Analysing Risk & Return Profiles: A Comparative Study of the Indonesian Stock Market against International Benchmarks

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ABSTRACT: The Indonesian stock market, also known as IDX, has emerged as a prominent player in the financial landscape of Southeast Asia. It has attracted the interest of investors who regard it as a potential source of massive returns. Nevertheless, empirical research has consistently demonstrated that developing nations' stock markets tend to exhibit a notable degree of volatility. This volatility is well recognised for its propensity to amplify risk levels for domestic investors, potentially leading to a decrease in the demand for stock market investments. The observed phenomenon in Indonesia reveals a very low degree of stock market engagement when compared to benchmark nations. This suggests that the high volatility in the market may be a contributing factor.

Understanding the risk-return characteristics of the IDX in comparison to recognised benchmark indexes is crucial for making educated investment decisions. This study will conduct a comparative analysis of the risk-return attributes of the IDX in comparison to six well recognised benchmark indexes, specifically the S&P 500 Index, the Straits Times Index, the FTSE 100 Index, the Shanghai Stock Exchange Composite, the BSE Sensex, and the BOVESPA Index. The study employs several risk and return measures, such as standard deviation, coefficient of variation, and the Sharpe ratio, to assess the relative performance of the IDX.

The objective of this study is to evaluate the comparative appeal of the Indonesian stock market when compared to international benchmarks, with a specific focus on risk and return. The aim is to determine the optimal level of stock market involvement and the inclination towards risk aversion or risk-seeking behaviour among retail investors in Indonesia.

KEYWORDS: Investment, Indonesian Stock Exchange, Risk-Return Profile, Volatility, Diversification.

INTRODUCTION

Indonesia, being the fourth largest country worldwide and classified as a developing economy, has earned significant attention from both domestic and international investors over the past years. The Indonesian stock market exhibits substantial growth potential and presents an appealing characteristic that make it an enticing prospect for investors (Gutierrez, 2016). The Indonesian stock market has performed outstandingly, reaching 1660,71% growth in twenty years, at a yearly growth rate average of 15,86%. This notable momentum was caused by a few major drivers. The first driver is the strong growth in the economy. Indonesia has a 5,57% annual GDP growth rate for the past 5 years (World Bank Open Data, 2023). Second driver is capital market improvements, according to data collected from (World Bank Open Data, 2022) Indonesia's market cap as per 2022 has reached US$ 603.5 billion. A 15,8% increase compared to 2017. The third driver is the increase interest from foreign investors. Indonesia's foreign direct investment has continued showing a positive trend at an annual rate of 5,56% for the past 5 years as of 2022 (ASEAN Briefing, 2023).

However, in addition to its performance growth, Indonesia displays significant volatility in their stock market, which is commonly found in empirical observation of developing economies (De Santis 1997; Aggarwal et al. 1999; Xu 1999; Cano-Berlanga and Giménez-Gómez 2018). the stock price index volatility of Indonesia (measured by the 360-day standard deviation of the return on the national stock market index) reveals that Indonesia, along with other developing markets, exhibits a somewhat greater level of volatility in comparison to developed markets (Federal Reserve Economic Data, 2023). This claim is further supported by prior study findings, which have demonstrated that market volatility in emerging economies demonstrates a greater level of volatility in comparison to that witnessed in established economies. One issue pertaining to volatility is that empirical evidence has shown a positive correlation between heightened volatility and an upsurge in the cost of capital, leading to a subsequent decline in domestic investor participation (Kristian, M., Adiwena, S., & Laksana, Y. B., 2023). The above problem has the potential

to impact the investment decision-making process of Indonesian nationals, since they face a comparatively greater degree of risk in comparison to foreign investors.

BUSINESS ISSUE

The study conducted by Morck, Yeung, and Yu (2000) revealed that the observed volatility in the market was not attributed to basic economic factors. However, the findings of the study imply that there may be a lower frequency of insider trading activities in developed markets compared to emerging markets. Developed markets tend to have a higher degree of regulation for equities trading compared to emerging markets. According to Lee, David, and Swaminathan (2003), increased volatility is associated with a corresponding increase in the cost of capital, which is mostly attributed to the higher discount rate resulting from heightened perceived risk. Consequently, this leads to a decrease in market involvement by domestic investors.

