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FULL PAPER

Financial behavior within the framework of the international financial markets environment and its role in sustainable development

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Abstract:

The research sought to highlight the role played by financial behavioral tools, as well as models related to common stocks, in the process of making financing and investment decisions through common stocks and their impact on achieving sustainable development within the framework of the financial market environment and the related variables it reflects. It was possible to adopt common stock evaluation models and determine the values of these stocks. It was possible to evaluate these stocks by taking the shares of the international companies concerned with the research during the period (2013-2022), with ten companies operating in different fields and sectors. The analysis of the research variables was achieved through the portfolio method and by adopting advanced financial models, in addition to the use of accurate financial measures, most notably the Sharpe and Treynor indexes, extracting their real values, and determining the returns and risks of common stocks within the framework of the investment portfolio that contains the shares and bonds of various companies. The research reached a number of conclusions, the most important of which was the impact of financial behavior in achieving sustainable development through the financial market environment. In addition, the researcher recommends a number of appropriate recommendations related to the topic.

Keywords: Financial behavior, market environment, sustainable development.

Section One: Study Methodology

This section is devoted to presenting and discussing the research methodology through the following axes:

First: Research Problem

There are significant and continuous fluctuations in the financing behavior of stocks traded within the framework of the financial markets environment climate and the impacts it reflects on sustainable development. This is due to its being affected by the nature of political and economic conditions, in addition to the diversity of available information and its degree of transparency, which is reflected in the difficulty of making the optimal financing and investment decision by investors in these stocks, due to the difficulty of identifying the true fair value of these investments, and how to reduce risks, maximize returns, and avoid some of the inherent risks of investing in stocks.

Second: Research Objective:

This study attempts to reach a main objective represented by evaluating financing behavior within the international financial markets environment climate, and knowing its impact on the return and risks of the investment portfolio formed by investors, whether individuals or institutions, while determining its impact on sustainable development.

Third: The importance of the research

The importance of this study is highlighted by its close connection with the rapid developments in the financial market environment recently, in terms of transactions and financial operations related to investing in common stocks, identifying financial behavior and how to form investment portfolios from securities, in addition to being an attempt to understand the impact of these changes in a manner consistent with achieving sustainable development.

Fourth: Research hypothesis

There is a relationship between financial behavior and the climate of the financial markets environment and the variable of sustainable development for the companies included in the research.

Fifth: Research data

1-Theoretical aspect: Information was collected for the theoretical aspect by relying on a group of Arabic and foreign books in addition to university theses and dissertations, research, previous studies, and the Internet.

2-Practical aspect: The research relied on a group of financial and statistical models prepared for this purpose and mentioned in their place in analyzing the data of the shares of companies listed in international financial markets during the period 2013-2023.

Sixth: Temporal and spatial limits of the research

The limits of the research were as follows:

•Temporal limits: monthly data of the companies included in the research during the period from (2013-2022)

•Spatial limits: The spatial limits of the research were represented by ten companies listed in international financial markets.

Seventh: Research community and sample

The research community is the companies listed in international financial markets, and ten companies were selected during the period from (2013-2022) according to published data. Table (1) shows information about the companies that represented the research sample.

Table (1) Data of the companies included in the research

nature of work	Company names	ت
Communications	**AT&T**	-1
Digital	**GOOGLE**	-2
Industrial	**APPLE**	-3
Industrial	**TESLA**	-4
Industrial	**BMW**	-5
Banking	**CISCO**	-6
Industrial	**JPMORGAN**	-7
Industrial	**BOEING**	-8
Tourism and Entertainment	**DISNEY**	-9
Industrial	**DAIMLER AG**	-10

Source: Prepared by the researcher based on data from the companies included in the research.

