EMPIRICAL STUDY OF CARHART FOUR FACTOR MODEL AND FAMA FRENCH FIVE FACTOR MODEL IN INDONESIA

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EMPIRICAL STUDY OF CARHART FOUR FACTOR MODEL AND FAMA FRENCH FIVE FACTOR MODEL IN INDONESIA

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ABSTRAK

Penelitian ini bertujuan untuk menguji kemampuan Carhart *Four Factor Model* dan Fama French *Five Factor Model* dalam menjelaskan variasi *return* di pasar modal Indonesia. Objek penelitian ini menggunakan perusahaan yang terdaftar dalam Index LQ45 pada periode 2018 hingga 2022, dengan pemilihan sampel menggunakan metode *purposive sampling*. Teknik analisis pada penelitian ini menggunakan analisis regresi data panel. Hasil penelitian menunjukkan adanya pengaruh positif signifikan dari variabel *market excess return* dan *book-to-market* terhadap *excess return*, serta pengaruh negatif signifikan dari variabel profitabilitas terhadap *excess return*. Sementara itu, tidak ditemukan pengaruh signifikan dari variabel ukuran perusahaan, momentum, dan investasi terhadap *excess return*.

Kata Kunci: Carhart Four Factor Model, Fama French Five Factor Model, Excess Return

EMPIRICAL STUDY OF CARHART FOUR FACTOR MODEL AND FAMA FRENCH FIVE FACTOR MODEL IN INDONESIA

Lisa Monica Sievandu

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ABSTRACT

This research aims to test the ability of the Carhart Four Factor Model and the Fama French Five Factor Model in explaining variations in returns on the Indonesian stock market. The research object uses companies that were listed on the LQ45 Index in the period of 2018 to 2022, with sample selection using the purposive sampling method. The analytical method used in this study is panel data regression analysis. The research findings show that the market excess return and book-to-market variables have a positive significant effect on excess return, while the profitability variable has a negative significant effect on excess return. Meanwhile, the firm size, momentum, and investment variables have no significant effect on excess return.

Keywords: Carhart Four Factor Model, Fama French Five Factor Model, Excess Return

EMPIRICAL STUDY OF CARHART FOUR FACTOR MODEL AND FAMA FRENCH FIVE FACTOR MODEL IN INDONESIA

RINGKASAN

1. Latar Belakang dan Tujuan Penelitian

Tujuan keuangan merupakan target yang ingin dicapai dalam mengelola keuangan. Salah satu upaya dalam mencapai tujuan ini adalah dengan melakukan investasi. Salah satu jenis aset yang dapat digunakan sebagai instrumen investasi adalah saham. Meskipun ada kemungkinan untuk memperoleh keuntungan, investasi juga tidak dapat dipisahkan dari risiko.

Capital Asset Pricing Model (CAPM) adalah salah satu *asset pricing model* yang paling umum dikenal di kalangan akademisi dan praktisi. Model ini dikembangkan oleh Sharpe dan Lintner pada tahun 1960-an dengan mempertimbangkan risiko pasar dalam memperkirakan tingkat *return* suatu aset. Akan tetapi, beberapa penelitian menemukan hasil yang tidak konsisten terhadap pengujian CAPM yang menunjukkan bahwa beta pasar mungkin tidak cukup untuk menjelaskan variasi *return*. Model tersebut kemudian dikembangkan oleh Fama & French (1992) dengan menambahkan faktor ukuran dan nilai perusahaan, yang kemudian dikenal sebagai *Fama French Three Factor Model*.

Terlepas dari seberapa akurat model tersebut, Carhart (1997) membentuk *asset pricing model* dengan menambahkan faktor momentum pada *Fama French Three Factor Model* berdasarkan penelitian Jegadeesh & Titman (1993) tentang efek momentum, yang kemudian dikenal sebagai *Carhart Four Factor Model*. Selain itu, Fama & French (2015) juga melakukan penelitian lanjutan yang menambahkan faktor profitabilitas dan investasi terhadap *Fama French Three Factor Model* karena banyaknya keterbatasan dalam penelitian tersebut, yang kemudian dikenal dengan *Fama French Five Factor Model*.

