The effect of macro variables on Indonesian stock exchanges in pandemic COVID-19

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ABSTRACT

During the COVID-19 pandemic, it is crucial for stock traders inside a specific nation to conscientiously examine and assess the current monetary conditions and macroeconomic data. This study examined the influence of macroeconomic factors, namely unemployment, inflation, interest rates, and exchange rates, on the Indonesian stock market index within the framework of the COVID-19 pandemic. This research employs quantitative approaches, notably autoregressive distributed lag (ARDL) analysis, to evaluate the dynamics of time series data. The current analysis shows that a variety of factors, such as inflation, interest rates, and exchange rates, have an impact on the stock price index. Furthermore, the results of this study indicate that the deviation from the long-term equilibrium in the short term is rectified at a monthly rate of 33.47%. As a result of completing an exhaustive analysis of this study, it is of the utmost importance for the Indonesian government to concentrate its attention on the issues of unemployment, inflation, interest rates, and currency rates during the COVID-19 epidemic. This is done with the intention of achieving stability on the stock exchange. In addition, it is strongly suggested that investors do a comprehensive analysis of the volatility of stock prices by incorporating a variety of macroeconomic elements.

Contribution/ Originality: This study makes a valuable contribution, specifically addressing the challenges encountered in the field of macroeconomics and the fluctuations of the stock market, enhancing the current literature on macroeconomic factors and stock study models, and aiding Indonesian firms in assessing macroeconomic variables that influence the volatility of stock values.

1. INTRODUCTION

The global stock markets witnessed a downturn amidst the COVID-19 pandemic. While several nations impacted by the COVID-19 virus have witnessed progress, there are still countries, such as Indonesia, that continue to grapple with the ongoing peak of the pandemic. Several public sectors, the corporate world, and the global stock market have all had a significant impact on this global event. According to Ferdiyal (2020), the Indonesia Stock Exchange has expressed that in the event of a global collapse in stock prices, as evidenced by the simultaneous

decrease in the composite stock price index of global exchanges during the pandemic, there would be an impact on the financial markets. The emergence of COVID-19 in Wuhan City, China, has not only posed significant health risks, but it has also posed a threat to the global economy, including countries like Indonesia. The World Health Organisation (WHO) has declared the COVID-19 outbreak a pandemic, which has had a detrimental influence on several industries worldwide. The stock market holds considerable importance within a nation's economy. The Indonesian Composite Index is employed for the computation of stock market performance by evaluating the performance of equities traded on the Indonesian stock exchange. By utilising the Indonesia Composite Index (ICI), investors have the ability to make projections regarding a country's growth rate and the generation of investments. The stock market is a dynamic and rapidly evolving economic asset. The expansion of investment endeavours is closely linked to the availability of cash, deregulation policies, and the unrestricted dissemination of knowledge. Investors with a keen interest in capital market investments have the opportunity to allocate their funds on the Indonesia Stock Exchange, commonly referred to as *Bursa Efek Indonesia* (BEI).

The COVID-19 pandemic and the subsequent decline in the Indonesian financial market have had significant consequences. From January to April 13, 2020, there was a substantial capital outflow of Rp. 159.3 trillion. This outflow primarily consisted of government securities (SBN) amounting to Rp. 143.5 trillion (91%), shares totaling Rp. 11.8 trillion (7.4%), Bank Indonesia Certificate (BIC) amounting to Rp. 3.3 trillion (2.1%), and corporate bonds totaling Rp. 0.6 trillion (0.4%). According to Haryanto (2020), the occurrence of capital outflows from foreign investors consistently leads to heightened levels of volatility in both the Rp/US exchange rate and the stock index in times of crisis. The stock market has a good relationship with the domestic economy. A healthier demand for money leads to a healthier economy in a healthier country, and vice versa. This is due to the fact that a country's capital markets represent almost every industry or public enterprise (Crockett, 1997). Many businesses have chosen the stock market as an option for financing, as long-term, unlimited buyers supply them with funds. Additionally, long-term investment enterprises can use these funds to increase work capital and business growth in addition to using them for organizations. Investors commonly use the Composite Stock Price Index (CSPI) as a way to observe share price adjustments noted in the Indonesian bond (IDX) so that investors can understand how Indonesia's capital market dynamics are bizarre and bullish (active). The Situation Investment decisions that have an impact on stock market movements will change buyers' views (Crockett, 1997).

As seen by the ICI in terms of exports, international spending, and direct investment, Indonesia's economic growth has been strengthened. The US, after Japan and China, is Indonesia's third-largest export destination, with an approximate annual medium-term amount of US$ 14.395.98 million, based on 2000-2015 estimates (Statistics Indonesia, 2020). While the US is the largest economy in the world, with 20% to 30% of the global economic turnover (Sihono, 2008) and 20% of the world GDP (Sihono, 2008).

The nominal economic presence in the US will certainly have a bigger effect on many countries than Japan and China. The United States' economic unrest has had an impact on many nations. Robiyanto (2018) reported that the 2008 financial crisis in the United States had an impact on the US, which, after Japan and China, is Indonesia's third-largest export destination, with an approximate annual medium-term amount of US$ 14.395.98 million, based on 2000-2015 estimates on the markets of America, China, India, England, Japan, Malaysia, and Indonesia. In the meantime, the currency is an inseparable part of international operations for foreign trade transactions. In international exchange countries worldwide, the US dollar is the most widely-used currency. The movement of the Rupia's exchange rate versus the US dollar will affect the ICI movement (Gumilang, 2014). Moreover, the weakening of the Rupiah against the US Dollar would impact the Rupiah's rise in external debt and import costs. As we know, the causes of the rise and fall of the Composite Stock Price Index (CSPI) are influenced by macroeconomic factors— a pandemic that would slow down the economy of Indonesia—but without the efforts of stakeholders to swiftly rescue Indonesia's economy, the economic optimism. The Indonesia Composite Index (ICI) can also be a significant factor in the unemployment rate, according to research conducted by Sirucek (2012), which shows that inflation and

unemployment are the most important factors of the Dow Jones Industrial Average (DJIA) and the standard and poor index 500 (S&P 500), both of which have a negative effect (when the ICI rises, unemployment falls). Multidimensional and successional policies and appeals starting in Jakarta (14 March 2020), West Java (6 May 2020), East Java (12 May 2020), and other regions throughout.

After relatively steady measures in January and February 2020, which reached an average of IDR 13,732 and IDR 13,776 per dollar, the rate of Rupiah started to depreciate in March 2020, in line with the Covid-19 pandemic that began spreading to Indonesia. In the 2020 study, in the semester I 2020, the Government spoke about the weakening of the exchange rate rupia because of the global spread of the Covid-19-pandemic including Indonesia. The government announced the fiscal year 2020. This report will divert investors to safe-haven investments, such as gold, retirement regimes in developing countries, and global currencies such as the US dollar.

Indonesia has contributed to negative disruptions in various sectors, such as connectivity and barriers to labor mobility (Azanella, 2020; Purba, 2020; Ramadhan & Galih, 2020). At an income rate of US $ 3.2 / day for 130 million people and a total income level of US $ 5.5 / day for 124 million people in the world, the aggregate capacity of the poor is only measured by Sumner, Hoy, and Ortiz-Juarez (2020) as a direct result of the effects of COVID-19. Sri Mulyane (Minister of Finance) estimates that COVID-19 will cause an increase in unemployment in Indonesia by 3.78 million people (Fauzia & Sukmana, 2020). Jakarta has generated 227,722 unemployed people as of April 2007 and has imposed the Large-Scale Social Restrictions (LSSR), companies, hotel, and restaurant industries into the most labor-intensive conditions (Statistics Indonesia, 2020).

