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The Effect of World Oil and Gold Prices on Indonesia Composite Stock Price Index Mediated by Exchange Rates

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Abstract

The relationship among world oil, gold and stock prices is still needed to be explored, because gold and oil are the most active commodities traded in global market. The price changes of both will be reacted by the capital market so that these factors have potential to influence stock prices. This study used a quantitative approach with a sample of weekly data on the Indonesia Composite Stock Price Index (IDX Composite), Brent World Oil Prices, LBMA World Gold Prices, and the Exchange Rate of Rupiah against the US Dollars from June 2017 to May 2022. The sample used is 260 data observation. The results showed that world oil prices directly affect IDX Composite, while world gold prices only affect through exchange rates. This study supports the theory of investment decision making regarding to the direct and indirect effects that lead to the IDX Composite. These findings can provide guidance to the company to carry out various corporate actions for changes in world oil and gold prices and exchange rates so that stock prices can be stable. Also, providing practical guidelines to investors in investing in the capital market, so that they always pay attention to the movement of the IDX Composite.

1. Introduction

Stock price is a reflection of the company's value and used for investment decisions making. One of the indicators used to see the stock prices development in Indonesian capital market is the IDX

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Composite (Untono, 2015). The IDX Composite is an index that summarizes all stock prices in the Indonesia Stock Exchange so that it is a reflection of the condition of all shares on the capital market.

IDX Composite plays an important role in the economic of the country because it is related to the expectations of capital market participants. Investors will choose stocks that have good expectations. If the IDX Composite, which reflects the performance of the economic sector in a country, is good, then investors will be interested in investing in that country so that the supply-demand law applies and stock prices will increase. In economic theory there are two things that affect the fluctuation of stock prices, namely internal and external factors (Zulfikar, 2016). Internal factors are those that come from within the company itself such as company fundamentals. While external factors are those that come from outside the company such as macroeconomic conditions that have potential to affect stock market (Samsul, 2006). This study uses macroeconomic factors because they provide a systematic risk that affects the condition of all companies, in contrast to internal factors which only affect the condition of the company concerned so that it will provide a very complex analysis. The macroeconomic factors used in this study are world oil and gold prices because they are the most active traded commodities in global markets (Baruník et al., 2016). Changes in both prices will be reacted by the capital market so that these factors have the potential to affect stock prices.

It is assumed that the expectations of capital market participants change when there is a fluctuation in oil prices. These expectations have changed, especially in companies whose main raw materials use crude oil so that an increase in operastional costs will reduce the company's potential to make profits which then makes stock prices decrease. Meanwhile, gold is a hedge investment and is assumed to be a substitute for stocks when there are fluctuations in the gold price. Gold plays an important role in IDX Composite fluctuations because of the expectations of returns when gold prices fluctuated. When the gold prices fall, it is assumed that investors buy gold, so that the proportion of stock in their portfolio decreases, because they sell the stock to be substituted with gold. The large number of capital market participants selling shares will cause the stock price to fall when the price of gold falls.

Even though there are important roles of world oil and gold prices in the IDX Composite, several studies have found different results regarding the direction of the relationship between these variables. Singhal et al. (2019); Ansari & Sensarma (2019); Raza et al. (2016) found that gold prices have a positive effect on stock prices and oil prices have a negative effect on stock prices. Meanwhile, Jain & Biswal (2016); Tursoy & Faisal (2018) found the opposite result, that gold prices have a negative effect on stock prices and oil prices have a positive effect on stock prices.

From the inconsistency of the past research results, the exchange rate mediating factor is added as an intermediary for this indirect relationship. The exchange rate factor is added to mediate the relationship among world oil and gold prices and the IDX Composite because the expectations for the performance of company that rely on imported raw materials with the domestic market will decrease because the company's operating costs increase due to the weakening domestic exchange rate, so it is assumed that the company's performance will decline. Declining company performance will reduce the company's stock price. Apart from that, world gold transactions use US Dollars so that when there is an increase or decrease in the gold price, it is assumed that the expectations of capital market participants will change due to the domestic exchange rate. The results of this study are expected to be useful in developing insights into financial management, especially on the factors that affect stock prices concerning the influence of macroeconomic factors with exchange rates as mediating factor. The results of this study can be used by company as one consideration to do corporate action by seeing the fluctuation of macroeconomic factors.