This phenomenon has been observed in Indonesia, as indicated by the significantly low investor-to-population ratio inside the country. Melani (2021) reports that the proportion of persons engaging in the capital market in Indonesia is at around 2%, a much lower figure when compared to other nations. In 2023, (KSEI, 2023) reported the number of Indonesian capital market investors had reached approximately 10 million investors. Which makes up of approximately 3.5% of the Indonesian population. When compared to the chosen benchmark of this study, this number is fairly low. (Rukhaiyar, 2023) claimed that the stock investors in India has reached 80 million, which is approximately 8% of the population. While (Soon, 2023) has stated that the State Council of the People's Republic of China has claimed that there over 219 million number of Chinese stock market investors, which is approximately 15% of the country's population. According to Lubis and Anta (2023), It might be said that the return on investment in the banking sector exhibits a somewhat smaller in comparison to the average capital gain acquired from stocks. For example, the average 1 year bank deposit rate is approximately 2.80% in 2023, while the average yearly yield from the IDX composite is 15.86% (from 2000-2023). This shows that the average yield from equity investments far exceeds the investment from banking services. The observed incidence is deemed to be uncommon, given that the total number of savings accounts exceeded 360 million as of July 2021, indicating a high level of banking inclusion among the Indonesian population. It is noteworthy that there exists an odd phenomenon in Indonesia, wherein the general population exhibits a preference for bank investments over equities. This claim is also backed by (Firmansyah, E. A., & Andanawari, N, 2020) that stated that Indonesian investors are very risk averse and has less appetite in taking risks.

If we look from an international point of view, Indonesia is seen as an attractive foreign investment destination due to its massive market size, growing infrastructure, and weakening exchange rate (Fernandez, Almaazmi, Joseph, 2020). In research conducted by Michelle Kristian, Stevanus Adiwena, and Yohanes Bayu Laksana (2023), foreign trading activity has a visible impact on market volatility. Whereby an increase in trading activity is associated with a corresponding increase in volatility. Which presents a heightened risk for domestic investors.

In conclusion, empirical evidence indicates that the investment environment in Indonesia discourages domestic retail investments and its risk averse investors. Hence, the author exhibits an interest towards undertaking a thorough analysis of the risk and return dynamics inside the Indonesian stock exchange, compared with global benchmarks, with the aim of assessing the attractiveness of the present condition of the Indonesian stock market and its implication to its retail investors.

LITERATURE REVIEW

I. Index Performance Measurement

Prior to the fundamental work of (Markowitz, 1952), investment performance was primarily evaluated based on the generated returns, thereby presenting return as the principal criteria for investors in their investment decisions (Zulkafli, Ahmad, & M., 2017). According to Markowitz's theory, investors aim to enhance their wealth by strategically diversifying their portfolios, therefore mitigating risks without compromising returns. The understanding of the origins of risk and return is crucial in the field of investing, since these two attributes play significant roles in investment decision-making. To comprehensively assess risk and return, it is necessary to identify and analyse the many factors that exert effect on these financial variables (Sharpe, 1995). According to (Kamuti, J. M., & Omwenga, J., 2017), the expected rate of return refers to the anticipated return that investors expect to get on

their investment. The level of risk associated with an investment increase when there is greater uncertainty around the potential result of the investment.

Holding Period Yield: The holding period yield refers to the total return obtained by holding an asset or a collection of assets throughout a specific duration, sometimes referred to as the holding period. The metric is commonly represented as a percentage and proves to be particularly valuable for the purpose of evaluating returns on assets acquired at various points in time (Chen, J., Hong, H., & Stein, J. C., 2002). The measurement can be mathematically written as follows

$$HPY_{i,t} = \frac{(P_{i,t} - P_{i,t-1})}{P_{i,t-1}}$$

Where:

P(i,t) = The price of an asset at the end of a period.