Terdapat berbagai hasil penelitian yang berbeda mengenai kemampuan *Carhart Four Factor Model* dan *Fama French Five Factor Model* dalam menjelaskan *return*. Sementara itu, terdapat keterbatasan penelitian atas *Carhart Four Factor Model* dan *Fama French Five Factor Model* terhadap pasar modal Indonesia. Oleh karena itu, penulis melakukan penelitian ini untuk menguji kemampuan kedua model tersebut dalam menjelaskan variasi *return* dan menentukan model yang lebih efektif untuk digunakan pada pasar modal Indonesia.

2. Rumusan Masalah

1) Apakah *Carhart Four Factor Model* dapat menjelaskan variasi *return* di pasar saham Indonesia?

2) Apakah *Fama French Five Factor Model* dapat menjelaskan variasi *return* di pasar saham Indonesia?
3) Model manakah yang lebih efektif dalam menjelaskan variasi *return* di pasar saham Indonesia?

3. Tujuan Penelitian

1) Untuk menguji kemampuan *Carhart Four Factor Model* dalam menjelaskan variasi *return* di pasar saham Indonesia.
2) Untuk menguji kemampuan *Fama French Five Factor Model* dalam menjelaskan variasi *return* di pasar saham Indonesia.
3) Untuk menentukan model mana yang lebih efektif dalam menjelaskan variasi *return* di pasar saham Indonesia.

4. Metode Penelitian

Jenis penelitian ini adalah penelitian kuantitatif. Metode yang digunakan dalam penelitian merupakan analisis regresi data panel dengan objek penelitian berupa perusahaan yang terdaftar dalam Index LQ45 pada periode 2018 hingga 2022. Jumlah perusahaan yang terpilih sebagai sampel penelitian adalah 38 perusahaan, yang mana diseleksi berdasarkan metode *purposive sampling*. Pengolahan data dilakukan dengan alat analisis *Eviews 12*.

5. Hasil dan Pembahasan

1) Berdasarkan hasil penelitian terhadap analisis *Carhart Four Factor Model*, variabel *market excess return* dan *book-to-market* berpengaruh signifikan positif terhadap *excess return*. Dengan demikian, pada penelitian model ini hipotesis pertama (H1) dan hipotesis ketiga (H3) diterima. Sementara itu, variabel ukuran perusahaan dan momentum berpengaruh positif tidak signifikan terhadap *excess return*, sehingga pada model ini hipotesis kedua (H2) dan hipotesis keempat (H4) ditolak. Hasil uji koefisien determinasi menunjukkan bahwa variabel independen pada *Carhart Four Factor Model* dapat menjelaskan variasi *return* sebesar 48%, sedangkan 52% dipengaruhi oleh faktor lainnya.
2) Berdasarkan hasil penelitian terhadap analisis *Fama French Five Factor Model*, variabel *market excess return* dan *book-to-market* berpengaruh signifikan positif terhadap *excess return*, sedangkan profitabilitas berpengaruh signifikan negatif. Dengan demikian, pada penelitian model ini hipotesis pertama (H1), hipotesis ketiga (H3), dan hipotesis kelima (H5) diterima. Sementara itu, variabel ukuran perusahaan dan investasi berpengaruh negatif tidak signifikan terhadap *excess return*, sehingga pada model ini hipotesis kedua (H2) dan hipotesis keenam (H6) ditolak. Hasil uji koefisien determinasi menunjukkan bahwa variabel independen pada *Fama*

French Five Factor Model dapat menjelaskan variasi *return* sebesar 49%, sedangkan 51% dipengaruhi oleh faktor lainnya.