From Tuesday, September 15, 2020, until Wednesday, September 16, 2020, the US Central Bank and the Federal Reserve will hold a meeting of the Federal Open Market Committee (FOMC). On the other hand, Bank Indonesia (BI) will hold a BI Board of Governors Meeting (RDG) from Wednesday, September 16, 2020, to September 17, 2020. According to the view of Anugerah Mega Investama Director Hans Kwee, it is likely that the results of the FOMC meeting will not lower the Fed Fund Rate (FFR), with the FFR at a level of 0% to 0.25%. However, there are some parties who argue that the benchmark interest rate will be cut again. Therefore, if the benchmark interest rate is maintained at the 4% level, market players will respond negatively to this, even though it will not be too drastic. It is estimated that if Bank Indonesia (BI) continues to maintain interest rates, the ICI will move lower in the range of 4,950 to 5,000.

Since we know that inflation has a negative relation with the Composite Stock Price Indices, that is to say, if inflation rises, it will result in a decline in the ICI of the Indonesian Bourses (Nopirin, 2009). Inflation itself should not be considered an increase in the cost of an item or two until it applies to other things (or results in a price increase). Inflation that continues to rise uncontrollably means that the operational costs of the IDX issuers will increase due to increases in energy prices, employee salaries, etc. The issuer's net profit is afraid of falling. As a result, stock prices fall, and the ICI as a whole will also fall if this happens to many stocks. The ICI will also grow again if the BI rate rises, and it is hoped that inflation can be regulated.

However, the impact of the COVID-19 pandemic on Indonesian inflation became evident during the month of Ramadan, which spanned from April to May 2020, when inflation rates decreased significantly. The recorded rates of inflation were 0.08% and 0.07%, respectively. Ideally, it is desirable for inflation to manifest throughout the period of Ramadan, namely in May–June 2019, within the range of 0.68%–0.55%. This pattern disorder can also be seen in more depth in the spending classes reported frequently by Statistics Indonesia. Low inflation in education, though July coincides with the start of a new school year, is the most obvious thing. July 2020 inflation amounted to just 0.16% for a 0.01% share. The rise in primary school fees, with a share of 0.01 percent, is one of the components that has gained attention from Statistics Indonesia. In the education subsection at the time, inflation was 1.29%, compared to 1.16% in July 2018–2019. In the meantime, inflation in school supplies was 0.56% and 0.66% in July 2018–2019. Besides school, there have been improvements in diet, drink, and tobacco inflation as well. This group faced 0.45% and 0.24% inflation between July 2018 and 2019. In 2020, the figure of inflation was below 0.73%, and deflation was

below 0.09% (Jatengprov, 2020). In July 2019, an announcement was made regarding a food group inflation rate of 0.8%, accompanied by a corresponding share of 0.17%. During the corresponding period in 2020, there was a deflationary trend with an inflation rate of -1.06% and a marginal inflation rate of less than 0.19%. There are numerous rationales for the reduction in prices of food products. One notable aspect is that chicken flesh, comprising 0.9% of the product, and garlic shallots, accounting for 0.04%, possess a deflationary component. Subsequently, there was a reduction in the prices of corn, cayenne pepper, coconut, and sugar, with each commodity experiencing a decline of 0.01% in value. In contrast, the primary driver of inflation in July 2020 was the outlay on personal care and other utilities. According to Jatengprov (2020), the current inflation rate stands at 0.93%, representing a marginal increase of 0.06%. Hence, an inquiry emerges when contemplating the aforementioned variables: what is the impact of all of the macroeconomic factors elucidated on the time series of the Indonesian stock price index within the COVID-19 pandemic? Therefore, the objective of this study is to examine the impact of macroeconomic variables on the Indonesian stock price index. The existing body of academic research has primarily focused on analyzing the macro-level volatility patterns of the composite stock index on the Indonesian stock exchange. The current body of research lacks comprehensive investigation into the relationship between macroeconomic variables and stock price indicators in the context of the COVID-19 pandemic. This analysis utilizes a time-series technique to evaluate the influence of macroeconomic variables on the performance of the Indonesian stock index. Therefore, the present study aims to examine the influence of macroeconomic indicators on the composite stock price index of the Indonesia Stock Exchange amidst the COVID-19 pandemic. The macroeconomic parameters under consideration comprised four primary dimensions, namely unemployment, inflation, interest rates, and currency exchange. The examined stock price index comprises a diverse array of sectors, such as agricultural, mining, basic and chemical industries, varied industries, consumer and commodities industries, property and real estate, transportation and infrastructure, banking, commerce, services, and investment sectors.

This study makes valuable contributions to both the theoretical and practical domains. This work is anticipated to yield theoretical advantages by contributing to the advancement of economics, particularly in the realm of macroeconomic issues and stock price dynamics. This research is anticipated to contribute to the existing body of literature on the study model of macroeconomic variables and stocks. This study offers valuable insights for corporate organizations in Indonesia by examining the model of macro-variables associated with stock prices. It provides input and ideas that should be taken into account when analyzing macro-variables that influence stock price fluctuations.

2. LITERATURE REVIEW

The research by Amrial and Arundina (2019) attempts to show the importance of dual money policy through the Phillips curve on inflation and unemployment, based on the modified Taylor model. This study also shows the relevance of the Phillips curve in Indonesia for inflation and unemployment. The results of the study indicate that when the rate of inflation increased and growth increased, it was observed that the inflation rate here was responding positively to unemployment and shocks. The monetary policy response in Indonesia is in line with the theory that the policies taken are contractionary. The rate of inflation is also not influenced by unemployment.

The Phillips curve is the theory used to describe the compromise between inflation and unemployment. Phillips (1958) published a popular study that showed how the rate of unemployment and inflation in Britain was adverse between 1861 and 1957. The negative relationship between these two variables is the Phillips curve. According to this principle, the unemployment rate would be low while inflation was high, and vice versa. Investors should look after the unemployment rate as a macroeconomic indicator, and the unemployment rate has a significant effect on the country's economy. The higher the job rate, the lower consumer investment, which contributes to a decrease in retail sales and eventually to a negative economic growth effect on high transport costs and the Jakarta Composite Index of Dewi and Asakdiyah (2020). Macroeconomic factors that are themselves influenced by the US dollar's exchange rate have an impact on the inflation affecting the Composite Stock Price Index. Inflation leads to a rise in the price of

products and services and a reduction in human buying capacity. Suppose supply increases relative to USD demand; the surplus money supply growth would trigger inflation in Indonesia. Finally, a country's currency supply and demand have an impact on inflation. Investors also saw inflation as a benchmark for the state of the economy. Investors are less attracted to investing their money because of the rise in inflation. The result of inflation is an increase in product prices, which, if production costs rise faster than the price of a product, has an impact on the company's profit and the dividend paid to investors. Investors are less attracted to investing their money because of the rise in inflation. The result of inflation is an increase in product prices, which, if production costs rise faster than the price of a product, has an impact on the company's profit and the dividend paid to investors.

In their research into the inflation-to-composite stock price index, Rohmanda, Suhadak, and Topowijono (2014) explored inflation in a constructive, substantive way. A broad body of literature on the relationship between inflation and stock prices is also available. The negative effects of stock price inflation have been observed in Mukherjee and Naka (1995). Inflation rises trigger insecurity, so investors are seeking more risk premiums that also decrease stock prices, according to Malkiel (1979). The negative correlation is also due to a rise in inflation, which increases production costs and reduces cash flow in the sector, contributing to a decline in stock prices. In his research, Marshall (1992) points to a negative relationship between inflation and stock prices. Maysami, Howe, and Hamzah (2004) also argued that inflation and stock prices had a negative connection.

Nasseh and Strauss (2000), on the other hand, argued that inflation and stock prices were co-integrated positively. Dritsaki (2005) looks at the causal link between inflation and the price of stocks and points out that inflation influences the price of stocks. An analysis using the VAR model was carried out by Delgado, Delgado, and Saucedo (2018), who conducted an analysis using the VAR model and found that inflation has a negative impact on stock prices. There are some factors that contribute to the stock price movement: inflation, bank interest rates, and the actual gross domestic product (GDP). The findings of the study by Desfiandi, Desfiandi, and Hapzi (2017), with the model added to a multiple linear regression with ordinary lesser square, show there is no important connection between inflation and the ICI movement. By doing this, inflation won't have a direct impact on your decision to invest in equity or IDX stocks. The stock price index represents a country's economic circumstances. As a metric for economic operators in carrying out economic operations, economic stability is a fundamental indicator suggested. In theory, macroeconomics and price index movements are interrelated. In other research, shocks in interest rates have no impact on the composite inventory price index. According to Mukhlis, Simanjuntak, and Prasetyo (2018), the exchange rate variable would lead to a negative composite in their research in 2018 by using the VECM model's method in order to illustrate the pace at which the balance is changed from short to long periods to stock price variable values.

