International Journal of Financial Management and Economics

Abbas Mohammed Allaw
Assistant Lecturer,
Department of Preparation
and Training, General
Directorate of Education in
the Province of Kirkuk, Iraq

Evaluating the performance of investment portfolios using the information ratio

Abbas Mohammed Allaw

Abstract
The study aimed to identify the information ratio as a tool for evaluating investment portfolios and identify the way to calculate it, while the problem of the study was that the majority of investors did not realize the importance of using methods to evaluate the performance of their investment portfolios or do not have the necessary scientific capabilities to use those methods, and to reach the results of this study, I used the descriptive analytical approach, and the study relied on the approved websites on the internet to obtain the data processed using my program (Excel, Minitab), The study found that the rate of excess returns measures the extent to which the fund manager can generate returns in excess of the standard indicator, and that the information ratio measures the value of excess returns compared to the risk rate, and the higher the rate of excess returns, the more there is a chance to be high performance if it is reconciled with the risk rate, in addition, negative values of the rate of excess returns leads to negative information ratios, which means low performance for portfolio managers.

Keywords: Information ratio, excess returns, normative indicator

Introduction

Investment portfolios have become one of the most important topics that investors, specialists and theorists focus on financial affairs, due to the importance of these portfolios represented by the optimal exploitation of financial resources by maximizing returns, and reducing risks, so investors when forming their investment portfolios to carefully select their investment tools based on the principle of diversification to reduce risks on the one hand, while specialists, Therefore, the process of evaluating the performance of portfolios has gained great importance and has captured the attention of writers and researchers due to the benefit it provides to them, it helps investors to make the appropriate investment decision on the one hand, and may meet the ambitions of writers and researchers in the field of scientific research, so research studies in this field have been, On this basis, the study came to identify the methods of evaluating investment portfolios and how to use the percentage of information, which is one of these methods, which may not have been properly addressed in the book, especially at the Arab level.

The Study Problem:

The study problem appears in general in the investment decision-making process, which is based by its nature on the duality represented by the duality (return and risk), as it is known that these two elements of this duality run in parallel unevenly or asymmetrically as soon as there is an investment except for risk-free investments (bonds), and of course investors seek to increase their profits by maximizing the return on their investments in exchange for reducing, On this basis, researchers and experts have set out to find a set of technical and scientific methods to reach those alignment through a set of metrics to avoid making the wrong investment decision, and due to the difficulty and complexity of these methods made it very difficult to use and work with them by all investors because they require technical and scientific expertise that not all investors have, so the research problem manifests itself in particular by the fact that the majority of investors do not realize the importance of using methods to evaluate the performance of their portfolios, or they do not have the scientific capabilities and technical expertise necessary to use those methods in a way that enables them to reach the appropriate investment decision,

Corresponding Author:
Abbas Mohammed Allaw
Assistant Lecturer,
Department of Preparation
and Training, General
Directorate of Education in
the Province of Kirkuk, Iraq

Based on the foregoing, the study problem can be formulated with the following questions:
1. What are the methods of evaluating the performance of investment portfolios?
2. What is the percentage of information and what is the mechanism of its use?

The Importance of the Study
The study derives its importance from the importance of investment portfolios in general and the methods of evaluating them in particular, by highlighting the scientific methods used to assess the performance of investment portfolios and clarifying the role of those methods to reach the appropriate investment decision, and identify the percentage of information and the mechanism of its use as one of these methods that have not been widely addressed by researchers and writers, especially at the Arab level, as well as identifying the differences between them and the rest of the metrics.

Objective of the study
The study aims to identify the methods used to assess the performance of investment portfolios, in addition to identifying the concept of Information Ratio and how to be used by investors in the Saudi financial market to assess the performance of their investment portfolios to reach the appropriate investment decision.

Study Hypothesis
Since the information ratio is a tool for evaluating the performance of investment portfolios by evaluating the performance of managers of those portfolios, the research hypothesis is as follows:
The use of the information ratio by investors in the Saudi financial market gives the best evaluation results for their investment portfolios, by measuring the relationship between the dependent variable represented by excess returns and the independent variable represented by risks, and thus they can reach the appropriate investment decision to maximize the returns of their investments and reduce risks.

