

# THESIS

## ANALYSIS OF THE APPLICATION OF THE SINGLE INDEX MODEL IN THE FORMATION OF THE OPTIMAL PORTFOLIO ON IDXBUMN20 STOCK IN THE PANDEMIC PERIOD

(APRIL 2020 - JUNE 2021 PERIOD)



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FACULTY OF ECONOMIC AND BUSINESS  
UNIVERSITY OF 17 AGUSTUS 1945 SURABAYA  
2022

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This document was submitted to meet the requirements for

Obtain an Economics Bachelor's Degree

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Writer



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## PREFACE

Alhamdulillah, Praise be to Allah SWT for His grace, guidance, and guidance in allowing me to complete this thesis, titled " Analysis of the Application of the Single Index Model in the Formation of an Optimal Portfolio on IDXBUMN20 Stocks in the Pandemic Period (April 2020-June 2021)" as one of the requirements for completing the undergraduate program (S1) majoring in Management, Faculty of Economics and Business, University of 17 Agustus 1945, Surabaya.

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My motto is "As much as we seek information, we will be very happy if, by studying it, we can make our family and other people happy and enjoy the benefits."

Hopefully, writers and readers will find this thesis useful. Thank you very much.

Surabaya, January 27, 2022

Writer

## SUMMARY

The purpose of this research is to obtain the stocks that included in the optimal portfolio category on IDXBUMN20 stocks, the proportion of large funds that can be invested in the optimal portfolio on IDXBUMN20 stocks, and the rate of return and risk that the optimal portfolio on IDXBUMN20 stocks forms for the period April 2020 to June 2021.

The population for this research is IDXBUMN20 stocks, which total 20 stocks listed on the Indonesia Stock Exchange between April 2020 and June 2021. The sampling technique used in this research is saturated sampling or total sampling, with a sample of 20 IDXBUMN20 Stocks listed on the Indonesia Stock Exchange from April 2020 to June 2021. Single Index will be used as research tools in this research. Documentation and literature review are the data gathering strategies used in this research. A single index model was used to analyze the data in this research.

The results of the analysis show the value of stock return ( $R_i$ ), expected return  $E(R_i)$ , variance ( $\sigma_i^2$ ), standard deviation ( $\sigma_i$ ), stock covariance with market ( $\sigma_{im}$ ), beta ( $\beta$ ), alpha ( $\alpha$ ), Variance residual error ( $\sigma_{e_i}^2$ ), Excess Return to Beta (ERB), the values of  $A_i$ ,  $B_i$ ,  $C_i$ , and Cut off Point ( $C^*$ ) of each individual stock. Then obtained market return ( $R_m$ ), expected market return  $E(R_m)$ , market variance ( $\sigma_m^2$ ), and standard deviation ( $\sigma_m$ ) with an  $E(R_m)$  value of 0.018551603 and market standard deviation ( $\sigma_m$ ) or market risk to be borne is 0.043492425 or 4.35%. The risk-free return ( $R_{br}$ ) or the average Indonesian interest rate for the April 2020-June 2021 period is 0.038666667. Then the results of sorting the Stocks from the largest ERB value to the smallest and it is known that the largest ERB value is PTBA with an ERB value of 1.714662105 and the smallest ERB value in BBNI Stocks is -1.022466315. From the calculation of the max formula, the value of  $C^*$  is obtained which is the largest value of  $C_i$ , namely in TINS stock is 0.0009746812. From the determination of stocks that enter the portfolio with the criteria that the stocks included in the portfolio must have ERB requirements greater than  $C^*$  and obtained 7 stocks that include to the optimal portfolio, namely PTBA, WIKA, TINS, SMBR, SMGR, WSKT, and PTPP Stocks. while the other 13 stocks have an ERB value that is smaller than the Cutoff Point ( $C^*$ ) value so they are not included in the optimal portfolio. The results of the calculation of the proportion of funds for each stock to form the optimal portfolio, the largest proportion of funds forming the optimal portfolio is PTBA Stocks of 1.322430771 or 132.24% and the smallest proportion of funds is PTPP Stocks of -0.00014111 or -0.014%, the optimal expected return portfolio is -0.082401654 or -8.24% which is smaller than the expected market return of

0.018551603 or 1.86% and gives a loss of -8.24%. Portfolio risk is -0.177240262 or -17.72%. This risk is smaller than the individual risk of each stock.