P(i,t-1) = The price of an asset at the beginning of a period

Standard Deviation as Basic Measurement of Risk: Standard deviation is the measure of how much the values of the data within a group diverge from the average value. (Asante, 2023) notes that the standard deviation is also employed in statistics to quantify the deviation of a dataset from its mean value and a statistical indicator of market volatility, indicating the extent to which prices differ from the average price. The risk increases with the range and degree of unpredictability in the price action. A security that has a wide range of price movements and has a tendency to gap, spike, or reverse abruptly is riskier and may result in a greater loss. According to (Hargrave, 2023), and other empirical studies, standard deviation (σ) is considered the classical measure of risk in finance. In this research, standard deviation (σ) is calculated using the following formula:

$$s = \sqrt{\frac{\sum_{i=1}^{N}(xi - \bar{x})^2}{N-1}}$$

Where:

s = sample standard deviation.

N = the number of observations.

xi = the observed value of sample item. $\bar{x}$ = the mean value of the observations.

Coefficient of Variation as Measurement of Risk Sensitivity: The coefficient of variation (CV) is a statistical measure of the distribution of data points around the average value. The measure is frequently employed to examine the variability of data across different data series. The coefficient of variation offers a somewhat easy and rapid approach to compare several data series, in contrast to the standard deviation, which must always be taken into account in relation to the data mean (Taylor, 2023). From a financial standpoint, the risk-to-reward ratio is represented by the coefficient of variation (CV), where the mean reflects the investment's return and the standard deviation reveals the investment's risk. An investor may determine the risk-to-reward ratio of each security and make an investment choice by comparing the coefficient of variation of several securities. The standard formula for the coefficient of variation may be written mathematically as follows:

$$CV = \frac{\sigma}{\mu} \times 100\%$$

Where: σ = volatility or standard deviation of the dataset. μ = expected return or mean of the dataset.

Sharpe Ratio as Measurement of Total Risk Adjusted Performance: The Sharpe ratio was initially introduced by Sharpe in 1966. The index encompasses a metric of portfolio return's standard deviation, which was addressed by (Leković, 2017). (Pangestuti et al, 2017) proposes that the Sharpe ratio serves to evaluate and compare the performance of various portfolios or stocks. This evaluation is based on the notion of the capital market line, sometimes referred to as the Reward to Variability (RVAR). The purpose of this purpose of this index assessment is to assess the performance of each index and the total risks associated with each individual

index, specifically those risks that cannot be diversified or are non-diversifiable. The standard formula for the Sharpe ratio may be written mathematically as follows:

$$S_i = \frac{R_i - RFR}{\sigma_i}$$

Where:

S_i = Average return of observed index for a certain period.

RFR = The risk-free rate for the period.

σ_i = Volatility or standard deviation of the dataset.

Other Ratios as Measurement of Risk Adjusted Performance: This study recognises the existence of several methods for evaluating portfolio performance. In addition to the previously discussed Sharpe ratio, several other measuring tools are commonly employed, including the Treynor ratio, Jensen alpha, Sortino ratio, and Information ratio. However, these ratios are excluded from our analysis as they need the use of Beta in their computations. Beta is a quantitative indicator that assesses the anticipated level of fluctuation in a particular stock in relation to the broader market movements. Given that this study tracks the fluctuations of a stock index, which serves as a representation of the market, the beta value will consistently be 1. Consequently, this renders the ratio unsuitable for comparative purposes. Moreover, the Sharpe ratio incorporates the measurement of total risk, encompassing both systematic and unsystematic risk within a given market (Leković, 2017).

Ii. Modern Portfolio Theory

In the Journal of Finance, Markowitz clarifies his initial two assumptions: investors aspire to optimise discounted expected earnings and perceive deviation as undesirable. He highlights that an investor should logically invest in a security that has the maximum potential for return. Markowitz posits a principle, stating that the investor should allocate their assets over all securities that offer the highest anticipated return. However, Markowitz also acknowledges that diversification alone cannot completely eradicate variance completely (Markowitz, 1952).

