DETERMINANT OF INDONESIAN PLANTATION INDUSTRY INVESTMENT ERA 4.0

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ABSTRACT

The plantation management, its performance are determined by its productivity which is influenced by both internal and external factors. The objectives of this study are to determine the effect of inflation, interest rates, exchange rates, and infrastructure on plantation investment in Indonesia, to determine which factors are dominant in plantation investment, and to determine the effect of plantation investment on the gross domestic product of plantations in Indonesia. The method of determining the research area was carried out purposively, namely plantations in Indonesia. This study uses secondary data from annual data from 1990 to 2019 with OLS multiple linear regression data analysis methods. The results of this research are that simultaneously, the variables of inflation, interest rates, exchange rates, and infrastructure have a significant effect on plantation investment in Indonesia. Partially, the inflation and interest rate variables have a negative non-significant effect on investment, while the exchange rate and infrastructure variables have a positive significant effect on plantation investment. Infrastructure is a dominant factor. Investment has a positive significant effect on plantation GDP. The findings of his research are that plantation investment is resistant to shocks from fluctuations in inflation and interest rates. The increase in the rupiah exchange rate against the US dollar provides benefits for foreign investment. Infrastructure as a dominant factor is an attraction and a driver for investment. Investment has a strong and large contribution to the formation of GDP for plantations and their productivity.

Contribution/Originality: The paper's primary contribution is finding that the driver and attractor of plantation investment is infrastructure. The originality of this study is to examine the effect of macroeconomic factors i.e. inflation, interest rates, exchange rates, and infrastructure on long-term investment in the plantation industries.

1. INTRODUCTION

With the industrial revolution 4.0, economic activity has undergone major changes. According to Anindita and Reed (2008) technological changes with an open system encourage economic growth. The increase in world trade is the impact of globalization. The determinants of the domestic industry in the agricultural sector in the era of 4.0 in Indonesia are considered important because they have an impact on national development. Some of the things that underlie the development of plantations in Indonesia include the potential for large and diverse natural resources and have a significant effect on national income (Susanty, 2017) with the potential for developing cultivation

technology as well (Susilastuti, 2017). Jahan (2020) states that trade openness, availability of natural resources, economic instability, infrastructure facilities, and the level of financial development are potential determinants of foreign direct investment inflows to developing countries.

Indonesia's plantation commodities are ranked number one in the world, namely oil palm, coconut, and cloves; number two in the world, namely Rubber and Pepper; cocoa is number three in the world, coffee is number four in the world and tobacco is in number six in the world (Informasi Agribisnis, 2018). This shows that nine leading plantation commodities play an important role in trade in world markets. However, the competitiveness of Indonesian plantation commodities is still in the last opportunity quadrant so that the benefits that should be obtained are lost because the average export performance is fluctuating, productivity and quality are still low, unable to maintain export consistency (Teguh, 2011).

The plantation sub-sector is part of the agricultural sector which still has a strategic role in the structure of national economic development, especially in the regions (Susanty, 2017). This strategic role is not only shown by the contribution of the agricultural sector to the national gross domestic product (GDP) but also as a provider of employment. According to Rudianto and Susilastuti (2019) stated that GDP has a positive effect on labor absorption. When the industrial sector and other non-agricultural sectors have not been able to fully absorb the additional labor force, agriculture is often the reservoir. The high number of workers who depend on this sector for their life indicates the importance of the agricultural sector in the framework of efforts to reduce poverty, reduce income inequality, and increase the welfare of the community (Hanafie, 2010). According to Susilastuti (2017) poverty in Indonesia is influenced by productivity in the agricultural sector. Agricultural development in Indonesia is considered important from the overall national development. Murti (2017) states that demand for plantation products drives economic growth, as well as Sophia, Gnych, Dermawan, Komarudin, and Okarda (2017) stated that the demand for plantation products encourages investment and is influenced by macro and institutional policies. Productivity in the agricultural sector, both from plantations and forestry, is influenced by many factors including land area, investment, infrastructure, total production, inflation (Hasibuan, 2019) prices, exchange rates (Olufemi, 2015) interest rates, and government policies (Wang, Bai, Shao, & Cao, 2014).