3) Berdasarkan hasil uji F, baik *Carhart Four Factor Model* maupun *Fama French Five Factor Model* secara simultan mempengaruhi *return*. Sementara itu, hasil uji koefisien determinasi menunjukkan nilai yang cukup kecil untuk menentukan model mana yang lebih efektif dalam menjelaskan variasi *return*. Meskipun demikian, nilai 49,65% pada *Fama French Five Factor Model* lebih tinggi dibandingkan nilai 48,43% pada *Carhart Four Factor Model*. Oleh karena itu, penelitian ini juga menolak hipotesis ketujuh (H7) yang menyebutkan bahwa *Carhart Four Factor Model* lebih baik dibandingkan *Fama French Five Factor Model* dalam menjelaskan variasi *return*.

6. Kesimpulan dan Saran

Kesimpulan

1) Pada *Carhart Four Factor Model*, variabel *market excess return* dan *book-to-market* berpengaruh secara signifikan terhadap *return*, sehingga kedua variabel tersebut mampu menjelaskan variasi *return* di pasar modal Indonesia. Selain itu, hasil uji koefisien determinasi menunjukkan variabel independen pada model hanya berpengaruh sebesar 48% terhadap variabel dependen *excess return*. Hal tersebut menunjukkan bahwa *Carhart Four Factor Model* memiliki kemampuan yang cukup lemah dalam menjelaskan variasi *return* di pasar modal Indonesia.
2) Pada *Fama French Five Factor Model*, variabel *market excess return*, *book-to-market*, dan profitabilitas berpengaruh secara signifikan terhadap *return*, sehingga ketiga variabel tersebut mampu menjelaskan variasi *return* di pasar modal Indonesia. Selain itu, hasil uji koefisien determinasi menunjukkan variabel independen pada model hanya berpengaruh sebesar 49% terhadap variabel dependen *excess return*. Hal tersebut menunjukkan bahwa *Fama French Five Factor Model* memiliki kemampuan yang cukup lemah dalam menjelaskan variasi *return* di pasar modal Indonesia.
3) Hasil uji koefisien determinasi menunjukkan bahwa *Fama French Five Factor Model* memiliki kemampuan yang lebih baik dan lebih efektif dibandingkan *Carhart Four Factor Model* dalam menjelaskan variasi *return*. Meskipun demikian, nilai yang rendah tersebut menunjukkan bahwa kedua model memiliki *explanatory power* yang lemah.

Saran

1) Investor disarankan untuk mempertimbangkan *Fama French Five Factor Model*, terutama variabel *market excess return*, *book-to-market*, dan *profitability*, sebagai acuan dalam membentuk portofolio atau memilih saham untuk investasi sehingga dapat memperoleh *return* yang optimal.
2) Penelitian selanjutnya disarankan menggunakan berbagai macam indeks, sektor, dan periode waktu untuk memperbesar ukuran sampel, serta menyertakan *asset pricing model* lainnya untuk membandingkan dan menentukan model yang paling efektif dalam menjelaskan variasi *return*.

EMPIRICAL STUDY OF CARHART FOUR FACTOR MODEL AND FAMA FRENCH FIVE FACTOR MODEL IN INDONESIA

SUMMARY

1. Background and Research Objectives

Financial objectives are targets to be achieved in managing funds over a period of time. One of the strategies to accomplish this objective is by making an investment. Stock is one of the assets that is widely used as an investment instrument. Although there is a probability to earn returns, investment cannot be separated from the risk.

The Capital Asset Pricing Model (CAPM) is one of the most commonly known asset pricing models among academics and practitioners. This model was developed by Sharpe and Lintner in the 1960s by taking market risk into consideration in estimating the rate of return of an asset. However, several studies found inconsistencies of CAPM that suggested market beta might not be sufficient to explain variation in returns. This model was then developed by Fama & French (1992) by adding firm size and book-to-market value factors, which later known as the Fama French Three Factor Model.

