The Effect Of Money Supply And Interest Rate On Stock Price
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ABSTRACT
Research on stock prices is an important aspect in the development of financial management studies, because it has an impact on scientific perspectives and is able to become a practical study for investors in making investment decisions. Interestingly, various studies show different results regarding the effect of macroeconomics on stock prices, both by sector, country classification, and study period. This study aims to examine more generally using the composite stock price index in analyzing macroeconomic effects on stock prices. The research period is used during 2000-2020, using the money supply and interest rates as macroeconomic variables in Indonesia and Malaysia. The results of the study show that both the money supply and interest rates have an influence on stock prices in Indonesia, while research in Malaysia shows that only interest rates have an influence on stock prices. Research in two emerging market countries shows different patterns of influence, this shows that Arbitrage Pricing Theory has different patterns of influence.

Keywords: Money Supply; Interest Rates; Stock Prices.

1 Introduction
Macroeconomics is an environment that affects the company's daily operations. The ability of investors to understand and predict future macroeconomic conditions will be very useful in making profitable investment decisions. For this reason, an investor must consider several macroeconomic indicators that can assist investors in making decisions. This makes the study of the influence between macroeconomic factors and stock prices one of the most debated topics of study in finance in the last few decades.

The important role of the capital market in the economy is first as a means of business funding. Funds obtained from the capital market can be used for business development, expansion, additional working capital and others. Second, the capital market is a means for the public to invest in financial instruments such as stocks, bonds, mutual funds, and others (Kartika, 2010).

The stock price index changes every day due to changes in market prices that occur every day and the existence of additional shares. The increase in the number of outstanding shares comes from new issuances, namely the entry of new issuers listed on the Stock Exchange or corporate actions in the form of splits, rights, warrants, stock dividends, bonus shares and convertible shares. In an effort to develop their economies, Southeast Asian (Asean) countries are committed to strengthening economic growth, as well as promoting stability and financial integration in the Asean region, amidst the uncertainty caused by the Covid-19 pandemic.

In understanding the macroeconomics of stock prices, there is the theory of Arbitrage Pricing Theory which is an asset pricing model based on the idea that the return of an asset can be predicted by using the relationship that exists between the same assets and risk factors in general. This theory was created by Stephen Ross in 1976. Arbitrage Pricing Theory predicts the relationship between portfolio returns and single asset returns through a linear combination of many macroeconomic variables (Lorenz & Trück, 2008).

This APT theory explains the price at which a mispriced asset is expected to be. It is often seen as an alternative to the Capital Asset Pricing Model (CAPM), as APT has more flexible assumption requirements. While the CAPM formula requires the expected rate of return by the market, the APT uses the expected rate of return on risky assets and the underlying risk of a number of macro-economic factors. Arbitration uses the Arbitrage Pricing Theory model to benefit by taking advantage of mispriced securities (Hu et al., 2021). A mispriced security will have a price that is different from the price predicted by the model in theory. By taking short positions on overpriced securities, while simultaneously taking long positions on portfolios that use APT calculations, arbitrageurs are in a position to take theoretical, risk-free profits.

The APT theory is a theory that explains that there is influence between macroeconomics and stock movements. This theory has been widely studied which shows that there are different patterns regarding macroeconomic influences on stock movements, such as in developed countries and emerging market countries. As an effort to find novelty from the APT theory, researchers seek to compare the effect of macroeconomics on the JCI and the dominant stock sector on GDP.
Various studies show that there are differences in the results of APT testing in each country, which shows that the pattern of APT in various countries differs from one another. As research by Nkoro and Uko (2013) in Nigeria during the 1985-2009 period showed the results that the exchange rate and money supply had no effect on stock prices. Likewise, research by Zaheer & Rashid (2014) in Pakistan for the period 2001-2011 states that the money supply has a negative effect on stock prices. The results of these studies show that there are differences in APT patterns among emerging market countries. Ratanapakorn & Sharma (2007), in the United States during the research period from 1975 to 1999, stated that the money supply had a one-way relationship with stock prices. Research in the United States by Gallagher and Taylor (2002) in G-7 countries conducted by Abdullah and Hayworth (1993) research in New Zealand conducted by Gan, Lee, Yong and Zhang (2006) states that interest rates have an influence on stock prices.