The second section: The theoretical framework of the research

1.Financial behavior of stocks:

The concept of fair value is one of the main concepts in accounting and finance and aims to evaluate assets at a value that reflects the true value of the asset. However, different interpretations and translations have led to some issues related to perceptions of true value (Grabler & Floberg, 2016: 13). The concept of fair value has developed for more than a century and this stage indicates the use of many concepts to measure the fair value currently used (Zyla, 2015: 9). The Financial Accounting Standards Board (FASB) indicated the objective of determining the basis for measuring the fair value, which is to determine or estimate the exchange price of the assets or liabilities that are measured in the absence of an actual transaction for that asset or liability (Landsman, 2006: 2)

Interest in the concept of fair value has increased in order to reach a fair and equitable basis for measurement, but achieving this was not easy because fair value accounting was not included as a basis for measurement in the conceptual framework for financial statements issued by both the International Accounting Standards Board and the conceptual framework for financial accounting issued by the American Accounting Standards Board (Jaarat et al, 2016: 157). Fair value has been defined by the International Accounting Standards Board as the amount for which an asset could be exchanged, or a

liability settled, between two knowledgeable and willing parties in an arm's length transaction, or in balance or under normal circumstances between two independent parties (Marra, 2016: 585). It has also been defined as an estimated amount, as the asset can be exchanged in the valuation between the seller and the buyer who are willing to conclude the transaction, and in a neutral market where each has sufficient information and has complete freedom and without coercion to complete the transaction (Hamad, 2003: 11). In the framework of the International Financial Reporting Standards (IFRS), fair value is defined as the amount for which an asset could be exchanged or a liability settled between two independent and knowledgeable parties under the exchange process and who are willing to transact) (IASB, 2008: 1945). As for the definition of fair value according to the International Financial Reporting Standard (IFRS13), it is defined as the price delivered to sell an asset or paid to transfer a liability in a transaction in circumstances Fair value is the value of an asset or liability that can be bought, carried, sold, or settled in a current transaction between two willing parties other than a forced sale or liquidation (Shaheen, 2013: 227). Fair value is also defined as the current value at which an asset is bought or sold or an obligation is equal to an obligation in a market that enjoys normal conditions of supply and demand (market equilibrium) and the availability of appropriate information to evaluate the asset or liability (market efficiency) for all parties dealing in the market, in addition to the availability of evidence indicating the buyer's intention to buy. The seller's intention to complete the sale, which is the value of the assets in an efficient market. (Mohammed, 2008, 181).

2.Financial market environment climate and policies

The portfolio manager or investor sets investment policies that are most appropriate for managing the investment portfolio, because investors differ in their policies and goals, as some of them face risks in order to obtain quick profit, others aim for security and stability and are satisfied with obtaining an acceptable profit with a margin of safety, and others want to balance between risk and safety in their investments.

The policies followed in managing the investment portfolio and the financial market environment climate can be explained as follows: (Al-Hasnawi, 2018: 204)

Offensive policy

In this policy, the investor's goal is speculation, i.e. achieving maximum returns, so he prefers the element of profitability over safety, and investors' interest is in the profits resulting from price fluctuations in securities. Usually, this type of investment portfolio is called the capital portfolio, and stocks are among the most used financial instruments in this type of portfolio, as their percentage ranges from 90-80% of the value of the investment portfolio (Abdul Qader, 2010: 227). The common model in this policy is the capital and growth portfolio, and sometimes shares of companies that are at the beginning of their growth are purchased with the aim of reaping capital gains in the future, and this policy is successful during a period of economic prosperity (Hardan, 1997: 81).

Defensive policy:

The investor uses this policy when he wants to obtain a fixed and continuous income, and the investor is conservative towards risks, as the defensive method is concerned with the element of security through investing in safe financial instruments such as long-term bonds, real estate and preferred stocks that achieve a fixed and continuous income (Jamil, 2015: 279), and defensive investment tools constitute 60-80% of the portfolio capital and consist of preferred stocks, bonds and treasury bills, and this type of portfolio appears in the event of an economic recession (Al-Baroudi, 2015: 329).