Study of the Sample
The study sample consisted of seven investment funds registered in the Saudi stock market, which provided monthly data for the period from 1/3/2021 to 31/12/2024 and listed in Table No. 1 with 46 views

Table 1: Investment portfolios study sample

No.	Portfolios	Code
1	Alinma Saudi Government Sukuk ETF Fund - Short Maturity	9404
2	Alawwal Invest MSCI Tadawul 30 Saudi ETF	9402
3	Albilad Gold ETF	9405
4	Alkhabeer Diversified Income ETF	4700
5	Falcom 30 Saudi Equity ETF	9400
6	Falcom Petrochemical ETF	9401
7	Albilad Saudi Sovereign Sukuk ETF	9403

Source: Prepared by the researcher based on the annual reports of the Saudi Stock Exchange.

Study Structure
The Study included three main researches, the first dealt with the general framework of the research, the second included the theoretical aspect of the research on the methods of evaluating the performance of investment portfolios, and the third dealt with the practical aspect of the research.

Methods and Models Used in the Study
The study used a set of methods and metrics to measure the percentage of information from (Vyachkileva, 2018;1) [22].
Excess returns according to the following formula:

ERt= Rpt- Rbt

Where ERt represents the excess returns on an active portfolio in the period
Where Rpt is the return on an active portfolio in the period t
An Rbt is the return on a standard portfolio or security in the period t
The arithmetic average of excess returns during the historical period from t =1 through t according to the following formula:

$$\overline{ER} = \frac{1}{T} \sum_{t=1}^{T} ERt$$

The standard deviation of returns in excess of the norm, or tracking error, for the same period according to the following formula:

$$\sigma = \sqrt{\frac{1}{T-1} \sum_{T=1}^{T} (ERt - \overline{ER})^2}$$

The ratio of information according to the following formula:

$$IR = \frac{\overline{ER}}{\sigma}$$

Literature Review
First: The Concept of Evaluating the Performance of Investment Portfolios
The main objective of managing an investment portfolio is the general goal pursued by all investors, which is to invest in a way through which the investor can achieve high returns for low risks, in addition to the secondary objectives, which are supposed to be specific to the investor himself and not generalizable to the rest of investors (Gemayel & Shoukry, 2023:92) [9], and the performance evaluation process is one of the most important methods of monitoring the performance of the portfolio, which leads to the final result to improve the performance of the portfolio by measuring the performance of all its components in one

package to maintain the stability of the target performance and expected return, The good performance of the investment portfolio is based on two main elements, the first is the right timing to buy and sell a security according to market variables, and the second is the correct choice of securities that achieve high returns against low risks (Mikael & Mahmoud, 2022:949) [24], and in order for an investor to succeed in managing his investment portfolio, he must have the necessary material, One of the most important actions that an investor should take is the necessary analysis of return and risk because they are the two elements on which the process of evaluating the performance of an investment portfolio is based(al-Mousawi, 2009:243) [4], through all this, an investor should identify what return and risk are in order to be able to use the various methods used to evaluate the performance of an investment portfolio based primarily on these two elements and thus reach the appropriate investment decision.

Second: The Return
Therefore, the return is considered the main pillar on which the investment analysis is based, through which the process of differentiation between available investment instruments is carried out, and it is viewed from an economic point of view as the increase in wealth resulting from the increase in revenues that exceed costs (Fadel & Abadi, 2021:228-2029) [8] the rate of return on the investment portfolio can be measured according to the following equations (Al-Hamdouni, 2013:20-21) [3]:
Measure the average monthly retention period in the following way:

$$R_{it} = p_t - p_{t-1} \Big/ p_{t-1}$$

Where the
R_{it} = Rate of return per share per term
P_t = Average monthly closing price per term =
P_{t-1} = Average monthly closing price of the stock in the previous period

Third: The Risk
Risk is defined as the degree of volatility of the expected return or the amount of deviation in the actual return from the expected return or is the state of fluctuation of returns due to uncertainty about future forecasts (Abdulaziz, 2018:45) [1], and the risk is measured by a set of measures, including the beta coefficient, which expresses the amount of fluctuation of a stock or portfolio with the fluctuation of the market, the variance, which serves as a statistical measure of the dispersion of expected value outputs, and the coefficient of difference used when comparing two or $Sd = \sqrt[2]{sv}$ more groups addition to the standard deviation, which represents the dispersion of returns from their arithmetic mean and is measured by the square root of the variance according to the formula below (Drubb, 2017:40-42): [7]

