# Impact of Crude Oil Prices and Buying Value of Foreign Investors to Stocks Prices on the Indonesia Stock Exchange Oil and Gas Sector during the Early Period of the COVID-19 Pandemic

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**Abstract.** The purpose of investing is profit, although stock investment is risky and uncertain, especially during the early phase of the COVID-19 pandemic. The COVID-19 pandemic caused macroeconomic uncertainty. The quarantines and social restrictions impacted decreasing demand and falling Brent oil prices by approximately -78%, collapsing the price of oil and gas companies' stocks; for example, MEDC declined circa -69%, and ELSA -63%. Foreign investors sold off their stocks. So, it is interesting to analyze the correlation between Brent oil prices, the buying value of foreign investors, and the stock prices of oil and gas companies. It utilized path analysis using the IBM SPSS Amos program. The result shows that Brent crude oil prices and the buying value of foreign investors account for 44.9% of stock price variations positively and significantly. There is no significant correlation between Brent crude oil prices and the buying value of foreign investors.

**Keywords:** Stock Price, Foreign Investor, Brent Oil, COVID-19, Stock Investment

## 1. Introduction

The purpose of investing is to make a profit [1], even though stock investment is risky and there is no certainty of a result [2]. Especially when investing under uncertainty [3], such as during the early period of the COVID-19 pandemic.

The COVID-19 pandemic poses risks to various sectors, like energy, economics, and stock markets. Uncertainty and economic losses cause the markets to be very unstable and unpredictable [4]. Public fear is increasing with the implementation of community lockdowns and restrictions [5]. This policy was chosen to limit the risks that arise to public health, but it has a tremendous effect on the global economy [6].

ICONIC-RS 2023, September 21-22, Bali, Indonesia

DOI 10.4108/eai.21-9-2023.2347037

The existence of quarantines and social restrictions changes a country's energy policy to reduce the risk of crude oil oversupply, which has an impact on decreasing demand and falling prices [7]. Based on the Investing website, Brent crude oil collapsed approximately -78%, from 71.75 $/barrel to 15.98 $/barrel. These declining prices had a very significant impact on the stock market [8] because oil has a significant effect on the economic sector as impotant pillar of energy for the development of a country [9], [10].

The significant impact of crude oil prices on stock prices, particularly in the oil and gas sector, occurred due to changes in investment strategies made by investors in response to falling crude oil prices. Crude oil prices and investors' decisions or sentiments are significantly correlated [11]. They sell oil and gas sector stocks to avoid the risk of losses.

Regarding investors, two types of stock investors are foreign and domestic, with individual (retail) and institutional investors making up the domestic investor population [12]. According to the investor profile at the Indonesia Stock Exchange (IDX) in 2020, local investors have more assets than foreign investors. Based on the Indonesian Capital Market Statistics report, the total assets of foreign investors in the Indonesian capital market were 43.15%; the rest were local investors. According to this report, declining foreign investor assets also result in a decline in IDX's capitalization value. Even though the number of investors increased significantly by 56%, retail investors dominated this amount.

The COVID-19 pandemic certainly impacted IDX's performance. Referring to the Investing website, the JCI experienced a drop in value of approximately -31%, from 6,348 to 3,911 from January to March 2020. Oil and gas companies also experienced the same condition. For example, Medco (MEDC) experienced a decline in value of approximately -69%, from 834 to 259; Elnusa (ELSA) fell by -63%, from 338 to 124; AKR (AKRA) fell by -65%, from 798 to 281; PGN (PGAS) fell by -72%, from 2200 to 605; in the same period. From this description, we can estimate how much loss risk will be borne by investors.

In stock investing, apart from dividends, gains or losses on investment capital are based on capital gains or losses derived from the difference in share prices when bought and sold. It becomes the primary cause of stock price swings is the investors' subjectify expectation of profit [13]. It also demonstrates that investor optimism and pessimism play a significant role in determining the fluctuations of stock prices. The decision-making process is based on several pieces of information to evaluate the performance and prospects of the company in an effort to maximize profits. And also to ensure that investment in selected stocks will provide benefits commensurate with the possible risks [14]. This loss isn't suitable for investors' expectations and creates a gap between investment objectives and actual conditions in the stock market. Generally, in investing, of course, investors hope to get profits [1].