Balanced policy:

This policy is used by most investors, and in it, the relative balance in the portfolio is taken into account, and through this portfolio, reasonable returns and an acceptable level of risk can be achieved, and the investor distributes the capital invested in the portfolio between investment tools that achieve a fixed income and tools that achieve capital gains (Kamal 2004: 40) This policy combines two types of the previous policies (offensive - defensive) and is the middle solution between them and is represented by balanced investment tools, short-term and highly liquid assets such as treasury bills and long-term assets such as real estate, bonds, common and preferred stocks (Alwan, 2009: 199)

3.Sustainable development

During the decade of 2000 AD, according to which (189) countries were committed to creating a favorable environment in order to address poverty cases and then eliminate it at the local and global levels, and then strive to achieve their specific goals for the year 2015 AD, including the following:

1.Eradicating extreme poverty and hunger

This goal is achieved by half between the years (1990 and 2015), and in this regard, the percentage of people whose income is less than one dollar per day was counted, and it was verified that these productive workers obtain decent work, including women and youth.

2.Achieve universal primary education

Provide a general guarantee (2015) that children everywhere, boys and girls alike, will be able to complete a full course of primary education.

3.Promote gender equality and empower women

Strive to eliminate gender inequality in primary and secondary education by 2005, and at all levels of education by the end of 2015.

4 Reduce child mortality

Work to reduce under-five mortality by two-thirds between 1990 and 2015.

.5Improve maternal health

Reduce maternal mortality by (0.75) between 1990 and 2015.

6.Combating HIV/AIDS

Within this measure, it was decided that by the year (2010), universal access to effective treatment for HIV/AIDS should be available to all who need it. In the year (2015), the incidence of malaria and other serious diseases began to decrease.

7.Ensuring environmental conservation

Integrating the principles of sustainable development into national policies and programs and reducing the loss of environmental resources to significantly reduce and slow the loss of biodiversity in 2010, as well as reducing the proportion of people deprived of drinking water and basic sanitation services by half by the year (2015), and in the year (2020), the lives of at least (100) million slum dwellers improved.

8. Strengthening the global partnership for human development

In order to continue developing an open, predictable and non-discriminatory trading and financial system based on certain criteria, to meet the special needs of the least developed countries and to meet the special needs of landlocked developing countries and small island developing countries through the Programme of Action for the Sustainable Development of Small Island Developing Countries, and to address the debt problems of developing countries And a comprehensive treatment by taking national and international

measures to make debt sustainable in the long term, And providing access to essential medicines in developing countries at affordable prices, in cooperation with pharmaceutical companies and granting access to the benefits of new technologies, especially those related to information and communications, in cooperation with the private sector.

Section Three: The analytical framework of the research

1-Building an optimal portfolio at the level of the total companies

Within the ((Simple Ranking) model, short selling remains prohibited: The (Treynor) ratio is calculated for the shares of the research sample companies in Table (2) and then arranged from top to bottom according to the desirability of the shares, i.e. the desirability of each share for inclusion in the portfolio. We note after extracting the Treynor ratio and arranging the shares entered from top to bottom, it becomes clear that the highest value of the Treynor ratio was for DAIMLER AG, as it reached (0.438), which indicates that this company is the most attractive among the research sample shares for inclusion in the optimal portfolio. As for the lowest value of the Treynor ratio, it reached (-1.8) for BMW, meaning that this company is the least attractive for inclusion in the optimal portfolio. As for the rest of the researched companies, they fall between these two companies.

The optimal portfolio of common stocks was built based on the results of the statistical analysis in the previous table, by using the (Simple Ranking) model to extract the optimal weights for the optimal portfolio through the market index model according to the steps The following:

Step one: In this step, the stocks are arranged from top to bottom according to the Treynor index β/(Ri-RF) and for each stock in the research sample as in column (1).