Fourth: Methods of evaluating the performance of the financial portfolio.
The simple method: through this model, investors compare the rate of return on investment in their portfolios with the rate of Return.

non-investment in the portfolios of other investors, and it is considered that this model is one-sided, meaning that it focuses on the return and does not take into account the size of the risks, it is not necessary that a high return is an indicator of good performance unless it takes into account the size of the risks it corresponds to (Mehsul & mehriz, 2018:69) [13].

Composite method: based on the capital asset pricing model and recognizing the need to include return and risk, William Sharp, Jack Trainor and Michael Jensen developed the measurement of portfolio performance around 1960, and these metrics are often called composite measures because they take into account both the return of the portfolio and its risks, which are still used today (Nugraha, 2021:38) [16], There is no doubt that the simple method is not enough to assess the performance of investment portfolios, so the dual method appeared, which it represents the scientific method that depends on the rate of Return of the portfolio, and its risk rate, so many models have appeared that adopt this method(Mikael and Mahmood, 2022: 950) [24], and these include the Sharpe ratio, the Trainor ratio, the Jensen ratio, the M-Squared scale (M^2) and the information ratio.

Fifth: Information Ratio
Many investment portfolio managers are still opposed and wondering what is the percentage of information on the ground and how it is calculated, so some investors place great importance on what this percentage tells them, because through it they determine the performance of their portfolio managers, and therefore keep them in their jobs or replace them, others believe that this percentage can be manipulated and therefore this statistic should not be trusted, and it is important to understand this percentage well and take the necessary measures to calculate it correctly (Blatt, 2004;2) [17], this ratio developed by Trainor and black in general 1973 is considered an acceptable measure of the performance of active portfolio management, It can be viewed simply as the ratio of excess returns on a reference standard divided by the volatility of excess returns, and its advantages lie in its computational feasibility and mathematical similarity with sharp's reward-to-variance ratio (Nanigian, 2011;1) [15], the information ratio is often referred to as a generalized version of the sharp ratio, it developed when users of the sharp ratio began passive substitution of risk-free rate criteria, it tells investors the amount of excess generated by the amount of excess risk taken compared to the standard (Kidd, 2011;2) [12], except that the difference between the information ratio and the Sharpe ratio, the latter is calculated using a risk-free rate, While the percentage of information is calculated using a reference standard, it does not necessarily have to be risk-free (Vyachkileva,2018,16) [22].
In general, it can be defined as a measure of the performance of investment portfolio management against risk and return compared to the standard, and the standard is a reference portfolio for active managers, and the management goal should be to outperform the standard, and from this definition, three sub-definitions can be formulated, so that the first is based on historical data to measure the success or failure of the active manager and calculated by dividing the excess returns on risk according to the following equation (Blatt, 2004:6-9): [17].

$$IR = \frac{ER}{\sigma}$$

The second definition looks ahead and calculates the information ratio based on the expected information in the future, which is seen as the expected level of annual excess return for each amount of annual residual risk. The third definition provides a theoretical estimate of the information ratio by breaking the information ratio down into components, which is represented by the information coefficient and its breadth. The excess returns (ER) are typically calculated by subtracting the standard from the portfolio return, and (σ) stands for the standard deviation or tracking error., Since it measures the performance of the portfolio in relation to its standard indicator and adjusts it based on fluctuations in the dispersion between the two compared to the sharp ratio, it can be classified as the relationship between the actual returns and the manager's expected returns. The breadth of information indicates the number of investment decisions made by managers annually, and it should be independent forecasts. It is regarded as one of the most common metrics used by investors to evaluate the performance of their investment portfolios as the most advanced. The Active Return is the difference between the return of the portfolio and the return of the investment of its standard indicator, and the standard deviation of the active return is the tracking error. Instead of taking the ratio of the expected difference between the return of the managed portfolio and the market to the portfolio risk, we might take the ratio of the expected difference to the standard deviation (Aboy & Magadia, 2021;1) [2].