Efficient Frontier: The term "efficient frontier" is now often used to refer to a highly effective collection of asset combinations (portfolios) (Abalkhail, 2017). The creation of the efficient frontier is predicated on two characteristics that dictate investors' portfolio selection. The criteria in question are anticipated to be the return and risk. Risk is commonly assessed by the standard deviation of the average return of the investment. The anticipated yield of a collection of several high-risk assets is calculated by summing the weighted average of the projected returns of each individual item in the portfolio. If the portfolio consists of two different assets, the expected portfolio return can be represented by the following formula:

$$RP = wARA + wBRB$$

Where:

RP = Portfolio expected returns.

wA = Weight of asset "A"

RA = Return of asset "A"

wB = Weight of asset "B"

RB = Return of asset "B"

Similarly, the portfolio risk, or standard deviation can be mathematically expressed using the following formula:

$$\sigma P = \sqrt{wA^2 \sigma A^2 + wB^2 \sigma B^2 + 2wAwB\rho AB\sigma A\sigma B}$$

Where:

RP = Portfolio expected returns.

wA = Weight of asset "A"

RA = Return of asset "A"

wB = Weight of asset "B"

RB = Return of asset "B"

The aim of the efficient frontier is to allocate each asset proportionally in order to construct a portfolio with the highest return and lowest standard deviation.

METHODS

The risk and return characteristics of different indices will be assessed using statistical metrics such as standard deviation, coefficient of variation (CV), and Sharpe ratio. By employing these financial evaluation methods, a systematic side-by-side analysis will be conducted to identify and assess similarities and differences between two or more entities. The objective of this study is to provide significant insights into the comparative performance and risk characteristics displayed by various indexes.

RESULT

I. Returns Analysis

Table IV. 1 Summary of Holding Period Yield of different Indexes

No	Period	IDX(ID)	S&P 500 (U.S)	STI (SG)	FTSE (UK)	BSE SENSEX (IN)	BOVESPA (BR)	SSEC (CN)
1	1 Yr HPY	3,14%	-9,72%	3,56%	0,65%	2,65%	1,02%	-14,20%
	Avg Monthly HPY	0,28%	-0,63%	0,10%	0,35%	0,31%	0,26%	-1,14%
2	5 Yr HPY	3,54%	44,37%	-6,13%	-1,23%	65,58%	33,70%	-6,92%
	Avg Yearly HPY	0,95%	8,41%	-0,82%	0,45%	10,96%	6,89%	0,36%
	Avg Monthly HPY	0,14%	0,84%	0,01%	0,08%	1,00%	0,74%	0,01%
3	10 Yr HPY	53,57%	172,12%	-1,77%	18,87%	199,32%	89,98%	32,19%
	Avg Yearly HPY	5,04%	11,16%	0,64%	2,29%	12,66%	9,01%	5,29%
	Avg Monthly HPY	0,45%	0,96%	0,10%	0,27%	1,04%	0,74%	0,46%
4	20 Yr HPY	1660,71%	192,34%	44,57%	19,03%	1044,03%	592,78%	105,43%
	Avg Yearly HPY	18,33%	9,53%	6,95%	4,68%	19,20%	16,61%	9,67%
	Avg Monthly HPY	1,32%	0,73%	0,48%	0,31%	1,25%	1,01%	0,65%

The Indonesian Stock Exchange Composite has consistently yielded positive returns over all holding periods, indicating a strong performance. Nevertheless, its performance exhibits significant difference over different holding durations. In the short period of 1 year, the Indonesian Stock Exchange Composite has demonstrated a performance of 3.14%, a performance level that is still lower than the country's risk-free rate. When considering a longer duration of 5 years, the performance of the IDX Composite falls significantly behind that of several of its benchmark indices. The stock index has underperformed in comparison to other developing economies (excluding China). The BSE Sensex demonstrated an impressive performance of 65.58%, while the Brazilian stock index experienced a growth of 33.70%. In addition, the performance of the IDX Composite was surpassed by the S&P 500, a worldwide benchmark that is a better-established index. Over the course of 10 years, the stock market had a much lower rate of growth in comparison to its developing markets benchmarks. India saw a remarkable growth rate of 199%, while Brazil achieved a growth rate of over 90%. In contrast, Indonesia's growth rate was just 53.57%, with an average annual percentage yield (HPY) of 5.04%. For the past twenty years, the Indonesian stock market has shown exceptional performance compared to others, with a remarkable return of 1660.71%. This indicates that the exponential expansion of the stock market has been decelerating in recent years. Over a span of 20 years, the IDX Composite has exhibited exceptional performance in comparison to its standards. The BSE Sensex saw a growth rate of 1044.03%, while the Bovespa index experienced a growth rate of 592.78%.

