



Portfolio Establishment of Bumn20 Stock Index in Indonesia Stock Exchange: An Analysis During the Covid-19 Pandemic

Isbaya^(✉)

Magister Management, Ibn Khaldun University, Bogor, Indonesia
Isbayasutrabayu@gmail.com

Abstract. The Covid-19 Pandemic in Indonesia was first announced by the government at the beginning of March 2020. It was then followed by PSBB policies that affected the national economy. PSBB affected the reduction of public consumption. This caused many businesses to slow down. BUMN is a state-owned enterprise engaged in strategic industries. Not only receiving government support and guarantee but BUMN also has strong fundamentals and thereby the shares are sought-after by investors. The BUMN20 Index is a collection of selected BUMN with the best stock price performance. This study aims to determine whether, during the pandemic, investors can construct the optimal portfolios on the BUMN20 stock index using a single index model. The results of data analysis revealed that all BUMN20 index stocks during the coronavirus period experienced a positive mean return but with a very small value. The largest mean return was on Kalbe Farma stocks at 1.10% and the smallest on BBNI stocks at 0.04%. The single index method calculation resulted in negative ERB and Ci values for all stocks. Hence, the investors could not establish optimal portfolios during the Covid-19 pandemic.

Keywords: Single Index model · BUMN20 Index · Covid-19 Pandemic · Stocks

1 Introduction

The Covid-19 outbreak suddenly hit all countries in the world, including Indonesia. The outbreak shocked the business all over the world. The Indonesian government officially announced the case of the Covid-19 for the first time in early March 2020, which was then followed by policies to prevent the spread of the virus. The government does not strictly enforce the lockdown as had been done in China. Rather, the Indonesian government imposed Large-scale Social Restrictions (PSBB), especially in big cities. The restrictions on interaction and business closure enter the Indonesian economy into a recession. In the second quarter of 2020, Indonesia's economic growth was negative 5.32%, and in the third quarter of 2020, it was negative 3.49%.

The recession of the national economy is proffered to have an impact on the declining company performance, decreasing community activities resulting in the reduction of public consumption reducing the business and company's income. During the pandemic,

stock investors, especially foreign investors secured their investment by making large-scale share sales and exchanging their rupiah for US dollars caused the rupiah to weaken to more than Rp. 14,500. Investments in developing countries such as Indonesia have a higher level of risk compared to developed countries (Fahmi, 2014) [1] due to the fragile economic fundamentals.

The Indonesia stock exchange has 36 indices and IDX BUMN20 is one of them. This index measures the stock price performance of the 20 best performing BUMNs (State-Owned Enterprises). This index is periodically updated every January, April, July, and October. The list of IDX BUMN20 shares taken in this study was taken from the latest data released on October 21, 2020. BUMN stocks are sought after by investors since not only being supported by the government but also have good fundamentals, routinely pay dividends, and are best for long-term investment. It has a liquid stock price and thereby is also suitable for short-term investors looking for capital gain from daily rate changes.

The focus of this research is to explore the optimal portfolio established by the BUMN20 stock index during the Covid-19 Pandemic with the assumption that investors expect a higher return than stock market returns with the lowest possible risk. The method used was the Single Index Model, which is a simplification of the Markowitz Model (Husnan, 2015) [2]. Portfolios are formed to create maximum profit, minimum risk, and sustainable business (Fahmi, 2014) [1].

The single index model is based on the observation that the price of a security fluctuates in the direction of the market price index and stock prices tend to increase when the market price index increases, and vice versa; this shows that the profit level of a stock correlates with market changes (Handini, 2020). Assuming that market price changes are expressed as return market, the expected return of a share can be formulated as follows:

$$R_i = a_i + \beta_i R_m$$

where $a_i = \alpha_i + e_i$

R_i stock return i

a_i the expected value of stock returns that is independent of market returns

β_i the coefficient measuring the change in R_i as a result of the change in R_m

R_m return market

α_i the expected value of a_i

e_i a random variable of a_i

The equation above breaks the stock return into two components, namely the β component which shows the level of stock return sensitivity to the stock market indexes. The α component shows the expected stock return expectations that are independent of market returns.

The Single Index Model for portfolios is prepared to make it easier for investors to choose stocks to include in the portfolio. This model looks for portfolio returns and portfolio risks by reducing the number of variables that need to be estimated, in which both alpha and beta portfolios are the weighted average of the beta and alpha of the individual stocks that make up stocks. The Single Index Model for portfolios can be expressed as the following equation:

$$\text{Expected return, } E(RP) = \alpha_p + \beta_p E(R_m)$$

Expected Risk, $\sigma_p^2 = \beta_p^2 \sigma_m^2 + \sum X_i^2 \sigma_{ei}^2$

where: $\beta_p = \sum X_i \beta_i$ dan $\alpha_p = \sum X_i \alpha_i$

In this article, the best combination of stocks in a portfolio will be determined by stocks with high returns with low risk.