The information ratio measures the consistency of excess returns relative to its reference standard, so if the portfolio manager consistently or inconsistently outperforms the standard, the information ratio is taken by calculating the tracking error, which is the deviation criterion of monthly excess returns, where the numerator indicates the ability of the portfolio manager to generate a return that differs from the standard, while the denominator indicates the amount of irregular risks resulting from the portfolio manager's search for excess returns, and in general, the information ratio shows the benefit relative to the cost of active management (Trahan, 2008;287) [21], and the information ratio allows to compare the returns of the portfolio the higher the percentage, the better the performance of the investment portfolio compared to its standard, An investment is considered good if the value of the information ratio is limited between (0.4-0.6), while an investment is great if its value is limited between (0.6-1) (Carlsen, 2021;51) [5].

The information ratio is used to assess the ability (skill) of the portfolio manager in producing returns exceeding a certain standard, and in order to calculate the information ratio, the total portfolio return for a certain period is subtracted from the total return of the tracked standard indicator, and the output is divided by the tracking error, and the tracking error is measured by taking the standard deviation of the difference between portfolio returns and index returns (Kayhan, 2022:40) [11], there are two factors leading to a high Information Ratio, the first factor is the manager's skill in correctly predicting the remaining return on each paper in the second factor is the number of

independent investment decisions that are made annually and is called expanding (Sharma, 2020;1483) [18], one of the advantages of the information ratio is that it is easy to calculate, and it is a useful measure if the reference standard is carefully chosen to suit the manager's style, in addition, it has a better digital representation than the Sharpe ratio so that if it is 0.5 good, 0.75 very good and 1.0 exceptional, and everything above 1.0 is unsustainable or fraudulent, or its disadvantages are incomplete statistics, so investors cannot rely on it only to make their decisions, Maximizing the information ratio can only lead to erroneous conclusions because it captures only the active portfolio, but investing in risk-free assets can increase the risk-adjusted performance of the entire portfolio instead of increasing the information ratio, as well as it does not provide measures on performance nor any guidance on the composition of portfolios, besides it does not explain the nature of the correlation between portfolio components) Zinal, 2023;19) [23], In general, portfolio managers seek to achieve positive returns higher than the benchmark to earn additional revenue, so their focus is on improving the excess returns to be a higher percentage of information, which in turn indicates their high performance, ignoring the risks of the investor's total portfolio, which exacerbates the agency problem, because this attempt involves additional risks, so we see investors do not attach great importance to the high of this percentage) Hausner & Vuuren, 2021;95-96) [10] and this is confirmed by (Vyachkileva, 2018,18) [22] by saying that many managers focus on maximizing the percentage of information in order to demonstrate higher skills to confirm their success, so if the percentage of information exceeds 1%, it is considered unsustainable or fraudulent, and this is considered incomplete statistics, and investors should not rely on it only to make their decisions because maximizing the percentage of information can lead to wrong conclusions because it is limited to the performance of the active portfolio only and increases the risk-adjusted performance of the entire portfolio instead of increasing the percentage of information

Practical Results
The paragraphs of this research are devoted to the applied aspect of the study, starting from the description of the study variables represented by (excess returns, risks), passing through the analysis of these variables using statistical methods followed by the methodology of scientific research as programs (Excel, Minitab) to end with the final result to the percentage of information through which the evaluation of the performance of investment funds sample the study.
To reach the excess returns, the return of the funds should be compared with the return of a reference or standard index by finding the difference between the return of the fund and the return of the reference index, so the Saudi General Index (TASI) was chosen as the closest to the funds sample as a reference indicator, where Table No. (2) shows the series of average monthly excess returns achieved for the sample funds during the time period during the research, where it shows that the average excess return of the Fund (MSCI Saudi ETF), which amounted to (3.118179) is the highest this is followed by the INMA Portfolio for local (Sukuk-ETF) with a value of (0.018916),