2. Materials and Methods

Park & Ratti (2008) stated that changes in oil prices affect real cash flows now and in the future and then impact stock returns. An increase in oil prices can lead to high operational costs and have an impact on company performance. Low company performance will have an impact on company stock, because capital market participants tend to be disinterested in companies with low performance. The low issuer's stock price ultimately has an impact on the decrease of composite stock price index. It can be concluded that, there is a negative relationship between oil prices and stock prices. This is supported by research by Raza et al. (2016); Singhal et al. (2019); Ansari & Sensarma (2019) found that oil prices have a negative effect on stock prices.

H1: The increase in world oil prices will reduce the IDX Composite

Investor interest in the gold prices is to make a decision to invest in gold or invest in the stock market. This is because, investing in gold has a low risk and gold offers definite returns, because the gold prices is relatively stable. Gold investment provides investors with certainty of returns even during periods of crisis and can be used as an alternative investment because the gold market is very simple (Baur & McDermott, 2010) When the gold price increases, investors will decide to sell their gold and divert their investment into stocks. This causes the stock price to increase. Meanwhile, when the gold prices falls, investors will sell their stock to be substitute with gold. This causes the stock price to decline. It can be concluded that there is a positive relationship between gold prices and stock prices. This is proven by the research of Arouri et al. (2015); Raza et al. (2016); Singhal et al. (2019); Ansari & Sensarma (2019) found that gold prices have a positive effect on stock prices.

H2: The increase in world gold prices will increase the IDX Composte

If the rupiah exchange rate weakens and industrial raw materials are still imported, there will be an increase in the cost of raw materials, because they will buy more in rupiah. The increase in raw material costs will have an impact on decreasing company performance. This will give a bad signal to investors and cause the issuer's stock price to decline. A fall in the issuer's stock price will reduce the attractiveness of investors to invest in the capital market, so that the value of the stock market will decrease (Syarif & Asandimitra, 2015). It can be concluded that there is a negative relationship between the exchange rate and stock prices, the higher the Rupiah exchange rate against the US Dollar or the rupiah exchange rate weakens, the stock price will decrease. This is supported by the research of Abouwafia & Chambers (2015), Husnul et al. (2017), and Anggriana & Paramita (2020) who stated that the exchange rate has a negative effect on stock prices.

H3: The increase in the rupiah exchange rate will lower the IDX Composite.

Amano & Van Norden (1998) stated that oil prices have always been used as the main indicator in exchange rate movements in the global economic. This is because international transactions of crude oil are denominated in US Dollars. The increase in oil prices on the international market caused the rupiah exchange rate to weaken, due to increased demand for foreign exchange in the context of paying for oil imports (Nizar, 2012) Based on this, there is a positive relationship between world oil prices and exchange rates. An increase in world oil prices will cause the rupiah exchange rate to increase against the US dollar, because more rupiah is needed to be exchanged with US dollars. This is in accordance with Lin & Su (2020) research which found that world oil prices have a positive effect on exchange rates.

H4: The increase in world oil prices will increase the exchange rate.

US Dollars are used in world gold transactions. When the world gold price increases, it will cause the demand for gold to fall, because many investors take advantage of the high gold price to sell their gold. This will cause the value of the US Dollar to weaken and on the other hand the value of the Rupiah strengthens. This causes the exchange rate of the Rupiah against the US Dollar to decrease, because a smaller amount of Rupiah is needed to be exchanged for US Dollars. An increase in world gold prices

will cause the rupiah exchange rate to decrease against the US dollar. A negative relationship between world gold prices and exchange rates was found by Jain & Biswal (2016) who found that a fall in world gold prices caused a fall in the value of the Indian Rupee.