The main commodity of Indonesia's large plantations is oil palm, whose number of companies has tripled to 693 in 2000 and by 2020 it has grown to 2165 companies. Other commodities are rubber, coconut, coffee, cocoa, cloves, tobacco whose number of companies tends to decline, tea and sugarcane are growing steadily (BPS, 2020; Hasibuan, 2019). However, for smallholder plantations, the commodity of oil palm, rubber, coconut, and tobacco is dominated by increasing numbers (BPS (Center of Statistical Bureau), 2020). The contribution of the plantation sector to Indonesia's GDP fluctuates, tends to decline (BPS., 2020) is presented in Figure 1. This decrease is due to increased contributions from other sectors, namely the non-oil and gas processing industry, services, and large trade (BPS., 2020). The plantation investment rate fluctuates between 0.2-11% with an average of 4%. Plantation GDP growth rate 2-7% with an average of 3.7%, while the national GDP growth rate is 2.97-5.27% with an average of 4.6% (BPS., 2020): processed data). Skufina, Baranov, Shatalova, and Samarina (2015) stated that investment has an effect on GDP in Russia.

Inflation, interest rates and exchange rates are macroeconomic elements that affect economic growth. Salim, Susilastuti, and Rafiqah (2020) states that interest rates and exchange rates affect income and have an impact on the GRDB. Nining (2020) in his research states that inflation and the exchange rate have an effect on electricity investment, and investment affects economic growth as measured by GDP.

Economic growth is driven by infrastructure growth. Infrastructure is input in influencing output and is a possible source within the limits of technological progress that can create externalities in economic development (Jahan, 2020). Infrastructure continues to increase every year with an average growth of 0.5% (BPS., 2020): data processed).
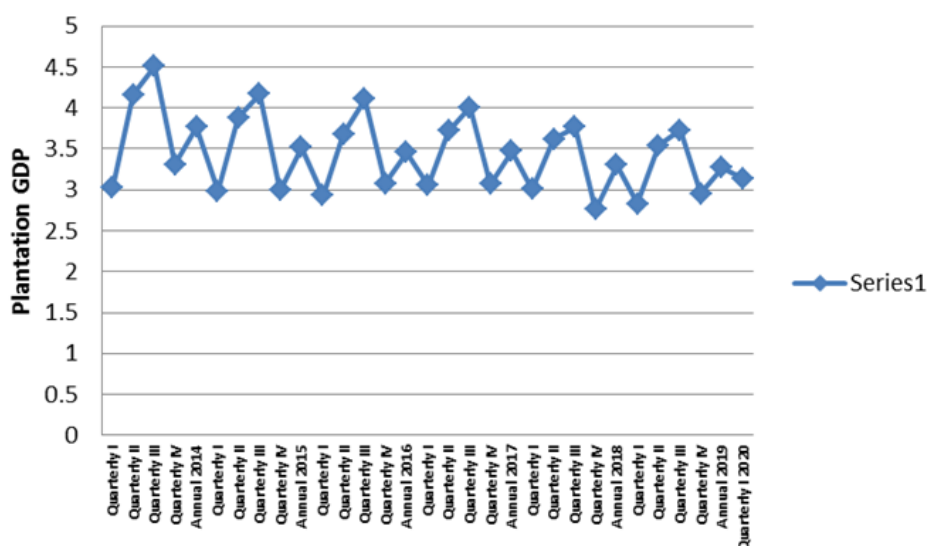
Figure-1. The Distribution of Plantation GDP to Indonesia GDP 2014-2020.
Source: BPS. (2020).

The plantation industry can absorb a large number of workers so that it can reduce the unemployment rate but its performance is still low. Interest rates affect plantation investment, thus high-interest rates can negatively affect plantation investment. Plantation investment is strongly influenced by the rupiah (IDR) exchange rate because most of the plantation products used are imported from abroad, however, the exchange rate can also benefit foreign investors by the strengthening of the US dollar value. Fluctuating inflation affects plantation investment. Thus, high inflation affects plantation investment. Infrastructure greatly affects plantation investment, thus high infrastructure can affect plantation investment. Hasibuan (2019) states that land area, investment, infrastructure, total production, and inflation affect plantation productivity. Furthermore, plantation productivity affects the GRDB, but it is not enough to alleviate poverty.

