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Stock Selection Analysis on the IDX30 Stock Index Listed on the Indonesia Stock Exchange Using the Single Index Model

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ARTICLE INFO

Keyword:
IDX30, Single Index Model, Stock Selection, Return and Risk

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ABSTRACT

This research is entitled Analysis of Share Selection on The Idx30 Stock Index Listed on The Indonesia Stock Exchange Using Single Index Model. This study aims to determine the optimal stock as a basis for decisions in determining investment in company shares that are in the IDX30 stock index listed on the Indonesia Stock Exchange (IDX) using the Single Index Model method. The research period used is January 2015 – December 2019. The population of this study is 30 stocks listed in the IDX30 stock index. The sample of this study was determined by purposive sampling with the criteria of stocks listed on the IDX30 index consecutively during the study period. So there are 19 stocks that became the sample of this study. The results of the analysis using the Single Index Model method, can form the best stock selection consisting of BBCA 56.94%, CPIN 9.34%, ICBP 17.91%, BBRI 9.29%, ADRO 3.39%, and TLKM 3.12%. The results of this study indicate that it is possible to build stock selections with maximum returns for a certain level of risk on the IDX30 stock index using the Single Index Model for the period January 2015 – December 2019.

1. Introduction

Investment is use funds on assets with the aim of earning income or capital appreciation. Every investment involves return and risk. The possibility of variations in actual returns is known as investment risk. To make wise investment decisions, knowledge of security analysis and portfolio management is required. An investment portfolio is an investment in liberal or passive securities in a portfolio, and is made with the expectation of a return. The expected return is directly correlated with the expected risk of the investment. (Varghese; Joseph, 2018).

Rational investors aim to get the maximum return with the minimum level of risk. Therefore, to build a portfolio using one of two approaches, namely traditional and modern. With stock selection analysis, investors can form a portfolio. By analyzing the optimal stock selection, investors can invest with little risk. A portfolio can be said to be efficient if it has a higher profit or the same profit with a lower level of risk (Darmawan, 2015).

In the traditional approach, investors' needs in terms of income and capital appreciation are evaluated and suitable securities are selected to meet the investor's needs. In the modern approach, the Markowitz model is used in the selection of securities based on risk and return analysis. However, William Sharpe extended the work done by Markowitz. He considers market indexes when analyzing portfolios. He makes many and complex calculations easy which is essential to achieve an optimal portfolio. He developed the Single Index Model to make this calculation easy and build an optimal portfolio (Nalini, 2014).

By using the Sharpe Single Index Model, it has an almost valid level of accuracy. The model provides appropriate indicators for analyzing stock and portfolio selection. When compared with the Markowitz model with a covariance matrix, it will involve risk estimation from thousands of components and can have consequences for the risk of error on the portfolio which should be smaller than the estimated risk and error estimate of the Single Index model (Thomas; Widiyanto, 2017). Markowitz model was created by Markowitz (1952) which shows that by combining assets in one portfolio can reduce the risk of investing. (Marlina, 2015).

2. Literature Review

2.1 Investment

Investment is an activity carried out using cash at this time, with the aim of being able to provide benefits or an object in the future (Pajar, 2017). Investment is investing one or more capital from an asset, usually in the long term with the results of being able to earn profits in the future.

2.2 Stock returns

*Return*is profit or investment, usually expressed as an annual percentage. Stock return is the expected profit from investments made in the form of shares or a group of shares through an investment portfolio. Stock returns can be used as an indicator of stock market trading activity (Atidhira & Yustina, 2017).

2.3 IDX30 Stock Index

IDX30 is a stock market index listed on the Indonesia Stock Exchange (IDX) which has a high liquidity value and market capitalization value. The IDX30 index is part of the LQ45 stock index. Where LQ45 is a stock index consisting of 45 bluechip companies, but of those 45 companies only 30 companies are active in trading stocks. So the IDX30 stock index was formed. In 2012 the IDX30 value immediately rose 15%.

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2.4 Portfolio

A portfolio is a guarantee held by an investor that is taken as a unit. A portfolio is a collection of several assets that are collected by investors. Because there are risks when investing in certain assets, building a diversified portfolio consisting of various types of assets can be an option to reduce the risk borne by one particular asset (Pinasthika, 2014).