Step two: Extract the total for the Treynor index cumulatively β/(Ri-RF. ∑(

Step three: Place the results of the second step in column (2).
Step four: Calculate the formula (B2/62ei) for each stock as shown in column (3)
Step five: The values of column (3) were collected cumulatively and the results were placed in column (4).
Step six: This step was concerned with calculating the cut-off limit ((Cut off-Rate), as shown in the following equation:

$$Ci = \frac{\sigma 2m \sum_{j}^{i} = 1 \ \frac{(R_j - R_f)\beta_i}{\sigma_{ei}^2}}{1 + \sigma 2m \sum_{j}^{i} = \frac{\beta_i^2}{\sigma_{ei}^2}} \qquad \ldots\ldots (1)$$

In this regard, the results were placed in column (5) and the aim behind this is to compare the column values shown in column with column (1) and if the results in the cut-off limit (Ci) in column (6) for a particular stock are less than the values in column (1), then this stock will be included in the portfolio components, and we note from the table that the value of (Ci) for the first four companies was less than the Treynor index, which means that they joined the portfolio, unlike the rest of the other companies that achieved negative Treynor values, which means that they were excluded from the portfolio. Step Seven: Within this step, the optimal cut-off limit *C is located in column (7) in front of the last stock included in the optimal portfolio, and through the optimal cut-off limit, the value of (Z) was calculated through the equation:

$$Zi = \frac{\beta i}{\sigma_{ei}^2}\left(\frac{Ri - Rf}{\beta i}\right)\text{-C} \quad \ldots\ldots\ldots (2)$$

Step Eight: According to this step, the optimal weight for each stock in the optimal portfolio is calculated by collecting the (Z) values for the nominated stocks first, then finding the optimal investment ratios for each stock by dividing the (Z) values for each stock by the sum of the (Z) values.

Based on what was mentioned, the optimal portfolio consists of a group of stocks from the first four companies, unlike the remaining companies.

It is clear from Table (2) that the investor must allocate the largest percentage of the investment amount in the shares of the company DAIMLER AG, which is (36%), and allocate a percentage of (17) to the company DISNEY, and so on for the rest of the other companies.

According to the above, the relative weights of the stocks in the optimal portfolio vary in the percentages allocated for investment in them, meaning that the investor who wants to build the optimal portfolio, during the research period, must allocate (36%) of his money in the (DAIMLER) stock and distribute the remaining investment amount among the shares of the remaining companies in the portfolio.

Table (2): The optimal total investment portfolio in light of allowing short selling

Wi	Zi	β/σ2ei	(R – Rf)β – C*	C*	CI	∑β2 /σ2ei	β2/σ2ei	∑(Ri – Rf)/ β/σ2ei)	(Ri – Rf)/ β/σ2ei)	∑(Ri – Rf)/β	(R – Rf)/β	Companies
0.9	2.9	98.4	0.03	-0.0009	0.003	50	50	1.4	1.4	0.007	0.438	DAIMLER AG
0.04	1.37	58.4	0.03	-0.0009	0.001	78.8	29.2	2.05	0.65	0.005	0.107	DISNEY
0.03	1.06	54.9	0.02	-0.0009	0.0008	100.2	21.4	2.4	0.003	0.003	0.1	BOEING
0.01	0.4	23.4	0.02	-0.0009	0.0003	109.7	9.49	2.58	0. 13	0.002	0.005	TESLA
0.04	1.3	89.7	0.014	-0.0009	0.002	191.9	82.1	3.7	1.09	0.01-	(-0.041)	AT&T
0.01	0.34	35.8	0.0009	-0.0009	0.0007	231	36.1	0.31	0.0009	0.0009-	(-0.1)	GOOGLE
0.04	1. 1	185.3	0.006	-0.0009	0.002	512	284	5.5	1. 5	0.01-	(-0.1)	APPLE
0.02	0.60	107	0.006	-0.0009	0.0005	559	46.5	5.7	0.22	0.0009-	(-0.162)	CISCO
0.02	0.07	71.02	0.0009	-0.0009	5.08	744	104	5.84	0.14	0.002-	(-0.2)	JPMORGAN
-0.003	-109	201	-0.0006	-0.0009	-0.0009	1116	372	5.03	-0.06	0.005-	(-1.8)	BMW

Source: Prepared by the researcher based on data from the companies included in the research.

