IDX BUMN20 PERFORMANCE MEASUREMENT WITH SHARPE, TREYNOR, AND SORTINO

Ahmad Hilmy
School of Interdisciplinary
Management and Technology,
Institut Teknologi Sepuluh Nopember
Jl. Raya ITS, Kec. Sukolilo, Kota Surabaya,
Jawa Timur, Indonesia
Hilmy007@gmail.com

Lidya Valent Shafira
School of Interdisciplinary
Management and Technology,
Institut Teknologi Sepuluh Nopember
Jl. Raya ITS, Kec. Sukolilo, Kota Surabaya,
Jawa Timur, Indonesia
Lidyavalents@gmail.com

ABSTRACT

Portfolio asset management must minimize risk exposure for the investor. Measuring the performance of any asset instrument can be done by looking at risk-reward. Observe stock performance listed in BUMN 20 Index with measurement analytical tools like Sharpe ratio, Treynor Ratio, and Sortino ratio. This study is descriptive quantitative research as this study aims to explain how stock performance measurement with the analytical ratio between 2018 and 2021. All population of this study focuses on IDX BUMN20 constituents. This study uses purposive sampling with criteria. This study reveals that the constituents in IDX BUMN20 with the use of three produce performance dominated by negative values so that they have not been able to exceed the performance of the BI rate as a risk-free investment instrument. This study helps investors make more accurate considerations in making decisions in investing.

INTRODUCTION

Portfolio asset management must minimize risk exposure for the investor. Minimizing risk exposure can be done with any treatment such as diversification (Arreola Hernandez & Al Janabi, 2020). Diversification in investment terms means selecting more than one instrument with optimal risk and reward that looks like an efficient and effective way to get an optimal result for the investor. Optimizing return in investment instruments, especially in the stock market, must be done with accurate conviction because the stock market itself has any volatility exposure for the investor to be warned (Atkins et al., 2018). Characterization in the optimal portfolio has various risks from any asset instrument. Diligence activity for an investor before investing is the analytical thing for getting a wide perspective about investment decision-making. Investing in rational terms can be found in deliberately analyzing asset price movement. Diversification asset instrument is an investor's way to minimize the risk exposure in decision making (Zahera & Bansal, 2018). Index benchmarking in portfolio asset management is one of the investor ways to measure how optimal an investor asset is against an asset represented with an index

(Schoenmaker & Schramade, 2019). Measuring the performance of any asset instrument can be done by looking at risk and reward with analytical ratio formulas like Sharpe, Treynor, and Sortino.

This research aims to reveal performance which stocks that include in the benchmark index have optimal risk and reward with an analytical ratio like Sharpe, Treynor, and Sortino.

Formulation of The Problem

Based on the background explained, the formulation of the problem in this study is how to measure stock performance which listing in BUMN 20 index with Sharpe ratio, Treynor ratio, and Sortino ratio.

Writing Purpose

Observe stock performance listed in BUMN 20 Index with measurement analytical tools like Sharpe ratio, Treynor Ratio, and Sortino ratio.

LITERATURE REVIEW

IDX BUMN20

An index containing 20 shares of companies owned by the Indonesian government was listed on Indonesia Stock Exchange and listed in 2018 (IDX, 2022). Many researchers conducted IDX BUMN20 as a research object for benchmarking performance between each other's asset price movement. One of the research reveals if IDX BUMN20 can be used to benchmark with the IHSG index for investor decision-making (Suryawati et al., 2022). IDX BUMN20 performance based on the research results can be affected by exchange rate currency (Yustisiana et al., 2020). Also, IDX BUMN20 was researched to applicated different investment strategies in different age groups for diversification (Sitinjak, 2019).

Sharpe Index

Sharpe is known for the relative risk-adjusted return measure, developed by Sharpe in 1966 and derived from the stock market line. The fundamental advantage of the Sharpe Ratio is that it offers an additional return per unit of total risk between unsystematic risk and systematic risk (Tanuj & Nivedita, 2021). Risk is measured using standard deviation, and this measure provides a trade-off between risk and return. The Sharpe ratio is widely used in various research on finance in Indonesia, namely Research in Indonesia which concludes that the Sharpe ratio is used in financial assets in the form of mutual funds (Barus & Kholiq Mahfud, 2013). Other research further reveals that the Sharpe ratio can also be used to measure the performance of stock assets (Fajar, 2020). Also, the Sharpe ratio is applied at a more advanced level to track the performance of a single index asset model (Firmansyah, 2019).