Research by Wahyudi (2017) shows that the composite stock price index has major advantages and effects. The exchange rate adjustment has an effect on stock efficiency, Mukherjee and Naka (1995) claim, and they conclude that the devaluation of the domestic currency improves stock performance at home. Domestic currency depreciation improves the competitiveness of domestic goods on the foreign market and thus raises exports and cash flow, resulting in higher share prices. Especially because the value of the increase in the investment exchange rate in the foreign portfolio increased, affecting both the domestic economy and stock prices positively.

Research in East Asian countries has been performed by Granger, Huang, and Yang (2000) using daily data showing that exchange rates impact stock prices significantly in eight of the nine countries. Nieh and Lee (2001), using regular data from 1993 to 1996, conducted a study in the G7 countries that showed that exchange rates do not influence stock prices significantly in the long run, although they have influenced stock prices significantly in the short run. Within the context of the study by Rahman and Uddin (2009), carried out using the Granger causality and Johansen cointegration tests in the countries of Bangladesh, India, and Pakistan, the two variables have been found to have no long-term or short-term effect.

The correlation between variable exchange rates and stock prices, which is a nonlinear relationship, was tested

by Robiyanto (2018) using the VAR and Markov changing models. Also, in this relationship in Mexico, Delgado et al. (2018) analyzed using the VAR model and showed the negative effect on the stock price of exchange rates. Meanwhile, the analysis by Mankiw (2015) indicates that the exchange rates of the second population between two countries are prices that were accepted for trading with each other in those countries. According to Desfiandi et al. (2017), exchange rate growth influences expected social inflation, particularly for imported goods and domestic companies' price decisions. IDR depreciation against USD and inflation can be regarded as having an impact on the Indonesian economy's movement. Cointegration and the Vector Error Correction Model (VECM) for monthly US data are possible connections (Ratanapakorn & Sharma, 2007). The impact of the rate on stock prices has been scientifically confirmed in some previous studies. For example, in Fisher, inflation increases the nominal rate as a result (Fisher, 1930). The inflationary impact has a detrimental effect on both the currency rate and stock prices. Ratanapakorn and Sharma (2007) have argued that a higher rate would increase operating expenses, decrease corporate revenues, and thus lower inventory values. The linked interest rates and inventory prices of Bulmash and Trivoli (1991) and Humpe and Macmillan (2009) illustrate a negative influence of long-term rates of interest on inventory prices. Peiro (2016) analyzed the relationship further and showed that interest rates have an impact on stock returns, using data from France, Germany, and the UK. Huang, Mollick, and Nguyen (2016) examined the relationship using US information and found that this rate had adverse repercussions on stock prices.

The Vector Error Correction Model (VECM) using monthly data from S&P 500 in the USA, Ratanapakorn and Sharma (2007), is tied to inflation, exchange rates, and short-term interest rates but connected to a negative long-term interest rate. The S&P 500 is a comparable achievement, while the Nikkei 225 is held in the USA and Japan. The S&P 500 exercise was similar in 2009.

Gan, Lee, Yong, and Zhang (2006) studied the correlation between various macro variables such as long and short-term interest, exchange rates, and inflation, with month-long framework findings from January 1990 to January 2003. The results reflect the long-term equilibrium of these macroeconomic factors with the New Zealand Börse (NZSE40). It is suggested by the authors that money is generated on the basis of the Granger cause-and-effect test and that for short-term returns, the long-term interest rate is not appropriate.

Maysami et al. (2004) investigate whether, using the monthly observations from January 1989 to December 2001, finances and the property of Singapore, together with a consumer price index, form a co-integrative connection with inflation, monetary supplies, the short-term and long-term interest rates, and the exchange rate. The financial sector has a positive relationship between monetary supply, inflation, and short-term interest rates, while the sector index has a negative association with industrial growth, long-term interest rates, and exchange rates. The property market has a strong relationship with economic development, capital supply, inflation, and short-term interest rates, and a poor relationship exists between the long-term interest rate and exchange rate with the property index. The composite index represents a positive correlation between monetary supply, economic development, inflation, and a short-term interest rate, whereas a negative association with the index is the long-term interest rate and exchange rate. The most recent study by Amrial and Arundina (2019) attempts to demonstrate the significance of Indonesia's dual money policy as well as the Phillips curve in relation to inflation and unemployment using the modified Taylor model. This study also demonstrates the usefulness of the Phillips curve for analyzing inflation and unemployment in Indonesia. According to the findings of the study, when there was an increase in both the rate of inflation and growth, it was discovered that the inflation rate in this region was responding favorably to fluctuations in unemployment and shocks. The response of Indonesia's monetary policy has been consistent with the idea that the policies that have been implemented are contractionary.

Unemployment does not exert any influence on the rate of inflation. The Phillips curve theory is employed to elucidate the trade-off relationship between inflation and unemployment. Phillips (1958) conducted a seminal study that demonstrated the inverse relationship between the unemployment rate and inflation in Britain for the period spanning from 1861 to 1957. The Phillips curve represents the inverse correlation between the two aforementioned

variables. Based on this theory, it can be inferred that there exists an inverse relationship between the unemployment rate and inflation, whereby a low unemployment rate corresponds to high inflation, and conversely, a high unemployment rate corresponds to low inflation. It is advisable for investors to monitor the unemployment rate as a macroeconomic indicator, given its substantial impact on the overall economy of a nation. According to Dewi and Asakdiyah (2020), there exists an inverse relationship between the job rate and consumer investment, wherein an increase in the former leads to a fall in the latter. This decline in consumer investment then adds to a reduction in retail sales, ultimately resulting in a negative impact on economic growth. Furthermore, high travel costs and the Jakarta Composite Index are identified as additional factors that exacerbate this adverse economic effect.

Additionally, Delgado et al. (2018) came to the conclusion that inflation has a negative impact on stock prices after doing an analysis utilizing the VAR model. The high stock price index is indicative of optimistic results regarding the economic performance of the contract. The change in stock prices can be attributed to a number of factors, including inflation, interest rates offered by banks, and actual GDP.

While the study conducted by Jefry and Djazuli (2020) investigates the relationship between exchange rates and inflation in the context of manufacturing companies in the basic and chemical industrial sectors listed on the Indonesia Stock Exchange. The findings indicate that inflation has a significant impact on the Stock Price Index. Additionally, the Main Composite Stock Index highlights the positive influence of exchange rates on the major stock index. However, Indonesia deviates from the findings of Wahyudi (2017) research, which demonstrates the significant benefits and impacts of the composite stock price index. The alteration of the exchange rate has an impact on the efficiency of stocks. The depreciation of home currency enhances the competitive advantage of domestic goods in the international market, leading to an increase in exports and cash flow. Consequently, this upward trend in economic performance is reflected in higher share prices. The beneficial impact on both the local economy and stock prices can be attributed to the significant increase in the investment exchange rate inside the international portfolio.

3. DATA AND METHODOLOGY

Throughout the pandemic, the investigation involved gathering monthly data. The research data in concern falls under the category of quantitative data, encompassing an observation period spanning from January 2019 to December 2020. The study uses secondary data as the primary source of information, specifically data that aligns with the research variables. The data pertaining to the independent variables in this study, including the unemployment rate, monthly inflation rate, Rupiah currency exchange rates, and interest rates, as well as the dependent variable data, namely the composite stock price index on the Indonesia Stock Exchange, has been sourced from information and reports provided by the Indonesian Stock Exchange, Bank Indonesia, and Statistics Indonesia.