Table 2: description of the excess returns achieved for the funds

No.	Portfolios	Coode	RPt	RBt	$\overline{ER}t$	Level
1	Alinma Saudi Government Sukuk ETF Fund - Short Maturity	(9404)	0.001051	0.004355	0.018916	2
2	Alawwal Invest MSCI Tadawul 30 Saudi ETF	(9402)	0.005059	0.004355	3.118179	1
3	Albilad Gold ETF	(9405)	-0.00457	0.004355	-0.00893	7
4	Alkhabeer Diversified Income ETF	(4700)	0.007965	0.004355	0.003609	3
5	Falcom 30 Saudi Equity ETF	(9400)	-0.00607	0.004355	-0.01043	5
6	Falcom petrochemical ETF	(9401)	0.005409	0.004355	0.001054	4
7	Albilad Saudi Sovereign Sukuk ETF	(9403)	-0.0026	0.00435	-0.0069	6

Source: prepared by the researcher based on the statistical program SPSS.

(Alkhabeer Diversified ETF) with a value of (0.003609), petrochemical ETF) with a value of (0.001054), (Falcom 30 Saudi Equity ETF) with a value of (-0.01043), to occupy the last place in terms of returns (Albilad Gold ETF) with a value of (-0.00893), However, these results do not necessarily mean that funds that have not achieved excessive returns do not achieve returns completely, and does not mean that they do not perform well, because these results indicate the extent to which the fund's performance exceeds the performance of the benchmark index through the achieved return, and to reach the highest performing fund should take into account the size of the realized risk.

Table 3: Risk Analysis

No.	Portfolios	Coode	S. d.	Level
1	Alinma Saudi Government Sukuk ETF Fund - Short Maturity	(9404)	0.322879	2
2	Alawwal Invest MSCI Tadawul 30 Saudi ETF	(9402)	15.52947	1
3	Albilad Gold ETF	(9405)	0.047018	6
4	Alkhabeer Diversified Income ETF	(4700)	0.054724	4
5	Falcom 30 Saudi Equity ETF	(9400)	0.057934	3
6	Falcom petrochemical ETF	(9401)	0.020157	7
7	Albilad Saudi Sovereign Sukuk ETF	(9403)	0.04762	5

Source: prepared by the researcher based on the statistical program SPSS.

Table 3 shows that the highest risk fund is the HSBC (MSCI Tadawul 30 Saudi ETF) with a risk value of (15.52947) followed by the (Alinma Saudi Government Sukuk ETF), where its risk amounted to (0.322879), then the rest of the funds come successively, (Falcom 30 Saudi Equity ETF) with a risk value of (0.057934), (Alkhabeer Diversified Income ETF) with a risk value of (0.054724), (Albilad Saudi Sovereign Sukuk ETF) with a risk value of (0.04762), (Albilad Gold ETF) with a risk value of (0.047018) to come the (Falcom petrochemical ETF) ranked last with a risk value of (0.020157), which is the least risky fund, which does not mean that it is the highest performer if this risk is compared with the excess returns achieved.

Table 4: Comparing Excess Returns with Risks

No.	Portfolios	Coode	$. \overline{ER}$	Level
1	Alinma Saudi Government Sukuk ETF Fund - Short Maturity	(9404)	2	2
2	Alawwal Invest MSCI Tadawul 30 Saudi ETF	(9402)	1	1
3	Albilad Gold ETF	(9405)	7	6
4	Alkhabeer Diversified Income ETF	(4700)	3	4
5	Falcom 30 Saudi Equity ETF	(9400)	5	3
6	Falcom petrochemical ETF	(9401)	4	7
7	Albilad Saudi Sovereign Sukuk ETF	(9403)	6	5

Source: prepared by the researcher based on the statistical program SPSS.