The comparative competitiveness of Indonesian plantations has not been matched by their competitive competitiveness. The distribution of GDP from the agricultural sector including plantations tends to decline, namely, in 2019 it was only 12.72% below the distribution of the processing industry sector of 17.58%, even though the agricultural sector is able to absorb a larger workforce (BPS., 2020). Investment in the plantation sector in 2019 amounted to 56916.8301 billion IDR, up 50.4% compared to 2015. However, if analyzed from the source of investment, domestic investment increased by 252%, while from the foreign investment it decreased by 91.3% (BPS, 1991-2020, processed data). This shows that there are factors driving and inhibiting plantation investment. Plantation industry investment has a high risk (Ministry of Agriculture, 2015; Susanty, 2017) apart from being influenced by economic factors, it is also influenced by environmental ecological factors, the nature of perishable agricultural products, regulations, and technology. Thus, it is necessary to study the factors that influence plantation investment.

Indonesia as an agricultural country in the current era of technology 4.0, still fluctuating plantation productivity, it is necessary to know the economic factors that influence it, given the potential of natural resources, human resources, tropical climate that provides full sunshine, and cultivation technology is very available to be developed. High plantation productivity can not only increase income from exports, meet domestic demand, but also alleviate poverty.

The problems of this research are: (1). How are the simultaneous and partial effects of inflation, interest rates, exchange rates, and infrastructure on plantation investment in Indonesia?; (2) What are the dominant factors for plantation investment in Indonesia?; and (3) How does plantation investment affect the plantations' gross domestic product.

2. LITERATURE REVIEW

2.1. Theoretical Basis

Economic development is caused by changes, especially in the industrial and trade fields (Todaro & Smith, 2006). The relationships between aggregative variables in economic development (Pyndyck & Rubenfeld, 2009) include Level of national income; Household consumption; National investment; Savings rate; Government spending; Price level; The amount of money circulating in society; Interest rate earned; Job opportunities and employment opportunities; Balance of payments; and Export and import.

The government's macroeconomic aggregate formulation policy must be adjusted to the objectives or targets that must be achieved with the policies to be made. Therefore, before deciding on a policy, the targets and objectives to be achieved are first determined, so that the policy can run as expected. The macroeconomic assumption is the main indicator that used to be guided in budget formulation. In Indonesian, there is GDP, growth, inflation, exchange rate, interest rate, ICP (Indonesian Crude Price), oil lifting production, and gas lifting production (Ministry of Finance, 2019).

Pyndyck and Rubenfeld (2009) state that production is the change of two or more inputs resources into one or more outputs (products). In agriculture, production is the essence of an economy. To produce, several inputs are required, namely the presence of capital, power. work and technology. Thus, there is a relationship between production and input in the form of maximum output produced by certain inputs or what is called the production function (Murti, 2017).

2.2.1. Plantation

Plantation (estate; orchard) are all activities that cultivate certain plants on the soil and/or other growing media in a suitable ecosystem, process and market goods, and services from these plants, with the help of science and technology, capital, and management to realize welfare for plantation business actors and the community. Plant commodities in the plantation business can be grouped as industrial plants that are cultivated intensively and in monoculture, among others, rubber, oil palm, tea, coffee, cacao, pepper, vanilla, and others; horticultural plants such as orchids, roses, oranges, mangosteen and others; and not a forest plant or staple food plant (Ministry of Agriculture, 2015).

Small-scale plantation businesses are cultivated by the farmers known as people's plantations, while on a large scale (t Company) in the form of a corporate (BPS, 2020).

2.2.2. Inflation

Inflation is an event that describes situations and conditions where the price of goods has increased and the value of the currency has weakened. According to Samuelson and Nordhaus (2005) inflation is a condition where there is an increase in the general price level, both goods, services, and production factors. Inflation that occurs continuously will result in a deterioration of the overall economic condition and be able to shake the political stability of a country. Inflation is a dangerous thing for the economy because it can have an effect that is difficult to overcome and even ends in a situation that can overthrow the government. According to UMN (2016) inflation encourages unemployment, decreases purchasing power, and increases the price of goods. Based on the Philips Curve Theory, short-term inflation is influenced by economic activity, inflation expectations, supply shocks, and exchange rates (Syarifuddin, 2017; UMN, 2016).