Treynor Index

This method measures portfolio performance by comparing the portfolio risk premium, the difference between the average portfolio return and the average return on investment with minimal risk to the risk of a mutual fund portfolio, expressed in beta. Various studies reveal the method of measuring performance with Sortino in several studies using different instrument assets. The use of the Treynor method in research to measure performance can be used as a portfolio diversification of investors in Indonesia companies owned mutual funds and foreign company's mutual fund assets (Wijayanti & Mahfud, 2021). One study describes that investors can also use the Treynor ratio on Islamic stock assets owned by investors (Setiawan & Asbaniar, 2021). This Treynor ratio has also been investigated that can be combined with Markowitz and CAPM as an optimal asset portfolio in compiling its portfolio (Tarina et al., 2021). A study about Treynor also can measure stock performance with selection in a pandemic era (Tamara et al., 2021).

Sortino Index

This method measures portfolio performance by comparing the portfolio risk premium, the difference between the average portfolio return, and the average return on investment with minimal risk to the risk of a mutual fund portfolio, expressed in beta (Muharam, 2019). The use of measuring the performance of an asset with the Sortino ratio method is still relatively small in Indonesia. Company analysis research in Iraq using the Sortino ratio resulted in a better risk-reward setting with a combination of the Sharpe ratio (Obaid et al., 2021). Sortino ratio also focuses on the risk of a decline in stock performance on the Tehran stock exchange (Kolbadi & Ahmadinia, 2011). Research on the Sortino ratio combined with the Capital Equally and Mean-Variance methods also produces a better risk-reward for investors (Chen et al., 2014).

RESEARCH METHODS

Research Design

This study is descriptive quantitative research as this study aims to describe a variable that, in this case, explains how stock performance measurement using analytical tools such as the Sharpe Index, Treynor Index, and Sortino can be used as a decision support tool for investors.

Research Limitations

This study focuses on constituent companies which have been consistently in the IDX BUMN20 for 48 months from 2018 to 2021.

Variable Identification

The variables in this study use the monthly closing price of shares in the 2018-2021 period.

Operational Definition and Variable Measurement

Sharpe Index

This method measures the premium on the risk of the portfolio. Average portfolio return and average risk-free return. The risk of a mutual fund portfolio represented by the standard deviation used to value the portfolio. The Sharpe ratio formula in this research based on Agustinus (2021).

$$Sharpe\ Ratio = \frac{(Portfolio\ return - \ Risk\ free\ rate)}{Standard\ deviation}$$

Treynor Index

Treynor ratio is a risk premium portfolio that measures portfolio performance by comparing the average return on the portfolio to the average return from a minimal risk investment. The risk of an asset instrument portfolio is shown in beta. Treynor ratio formula based on Sugiharto (2021).

$$Treynor\ Index = \frac{(Portfolio\ return - \ Risk\ free\ rate)}{Portfolio\ Beta}$$

Sortino Index

Sortino ratio is the development of Sharpe's formula that focuses on the downside risk of an instrument asset. The formula used is based on research from Srivastava & Mazhar (2018).

$$Sortino\ Index = \frac{(Portfolio\ return - \ Required\ rate\ of\ return)}{Downside\ risk\ deviation}$$

Population, Sample, and Data Collection Techniques

All companies listed on the Indonesian stock exchange are the population of this study which focuses on IDX BUMN20. This study uses purposive sampling with the criteria that constituent issuers are consistently in the 2017-2021 period in IDX BUMN20. The data retrieval method uses a documentation review using index reports published by the Indonesian stock exchange from 2018 to 2021.

Analysis Data Techniques

Monthly stock price data that is collected is then processed using Microsoft Excel. After successfully collecting the data, then analyzing the data using the predetermined Sharpe ratio, Treynor ratio, and Sortino ratio formulas. Then from the results, it will be interpreted to determine the performance of each ratio.

