**The determinants of Malaysian stock market return**

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**Abstract**

The stock market has become an important indicator for evaluating the state of the economy. Due to its central role in any economy's functioning, the stock market is increasingly the subject of academic research. In many developed countries, the theoretical and empirical literature provides different perspectives on the relationship between each micro and macroeconomic determinant and stock market return, but only a few studies on the Malaysian stock market have been conducted. Hence, we are extending the existing literature to validate whether the empirical micro and macroeconomic variables will affect the Malaysian stock market’s returns. This study examines the relationship of micro and macroeconomic determinants to the Malaysian stock market return. Besides, the purpose of the analysis is to investigate the validity of the micro and macroeconomic determinants whether they have long run effect on the Malaysian stock market returns. A set of monthly data starting from January 2010 to December 2021 were collected to get statistical results. The ARDL model results indicate that inflation rate (INF), profitability (P), price-to-earnings ratio (P/E), and investor risk averse (IRA) statistically significantly influence Malaysian stock market return. However, interest rate (IR), dividend yield (DY), and firm size (FS) were shown to be statistically insignificant, leading researchers to make a conclusion that there is inadequate proof that they can significantly influence Malaysian stock market return. The important drivers that our study discovered, including investor risk aversion, profitability, price-to-earnings ratio, and inflation rate, should be addressed by policymakers. The Malaysian stock market can be strengthened, investors may be attracted in, and economic stability can be fostered by policies that support stable inflation, favourable business conditions, open reporting, and increased investor confidence.

**Keywords**: Malaysian stock market; Stock return; Microeconomic determinants; Macroeconomic determinants; ARDL bound test; Regression analysis

# 1. Introduction

Bursa, the stock exchange in Malaysia, is consistently ranked as one of the most important and largest bourses in the ASEAN region (Liew, Lim, & Goh, 2022). The year 1976 marks the beginning of Bursa Malaysia's history. Until now, Bursa is helping more than 900 companies in Malaysia raise capital by participating, and one of three different markets that were started in 2017. The goal of the Bursa stock exchange is to become one of the most influential, environmentally responsible, and internationally connected marketplaces in all of ASEAN (Bursa Malaysia, 2022). Nonetheless, trading on the stock market is not simple since it requires individuals to have an understanding of finance (Fama & Marshall, 1966). The stock market in Malaysia can be influenced by different types of factors but concluded two which are the macroeconomics or the microeconomics factor. Macroeconomics studies national economies and how national policies affect them. This method is top-down because it focuses on entire economies and industries, not individuals or businesses. Other than that, microeconomics examines how individuals and businesses allocate resources and price goods and services, for example, taxes, restrictions, and laws are considered. This method evaluates the economy bottom-up. Thus, these are the two main factors that will have a critical influence on the stock market in Malaysia (Koller et al., 2005 & Das, 2005; Liew et al., 2022).

In the financial economics literature, the assertion that micro and macroeconomic factors influence stock market behaviour is a well-established theory. Stock price volatility is not inherently independent, both extrinsic and intrinsic variables have been identified as having an impact on stock price changes (Tandon & Malhotra, 2013). Other than the basic factor, several microeconomic factors including book value of the firm (BVPS), price earnings ratio (P/E), dividend yield (DY), earnings per share (EPS), and dividend yield (DY) have a significant impact on the price of stocks in the market, whether it is the primary or secondary market (Gompers, Ishii, & Metrick, 2003). Over the past two decades, an increasing amount of research has been done to examine the implications on macroeconomics empirically. The majority of the research is concentrated on the topic of developed markets such as United States of America and United Kingdom. Fama (1981) for the United States market, Poon and Taylor (1992) for the United Kingdom market are examples of such research. In addition, Gan et al. (2006) mentioned that the stock market participants feel that macroeconomic issues have a significant influence on stock price volatility. Paul and Malik (2003) analysed the impact of inflation, interest rate, and GDP on the share prices of Australian banks and financial institutions from 1980 to 1999.

In recent years, Malaysia has seen a period of significant economic development, which has resulted in an increase in the number of businesses that are now publicly traded, or "listed," on the country's stock exchanges. It is projected that there will be more than 900 public listed firms in Malaysia by the year 2020 (Müller, 2020). This would provide potential investors with a vast selection of options from which to pick. Because there are so many firms that are listed on the stock market, investors need to be aware of the factors that might influence their decisions. We are aware that the basic reports and technical analyses of firms play an essential part in the process of assessing the company; but, in order to properly evaluate the company, we need to look at the wider picture, which is the systemic risk that impacts the whole industry. In today's day and age, more Malaysians are becoming aware of the fact that investing affords them the potential to build or improve their wealth (*Malaysia Records*, 2022).

Other than that, the main theory in our research is multi-factor model, which illustrates that asset pricing holds the returns of an asset. Following the theory's formula, the expected return of stocks has a linear relationship with the explanatory variables including the micro and macroeconomic factors (Fama & French, 1992). In order to determine a fair market price for a stock, the multi-factor model proposes that takes into account not just the assets’ expected return but also its risk. Investors and financial analysts may customize their valuations to the specifics of the model. Furthermore, Bhandari (1988) stated that there is a significant relationship between the micro and macroeconomic variables of the stock market. The study concluded the changes in stock prices are not only influenced by the variation of macroeconomic variables. However, given the difficulty in determining the variables that affect the stock return, in practice, it is more difficult to adapt and implement than one may expect. Furthermore, the main issue that must be addressed in multi-factor model is the difficulty in identifying variables or events that are likely to affect all assets in a basket. The co-movements of stock prices imply the presence of an external economic effect; nevertheless, is not yet been established which economic factors are involved (Chen, Roll, & Ross, 1986). Therefore, there is no explicit theoretical direction for choosing the appropriate selection of economic variables to be included in the multi-factor model prior to the completion of the study.