Stock prices are considered a leading indicator for economic activity (Stock and Watson, 2003; Rapach and Weber, 2004), and determining what factors drive these markets is very important. While stock prices are primarily driven by financial variables (Bekaert, Engstrom, & Xing, 2009), the importance of macroeconomic variables also cannot be ruled out (Rapach and Zhou, 2013).

Information is an important element for investors and business people because information essentially provides information, notes or descriptions for past, present and future conditions for the survival of a company and how the market for securities is. Complete, relevant, accurate and timely information is needed by investors in the capital market as an analytical tool to make investment decisions. Information published as an announcement will provide a signal for investors in making investment decisions. If the announcement contains a positive value, it is hoped that the market will react when the announcement is received by the market (Jogiyanto, 2000).

Indonesia has changed from a country whose economy is heavily dependent on agriculture to a country with a more balanced economy, where the manufacturing sector (a type of industry) is now more dominant than the agricultural sector. This also implies that Indonesia is reducing its traditional dependence on the primary export sector. However, it should be noted that all of these major sectors experienced expansion during the stated period. This can be seen from the graph of the contribution of the manufacturing and agricultural sectors to Indonesia's GDP.

Malaysia as a neighboring country to Indonesia, has a much better economic condition. Malaysia's GDP per capita is $12,000, three times that of Indonesia's GDP per capita which is only around $4,000. Malaysia has a policy and vision to change its economic production base into a semiconductor industry like South Korea, Japan and China. It can be said that policy makers in Malaysia have a vision for the future, there is continuity from policies that have been implemented before. With an inflation rate of only around 1.9%, much lower than Indonesia's (around 9%), Malaysia's economy has stable growth and is good for investment. Under such economic conditions, Malaysia should be a more attractive country for investors than Indonesia, with a relatively small risk of uncertainty (Kartika, 2010).

Companies listed on the Malaysian Stock Exchange dividend policy is influenced by insider ownership and debt policy, while in Indonesia it is not. This indicates that the laws applied in Malaysia relating to investor law protection are felt to be more effective in controlling managers and insider ownership, so that insiders are unlikely to increase firm value because the interests of owners and agents are aligned due to market control and manager disciplinary actions (Hermuningsih and Wardani, 2009).

In 2020, the Malaysian economy plunged minus 17.1% in the second quarter of this year. This is the worst economic achievement in the last 20 years. The Central Bank of Malaysia said Malaysia's gross domestic product shrank by 17.1% in April-June from the same period the previous year. The contraction is much deeper than the 10% decline forecast in a Reuters poll. Malaysia's economic collapse is the result of a policy of strictly limiting the movement of citizens and businesses to contain the spread of the coronavirus which has infected more than 9,000 people in the Southeast Asian country. Malaysia's worst economic slump since the Asian financial crisis in 1998 and marks a sharp drop from the 0.7% year-over-year growth seen in the first quarter. This achievement is also the worst since the Asian financial turmoil 11 years earlier which marked the neighboring country's recession.

On the basis of theory and various previous studies, there is an urgency to conduct research related to macroeconomic effects on stock prices, especially research on emerging market countries that have different patterns of influence.
2 Method

In conducting this research, the authors used empirical study research methods. According to Geiger & Gross (2018) empirical studies are ways that can be observed by the human senses, so that other people can observe and know the methods used. In this study the authors used an associative descriptive approach because there are variables to be examined and the relationship is to present a structured, factual, and accurate description of the facts and the relationships between the variables studied.

The objects in this study are macroeconomic factors and IHSG stock prices in Indonesia and Malaysia. The population in this study are companies that are included in the JCI, interest rate data and money supply obtained on the stock exchange and the central bank during 2000-2020. The sample in this study uses a saturated sample, which means that all research data is used as a research sample. The data analysis technique uses the classical assumption test, namely the normality test, heteroscedasticity, multicollinearity, linearity, and the classic assumption test. After the researcher conducted the classical assumption test, then the panel data test was carried out. The data test tool uses the eviews10 application.