Specifically, this study focused on a single dependent variable, namely the CSPI, which represents the fluctuation or movement of stock prices for all issuers listed on the Indonesia Stock Exchange. The CSPI was measured at the end of each month. The independent variables considered in this study include the inflation rate, the Bank Indonesia Certificate (BIC) interest rate, the exchange rate of the rupiah against the US dollar, and the unemployment rate. At the end of each month, Statistics Indonesia records and publishes an inflation rate that serves as the basis for the inflation rate measurement. The calculation of the BIC interest rate is based on the average three-month BIC. The Rupiah exchange rate against the US Dollar used is the monthly average rate. Last but not least, the Central Statistics Agency's (CSA) calculation of monthly unemployment data yields the unemployment rate.

The previous study employed Johansen cointegration and vector autoregressive models to analyse the long-term series data, specifically focusing on the volatility of the stock price index. In contrast to prior research, the present study used the autoregressive distributed lag (ARDL) approach to investigate the influence of macroeconomic variables on the stock price index during a specific timeframe that encompasses the COVID-19 pandemic.

The research employed autoregressive distributed lag (ARDL) analysis utilising the Eviews 10 software to address the topic at hand. Time series data refers to a specific form of data that comprises variables that are collected

in a sequential manner over a defined time period. The examination of time series data involved the utilisation of a stationarity test. The stationarity test is a statistical procedure conducted to ascertain that time series data are not subject to temporal influences. The Autoregressive Distributed Lag (ARDL) approach is a widely used econometric technique. This approach is capable of estimating the linear regression model in the context of studying long-term relationships that encompass the cointegration test between variables of a time series nature. The research used a model that examines many parameters, including the unemployment rate, inflation, exchange rate, and interest rate, in relation to the dependent variable, namely the Composite stock price index (CSPI) on the Indonesian Stock Exchange. The multiple regression equation can be written as:

$$CSPI_t = \alpha + \beta_1 UPR_t + \beta_2 INF_t + \beta_3 ER_t + \beta_4 IR_t + e_t \quad (1)$$

Information :

CSPI = Value of composite stock price index.

α = Constant.

UPR = Unemployment rate.

INF = Inflation.

ER = Rupiah currency exchange.

IR = Interest rate.

β = Regression coefficient.

e = Error term.

t = 1, 2, 3....., T (*Time series*).

From Equation 1, the equation for the ARDL model can be expressed for each variable in the following manner:

$$\Delta lnCSPI_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \, \Delta lnUPR_{t-i} + \sum_{i=0}^{q} \gamma_i \, \Delta lnINF_{t-i} + \sum_{i=0}^{r} \gamma_i \, \Delta lnER_{t-i} + \sum_{i=0}^{s} \gamma_i \, \Delta lnIR_{t-i}$$

$$+ \delta_1 lnUPR_{t-1} + \delta_2 lnINF_{t-1} + \delta_3 lnER_{t-1} + \delta_4 lnIR_{t-1} + \varepsilon_t \quad (2)$$

The hypothesis of the bound test can be expressed as:

$H_0: \delta_1 = \delta_2 = \delta_3 = 0$

$H_1: \delta_1 \neq \delta_2 \neq \delta_3 \neq 0$

4. FINDINGS

The subsequent section will elucidate the outcomes of the research, derived from the analysis performed in Section 3. The next discourse will centre on the analysis of the study's findings, specifically pertaining to the outcomes of various tests and model estimations. These findings will be elucidated through the establishment of theoretical and empirical connections. This part encompasses the analysis of study variables and the estimation of auto-regressive distributed lag (ARDL) models. According to the data shown in Table 1, the average CSPI value observed in this study is Rp. 5,736.70, accompanied by a standard deviation of Rp. 673.92. The data indicates that the standard deviation value is less than the mean value. This implies that, within the scope of this research, CSPI did not exhibit a significant level of variation. In the interim, the upper limit for CSPI stands at Rp. 6,532.97, while the lower limit is Rp. 4,538.93. A total of 24 observations were recorded for the CSPI.

Table 1. Statistical descriptive results.

Variable	Mean	Median	Maximum	Minimum	Std. dev.	Obs.
CSPI (Rp)	5736.700	5975.940	6532.970	4538.930	673.920	24
UPR (%)	7.090	7.260	8.710	4.840	1.200	24
INF (%)	2.530	2.700	3.490	1.320	0.710	24
IR (%)	4.930	5.000	6.000	3.750	0.820	24
ER (Rp)	14377.920	14224.500	16367.000	13662.000	542.980	24

Moreover, the statistical measures UPR, INF, IR, and ER indicate that the average value surpasses the value of the standard deviation. In the given dataset, the average UPR value is 7.09%, with a standard deviation of 1.20%. Similarly, the average INF value is 2.53%, with a standard deviation of 0.71%. The mean value for IR is 4.93%, with a standard deviation of 0.820%. Lastly, the mean value for ER is Rp. 14,377.92 with a standard deviation of Rp. 542.98. The analysis indicates that the UPR, INF, IR, and ER variables exhibit low levels of variation. There are a total of 24 observations recorded for each variable.

Now we move to the time series analysis of ARDL. The cointegration test is performed by taking into account the bound testing model of unrestricted error correction. Considering the Schwarz Bayesian Criterion (SBC) on the ARDL, the estimate of the *unrestricted error correction* of the model is known to have an optimal lag order of (1,0,0,1,1).

Estimates of *unrestricted error correction* to find out the long-run relationship found that the value of the F-statistics test (6.176403) is greater than the upper bound test (3.520-5.060) with a significance level of α = 1 percent (see Table 2). Therefore, it can be concluded that there is a long-run relationship (integration) between UPR, INF, IR, ER, and CSPI. Thus, the bound testing method shows that the residual (εt) is stationary (*weak form*). This shows that despite the crisis, in the short term, the movement of the Indonesian stock price index can remain stable.

Table 2. Bound test result.

Test statistic	Value	Sign if. (%)	Lower bound l (0)	Upper bound l (1)
F-statistic	6.176	10	2.450	3.520
		5	2.860	4.010
		2.5	3.250	4.490
		1	3.740	5.060

The findings from the long-term ARDL model, as presented in Table 3, indicate the presence of a significant and positive relationship between the unemployment rate (UPR) and the composite stock price index (CSPI). The estimated coefficient value of 0.130892, with a p-value of 0.0023, suggests that this relationship is statistically significant at the 1 percent level of significance. This implies that, holding all other factors constant, a 1 percent shift will have an impact of approximately Rp. 0.130892 on the Indonesian CSPI over the course of a month.

Table 3. ARDL long- run estimation.

Variable	Coefficient	Std. error	t-statistic	Prob.
CSPI	–0.341	0.159	–2.143	0.049
UPR	0.131	0.036	3.670	0.002
INF	–0.080	0.032	–2.515	0.024
IR	0.205	0.073	2.803	0.013
ER	–0.515	0.364	–1.315	0.177
D(IR)	–0.340	0.240	–1.417	0.177
D(ER)	–1.139	0.162	–7.034	0.000
C	3. 195	2.023	1.579	0.135

Furthermore, a long-term relationship was discovered between inflation (INF) and the Composite Stock Price Index (CSPI) over an extended period. The coefficient obtained was -0.07988, indicating a negative association between the two variables. This coefficient was judged to be statistically significant at the 5 percent significance level, with a probability of 0.0238. This implies that, holding all other factors constant, a 1 percent alteration in inflation will result in a diminishing impact on the CSPI over time, namely by Rp. 0.079888 each month, *ceteris paribus*.

Interest Rate (IR) shows a positive and significant relationship to the CSPI, where the value of the coefficient is 0.204564 with a p-value of 0.0134 (significant at the 5 percent significance level). This means that each 1 percent change in interest rate will give the impression or increase on the Indonesian stock price index by Rp. 0.204564 per month, *ceteris paribus*.

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Furthermore, it is found that there is no long-term relationship between the Exchange Rate (ER) and the Composite Stock Price Index (CSPI), where the value of the coefficient obtained is -0.515408 with a p-value of 0.1774. Meaning that any change of Rp.1,000 in the exchange rate will not affect the change or increase in the Indonesian combined stock price index, *ceteris paribus*.

