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The Impact of Macroeconomics and the Covid-19 Pandemic on the Sustainability of Agribusiness Companies in Indonesia

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Abstract

The Covid -19 pandemic and changes in macroeconomic conditions have had an impact on the performance and sustainability of companies around the world, including in Indonesia. This study analyzes the effects macroeconomic changes and the pandemic have on corporate performance and sustainability, proxied by stock prices. Five macroeconomic variables i.e. inflation, exchange rate, BI interest rate, world oil price, and palm oil price are used as the independent variables, the COVID-19 pandemic as a dummy variable and agribusiness company stock prices as the dependent variable. The data used is secondary data from 2015 to 2020 and analyzed by the ECM (Error Correction Model). The results show that in the short-run, world oil prices and palm oil prices affect upstream agribusiness companies' share prices, while for the downstream companies, all variables including the COVID-19 pandemic have no effect on share price performance. In the long-run, however, all variables including the COVID-19 pandemic statistically affect upstream companies' share price performance, while for the downstream companies, all variables but BI interest rate affect share price performance.

Keywords: agribusiness share price, COVID-19, ECM, macroeconomic, sustainability.

Introduction

COVID-19 or Corona Virus is a zoonotic disease that is transmitted from animals to humans (Wu et al. 2020; Zheng, 2020). The spread of Corona disease outbreak first occurred at the end of 2019 in Wuhan, China. COVID-19 (Corona Virus Disease, 2019) is a virus that is in the same familiy as the virus that caused the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003 and Middle East Respiratory Syndrome (MERS) in 2012. This virus can mutate effectively. So infected people should stay at home and rest to prevent transmission and should avoid direct contact with other people. The determination of the Corona Virus status as a pandemic by the World Health Organization (WHO) adds to market and investor concerns. People's fear of food availability causes panic buying and increase in food prices. The COVID-

19 pandemic is not just a disease that affects health but also has an impact on the economy (Semaun and Syahriyah, 2020). A number of countries including Indonesia have implemented lockdowns (isolation) in several cities that are positively infected to reduce the spread of the COVID-19 virus. Isolation has the potential to compress regional economic growth in various sectors. Sector agriculture including agribusiness is one of the sectors that affected by the COVID-19 pandemic because it is directly related to the needs of human life which causes the demand for food to remain there (Khairad, 2020). One of the new regulations from the Indonesian government during the pandemic was the implementation of Large-Scale Social Restrictions as known as PSBB which resulted in supply chain delays such as the process of sending raw materials and foodstuffs for household needs. PSBB also resulted in a decline in agricultural production by five percent due to increased production facilities prices and uneventful distribution (Kementerian Pertanian, 2020). The disruption of agriculture inputs affects the performance of the agriculture industry both upstream and downstream which ultimately affects the company's performance.

Companies in the development and sustainability of their business need funding sources to finance their business activities where the company's funding sources are divided into two, namely internal and external (Astikawati and Relita, 2017). Internal funding is a fund that come from profits that are retained by the company for years, while external funding is funds obtained from outside parties such as stocks. Company shares are securities that provide clarity that those who hold these shares (investors) are the parties who own the company (Astikawati and Relita, 2017). For companies, maintaining and increasing net income is something that must be done so that stocks remain attractive to investors (Hermansyah and Ariesanti, 2008). Masoud and Glenn (2012) also states that the development of the capital market has a significant influence on economic growth where the stock market has played an important role for a country's economy. Macroeconomic variables such as inflation, interest

rates, and exchange rates are also factors that investors really pay attention before making an investment decision because they can affect the performance of the company's stock price (Sudiyatno and Nuswandhari, 2009).