3 Result and Discussion

Table 1. Research in Indonesia

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1590.700</td>
<td>769.3766</td>
<td>2.067518</td>
<td>0.0534</td>
</tr>
<tr>
<td>Interest_Rate</td>
<td>-119.7618</td>
<td>61.56328</td>
<td>-1.945345</td>
<td>0.0675</td>
</tr>
<tr>
<td>Money_Supply</td>
<td>0.892191</td>
<td>0.106934</td>
<td>8.343401</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared         | 0.924844    | Mean dependent var 3111.905
Adjusted R-squared| 0.916494    | S.D. dependent var 2095.546
S.E. of regression| 605.5599    | Akaike info criterion 15.78175
Sum squared resid  | 6600650.    | Schwarz criterion 15.93097
Log likelihood    | -162.7083   | Hannan-Quinn criter. 15.81413
F-statistic       | 110.7513    | Durbin-Watson stat 0.892787
Prob(F-statistic) | 0.000000    |                 |

Based on research data in Indonesia, it shows that interest rates have a negative influence on stock prices, meaning that the lower the interest rate, the higher the stock price. This is because low interest rates make investors choose to invest in the stock market, because it has the potential to increase profits. The money supply shows a positive influence, which means that the greater the money supply in society, the greater the increase in stock prices in Indonesia. This research model contributes 91% to changes in stock prices, there are only 9% of factors outside the model.

Table 2. Research in Malaysia

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2018.371</td>
<td>1321.835</td>
<td>1.526947</td>
<td>0.1442</td>
</tr>
<tr>
<td>Interest_Rate</td>
<td>-273.1575</td>
<td>95.72437</td>
<td>-2.853583</td>
<td>0.0106</td>
</tr>
<tr>
<td>Money_Supply</td>
<td>7.110412</td>
<td>7.744130</td>
<td>0.918168</td>
<td>0.3707</td>
</tr>
</tbody>
</table>

R-squared         | 0.745087    | Mean dependent var 1299.048
Adjusted R-squared| 0.716764    | S.D. dependent var 414.2773
S.E. of regression| 220.4782    | Akaike info criterion 13.76104
Sum squared resid  | 874991.6    | Schwarz criterion 13.91026
Log likelihood    | -141.4909   | Hannan-Quinn criter. 13.79342
F-statistic       | 26.30619    | Durbin-Watson stat 1.043543
Prob(F-statistic) | 0.000005    |                 |
Based on research data in Malaysia, it shows that interest rates have a negative influence on stock prices, meaning that the lower the interest rate, the higher the stock price. This is because low interest rates make investors choose to invest in the stock market, because it has the potential to increase profits. The money supply shows no effect, which means that the greater or lower the money supply in society, has no impact on increasing or decreasing stock prices in Malaysia. This research model contributes 71% to changes in stock prices, there are 29% of factors outside the model.

The results of this study were analyzed using the Arbitrage Pricing Theory which is an asset pricing model based on the idea that the return of an asset can be predicted by using the relationship that exists between the same assets and risk factors in general. This indicates that there is a predictable relationship in understanding macroeconomic factors. Empirically, many studies have been carried out in various countries and various research periods.

Abdullah and Haywort (1993), in the G-7 countries during the 1987 study period, stated that interest rates have a one-way relationship to stock prices, this means that there is no relationship between the two variables. The results of research conducted by Gallagher and Taylor (2002), in the United States during the research period 1974 to 1975, state that interest rates have a one-way relationship to stock prices. The results of research conducted by Gan, Lee, Yong, & Zhang (2006), in New Zealand during the research period 1990 to 2003, stated that interest rates have a one-way relationship to stock prices.