In summary, the Indonesian stock market presents a positive opportunity for investors, particularly in terms of possible returns for a longer holding period. The market has had a positive historical performance in every holding period recorded and is indicated of experiencing advantageous conditions, such as substantial economic growth. Nevertheless, the present research has not considered the potential risks of volatility that are inherent in investing in Indonesia. Hence, more analysis is necessary.

II. Basic Measurement of Risk using Standard Deviation

The use of standard deviation as a risk measuring tool holds significance in the context of stocks, since it quantifies the degree to which a stock's price may exhibit variability or fluctuation. A greater magnitude of standard deviation implies increased volatility in a stock, thereby making it more prone to risk. In the present analysis, we shall employ monthly and yearly historical pricing data spanning from January 1, 2003, to January 1, 2023, for the purpose of computing the yearly and monthly standard deviation of each index.

Table IV. 2 Standard Deviation Across Indexes

No	Period	IDX(ID)	S&P 500 (U.S)	STI (SG)	FTSE (UK)	BSE SENSEX (IN)	BOVESPA (BR)	SSEC (CN)
1	1 Yr Monthly σ of HPY	2,32%	6,70%	3,31%	3,38%	4,32%	6,06%	5,03%
2	5 Yr Yearly σ of HPY 5 Yr Monthly σ of HPY	8,10% 4,10%	18,62% 5,39%	10,27% 4,78%	13,18% 4,37%	9,85% 5,57%	8,62% 7,06%	20,77% 5,05%
3	10 Yr Yearly σ of HPY 10 Yr Monthly σ of HPY	12,45% 3,80%	12,11% 4,27%	13,23% 4,06%	10,98% 3,76%	16,42% 4,74%	23,37% 6,55%	24,78% 6,07%
4	20 Yr Yearly σ of HPY 20 Yr Monthly σ of HPY	33,69% 5,53%	16,46% 4,27%	22,07% 4,80%	13,69% 3,93%	28,65% 6,20%	32,92% 6,63%	38,76% 7,63%

Upon analysing table 4.2, mature markets exhibit a higher level of stability in their standard deviation score in comparison to emerging markets. Empirical research provide evidence for the fact that established markets have a smaller standard deviation in longer time periods, such as 10 and 20 years compared to emerging markets. In contrast, the IDX Composite often has a lower or comparable standard deviation over most time periods when compared to its developing markets counterparts. During the past 5 years, the IDX Composite had the lowest annual and monthly standard deviation when compared to all other benchmarks. In the 10-year period, the IDX Composite saw a similar scenario where its yearly standard deviation was somewhat higher than that of the S&P 500 but lower than the other developing markets. This can be attributed to the fact that the IDX Composite did not yield significantly positive returns over those time periods. Upon examining the 20-year timeframe, it is apparent that the IDX exhibited greater volatility, like other rapidly expanding indices in emerging markets. It is evident that the IDX saw significant volatility with its great gains throughout the early 2000s.

Indonesia had a very modest level of volatility, as measured by standard deviation, as compared to its benchmarks. However, as the performance of the IDX composite improves, the volatility is expected to increase significantly, like other developing market indexes.

III. Risk Sensitivity Measurement using Coefficient of Variation

Based on the data, it is apparent that the Indonesian stock market has a more favourable return and a somewhat smaller standard deviation in comparison to other emerging nations. Nevertheless, for the purpose of conducting a thorough comparison, it is necessary to identify the level of risk taken in relation to the returns associated with an index. Hence, this study will proceed to

employ the coefficient of variation. The coefficient of variation (CV) is a risk statistic that is calculated by dividing the standard deviation by the mean. Below are the results.