Table 1. Changes in composite stock price index in 2020

Index	High	Low	Close	Change (%)		
				1 Month	3 Month	6 Month
Agriculture	983,292	948,195	964,931	0.74	16.58	29.32
Consumer Goods Industry	1,889.13	1,770.58	1.806,73	0.81	3.66	9.96
Manufacturing	1,186.69	1,131.19	1,186.70	0.90	0.71	15.72

Source: Indonesia Stock Exchange (2020)

When the COVID-19 pandemic enters Indonesia in 2020, it will have an impact on the share price of agribusiness companies from the upstream-downstream sector. Table 1 shows that all companies experienced a decline for 6 months (December 2019 to May 2020). The industrial sector that experienced the smallest decline was the consumer goods industry sector with a decrease of 9.96 percent. This is because people still need consumer goods even in pandemic conditions so that even though there is a decrease, the numbers are not large and will quickly return to normal conditions (Saraswati, 2020). Meanwhile, the largest decline was experienced by the agriculture industry by 29.32 percent because some agricultural products experienced a decrease in price due to crop yields that were not propotional to market demand due to the imposition of restrictions on market operational time by the government. Several previous studies have been conducted to determine the effect of macroeconomic and pandemic variables on company sustainability as indicated by the company's stock price. Asmara and Suarjaya (2018); Gumilang et al. (2014); Ardana (2016); and Dirga et al. (2016) stated that interest rates, inflation, exchange rates, money supply, world oil prices, and exchange rates simultaneously have a significant effect on the Jakarta Composite Index (IHSG) and corporate sustainability. Furthermore, Chen et al. (2018); Ceylan and Ozkan (2020); Sutrisno et al.

(2020); and Loh (2006) also stated that pandemics such as SARS, MERS, and COVID-19 had a negative impact on company sustainability and company stock prices.

This paper aims to find out more about the macroeconomic impact and the COVID-19 pandemic on the sustainability of agribusiness companies in Indonesia by incorporating the COVID-19 pandemic as a shock into the model in the form of a dummy variable. In addition, this research provides new evidence and methodologies for capturing the long-term and short-term impacts of pandemic shocks. This study consists of several sections, beginning with an introduction. Then, research & methodology, results and discussion will be described in the next section. Furthermore, it ends with a conclusion to summarize the research discussion and suggestions for further research.

Methods

Data

To fully capture the research's aim, 5 macroeconomic variables (inflation, interest rates, kurs, world oil price, and crude palm oil price) and pandemic COVID-19 as a dummy variable are observed in this study by using time series data from January 2015 to September 2020. Macroeconomic data is taken from Bank Indonesia, the World Bank, and the Indonesia Stock Exchange. Based on previous research, this study uses several variables to assess the effect of macroeconomic variables and the COVID-19 pandemic on the sustainable performance of agribusiness companies in Indonesia. The company sustainability indicators in this study are proxied by the performance of the shares owned by each company.

The number of agribusiness company data samples used in this study were 10 companies. The considerations for taking a sample of the 10 companies are; a) The company is incorporated in the agribusiness sector, registered and active on the Indonesia Stock Exchange (IDX/BEI) during the study period, namely 2015-2020. And b) The company has the largest market capitalization in each subsystem and has complete data from 2015-2020.

Furthermore, in the analysis, companies will be grouped into upstream agribusiness subsystems (5 companies) and downstream agribusiness (5 companies). The following is a sample list of companies included in the Upstream group: Astra Agro Lestari, Sawit Sumbermas Sarana, PP London Sumatra Indonesia, Smart, and Salim Ivomas Pratama. While the companies used as samples of agribusiness companies engaged in downstream are; Hanjaya Mandala Sampoerna, Polychem Indonesia, Eratex Djaja, Indofood CBP Sukses Makmur and Charoen Pokphand Indonesia.

The method that will be employed to show the effect of macroeconomic variables and the COVID-19 pandemic on the sustainability (stock prices) of agribusiness companies in Indonesia is the Error Correction Model (ECM). Nevertheless, before estimating the model, the variables will be substantiated in terms of stationarity and long-term relationship. The econometric tools that will be used for these verifications are the Augmented Dickey-Fuller test for stationarity and the Johansen cointegration test for long-term relationship given that the variable is integrated of the same order one I(1).

