

Macroeconomic Factors and Stock Returns: An Approach of Arbitrage Pricing Theory in the Food and Beverage Industry



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ABSTRACT: We examine the efficiency and efficacy of the Arbitrage Pricing Theory model in explaining stock returns in the food and beverage industry. To that end, we analyze the relationship between macroeconomic variables and stock returns before and during the pandemic. In this paper, we use unexpected changes in economic growth, inflation, interest rate, exchange rate, and crude oil price as generating factors and find that these factors have come to explain stock returns movement. Using the generalized least square (GLS) technique, we study stocks from 19 firms listed in Indonesia Stock Exchange over sixteen months from 2018 to 2021. While most significant relations are negative, some are significantly positive. The significant associations suggest that the theory is supported in that estimated expected returns depend on selected generating factors. The result also shows that investors are rational because they consider these factors as systematic risks influencing their profit. Furthermore, we find that there is a difference in stock returns before and during the pandemic, with the average being greater during the pandemic. We assume that this is due to investors' choice to seek out safe-haven assets in order to limit their exposure to losses.

KEYWORDS: macroeconomic, arbitrage pricing theory, systematic risk, unexpected changes in macroeconomics, stock return, pandemic

INTRODUCTION

The capital market has a very substantial role in the economy and development of a country (Fadly, 2021; Otoritas Jasa Keuangan, 2016). For investors, the market serves as a means of obtaining additional income (Otoritas Jasa Keuangan, 2016). The food and beverage subsector is one of the sectors of the manufacturing industry that supports Indonesia towards the industrial era 4.0. The subsector's average real investment increased by 3% annually from 2015 to 2020, indicating that food and beverage are of interest to investors and have promising prospects (BKPM, 2020b, 2020a). In addition, its productivity, export, and employment achievements were recorded as positive and consistent. Its export value reached US\$29.91 billion in 2018, showing its competitiveness in the global market is relatively strong. This is greatly influenced by the diversity of products and the presence of a sustainable market. The food and beverage industry has also become a mainstay in supporting the increase in national investment value and contributing to Indonesia's economic growth (Kemenperin, 2019). In the first quarter of 2020, its positive growth significantly declined along with the market and most sectoral indices as a negative effect of the Covid-19 pandemic (*Indonesia Stock Exchange*, 2020; Purwoko *et al.*, 2020). This decline occurred due to investors' fear, who gave up their shares when the first Covid-19 case was confirmed (Limanseto, 2020).

Improvements were recorded in the second quarter of 2020, which is believed to correlate with increased community social activities. The positive growth of the food and beverage industry was reported to be more consistent compared to basic metal and allied products and pharmaceutical sectors (Bayu, 2021). This may be influenced by the nature of food and drink as primary human needs. Meanwhile, its stock returns—measured by the capital gain (loss)—have significantly fluctuated, even since before the pandemic. The most significant decline was recorded in the 2nd quarter of 2018 before increasing rapidly in the following period. This movement continued until 2020, which was influenced by changes in household consumption patterns (Kemenperin, 2021; Puspitasari, 2021; Tamara, 2020), global and national economic uncertainty, and negative market sentiment.

The majority of investors prefer stock over other instruments mainly because they are believed to provide high returns. This is related to their desire to get the maximum profit, which is the primary goal of investment (Fadly, 2021; Jones, 2013; Reilly *et al.*, 2020). Stock price volatility produces gains. That means changes in the prices will lead to changes in returns (Markowitz, 1952; Nghiem, 2015; Ross *et al.*, 2013). The level of return on investment will be directly proportional to the risk that investors must bear, regardless of the instrument. Therefore, experts have developed various theories and models to estimate asset returns

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(Khan et al., 2017), one of which is the Arbitrage Pricing Theory (APT). According to the theory, an asset is not only influenced by market risk but also various unexpected and unanticipated factors. These factors are systematic risks that cannot be diversified (Ross, 1976; Ross et al., 2013; Sumarto and Saluy, 2018). The arbitrage theory is an extension of the Capital Asset Pricing Model (CAPM), which is criticized by several experts because it only considers market risk as a systematic risk that explains changes in returns between two different assets (Ansari, 2000; Fama and French, 2004; Sutrisno and Nasri, 2018). The APT approach is a more efficient alternative to traditional asset pricing models as it considers multiple risk factors. Determining the risk element may be difficult in some cases, but APT will often give investors a more accurate rate of return.

