-statistics (F arithmetic). If Prob. F arithmetic is greater than the alpha level of 0.05 (5%) then  $H_0$  is accepted, which means there is no heteroscedasticity, whereas if the Prob value. F arithmetic is smaller than the alpha level of 0.05 (5%) then  $H_0$  is rejected, which means heteroscedasticity occurs. The value of Prob F arithmetic is 0.09 which means greater than the alpha level of 0.05 (5%) so that based on the hypothesis test,  $H_0$  is accepted, which means there is no heteroscedasticity.

## Government Spending

The analysis shows that the value of the government spending regression coefficient is negative. This means that the higher the government spending, the lower the investment on fisheries sector in the Cirebon district. The coefficient value of the government spending regression is -2.26 percent. This value means that if there is an increase in government spending by 1 percent there will be a decrease in investment in the fisheries sector in Cirebon district by -2.26 percent. This data is also supported by the results of a partial hypothesis test (T-test) on the investment value of the fisheries sector in Cirebon district which shows a value of 0.33, of course the value is greater than the value of  $\alpha$  (0.05) which means that government spending has no significant effect to investment in the fisheries sector in Cirebon district.

## Economic Growth

The results of the analysis using Eviews shows that the regression coefficient of economic growth is negative. It can be seen from Table 9 that shows the regression coefficient of economic growth value is - 0.08 means that for every 1% increase in economic growth, investment in the Cirebon district fisheries sector will decrease by 0.08 percent.

In theory, economic growth can significantly influence the value of investment. However, technically and practically this can have the opposite effect. The value of economic growth is not only determined by the value of investment but also influenced by the workforce and technological advances related to one another.

Furthermore, the second factor causing the results of the calculation of economic growth to have a negative effect on investment is due to the fact that investment data recorded is unclear whether an investment is operating or not, because not all direct investments produce products that are part of Gross Domestic Product (GDP) which can be used as a calculation in calculating economic growth.

Then for the third factor is because the installation of t-year economic growth data with t-year investment data also means that t-year economic growth will have an impact on t-year investment as well. For small-scale investments such as the culinary field it might be right, but for investments in large fields such as the fisheries sector which is considered to be the primary sector would be extremely unreasonable. Generally, those who study the effect of investment on economic growth will directly link investment with economic growth in the same year. For example, investment in 2008 with economic growth in 2008 as well, investment in 2009 with economic growth in 2009 as well and so on. However, the reality is not yet clear whether the 2008 economic growth was due to investment realization that year. Perhaps economic growth in 2008 was affected by various investments in a number of years. On the other hand, investment in 2008 will mostly affect economic growth in the next two, three, four years.

## Inflation

The calculation results show that the inflation variable has a negative effect on the inflation value of the fisheries sector in Cirebon District. This is indicated by the value of the regression coefficient which shows the number -0.03. This value means that for every 1 percent increase in inflation, a decline in the value of investment in the fisheries sector in Cirebon is equal to - 0.03 percent. Hypothesis testing using the t-test between inflation and investment variables shows that the value of the inflation variable does not significantly influence the investment value of the fisheries sector in Cirebon District which has a value of 0.73 whose value is greater than the value of  $\alpha = 0.05$ . According to Ratih (2011), the inflation rate does not have a large impact on investment flows entering Indonesia. This indicates that foreign investors have less influence with expectations made on the basis of inflation so that whether or not inflation becomes a normal condition.

The results of this study also support a study (Gharaibeh 2015) entitled "The Determinants of Foreign Direct Investments-Empirical Evidence from Bahrain" The results of this study are "inflation variables do not significantly influence foreign direct investment into Bahrain". In the study of Alhamsymi (2010) explains that inflation partially cannot significantly influence foreign direct investment. Investment can be influenced by several variables, such as the destination country's environment, human resources, natural resources, political conditions.

## Interest Rate

The results of the estimated regression model show that the interest rate regression coefficient has a positive effect on investment in the fisheries sector in Cirebon District. As shown in table 9, the interest rate regression coefficient is 0.40, meaning that for every 1 percent increase in interest there will be an increase in investment of 0.40 percent. However, at the partial test (T-test) between the interest rate variable and the fisheries sector investment variable shows that the interest rate does not significantly influence the investment of the fisheries sector in Cirebon District which is worth 0.36 greater than the value of  $\alpha = 0,05$ .

Many economists who follow Keynes emphasize that the interest rate is not a critical variable in determining investment demand. According to them the critical variable is the variable that determines the expected profit and is known as the "Marginal Efficiency of Investment". They argue that investment demand is inelastic to the interest rate. This means that changes in interest rates bring about small changes in investment demand. The rationale is that the expected return on investment will decline rapidly if the interest rate increases. But investment demand is expected to change if factors other than the interest rate experience changes.

## Hypothesis testing

**T-Test (Partial Test)** T-test is used to determine whether there is an effect of each independent variable partially (individually) on the dependent variable tested at the 0.05 significance level. According to (Ghozali 2013) t test is a test used to partially test hypotheses in order to show the effect of individual independent variables on the dependent variable. T test is a regression coefficient testing of each independent variable on the dependent variable to find out how much influence the independent variable has on the dependent variable.

T test results of government spending can be indicated by the value of the probability of government spending in table 9. Which shows the value of 0.33 or greater than the value of  $\alpha$  (0.05). This shows that the variable government spending does not significantly influence investment in the fisheries sector in Cirebon District. Then for the variable economic growth has a value of 0.47 which is certainly still greater than the value of  $\alpha$  (0.05) also means that economic growth has no significant effect on investment in the fisheries sector in Cirebon Regency. For each inflation probability and interest rate values of 0.73 and 0.36, which is still greater than the value of  $\alpha$  (0.05) means that the value of inflation and interest rates in Cirebon Regency has no significant effect on investment in the fisheries sector in the Cirebon District.

## F-Test (Test of Significance)

According to (Ghozali 2013), the F-Test basically shows whether all independent or independent variables included in the model have a joint influence on the dependent variable. According to the test results listed in Table 9, the F-test or simultan test can be seen from the F value of the statistics which is 0.49. This value is still greater if compared by the value of (0,05). So the conclusion is that government spending, economic growth, inflation and interest rates in Cirebon Regency, do not significantly influence the investment in the fisheries sector in Cirebon Regency.

## Conclusion

The coefficient of determination ( $R^2$ ) in the analysis of macroeconomic factors that affect investment in the fisheries sector in Cirebon Regency is 0.28 or 28 percent. Based on the classical assumption test shows that the equation of the multiple linear regression model does not contain multicollinearity, autocorrelation and heteroscedasticity. And in the normality test in the equation of the regression has been fulfilled. Partial test results (T-test) indicate that the variables of government spending, economic growth, inflation and interest rates do not significantly influence the investment in the fisheries sector in Cirebon Regency. Simultaneous test results (Test F) of government spending, economic growth, inflation and interest rates in Cirebon regency, do not significantly influence the investment in the fisheries sector in Cirebon regency at the same time.

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