2.2.3. The Interest Rate

The interest rate is the price of the loan. Interest rates are expressed as a percentage of the principal per unit of time. Interest is a measure of the price of resources used by debtors to be paid to creditors (Sunariyah, 2004). In

Indonesia itself, the benchmark interest rate is the BI (Indonesian Bank) rate (Hasanah & Priantina, 2017). Interest rates are a determinant of the export of many products (Rudianto & Susilastuti, 2019).

2.2.4. The Exchange Rate

The exchange rate is the price in the exchange between 2 different currencies, there will be a comparison of the value or price between the two currencies. This comparison is called the exchange rate (Nopirin, 2012). The exchange rate is important because it is linked to inflation, foreign trade, and foreign debt payments (Syarifuddin, 2017). Exchange rates are a difficult economic variable. predictable. Exchange rate risk is partly a source of uncertainty using foreign currency (Bodie, Kane, & Marcus, 2009) or international investment.

2.2.5. Infrastructure

Infrastructure is a physical system that provides means of transportation, drainage, irrigation, buildings, and other public facilities, which these facilities are needed to meet various economic and social needs. Non-physical infrastructure includes administrative services, easy access to information, regulations, and security (Hanafie, 2010). Infrastructure is a form of public capital formed from government investment (Mankiw, 2009) and as a basic essential service in the development process (Falomi, 2004). According to Jahan (2020) infrastructure is one of the determining factors for Foreign Direct Investment beside are trade openness, availability of natural resources, economic instability, and the level of financial development. The infrastructure supports economic growth which is an important consideration that can affect the smooth distribution of output to consumers. Good infrastructure, such as the length of roads, can shorten the production process to distribution to consumers, making activities efficient.

2.2.6. Plantation Investment

Plantation investment is an activity of placing funds in a certain period in the hope that the use of these funds can generate profits and increase the value of plantation investment. According to Bodie et al. (2009) investment is several funds spent by the business sector to increase capital stock in a certain period, which is the placement of several funds at this time with the hope of obtaining future profits. Investment is defined as the expenditure or capital expenditure of a company to buy capital goods and production equipment to increase production capacity (Sukarno, 2012). Short and long term investment, is important because it affects the rate of economic growth, that is, it affects the long-term aggregate supply. Sources of investment come from the government and private both domestic and foreign (UMN, 2016).

Plantation investment, especially large-scale plantations, is an international investment. According to Bodie et al. (2009) international investment is not only influenced by exchange rates but also country-specific. Plantation commodities have specific characteristics as well, this affects investment policy.

2.2.7. Gross Domestic Product

Gross Domestic Product (GDP) is the monetary value of all goods produced by a country in a certain period. The GDP is generally calculated in an annual period. GDP is used as an indicator of the good or bad of the country's economy as well as a measure of the welfare of the people in that country. According to Eliza (2013) gross domestic product is good at describing economic growth because it shows a measure of productivity and economic prospects. Dynan and Sheiner (2018) should be viewed as a measure of aggregate economic well-being. GDP concept available through the national accounts is useful and of itself and should provide a great deal of information that is closely related to welfare.

An increase in real GDP can represent national income and will increase the amount of investment. The narrow agricultural GDP for the 2000 base year includes food crops, plantation crops, livestock, and their products

with 9 business fields in Indonesia. Meanwhile, starting from 2015 with the base year 2010, GDP Agriculture covers 17 business fields with details of the narrow agricultural sector including food crops, horticultural crops, plantation crops, livestock, as well as agricultural and hunting services (Ministry of Agriculture, 2015).