2.5 Single Index Model

The Single Index Model was first introduced by William Sharpe (1963). The Single Index Model has an observation that the value of securities fluctuates following the market price index. The single index model is just a simplified variation of the Markowitz model, and it is based on the assumption that joint movements between stock returns are caused by movements in market returns, or broad market index returns to be specific (Mahmud, 2019).

2.6 Previous Research

Previous research researched by Nalini (2014) on the formation of an optimal portfolio using the Sharpe Single Index Model on stock options from the Bombay Stock Exchange (BSE). In the results of this study, after analyzing the Single Index Model, it was found that Tata Consultancy Services Limited had the highest return of 26.6% and Oil and Natural Gas Corporation Limited had the lowest return of 2.12%. Risk can be reduced if the portfolio is diversified. With diversity, it is expected to be able to achieve the expected level of return by bearing the smallest possible risk.

Research on stock selection researched by Singh, Parwej, & Sharma (2017), regarding the calculation of shares in 10 selected stocks with large market capitalizations listed in Nifty, found that risk and return are important factors in determining any investment decision. Of the 10 stocks used in the study, 3 stocks showed a negative return and the remaining 7 stocks showed a positive return. If based on beta value, of the 10 stocks selected, there are only 2 stocks with beta values higher than 1, indicating that investing in these stocks is better than in the wider market.

Based on the problem formulation, research objectives and conclusions from previous studies, it can be concluded that the hypotheses in this study are:

Ho: Unable to build stock selection with maximum return for a certain level of risk on the IDX30 stock index using the Single Index Model

H1: Can build a stock selection with maximum return for a certain level of risk on the IDX30 stock index using the Single Index Model

3. Research methods

3.1 Data

This study was designed using descriptive research methods and quantitative approach techniques. The description of quantitative descriptive itself is a method used to focus on finding a phenomenon, fact, or problem by using numbers for its description (Milliondry, 2018). In this quantitative descriptive study, all things that are related to the optimal stock calculation analysis using the Single Index Model theory on the IDX30 stock index.

3.2 Methodology

a. Find the closing price of stock i and JCI
b. Looking for expected return, realized return, standard deviation/variance per individual share, JCI and Bank Indonesia Interest Rate (SBI)
c. Calculating the Beta and Alpha of individual stocks
d. Calculating the Excess Return to Beta (ERB) of individual stocks
e. Calculates the Cut Off Rate (Ci) which is the point value to indicate whether the stock can be included in the portfolio or not. The shares taken are shares with a value of Ci less than or equal to (≤) the result of the ERB value.
f. Determine the value of the Cut Off Point (C*) this value is the highest of the results of the Ci value.
g. Looking for candidates which stocks are included in the optimal portfolio by looking at the ERB value of the stock which is greater than or equal to the value of C*.
h. Calculating the proportion of funds and risk from each stock, is done after the portfolio is formed.
i. Calculating the covariance and correlation of the stocks that make up the portfolio
j. Looking for the expected return value and the variance of the formed portfolio
k. Perform stationarity test and data normality test

4. Results and Discussion

4.1 Stock Selection and Proportion of Funds Measured by Excess Return to Beta (ERB) value

Find the actual return of each individual stock by means of closing price of share I in month t minus the closing price of share I in month t-1, then divided by closing price of share I in month t-1. The results of calculating the actual return on each stock can be seen in appendix 2. After getting the actual return value, the next step is to calculate the Expected Return value using the Average formula on the actual return value of each individual stock. Then look for the Variant value by using the VAR.P formula on the actual return value of each individual stock. Below are the results of the calculation of the expected return and variance on each individual stock:

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Table 1.
Expected Return (E(Ri) and Individual Stock Variance

No	Kode Saham	Expected Return	Variance
1	ADRO	0.0127	0.0125
2	ASII	0.0011	0.0043
3	BBCA	0.0167	0.0020
4	BBNI	0.0078	0.0069
5	BBRI	0.0130	0.0048
6	BMRI	0.0076	0.0034
7	CPIN	0.0155	0.0130
8	GGRM	0.0003	0.0050
9	ICBP	0.0104	0.0030
10	INDF	0.0051	0.0050
11	INTP	0.0004	0.0096
12	JSMR	-0.0023	0.0057
13	KLBF	-0.0001	0.0037
14	LPPF	-0.0143	0.0129
15	PGAS	-0.0086	0.0175
16	SMGR	-0.0008	0.0087
17	TLKM	0.0069	0.0029
18	UNTR	0.0066	0.0061
19	UNVR	0.0060	0.0034

Next is to calculate the expected return and variance from the market return data or JCI during the period January 2015 – December 2019. The result of the expected return on the JCI data is 0.0036 per month and the value of variance or market risk is 0.0010. Based on these results, it can be concluded that if investors invest in the JCI capital market, they will get a positive return.