The study contributes to the academic area by bolstering the theoretical framework of the growth of the stock market from the viewpoint of micro and macroeconomic variables within the setting of a developing stock market such as Malaysia. The study determines whether the variables in the research are significant enough to have an impact on the investment environment in Malaysian stock market and influence the country's economy. Investors will benefit from our findings because they will have a better understanding of how stock market behaviour fluctuations interact with micro and macroeconomic variables. Most previous studies focused on developed stock markets or just include macroeconomic variables. We address this gap by examining the micro and macroeconomic variables that led to Malaysian stock market return. More importantly, we examine how interest rates, inflation, dividend yield, profitability, price-earnings ratio, firm size, and investor risk-aversion affect the Malaysian stock market and determine whether micro and macroeconomic variables affect stock returns in emerging markets like KLSE. Therefore, our research questions are as follows:

1. Do the interest rate and inflation rate significantly influence Malaysian stock market returns?

2. Do the companies’ dividend yield, profitability, price-to-earnings (P/E) ratio and firm size significantly influence Malaysian stock market return?

3. How do the investors’ risk-averse significantly influence Malaysian stock market return?

**2. Literature review**

# *2.1 Theoretical underpinning*

# 2.1.1 Arbitrage pricing theory (APT)

The Arbitrage Pricing Theory (APT) was developed by the economist, Stephen Ross (1976). It is a multi-factor asset pricing model that relates a variety of macroeconomic variables to value the financial assets, alternative to a single risk-based model like CAPM. According to the theory's formula, the expected return on financial assets has a linear relationship with macroeconomic factors. Besides, Ross (1976) believed that APT is an improved and extended alternative of the predecessor, the Capital Asset Pricing Model (CAPM), both hypothesize that the expected returns on assets are linearly related to the covariance along with other random variables. In CAPM, it indicates that systematic risk is the only linear function of the expected return. However, APT specifies there is more than one single factor as a linear function to the expected return, either a single asset or portfolio’s return has linear relationship with combination of variables. This has allowed investors and financial analysts to tailor-made their valuations in accordance with the theory.

# 2.1.2 Prospect theory

The term "prospect theory" refers to a branch of economics known as "behavioural economics." This branch of economics examines how humans choose between numerous probabilistic options when there is an element of risk involved and the likelihood of various outcomes where there is uncertainty. This theory was created in 1992 by Amos Tversky and Daniel Kahneman, is seen as being more psychologically accurate in describing how decisions are made. According to prospect theory, the underlying explanation for an individual's behaviour is that because the choices are singular and also independent at the same time, therefore the probability of a gain or a loss is reasonably assumed as being 50 to 50 chances. However, as Tversky and Kahneman proposed that losses have a greater emotional impact on an individual with an equivalent amount of gain. It is because of this, they hypothesised that when an individual is presented with two options, both of which offer the same result in the end, the individual will select the alternative that offers perceived gains. Therefore, investors in the stock market who are more risk averse would choose some stocks that are safer and not volatile given the risk and return. (Edwardds, 1996)

2.1.3 Multi-factor Model

The multi-factor model was developed by Barr Rosenberg and Vinay Marathe (1975). It is the model that uses multiple variables to value the financial assets and it is generally extended from the single-factor model, CAPM. According to Kavussanos and Marcoulis (1997), applying multi-factor model which variables collected of macroeconomic factors such as interest rates, consumers’ consumption, and inflation rates surpassing the use of traditional CAPM. Besides, Bhandari (1988) and Fama and French (1992) also indicated that a multi-factor model in which the explanatory variables are aside from the systematic risk, including the microeconomic and companies’ specific factors have a significant impact on stock prices. In the research, they discovered that variables related to both micro and macroeconomics have a significant impact in explaining stock returns. In multi-factor model, macroeconomic factor models, fundamental factor models, and statistical factor models are generally the type of factors used. In macroeconomic factor models, the factors obviously are in macroeconomic variables that significantly influence the stock prices. The factors are intended to have independent effects on bringing these cash flows back to the present. Next, in fundamental factor models, the factors are important in valuing stock prices differences in cross-sectional. Thirdly, in statistical factor models, the factors are basically from statistical analysis methods such as covariances of historical returns of stocks. A multi-factor model has a wider range of explanatory power and flexibility compared to single-factor models only have limited explanatory power (CFA Institute, 2022). Moreover, this model become famous in recent years because it overcome the limitations of single-factor models and given the analyst building or modifying the model in the desired way following the characteristics of the model. As a result, we intend to use the multi-factor model to explore the effect of micro and macroeconomic determinants that lead to Malaysian stock market returns.

# *2.2 Hypothesis development*

# 2.2.1 Interest Rate (IR)

The proportion of money that charged on the sum of principal by a lender to a borrower due to the usage of an asset is called interest rate. It also relates to the amount received from saving accounts at the bank. Chen, Roll and Ross (1986) demonstrated that macroeconomic variables such as inflation rate, money supply, interest rates and unemployment do influence stock market returns in a predictable pattern. According to Chen (2009), stock market movements may be predicted using macroeconomic variables including interest rate, inflation rates as well as money supply. This is because these factors can be used to forecast future economic outcomes as they affect consumers’ future consumption and investment decisions. In South Asian countries like India, Pakistan and Sri Lanka, the regression conducted by Aurangzeb (2012) showed that interest rate has negative significant effect on stock market’s performance. The data also show that inflation has a negative effect on South Asian stock markets because the interest rate on loan cause adverse impact on the borrower. It has increased the interest expense and eventually reduces company’s net profit.