H5: An increase in the world gold price will lower the exchange rate.

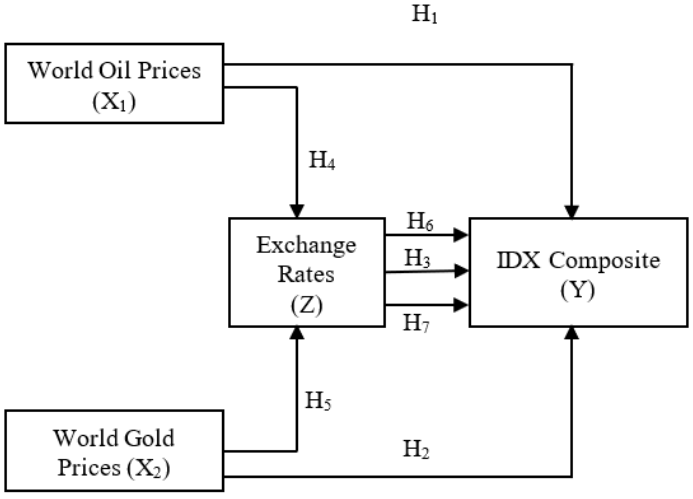
International transactions of crude oil use the US Dollar exchange rate, an increase in demand for crude oil will make the US Dollar currency strengthen. The strengthening US Dollar currency causes the Rupiah exchange rate to weaken against the US Dollar. This causes companies in Indonesia to buy oil in larger amounts of currency, this will then increase operational costs and reduce company performance. The issuer's declining performance is a signal for investors to withdraw their shares, this causes the stock price to decline. A fall in the issuer's stock price will reduce the attractiveness of investors to invest in the capital market, so that the value of the stock market will decrease (Syarif & Asandimitra, 2015).

H6: The exchange rate mediates the effect of world oil prices on IDX Composite

US Dollars are used in world gold transactions. When the world gold price increases, it will cause the demand for gold to fall, because many investors take advantage of the high gold price to sell their gold. This will cause the US Dollar currency to be weaken and have an impact on the Rupiah exchange rate which strengthens. The fall in the value of foreign currency against domestic currency causes stock prices to rise, because the fall in foreign currency encourages investors to invest in the capital market (Madura, 2018). The high price of gold encourages investors to sell their gold and switch to other investments, such as stocks. An increase in demand for stock causes the stock price to increase.

H7: The exchange rate mediates the effect of world gold prices on IDX Composite

Study related to the relationship between world oil and gold price, exchange rates and stock price was still needed to be explored and developed; so that it could provide theoretical and practical contributions, a research conceptual framework with the relationship between variables is proposed as follows:



Source: Researcher (2022)

Figure 1. Research Conceptual Framework

The type of the research is a quantitative research using explanatory research method. The data in this study are in the numbers form to be processed using statistical methods. The data for this research was sourced from investing.com through the website www.investing.com to obtain data on

the IDX Composite, world oil prices, world gold prices, and the rupiah exchange rate against the US Dollar.

The population used in this study is weekly data on world oil prices, world gold prices, the Rupiah exchange rate against the US Dollar, and the IDX Composite. A purposive sampling method was used with criteria of weekly data from June 2017 to May 2022. Weekly data samples were used because the volatility of the variables in this study was relatively high, so weekly data was used to better reflect movement. The sample in this study was 260 observations.

The world oil price used is the price of Brent Crude Oil, because Brent Crude Oil is the most widely used crude oil based on the contracts in the world. The data used is the weekly closing price of Brent oil in Rupiah per barrel. The gold price data used is LBMA gold closing price data at the end of each week in Rupiah per ounce. The LBMA gold price is used because it is recognized internationally and is considered a good standard of delivery (Banjar, 2021). Meanwhile, the exchange rate data used is the weekly middle rate of the rupiah exchange rate against the US dollar.