2.2. Research Framework

The plantation industry can absorb a large number of workers so that it can reduce the unemployment rate but its performance is still low. Interest rates affect plantation investment, thus high-interest rates can harm plantation investment. Plantation investment is strongly influenced by the rupiah exchange rate because most of the plantation products used are imported from abroad. Fluctuating inflation affects plantation investment. Thus, high inflation affects plantation investment. Infrastructure greatly affects plantation investment, thus high infrastructure can affect plantation investment. The following is a schematic framework for the relationship between variables in the study as shown below Figure 2:
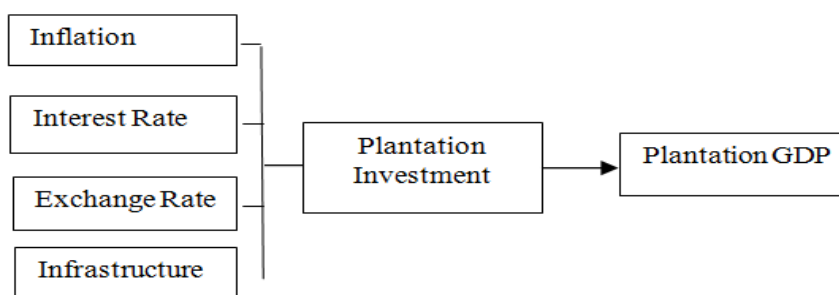

Figure-2. Framework for Relationship between Variables.

2.3. Research Hypothesis

Based on the description above, the research hypothesis is structured as follows: (1). There are simultaneous and partial effects of inflation, interest rates, exchange rates, and infrastructure on plantation investment in Indonesia; (2). It is suspected that exchange rates and infrastructure are dominant in plantation investment in Indonesia; and (3). There is a positive effect of plantation investment on the gross domestic product of plantations in Indonesia

3. RESEARCH METHODS

The independent variables are Inflation (X1), Interest Rates (X2), Exchange rate IDR against US Dollars (X3), and Infrastructure (X4). Plantation Investment (Y) and Plantation Gross Domestic Product (Z) as the dependent variable. The secondary data for the annual time series were purposively determined from 1990 to 2019 so that the sample amounted to 30.

The research method uses multiple linear regression with the following model formulations:

Model 1 : $Y = b_o + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + e$ (1)

Information:

      Y   = dependent variable, namely plantation investment.

      x1   = Inflation Rate, independent variable.

      x2   = Interest Rate, independent variable.

      x3   = Exchange Rate, independent variable.

      x4   = Infrastructure, independent variable.

      Bo   = intercept.

      b1… .b4 = Estimated parameter.

Model 2 : $Z = b_o + b_1 \hat{y}$ (2)

Information:

ŷ = Plantation Investment (recursive).

Z = GDP Plantation.

The classical assumption test uses The Normality Test, The Multicollinearity Test, The Heteroscedasticity Test, and The Autocorrelation Test, while the hypothesis test uses the F-test and the t-test. The Determination test is to test the Goodness of Fit, while the determination of the dominant factor using Beta Value (β Standardized Coefficients). Cointegration testing to avoid spurious regressions is done by Augmented Dickey-Fuller (ADF) Test (Gujarati & Porter, 2012).

4. RESULT AND DISCUSSION

Based on the Data Normality Test with the Jarque-Bera Method, the Multicollinearity Test with the Variance Inflation Factors Correlation Matrix, the Heteroscedasticity Test with the White Method, and the Autocorrelation Test with the Lagrange Multiplier Test, all variables have met the conditions and passed the classical assumption test. Based on the Unit Root Test, all Model 1 and Model 2 variables are stationary at a second difference at $\alpha = 5\%$. The cointegration test results with the ADF Test state that the regression equation Model 1 is cointegrated at $\alpha = 10\%$. and the regression equation Model 2 is cointegrated at all α (Table 1). This means that the two equations are cointegrating regressions that have long-term equilibrium and meaningful (Gujarati & Porter, 2012).

Table-1. Augmented Dickey-Fuller (ADF) Test Model 1 and Model 2.

Model 1			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-2.928451	0.0543
Test critical values:	1% level		-3.679322	
	5% level		-2.967767	
	10% level		-2.622989	
Model 2			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.180921	0.0004
Test critical values:	1% level		-3.769597	
	5% level		-3.004861	
	10% level		-2.642242	

Note: *MacKinnon (1996) one-sided p-values.