**H1**: There is a negative relationship between the interest rate and the Malaysian stock market.

# 2.2.2 Inflation Rate (INF)

The depreciation of buying power of a currency over time is what economists refer to as inflation. Inflation can be described as an increase in the price level of an average basket of selected goods and services in an economy over some period. The empirical research carried out by Zhao (1999) in China, found that there is a considerable inverse association between the inflation and the stock market relationship. Rao and Bhole (1990) conducted research to determine the effect that inflation has on the returns of equities markets in the Indian stock market. They found negative association between inflation and stock returns, but there was a positive return in the long term. In an analysis, Munene (2007) discovered a direct association between actual inflation and stock price, in contrast to the inverse relationship that existed between anticipated inflation and stock price. Therefore, when there is a higher inflation rate, it will cause a negative effect on the stock prices.

**H2**: There is a negative relationship between the inflation rate and the Malaysian stock market.

# 2.2.3 Dividend Yield (DY)

The information is the companies’ internal conditions, such as financial information and non-financial information. The financial information includes companies’ revenue, costs, the value of assets and liabilities as well as accounting ratios while non-financial information includes companies’ management, environmental and corporate governance. Modigliani and Miller (1961) have developed the dividend irrelevance theory. This theory illustrates that the distribution of dividends should have zero effect in valuing the stock price of a company, earnings of the company are the base for the stock price. However, bird-in-hand theory developed by Myron Gordon (1962) and John Lintner (1963) criticized the dividend irrelevance theory. This is because the bird-in-hand theory implies the investors’ concern about their source of returns from both dividends and capital gains. In addition, the investors are also more interested in purchasing the stocks which the companies may pay higher dividends and eventually make the stock prices in the market rise. Kothari et al. (2006) discovered there is a positive relationship between dividend per share and stock return. Other fundamental information of a company such as dividends, growth rates, financial characteristics and company size also have a significant impact on the stock prices.

**H3**: There is a positive relationship between dividends and the Malaysian stock market.

# 2.2.4 Profitability (P)

Although profitability is a relative concept, profit is a measurable quantity of the earnings of the company but profitability is that the statistic is used to assess the extent to which a firm is profitable in relation to the size of the business. Sari et al. (2016) states that the profitability of the company could be said by using its ROE (return on equity), NPM (net profit margin), ROA (return on assets) or GPM (gross profit margin). Investors should determine a company's success by its net profit margin. Because a company's gross profit on net sales is proportional to rate of return, measuring its rate of return may be an indicator of business health. Next, the presence of high dividends distributed by the company using its profitability may encourage investors to purchase shares of the firm, which may in turn have the effect of driving up the stock price of the company (Pattiruhu, 2020).

**H4**: There is a positive relationship between profitability and the Malaysian stock market.

# 2.2.5 Price to earnings ratio (P/E)

A company's stock price may be estimated using the price-to-earnings (P/E) ratio, which compares the price of a share of stock to its earnings per share (EPS). Campbell and Yogo (2006) have performed new test that investigate the relationship between the stock returns and various factors such as P/E ratio and dividend yield. According to the author's research, high P/E ratio have historically been followed by poor stock market performance in both the short and long term. Particularly, high P/E ratio stocks have suffered with slow growth in stock returns over the long term. Besides, short-term stock market performance also negatively impacted when a high P/E ratio has decreased the earnings yield on investments compared to returns on alternative assets. As shown by the research of Fama and French (1992), stocks with a low price-to-book (P/B) value and a low P/E ratio both performed better than the market overall from 1963 to 1990. In these studies, they have found that stock returns are negatively impacted by their fundamental factor, P/E ratio.

**H5**: There is a negative relationship between the price to earnings (P/E) ratio and the Malaysian stock market.

# 2.2.6 Firm Size (FS)

Firm size means measuring the size of a company’s market capitalization or market value of equity. In three-factor model by Fama and French (1993), one of the variables in the model is small minus big (SMB). It means the excess return of the small market capitalization companies’ returns against big companies. They have provided an explanation based on the premise that small firms have a larger risk of financial instability and the cost of bankruptcy. Hence, the stock returns of small size firm may be higher to compensate the investors as they are bearing higher risk for firms in financial instability. Furthermore, Banz (1981) believed that the poorer quality of information disclosed by small firms may be reflected in the greater realised returns of small stocks. In general, the amount of information uncertainty is greater for small capitalization companies since they get less analyst attention and are subject to fewer required disclosure obligations. Elton (1999) stated that there is a relationship between firm size and expected returns of stocks, the stock prices are directly affected by the profitability shock. Small cap companies normally will experience higher probability shocks compared to large cap companies, so this makes the investors or speculators may be more interested to small cap companies.

**H6**: There is a negative relationship between firm size and the Malaysian stock market.

# 2.2.7 Investor’s Risk Averse (IRA)

In finance, the word "risk" refers to the possibility that the actual gains or profits made from an event or an investment would be different from the projected outcome or return. The danger of losing part or all of an initial investment is included in the definition of risk. According to Droms (1987), one of the many elements that an individual or investors has to take into consideration in order to be able to make an optimum portfolio selection in terms of the risk-reward trade is having an awareness of their risk tolerance. Deakin et al. (2004) demonstrate in their research that the senior or older generation has a tendency to select the choice with the lowest level of risk if a decision is tied to any probabilistic consequences as older people may have to rely on their retirement income for a living. An investor who is more risk averse, will tend to invest in stocks that have less volatility to gain a more stable income. In conclusion, investors who are more risk-averse will have a negative correlation with the stock market.