Long-run model

In order to establish the long-run relationship between macroeconomic variables, pandemic COVID-19 and stock prices, the Error Correction Model (ECM) will be applied. To avoid the problem of autocorrelation the equation can be transformed using the natural logarithm. This can be stated specifically as:

$$LnHS_t = a_0 + a_1 INFt + a_2 SBt + a_3 LnKURSt + a_4 LnHMDt + a_5 LnHMKSt + a_6 Dt + u_t$$

Short-run model

The short-run relationship will be established using the Error Correction Model (ECM) too. This can be stated specifically as:

$$\Delta LnHS_t = b_0 + b_1 \Delta INF_t + b_2 \Delta SB_t + b_3 \Delta LnKURS_t + b_4 \Delta LnHMD_t + b_5 \Delta LnHMKS_t + b_6 D_t + \lambda u_{t-1} + v_t$$

Where:

LNHS	: Natural logarithm of stock prices
INF	: Inflation rate
LNKURS	: Natural logarithm of exchange rates
LNHMD	: Natural logarithm of world oil price
LNHMKS	: Natural logarithm of crude palm oil price
D_t	: Dummy variable of COVID-19
a_i,b_i	: Coef the predicted var. (i = 1,2,3,...,n)
λ	: Coef *Error Correction Term*
u_{t-1}	: *Error Correction Term*
u_t	: Long-run error term
v_t	: Short-run error term
Δ	: Differencing
a_0,b_0	: Intercept
t	: Period of time

The model is a semilog model because there are variables that cannot be used in logarithm form because it is already in percent, namely inflation and interest rate, and is zero, namely the dummy variable. This study used two models for agribusiness companies in the upstream and downstream. Stock price data is processed using the average method which refers to research by Hidayat *et al.* (2019).

Results and Discussion

Unit root test

To examine the long-term relationship between exogenous variables, in the beginning, a unit root test will be applied. Because when data that isn't stationary entered the model, it will produce an invalid equation so that the conclusions obtained will be wrong (Pasaribu and Saleh, 2011). From the unit root test result, each variable in the model has stationarity in the first level. This stationarity utilizes Augmented Dickey-Fuller (ADF). The result can be seen in Table 2.

Table 2. Unit root test results

Variable	Level			*First Difference*		
	t-ADF	MacKinnon pada 5%	Prob*	t-ADF	MacKinnon pada 5%	Prob*
LNHULU	-2.011260	-2.904848	0.2815	-8.221851	-2.905519	**0.0000**
LNHILIR	-1.578514	-2.905519	0.4879	-6.801749	-2.905519	**0.0000**
INF	-1.693999	-2.904848	0.4297	-5.987045	-2.906210	**0.0000**
LNKURS	-3.142943	-2.905519	**0.0281**	-9.902389	-2.906210	**0.0000**
SBI	-1.248733	-2.905519	0.6484	-5.874801	-2.905519	**0.0000**
LNHMD	-3.252041	-2.905519	**0.0213**	-6.785996	-2.906210	**0.0000**
LNHMKS	-2.368220	-2.904848	0.1545-	-9.965470	-2.905519	**0.0000**

*** in bold indicate that the data is stationary at the 5% level.**

Even though the general conclusion is that all variable has a long-term relationship, some variables are non-stationary at the level. This nonstationary results do not change the general conclusion due to the results remain stationary in the first level.

Cointegration test

After it is known that all the variables used in this study are stationary at the same degree [I(1)], a cointegration test is carried out to determine whether there is a long-term relationship between the variables used. In Appendix, it can be seen that the result of the cointegration test shows that there is significant cointegration (long-term relationship between the variables used in this study both upstream and downstream). This can be seen from the significance of the probability value of the residual value which is smaller than the critical value test at the 5% level, which means that the variables used in this equation have been cointegrated.