4.1. Hypothesis Test

4.1.1. Hypothesis Testing Model 1

Hypothesis testing model 1, namely whether there is a significant effect either simultaneously or partially on the inflation variable, interest rates, exchange rates, and infrastructure on plantation investment in Indonesia. The test results are presented in the following table:

Table-2. F-test and t-test Model 1.

Dependent Variable: Log(Y_Plantations_Investment)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.123738	0.015945	7.760298	0.0000
LOG(X1_INFLATION_RATE)	-0.000526	0.000379	-1.389065	0.1771
LOG(X2_INTEREST_RATE)	-7.61E-05	0.001006	-0.075678	0.9403
LOG(X3_EXCHANGE_RATE)	0.013659	0.000370	36.91992	0.0000
LOG(X4_INFRASTRUCTURE)	0.982632	0.001320	744.6978	0.0000
R-squared	0.999984			
Adjusted R-squared	0.999982			
F-statistic	402189.0			
Prob. (F-statistic)	0.000000			

1). F-Test

The results of the calculations in Table 2. A probability value of F-stat $0.000000 \leq 0.05$, meaning that inflation, interest rates, exchange rates, and infrastructure simultaneously have a significant effect on plantation investment.

2). t-Test

Based on Table 2, it can be concluded:

a) Inflation Effect: the probability value is greater than α (0.17771> 0.05), it is concluded that the Inflation variable has no significant effect on Plantation Investment in Indonesia 1990-2019.

b) Effect of Interest Rates: probability value is greater than α (0.9403> 0.05), it is concluded that the Interest Rate variable has no significant effect on Plantation Investment.

c) Exchange Rate Effect: the probability value is smaller than α (0.0000 <0.05), it is concluded that the Exchange Rate variable has a significant effect on Plantation Investment in Indonesia 1990-2019.

d) Influence of Infrastructure: the probability value is smaller than α (0.0000 <0.05), it is concluded that the infrastructure variable has a significant effect on plantation investment in Indonesia.

3). Analysis of the Coefficient of Determination (R^2) and Beta

In Table 2, the Adjusted R^2 value of 0.99 shows that the influence of inflation, interest rates, exchange rates, infrastructure on plantation investment in Indonesia is very strong with a contribution of 99%. While the remaining 1% is the influence of other factors outside of research.

The magnitude of the contribution of the independent variable partially to the dependent variable by calculating the value of the Beta coefficient (β Standardized Coefficients), if the coefficient is greater than 0.5 or 50% then the variable is declared as the dominant variable or has a large contribution. Based on Table 3, it can be seen that the Infrastructure variable with a β value of 0.94 or 94% has the greatest influence on investment and can be stated as the dominant factor.

Table-3. Independent variable beta coefficients.

No.	Independent Variable	Beta Value (β Standardized Coefficients)
1	Inflation	–0.002
2	Interest Rate	0.000
3	Exchange Rate	0.047
4	Infrastructure	0.964

4). Multiple Linear Regression Analysis

Based on Table 2, the Multiple Regression Equation is:

Y = 0,1223738 -0,000526 X1-7,61E-05X2+0,013659X3+0,982632X4 (3)

The interpretation of the regression equation is as follows:

a. Constant Value = 0.1223738, meaning that if all ceteris paribus variables or value = 0, then plantation investment is 0.1223738 units.

b. The value of the Inflation Regression Coefficient = - 0.000526, which means that inflation increases by 1 unit, assuming that the other independent variables are constant, the Plantation Investment will decrease by 0.000526 units.

c. The Interest Rate Regression Coefficient = -7.61E-05, meaning that the Interest Rate increases by 1 unit, assuming the other independent variables are constant, the Plantation Investment decreases by -7.61E-05 units.

d. The Exchange Rate Regression Coefficient = 0.013659, meaning that the Exchange Rate increases by 1 unit, assuming the other independent variables are constant, the Plantation Investment will increase by 0.013659 units.

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e. The value of the Infrastructure Regression Coefficient = 0.982632, which means that infrastructure increases by 1 unit, assuming the other independent variables are constant, the Plantation Investment will increase by 0.982632 units.

4.1.2. Hypothesis Testing Model 2

This test tests model 2, namely whether there is a significant effect both simultaneously and partially on the plantation investment variable (recursively) on the GDP of Indonesian plantations. The test results are presented in the following table:

Table-4. F-test and t-test Model 2.