Furthermore, there is no long-term relationship between the Interest Rate (IR) at the first difference level and the Composite Stock Price Index (CSPI). Where the value of the coefficient obtained is 0.340048 and the value of p is 0.1770. Therefore, any 1 percent change in the interest rate will not affect the change in the Indonesian combined stock price index, *ceteris paribus*. It is possible to provide additional clarification that a long-term relationship exists between the exchange rate (ER) at the first difference level and the Composite Stock Price Index (CSPI). The coefficient obtained is -1.139274, and its associated p-value is nearly zero, indicating statistical significance at the 1 percent level. This implies that each alteration of Rp1,000 in the exchange rate will have a consequential impact on the long-term decrease of CSPI Indonesia. The monthly figure is 1,139,274, assuming all other factors remain constant. According to Table 4, the ECM reveals that the coefficient of CointEq (-1) is statistically significant at the 1% level, indicating the presence of short-term cointegration in the model. The CointEq coefficient will then be employed to quantify the rate of adaptation, specifically the rate at which adjustments are made in response to alterations. The validity of the CointEq value is established when the coefficient exhibits a negative sign with a statistically significant probability at the 5% level. The coefficient value of 0.3347 indicates the rate at which the system adjusts towards equilibrium. The velocity is measured at a rate of 33.5 percent per unit of time. The significance lies in the observation that the Indonesian stock market experienced a shock as a result of the COVID-19 pandemic. This shock is anticipated to generate a temporary imbalance in the stock market. However, it is expected that this imbalance will gradually revert to a long-term equilibrium, with a rate of adjustment estimated at 33.5%.

Table 4. ARDL-ECM short-run estimates.

Variable	Coefficient	Std. error	t-statistic	Prob.
C	2.947	0.603	4.891	0.000
D (UPR)	0.121	0.035	3.419	0.005
D (INF)	-0.099	0.044	-2.258	0.042
D (IR	-0.364	0.177	-2.053	0.061
D (ER)	-1.094	0.125	-8.741	0.000
CointEq(-1)*	-0.335	0.068	-4.903	0.000
R²	0.896			
Adj.R²	0.895			
Dw test	2.413			

Note: * Indicate the 1% significance level.

The empirical autoregressive distributed lag (ARDL) model with lag orders (1,0,0,1,1) can be estimated. A number of diagnostic and stability tests can then be used to make the model more reliable. The autocorrelation of the model was assessed using the Breusch-Godfrey serial correlation Lagrangian Multiplier (LM) test, while heteroskedasticity was examined using the White test. The normality of the model's residuals was checked using the Jarque-Bera test, and any specification errors or omitted variables were evaluated using the Ramsey RESET test. The diagnostic test outcomes are displayed in Table 5.

Table 5. ARDL diagnostic test.

Test	F- statistic	Prob.
Breusch-Godfrey serial correlation LM test	3.770	0.050
Breusch-Pagan-Godfrey heteroscedasticity test	0.770	0.610
Jarque-Bera test	2.010	0.366
Specification error: Ramsey reset test	73.440	0.000

Based on the findings presented in Table 5, the diagnostic tests reveal that the residuals exhibit serial uncorrelation, homoscedasticity, and normal distribution as determined by the Breusch-Godfrey serial correlation LM test, Autoregressive Conditional Heteroscedasticity (ARCH) LM test, and Jarque–Bera test, respectively. This implies that the model possesses validity and may be employed for policy suggestions without necessitating any modifications. The model exhibits a high level of specification, as determined by the Ramsey RESET test. The presence of a stable and predictable relationship is widely regarded as an essential need for the development of effective economic policy measures. The potential instability of a model may arise due to insufficient incorporation of the short-term dynamics that characterize deviations from the long-term relationship. Therefore, it is crucial to incorporate short-term dynamics in order to maintain the stability of long-term characteristics. Given this viewpoint, we use the Brown, Durbin, and Evans (1975) CUSUM-of-squares (CUSUM-SQ) test, a statistical technique. When the CUSUM-SQ statistic remains within the 5% significance level, it indicates that the computed coefficients are considered stable. Figure 1 and Figure 2 depict the graphical representation of the test conducted for our autoregressive distributed lag (ARDL) model.

A stability test is employed to ascertain the stability of the cointegration connection among variables. The stability tests employed in this study are the Cumulative Recursive Residual Sum (CUSUM) and the cumulative sum of the Square Recursive Residual (CUSUMQ). According to Janjua, Samad, and Khan (2014), if the CUSUM and CUSUMQ lines fall inside the critical limit of 5%, it indicates that the cointegration result is both statistically significant and exhibits stability. The subsequent findings pertain to the stability analysis conducted for this study:
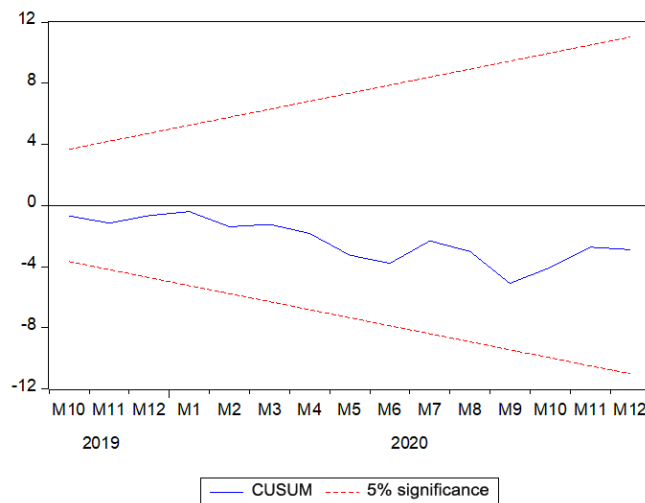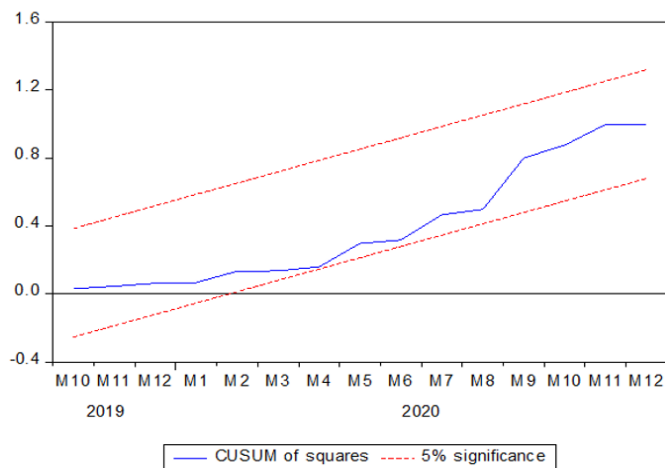

Figure 1. CUSUM.

Figure 2. CUSUMQ.

The fact that both the CUSUM and CUSUMQ statistics remain within the crucial threshold of 5% serves as evidence that the cointegration outcomes exhibit a notable level of stability, according to the analysis of Figure 1 and Figure 2.

5. DISCUSSION

5.1. Unemployment and CSPI

The study results show that UPR has a positive and significant effect on CSPI, with a t-value of 3.920 and a probability value of 0.0009. So the results of this study follow the expectations of the H_1 hypothesis, where UPR has a positive and significant effect on CSPI.

In general, a lower unemployment rate will affect the US Dollar, which tends to strengthen. Reduced unemployment will encourage workers' income so that it spurs consumer spending and encourages inflation, which in the end leads to the central bank's consideration of increasing interest rates so that increasing interest rates will result in a decrease in stock prices because if interest rates increase, investors tend to invest their funds in deposits or bonds so that the stock market will be abandoned, which causes stock prices to decline.

This study demonstrates a positive and statistically significant relationship between the unemployment rate and the Industrial Confidence Index (ICI) during the COVID-19 pandemic. Specifically, it suggests that any increase in unemployment exerts an influence on stock prices. The results of this study are consistent with those of the Holmes and Maghrebi (2016) study, which found that the unemployment rate has a positive and statistically significant impact at a 1% level of significance. The validity of these findings remains unaffected by the specific definition of market returns, therefore supporting the assertion that heightened stock market volatility exhibits a positive correlation with the unemployment rate. The results of this study are consistent with Sirucek (2012) research on the connection between macroeconomic factors and the stock market, which specifically focused on the US market. Sirucek's analysis identified inflation as the most influential factor for the Dow Jones Industrial Average (DJIA) and Standard and Poor's 500 (S&P 500) indexes. The JCI's upward movement is associated with a decrease in unemployment, indicating a negative correlation between these two variables.