2 Method

In this study, the 20 stocks taken were stocks in the BUMN20 index released by the IDX on October 21, 2020. The closing price and the IHSG (Jakarta Composite Index) were taken daily from the beginning of the outbreak in early March, from March 2 to November 27, 2020, which is equivalent to 179 trading days. The BI rate is set at 4.17% obtained from the average rate from March to November 2020.

2.1 Data Analysis Model

The analysis models used in this study is described as follows:

Stock return is calculated using the following formula:

$$R_i = (P_i - P_t - 1)/P_t,$$

Stock return from 2 March to 27 November 2020 can be found using the following equation: $R_i = 1/N \sum R_{it}$.

Market return can be calculated using the following formula:

$$R_m = (IHSG_i - IHSG_t - 1)/(IHSG_t - 1) \text{ and } R_m = 1/N \sum R_{mt}$$

2.2 Beta and Alpha

Beta and Alpha are measured to determine the sensitivity of changes in stock prices to the stock market index and the extent to which stock prices are affected by risk-free factors.

Beta can be determined using the following equation: $\beta_i = (\sigma_{im}/\sigma_m^2)$ dan $\beta_p = \sum X_i \beta_i$.

Alpha can be determined using the following equation: $\alpha_i = R_i - \beta_i R_m$ dan $\alpha_p = \sum X_i \alpha_i$.

2.3 Standard Deviation

Standard deviation is calculated to measure the level of risk using the following formula:

$$\sigma_i = \frac{\sum_{t=1}^N (R_{it} - E(R_i))^2}{N}$$

$$\sigma_p = \left[\sum_{i=1}^N \sum_{j=1}^N w_i \cdot w_j \cdot \sigma_{ij} \right]^{1/2}$$

2.4 Excess Return to Beta (ERB)

The Excess return to the beta is determined using the following formula:

$$ERBi = (E(Ri) - Rbr)/\beta i$$

2.5 Cut-Off Rate (Ci)

The cut-off rate is calculated as follows:

$$Ci = \frac{\sigma m2 \sum_{j=1}^i \frac{[E(Ri)-Rbr] \cdot \beta i}{\sigma ei2}}{1 + \sigma m2 \sum_{j=1}^i \frac{\beta i2}{\sigma ei2}}$$

2.6 Stock Selection Based on the Value of the ERB and Ci

After the value of ERB and Ci is found, stocks are taken into the portfolio if the value of excess return to the beta is bigger than the value of the cut-off rate (ERB > Ci). A subsection.

3 Result and Discussion

The BUMN20 index released by the IDX (Indonesia Stock Exchange) on 23 October 2020 consisted of 20 BUMN stocks with the best performance (Table 1):

Table 1. The Stock Indices of BUMN20 and the sectors

| No. | Stock Code | Sector |
|-----|------------|------------------------------|
| 1 | BBNI | Banking |
| 2 | BBRI | Banking |
| 3 | BBTN | Banking |
| 4 | BJBR | Banking |
| 5 | BMRI | Banking |
| 6 | SMBR | Basic Industry and Chemicals |
| 7 | SMGR | Basic Industry and Chemicals |
| 8 | JSMR | Infrastructure |
| 9 | PGAS | Infrastructure |
| 10 | WEGE | Infrastructure |
| 11 | WSBP | Infrastructure |

(continued)

Table 1. (continued)

| No. | Stock Code | Sector |
|-----|------------|-------------------|
| 12 | KAEF | Consumer Goods |
| 13 | ANTM | Mining |
| 14 | ELSA | Mining |
| 15 | PTBA | Mining |
| 16 | TINS | Mining |
| 17 | PTPP | Property |
| 18 | WIKA | Property |
| 19 | WSKT | Property |
| 20 | TLKM | Telecommunication |

The stocks in the BUMN20 look quite evenly distributed to represent several major industries in Indonesia. In the banking sector, there are five stocks namely BBNI, BBRI, BBTN, BJBR, and BMRI. In the basic industry and chemical sector, there are SMBR and SMGR. In the infrastructure sector, there are four shares, namely ANTM, ELSA, PTBA, and TINS. For consumer goods, there is namely KAEF. In the mining sector, there are four sectors, namely ANTM, ELSA, PTBA, and TINS. In the property sector, there are PTPP, WIKA, and WSKT. Finally, for the telecommunication sector, there is TLKM.