So, it is substantial to analyze the correlation between the decline in crude oil prices (BREN), the buying value of foreign investors (VBIA), and the stock prices (HASA) for companies engaged in the oil and gas sector. The Brent crude oil price crash may influence investors' decisions that impact oil and gas stocks. There is a massive loss potential for investors; this reality is not the investment goal because the investment goal is profit.

This research focuses on foreign investor transactions (VBIA) as a research variable because foreign investors tend to have an advantage in analyzing pieces of information [15]; they are usually not trapped in the manipulative mechanisms that occur on the stock market [16], and

they provide valuable output and stabilize prices as they gain the trust of domestic investors [17]. Also, according to the investor profile at the Indonesia Stock Exchange (IDX) in 2020, the decline of foreign investor assets resulted in IDX's capitalization value declining. It means foreign investors have an important role in IDX.

The considerations in choosing the initial period of the COVID-19 pandemic, namely to find out the impact of this crisis on stock prices, also obtained data with bullish and bearish trends that are close together. Hopefully, this data will provide accurate test results and analysis.

Conceptually, the framework that will be tested and analyzed is to determine the direct effect of BREN (the independent variable) on HASA (the dependent variable) and its indirect effect through VBIA (the mediation variable). The method is path analysis using the IBM SPSS Amos program. The samples are stocks from the oil and gas sector that were also actively traded by foreign investors during the early stages of the COVID-19 pandemic. The hope is that by utilizing the results of this research, investors can mitigate risks and gain profits by investing in stocks in the oil and gas sector.

## 2. Literature Review

An investment is a present commitment of funds or money for a specified period of time. The objectives are to get compensation for the investment period, the anticipated inflation rate, and future payment uncertainty [18]. Consequently, there are several considerations for determining investment, usually prioritizing investment options that can provide maximum results. Stock investment is one of the choices that can give higher returns but comes with high risks [2]. Investors should have the ability in the investment risk management. Especially when investing under uncertainty, such as during the early period of the COVID-19 pandemic.

The COVID-19 pandemic risks to various sectors, like energy, economics, and stock markets. Financial markets are experiencing volatility on an unprecedented scale. It suggests that the risk of global financial markets increases substantially in response to the pandemic. The reaction of the stock market in each country is interrelated. Uncertainty and economic losses cause a highly erratic and unpredictable market [4]. News and information regarding an increase in confirmed cases and deaths due to the coronavirus have significantly reduced the liquidity and stability of the stock market. Likewise, public fear and the imposition of restrictions and lockdowns contributed to the market [5]. This pandemic impacted the significant fall of the stock market in India; foreign investors sold off and pulled their money [19], causing volatility [20]. In Japan, foreign investors also sold stock. Companies with higher foreign investor holdings had a loss than those with fewer [21]. In Indonesia, increased foreign investor trading activity impacted IDX's performance decline [22]. In Thailand, there is no positive role for foreign investors in determining stock prices, which also has no evidence to be a destabilizing role. Foreign investors tend to stick with their decisions and strategies before COVID-19 [23].

The COVID-19 pandemic resulted in a health crisis. To contain and prevent the spread of the virus, the government implemented preventive and restrictive measures, such as quarantine and lockdown. It impacted the industrial and consumer sectors, resulting in an oversupply of

crude oil [7]. The oil prices affect not only oil exploration and production companies but also the transportation and hospitality industries. It also influences investors' decisions regarding the allocation of share ownership, which is sensitive to oil prices [8]. Oil is the most important source of energy for almost all countries. Therefore, the impact of oil prices is significant and influences each country [10]. Oil is also a crucial energy for a nation's economic growth, a strategic substance, a unique product, and necessary for many everyday activities. So, oil prices have a significant impact on the economy [9].