5.2. Inflation and CSPI

The results showed that INF had a negative and insignificant effect on CSPI with a t value of -0.3157 and a probability value of 0.75, which indicated a significant level at the 5% level. So the results of this study follow the expectations of the H_2 hypothesis, where INF affects CSPI.

A negative coefficient indicates an inverse relationship between the increase in the INF and the decrease in the CSPI, and vice versa. The present study demonstrates a significant inverse relationship between inflation and the Composite Stock Price Index, confirming the acceptance of hypothesis 2. Similar findings showed that inflation had a negative impact on the stock price index in the studies by Novitasari (2013) and Singh, Mehta, and Varsha (2011). According to the findings of Anton and Triono (2011), it was observed that inflation exerts a detrimental impact on the Industrial Confidence Index (ICI). This observation indicates that as inflation rates increase, individuals tend to exhibit a greater inclination towards saving their money rather than allocating it towards investments in the stock market.

Therefore, an increase in inflation will affect a decreasing Industrial Confidence Index (ICI). The impact of inflation on the Jakarta Composite Index (JCI) is detrimental, as increasing inflation serves as an unfavourable indication for investors, leading them to divert their investments away from the capital market. Consequently, investors tend to sell their shares and allocate their funds towards alternative investment vehicles, such as savings accounts or time deposits. The transition towards alternative investment vehicles will prompt investors to divest their shares, thereby leading to a decline in stock prices, according to the Investment Company Institute.

5.3. Interest Rate and CSPI

The research results show that IR has a positive and significant effect on CSPI, with a t-value of 4.486 and a probability value of 0.0003. So the results of this study follow the expectations of hypothesis H_3, where IR has a positive and significant effect on CSPI.

The impact of the interest rate can explain the inverse relationship between stock prices and interest rates. Specifically, when the interest rate is high, stock prices tend to be low, and conversely, when the interest rate is low, stock prices tend to rise. When the interest rate is elevated, investors exhibit a greater inclination to allocate their funds into deposits, namely Savings Bank Interest (SBIs), rendering investments in shares comparatively less attractive and consequently leading to a decrease in share values. The findings of this research demonstrate that there is a positive and statistically significant relationship between interest rates and stock prices. The estimated coefficient of 2.354, along with the significant probability value of 0.03, suggests that a decrease in interest rates over time is associated with an increase in the stock price of a company. The findings of this study are consistent with those of Aurora and Riyadi (2013), who contend that the Bank Indonesia (BI) interest rate has a significant impact on the Jakarta Islamic Index. The studies conducted by Hasanah, Hadiantini, and Kusumawardhani (2021) and Gunardi and Disman (2023) provide evidence that the Bank Indonesia (BI) interest rate exerts an influence on the stock prices inside the Indonesian market.

Nevertheless, the findings of this study diverge from the outcomes of prior research conducted by Gupta, Chevalier, and Sayekt (2000), who assert that there exists no causal association between interest rates and stock prices, as well as the investigation conducted by Ginting, Topowijono, and Sulasmiyati (2016), which demonstrates that the variable of the BI rate does not exert a noteworthy impact on stock prices. The observed discrepancy could be attributed to variations in the study's time frame and the specific sector under investigation.

5.4. Exchange Rate and CSPI

The study results show that ER has a negative and significant effect on CSPI, with a t value of -6.367 and a probability value of 0.0000. Thus, this research supports hypothesis H_4, which is that ER affects CSPI. The results of this study follow the expectations of the hypothesis.

A negative coefficient signifies that an increase in the ER will result in a decrease in the CSPI. The findings of this study are in line with those of Dewi and Asakdiyah (2020) and Ginting et al. (2016), which show that the exchange rate has a statistically significant negative impact. Aurora and Riyadi (2013) similarly discovered comparable findings, wherein their study indicated a noteworthy impact of the rupiah exchange rate on the Jakarta Islamic Index. Munib (2016) similarly observed comparable results. The researcher's findings indicate that the rupee exchange rate variable exerts a notable impact on stock prices. A t value of -2.656 and a probability value of 0.01 in this study demonstrate that the rupiah exchange rate exhibits a statistically significant negative effect. Based on the findings of this study, it can be inferred that the rupiah exchange rate exerts a notable impact on the upward movement of stock prices. The appreciation of the Rupiah currency rate is associated with a decline in the share price of a corporation.

Nevertheless, the findings of this investigation diverge from the research conducted by Raharjo (2010), which concluded that the inflation variable and the rupiah exchange rate do not exert a statistically significant impact on stock prices.

According to a study by Fahlevi (2019), there is a notable and statistically significant impact on stock prices within the Indonesian Stock Exchange (IDX) due to changes in the exchange rate of the Indonesian rupiah relative to the US dollar. The observed discrepancy could be attributed to variations in the study's time frame and the specific sector under investigation.

6. CONCLUSION

Based on the findings and subsequent analysis of this research, it can be inferred that the unemployment rate exerts a positive and statistically significant impact on the Composite Stock Price Index (CSPI) of the Indonesia Stock Exchange (IDX). Furthermore, it can be concluded that the unemployment rate variable exhibits a positive and significant long-term association with the CSPI. In the context of the Indonesia Stock Exchange, it has been observed that inflation exerts a noteworthy and adverse impact on the Composite Stock Price Index. Furthermore, a persistent and adverse association has been established between inflation and the Composite Stock Price Index over the long run. The impact of interest rates on the Composite Stock Price Index (CSPI) on the Indonesia Stock Exchange (IDX) is both positive and statistically significant. Furthermore, this relationship exhibits a positive and substantial long-term association with the CSPI. The variable of the rupiah exchange rate exhibits a statistically significant negative impact on the Composite Stock Price Index on the Indonesia Stock Exchange. This implies that when the rupiah strengthens against the US dollar (i.e., appreciates), the Composite Stock Price Index tends to increase. The focus is on the inverse correlation rather than the actual value of the stock price. This discovery has theoretical ramifications that experimentally validate the idea that increasing a nation's currency exchange rate is indicative of a positive economic outlook for the nation. Hence, this finding implies that it is crucial for the government to continually employ strategic measures in order to enhance the stability and value of its currency exchange rate.

Based on the conclusions above, investors can pay attention to the variables of the unemployment rate, inflation, interest rates, and exchange rates in making decisions in the capital market, especially the exchange rate variable, which has a large enough influence so that there is no big loss in investing in the capital market. And to ensure the stability of the Indonesian Stock Exchange, the Indonesian government needs to focus on the macro variables Unemployment rate, Inflation, Interest rate, and Exchange rate in the Covid-19 pandemic situation.

The drawback of this research is that it has limited research, which is limited to only analyzing macro variables as independent variables on the Composite Stock Price Index on the Indonesia Stock Exchange as the dependent variable. This research only uses macroeconomic variables to measure the performance of the Composite Stock Price Index, even though many other factors can affect the object of the research.

Significant policy issues arise from this situation. It is anticipated that macroeconomic policies will exert an influence on the Indonesian stock market. In order to sustain a robust stock market, it is anticipated that authorities will prioritize the monitoring and management of key economic indicators such as unemployment levels, interest rates, exchange rates, and inflation rates. It is imperative for authorities to closely observe global financial market dynamics, including fluctuations in major stock markets, interest rates, and the value of the rupiah exchange rate. This is crucial, as these factors significantly impact the performance of the Indonesian stock market. Specifically, a stronger rupiah exchange rate against the US dollar (indicating appreciation) corresponds to an increase in stock prices. This observation suggests a theoretical conclusion that, from an empirical standpoint, the aforementioned discovery serves to reinforce the notion that enhancing a nation's currency exchange rate conveys a favorable indication for its economy. This suggests that it is imperative for the government to consistently implement strategic measures in order to enhance the stability and value of the rupiah exchange currency.