**H7**: There is a negative relationship between the investors' risk averse and the Malaysian stock market.

**3. Research Methodology**

In recent years, majority of research is conducted to examine the macroeconomic factors of stock market behaviour. However, we found that some of the studies debated that not only the macroeconomic factors will affect stock market returns, but both micro and macroeconomic variables are affecting stock market returns. In this study, the stock returns serve as the dependent variable, which is the Malaysian stock market return, while the interest rate (IR), inflation rate (INF), dividend yield (DY), profitability (P), price to earnings ratio (P/E), firm size (FS) and investor risk averse (IRA) serve as the independent variables. To assure the quality and dependability of the data, we will utilise the monthly data starting from January 2010 to December 2021 for our analysis. The stock returns data were retrieved from different investment related websites and journal articles, central bank of Malaysia's website as well as Bursa Malaysia’s website. The interest rate, inflation rate, dividends, profitability, price to earnings ratio (P/E), firm size and investor risk averse data will be taken from the trading economics website and articles.

# *3.1 Regression Analysis*

In mathematical regression analysis, the least squares approach is used to find the line of best fit for a dataset, thereby establishing the relationships between the data points more evident. Each data point illustrates the connection between two variables, one is the known independent variable, and the other is unknown dependent variable. Least-squares regression analysis is used to predict or characterize the independent actions of dependent variables in a data collection. Data points may be thought of having some kind of relationship with the undefined and independent variables. Connections and behaviours are demonstrated using the least-quadratic form. Legendre (1805) published the model of the least squares method. The processes that determine the curve or line that provides the best fit for any given data set are included in this approach. The implementation of a balance, which requires the reduction of the number of other data points is required in order to choose the appropriate suit. One of the standard uses of the rule of least square is helping to minimise the amount of the error square that is discovered in an equation. When using regression analysis, the dependent variables and independent variables are placed into a matrix, and the resulting equation represents the line that provides the best fit.

# *3.2 Autoregressive Distributed Lag (ARDL) model*

In our research, we implement the autoregressive distributed lag (ARDL) bounds testing approach which proposed by Pesaran and Shin (1995/1997) to investigate the long-run relationships between the Malaysian stock market returns and its micro and macroeconomics determinants. The ARDL model is based on the Ordinary Least Squares (OLS) model, both time series in non-stationary as well as mixed order of integration are applicable with the model. The ARDL model is a kind of linear time series model, which the correlation between the dependent and independent variables not only at the same time, but also in historical (lagging) data.

Firstly, Equation 1 applied linear error correction model (ECM):

Pesaran et al. (2001) established the ARDL model, which consists of two crucial steps:

1. Using the bounds testing to investigate the significance presence of long-term relationship

2. Estimating the long-term coefficients as well as the associated short-term coefficients

Following the bounds testing approach, the specification of ARDL model used in our research is expressed by Equation 2 as:

where: n is the lag length, *β*1 *β*2 *β*3 *β*4 *β*5 *β*6 *β*7 are the long-term multipliers, *δ*1 *δ*2 *δ*3 *δ*4 *δ*5 *δ*6 *δ*7 are the short-term dynamic coefficients and ∆ is the first difference operator.

**4. Result discussion**

# *4.1 Descriptive Analysis*

Descriptive statistics are available in the following table, including mean, median, maximum, minimum, standard deviation, skewness, and kurtosis. A mean yearly increase in interest of 0.028411% can be inferred from the data shown below. Next, the average inflation rate 0.018896%. Dividend yield thereafter averages 0.003558% per year. The next important fact is that the average profitability is 0.084070%. Aside from that, the average PE ratio or price to earnings ratio is 13.95489%. The firm size lastly is 1.75E+10 % per year. This outcome suggests that Malaysia's GDP is growing at a healthy clip, which could have a positive impact on the country's stock market. Independent variables IR, INF, DY, P, P\_E and FS have standard deviation values of 0.003969, 0.03, 0.018, 0.00319, 0.090981, 13.33857 and 1.81E+10 respectively. Firm size standard deviation is the largest among these independent variables, indicating that it is also the most variable.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **SR** | **lR** | **lNF** | **DY** | **P** | **P\_E** | **FS** |
| **Mean** | 0.004953 | 0.028403 | 0.018896 | 0.003558 | 0.084070 | 13.95489 | 1.75Ε+10 |
| **Median** | 0.003969 | 0.030000 | 0.018000 | 0.003190 | 0.090981 | 13.33857 | 1.81Ε+10 |
| **Maximum** | 0.161022 | 0.032500 | 0.049000 | 0.006867 | 0.147575 | 31.42152 | 2.28Ε+10 |
| **Minimum** | -0.176034 | 0.017500 | -0.029000 | 0.002266 | -0.041453 | -1.487829 | 9,85E+09 |
| **Std. Dev.** | 0.041346 | 0.004864 | 0.014943 | 0.001179 | 0.036224 | 5.419129 | 3.08Ε+09 |
| **Skewness** | 0.134353 | -1.419198 | -0.771242 | 1.006400 | -1.036013 | 0.590367 | -0.605002 |
| **Kurtosis** | 7.154361 | 3.636372 | 3.811007 | 3.107816 | 4.583902 | 4.672621 | 2.581211 |
| **Jarque-Bera** | 103.9855 | 50.76880 | 18.22195 | 24.37795 | 40.81221 | 25.15075 | 9.836962 |
| **Probabillty** | 0.000000 | 0.000000 | 0.000110 | 0.000005 | 0.000000 | 0.000003 | 0.007310 |
| **Sum** | 0.713274 | 4.090000 | 2.721000 | 0.512324 | 12.10607 | 2009.504 | 2 53E+12 |
| **Sum Sq. Dev.** | 0.244459 | 0.003383 | 0.031931 | 0.000199 | 0.187636 | 4199.476 | 1.36Ε+21 |
| **Observations** | 144 | 144 | 144 | 144 | 144 | 144 | 144 |