Regardless of how accurate the model is considered to be, Carhart (1997) developed an asset pricing model by adding the momentum factor to the Fama French Three Factor Model based on Jegadeesh & Titman (1993) research on the momentum effect, which is then known as Carhart Four Factor Model. In addition, Fama & French (2015) also conducted research by adding profitability and investment factors to the Fama French Three Factor Model as a result of many limitations in the research, which is then known as Fama French Five Factor Model.

There are a variety of different results regarding the ability of Carhart Four Factor Model and Fama French Five Factor Model in explaining returns. There are also limitations of research on Carhart Four Factor Model and Fama French Five Factor Model in the Indonesian stock market. Therefore, the author conducted this study to test the ability of both models in explaining the variation in returns and determine the model that would be most effective to use in the Indonesian stock market.

2. Research Problem

1) Can the Carhart Four Factor Model explain the variation in returns on the Indonesian stock market?
2) Can the Fama French Five Factor Model explain the variation in returns on the Indonesian stock market?

3) Which model is more effective in explaining the variation in returns on the Indonesian stock market?

3. Research Objectives

1) To test the ability of the Carhart Four Factor Model in explaining the variation in returns on the Indonesian stock market.
2) To test the ability of the Fama French Five Factor Model in explaining the variation in returns on the Indonesian stock market.
3) To determine which model is more effective in explaining the variation in returns on the Indonesian stock market.

4. Research Method

The type of this research is quantitative research. The method used is panel data regression analysis with the research object using companies listed on the LQ45 Index in the period of 2018 to 2022. The number of companies selected as the research sample is 38 companies, which were selected based on the purposive sampling method. Data processing was carried out using the Eviews 12 analysis tool.

5. Results and Discussion

1) Based on the result of Carhart Four Factor Model test, the market excess return and book-to-market variables have a significant positive effect on excess return. Thus, in this model, the first hypothesis (H1) and the third hypothesis (H3) are accepted. Meanwhile, the firm size and momentum variables have a positive but insignificant effect on excess return, so in this model, the second hypothesis (H2) and the fourth hypothesis (H4) are rejected. The results of the determination coefficient test show that the independent variables in the Carhart Four Factor Model can explain 48% of the variation in returns, while the remaining 52% is influenced by other factors.
2) Based on the result of Fama French Five Factor Model test, the market excess return and book-to-market variables have a significant positive effect on excess return, while profitability has a significant negative effect. Thus, in this model, the first hypothesis (H1), the third hypothesis (H3), and the fifth hypothesis (H5) are accepted. Meanwhile, the firm size and investment variables have negative insignificant effect on excess return, so in this model the second hypothesis (H2) and the sixth hypothesis (H6) are rejected. The results of the determination coefficient test show that the independent variables in the Fama French Five Factor Model can explain 49% of the variation in returns, while the remaining 51% is influenced by other factors.
3) Based on the F-test results, both the Carhart Four Factor Model and the Fama French Five Factor Model simultaneously affect the excess return.

Meanwhile, the results of the coefficient determination test show the values that are not sufficient to determine which model is more effective in explaining the variation in returns. However, the value of 49.65% on the Fama French Five Factor Model is greater than the value of 48.43% on the Carhart Four Factor Model. Therefore, this research rejects the seventh hypothesis (H7) which states that the Carhart Four Factor Model is better than the Fama French Five Factor Model in explaining the variation in returns.