RESULTS

The steps taken to get the ratio calculation can be the monthly closing price of the shares listed in the IDX BUMN 20 index from 2018 to 2021. The results of the calculation carried out obtained 17 shares. Then look for the value of the Indonesian Interest Rate and the Jakarta Composite Index for the same period. The results of calculations using Microsoft Excel obtained the results of the expected return, variance, standard deviation, and covariance of each stock as follows:

Table 1. Risk Free Rate

Year	BI Rate
2018	6%
2019	5%
2020	3.75%
2021	3.50%

Source: Bank Indonesia, 2022

Table 2. Minimum, Maximum, Mean, Standard Deviation, and Number of Samples

No	Company Code	Min	Max	Mean	Standard Deviation	N
1	ANTM	0.0546	0.2240	0.4471	0.1806	48
2	BBNI	-0.2134	0.0931	-0.0848	0.1141	48
3	BBRI	-0.0523	0.2022	-0.0353	0.0806	48
4	BBTN	-0.2885	0.0029	-0.1593	0.1631	48
5	BJBR	-0.8692	7.6129	4.7665	2.8434	48
6	BMRI	-0.1759	0.1107	-0.0257	0.0753	48
7	ELSA	-0.2159	0.1503	0.0118	0.1355	48
8	JSMR	-0.3313	0.2091	-0.0968	0.1012	48
9	PGAS	-0.2373	0.2114	-0.0429	0.1612	48
10	PTPP	-0.4692	0.1767	-0.1827	0.1818	48
13	SMGR	-0.4165	0.1616	-0.0440	0.1249	48
14	TINS	-0.0258	0.8000	0.2117	0.1922	48
15	TLKM	-0.1662	0.2205	-0.0106	0.0664	48
16	WIKA	-0.4433	0.2024	0.0892	0.1766	48
17	WSKT	-05590	-0.0303	-0.2363	0.1663	48

Source: Primary Data Processed, 2022

The lowest return was generated by BJBR with a value of -0.8692, while the highest return was obtained by issuers of BJBR with a value of 7.6129. Five issuers get an average positive return, namely BJBR, ANTM, TINS, WIKA, and ELSA issuers by consecutive values of 4.7665, 0.4471, 0.2117, 0.0892, and 0.0118.

Table 3. IDX BUMN20 Stock Performance

Company Code	Sharpe	Treynor	Sortino
ANTM	0.2190	0.0419	0.3733
BBNI	-0.2311	-0.0485	-0.0563
BBRI	-0.2551	0.0267	-0.0849
BBTN	-0.3406	-0.1615	-0.0716
BJBR	0.2206	-0.4001	5.9448
BMRI	-0.0246	0.0432	-0.0253
ELSA	-0.1272	-0.0136	-0.0662
JSMR	-0.3717	-0.1083	-0.1161
PGAS	-0.0713	-0.0133	0.0471
PTPP	-0.4278	-0.0617	-0.1019
SMGR	-0.1422	-0.1101	-0.0144
TINS	0.2587	0.0751	0.2225
TLKM	0.0557	0.0926	-0.0242
WIKA	0.2020	0.0267	0.0266
WSKT	-0.6431	-0.0933	-0.1597

Source: Primary Data Processed, 2022

Sharpe Index

Sharpe index of the data processing from table 3 found that there are five constituents that get a positive Sharpe ratio value, and 12 are negative. The highest positive value was obtained by TINS with a value of 0.2587, while the lowest negative value was obtained by WSKT with a value of -0.6431. The results of the overall Sharpe index state that IDX BUMN20 is still dominated by negative results so it still cannot achieve better performance than the BI rate.

Treynor Index

Treynor index from the results of data processing from table 3, it is found that six constituents get a positive Sharpe ratio value, and 11 are negative. The highest positive value was obtained by TLKM with a value of 0.0926, while the lowest negative value was obtained by BBTN with a value of -0.1615.

The results from the overall Treynor index state that IDX BUMN20 is still dominated by negative results so it still cannot achieve better performance than the BI rate.

Sortino Index

The Sortino index from the result of data processing in table 3 shows that five constituents get a positive Sharpe ratio value, and 12 are negative. The highest positive value was obtained by BJBR with a value of 5.9448, while the lowest negative value was obtained by WSKT with a value of -0.1597. The results of the overall Sortino index state that IDX BUMN20 is still dominated by negative results so it still cannot achieve better performance than the BI rate.

DISCUSSION

The results obtained from the three calculated ratios of the Sharpe index are very much in line with the research from Fajar (2020), which can also be used not only in mutual funds but also in the stock instruments. And to the findings of the research conducted by the journal of Tamara et al. (2021), Treynor can also be used in stocks that focus on other than Islamic stocks but can be used on other indices. And other research findings from Kolbadi & Ahmadinia (2011) are in line with that Sortino can become an alternative measuring tool besides the Sharpe index and Treynor index so that investors can make more accurate considerations in making decisions for investing.