ECM results for upstream agribusiness companies

Based on the cointegration test, ECM estimation is carried out on the sustainability of upstream agribusiness companies. Table 3 shows the relationship of variables in the short term.

Table 3. ECM results for the short-run model (upstream companies)

Variable	Coefficient	t-Statistic	Prob.
D(INF)	0.029	1.156	0.252
D(LNKURS)	0.002	0.014	0.988
D(SBI)	-0.016	-0.354	0.724
D(LNHMD)	0.366	5.415	0.000***
D(LNHMKS)	0.423	3.173	0.002**
COVID	-0.041	-0.131	0.895
ECT(-1)	-0.391	-3.165	0.002**
C	-0.100	-1.046	0.299
R-*squared*	0.430	F-statistic	6.468
Adjusted R-*squared*	0.363	Prob (F-statistic)	0.000

Note : ***,** = significant at 1%, 5%

Based on Table 3, it can be seen that in the short term there are only two factors that significantly influence the performance and sustainability of upstream agribusiness companies, namely world oil prices and palm oil prices. Meanwhile, the COVID-19 pandemic did not affect the company's performance and sustainability in the short term, because the effect of one variable on other variables takes time (lag) and generally the reaction of one variable to another occurs in the long term (Firdaus, 2011). The arrival of the COVID-19 pandemic in Indonesia has made investors consider the positive and negative impacts on company performance in the next few years, then make a decision to buy, sell or maintain these shares. So that the impact of the COVID-19 pandemic is not immediately visible in the short term. Astuti et al. (2016) also stated that macroeconomic changes did not directly affect company performance in the short term but slowly in the long term and stock prices as an indicator of company sustainability would be affected by these macroeconomic changes due to investor response. Furthermore, Table 4 shows the relationship between variables in the long run.

Table 4. ECM results for the long-run model (upstream companies)

Variable	Coefficient	t-Statistic	Prob.
INF	0.073	5.853	0.000***
LNKURS	-0.370	-1.683	0.097*
SBI	0.088	5.200	0.000***
LNHMD	0.263	3.991	0.000***
LNHMKS	0.809	7.342	0.000***
COVID	-0.146	-2.602	0.011***
C	3.771	1.419	0.160
R-*squared*	0.873	F-statistic	71.049
Adjusted R-*squared*	0.860	Prob (F-statistic)	0.000

Note : ***,* = significant at 1%, 10%

Based on Table 4, the factors that significantly affect the sustainability and performance of upstream agribusiness companies in the long term are inflation, exchange rates, BI interest rates, world oil prices, palm oil prices, and the COVID-19 pandemic. Inflation has a significant positive effect on the long-term sustainability of upstream agribusiness companies. A positive relationship between inflation and stocks can occur, Pratiwi et al. (2015) stated that the agricultural sector is not only concerned with upstream (on-farm) but is related to downstream (off-farm) where inflation can have a positive effect, especially for companies that produce staple products because there are no significant changes in demand but instead cause increased revenue. So, company profits and stock prices increase. The exchange rate has a significant negative effect on the sustainability of upstream agribusiness companies in the long term. Rachman (2012) states that the exchange rate has a negative effect on stock returns in the mining/plantation sector because many companies have debt in foreign currency, namely the purchase of machinery and production equipment so that when the rupiah weakens it will increase the company's foreign debt. As a result, investor confidence in the company decreases so that investors will reconsider their capital/shares and divert it to the foreign exchange market because it can provide expectations of higher returns (Gumilang et al., 2014).