6. Conclusion and Recommendation

Conclusion

1) In the Carhart Four Factor Model test, market excess return and book-to-market variables have a significant effect on returns, which indicates that both variables are able to explain the variation in returns on the Indonesian stock market. On the other hand, the coefficient of determination test shows that the independent variables only have a 48% effect on the dependent variable excess return. It shows that the ability of Carhart Four Factor Model to explain the variation in returns on the Indonesian stock market is considered weak.
2) In the Fama French Five Factor Model test, market excess return, book-to-market, and profitability variables have a significant effect on returns, which indicates that the three variables are able to explain the variation in returns on the Indonesia stock market. On the other hand, the coefficient of determination test shows that the independent variables only have a 49% effect on the dependent variable excess return. It shows that the ability of Fama French Five Factor Model to explain the variation in returns on the Indonesian stock market is considered weak.
3) The findings regarding the coefficient of determination indicate that the Fama French Five Factor Model has a better ability and more effective than Carhart Four Factor Model in explaining the variation in returns. However, the low values show that the explanatory power of both models are weak.

Recommendation

1) It is recommended for investors to consider the Fama French Five Factor Model, especially market excess return, book-to-market, and profitability factors, as an outline for constructing a portfolio or selecting stocks to invest in order to gain optimal returns.
2) It is recommended that further studies use various indexes, sectors, and time periods to expand the sample size, and to include other asset pricing models to compare and determine the more effective model to explain the variation in returns.

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CHAPTER I
INTRODUCTION

1.1. Background

Financial objectives are targets to be achieved in managing funds over a period of time. One of the strategies to accomplish this objective is by making an investment. Investment refers to the current commitment of money or other resources in the expectation of reaping future benefits (Bodie, Kane, & Marcus, 2014). Stock is one of the assets that is widely used as an investment instrument. It is defined as an instrument that represents ownership or participation in a company. Therefore, as one of the securities, stock is offered on the capital market.

Capital market is a place where different types of investment securities are traded. According to Law No. 8 of 1995, capital market is an activity concerned with public offerings and securities trading, public companies related to the securities they issue, and also institutions and professions related to securities. The capital market connects people who have funds (investor) with those who need funds (issuer). The issuer may obtain a larger source of funds through the capital market to finance new projects, expand business, pay back loans, or other purposes. On the other side, the investors have possibilities and opportunities in the form of returns on their investment in the capital market.

Although there is a probability to earn returns, investment cannot be separated from the risk. Investors typically have a tendency to avoid risk, or commonly refer as risk-averse. However, not all risks can be avoided. Investment risk consists of two types, namely systematic risk and unsystematic risk (Bodie et al., 2014). Systematic risk is a risk that cannot be eliminated because it is caused by external factors such as economic, political, social, cultural, etc. On the contrary, investors can still eliminate unsystematic risk because it is caused by internal factors, and therefore can be avoided by creating a portfolio.

Before creating a portfolio, investors should analyze whether the stock prices in the market accurately reflect relevant information. It is based on the Efficient Market Hypothesis theory by Fama (1970), which states that a market is efficient if all relevant information is already reflected in the current stock price. The information can be in the form of past information, public information, and private information. Fama (1970) classified the efficient market into a weak form, a semi-strong form, and a strong form. Therefore, these differences will encourage investors to choose the best strategy in forming a portfolio.

Investors certainly expect the maximum return on their investment. Thus, it is important to analyze various stocks before creating a portfolio. One of the approaches to analyze is by using the asset pricing model, as it can estimate stock returns by considering the risks and other influential variables. This method will help investors to select which stocks to include in forming an optimal portfolio. Additionally, because there is a linear relationship between risk and return, the level of risk will likely affect the rate of return.

The Capital Asset Pricing Model (CAPM) is one of the most commonly known asset pricing models among academics and practitioners. This model was developed by Sharpe and Lintner in the 1960s by taking market risk into consideration in estimating the rate of return of an asset. This market risk is measured by beta (β). Beta in the CAPM reflects the volatility of an asset against the market as a whole. Theoretically, it is assumed that the greater the beta value (more than 1), the higher the risk and return of a stock. This model has two main assumptions, which are (a) the rate of return has a positive linear relationship to market beta, and (b) market beta is adequate to explain the cross-section of expected returns (Fama & French, 1992).