Investors are always seeking stocks to be listed in the optimal portfolio. High return is the main indicator in selecting stocks, without neglecting the risk of the selected stocks.

Table 2 shows that all BUMN20 indices have a positive mean return. However, the value is very small. There is only one stock that has a mean return greater than 1%, namely KAEF of 1.10% followed by SMBR of 0.93%. The rests are under 1% with the smallest BBNI at 0.04%. However, the expected return is still more than the expected market return, which is 0.06%. Investment risk is measured by the standard deviation, which indicates the possibility of return deviating from the expected return; thus, risk can deviate more or less than expected (Husnan, 2015) [2]. Observing the standard deviation, it can be seen that all stocks have a greater risk than the market risk. Market risk is 1.86% while the stock with the lowest risk is TLKM at 2.90%, and the stock with the highest risk is KAEF at 6.8%.

The volatility of return relative to market returns is shown by β (Beta), which is the sensitivity of changes in stock returns to market returns (Handini, 2020) [3]. Thus, if $\beta = 1$, then, if the market increases by 1%, the shares will also rise 1%. Table 2 presents that all β is greater than 1, ranging from 1.18 to 1.86. The largest is WIKA with a beta of 1.88 followed by WSKT of 1.822. This shows that if the IDX Composite increases or decreases by 1%, the WSKT stock will increase or decrease by 1.88%. The stocks having the smallest Beta is TLKM of 1.18. This shows that the return of BUMN20 stock return has a high level of sensitivity to an increase or decrease in market returns as the beta is greater than 1 it is called aggressive stocks (Husnan, 2015) (Table 3).

Table 2. E(R) stock, E(R) market, Standard deviation of shares, Standard deviation of the market, Beta

| No. | Stock Code | E(R _i) | E (R _m) | σ _i | σ _m | β |
|-----|------------|--------------------|---------------------|----------------|----------------|-------|
| 1 | KAEF | 0.011 | 0.0006 | 0.068 | 0.0186 | 1.355 |
| 2 | SMBR | 0.0093 | 0.0006 | 0.0625 | 0.0186 | 1.714 |
| 3 | ANTM | 0.0051 | 0.0006 | 0.0438 | 0.0186 | 1.579 |
| 4 | TINS | 0.0047 | 0.0006 | 0.0452 | 0.0186 | 1.628 |
| 5 | BJBR | 0.0033 | 0.0006 | 0.0351 | 0.0186 | 1.306 |
| 6 | ELSA | 0.0028 | 0.0006 | 0.0434 | 0.0186 | 1.468 |
| 7 | PTPP | 0.0022 | 0.0006 | 0.0449 | 0.0186 | 1.73 |
| 8 | WSBP | 0.0022 | 0.0006 | 0.0434 | 0.0186 | 1.61 |
| 9 | WSKT | 0.0018 | 0.0006 | 0.046 | 0.0186 | 1.822 |
| 10 | PGAS | 0.0017 | 0.0006 | 0.0416 | 0.0186 | 1.776 |
| 11 | SMGR | 0.0016 | 0.0006 | 0.042 | 0.0186 | 1.541 |
| 12 | WEGE | 0.0016 | 0.0006 | 0.0421 | 0.0186 | 1.671 |
| 13 | BBTN | 0.0013 | 0.0006 | 0.0449 | 0.0186 | 1.651 |
| 14 | PTBA | 0.0013 | 0.0006 | 0.0392 | 0.0186 | 1.44 |
| 15 | BBRI | 0.0011 | 0.0006 | 0.0373 | 0.0186 | 1.68 |
| 16 | WIKA | 0.0008 | 0.0006 | 0.0468 | 0.0186 | 1.883 |
| 17 | JSMR | 0.0005 | 0.0006 | 0.0388 | 0.0186 | 1.394 |
| 18 | BMRI | 0.0004 | 0.0006 | 0.0373 | 0.0186 | 1.649 |
| 19 | TLKM | 0.0004 | 0.0006 | 0.029 | 0.0186 | 1.177 |
| 20 | BBNI | 0.0004 | 0.0006 | 0.0379 | 0.0186 | 1.68 |

Risk-Free is taken by the BI rate released by BI (Bank Indonesia). The BI's benchmark interest rate in March was 4.50% and declined in November 2020 to 3.75%. The decline in interest rates by BI during the pandemic was intended to boost the economy for a cheaper credit facility and provide credit facilities to the business to revive the economy.