Because the number and types are not determined (Ross, 1976), macroeconomic variables are widely used by researchers to replace unexpected factors in the APT approach as systematic risks related to assets. It is also believed that these factors can indicate general economic conditions (Chen et al., 1986; Gusni and Riantani, 2017; Khan et al., 2017; Ross and Roll, 1980; Sumarto and Saluy, 2018). Several variables that are often used in the study include the rate of economic growth, inflation, interest rate, exchange rate, and crude oil price (Altay, 2003; Basu and Chawla, 2012; Chen et al., 1986; Elshqirat, 2019; Gusni and Riantani, 2017; Kewal, 2012; Khan et al., 2017; Ross and Roll, 1980; Sumarto and Saluy, 2018; Zunara and Hartoyo, 2016). In theory, a country's economic growth signifies an increase in people's welfare and has a positive impact on stocks (Nurpramana, 2005). The difference between the realized value and the expected value of economic growth that cannot be anticipated is a risk suspected to be related to stock returns (Ross et al., 2013). In contrast with the rate of inflation and interest rates, in theory, the increase of both variables would generate negative sentiment from investors. The high rate of inflation causes a decrease in people's purchasing power, while an increase in the interest rate reduces the attractiveness of the capital market (Nurpramana, 2005; Tandililin, 2010). Unpredictable changes in inflation and interest rates are a risk that impacts negatively on realized rate of return obtained by investors. The higher the risk, the lower the stock returns (Chen et al., 1986; Gusni and Riantani, 2017; Halton, 2022; Ross et al., 2013). The rise of the Rupiah will reduce the cost of imported raw materials, which has a positive impact on the firm's shares (Tandililin, 2001). The exchange rate becomes a risk that negatively affects investors' income when the actual value is lower than the expected value (Ross et al., 2013). Meanwhile, crude oil prices negatively correlate with the stock of importing companies such as Indonesia (Atif et al., 2022; Filis et al., 2011; Gisser and Goodwin, 1986; Rahmanto et al., 2016). Therefore, price changes that occur outside expectations are a risk that negatively affects stock returns (Ross et al., 2013).

Several previous pieces of research show gaps in macroeconomic relations with stock returns. Among all the variables, Gusni and Riantani (2017) only found a positive effect of inflation on sharia stock returns. Siregar and Diana (2019) show a positive influence between market returns, economic growth, inflation, exchange rates, and political risk on stock returns. This is different from the findings of Nugroho and Hermuningsih (2020), which prove that the exchange rate has a positive effect on stock returns, while inflation and interest rates have a negative effect.

Based on the introduction above, the authors are interested in examining the Arbitrage Pricing Theory approach—using macroeconomic variables as risks—in explaining changes in stock returns in the food and beverage industry before and during the pandemic. Over a period of time, it has been known that the company's positive growth is not always followed by an increase in profits earned by investors. It can be seen by the increasing historical stock returns to 0.3% when the growth declined by 0.22% in the second quarter of 2020. Conversely, the rate of returns decreased when the subsector's performance improved in the first quarter of 2021.

LITERATURE REVIEW

Markowitz (1952) created a theory in which investors should be compensated with higher returns for bearing higher risk and vice versa. According to the theory, risk is the deviation from asset returns (Guerard, 2010). Markowitz stated that rational investors would consider the average expected return (mean) and the risk they have to bear (variance) when choosing an asset. Therefore, this framework is also known as the mean-variance model, which stresses the idea of analyzing assets based on the risk contained in the assets. Markowitz's argument was later criticized by Lubor Pastor, who said that some irrational investors choose assets outside of the mean-variance calculation and expect abnormal returns. However, Pastor's assumptions cannot be used to generalize the behavior of all investors. The Markowitz model remains acceptable and forms the foundation of the formalized asset pricing concept under the name Capital Asset Pricing Model (CAPM).