CONCLUSION

This study reveals that constituents in IDX BUMN20 with users of three measuring instruments namely the Sharpe Index, Treynor Index, and Sortino Index produce a performance dominated by negative values, so they have not been able to exceed the performance of the BI rate as a risk-free investment instrument. It indicates that investors can be more observant in capturing various opportunities in choosing stocks included in the index that has been formed by the Indonesian stock exchange so that investors can get better risk rewards in the future.

SUGGESION

Future research is expected to be able to use a wider variety of investment instruments and to be able to use a longer timeframe to gain a more comprehensive understanding of the research.

REFERENCES

[1]   Agustinus, M. (2021). Comparative Analysis of The Performance Between Sharia And Conventional Equity Mutual Funds Using Sharpe And Treynor Method. International Journal Of Innovative Science And Research Technology. Vol. 6. No. 11. Https://Ijisrt.Com/Assets/Upload/Files/Ijisrt21nov047.Pdf

[2]   Arreola Hernandez, J., & Al Janabi, M. A. M. (2020). Forecasting of Dependence, Market, And Investment Risks of a Global Index Portfolio. Journal of Forecasting. Vol. 39. No. 3. Hal. 512-532. Https://Doi.Org/10.1002/For.2641

[3]   Atkins, A., Niranjan, M., & Gerding, E. (2018). Financial News Predicts Stock Market Volatility Better Than Close Price. Journal Of Finance And Data Science. Vol. 4. No. 2. Hal. 120–137. Https://Doi.Org/10.1016/J.Jfds.2018.02.002

[4]   Barus, G. A., & Kholiq Mahfud, M. (2013). Analisis Pengukuran Kinerja Reksa Dana Dengan Metode Sharpe Dan Metode Treynor (Studi Pada Reksa Dana Saham Periode Tahun 2011-2012). Diponegoro Journal Of Management. Vol. 2. No. 2. Https://Ejournal3.Undip.Ac.Id/Index.Php/Djom/Article/View/9028

[5]   Chen, H. H., Yang, C. B., & Peng, Y. H. (2014). The Trading On The Mutual Funds By Gene Expression Programming With Sortino Ratio. Applied Soft Computing Journal, Vol. 15. Hal. 219–230. Https://Doi.Org/10.1016/J.Asoc.2013.09.011

[6]   Fajar, M. A. (2020). Analisis Perbandingan Kinerja Saham Syariah Dan Saham Konvensional Berdasarkan Return, Rasio Sharpe, Rasio Jensen Dan Rasio Treynor Di Sektor Manufaktur Bursa Efek Indonesia. Jurnal Fokus Ekonomi. Vol. 15. No. 2. Hal. 445–461. Https://Ejournal.Stiepena.Ac.Id/Index.Php/Fe/Article/View/331

[7]   Firmansyah, M. A. (2019). Analisis Portofolio Optimal Dengan Menggunakan Model Indeks Tunggal Pada Saham Idx Bumn20 Di Bursa Efek Indonesia Januari 2018-Januari 2019. JEM17: Jurnal Ekonomi Manajemen. Vol. 4. No. 2. Hal. 31–46. Https://Doi.Org/10.30996/Jem17.V4i2.3023

[8]   Idx. (2022). Indeks Saham. Https://Www.Idx.Co.Id/Produk/Indeks/

[9]   Kolbadi, P., & Ahmadinia, H. (2011). Examining Sharp, Sortino And Sterling Ratios In Portfolio Management, Evidence From Tehran Stock Exchange. International Journal Of Business And Management. Vol. 6. No. 4. Https://Doi.Org/10.5539/Ijbm.V6n4p222

[10]   Muharam, D. P. P. S. W. S. S. H. (2019). The Performance Evaluation Of The State-Owned Enterprise's Stocks In Indonesia. Investment Management And Financial Innovations. Vol. 16. No. 2. Hal. 140–149.