Bank Indonesia's interest rate variable has a positive and significant effect on stock price performance as an indicator of long-term corporate sustainability. Bank Indonesia's

interest rate variable, which is not negatively correlated, is suspected because the rate of change in interest rates is so small that it doesn't have too much of an effect. The world crude oil price variable has a positive and significant effect on the company's long-term performance and sustainability. In general, the increase in world oil prices was motivated by an increase in world oil consumption and demand caused by world economic growth (Mubarok et al. 2014). The increase in oil prices was due to the increase in oil prices caused by increased consumption and demand, which will directly or indirectly encourage an increase in the performance of company stock prices, especially plantation group companies. The palm oil price variable has a positive and significant effect on the company's long-term stock price performance. This is because the profits of companies engaged in oil palm plantations are determined by movements in the price of palm oil (CPO) on the world market so the higher the price of palm oil on the world market, the company's profits will increase. So that more and more investors buy shares in companies which results in increased stock prices (Andiantyo et al. 2018).

The COVID-19 pandemic variable has a negative and significant impact on the company's long-term performance and sustainability. In contrast to the short term, the COVID-19 pandemic has had a significant impact on the long-term performance of share prices of upstream agribusiness companies because during the COVID-19 pandemic world oil prices fell by around 60 percent and touched negative levels, which ultimately affects market demand (Sutrisno et al. 2020). The phenomenon of oil prices where the sales value is below USD 0 is the first phenomenon that has occurred (Widyastuti and Nugroho, 2020). The decline in prices and the closure of international trade due to the COVID-19 pandemic caused enormous losses for producers so agribusiness companies upstream, which are mostly export-oriented, had to reduce their exploration and production activities. Profit loss will reduce production and affect company performance and returns to investors. The amount of return received by investors can affect investors' decisions to buy or sell their shares (Kristanto and Idris, 2016).

ECM results for downstream agribusiness companies

Table 5 shows the results of the ECM estimation of the sustainability of downstream agribusiness companies as shown by the performance of stock prices showing a variable relationship in the short term.

Table 5. ECM results for the short-run model (downstream companies)

Variable	Coefficient	t-Statistic	Prob.
D(INF)	-0.016	-0.983	0.329
D(LNKURS)	-0.009	-0.091	0.927
D(SBI)	0.011	0.374	0.709
D(LNHMD)	0.017	0.391	0.696
D(LNHMKS)	-0.003	-0.041	0.966
COVID	-0.009	-0.471	0.638
ECT(-1)	-0.308	-4.382	0.000
C	0.004	0.605	0.547
R-*squared*	0.266	F-statistic	3.122
Adjusted R-*squared*	0.181	Prob (F-statistic)	0.007

Based on Table 5, it can be seen that in the short term, there are no variables that have a significant effect on the sustainability of downstream agribusiness companies. According to Firdaus (2011), a variable reaction to other variables takes time (lag) and generally, the reaction of a variable to other variables occurs in the long term. The arrival of the COVID-19 pandemic in Indonesia has made investors consider the positive and negative impacts on company performance in the next few years, then make decisions to buy, sell or maintain these shares so that the effects of the COVID-19 pandemic can be felt indirectly in the short term. This condition is in line with the findings of Astuti et al. (2016) which state that macroeconomic changes do not directly affect company performance in the short term but slowly in the long term and stock prices will be affected by these macroeconomic changes due to investor response. Furthermore, Table 6 shows the relationship of variables in the long term.

Table 6. ECM results for the long-run model (downstream companies)

Variable	Coefficient	t-Statistic	Prob.
INF	-0.111	-8.210	0.000***
LNKURS	0.568	2.408	0.019**
SBI	-0.014	-0.794	0.429
LNHMD	0.156	2.207	0.031**
LNHMKS	-0.617	-5.224	0.000***
COVID	-0.140	-2.336	0.022**
C	7.513	2.638	0.010
R-*squared*	0.797	F-statistic	40.815
Adjusted R-*squared*	0.778	Prob (F-statistic)	0.000

Note: *,** = significant at 1%, 5%**

Based on Table 6, the factors that significantly influence the sustainability of downstream agribusiness companies are inflation, exchange rates, world oil prices, palm oil prices, and the COVID-19 pandemic. Inflation has a negative and significant effect on the stock price performance of downstream agribusiness companies as an indicator of the company's long-term sustainability. The negative relationship between inflation and stock returns is because goods produced by companies are goods that are strongly influenced by inflation, when inflation increases, people will tend to reduce consumption of these goods which results in a decrease in company sales thereby reducing company income and decreasing stock prices due to lack of investor interest. (Rachman, 2012).