Dependent Variable: LOG(Z2_PLANTATIONS_GDP)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-78.81291	6.514727	-12.09765	0.0000
LOG(Y_INVESTMENT_RECURSIVE)	6.906469	0.503318	13.72188	0.0000
R-squared	0.870544			
Adjusted R-squared	0.865921			
F-statistic	188.2899			
Prob.(F-statistic)	0.000000			

Based on Table 4, the probability value of plantation investment is smaller than α (0.0000 <0.05), it is concluded that the investment variable has a significant effect on the GDP of plantations in Indonesia in 1990-2019. The Adjusted R^2 value of 0.87 shows that the contribution of the influence of plantation investment on the GDP of plantations in Indonesia is very strong with a contribution of 87%. While the remaining 13% is the influence of other factors outside of research.

Based on Table 4, the Linear Regression Equation is: Z = -78.81291 + 6,906469 ŷ . The interpretation is: (1). Constant value = -78.81291 means that if the variable ŷ ceteris paribus or has a value of = 0, then the GDP of the plantation is -78.81291 units, and (2). The Coefficient of Plantation Investment Regression Coefficient = 6.906469, which means that investment has increased by 1 unit, then the GDP of the Plantation has increased by 6.906469 units.

4.3. Discussion

4.3.1. Simultaneous and Partial Effects of Inflation, Interest Rates, Exchange Rates, and Infrastructure on Plantation Investment in Indonesia.

Plantation investment is influenced by inflation, interest rates, exchange rates, and infrastructure variables simultaneously with an Adjusted R^2 value of 0.99. This means that both in the short and long term, inflation, interest rates, exchange rates, and infrastructure are very important and play a role in increasing investment in the plantation sub-sector in Indonesia. The role of the plantation sub-industry, in this case, is as an absorber of work, a provider of industrial and export raw materials, as well as a foreign exchange earner. This is supported by the opinion of UMN (2016) which states that investment, both short and long term, is important because it affects the rate of economic growth, that is, it affects long-term aggregate supply. This is by the opinion of Wang et al. (2014); Olufemi (2015) and Hasibuan (2019) which state that investment is influenced by macroeconomic factors, internal state/company factors, and government policies.

Partially, inflation and interest rates have a negative insignificant effect, this means that investment in the forestry sub-sector is not affected by fluctuations in inflation or interest rates, or it can be said as resistant to shocks to inflation and interest rates. However, if inflation and interest rates increase uncontrollably, it will reduce investment. According to UMN (2016) and Syarifuddin (2017) inflation encourages unemployment, decreases purchasing power and increases the price of goods, and is influenced by economic activity, thus affecting the

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investment climate. Likewise, interest rates, investment originating from bank loans will be negatively affected by an increase in loan interest rates

While the exchange rate, partially has a positive significant effect on investment. The increase in the IDR exchange rate against the US dollar caused a weakening of the IDR against the US dollar. This will benefit foreign investors. For foreign investors, the increase in the IDR exchange rate against the US dollar is an advantage because the investment is in the form of US dollars (Nining, 2020). However, this condition is generally only in the short term and the government will always try to strengthen the IDR value because this will greatly affect the short-term economic balance, foreign debt payments of international trade, and international investment (Bodie et al., 2009; Syarifuddin, 2017) it can even lead to recessions and economic crises.

The infrastructure variable partially has a positive significant effect on investment. The Infrastructure variable has the biggest Beta value (β Standardized Coefficients) is which is 0.96. This shows that if infrastructure improves in the short and long term it will increase investment and is a determining factor for investment. In this case, infrastructure, both physical and non-physical (Jahan, 2020; Sophia et al., 2017) plays a role both as a pulling factor and a driving force for investment, according to the research of Musyoka and Ocharo (2018). According to Jahan (2020) infrastructure is one of the determining factors for Foreign Direct Investment besides trade openness, availability of natural resources, economic instability, and the level of financial development.

Based on the explanation above, it can be stated that plantation investment is resistant to shocks of fluctuation in inflation and interest rates, however, increasing inflation and interest rates can reduce investor interest. While an increased Exchange Rate and Infrastructure can attract investors, and infrastructure is the main driver of investment.