The study reveals practical consequences arising from the positive and negative impacts of macroeconomic variables on stock values. The available evidence indicates that there is a discernible negative reaction to stock prices, particularly in response to upward movements in both exchange rates and interest rates. One plausible explanation for this correlation is the anticipated yield on equities, which is directly affected by increased interest rates. According to the theoretical framework, it is posited that an increase in interest rates will have a direct impact on stock returns, resulting in a decline in prices. When there is an increase in interest rates, investors typically exhibit a tendency to divert their attention from stocks, resulting in a decline in stock values. Hence, it can be inferred that the stock price exhibits a certain level of predictability, which can be attributed to the patterns observed in the behaviour of the

three-month Treasury Bill rate. The relationship between the money supply and stock prices has significant consequences for monetary policy, as changes in the money supply can directly influence share values. The consideration of the stock market's impact on monetary policy should not be disregarded, as the stock market holds significant influence over economic activity. However, it's crucial to remember that the stock market shouldn't be the only factor influencing monetary policy. Conversely, it has been shown that a deficient money supply has an adverse effect on the fluctuations of equity prices, suggesting that investors can potentially generate profits by employing trading strategies that rely on historical patterns of monetary stocks.

The exchange rate variable is widely recognized as the most crucial macroeconomic variable, exhibiting a predominantly negative correlation with stock prices. This discovery suggests that in economies where exports play a prominent role (referring to firms listed on the IDX), an increase in the value of the currency has a detrimental impact on stock markets. Conversely, in economies where imports are dominant (referring to IDX-listed import companies), an increase in the value of the currency positively influences stock markets. The implications of this study suggest that the COVID-19 pandemic had a negative effect on stock prices, as seen by their decline. Additionally, the study highlights the increasing unemployment rate in Indonesia as a contributing factor. Furthermore, the study identifies interest rates and the exchange rate of the rupiah as significant variables that exerted a substantial influence on the composite stock price index at IDX. The findings bear significance for both domestic and international investors, regulatory bodies including the Securities and Exchange Commission, policymakers, and analysts specializing in stock market trends. Investors and security analysts possess the ability to forecast stock values and therefore generate financial gains. Stock market authorities have the capacity to implement measures aimed at monitoring corporate activities in order to mitigate the potential for stock price manipulation. Additionally, they can undertake initiatives to enhance public awareness and understanding of the stock market, thereby fostering a climate conducive to increased participation in stock investments. It is imperative for policymakers to possess an understanding of the macroeconomic impacts on the stock market in order to enhance the efficacy and precision of their decision-making processes.

The findings of this research are derived from a dataset of exceptional quality. Subsequent scholarly investigations may explore the impact of macroeconomic indicators on stock prices through the utilization of diverse approaches and sector-specific stock price indices. In addition, researchers have the ability to utilize data collected at different frequencies, such as daily or weekly intervals, in order to assess the impact of data frequency on the obtained results. Another area of study that future researchers may want to look into is expanding the time period, making the sample size bigger, and adding more sectors with different macroeconomic and non-economic variables.

REFERENCES

Amrial, M., A., & Arundina, T. (2019). Implementation of dual monetary policy and its relevance to inflation and unemployment in the Phillips Curve context in Indonesia. *International Journal of Islamic and Middle Eastern Finance and Management, 12*(5), 680-697. https://doi.org/10.1108/IMEFM-11-2018-0398

Anton, & Triono, H. (2011). The influence of the SBI interest rate, US Dollar exchange rate, inflation rate, world oil price and gold price on the composite stock price index (Empirical study on the IDX for the 2005-2010 period). *Management Scientific Journal, 8*(10), 176-195.

Aurora, T., & Riyadi, A. (2013). The effect of inflation, interest rate, and exchange rate on LQ-45 index at Indonesia stock exchange year period 2007 to 2011. *Jurnal Dinamika Manajemen, 1*(3), 183-197. https://doi.org/10.22437/jdm.v1i3.1478

Azanella, L. A. (2020). *The Covid-19 case in DKI Jakarta and the implementation of the PSBB which has been approved by the minister of health Kompas.com.* Retrieved from https://www.kompas.com/tren/read/2020/04/07/114643065/kas-covid-19-di-dki-jakarta-dan-penerapan-psbb-which-has-been-approved

Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society Series B: Statistical Methodology, 37*(2), 149-163. https://doi.org/10.1111/j.2517-6161.1975.tb01532.x

Bulmash, S. B., & Trivoli, G. W. (1991). Time–lagged interactions between stocks prices and selected economic variables. *The Journal of Portfolio Management, 17*(4), 61-67. https://doi.org/10.3905/jpm.1991.409351

Crockett, A. (1997). *5 global capital markets and the stability of banking and financial systems in Enoch, C., & Green, J. H. (Eds.). Banking soundness and monetary policy.* USA: International Monetary Fund.

Delgado, N. A. B., Delgado, E. B., & Saucedo, E. (2018). The relationship between oil prices, the stock market and the exchange rate: Evidence from Mexico. *The North American Journal of Economics and Finance, 45*, 266-275. https://doi.org/10.1016/j.najef.2018.03.006

Desfiandi, A., Desfiandi, A., & Hapzi, A. (2017). Composite stock price index macro factor in investment in stock equity funds. *International Journal of Economics and Financial Issues, 7*(3), 534-536.

Dewi, A. P., & Asakdiyah, S. (2020). The influence of the rupiah exchange, interest rates, and unemployment rates on stock prices in oil and gas mining sub-sector companies listed on the Indonesian stock exchange for the 2012-2017 period. *Journal of Business Management Focus, 8*(2), 163–179. https://doi.org/10.12928/focus.v8i2.1588

Dritsaki, M. (2005). Linkage between stock market and macroeconomic fundamentals: Case study of Athens stock exchange. *Journal of Financial Management and Analysis, 18*(1), 38-47.

Fahlevi, M. (2019). The influence of exchange rate, interest rate and inflation on stock price of LQ45 index in Indonesia. *Advances in Social Science, Education and Humanities Research, 343*, 157-163. https://doi.org/10.2991/icas-19.2019.34

Fauzia, M., & Sukmana, Y. (2020). *Impact of corona, poverty rate could increase by 3.78 million people. Kompas.com.* Retrieved from https://money.kompas.com/read/2020/04/14/141348026/dampak-corona-angka-kemiskinan-bisa-meningkat-378-juta-orang

Ferdiyal, I. (2020). *Impact of the covid-19 pandemic, world stock exchanges experience the same situation. Metrojambi.com.* Retrieved from https://www.metrojambi.com/read/2020/06/01/53768/dampak-pandemi-covid19-bursa-saham-dunia-mengalami-situasi-yang-sama

Fisher, I. (1930). *The theory of interest: As determined by impatience to spend income and opportunity to invest it.* New York: MacMillan Company.

Gan, C., Lee, M., Yong, H. H., & Zhang, J. (2006). Macroeconomic variables and stock market interactions: New Zealand evidence. *Investment Management and Financial Innovations, 3*(4), 89–101.

Ginting, M. R. M., Topowijono, T., & Sulasmiyati, S. (2016). The effect of interest rates, exchange rates and inflation on stock prices study of the banking sub-sector on the Indonesia stock exchange period 2011-2015. *Journal of Business Administration, 35*(2), 77-85.

Granger, C. W., Huang, B.-N., & Yang, C.-W. (2000). A bivariate causality between stock prices and exchange rates: Evidence from recent Asianflu*. *The Quarterly Review of Economics and Finance, 40*(3), 337-354. https://doi.org/10.1016/S1062-9769(00)00042-9

Gumilang, R. C. (2014). The effect of macroeconomic variables, gold prices and world oil prices on the composite stock price index study on the Indonesia stock exchange 2009-2013 period. *Journal of Business Administration, 14*(2), 1-9.