Table No. (4) shows that the fund with the highest excess return rate is the same fund that bears the highest risk rate, which is the (Alawwal Invest MSCI Tadawul 30 Saudi ETF), followed by the (Alinma Saudi Government Sukuk ETF Fund - Short Maturity) fund, which is the same fund that bears second place in risk rate, while we note that (Alkhabeer Diversified Income ETF) achieves third place in return rate, achieving fourth place in risk rate, while (Falcom Petrochemical ETF) achieves fourth place in return rate, achieving seventh place in risk rate, followed by (Falcom 30 Saudi Equity ETF) in fifth place, but it occupies third place in risk rate, then (Albilad Saudi Sovereign Sukuk ETF) fund occupies sixth place in risk rate, and comes in seventh and last place in excess return rate (Albilad Gold ETF) which comes in sixth place in risk tolerance rate, through all of this we note that the fund that bears less risk does not necessarily achieve higher excess return rates, and this is what we see It is clear in the Albilad Gold (ETF), which came in sixth place in risk tolerance, but came in last place in achieving excess returns. However, these results cannot be used as evidence or relied upon to evaluate the performance of the funds, so we will move on to the following table for evaluating the performance of the funds through the information ratio.

Table 5: Evaluation of the performance of f Portfolios

No.	Name of the fund	Coode	RPt	RBt	$\overline{ER}t$	S. d.	IR	IR($\sqrt{12}$)	Level
1	Alinma Saudi Government Sukuk ETF Fund - Short Maturity	(9404)	0.0010	0.0043	0.0189	0.3228	0.0585	0.202	3
2	Alawwal Invest MSCI Tadawul 30 Saudi ETF	(9402)	0.0050	0.0043	3.1181	15.5294	0.2007	0.695	1
3	Albilad Gold ETF	(9405)	-0.0045	0.0043	-0.0089	0.04701	-0.1898	-0.657	7
4	Alkhabeer Diversified Income ETF	(4700)	0.0079	0.0043	0.0036	0.0547	0.0659	0.228	2
5	Falcom 30 Saudi Equity ETF	(9400)	-0.0060	0.0043	-0.0104	0.0579	-0.1799	-0.623	6
6	Falcom petrochemical ETF	(9401)	0.0054	0.0043	0.0010	0.0201	0.0523	0.181	4
7	Albilad Saudi Sovereign Sukuk ETF	(9403)	-0.0026	0.0043	-0.0069	0.0476	-0.1462	-0.506	5

Source: prepared by the researcher based on the statistical program SPSS.

Table No. (5) shows that the fund that achieves the highest information ratio (IR) is (Alawwal Invest MSCI Tadawul 30 Saudi ETF) which reached (0.695) to be the highest rated fund in performance compared to the rest of the other Portfolios funds in the research sample, which ranks first in achieving excess returns and first in bearing a higher risk rate, followed by (Alkhabeer Diversified Income ETF) with an information ratio of (0.228) to be the fund in second place in terms of performance evaluation, followed by (Alinma Saudi Government Sukuk ETF Fund - Short Maturity) with an information ratio of (0.202), Falcom Saudi Stock Exchange Traded Fund with an information ratio of (0.181), ((Falcom petrochemical ETF with an information ratio of (-0.506), (Albilad Saudi Sovereign Sukuk ETF) with an information ratio of (-0.623) and finally (Albilad Gold ETF) in seventh place The last one has an information ratio of (-0.657), making it the lowest rated fund in terms of performance.

Conclusions and recommendations: Conclusions

The results of the study showed that the rate of excess returns measures the extent of the fund manager's ability to generate returns in excess of the standard indicator, but it does not mean that the fund manager's performance is good without taking into account the risk rate.

It turned out that the information ratio measures the value of the excess returns on the benchmark achieved by the fund manager compared to the average risk he assumes.

The higher the excess rate of return achieved by the fund manager, the higher there is a chance that the performance will be high if it is matched with the risk rate, and this proves the hypothesis of the study, which calls for acceptance.

Negative values of the excess rate of returns lead to negative information ratios as well, which means that fund managers were unable to outperform the benchmark index and thus their performance is lower compared to their peers who achieve positive values.

Recommendations

Investors should take into account when evaluating their fund managers, the value of the excess rate of returns achieved by these funds because it indicates the superiority of the fund manager over the benchmark index by achieving returns.

When investors evaluate the performance of their fund managers, they should calculate the information ratio, because it is an important tool that measures the fund manager's superiority over the benchmark index compared to the losses he incurs.

He urged investment fund managers to work to outperform the benchmark index by achieving excess returns because it

is the main pillar of calculating the information ratio as an important tool for evaluating their performance.

The achievement of a higher rate of excess returns by fund managers should be aligned with the risk ratio to achieve high information ratios.

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