The capital market theory involves a set of predictions concerning equilibrium expected returns on risky assets. The model is an extension of the portfolio model by Markowitz, which allows investors to assess the relevant risk of either an individual asset or portfolio as well as to examine the relationship between risk and the returns expected from the stocks. Investors are assumed to diversify their portfolios according to the Markowitz model, choosing assets that match their return-risk preferences (Jones, 2013). In the 1960s, Sharpe, Lintner, and Mossin argued that investors are compensated for bearing not only total risk but also a

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market risk as systematic risk. They are not compensated for taking stock-specific (or firm-specific) risk, which can be diversified away in a portfolio context. The systematic risk is measured by a stock's beta (β) (Guerard, 2010), which is the asset's sensitivity to market changes. The model also believes that assets with the same systematic risk should have the same rate of return. Based on that assumption, investors will earn a profit equal to or close to the market price (Astuti, 2005; Jones, 2013; Khan et al., 2017; Nurpramana, 2005; Sihombing, 2018; Sumarto and Saluy, 2018). However, the validity of this model is questionable and is considered to be weak empirically (Ansari, 2000; Fama and French, 2004; Sumarto and Saluy, 2018). It is believed that market risk is not the only systematic risk that investors need to consider, so Ross (1976) developed an alternative theory called the Arbitrage Pricing Theory (APT).

The arbitrage theory is formulated based on the principle of "the law of one price" that in a competitive financial market, two assets with the same characteristics must have the same expected return, and they cannot be sold at different prices. If the two assets have the same risk but are sold at different prices, an arbitrage opportunity will arise. Investors will buy low-value assets and sell high-value assets at the same time to get a risk-free profit. Asset prices will then undergo adjustments due to an arbitrage process, in which low-value assets' price is increased, and high-value assets' price is even more affordable. The arbitrage process is said to be reached when eventually, the two assets have the same price or are in equilibrium. This encourages the creation of an efficient market where the opportunity to gain arbitrage profits will not be repeated (Azis et al., 2015; Jones, 2013; Sihombing, 2018).

Compared to the CAPM, APT takes into account a number of underlying risk factors to determine an asset's price and expected return. Market risk alone is believed to be insufficient to explain the difference in returns between two assets as some other unexpected factors or elements also underlie the changes in the rate of return. These unpredictable factors are also known as the surprise factors, measured as the difference between the actual value and the expected value of a variable. These unexpected or unanticipated changes in value will affect asset returns in a certain period. In other words, risk in APT is the sensitivity of assets to unexpected factors. Because of this argument, arbitrage pricing theory is called the factor model (Hartono, 2022; Jones, 2013). Ross's approach emphasizes that each risk factor must have a strong influence on the expected return of assets. In addition, risk factors must also be uncertain or unpredictable (Jones, 2013). Thus, Ross et al. (2013) formulated the factorial model in the following equation:

$$R = \bar{R} + \beta_1 F_1 + \beta_2 F_2 + \dots + \beta_k F_k + \epsilon$$

Where R is the actual rate of return, \bar{R} is the expected rate of return, F is the unexpected changes or surprise factor, β is the sensitivity of assets to generating factors, and ϵ is unsystematic risk.

According to Jones (2013), returns and risks are the main elements underlie all investment decisions. Stock returns consist of dividends and capital gain (loss). A dividend is an annual cash income that consists of the firm's retained earnings and is determined by the company's board of directors, while capital gain (loss) is profit (loss) due to changes in stock prices on the market (Jones, 2013; Ross et al., 2013; Sihombing, 2018). This study will only discuss stock returns in the form of capital gain (loss). The stock returns are divided into expected returns and actual returns. Stock returns in the form of capital gain (loss) are the result of the changes and volatility of stock prices. The bigger the changes, the higher the profit (loss) investors would get. The actual returns that investors get can deviate from their expectations at the beginning of the investment period. The greater the deviation, the greater the investment risk (Nurpramana, 2005; Reilly et al., 2020; Sihombing, 2018). These deviations or differences, either positive or negative, indicating that investors must always take into account the level of risk that exists in the investment process (Bodie et al., 2014; Jones, 2013; Ross et al., 2013), which is affected by uncertainty (Nurpramana, 2005; Reilly et al., 2020; Sihombing, 2018).

The Markowitz mean-variance model was the first theory to explain the relationship between risk and return expected from assets. Every investment is almost always accompanied by risks that are directly proportional to an asset's expected returns (Bodie et al., 2014; Markowitz, 1952; Ross et al., 2010). Intense competition in the capital market is one of the reasons for the equilibrium between risk and expected rate of return (risk-return trade-off) (Bodie et al., 2014). The linear relationship between the two occurs because rational investors are assumed to demand rewards or compensation commensurate with the risks they bear (Hartono, 2022; Jones, 2013).