The advantages of infrastructure that provide production infrastructure and ease of administration are attractive to investors (Jahan, 2020; Sophia et al., 2017). Infrastructure as an input in influencing output as well as a possible source within the limits of technological progress that can create externalities on economic development (Astuty & Siregar, 2018). In the 4.0 Industrial Era, inclusive information technology that stretches widely encourages the era of the digital economy which is a 'sharing economy' which will lift many companies to enter the world business (Juditha, 2017).

Sources of investment are government investment and private investment which consists of foreign investment or domestic investment (Sukarno, 2012; UMN, 2016). Various investment policies have been issued by the Indonesian government to stimulate investment in equipment and machinery import tax exemptions (BKPM, 2020) however investment in the agricultural sector is generally still low in value, this is due to lower profits and greater risks (Hanafie, 2010). The factors inhibiting investment include limited infrastructure, unclear local government policies, unclear tax system, unclear trade and customs procedures, high labor wages, and low labor productivity.

4.3.2. The Effect of Investment on Plantation GDP

Investment has a significant positive effect on plantation GDP with an adjusted value of $R^2 = 0.87$, indicating that the effect of investment on plantation GDP is very strong with a contribution of 87%. The magnitude of the negative intercept constant indicates that if there is no investment, the formation of plantation GDP will be very low. Partially, investment decisions will affect the GDP of plantations with a contribution of 87%. This is by the research results of Chenggang et al. (2016) stated that investment decisions have a positive and significant effect on GDP. This shows that the ability to maximize investment to generate profits will have an impact on the GDP of plantations. Plantation investment that is carried out can show that the activity of placing funds in a certain period by using these funds can generate profits and increase the value of plantation investment (Hanafie, 2010; Hasibuan, 2019). The yield of plantation investment is a plantation commodity that has specific characteristics and affects the GDP of plantations.

The increase in investment is believed to have contributed to boosting the economic development of a nation. In the macro-economy, investment also plays a role as a component of national income, namely GDP. Investment has a positive relationship with GDP or national income, if investment increases, then GDP will increase, and vice versa, when investment falls, GDP will also fall. In this study, the intercept has a large and negative value, which means that if there is no contribution from the forest sub-sector, the GDB will be very low.

In the same context, Harrod-Domar (in Sukarno (2012); Nining (2020)) put forward a very legendary theory that to grow an economy requires the formation of capital as additional capital stock. The formation of capital is seen as an expenditure that will increase the ability of an economy to produce goods as well as an expenditure that will increase the effective demand of the whole society. This requires investment to increase the ability to produce goods and services needed in the economy as an "engine of growth". Therefore, high and sustainable economic growth rates are generally supported by increased investment (Sugiarto, 2019).

Afrizal (2013) states that there is a positive relationship between investment formation and economic growth. This is supported by Nining, Rodoni, and Susilastuti (2019) who argue that investment has a positive effect on economic growth as measured by GDP. GDP of Plantation is the GDP of production or business field is the GDP of the sub-sector part of the agricultural sector. The potential of natural resources and human resources in Indonesian agriculture Sunariyah (2004) will prosper and reduce poverty (Susilastuti, 2017) if the factors of capital, infrastructure, and technology are developed (Juditha, 2017) through the development of the plantation sub-sector.

5. CONCLUSION

5.1. The Research Conclusions Are

1. Simultaneously, the variables of the inflation rate, interest rates, exchange rates, and infrastructure have a significant effect on plantation investment in Indonesia. Partially, the inflation and interest rate variables have a non-significant and negative effect on investment, while the exchange rate and infrastructure variables have a significant and positive effect on plantation investment in Indonesia.
2. Infrastructure is the dominant factor that has a significant and positive effect on investment.
3. Investment has a significant and positive effect on plantation GDP.

5.2. Findings

The findings of the study are that plantation investment is resistant to fluctuations in inflation and interest rates, increasing inflation and interest rates can reduce investment, while the exchange rate against the US dollar is expected to increase foreign investment. Infrastructure as a dominant factor is an attraction and a driver for investment. Investment has a strong and large contribution to the formation of GDP plantations and their productivity.

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