Table IV. 3 Coefficient of Variation of Each Index

No	Period	IDX(ID)	S&P 500 (U.S)	STI (SG)	FTSE (UK)	BSE SENSEX (IN)	BOVESPA (BR)	SSEC (CN)
1	1 Yr Monthly CV	8,15	-10,62	32,12	9,76	13,96	23,73	-4,39
2	5 Yr Yearly CV	8,49	2,21	-12,49	29,33	0,90	1,25	57,50
3	10 Yr Yearly CV	2,47	1,09	20,69	4,80	1,30	2,59	4,69
4	20 Yr Yearly CV	1,84	1,7	3,2	2,9	1,5	2,0	4,0

The data presented in table 4.3 demonstrates that the coefficient of variation of the IDX Composite is consistently higher than that of the S&P 500 throughout all time periods. This indicates that for every unit of return obtained, an investor in the IDX Composite is subject to a greater level of risk. When comparing the performance of the IDX Composite to the BSE Sensex, it is evident that the BSE Sensex has a significantly lower coefficient of variation (CV). Despite the Bovespa Index yielding lower returns than the IDX Composite, the IDX appears to have a larger coefficient of variation (CV). This suggests that Indonesia is not the most secure choice for investing in stocks among emerging economies that provide high returns.

IV. Measurement of Risk Adjusted Performance using Sharpe Ratio
Table IV. 3 Sharpe Ratio Result

No	Period	IDX(ID)	S&P 500 (U.S)	STI (SG)	FTSE (UK)	BSE SENSEX (IN)	BOVESPA (BR)	SSEC (CN)
1	1 Yr Monthly Sharpe	-0,34	-0,17	-0,05	0,06	-0,18	-0,11	-0,34
2	5 Yr Yearly Sharpe	-0,72	0,19	-0,41	-0,31	0,37	-0,57	-0,11
3	10 Yr Yearly Sharpe	-0,14	0,52	-0,21	-0,20	0,33	-0,12	0,10
4	20 Yr Yearly Sharpe	0,34	0,28	0,16	0,02	0,41	0,15	0,18

From the data presented in the table above, the IDX Composite has consistently exhibited a negative Sharpe ratio over most time periods. This is because the average annual return from the IDX Composite performance is lower than the risk-free rate offered in Indonesia. When comparing it to its primary benchmark, the S&P 500 has consistently shown a positive Sharpe ratio throughout various time periods. This suggests that investors can get better excess returns in the S&P 500.

Conversely, the BSE Sensex has achieved a positive Sharpe ratio because of its significant excess returns and much reduced volatility. This indicates a bad performance of Indonesia, as India has a greater risk- free rate in comparison. Other benchmarks have yielded comparable outcomes to the IDX, exhibiting negative Sharpe ratios because of their underperformance in generating negative excess returns. To summarize, while Indonesia has provided the best rate of return over the past twenty years, investors in this market had to assume greater and avoidable risks in comparison to investors in other indices such as the S&P 500 and the BSE Sensex.

V. Implication and Solution for Retail Investors
The IDX Composite has a level of total risk that is too high for the majority of Indonesian investors, as indicated by the relatively low Sharpe Ratio of the IDX in comparison to other benchmark indices. This study has indicated that the level of total risk in the IDX Composite is potentially demotivating investors to participate in the Indonesian Stock Market. The history of volatility and uneven performance of the IDX is the root cause of the absence of compensation. Due to the fact that the index has been subject to considerable volatility over the last few years, investors have been left feeling uneasy, which has discouraged their involvement. In

addition, the total returns of the IDX have not regularly outpaced those of other markets, which makes it less appealing to investors who are looking for larger returns.

This study has demonstrated that the cause for the negative Sharpe ratio in the IDX Composite is not related to the poor performance of the stock exchange, but rather owing to the negative excess returns. As a result, a workable alternative is to construct an optimum portfolio that includes both stocks and bonds, taking advantage of the risk-return profiles that are complimentary to those of both asset classes. Bonds, particularly those issued in Indonesia, have always given yields that are greater than those offered by equities. Investors have the opportunity to possibly improve the total risk-adjusted return of their portfolios by carefully allocating a part of their assets to bonds. Using Modern Portfolio Theory and the Efficient Frontier by Markowitz, this study will construct a hypothetical two-asset portfolio consisting of the IDX Composite and the S&P Indonesia Bond Index. The purpose of this study is to demonstrate how diversification of the IDX with the fixed income asset class can help retail investors reduce their exposure to risk. Just like the IDX Composite, the S&P Indonesia Bond Index was designed to monitor the performance of Indonesian government and business bonds that are denominated in the country's native currency.