Total risk is divided into systematic and unsystematic risk. Systematic risk occurs due to phenomena outside the firms and follows market movements, so it cannot be eliminated or controlled. These types of risks—including inflation rates, interest rates, exchange rates, government policies, and economic recessions—are broad, and their changes will impact all businesses and the course of a country's business activities (Irdawati et al., 2021; Ross et al., 2013; Samsul, 2006). Meanwhile, unsystematic or firm-specific risk occurs due to events within the company, for example, business risk, liquidity risk, bankruptcy risk, and legal risk

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(Ross et al., 2013). According to arbitrage theory, factors that affect asset prices are systematic risks (Jones, 2013; Ross et al., 2013), such as economic growth, inflation rates, interest rates, world oil prices, and other macroeconomic variables which were first used by Chen et al. (1986). They managed to show that the industrial production index, changes in risk premiums, the difference between long-term and short-term government bond yields, and changes in unanticipated inflation rates have a significant relationship with expected stock returns.

Changes and movements of macroeconomic aggregate variables are often faced by various countries, which are also related to stock returns. Amtiran et al. (2017) found that a decline in economic growth, as measured by gross domestic product (GDP), was responded to negatively by investors, thereby reducing stock returns. Meanwhile, inflation and depreciation of the Rupiah had a significant negative impact on stock returns. Surono et al. (2020) also show a positive relationship between GDP and stock returns. Khan et al. (2017) show the negative effect of inflation on stock returns in the Karachi capital market. The higher the inflation rate, the lower the returns obtained by investors. This also causes a decrease in investors' interest in investing. Siregar and Diana (2019) found a positive relationship between market returns, economic growth, inflation, exchange rates, and political risk and stock returns. Studies by Er and Vuran (2012) and Zunara and Hartoyo (2016) learn that crude oil prices have a negative and significant correlation with stock returns.

METHODOLOGY

The research uses a causality design and an explanatory quantitative approach which aims to explain the relationship between variables through hypothesis testing (Sugeng, 2022). The independent variable of the study is risks, namely the difference between the actual value and the expected rate of economic growth, inflation, interest rate, exchange rate, and world oil prices, whereas the dependent variable is capital gains (losses). The research was conducted on stock returns before the pandemic (Q1 2018 to Q4 2019) and during the pandemic (Q1 2020 to Q4 2021) based on the World Health Organization announcement of the global pandemic. The sample consisted of all food and beverage firms listed on the IDX consecutively and consistently from 2018-2021. A total of 19 firms were chosen using the purposive sampling technique.

All of the data was obtained from the official websites of the Indonesia Stock Exchange (IDX), Yahoo Finance, the Central Bureau of Statistics (BPS), Bank Indonesia (BI), and the United States Energy Information Administration (EIA). These data were analyzed through several stages. First, a univariate time series analysis is performed to estimate the expected macroeconomic value. This analytical method is based on the limitations of the researcher's data (Asrirawan et al., 2022; Rachbini et al., 2021). Then we calculate risk values by subtracting expected values from the actual values of each macroeconomic variable. The next step is descriptive analysis to help describe or summarize the distribution of all variables through arithmetic mean, minimum and maximum values, and variance. Then cross-sectional generalized least square regression was carried out to analyze the relationship between macroeconomic risks on food and beverage stock returns before and during the pandemic. Finally, a T-paired sample test was carried out to determine if there was a difference in average means before and during the pandemic. The regression model used in the study is written as follows:

$$R_{it} = \alpha_i + \beta_1 PE_{it} + \beta_2 INF_{it} + \beta_3 BI7DRR_{it} + \beta_4 KURS_{it} + \beta_5 OIL_{it}$$

Where R is the rate of return (Y), α is the intercept, β is the slope of the regression line, PE is the unexpected changes in economic growth (X1), INF is the unexpected changes in inflation rates (X2), BI7DRR is the unexpected changes in interest rates (X3), KURS is the unexpected changes in exchange rates (X4), and OIL is the unexpected changes in oil prices (X5).