Gunardi, N., & Disman, M. S. (2023). The effect of money supply and interest rate on stock price. *Central European Management Journal, 31*(1), 233-240. https://doi.org/10.57030/23364890.cemj.31.1.24

Gupta, J., Chevalier, A., & Sayekt, F. (2000). The causality between interest rate, exchange rate and stock price in emerging markets: The case of the Jakarta stock exchange. *SSRN Electronic Journal*. http://dx.doi.org/10.2139/ssrn.251253

Haryanto. (2020). The impact of covid-19 on movements in the Rupiah exchange rate and the composite stock price index. *The Indonesian Journal of Development Planning, 4*(2), 151–165. https://doi.org/10.36574/jpp.v4i2.114

Hasanah, S., Hadiantini, R., & Kusumawardhani, A. (2021). Analysis of macroeconomic factors and fundamental factors to Sharia stock return on trade, services and investment sector companies in Jakarta Islamic index (JII) period 2014-2018. *Advances in Social Science, Education and Humanities Research, 536*, 129-140. https://doi.org/10.2991/assehr.k.210312.020

Holmes, M. J., & Maghrebi, N. (2016). Financial market impact on the real economy: An assessment of asymmetries and volatility linkages between the stock market and unemployment rate. *The Journal of Economic Asymmetries, 13*, 1-7. https://doi.org/10.1016/j.jeca.2015.10.003

Huang, W., Mollick, A. V., & Nguyen, K. H. (2016). US stock markets and the role of real interest rates. *The Quarterly Review of Economics and Finance, 59*, 231-242. https://doi.org/10.1016/j.qref.2015.07.006

Humpe, A., & Macmillan, P. (2009). Can macroeconomic variables explain long-term stock market movements? A comparison of the US and Japan. *Applied Financial Economics, 19*(2), 111-119. https://doi.org/10.1080/09603100701748956

Janjua, P. Z., Samad, G., & Khan, N. (2014). Climate change and wheat production in Pakistan: An autoregressive distributed lag approach. *NJAS-Wageningen Journal of Life Sciences, 68*, 13-19 https://doi.org/10.1016/j.njas.2013.11.002

Jatengprov. (2020). *BPS recorded central java deflation of 0.09 percent central java provincial government news portal jatengprov.go.id*. Retrieved from https://jatengprov.go.id/beritaopd/juli-2020-bps-catat-deflasi-jateng-009-persen/

Jefry, J., & Djazuli, A. (2020). The effect of inflation, interest rates and exchange rates on stock prices of manufacturing companies in basic and chemical industrial sectors on the Indonesia stock exchange. *International Journal of Business, Management and Economics, 1*(1), 34-49. https://doi.org/10.47747/ijbmer.v1i1.49

Malkiel, B. G. (1979). The capital formation problem in the United States. *The Journal of Finance, 34*(2), 291-306. https://doi.org/10.2307/2326969

Mankiw, G. N. (2015). *Principles of economics: A guide tour* (7th ed.). USA: Cengage Learning.

Marshall, D. A. (1992). Inflation and asset returns in a monetary economy. *The Journal of Finance, 47*(4), 1315-1342. https://doi.org/10.1111/j.1540-6261.1992.tb04660.x

Maysami, R. C., Howe, L. C., & Hamzah, M. A. (2004). Relationship between macroeconomic variables and stock market indices: Cointegration evidence from stock exchange of Singapore's All-S sector indices. *Journal of Management, 24*(1), 47-77. https://doi.org/10.17576/pengurusan-2005-24-03

Mukherjee, T. K., & Naka, A. (1995). Dynamic relations between macroeconomic variables and the Japanese stock market: An application of a vector error correction model. *Journal of Financial Research, 18*(2), 223-237. https://doi.org/10.1111/j.1475-6803.1995.tb00563.x

Mukhlis, I., Simanjuntak, T. H., & Prasetyo, T. (2018). The analysis of the bank interest influence and exchange rate towards composite stock price index in Indonesia using vector error correction model approach. *KnE Social Sciences, 3*(3), 127–139. https://doi.org/10.18502/kss.v3i3.1879

Munib, M. F. (2016). Influence of Rupiah exchange rate, inflation and BI rate on banking sector companies' stock prices on the Indonesia stock exchange. *eJournal Business Administration, 4*(4), 947-959.

Nasseh, A., & Strauss, J. (2000). Stock prices and domestic and international macroeconomic activity: A cointegration approach. *The Quarterly Review of Economics and Finance, 40*(2), 229-245. https://doi.org/10.1016/S1062-9769(99)00054-X

Nieh, C.-C., & Lee, C.-F. (2001). Dynamic relationship between stock prices and exchange rates for G-7 countries. *The Quarterly Review of Economics and Finance, 41*(4), 477-490. https://doi.org/10.1016/S1062-9769(01)00085-0

Nopirin. (2009). *Monetary economics* (4th ed. Vol. 1). Yogyakarta: BPFE Yogyakarta.

Novitasari, I. (2013). The influence of inflation, Indonesian crude oil prices, and interest rates (BI rate) on the combined stock price index (IHSG) (monthly data for the period 2006-2012). *FEB Student Scientific Journal, 1*(2), 105-130.

Peiro, A. (2016). Stock prices and macroeconomic factors: Some European evidence. *International Review of Economics and Finance, 41*, 287-294. https://doi.org/10.1016/j.iref.2015.08.004

Phillips, A. W. (1958). The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861-1957. *Economica, 25*(100), 283-299. https://doi.org/10.1111/j.1468-0335.1958.tb00003.x

Purba, D. O. (2020). *Greater surabaya PSBB extended until June 8.* Retrieved from Kompas.com.https://surabaya.kompas.com/read/2020/05/25/22121411/psbb-surabaya-raya-diperpanjang-panjang-8-juni

Raharjo, S. (2010). The influence of inflation, Rupiah exchange rate, and interest rates on share prices on the Indonesian stock exchange. *ProBank, 1*(3), 1-16.

Rahman, M. L., & Uddin, J. (2009). Dynamic relationship between stock prices and exchange rates: Evidence from three South Asian countries. *International Business Research, 2*(2), 167-174. https://doi.org/10.5539/ibr.v2n2p167

Ramadhan, A., & Galih, B. (2020). *Ridwan Kamil says West Java PSBB results are encouraging.* Retrieved from Kompas.com.https://nasional.kompas.com/read/2020/05/16/17024841/ridwan-kamil-buat-hasil-psbb

Ratanapakorn, O., & Sharma, S. C. (2007). Dynamic analysis between the US stock returns and the macroeconomic variables. *Applied Financial Economics, 17*(5), 369-377. https://doi.org/10.1080/09603100600638944

Robiyanto, R. (2018). Indonesian stock market's dynamic integration with Asian stock markets and world stock markets. *Journal of Management, 52*, 181-192. https://doi.org/10.17576/pengurusan-2018-52-15

Rohmanda, D., Suhadak, & Topowijono. (2014). Influence course rupiah, inflasi, and BI rate against composite stock prices. *Journal of Business Administration Brawijaya University, 13*(1), 1-10.

Sihono, T. (2008). The United States financial crisis and the Indonesian economy. *Journal of Economics and Education, 5*(2), 171-192. https://doi.org/10.21831/jep.v5i2.597

Singh, T., Mehta, S., & Varsha, M. (2011). Macroeconomic factors and stock returns: Evidence from Taiwan. *Journal of Economics and International Finance, 2*(4), 217-227.

Sirucek, M. (2012). Macroeconomic variables and stock market: US review. *International Journal of Computer Science and Management Studies, 12*(3), 1-9.

Statistics Indonesia. (2020). *Open unemployment rate (TPT) of 4.99 percent.* Retrieved from https://www.bps.go.id/pressrelease/2020/05/05/1672/februari-2020--tingkat-pengangguran-terbuka--tpt--sebesar-4-99-persen.html

Sumner, A., Hoy, C., & Ortiz-Juarez, E. (2020). *Estimates of the impact of COVID-19 on global poverty (WIDER Working Paper 2020/43).* Helsinki: UNU-WIDER.

Wahyudi, S. T. (2017). The ARIMA model for the Indonesia stock price. *International Journal of Economics and Management, 11*(S1), 223 − 236.