Previous research on the effect of interest rates was conducted by Ratanapakorn and Sharma (2007) examining 6 macroeconomic factors (long term and short-term interest rates, money supply, industrial production, inflation and exchange rates). The results show that stock prices are negatively related to long-term interest rates but positively related to the money supply, inflation, exchange rates and industrial production. Talla (2013) argues that macroeconomic indicators are the consumer price index, industrial production, money supply (M0) and exchange rate. The results show that there is a negative relationship between inflation and currency depreciation on stock prices. Also negative interest rates on stock prices. Money supply shows a positive influence on stock prices. The Granger causality test shows that stock prices and selected macroeconomic variables are not unidirectional except for one unidirectional causal relationship from stock prices to inflation.

A study conducted by Rapach, Wohar and Rangvid (2005) tested the predictive ability of macroeconomic variables in twelve industrialized countries and concluded that interest rates were the most consistent predictor across geographic areas. Several research results in emerging market countries have also succeeded in proving that there is a long-term relationship between macroeconomic variables on stock prices (Sharma & Mahendru, 2010). Interest rates have both short-term and long-term effects (Maysami, Howe and Hamzah, 2004). However, according to Maysami and Koh (2000) interest rates have a positive relationship with stock prices in the short term but a negative relationship in the long term.

In developed countries, the results of research conducted by Ratanapakorn & Sharma (2007), in the United States during the study period 1975 to 1995, stated that interest rates had a one-way relationship with stock prices. The results of research conducted by Humpe & Macmillan (2009), in Japan and the United States during the research period 1965 to 2005, state that interest rates have a one-way relationship to stock prices. The results of research conducted by Francisco Jareño, Loredana Negrut (2016), in the United States during the research period 1995 to 2004, stated that interest rates have a one-way relationship to stock prices. The results of research conducted by Mukherjee and Naka (1995), in Japan during the research period of 1971 to 1990, stated that interest rates had a one-way relationship to stock prices. The results of research conducted by Bansal, Strauss, & Nasseh (2015) in France, Germany, Italy, the Netherlands, Switzerland and the UK in the research period 1962 to 1995, state that interest rates have a one-way relationship to stock prices.

This is in accordance with the classical theory of Yusuf, Ichsan, & Suparmin (2021) which states that if interest rates are higher, investors' desire to save will also be higher, so that people's desire to invest will be lower. For companies, an increase in interest rates will have an impact on increasing interest costs, especially for companies that have a fairly high debt burden, thus the increase in interest costs will also be a burden on the company, which will have an impact on reducing investor interest. With the increase in interest rates, many investors have diverted their investment to banking instruments such as deposits, so that investors can get a high return compared to stock investments.

The Effect of Interest Rates on Emerging Market Stock Prices was studied by Rahman and Mohsin (2011) in Pakistan for the 1998-2011 period and Oladeji, Ikpefan, & Alege (2018) in Nigeria for the 1985-2015 period which resulted in a negative effect between interest rates on prices share. As well as research by Chen, Kim, & Kim
Based on this presentation, it shows that the pattern of influence of interest rates on stock prices consistently occurs in developed countries, while studies in emerging market countries show different patterns of influence. This indicates that changes in interest rates in emerging market countries are not the only factor used by investors in selling or buying shares.

In developed countries, the results of research conducted by Ratanapakorn & Sharma (2007), in the United States during the study period 1975 to 1999, stated that the money supply had a one-way relationship with stock prices. The results of research conducted by Cheung & Ng (1998) in Canada, Germany, Italy, Japan and the United States during the 1997 study period, stated that the money supply has an influence on stock prices.

The results of research conducted by Flannery & Protopapadakis (2002), in the United Kingdom, Switzerland, Belgium and the United States during the research period 1980 to 1996, state that the money supply has an influence on stock prices. The results of research conducted by Humpe & Macmillan (2009), in Japan and the United States during the research period from 1965 to 2005, stated that the money supply had no effect on stock prices. Various previous studies have shown that there are differences in the results of research on the effect of macroeconomics on stock prices in terms of developed countries and emerging market countries, the research period and sector focus on stock exchanges.