RESULTS AND DISCUSSION

The results of the multivariate analysis show that the chosen regression model with a number of selected independent variables is statistically feasible in predicting stock returns in the food and beverage subsector. This is proven by the probability value of the F test of 0.00 (0.05). While 88% of a firm's stock returns before the pandemic are explained by the risks of economic growth, inflation, interest rates, exchange rates, and crude oil prices, 78% movements of the returns during the pandemic are completely explained by movements in macroeconomic variables (see Table 4.1). Therefore, the proposed APT regression model can predict variations in stock returns. Changes in one or more units of macroeconomic risk cause movements in stock returns in the food and beverage subsector. When unpredicted changes in economic growth and exchange rates increase by 1 unit, the industry's stock returns before and during the pandemic would also increase. On the contrary, one unit decrease in unexpected changes in inflation, interest rates, and crude oil prices would increase stock returns (see Table 4.1).

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TABEL 4.1 CROSS-SECTIONAL GLS REGRESSION OF GENERATING FACTORS ON STOCK RETURNS BEFORE AND DURING THE PANDEMIC

Variables	Prepandemic period				Pandemic period			
	t-stat	P value	Prob. F	Adj. R ²	t-stat	P value	Prob. F	Adj. R ²
Economic growth factor	21,96	0,00	0,00	88%	6,54	0,00	0,00	78%
Inflation factor	-8,73	0,00			-6,76	0,00		
Interest rate factor	-6,34	0,00			-4,88	0,00		
Exchange rate factor	3,47	0,00			21,23	0,00		
The crude oil price factor	-2,48	0,01			-18,74	0,00		

The results also show that the average returns increased by around 63.3% during the pandemic. The probability value of 0.002 means that, statistically, there is a significant difference between the firm's stock returns before and during the pandemic (see Table 4.2). Investors react to the changes that occurred due to the pandemic situation, either positively or negatively.

TABEL 4.2 MEAN DIFFERENCES IN STOCK RETURNS BEFORE AND DURING THE PANDEMIC

Stock Returns	Mean	Standard Deviation	P value
Prepandemic period	0,137	0,040	0,002
Pandemic period	0,770	0,473	

DISCUSSION

Macroeconomic variables are believed to be able to substitute generating factors that affect asset returns in arbitrage theory. Mainly, the selection of those factors is based on the assumption that macroeconomic variables are systematic risks that reflect general economic conditions (Gusni and Riantani, 2017; Khan et al., 2017; Sumarto and Saluy, 2018). As the results of regression analysis shown in Table 4.1, all observed macroeconomic risks, including economic growth, inflation, interest rates, exchange rates, and world oil prices, have a significant effect on the movement of stock returns. In other words, investors see macroeconomic variables as systematic risks that can affect the changes in their income from investments. The risks are taken into account in forming investment decisions. The study results support Ross's arbitrage theory that assets are influenced by various factors other than market conditions. Generally, two types of risk are believed to affect assets: systematic risk and unsystematic risk, also known as firm-specific risk. Rational investors will usually consider systematic risk in choosing an asset or portfolio. Decisions taken by investors are not speculative and tend not to be based on trends or other people's opinions (Sumarto and Saluy, 2018).

Before the pandemic, there were relatively many sources of income (with rather high amounts) for investors, so the investment options were not limited, regardless of the risks involved. However, their income changed drastically when the market fell due to the Covid-19 outbreak. In addition to reduced revenue and limited financial resource, investment risk has also increased significantly. As a result, investors are no longer free to invest in any instrument during the pandemic and as long as the market is still volatile. This uncertainty and unpredictability of economic conditions make investors tend to choose instruments whose value is expected to be consistent, even increase, during capital market turmoil (safe haven assets). The goal is to limit the potential losses that can be experienced during a pandemic. Safe haven assets are believed to have good stability and lower risk, including defensive stocks owned by large companies that sell daily necessities (Chen, 2021). This behavior is also a form of investor risk aversion. If the majority of investors invest in defensive shares from large firms, the price will certainly increase and cause the returns to rise. In addition to investors' perceptions of risk and safe assets, the investment decision is also influenced by investors' level of knowledge. The higher the level of knowledge, the more factors investors will consider before making their decision, including macroeconomic variables. That way, investors will not only speculate, and their choices will be more rational (Sumarto and Saluy, 2018).