The significant impact of crude oil prices on stock prices, particularly in the oil and gas sector, occurred due to changes in investment and risk management strategies made by investors in response to falling crude oil prices. Crude oil prices and investors' decisions or sentiments are significantly correlated [11]. When a crisis occurs, such as the emergence of the COVID-19 outbreak, the correlation between oil and stock returns becomes much higher, regardless of the country's status as an oil exporter or importer [24]. It also increased the correlation between gold, oil, and the S&P 500. In particular, the stock market response was unprecedented due to the strong correlation between crude oil and the stock market [25]. Volatility in oil prices occurs on the demand side due to travel restrictions and low production growth estimates in China and European countries. The oil commodity market is facing a complex situation due to an increase in supply but a decrease in demand. It may explain the pattern of associations between COVID-19 and petroleum that varied in frequency over the study period. Unprecedented oil price volatility increases geopolitical risks in the US due to the simultaneous impact of COVID-19 and uncertainty over US economic policy. In the short term, investors reallocate their portfolio assets based on their risk assessment and perception of bad news related to the COVID-19 outbreak [8].

Regarding investors, there are two types of stock investors: foreign and domestic, with individual (retail) and institutional investors making up the domestic investor population [12]. Individual investors on the IDX are more active in transactions and tend to make short-term investments [26]. Likewise, on the Korean stock exchange, individual investors are more interested in short-term investments compared to foreign investors, who are more interested in long-term future investments [27]. As for institutional investors, one of their most important roles as domestic investors is to prevent capital flight or sudden shutdowns caused by the speculative actions of foreign hedge funds during financial crises. Whereas individual investors get interested and buy shares when stock yields increase [12].

## 3. Data and Methodology

The conceptual framework of this research wants to see the effect of uncertainty in macroeconomic conditions due to the COVID-19 pandemic on microeconomic conditions in the investment sector at IDX. Brent crude oil prices (BREN) data represents macroeconomic uncertainty, while the buying value of foreign investors (VBIA) and the stock prices (HASA) data represent microeconomic conditions. This study uses a deductive approach, namely testing existing general theories with specific data obtained from stock exchanges in Indonesia.

In context with this, it is fascinating to examine the relationship between the drop of BREN, VBIA, and HASA of the oil and gas sector. BREN refers to Europe-based Brent crude oil. All West African, Mediterranean, and certain Southeast Asian crudes were measured against Brent, and Brent was used as a benchmark. The units used are US dollars per barrel [28]. VBIA refers to transaction valuations made by foreign investors. Transaction valuation is the nominal amount traded, namely the number of shares multiplied by the price in Rupiah [22]. HASA definition, based on the IDX website, is the amount of money or funds in Rupiah units that investors are willing to pay for a share of companies.

The research variables used were BREN as the independent variable, VBIA as the mediating variable, and HASA as the dependent variable. The conceptual framework of this research consists of one exogenous variable, namely BREN, and two endogenous variables, namely VBIA and HASA. All variables in this study are also measurable. The data used are in the form of quantitative, secondary, and panel data. The data were obtained from the IDX website (www.idx.co.id), Investing (www.investing.com), and the Home Online Trading System (HOTS) application owned by Mirae Asset Sekuritas (MAS). The data in this study are daily closing prices for each variable, except for VBIA data, which is the total accumulated purchases made in one day. Moreover, there was a time difference between several research variables, so there were adjustments as follows, BREN uses day t-1, while VBIA and HASA use day t. The data time period chosen takes into account the initial discovery of victims of the COVID-19 virus in December 2019 in Wuhan, China. Meanwhile, the final data for the study were adjusted to global data return to their initial values before the COVID-19 pandemic. So the research data period is about one year, from October 1, 2019, to October 31, 2020.

The hypotheses of this research are:
First, BREN has a positive and significant effect on VBIA;
Second, BREN has a positive and significant effect on HASA;
Third, VBIA has a positive and significant effect on HASA; and
Fourth, BREN has a positive and significant direct effect on HASA and indirectly through VBIA.
Path analysis is utilized for testing and analyzing the hypothesis using the IBM SPSS Amos program.

## 4. Result and Discussion

Based on the requirements for selecting the sample, namely shares affiliated with oil and gas which are also actively traded by foreign investors, the chosen stocks can be seen in **Table 1**.