**Table 1:** Result of descriptive analysis

# *4.2* *Unit root test*

Considering that regression tests may be invalid if the study generates unresolved data, stationarity is the most important test in time series analysis (Granger & Newbold, 1974). To determine if a time series variable is stationary, statisticians can employ the root test unit, which employs an autoregressive model. Improved Dickey-Fuller test, widely used for large samples. If a time series variable is not constant and has a root unit, the statistician can use the unit root test to find out where the variable's true centre of gravity lies. The existence of a unit root is assumed (the "null hypothesis"), and the alternatives (either stationarity, stability, or an explosive root) are tested. In chronology, a unit root is often referred to as "a random walk with drift." Recognizable systemic patterns emerge when time series exhibit the presence of a unit root (Skrondal & Everitt, 2010). Experiments have been run both with and without level and trend constants and starting difference constants. It is proper to regress time trends for non-zero time series but differing first is allowed for zero time series under the alternative time series hypothesis of trend stationarity. The unit root test can be used to determine if differentiating or regressing the deterministic functions of time is the best initial step in stabilising trend data. In addition, non-stationary time-series variables tend to balance out over the long run in economic and financial theory. If these variables are false positives, then you can use cointegration techniques to simulate long-term interaction. If the p-value of the variable is less than 0.05, as shown in the table below, we will conclude that the null hypothesis is false; this also indicates that the variable is stationary. In conclusion, the test analysis of the variables shows they are stationary at level and stationary at first difference.

**Table 2:** Result of unit root test

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| At level |  |  |  |  |  |  |  |  |  |
|  |  | **SR** | **IR** | **INF** | **DY** | **P** | **P/E** | **FS** | **IRA** |
| with constant | t-statistic | 11.57557 | -0.88958 | -3.71912 | -2.88456 | -1.91353 | -2.95563 | -2.35653 | -8.41971 |
| Probability | 0.0000 | 0.7892 | 0.0047 | 0.0497 | 0.3253 | 0.0418 | 0.1561 | 0.0000 |
| with constant and trend | t-statistic | 11.55322 | -1.69803 | -3.95881 | -2.84154 | -3.48391 | -3.04923 | -3.28338 | -8.38731 |
| Probability | 0.0000 | 0.7473 | 0.0122 | 0.1851 | 0.0450 | 0.1230 | 0.0732 | 0.0000 |
| without constant and trend | t-statistic | 11.46066 | -0.59986 | -1.54201 | -2.31884 | -1.09102 | -0.42330 | 0.87744 | -4.42621 |
| Probability | 0.0000 | 0.4559 | 0.1153 | 0.0202 | 0.2485 | 0.5289 | 0.8973 | 0.0000 |
|  |  |  |  |  |  |  |  |  |  |
| At first different | |  |  |  |  |  |  |  |  |
|  |  | **SR** | **IR** | **INF** | **DY** | **P** | **P/E** | **FS** | **IRA** |
| with constant | t-statistic | -9.43191 | -5.25308 | -8.77304 | -12.38397 | -10.05813 | -9.00446 | -13.91531 | -8.93135 |
| Probability | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| with constant and trend | t-statistic | -9.39498 | -5.58878 | -8.74270 | -12.61920 | -10.02066 | -8.97026 | -13.97680 | -8.90432 |
| Probability | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| without constant and trend | t-statistic | -9.46783 | -5.26171 | -8.80086 | -12.23774 | -10.08022 | -9.03364 | -13.77444 | -8.96466 |
| Probability | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

# *4.3 Multicollinearity test*

Multicollinearity indicates a linear relationship between the factors used to explain the dependent variable in a regression. In a linear regression model, the relationship between the exploratory variables is assumed to be less than perfect. Multicollinearity is an issue in regression analysis that occurs when this assumption is violated. Multicollinearity will lead to two issues. The first issue is that the estimates of the coefficients may vary widely, depending on which other independent variables are included in the model. Coefficients become highly sensitive to even small changes in the model. The second issue is that our regression model has less statistical strength since multicollinearity reduces the accuracy of derived coefficients. It's possible that we can't use p-values to determine which independent variables are significant. According to the data in the tables below, there is no severe multicollinearity because the centred VIF results for all variables are less than 10 (1.408561, 1.142299, 8.658026, 2.022598, 1.112190, 8.304915 and 1.109743).

**Table 3:** Result of multicollinearity test

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Coefficient Variance** | **Uncentered VIF** | **Centered VIF** |
| **c** | 0.003684 | 656.9054 | NA |
| **IR** | 0.336297 | 49.78168 | 1.408561 |
| **INF** | 0.028891 | 2.981614 | 1.142299 |
| **DY** | 35.16076 | 88.01441 | 8.658026 |
| **p** | 0.007105 | 10.45361 | 2.022598 |
| **P\_E** | 2.14E-07 | 8.538947 | 1.112190 |
| **FS** | 4.95E-24 | 279.9851 | 8.304915 |
| **IRA** | 9.46E-10 | 1.715294 | 1.109743 |

# *4.4 Autoregressive Distributed Lag (ARDL) Model*

In order to examine dynamic relationships with time series data, autoregressive distributed lag (ARDL) models are frequently used in dynamic research. The current value of the dependent variable may be affected not only by its past realisations, but also by the current and past values of other explanatory variables that form a distributed lag component. Stationarity and non-stationarity use of the two types of variables is possible, as is a combined use of the two types. The ARDL model can be used to analyse cointegration or, more generally, to determine the existence of a long-run connection with the variables of interest in the construction of the balance correction (Kripfganz & Schneider, 2018). In this model, we will check the F-statistic for significance using the 5% threshold, with values greater than this suggesting that the null hypothesis should be rejected. Thus, we can conclude that there is a link between the dependent variable and the independent variable in the long run and reject the null hypothesis if the F-statistic value is greater than the 5% significant upper bound. Using the table below, we can see that the F-statistic value is 7.730337, and the 95% confidence is more than 3.38. This finding suggests a link between the dependent and independent variables over the course of a future study.