[11]   Obaid, H. J., Yasir, M. H., & Hendi, A. J. M. (2021). Risk And Return Analysis For Companies Registered In The Iraq Stock Exchange Based On The Sortino And Sharpe Methods. Studies Of Applied Economics. Vol. 39. No. 10. Https://Doi.Org/10.25115/Eea.V39i10.5568

[12]   Schoenmaker, D., & Schramade, W. (2019). Investing For Long-Term Value Creation. Journal of Sustainable Finance and Investment. Vol. 9. No. 4. Hal. 356–377. Https://Doi.Org/10.1080/20430795.2019.1625012

[13]   Setiawan, & Asbaniar. (2021). Analisis Kinerja Saham Pada Industri Farmasi Sebelum Dan Setelah Adanya Pandemi Covid-19. Vol. 4. No. 1. Hala. 45–54. Https://E-Journal.Umaha.Ac.Id/Index.Php/Iqtisad/Article/View/1664

[14]   Sitinjak, E. (2019). Pola Strategi Investasi Investor Individu Saham Menurut Generasi X, Y, Dan Z. Jurnal Pasar Modal Dan Bisnis. Vol. 1. No. 1. Https://Doi.Org/10.37194/Jpmb.V1i1.10

[15]   Srivastava, P., & Mazhar, S. S. (2018). Comparative Analysis Of Sharpe And Sortino Ratio With Reference To Top Ten Banking And Finance Sector Mutual Funds. International Journal Of Management Studies. Vol. 4. No. 2. Hal. 93. Https://Doi.Org/10.18843/Ijms/V5i4(2)/10

[16]   Sugiharto, T. (2021). Formation Of Lq 45 Stock Portfolio Using Sharpe Ratio, Treynor Ratio And Jensen Alpha Metode Methods. Enrichment: Journal Of Management. Vol. 12. No. 1. Hal. 309–316. Https://Enrichment.Iocspublisher.Org/Index.Php/Enrichment/Article/View/210/157

[17]   Suryawati, B. N., Abidin, Z., & Muttaqillah, M. (2022). Penilaian Kinerja Portofolio Berdasarkan Kalkulasi Imbal Hasil Dengan Metode Time Weighted Return (Twr) Dan Dollar Weighted Return (Dwr) Pada Kelompok Indeks Tematik. Distribusi - Journal Of Management And Business. Vol.10. No. 1. Hal. 51–62. Https://Doi.Org/10.29303/Distribusi.V10i1.210

[18]   Tamara, D., Ashuri, A., Bagaskara, S. K., & Sulhadi, S. (2021). Treynor, Sharpe, And Jensen Ratio Of Health Sector Companies On The Indonesia Stock Exchange Before And During Covid-19 Pandemic Period. Syntax Idea. Vol. 3. No. 10. Https://Www.Jurnal.Syntax-Idea.Co.Id/Index.Php/Syntax-Idea/Article/View/1525

[19]   Tanuj, N., & Nivedita, S. (2021). Construction Of Optimal Portfolio Using Sharpe's Single Index Model: An Empirical Study On Nifty 50 Stocks. In Journal Of Management Research And Analysis (Vol. 2021, P. 4491). Ip Innovative Publication. Https://Doi.Org/2394-2770

[20]   Tarina, H. D. N., Sembel, R., & Sidharta, J. (2021). Pembentukan Portofolio Optimal Saham Menggunakan Single Index Model Metode Cut-Off Rate, Markowitz Model, Dan Capital Asset Pricing Model Pada 11 Sektor Industri Yang Terdaftar Di Bursa Efek Inonesia Tahun 2016-2020. Fundamental Management Journal. Vol. 6. No. 2. Hal. 51–65.

[21]   Wijayanti, C. M., & Mahfud, M. K. (2021). Analisis Perbandingan Kinerja Reksadana Saham Antara Pengelolaan Perusahaan Reksadana Lokal Dengan Perusahaan Reksadana Asing (Studi

Kasus: Reksadana Saham Konvensional di Indonesia Periode Tahun 2016-2020). Diponegoro Journal of Management. Vol. 10. No. 6. Https://Ejournal3.Undip.Ac.Id/Index.Php/Djom/Article/View/32424

[22]   Yustisiana, R., Andhyka, B., Widyaningsih, M., & Aryani, F. (2020). The Effect Of Interest Rates, Exchange Rate, Expectations Of Investors, Profitability And Capital Structures On Stock Prices (A Case Study Of Soes Registered In Bumn20 Index). Vol. 22. No. 3. Hal. 48–56. Https://Doi.Org/10.9790/487x-2203064856

[23]   Zahera, S. A., & Bansal, R. (2018). Do Investors Exhibit Behavioral Biases In Investment Decision Making? A Systematic Review. Qualitative Research In Financial Markets. Vol. 10. No. 2. Hal.210–251. Https://Doi.Org/10.1108/Qrfm-04-2017-0028