**Table 1.** Detail Stocks Sample

| No | Code | Company Names | Remark |
|---|---|---|---|
| 1 | AKRA | PT AKR Corporindo Tbk. | Oil & Gas Storage & Distribution |
| 2 | BULL | PT Buana Lintas Lautan Tbk. | Oil & Gas Storage & Distribution |
| 3 | ELSA | Elnusa Tbk | Oil & Gas Drilling Service |
| 4 | MEDC | PT Medco Energi Internasional Tbk | Oil & Gas Production & Refinery |
| 5 | PGAS | PT Perusahaan Gas Negara Tbk. | Oil & Gas Storage & Distribution |
| 6 | SOCI | PT Soechi Lines Tbk. | Oil & Gas Storage & Distribution |

For the purpose of data normality, BREN, VBIA, and HASA values need to be transformed using the Ln formula. Then the average statistical calculation and standard deviation are carried out according to **Table 2**. Descriptive Statistics.

**Table 2.** Descriptive Statistics

| No | Variables | Mean | Std. Deviation | N |
|---|---|---|---|---|
| 1 | HASA | 6.292677064 | 1.099266519 | 1444 |
| 2 | BREN | 3.815649260 | 0.2944520873 | 261 |
| 3 | VBIA | 19.97871474 | 2.880771874 | 1444 |

The data is then tested on the IBM SPSS AMOS program according to the conceptual framework, with the program results shown in **Figure 1**. The values shown in the figure are unstandardized. The complete results are shown in **Table 3**. for regression weights with unstandardized data and **Table 4**. for standardized data.

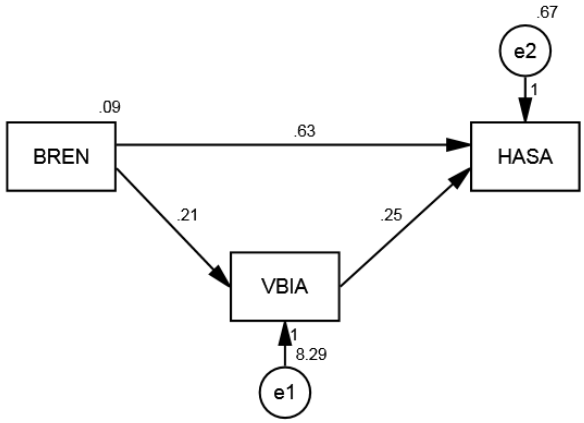


**Fig. 1.** Test results

**Table 3.** Regression Weights

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| VBIA | <--- | BREN | 0.212 | 0.257 | 0.825 | 0.409 | insignificant |
| HASA | <--- | BREN | 0.630 | 0.073 | 8.636 | *** | significant |
| HASA | <--- | VBIA | 0.246 | 0.007 | 32.961 | *** | significant |

**Table 4.** Standardized Regression Weights

| | | | Estimate |
|---|---|---|---|
| VBIA | <--- | BREN | 0.022 |
| HASA | <--- | BREN | 0.169 |
| HASA | <--- | VBIA | 0.644 |

First, BREN has a positive and significant effect on VBIA: FAILED. The probability value of the relationship between BREN and VBIA is 0.409, so it is insignificant. It indicates that the price of crude oil has no significant effect on the buying valuation of foreign investors in stocks oil and gas sector at IDX. Foreign investors may be more concerned about the volatility and fluctuations in the stock market due to the COVID-19 pandemic. The decline in share value also occurred in almost all stock sectors. They do not use the decline in the price of Brent crude as a major consideration. It is also consistent with the results of previous studies, such as increased foreign investor trading activity, which resulted in a decrease in IDX performance due to the COVID-19 pandemic [22]; increased volatility [20]; and a fall in the stock market in India due to foreign investors selling [19], which also occurred in Japan [21].

Second, BREN has a positive and significant effect on HASA: SUCCEED. According to the BREN-HASA regression test, there is a significant effect, with a probability of 0. The unstandardized coefficient value is +0.63, indicating a positive relationship between the price of Brent crude oil and stock prices. Because of the elasticity correlation between these two variables, a 1% increase in the price of Brent crude oil will result in a 0.63% increase in the stock price. The samples are active oil and gas stocks traded by foreign investors. The results of this test are also in line with previous research, which states that the decline in oil prices has the most significant impact on the US stock market, not only for oil exploration and production companies but also for companies in the transportation and hotel industries [8]. Crude oil prices have a positive and significant effect on stock prices in Turkey [29]; this effect also occurs in the BRICS countries (Brazil, Russia, India, China, and South Africa) [30].