The following risk and return characteristics have been seen in the IDX Composite and the S&P Indonesia Bond Index:

Table IV. 4 Stock & Bond Index Risk-Return Characteristics

No	Index	Avg Yearly Return	Yearly Std Dev
1	S&P Indonesia Bond Index	7,77%	6,80%
2	IDX Composite	18,33%	33,69%
3	Coefficient of Corelation (ρ)	0,844	

The hypothetical portfolios that will be assumed to reflect the efficient frontier are depicted in the table that can be found above. As can be seen in the table, the risks and returns that are associated with each portfolio will vary depending on the makeup of the portfolio, which includes both stocks and bonds. In most cases, the allocations described above are plotted and examined visually to determine which portfolios are the most effective. A graphic illustrating the efficient frontier for the portfolios mentioned above may be seen below.
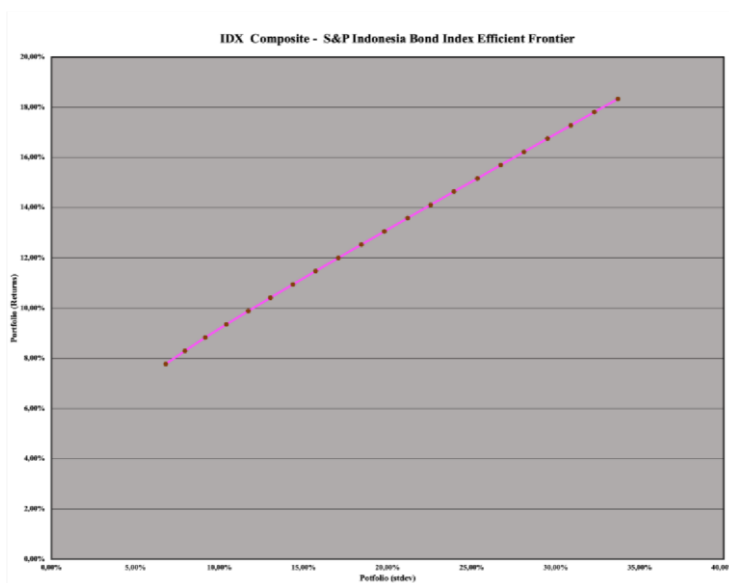

Figure IV. 1 Efficient Frontier of Optimal Portfolios

A representation of the efficient frontier that was produced by Microsoft Excel is shown in Figure 4.2. An illustration of the creation of a straight line by the Stock and Bond index portfolio is shown here. A straight line represents a portfolio that includes both a risk-free asset and an asset that is exposed to risk. Because of this, the implementation is made available to individual investors. Within the context of this hypothetical collection of portfolios, an investor who is risk averse can allocate a greater portion of their assets to a low risk asset (bonds), while an investor who is more risk seeking can allocate a greater portion of their assets to equity investments. As a result of the fact that the efficient frontier is a straight line, it can be deduced that the level of risk significantly increases with each extra return that is required. Accordingly, there is no distinction in terms of efficiency between an investor who is risk averse and an investor who is risk seeking

CONCLUSION

Based on the ratios that were generated in this study, it is evident that the IDX Composite has consistently displayed a Sharpe ratio that is negative for the majority of the possible time periods. This is due to the fact that the average yearly return in Indonesia from the performance of the IDX Composite is lower than the risk-free rate that is supplied in Indonesia. This indicates that investors have been subjected to risks that are both bigger and preventable in contrast to investors who have invested in different indices from the benchmark that was previously chosen. It is possible to draw the conclusion from this study that The IDX Composite possesses a degree of overall risk that is higher in comparison to the benchmark that was chosen. It has also been demonstrated that the majority of Indonesian investors, who are known to be risk adverse, do not feel comfortable taking on this risk. According to the findings of this study, the amount of overall risk that is present in the IDX Composite may be discouraging investors from taking part in the Indonesian Stock Market.

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