This study uses multiple regression analysis with path analysis which aims to determine how much the effects of the independent variables have on the dependent variable, either directly or indirectly through mediating variables. Before the effect test is carried out, a classical assumption test will be carried out to ensure that the data used meets the criteria in the basic assumptions of the regression analysis. The classical assumption test is carried out so that there is no bias in the research results and the regression model has a decent predictive power. The regression model in this study is as follows;

Y = a + B1X1 +B2X2 + B3Z.....(1)
Z = a + B1X1 + B2X2.....(2)
Information:
Y : IDX Composite
X1 : World oil price
X2 : World gold price
Z : Exchange rate
B : Regression coefficient
a : Constant coefficient

The test of the mediation hypothesis can be carried out using a procedure developed by Sobel (1982) and known as the Sobel test. The Sobel test is carried out by testing the strength of the indirect influence of X to Y via M. The indirect effect of X to Y via M is calculated by multiplying the path X — M (a) by the path M —Y (b) or the path ab. So the coefficient ab = (c' – c), where c is the effect of X on Y without controlling M, while c' is the coefficient of the effect of X on Y after controlling M. The standard error coefficients a and b are written as Sa and Sb and the magnitude of the standard error indirect is Sab which is calculated by the formula;

$S_{ab} = a^2\sqrt{b^2sa^2 + sb^2 + sa^2sb^2}$.....(3)
Information:
Sab : standard error coefficent indirect effect
Sa : standard error coefficient a
Sb : standard error coefficient b
b : coefficient of the mediating variable
a : independent variable coefficient

3. Results and Discussions

Direct Effect Test Results

The relationship of a variable is said to be significant if the significance value is smaller than 0.05. The results of the test analysis can be seen immediately in Tables 1 and 2:

Table 1
Summary of the Result of the Significance of IDX Composite Variables

Variable	Coefficient	T	*Sig*.	Information
World Oil Price	0.002	26.781	0.000	Significant(+)
World Gold Price	0.00001	0.296	0.767	Not significant
Exchange Rates	-0.478	-12.243	0.000	Significant (-)
R *Square* (0.774)				

Source: Processed Data (2022)

The world oil price path coefficient is 0.002 with a significance of 0.000, which indicates a positive influence, meaning that the higher the oil price value, the higher the IDX Composite. The world gold price path coefficient is 0.00001 with a significance of 0.767, which means no influence on IDX Composite. The exchange rates path coefficient of -0.478 with a significance of 0.000 indicates a negatif influence, meaning that the higher the exchange rates value, the lower the IDX Composite. Based on Table 1, the R square value is 0.774, this means that the IDX Composite variable is explained by world oil prices, world gold prices and the exchange rate of 77.4%. Meanwhile, the remaining 22.6% is influenced by variables outside the independent variables studied.

Table 2
Summary of the Result of the Significance of Exchange Rates Variables

Variable	Coefficient	T	*Sig*.	Information
World Oil Price	0,00003	0,263	0,793	Not Significant
World Gold Price	0,00006	9,174	0,000	Significant(+)
R *Square* (0,249)				

Source: Processed Data (2022)

The world oil price path coefficient is 0.00003 with a significance of 0.793, which means no influence on exchange rates. The world gold price path coefficient of 0.00006 with a significance of 0.000 indicates a positive influence, meaning that the higher the world gold price value, the higher the exchange rates. Based on Tabel 2, the R square value is 0.249, this means that the exchange rate variable is explained by the world oil price variable and world gold price of 24.9%. Meanwhile, the remaining 75.1% is influenced by variables outside the independent variables studied.

Indirect Effect Test Results

Testing the indirect effect is one variable to another through an intermediary called the mediating variable. The results of the indirect effect test analysis are presented in Table 3.