Third, VBIA has a positive and significant effect on HASA: SUCCEED. According to the VBIA-HASA regression test, there is a significant effect, with a probability of 0. The unstandardized coefficient value is +0.246, indicating a positive relationship between the buying value of foreign investors and stock prices. So decreasing buying value of foreign investors impacted significantly on declining stock prices. Because of the elasticity correlation between these two variables, a 1% increase or decrease in the buying value of foreign investors will result in a 0.246% increase or decrease in the stock price. The results fit previous research, stating that foreign investors tend to become momentum investors, selling declined-price stocks [31]. During the COVID-19 pandemic, foreign investors also sold their stocks as described in the first hypothesis above.

Even in non-crisis conditions, foreign investors positively affect operational performance and company value [32]. Their investments have a stronger positive relationship to investment returns because they have a preponderance of incentives to monitor company performance [33]. The ownership of foreign investors has also led to a significant increase in innovation, internationalization of company operations and sales, and company value. It means that

foreign investors have a positive and significant effect on increasing the company's stock price. This effect can occur due to the role of disciplinary action and monitoring by foreign investors [34].

The results of the simultaneous BREN and VBIA linear regression tests on HASA yield an $R^2$ or coefficient of determination with a value of 44.9%. It indicates that Brent crude oil prices and the buying value of foreign investors account for 44.9% of stock price variations, while other variables explain the remaining 55.1%. It can also be used as a lesson for investors that the influence of Brent crude oil prices and buying value of foreign investors on stock prices, especially for the oil and gas sector, is big enough, reaching 45%. For sorting and choosing the stocks to be purchased and kept, consider the price movements of Brent crude oil and foreign investors' transactions in these stocks. When Brent crude oil prices are rising or bullish, investors buy active oil and gas stocks traded by foreign investors with growing purchase valuations.

Fourth, BREN has a positive and significant direct effect on HASA and indirectly through VBIA: FAILED. BREN has no significant effect on VBIA, so there is no indirect relationship between BREN and HASA through VBIA. So VBIA is not a mediating variable in the conceptual framework of this research. The relationship between variables is not in the form of a path.

According to the results of this study, the price of Brent crude oil has a more significant effect than the buying value of foreign investors. So, the trend of Brent oil prices is the top consideration when buying stocks. Both have a positive and significant effect on oil and gas stock prices. Consider these two factors when purchasing oil and gas stocks.

Foreign investors considered the volatile market conditions due to the COVID-19 pandemic compared to the price of Brent oil when making decisions in health crisis conditions. With these considerations, investors should secure their funds by selling their stocks and temporarily saving their capital in cash. The aim is not to be dragged deeper by falling stock prices because the losses can reach tens of percent. Furthermore, reconsider buying stocks when foreign investors start to increase their buying valuations because this will elevate stock prices.

One of the parameters that can be used as a reference to determine a crisis is the fluctuation or volatility of commodity prices, in this example, crude oil. With the same concept, selecting stocks can use other commodities such as gold, coal, tin, and nickel. It can be research material for academics. Of course, this study is beneficial for investors. In simple terms, knowing what a thing is a commodity; then who is the perpetrator, namely both foreign and local investors; and then choosing the best stock that might give you more profit. Thus, investors can manage their risk of stock investments.

## 5. Conclusions

This research aims to determine the correlation between Brent crude oil prices, the buying value of foreign investors, and stock prices for oil and gas that are actively traded by foreign investors. The conclusions from this research are:

- The price of Brent crude oil has no significant effect on the buying value of foreign investors. Foreign investors may be more concerned about the volatility and fluctuations in the stock market due to the COVID-19 pandemic.
- The Brent crude oil price effect positively and significantly on stock prices. Because of the elasticity correlation between these two variables, a 1% increase in the price of Brent crude oil will result in a 0.63% increase in the stock price.
- The buying value of foreign investors has a positive and significant effect on the stock price. The declining buying value of foreign investors by approximately 1% impacted significantly declining stock prices by approximately 0.246%.
- The Brent crude oil price and the buying value of foreign investors account for 44.9% of stock price variations, while other variables explain the remaining 55.1%.
- The Brent crude oil price has no significant effect on the buying value of foreign investors, so there is no indirect relationship between Brent crude oil prices and stock prices through the buying value of foreign investors.

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