**Table 4:** Result of Autoregressive Distributed Lag (ARDL) Model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Conditional Error Correction Regression** | | | | |
|  |  |  |  |  |
| **Variable** | **Coefficien t** | **Std. Error** | **t-Statistic** | **Prob.** |
| **c** | 0.053236 | 0.068880 | 0.772878 | 0.4411 |
| **SR(-1)\*** | -1.124472 | 0.142888 | -7.869590 | 0.0000 |
| **IR(-1)** | 0.075017 | 0.687586 | 0.109103 | 0.9133 |
| **INF(-1)** | -0.114764 | 0.190843 | -0.601354 | 0.5488 |
| **DY(-1)** | -6.159603 | 6.793785 | -0.906653 | 0.3664 |
| **P(-1)** | 0.160250 | 0.114777 | 1.396187 | 0.1653 |
| **P\_E(-1)** | 0.000770 | 0.000542 | 1.420758 | 0.1580 |
| **FS(-1)** | -1.70E-12 | 2.60E-12 | -0.653216 | 0.5149 |
| **IRA(-1)** | 0.000327 | 5.59E-05 | 5.846793 | 0.0000 |
| **D(IR(-1))** | 0.157054 | 0.101588 | 1.545981 | 0.1248 |
| **D(IR)** | 6.651099 | 3.382751 | 1.966181 | 0.0516 |
| **D(IR(-1))** | -4.416185 | 3.473624 | -1.271348 | 0.2061 |
| **D(INF)** | -0.805815 | 0.438088 | -1.839392 | 0.0644 |
| **D(INF(-1))** | -0.291695 | 0.440294 | -0.662499 | 0.5089 |
| **D(DY)** | -3.670159 | 12.48195 | -0.244037 | 0.7692 |
| **D(DY(-1))** | 18.32508 | 12.74450 | 1.437881 | 0.1531 |
| **D(P)** | -0.112058 | 0.105830 | -1.058846 | 0.2918 |
| **D(P(-1))** | -0.217096 | 0.100409 | -2.162112 | 0.0326 |
| **D(P\_E)** | 0.000575 | 0.000657 | 0.875431 | 0.3831 |
| **D(P\_E(-1))** | -0.000819 | 0.000663 | -1.244877 | 0.2193 |
| **D(FS)** | 9.58E-13 | 4.24E-12 | 0.225735 | 0.8218 |
| **D(FS(- 1))** | 6.16E-12 | 4.40E-12 | 1.398607 | 0.1646 |
| **D(IRA)** | 0.000385 | 3.15E-05 | 12.20469 | 0.0000 |
| **D(IRA(-1))** | -2.01E-05 | 4.55E-05 | 0.442948 | 0.6586 |
|  |  |  |  |  |
| \* p-value incompatible with t-Bounds distribution. | | | | |
|  |  |  |  |  |
| **Levels Equation Case 2: Restricted Constant and No Trend** | | | | |
|  |  |  |  |  |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **prob.** |
| **IR** | 0.066714 | 0.611698 | 0.109063 | 0.9133 |
| **INF** | -0.102060 | 0.169442 | -0.602331 | 0.5481 |
| **DY** | -5.477774 | 6.071747 | -0.902174 | 0.3688 |
| **p** | 0.142512 | 0.102059 | 1.396361 | 0.1652 |
| **p E** | 0.000685 | 0.000482 | 1.421860 | 0.1577 |
| **FS** | -1.51E-12 | 2.31E-12 | -0.651709 | 0.5159 |
| **RA** | 0.000291 | 4.36E-05 | 6.661541 | 0.0000 |
| **c** | 0.047343 | 0.061369 | 0.771452 | 0.4420 |
|  |  |  |  |  |
| EC = SR - (0.0667\*IR - 0.1021\*INF - 5.4778\*DY + 0.1425\*P + 0.0000\*P\_E -0.0000\*FS + O.0003\*IRA + 0.0473) | | | | |
|  |  |  |  |  |
| **F-Bounds Test** | Null Hypothesis: No levels relationship | | | |
|  |  |  |  |  |
| **Test Statistic** | Value | Signif. | I(0) | I(1) |
|  |  | Asymptotic: n=1000 | | |
| **F-statistic** | 7.73.0337 | 10% | 1.92 | 2.89 |
| **k** | 7 | 5% | 2.17 | 3.21 |
|  |  | 2.50% | 2.43 | 3.51 |
|  |  | 1% | 2.73 | 3.9 |
|  |  |  |  |  |
| **Actual Sample Size** | 142 | Finite Sample: n=80 | | |
|  |  | 10% | 2.017 | 3.052 |
|  |  | 5% | 2.336 | 3.458 |
|  |  | 1% | 3.021 | 4.35 |

# *4.5 Regression Analysis*

Regression analysis is a tried-and-true method for pinpointing the causes of change in a dependent variable. Regression analysis is helpful for pinpointing the precise elements, identifying aspects that may be ignored, and discerning causal relationships. In a regression analysis, we can find both the raw and adjusted R-squared values. How closely the data fits along the correct regression line is represented by the R-squared value. Also called the multiple regression coefficient and the determination coefficient. R-squared measures the extent to which a linear model can account for variation in the response variable. The adjusted R-squared measures how much of the variance in the dependent variables can be accounted for by the independent variables in a linear regression model. The number of variables in the model determines how the statistics are modified to produce the adjusted R-squared. The table below displays an adjusted R-squared value of 55.55%, which indicates that the regression model employed in this study adequately explains 55.55% of the variance in KLSE returns, while the remaining 44.45% is best described by additional, unaccounted-for factors.