After calculating the market return, the next step is to calculate the risk free rate. Risk free rate data used for stock selection is monthly risk free rate data, where the total monthly risk free rate is 0.0048.

The next step is to find the beta, alpha, and residual error variance of each individual stock

Table 2.
Beta, Alpha, and Unsystematic Risk

No	Kode Saham	β	α	Unsystematic Risk
1	ADRO	1.77993	0.00628	0.01572
2	ASII	1.51921	-0.00442	0.00666
3	BBCA	1.07023	0.01280	0.00312
4	BBNI	1.91655	0.00081	0.01060
5	BBRI	1.62829	0.00715	0.00745
6	BMRI	1.40177	0.00255	0.00536
7	CPIN	1.32406	0.01071	0.01479
8	GGRM	0.89276	-0.00296	0.00576
9	ICBP	0.80121	0.00748	0.00365
10	INDF	1.08358	0.00122	0.00619
11	INTP	1.57569	-0.00536	0.01208
12	JSMR	1.18192	-0.00658	0.00706
13	KLBF	1.16901	-0.00437	0.00511
14	LPPF	1.31964	-0.01907	0.01460
15	PGAS	1.88903	-0.01549	0.02106
16	SMGR	1.67186	-0.00684	0.01150
17	TLKM	0.54733	0.00494	0.00319
18	UNTR	0.87238	0.00348	0.00690
19	UNVR	0.70718	0.00344	0.00385

Next, look for the Cut Off Rate or Ci value needed in order to determine which stocks will be classified as optimal, and look for the Cut Off Point (C*) limit value. Stocks that are classified as optimal are stocks that have ERB results Ci / C* value. The following is a table of the results of the Cut Off Rate calculation:

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Table 3.
E(Ri), Unsystematic Risk,, ERB, Ai, Bi, Ci

No	Kode Saham	E(Ri)	Unsystematic Risk	β	ERB	Ai	Bi	Ci
1	ADRO	0.0127	0.01572	1.7799	0.0045	0.8974	201.58	0.0007
2	ASII	0.0011	0.00666	1.5192	-0.0025	-0.8494	346.58	-0.0006
3	BBCA	0.0167	0.00312	1.0702	0.0111	4.0740	367.16	0.0030
4	BBNI	0.0078	0.01060	1.9165	0.0015	0.5335	346.37	0.0004
5	BBRI	0.0130	0.00745	1.6283	0.0051	1.8032	356.08	0.0013
6	BMRI	0.0076	0.00536	1.4018	0.0020	0.7377	366.40	0.0005
7	CPIN	0.0155	0.01479	1.3241	0.0081	0.9586	118.57	0.0009
8	GGRM	0.0003	0.00576	0.8928	-0.0051	-0.7020	138.40	-0.0006
9	ICBP	0.0104	0.00365	0.8012	0.0070	1.2271	176.03	0.0010
10	INDF	0.0051	0.00619	1.0836	0.0003	0.0595	189.79	0.0001
11	INTP	0.0004	0.01208	1.5757	-0.0028	-0.5806	205.54	-0.0005
12	JSMR	-0.0023	0.00706	1.1819	-0.0060	-1.1893	197.90	-0.0010
13	KLBF	-0.0001	0.00511	1.1690	-0.0042	-1.1295	267.68	-0.0009
14	LPPF	-0.0143	0.01460	1.3196	-0.0145	-1.7258	119.28	-0.0015
15	PGAS	-0.0086	0.02106	1.8890	-0.0071	-1.2065	169.43	-0.0010
16	SMGR	-0.0008	0.01150	1.6719	-0.0033	-0.8128	243.12	-0.0007
17	TLKM	0.0069	0.00319	0.5473	0.0039	0.3643	94.02	0.0003
18	UNTR	0.0066	0.00690	0.8724	0.0021	0.2326	110.33	0.0002
19	UNVR	0.0060	0.00385	0.7072	0.0017	0.2198	129.76	0.0002

In accordance with the Ci calculation table above, it can be determined that the Cut Off Point (C*) value is 0.0030 contained in BBCA shares. Optimal stocks are stocks that have an ERB value greater than or equal to the C* value. Then the stocks that are classified as optimal are BBCA, CPIN, ICBP, BBRI, ADRO, and TLKM stocks with ERB values greater than or equal to C* 0.0030. While the other 13 shares were not included in the stock selection.