2- Building the optimal portfolio according to the (Simple Ranking model in light of allowing short selling)

According to Linter's definition, global financial markets allow short selling, which is useful for the purpose of showing the differences between the returns and risks of the optimal portfolio in light of allowing and not allowing short selling. When building the optimal portfolio in light of short selling, the investor enters negative weights into the portfolio (short position) and raises positive weights (long position) to more than (100%) so that the weight of the portfolio is equal to one, by selling stocks that are expected to perform poorly (short selling), and then investing the proceeds of the short sale in purchasing stocks with a high expected return.

In this regard, the optimal portfolio was built using the common stocks of the research sample companies based on the results of the statistical analysis in Table (3), and by using the (Simple Ranking) model and in light of allowing short selling to extract the optimal weights for the optimal portfolio through the market index model.

The special procedures used to calculate the optimal portfolio, especially when short selling is allowed, are closely related to the procedures in the event that short selling is not allowed. The Treynor (Ri-RF/B) is calculated exactly as in the previous case. The cutoff rate for stocks *C has a different meaning and a different calculation procedure. When short selling is allowed, all stocks are either held long or sold short or both and then all stocks enter the optimal portfolio, and all stocks affect the cutoff rate according to the equation:

$$Ci = \frac{\sigma 2m \sum_{j}^{i} = 1 \ \frac{(R_j - R_f)\beta_i}{\sigma_{ei}^2}}{1 + \sigma 2m \sum_{j}^{i} = \frac{\beta_i^2}{\sigma_{ei}^2}} \quad \ldots\ldots\ldots (3)$$

This equation represents the cutoff rate, but now the numerator and denominator of this equation are added to all stocks. Because of the new cutoff rate *c, zi changes and must be calculated again for all stocks. A positive value indicates that the stock will be held for a long period, i.e. a long-term position, and a negative value indicates that it will be sold short. Thus, the effect of *c changes, and stocks with a Ternier ratio higher than *c are held, but stocks with a Ternier ratio lower than *c are now sold short (Elton, et al., 2014:185-186). The next stage, especially after arranging the stocks according to the Ternier ratio in descending order, is to calculate (ci) for all stocks of the research sample companies, and then we extract the optimal cutoff rate of (-0.0009), through which this stage is completed by determining the weights of the optimal portfolio combination while allowing short selling, as shown in Table (3).

The final stage of building the optimal investment portfolio in the absence of allowing short selling is determining and calculating the weights of the shares of the optimal portfolio of the research sample companies, through which the relative weight of the shares is extracted, and in the light of the aforementioned definition of Linter.

From Table (3) and according to Linter's definition, the investor must take a long-term position (buy) four shares of the research sample companies that have a positive value for Zi and take a short-term position, i.e. short sale of six shares of the research sample companies that have a negative value. The weights of

the shares of the companies included in building the optimal portfolio in the absence of allowing short selling are shown in Table (3).

According to this definition, short selling is a use of funds for the investor, but the investor receives a risk-free rate on the funds invested in short selling, which translates into the following restriction:

$$\Sigma|Xi|=1$$

The appropriate method for determining proportions is the following:

$$Xi= Zi\div\Sigma|zi|$$

According to the results that the research was able to reach, it leads to accepting the first main hypothesis, which is that it is possible to build an optimal investment portfolio using the Trenor model, which is based on the single-index market model, while short selling is not allowed. The second main hypothesis was rejected, which is that it is possible to build an optimal investment portfolio using the Sharpe model, which is based on the single-index market model, while short selling is allowed. The third main hypothesis was also rejected, which is that the optimal portfolio, while short selling is allowed, outperforms its counterparts in the optimal portfolio, while short selling is not allowed, and the market portfolio.