Research by Kim (2003) in the United States during the research period from 1974 to 1998, states that the money supply has a positive effect on stock prices. The results of research conducted by Maysami & Koh (2000), in Singapore during the research period 1988 to 1995, stated that the money supply had a positive effect on stock prices. The results of research conducted by Maysami, Howe, & Hamzah (2004), in Singapore during the research period 1989 to 2001, stated that the money supply had no effect on stock prices.

The results of research conducted by Humpe and Macmillan (2007) in America and Japan for the period 1965-2005 state that the money supply has a negative effect on stock prices. Alatiqi and Fazel (2008) in America 1965-2005 stated that the money supply has a significant effect on stock prices. Kraft & Kraft (1977) in the United States states that the money supply has no effect on stock prices. Based on the research results above, there are differences in research results, meaning that there are inconsistent results in research in developed countries, some also state that there is a negative effect between the money supply on stock prices, and there are results that support this research, namely the money supply does not affect stock prices.

The results of research conducted in other emerging market countries by Hasan Mohammed El-Nader & Ahmad Diab Alraimony (2012) in Jordan for the period 1991-2010, Hsing (2011) in South Africa for the period May 2008-November 2008, Emeka Nkoro & Aham Kelvin Uko (2013) in Nigeria for the 1985-2009 period and Zaheer Alam, Kashif Rashid (2014) in Pakistan for the 2001-2011 period stated that the money supply had a negative effect on stock prices while in Nigeria the 2001-2012 period stated that the money supply had a significant positive effect on stock prices. Based on the results of this study, it was concluded that the influence of the money supply on stock prices is still inconsistent in both developed and emerging markets.

Conceptually, the pattern of influence of interest rates on stock prices due to interest rates appears in some form in almost every calculation in science and finance. The Keynesian theory of interest rates refers to market interest rates, i.e. a rate that "regulates" the funds currently provided (Keynes, 1937). According to Keynes, the market interest rate depends on the supply and demand for money. The interest rate is a price that balances the willingness to hold wealth in cash with the supply of cash.

The basic understanding of interest rate theory (at a macro level) is the price of using money for a certain period of time. Interest is a reward for the inconvenience of releasing money, thus interest is the price of credit. The interest rate is related to the role of time in economic activities. Interest rates arise from the penchant for having money now. Classical theory states that interest is the price of loanable funds (investment funds) thus interest is the price that occurs in the market and investment.

According to Bean (2017) what must be considered as a determining factor for additional interest rates consists of "the length of time when money is lent, the extent of the risk of default from customers and the extent to which money loses its purchasing power over time". The imposition of interest rates would show that when interest rates are expressed in a continuous form, they can be broken down into amounts with one term representing compensation for delaying consumption, another compensation for lost purchasing power, and compensation for risk of default.

Differences in the pattern of influence regarding the effect of the amount in circulation on stock prices, because the money supply emphasizes the role of money as a liquid asset as well as a medium for conducting...
transactions. Money is a stock of assets that can be immediately used to make transactions (Mankiw, 2000). Money is also part of the development of the transaction process after previously the current transaction process by exchanging goods or known as barter.

Keynesians posit that the supply of money in a market-oriented production economy is endogenous, not exogenous, as Monetarists claim. Money supply is said to be endogenous if it is determined in the economic system itself (Hermawati, 2013). The history of the modern monetary economy has witnessed the emergence of two opposing views regarding the role of the central bank in managing the money supply and (indirectly) the level of economic activity in an economy. The first group of economists known as the Monetarist group, under the influence of Friedman (1961) argued that the money supply in the economy is exogenously determined. This view is based on the premise that the money supply equals the monetary base money multiplier. Because the central bank can change this basis, it can control the money supply in the economy.

4 Conclusion

Arbitrage Pricing Theory is a well-established theory, because testing in various countries shows that there is a macroeconomic effect on stock prices. Interestingly, this research confirms various previous studies which show that there are different patterns of macroeconomic influence on stock prices in emerging market countries. This condition indicates that macroeconomic fluctuations in emerging market countries are of great concern to investors, because they have an impact on investment returns earned by investors, such as lower interest rates, causing stock prices to increase.

References