Several studies found inconsistencies of CAPM that suggested market beta might not be sufficient to explain variation in returns. Fama & French (1992) then conducted a test that combined several variables to capture the cross-sectional variation in average stock returns. These factors consist of market beta, size, leverage, book-to-market equity, and E/P ratio. Based on the result, it can be concluded that the size and book-to-market factors have a significant correlation

with returns. The finding of this study is consistent with earlier research by Banz (1981) who found that market equity could contribute to the explanation of the cross-section of average return, and by Chan, Hamao, & Lakonishok (1991) which stated that the book-to-market ratio had a significant positive impact on expected returns. This test is known as the Fama French Three Factor Model, a model that adds size and value factors to the CAPM market beta factor to explain returns.

In the Fama French Three Factor Model, the size factor is proxied by Small Minus Big (SMB) and the value factor by High Minus Low (HML). The SMB proxy is obtained from the difference between the returns of companies with small and big capitalizations. The size factor explains that the small-cap companies tend to outperform the big-cap companies over the long term. On the other hand, HML proxy explains that value stocks tend to outperform growth stocks. This is measured by the firm's book-to-market equity value, where firms with high book-to-market equity are called value stocks, while those with low values are called growth stocks. This model is then considered more accurate in estimating returns because they consider other explanatory power in addition to market beta.

Regardless of how accurate the model is considered to be, the Fama French Three Factor Model cannot explain the momentum effect stated by Jegadeesh & Titman (1993). In the research, they implemented a strategy known as one-year momentum, which is a strategy that involves buying stocks that have performed well in the past (winners) and selling stocks that have performed poorly (losers) in the past 3 to 12 months to generate positive and significant returns. This research was conducted on the U.S stock market in the period of 1965 to 1989 and showed significant abnormal returns. In other words, the strategy of buying past winners and selling past losers is proven to produce significant returns.

Based on Jegadeesh & Titman (1993) research on the momentum effect, Carhart (1997) examined an asset pricing model by adding the momentum factor to the Fama French Three Factor Model. The momentum factor is proxied by Winner Minus Low (WML), which measures the difference between the average return of the winners and the losers stock portfolios. Each portfolio consists of stocks that have previously been sorted according to the past returns. The result shows that

most of the variables can explain the cross-sectional variation in average return, with size and momentum factors containing the greatest explanatory power. This model is then known as the Carhart Four Factor Model because it includes the momentum factor in addition to the market excess return, firm size, and book-to-market factors.

Several studies are conducted to analyze the ability of the Carhart Four Factor Model in estimating returns. Some of the studies are the study on the Colombo Stock Exchange (CSE) by Abeysekera & Nimal (2017), on the Tehran Stock Exchange by Azizi, Pakmaram, Rezaei, & Abdi (2020), on the Dhaka Stock Exchange (DSE) by Khan & Fahim (2021), and on the Casablanca Stock Exchange by Benali, Lahboub, & El Bouhadi (2023). Those studies found the same results which show that the Four Factor Model outperforms the CAPM and the Three Factor Model in terms of explanatory power. In other words, the model can significantly explain the cross-section of average return. However, contrary to those previous findings, Tazi, Aguenaou, & Abrache (2022) found that the Four Factor Model does not provide better explanatory power compared to the Three Factor Model.

There are several studies conducted in Indonesia. According to Candika, (2017) on non-financial firms during the period of 2010-2012, Four Factor Model has a significant positive effect on excess stock returns in certain portfolios of the 10 portfolios created. Another study by Gumanti, Sutrisno, Andreas, & Bernardus (2017) from July 2005 to June 2015 found this model to perform better than the Three Factor Model, however the momentum factor shows a weak effect on portfolio excess returns. The result is supported by Surono (2018) on the LQ45 Index in the 2005-2016 period which shows that the Four Factor Model has a weak and insignificant explanatory power even though it is still better than the Three Factor Model. On the contrary, there is also a study by Nugraha & Susanti (2019) on the LQ45 Index during the 2012-2016 period which found no significant difference to the Four Factor Model in explaining returns compared to the Three Factor Model.