Table 4.
Summary of Stocks Included in the Stock Selection

No	Kode Saham	ERB	C*
1	BBCA	0.01110	0.0030
2	CPIN	0.00808	0.0030
3	ICBP	0.00697	0.0030
4	BBRI	0.00506	0.0030
5	ADRO	0.00445	0.0030
6	TLKM	0.00388	0.0030

After calculating the values of Ci and C*, it was found which stocks were classified as optimal and which were not, according to the table above. The next step is to calculate the proportion of funds from individual shares that are included in the selection of shares by first finding the Zi value obtained from the calculation of the Beta of individual shares included in the stock selection, divided by the variance and then multiplied by the result of the ERB value minus the value of C* (Singh, Parwej, & Sharma, 2017). The following is the result of Zi and Wi calculations:

Table 5.
Zi &Wi Calculation of Shares Included in the Stock Selection

No	Kode Saham	β	Unsystematic Risk	ERB	Ci	C*	Zi	Wi
1	BBCA	1.0702	0.0031	0.0111	0.0030	0.0030	2.7813	56.94%
2	CPIN	1.3241	0.0148	0.0081	0.0009	0.0030	0.4563	9.34%
3	ICBP	0.8012	0.0036	0.0070	0.0010	0.0030	0.8749	17.91%
4	BBRI	1.6283	0.0074	0.0051	0.0013	0.0030	0.4538	9.29%
5	ADRO	1.7799	0.0157	0.0045	0.0007	0.0030	0.1657	3.39%
6	TLKM	0.5473	0.0032	0.0039	0.0003	0.0030	0.1522	3.12%
							4.8842	**100%**

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Based on the table above, it is known that the percentage of the proportion of funds that make up the most optimal shares is BBCA shares worth 56.94%, CPIN shares are worth 9.34%, ICBP shares are 17.91%, BBRI shares are 9.29%, ADRO shares are 3.39%, and shares with the proportion of funds the lowest was TLKM shares worth 3.12%. Stocks that have a higher proportion of returns are better stock alternatives for investors to invest.

After knowing the proportion funds from individual stocks that are included in the stock selection, the next step is to find the expected return from stocks that are classified as optimal as a whole. To find the expected stock return which is classified as optimal, it is necessary to first calculate the beta of the overall portfolio and the alpha of the overall portfolio. The beta and alpha of the overall portfolio are calculated by multiplying the beta and alpha of individual stocks by the Wi value of the individual stocks included in the stock selection. The following table shows the beta and alpha results of the selected stocks:

Table 6.

Beta and AlphaSelected Stocks

No	Kode Saham	W_i	β	α	βp	αp
1	BBCA	0.56944	1.07023	0.01280	0.60943	0.00729
2	CPIN	0.09342	1.32406	0.01071	0.12370	0.00100
3	ICBP	0.17913	0.80121	0.00748	0.14352	0.00134
4	BBRI	0.09292	1.62829	0.00715	0.15129	0.00066
5	ADRO	0.03392	1.77993	0.00628	0.06038	0.00021
6	TLKM	0.03117	0.54733	0.00494	0.01706	0.00015
					1.10538	**0.01066**

After calculating the beta and alpha of the selected stocks, the next step is to find the overall expected return from the stock portfolio by multiplying the expected market return or JCI with the portfolio beta and then adding up the alpha of the selected stocks:

E(Rp): [E(Rm) x p] + p
E(Rp): (0.0036 x 1.10538) + 0.01066
E(Rp): 0.0147

From the above calculation results, the optimal expected return value of the 6 stocks is 0.0147 where if investors invest in the portfolio, they will receive a profit of 1.47%.