Table 4 shows no positive Excess Return to Beta values. This could be due to the low expected return and the high-interest rates which become risk-free. This means that the expected return on investment with an interest rate is not profitable to build a portfolio.

The finding of this study is contrary to the results of research conducted by Firman-syah (2019) [4] on the establishment of the BUMN20 index portfolio throughout 2018. The study shows that in the period before the Covid-19 pandemic, the portfolio had been established with five stocks, namely TLKM, PTBA, PGAS, ANTM, and TINS with an expected return of 17%.

Table 3. Risk-Free

| Month | BI Rate |
|---------|---------|
| Mar-20 | 4.50 |
| Apr-20 | 4.50 |
| Mei-20 | 4.50 |
| Jun-20 | 4.25 |
| Jul-20 | 4.00 |
| Aug-20 | 4.00 |
| Sep-20 | 4.00 |
| Okt-20 | 4.00 |
| Nov-20 | 3.75 |
| Average | 4.17 |

Table 4. Determination of Optimal Portfolio Candidates (ERB > C)

| No. | Stock Code | E(Ri) | Rfree | Expected Excess Return | β | Excess Return to Beta (ERBi) | Ci |
|-----|------------|----------|-------|------------------------|---------|------------------------------|---------|
| 1 | SMBR | 0.00932 | 0.042 | -0.0323796 | 1.714 | -0.0189 | -0.0032 |
| 2 | WIKA | 0.000758 | 0.042 | -0.0409416 | 1.883 | -0.0217 | -0.0057 |
| 3 | WSKT | 0.001793 | 0.042 | -0.039907 | 1.822 | -0.0219 | -0.0057 |
| 4 | PGAS | 0.001665 | 0.042 | -0.0400346 | 1.776 | -0.0225 | -0.0063 |
| 5 | KAEF | 0.011037 | 0.042 | -0.0306633 | 1.355 | -0.0226 | -0.0024 |
| 6 | TINS | 0.004745 | 0.042 | -0.0369548 | 1.628 | -0.0227 | -0.0054 |
| 7 | PTPP | 0.002237 | 0.042 | -0.0394628 | 1.73 | -0.0228 | -0.0058 |
| 8 | ANTM | 0.005086 | 0.042 | -0.036614 | 1.579 | -0.0232 | -0.0055 |
| 9 | WEGE | 0.001617 | 0.042 | -0.0400829 | 1.671 | -0.024 | -0.0063 |
| 10 | BBRI | 0.001073 | 0.042 | -0.0406274 | 1.68 | -0.0242 | -0.0071 |
| 11 | BBTN | 0.001282 | 0.042 | -0.0404182 | 1.651 | -0.0245 | -0.0059 |
| 12 | WSBP | 0.002159 | 0.042 | -0.0395414 | 1.61 | -0.0246 | -0.006 |
| 13 | BBNI | 0.000371 | 0.042 | -0.041329 | 1.68 | -0.0246 | -0.0071 |
| 14 | BMRI | 0.000446 | 0.042 | -0.0412535 | 1.649 | -0.025 | -0.0072 |
| 15 | SMGR | 0.001627 | 0.042 | -0.0400727 | 1.541 | -0.026 | -0.0063 |
| 16 | ELSA | 0.002792 | 0.042 | -0.0389082 | 1.468 | -0.0265 | -0.0059 |
| 17 | PTBA | 0.001268 | 0.042 | -0.0404323 | 1.44 | -0.0281 | -0.0068 |
| 18 | BJBR | 0.003257 | 0.042 | -0.0384429 | 1.306 | -0.0294 | -0.0072 |
| 19 | JSMR | 0.000475 | 0.042 | -0.0412252 | 1.394 | -0.0296 | -0.007 |
| 20 | TLKM | 0.000446 | 0.042 | -0.0412539 | 1.177 | -0.0351 | -0.0093 |

4 Conclusion

Covid-19 Pandemic announced by the government in early March 2020, affected the investment returns on the stock market in Indonesia. Although all BUMN20 stocks have a positive expected return and are greater than the expected market return, all of them have a higher level of risk than the market risk.

The analysis of optimal portfolio establishment on BUMN20 Index stocks using a single index method shows no positive excess return to beta value. Thus, it is not possible to build a profitable portfolio. The result of this study is different from the previous research in 2018 that an optimal portfolio in the BUMN index20 could be established. Thus, it can be concluded that during the pandemic, it is better not to invest in the stock market due to the low return with a high level of risk at least until market conditions improve and the pandemic ends.

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