From the regression conducted, it was found that the risk of economic growth has a positive effect on stock returns. Consistent with this study, Amtiran et al. (2017) show that a fall in GDP has an impact on negative investor reactions and a decline in company stock returns. The same thing was also expressed by Siregar and Diana (2019), that GDP growth can explain an increase in stock returns. In contrast to these findings, three different studies could not prove the effect of GDP on stock returns (Altay, 2003; Gunarto and Sembel, 2019; Türsoy et al., 2008). Meanwhile, Elshqirat (2019) found that GDP has a significant and negative relationship with stock returns. Inflation risk, interest rates, and crude oil prices have a significant negative relationship with stock

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returns. Other studies have succeeded in proving a negative relationship between the three variables and stock returns (Iqmal and Putra, 2020; Nugroho and Hermuningsih, 2020; Safitri and Robiyanto, 2020; Siregar and Diana, 2019). Different results were also obtained by Ady (2021), Khan et al. (2017), Marwanti and Robiyanto (2021) that statistically, the three variables do not affect stock returns. Meanwhile, exchange rate risk moves in the same direction as stock returns. Supported by the research results of Amtiran et al. (2017), Gusni and Riantani (2017), Nugroho and Hermuningsih (2020), and Surono et al. (2020) who also found a positive relationship between the rupiah exchange rate and stock returns but were opposed by Artaya et al. (2014), Hartoyo (2016), Jacob and Kattookaran (2017), and Zunara and Hartoyo (2016).

Preventive actions to minimize Covid-19 transmissions were carried out by implementing restrictions on mobility and community activities which resulted in a significant reduction in economic stability (Junaedi and Salistia, 2020; Nugroho, 2020). The consequences can be seen from the decline in capital market performance channeled by investor fear and pessimistic sentiment. However, the regression results prove that the average returns on food and beverage stocks during the pandemic were higher than the returns before the pandemic. The food and beverage firms selected as the sample include large companies with large capitalization values. Apart from the position of food and beverages as a basic human need, investors' perceptions of safe assets also contributed to this improvement. Safe haven assets are all assets that are expected to have a consistent value, even expected to increase, in turbulent economic conditions. This type of asset is considered safe because of its good stability and low risk. Yuliana and Robiyanto (2019) stated in their paper safe assets are not correlated with other financial assets. One of the assets categorized as low risk is defensive stocks, namely shares of companies that sell various products for people's daily needs, including the food and beverage sector. Due to the consistent number of product demands (Chen, 2021), the food and beverage subsector is predicted to continue to grow going forward and survive crisis conditions.

Research by Herwany et al. (2021) concluded that the primary consumer goods sector is still showing optimism amid uncertainty due to the pandemic, while other sectors are receiving negative sentiment from investors. The impact of the Covid-19 outbreak on this sector was not immediately visible but only became apparent after the large-scale social restriction policy was implemented. This is in line with Gabrilia et al.'s study (2022), which proved that there was a difference in the average LQ45 stock price before and after the announcement of the pandemic and its volatility (Hutauruk, 2021). Both studies found a significant decline in stock prices based on the T-test results. The study results in support Yuliana et al. (2022), who noted a decrease in the average share price of the transportation sector from the period before the announcement of the first case of the Coronavirus in Indonesia, as well as a significant difference between the two.

Contrary to Sunandes (2021), there was no difference in IDX30 stock returns before and during the pandemic. Researchers believe that stocks in the IDX30 group tend to be more stable and less susceptible to the damage caused by the pandemic. This made investors choose to maintain IDX30 group shares.

CONCLUSIONS

Based on the multivariate statistical analysis performed, the regression model with all the constituent independent variables is proven to be related to the stock returns of food and beverage companies. This indicates two things, namely, investors take into account macroeconomic variables as a systematic risk that can affect their income. In addition, the decisions taken by investors are rational and not speculative or based on the opinions of others. In this way, the Arbitrage Pricing Theory approach is proven to be used to explain the movement of yields on stock returns in the food and beverage sub-sector. The test results also show that there is a difference between company yields before and during the pandemic. The average return during the pandemic was found to be greater than the return before the pandemic, which is related to investors' perceptions of safe and non-risk assets during the pandemic. When they are unable to invest freely in any type of instrument, investors will switch their choices to stable and low-risk assets.

The various findings in this study provide empirical support for the theories that have been discussed and are expected to provide benefits to related parties. Along with this, a number of suggestions are presented as material for consideration for investors to prepare a risk mitigation strategy. In addition, investors are advised to observe and pay different attention to each risk factor before making an investment decision. Researchers who wish to follow up on this research in the future are advised to add research objects, extend the observation period, use different macroeconomic variables, and compare other pricing theories or models.

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