As a result of many limitations in the Fama French Three Factor Model, Fama & French (2015) also conducted research by adding profitability and investment factors to the model. Profitability is proxied by Robust Minus Weak (RMW), which calculates the difference between firm returns with high and low operating profitability. Meanwhile, investment is proxied by Conservative Minus Aggressive (CMA), which compares the return of firms that invest conservatively with firms that invest aggressively. By adding profitability and investment factors, the model became known as the Fama French Five Factor Model.

The Fama French Five Factor Model is examined by many researchers. Studies by Musawa, Kapena, & Shikaputo (2018) on Zambian capital market, Ishtiaq, Tufail, Muneer, & Sarwar (2019) on Pakistan stock market, Ragab, Abdou, & Sakr (2019) on Egyptian stock market, and Altinay, Dogan, Ergun, & Alshiqi (2023) on Borsa Istanbul (BIST) have the similar findings which show that the Five Factor Model can explain returns better that the Three Factor Model. In contrast, Hou (2021) found that profitability and investment factors are insignificant and weakly affect the rate of return on the retail industry in the US stock market. Another study by Hossain (2022) on the Dhaka Stock Exchange (DSE) shows that profitability and investment are not significant and the Three Factor Model outperforms Five Factor Model in explaining stock returns.

There are also several studies conducted in Indonesia. A study by Wijaya, Murhadi, & Utami (2017) on the Kompas100 Index during the 2010-2015 period shows that the Five Factor Model can explain returns better than the Three Factor Model. Studies on the LQ45 Index by Widyaningsih & Zen (2021) over the 2014-2019 period and Yuliyana & Sembiring (2021) in the 2016-2019 period found the same results which show that the Five Factor Model has a simultaneous effect on excess returns. Another study by Nugraha, Nurmatias, & Wahyudi (2022) found that the Five Factor Model had a significant positive effect on excess return on the LQ45 Index during the 2018-2020 period. In contrast, a study by Saleh (2020) on listed companies in the finance sector over the 2012-2016 period shows that the Five Factor Model has lower explanatory power than the Three Factor Model. Another study by Sutedja & Wijaya (2022) on the Kompas100 Index during the

2010-2019 period found profitability and investment factors to have no significant effect on returns.

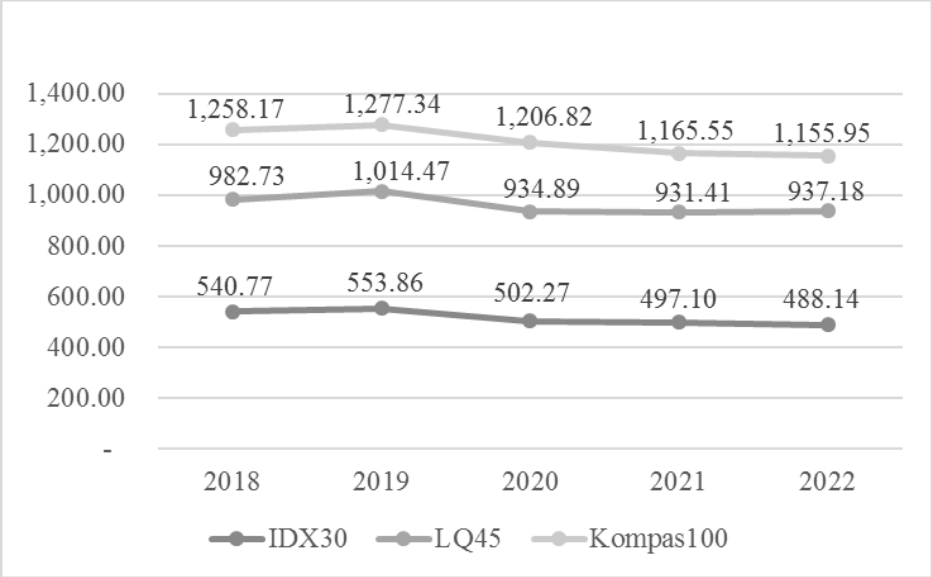


Figure 1.1 Index Growth, 2018-2022
Source: Processed Data (2023).