Table 3
Summary of Test Results for Exchange Rates Mediation

Variable	Coefficient	T	*Sig*.	Conclusion
World Oil Price	0,00003	0,263	0,793	Partial Mediation
World Gold Price	0,00006	9,174	0,000	Full Mediation
R *Square* (0,249)				

Source: Processed Data (2022)

The mediation role of world oil price between exchange rates and IDX Composite is partial mediation because world oil price against exchange rate has no significant coefficient value, and exchange rates on IDX Composite has a significant coefficient value. Still, the direct coefficient value between world oil price and IDX Composite is greater than the coefficient value between exchange rates and IDX Composite. Thus exchange rates in this study is stated as partial mediation. The mediating role of exchange rates between world gold prices and IDX Composite are stated as perfect mediation because world gold prices on exchange rates has a significant coefficient value, and exchange rates on IDX Composite also has a significant coefficient value. Still, world gold prices on IDX Composite has an insignificant coefficient value, so exchange rates is stated as perfect mediation or full mediation.

4. Conclusion

This study examines the effect of the exchange rate in mediating the effect of world oil prices and world gold prices on the IDX Composite. There are seven findings in this study. First, world oil prices have a positive effect on the IDX Composite. The increase in world oil prices does not necessarily increase the Retail Selling Price (HJE) of oil, due to Government subsidies (Kementrian Keuangan, 2022). In the middle of rising world oil prices, while the company continues to provide good performance, this is a good signal for investors which causes the company's share price to increase and causes the IDX Composite to increase. Second, world gold prices have no effect on the IDX Composite. This is because gold is an investment alternative that is considered by investors not to provide greater returns than stocks. Some investors prefer to invest in stocks that have a higher risk, but also with high returns.

Third, the exchange rate has a negative effect on the IDX Composite. Changes in exchange rates, through changes in costs and revenues, will have a direct impact on the company's profitability which ultimately affects the company's share price. Fourth, world oil prices have no effect on the exchange rate. This is because the Government has taken steps to maintain the stability of the Rupiah exchange rate against the US Dollar. One of the steps taken is the policy of using B20 or 20 percent Biodiesel which is expected to reduce the amount of oil imports (Finaka, 2018). Fifth, the world gold price has a positive effect on the exchange rate, because the movement in the value of the rupiah is strongly influenced by global dynamics which can weaken the value of the rupiah (Bank Indonesia, 2017).

Sixth, world oil prices have a negative effect on the IDX Composite through the exchange rate. The increase in demand for crude oil will make the US Dollar currency strengthen, and conversely the Rupiah exchange rate against the US Dollar weakens. The weakening of the exchange rate, through changes in costs and income, will have a direct impact on the company's profitability and performance and can influence investors to withdraw their shares causing the IDX Composite to decline. Seventh, the world gold price has a negative effect on the IDX Composite through the exchange rate. Gold prices

are generally inversely related to economic conditions or are counter-cyclical. When there is an increase in the price of gold and on the other hand the economic conditions are unstable, one of which can be seen from the weakening exchange rate, then this will actually make investors choose to invest in gold rather than stocks. It is stated as in these conditions, gold is safer than stocks, so an increase in world gold prices through the exchange rate will cause the IDX Composite to decrease.

Limitation and Future Research

This study uses the IDX Composite to measure all of the stock prices issued in Indonesia. This certainly makes this research results obtained are still global. The characteristics and sensitivity of each corporate sector may differ in response to macroeconomic fundamentals, especially changes in world oil and gold prices. Research that is similar to this study in the future is expected to fill the limitations of this study. Future researchers can examine the variables in this study for each industrial sector, how world oil and gold prices affect stock prices in each sector. This needs to be done so that research better reflects the business sector of each company because the characteristics and sensitivity of each industry are different in responding to macroeconomic fundamentals. Future researchers also need to add other macroeconomic and internal company variables that can affect stock prices, in order to gain a more thorough understanding of the variables that can affect stock prices as a whole.

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