**Table 5:** Result of Regression Analysis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** |
| **c** | 0.008129 | 0.026782 | 0.303529 | 0.762000 |
| **IR** | 0.355841 | 0.259774 | 1.369810 | 0.173000 |
| **INF** | 0.188221 | 0.101816 | 2.006932 | 0.046600 |
| **DY** | -0.215569 | 0.535451 | -0.402594 | 0.687900 |
| **p** | 0.101098 | 0.046405 | 2.178597 | 0.031100 |
| **p E** | 0.000749 | 0.000342 | 2.194271 | 0.029900 |
| **FS** | -6.16E-06 | 1.74E-05 | -0.354512 | 0.723500 |
| **IRA** | -0.000141 | 1.20E-05 | -3.976858 | 0.000100 |
|  |  |  |  |  |
| **R-squared** | 0.577319 | **Mean dependent var** |  | 0.004953 |
| **Adjusted R-squared** | 0.555563 | **S.D. dependent var** |  | 0.041346 |
| **S.E. of regression** | 0.027564 | **Akaike info criterion** |  | -4.290671 |
| **Sum squared resid** | 0.103328 | **Schwarz criterion** |  | -4.125681 |
| **Log likelihood** | 316.9283 | **Hannan-Quinn criter.** |  | -4.223628 |
| **F-statistic** | 26.53653 | **Durbin-Watson stat** |  | 1.887228 |
| **Prob(F-statistic)** | 0.000000 |  |  |  |

# *4.6 Discussion of major findings*

Ordinary Least Squares was employed in the regression analysis to calculate the significance level. Using the p-values, we may test if the associations we observe hold true throughout the entire population. To determine whether an independent variable is associated with a dependent variable, researchers use the p-value for that variable to reject the null hypothesis. If there is no correlation, then it cannot be concluded that one variable cause another to change. Put another way, there is not enough proof to assert a population-level impact. However, if the p-value for a variable is smaller than the significance level, we have enough evidence to reject the null hypothesis for the entire population based on our sample data. The data point deserves to be part of our regression model. We use a significance threshold of 0.05, or 5%, as the standard across all disciplines.

# *4.6.1 Interest Rate*

The regression analysis table displays a p-value for IR of 0.1730. As it is significantly higher than 0.05, we can conclude that there was not enough evidence to reject the null hypothesis. So, it's safe to say that this independent variable is not directly correlate to the interest rate. It is arguable as the stock market is not directly linked to interest rate fluctuations however is more volatile for the bond market. Stock prices may be affected indirectly by Federal Reserve actions. When the Federal Reserve raises interest rates, banks often respond by charging borrowers more for personal and commercial loans. That should theoretically mean less money for personal consumption. In addition, as interest rates for company loans rise, some companies may decide to suspend growth plans and lay off employees. Stock prices might drop when both consumers and businesses cut their expenditures. Even so, there is no assurance that a rate hike will have a negative effect on the stock market. Rising interest rates are a common sign of economic growth. In this case, rising rates typically occur during a market upswing.

# *4.6.2 Inflation Rate*

Regression analysis's table reveals that inflation's p-value is 0.0466. Because it is less than 0.05, we may confidently conclude that the null hypothesis for this independent variable is false. This demonstrates that there is a relationship between the independent and dependent variables. It follows that the inflation rate will act as a determinant of the KLSE stock return. According to the results of the regression analysis, the inflation rate has a positive correlation with the Malaysian stock market as measured by the coefficient. We evaluated the literature on inflation rate, and it shows that stock values will fall as inflation rate increases, thus this conclusion goes against that trend. Higher inflation expectations have been found to reduce wealth by reducing the purchasing power of long-term cash reserves, according to previous research. Accordingly, this reduces future gains from investing in stocks (Danthine & Donaldson, 1986; Stulz, 1986; Boyle, 1990; Marshall, 1992).

# *4.6.3 Dividend Yield*

The p-value of regression analysis for the exchange rate is 0.6879. This independent variable has evidence that is insufficient to reject the null hypothesis, as it is more than the significant level of 0.05. There is no evidence linking this independent variable to the dependent one. It has been argued that the research paper by Marshall E. Blume said that there is insignificant impact on stock prices as the sole reason to affect stock prices as EPS, profit after taxes is also what caused the dividend yield to impact on the stock market return. As there are many companies that have no high dividend yield but provide a steadier stock market return is better than a stock volatile return. As also the dividend yield is when company have extra profits to distribute to shareholders however some may argue that it is better when a company reinvests its additional returns so that in the long run that their company stock’s return may improve and increase its firm size and standing of competition (Blume, 1980).

# *4.6.4 Profitability*

The inflation p-value is 0.0311 according to the regression analysis table. Having a p-value of less than 0.05 means that we may reject the null hypothesis for this independent variable with high confidence. This shows that the independent and dependent variables are related. That means the inflation rate will be a factor in how the stock returns perform. The regression analysis shows a positive correlation between inflation and the Malaysian stock market. Profitability ratios are the ability of a corporation to create money relative to sales, assets, expenses, and stockholders' equity during a specified period can be evaluated using profitability measures. If the company can generate more income or revenue using their resources, they can gain more net income and to push the stock price or to expand their firm size and market thus creating a higher favourable stock return as they have a potential higher or more stable growth. Therefore, a higher profitability for the company is correlated to the stock market return (Alaagam, 2019).