The LQ45 Index is one of the indices listed on the Indonesia Stock Exchange (IDX). The graph above shows the growth of the LQ45 Index based on its share price fluctuation. Based on the comparison of index growth, the indexes tend to decline including the LQ45 Index. This shows that the decline occurred due to external factors such as macroeconomics issues, which resulted in the overall market experiencing a decline. In this case, during those periods Indonesia was still recovering economically after the Covid-19 pandemic. However, the LQ45 Index shows stable changes particularly between 2020 and 2022, indicating that the supply and demand for the stocks in the LQ45 Index tend to be balanced. Based on this data, the author chose the LQ45 Index to use as the research object because of its performance.

Based on the explanation above, the author discovered a variety of different results regarding the ability of the models to explain returns. There are also limitations of research on Carhart Four Factor Model and Fama French Five Factor Model in the Indonesian stock market. Therefore, the author conducted a study entitled ***"Empirical Study of Carhart Four Factor Model and Fama French Five***

Factor Model in Indonesia" to test the ability of both models in explaining the variation in returns and determine the model that would be most effective to use in the Indonesian stock market. The author will use LQ45 Index stock data for five years from 2018 to 2022 period to examine the model. Furthermore, the author expects that this research can present the most recent findings on the Carhart Four Factor Model and the Fama French Five Factor Model, and can be used as a reference for further studies.

1.2. Research Problem

Considering the background described above, it can be concluded that each country has different conditions in terms of capital market and investor behavior. There are also inconsistencies in the empirical studies of the two models in the Indonesian capital market. Therefore, the author proposes the following problems to be answered through this research.

1. Can the Carhart Four Factor Model explain the variation in returns on the Indonesian stock market?
2. Can the Fama French Five Factor Model explain the variation in returns on the Indonesian stock market?
3. Which model is more effective in explaining the variation in returns on the Indonesian stock market?

1.3. Research Objectives

Based on the problems above, the following is the objective of the research.

1. To test the ability of the Carhart Four Factor Model in explaining the variation in returns on the Indonesian stock market.
2. To test the ability of the Fama French Five Factor Model in explaining the variation in returns on the Indonesian stock market.
3. To determine which model is more effective in explaining the variation in returns on the Indonesian stock market.

1.4. Research Contribution

1.4.1. Theoretical Contribution

This research is expected to contribute to the theory of financial management, especially regarding the use of asset pricing models in stock selection

strategies. It is also expected to be able to fill in any gap in the literature from previous studies and also become a reference material for academic studies or further research regarding the Carhart Four Factor Model and the Fama French Five Factor Model.

1.4.2. Practical Contribution

This research is expected to contribute to the selection and implementation of strategies in forming an optimal portfolio. It is also expected that this research can be used as a consideration for investors in making decisions about which model is better to use in the Indonesian stock market, in order to maximize investment returns on capital market securities, especially stocks.

1.5. Contextual Description

The Carhart Four Factor Model and the Fama French Five Factor Model are familiar asset pricing models among academics and practitioners. There have been many studies conducted to test the validity of these two models. Nonetheless, many research findings show contradictory results. Several studies have shown that not all variables of the two models have a great explanatory power on returns. In Indonesia, research on these two models is still quite limited. Therefore, the author conducted this research to determine the validity of the models and to compare which model works better in the Indonesian stock market. To calculate these two models, the author uses LQ45 Index stock data obtained from the Indonesia Stock Exchange and interest rate data from Bank Indonesia for the period 2018 to 2022.