Stocks that are included in the optimal portfolio category in IDX-BUMN20 Stocks for the April 2020 - June 2021 period include Bukit Asam Tbk. (PTBA), PT Wijaya Karya (Persero) Tbk. (WIKA), PT Timah Tbk. (TINS), Semen Baturaja (Persero) Tbk. (SMBR), Semen Indonesia (Persero) Tbk. (SMGR), PT Waskita Karya (Persero) Tbk. (WSKT), and PP (Persero) Tbk. (PTPP). The proportion of funds that can be invested that form the optimal portfolio of IDX-BUMN20 Stocks for the period April 2020 – June 2021 is Bukit Asam Tbk. (PTBA) of 1.322430771 or 132.24%, PT Wijaya Karya (Persero) Tbk. (WIKA) of -0.04605487 or -4.61%, PT Timah Tbk. (TINS) of -0.6051962 or -60.05%, Semen Baturaja (Persero) Tbk. (SMBR) of -0.18646688 or -18.65%, Semen Indonesia (Persero) Tbk. (SMGR) of 0.578202167 or 57.82%, PT Waskita Karya (Persero) Tbk. (WSKT) of -0.06745046 or -6.75%, and PP (Persero) Tbk. (PTPP) of -0.00014111 or -0.01%. The expected rate of return from the formation of an optimal portfolio is -0.082401654 with a portfolio risk borne of -0.177240262. The advice given is that (a) investors in investing funds should not form a portfolio and should instead invest their funds in individual stocks by selecting the desired expected return with a certain level of risk, (b) for companies that have not yet entered the optimal category, it is better to evaluate company performance so that the company can improve in the future and attract investors to invest, and (c) for companies that have not yet joined the optimal category, it is better to evaluate company performance so that the company can be better in the future and attract investors to (c) more research. If you want to do optimal portfolio research on the IDX-BUMN20 object, you need use daily stock close price data for several months or a year to better understand the value of return and risk in the short term.



## ABSTRACT

### **ANALYSIS OF THE APPLICATION OF THE SINGLE INDEX MODEL IN THE FORMATION OF THE OPTIMAL PORTOFOLIO ON IDXBUMN20 STOCK IN THE PANDEMIC PERIOD (APRIL 2020-JUNE 2021 PERIOD)**

Investors are always looking for the best stock with a high return when it comes to investing. The goal of this research is to use the single index approach to establish the best stock portfolio on the Indonesia Stock Exchange using IDXBUMN20 stocks. This research is during pandemic era, it covers the period from April 2020 to June 2021, which is when the pandemic is expected to occur. This research is based on numbers. This research is quantitative research. The population in this research is IDXBUMN20 stock, which totals are 20 stocks. The sampling technique in this research is saturated sampling or total sampling which 20 IDXBUMN20 stocks are sampled in this research. This research uses descriptive research to examine IDXBUMN20 stocks on the Indonesia Stock Exchange in order to combine stocks into an optimal portfolio with the appropriate proportion of funds, as well as portfolio returns and risks determined from the optimal portfolio using the Single Index approach. From the 20 stocks analyzed, 7 belong into the optimal portfolio category, with proportions of funds from PTBA (132.24 percent), WIKA (-4.61 percent), TINS (-600.05 percent), SMBR (-18.65 percent), SMGR (57.82 percent), WSKT (-6.75 percent), and PTPP (-0.01 percent). Return portfolio formed is equal to -0.082401654 or -8.24 percent which is smaller than individual stock returns. Then the portfolio risk formed is -0.177240262 or -17.72 percent. The portfolio risk is then -0.177240262 or -17.72 percent, implies that the value is smaller than the individual risk of each stock.

**Keywords:** Optimal Portfolio, Single Index Model, IDXBUMN20

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