The exchange rate variable has a positive and significant effect on the company's stock price performance in the long run. An increase in the inflation rate will have an impact on weakening the domestic exchange rate against foreign currencies so that in general it will reduce the performance of a company and reduce investment in capital (Faoriko, 2013). Heru (2008) stated that the decline in the exchange rate of the rupiah against foreign currencies (US dollars) had an impact on the increase in the cost of importing raw materials and equipment needed by companies, resulting in an increase in production costs which in turn reduced performance. shares on the stock market. This condition in the long term will also affect the resilience of the company, especially in terms of performance and financial stability.

Bank Indonesia's interest rate variable has no statistically significant effect on the long-term sustainability of downstream agribusiness companies because its probability value is greater than the 10% real level. The BI interest rate has no statistical effect on the performance of company stock prices because according to Topowijono and Afiyati (2018), apart from BI interest rates, government policies can also affect stock returns such as company policies, export-import policies, debt policies, and others. The world crude oil price variable has a positive and significant effect on the company's sustainability in the long term. An increase in world oil prices in a certain period of time will be responded to positively by economic growth which indicates the economy is in good condition (Nizar, 2012) so that it will increase investor confidence in investing.

The variable price of palm oil has a negative and significant effect on the sustainability of downstream agribusiness companies. According to Karina (2018), high palm oil (CPO) prices will benefit palm oil-producing countries, but harm countries that use palm oil as raw material and companies. Movements in the price of palm oil certainly contribute to the level of sales of several downstream agribusiness companies, especially those that produce refined palm oil products. If the price of palm oil increases, it will affect the company's production costs so that the level of profit generated by the company will decrease. If the company suffers a loss, of course, it will affect financial performance which will have an impact on the performance of the company's stock price, so that the company will be more sustainable and resilient.

COVID-19 has had a negative and significant effect on the company's long-term stock price performance. The existence of a massive social distancing policy at the beginning of the pandemic led to the closure of shopping centers, restaurants, minimarkets, and others, thereby reducing public demand for buying processed products, which resulted in a decrease in company sales and a decrease in profits. This decrease in profit will affect the company's

performance and the returns provided to investors. The amount of return received by investors can affect investors' decisions to buy or sell their shares so that in the long term it will affect the sustainability of the company (Kristanto and Idris, 2016).

Conclusion

The sustainability and resilience of agribusiness companies, both upstream and downstream, are influenced by many factors, including macroeconomic variables and the COVID-19 pandemic. This study shows that world oil prices and crude palm oil prices have an effect on the sustainability and resilience of upstream agribusiness companies in the short term while in the long term, inflation, exchange rates, interest rates, world oil prices, palm oil prices, and the COVID-19 pandemic affect the sustainability of agribusiness companies in the upstream. Furthermore, inflation, exchange rates, interest rates, world oil prices, palm oil prices, and the COVID-19 pandemic have no effect on the sustainability of the downstream group of agribusiness companies in the short term. Meanwhile, in the long term, inflation, exchange rates, world oil prices, palm oil prices, and the COVID-19 pandemic will affect the sustainability and resilience of downstream agribusiness groups.

Based on this study’s results, the authors recommend that that companies need to be better prepared in risk management area including corporate risk governance, corporate strategic context, handling risks that are important to the company, and corporate action risks as well as making a business continuity plan (BCP) and business impact analysis. In future research, researchers need to consider using other variables such as the company's financial performance, the amount of debt it has and using a longer data period.

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