Next is to calculate the expected return of the selected stocks, next is to look for the overall risk of the selected stocks that have been formed. To calculate portfolio risk, it is necessary to square the beta value of the portfolio, the residual variance (unsystematic risk) of the portfolio, and the market variance or JCI. To find the residual variance of the portfolio using the calculation of the residual variance of the stock multiplied by the Wi value of the individual stocks included in the stock selection.

Table 7.

Risk of Selected Stocks

No	Kode Saham	W_i	Unsystematic Risk	Unsystematic Risk (σep^2)	βp^2	Varians Pasar
1	BBCA	0.56944	0.00312	0.00178	1.22187	0.00100
2	CPIN	0.09342	0.01479	0.00138		
3	ICBP	0.17913	0.00365	0.00065		
4	BBRI	0.09292	0.00745	0.00069		
5	ADRO	0.03392	0.01572	0.00053		
6	TLKM	0.03117	0.00319	0.00010		
				0.00514		

Varians Portofolio = (βp^2 x Varians Pasar) + σep^2	0.006362
Standar Deviasi Portofolio	0.079762

Based on the table above, the results of the portfolio variance are worth 0.006362. This shows that if investors invest in these optimal stocks, they will bear a risk of 0.63%, and when comparing portfolio risk with individual stock risk, the overall optimal stock risk value is lower. With this it can be concluded that from the formation of an efficient portfolio, investors can reduce investment risk by diversifying.

4.2 Stationarity Test

This test is carried out by comparing t-statistics or ADF test values using the Test critical value at the 5% level. If the ADF result is lower than the 5% critical value result, it can be said that the data is stationary data and the decision taken is Ho is rejected. And if the ADF value is higher than the critical value of 5%, it can be said that the data is non-stationary data and the decision taken is Ho is accepted. The following is a summary of the results of the optimal actual stock return stationarity test:

Table 8.

Summary of Stationarity Test Results

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No	Kode Saham	ADF	*Critical Value 5%*	Hasil
1	BBCA	-9.614404	-2.911730	Stasioner
2	CPIN	-7.373251	-2.911730	Stasioner
3	ICBP	-8.776821	-2.911730	Stasioner
4	BBRI	-8.835380	-2.911730	Stasioner
5	ADRO	-6.229719	-2.911730	Stasioner
6	TLKM	-8.100476	-2.911730	Stasioner

In the summary of the results of the stationarity test above, it can be concluded that the data from the 6 stocks included in the stock selection is stationary data.

4.3 Normality test

If the Jarque Bera value is smaller (<) than the Chi Square value of 5.9915, it can be concluded that the actual stock return data is normally distributed. On the other hand, if the Jarque Bera value is greater (>) than the Chi Square value of 5.9915, it can be concluded that the actual stock return data is not normally distributed (Indi, 2017). The following table summarizes the results of the normality test for actual stock returns which are included in stock selection shares:

Table 9.
Summary of Normality Test Results

No	Kode Saham	Jarque Bera	Chi Square	Hasil
1	BBCA	1.429343	5.9915	Normal
2	CPIN	0.465924	5.9915	Normal
3	ICBP	0.345129	5.9915	Normal
4	BBRI	2.898611	5.9915	Normal
5	ADRO	5.353575	5.9915	Normal
6	TLKM	4.440182	5.9915	Normal

In the summary of the results of this normality test, it can be concluded that the data from the 6 stocks classified in the stock selection are normally distributed where the result of the Jarque Bera value is lower than Chi Square 5.9915.

5. Conclusion

In accordance with the results of the calculation and analysis of stock selection on the IDX30 stock index listed on the Indonesia Stock Exchange in the period January 2015 - December 2019 using the Single Index Model, it was found that from a total of 19 stock samples, only 6 stocks were formed in the stock selection. The 6 shares are BBCA, CPIN, ICBP, BBRI, ADRO, and TLKM shares. The shares included in the selection of shares are shares that have an ERB value greater than the Cut Off Point (C*) value of 0.0030. Each share has the following proportion of funds, BBCA shares are 56.94%, CPIN shares are 9.34%, ICBP shares are 17.91%, BBRI shares are 9.29%, ADRO shares are 3.39%, and TLKM shares are 3.12%.

The 6 stocks have a portfolio return of 0.0147 or 1.47% per month and investors have a portfolio risk level of 0.0064 or 0.64%. This portfolio risk is lower than the risk of investing in individual stocks. By calculating this stock selection is the same as diversifying the risk of investing.

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