# *4.6.5* *Price to earnings ratio (P/E ratio)*

The regression analysis table says that the p-value for inflation is 0.0299. If the p-value is less than 0.05, we can reject the null hypothesis for this independent variable. This shows that there is a correlation between the independent and dependent variables. That means that the rate of inflation will affect how well the stock market does. A regression study shows that inflation and the Malaysian stock market moves along together. The performance of these PE ratios is related as price to earnings ratio is known as the price multiple or the earnings multiple. If we want to know if a stock is overpriced or under-priced, the price-earnings ratio is one of the most used methods to access. Firms with a high P/E ratio are expected to see greater future profits growth by investors than those with a lower P/E ratio. Both undervaluation and outperformance relative to historical norms are possible interpretations of a low P/E ratio. If a company is not profitable or is actually incurring losses, the P/E ratio will be shown as negative. A negative P/E ratio can be calculated, but it is not usual practise (Basu, 2017).

# *4.6.6 Firm Size*

From the table shown in the regression analysis, we can find out that the p-value of gross domestic product is 0.7235. It is higher than the significant level of 0.05 which means that this independent variable has high deviation from the null hypothesis is not statistically significant and the null hypothesis is not rejected. According to the regression analysis, we cannot conclude that firm size has a correlation with the dependent variable. The size and return relationship has disappeared from the beginning of 2000s. The correlation of those variables turned out to be blurring in the US and UK markets. According to Easterday, Sen and Stephan (2009) and Amihud (2002) their past study found that the firm size effect disappeared when observing the performance in terms of stock returns between the groups of smallest size decile and largest size decile. Similar to the result we found, 72.35% is extremely higher than the significant level of 5%. Until this point, firm size is shown not attributable to stock returns in developed countries as well as developing country like Malaysia.

# *4.6.7 Investor risk averse*

From the regression analysis table, the result says that the p-value for investor risk averse is 0.0001. If the p-value is less than 0.05, we can reject the null hypothesis for this independent variable. This clearly indicates that there is a correlation between the independent and dependent variables. That means that the investor risk averse will affect the Malaysian stock market returns. According to the regression analysis, the coefficient shows that the inflation rate has a negative relationship to Malaysian stock market. As well-known, investors' risk preferences as represented in their decisions about asset allocation have received a lot of attention. In Friedman and Savage’s (1948) study, it is probably true to say that they are one of the first scholars who tried to conceptualise investor’s attitudes towards risk such as risk aversion by concluding that investors must be paid a premium to induce them to undertake moderate risk, instead of subjecting themselves to either small or larger risks. This result from the past research is same as the result we found; shows that investor risk averse has a significant effect to stock returns. To the extent of the Malaysian stock market, the higher the risk aversion of an investor, the lower the demand to the stocks and lead to lower stock return.

# 5. Conclusion and recommendation

This research provides an alternative perspective on Malaysian stock market based on the macro and microeconomics determinants. Compared to other developed countries, Malaysian stock market still cannot explain by those determinants such as interest rate (IR), dividend yield (DY) and firm size (FS) even though there are significant effects in developed countries. In order to make a more certain and stable stock market, policymakers may have to take action to improve the efficiency, regulations, and other policies regarding the stock market. This eventually will lead Malaysian stock market to be closer to the developed countries.

However, inflation rate, profitability, PE ratio and investor’s risk averse emerge as relevant variables in our analysis of the multi-factor model relevant to the Malaysia stock market return. Although our findings have denied the significance of interest rate in the Malaysia stock market, we cannot do so with absolute certainty. These results suggest that the Malaysian stock market continues to place a greater emphasis on microeconomics and macroeconomics together rather than either of them.

In order for economies to work, policymakers are essential, and their choices can have a big impact on many other industries, including the stock market. Policymakers can make policies that have a favourable impact on investor sentiment and market performance by having a thorough understanding of the factors that affect stock market returns. For instance, authorities can enact measures like laws or fiscal policies to limit the risk of unfavourable market outcomes if they are aware of the variables that contribute to market volatility or instability. Similar to this, governments can use their knowledge of the factors that affect stock market performance to draw in foreign investment and lessen capital flight. By figuring out what influences market performance, authorities will be better able to predict and react to stock market fluctuations, which would eventually boost economic stability and growth. In addition, decision-makers can utilise their understanding of stock market returns to guide other policy choices, such monetary or trade policy. In general, policymakers may make data-driven decisions that build their economies and benefit their constituents when they are aware of the factors that affect stock market performance.

5.1 Limitations of study

Our study objective is too broad, limiting our preliminary research. We cannot discover all of our economy's macroeconomic and microeconomic determinants, and some are difficult to access. To conduct this research, we identified some factors recognised by most studies in developed countries like the US and UK. The goal is to determine if these determinants will have the same effects in Malaysia as in developed countries. Furthermore, we did not separate our data from covid 19 pandemic. As we all know that during covid period stock market performance was not good. Therefore, future studies could divide data into pre and post covid.

Lastly, the third limitation of our study is stability of the Malaysian stock market affected by the COVID-19 pandemic. From March 2020, it may be the most significant phenomenon in every country. Malaysia and many other countries limit economic activities to prevent COVID-19's spread. The pandemic has affected manufacturing, construction, and many service sectors, which affects the Malaysian stock market. The COVID-19 pandemic may have new factors that affect the Malaysian stock market.

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