Table (3): The optimal investment portfolio in light of allowing and not allowing short selling

olio when short sel allowed	io when short selli allowed	Market portfolio	Financial indicators
0.03	0.02	0.006 –	RP
0.021	0.003	0.035	RF
0.03	0.002	0.004	Systematic risk
0.04	0.005	0.001	unsystematic risk
0.02	0.004	0.005	Total risk
0.08	0.09	0.05	$\sigma 2$
0.019	0.012	0.765	

Source: Prepared by the researcher based on the financial indicators in the previous tables.

Fourth: Building an optimal portfolio at the level of the total companies

Within the (Simple Ranking) model, short selling remains not allowed: In addition to calculating the Treynor ratio for the shares of the research sample companies in Table (4) and then arranging them from top to bottom according to the desirability of the shares, i.e. the desirability of each share for inclusion in the portfolio. We note after extracting the Treynor ratio and arranging the shares included from top to bottom, it becomes clear that the highest value of the Treynor ratio was for DAIMLER AG, as it reached (0.438), which indicates that this company is the most attractive among the research sample shares for inclusion in the optimal portfolio. As for the lowest value of the Treynor ratio, it reached (-1.8) for BMW,

meaning that this company is the least attractive for inclusion in the optimal portfolio. As for the rest of the researched companies, they fall between these two companies. The optimal portfolio of common stocks was built based on the results of the statistical analysis in the previous table, and by using the (Simple Ranking) model to extract the optimal weights for the optimal portfolio through the market index model and according to the following steps:

Step one: Arrange the stocks from top to bottom using the Treynor index β/(Ri-RF) and for each stock in the research sample as in column (1)

Step two: Extract the total for the Treynor index cumulatively β/(Ri-RF.∑(

Step three: Place the results of the second step in column (2)

Step four: Calculate the formula (B2/62ei) for each stock as shown in column (3)

Step five: In this step, the values of column (3) were collected cumulatively and the results were placed in column (4.(

Step six: This step was concerned with calculating the cut-off limit (Cut off-Rate, as shown in the following equation:

$$Ci = \frac{\sigma 2m \sum_{j}^{i} = 1 \ \frac{(R_j - R_f)\beta_i}{\sigma_{ei}^2}}{1 + \sigma 2m \sum_{j}^{i} = \frac{\beta_i^2}{\sigma_{ei}^2}} \quad \ldots\ldots\ldots (4)$$

In column (5), the results were placed, and the purpose of this is to compare the column values shown in the column with column (1). If the results in the cut-off limit (Ci) in column (6) for a particular stock are less than the values in column (1), then this stock will be included in the portfolio components. We note from the table that the value of (Ci) for the first four companies was less than the Treynor index, which means that they joined the portfolio, unlike the rest of the other companies that achieved negative Treynor values, which means that they were excluded from the portfolio. Step Seven: The optimal cut-off limit *C is located in column (7) in front of the last stock included in the optimal portfolio, and through the optimal cut-off limit, the value of (Z) was calculated through the equation:

$$Zi = \frac{\beta i}{\sigma_{ei}^2}\left(\frac{Ri - Rf}{\beta i}\right)\text{-C} \quad \ldots.. (5)$$

Step Eight: In this step, the optimal weight for each stock included in the optimal portfolio composition was calculated by first collecting the (Z) values for the nominated stocks, then finding the optimal investment ratios for each stock by dividing the (Z) values for each stock by the sum of the (Z) values.

Based on what was mentioned, the optimal portfolio consists of the stocks of the first four companies, unlike the remaining companies.

It is clear from Table (4) that the investor should allocate the largest percentage of the investment amount in the shares of the company DAIMLER AG)) and a percentage of (36%) and allocate a percentage of (17) to the company (DISNEY) and so on for the rest of the other companies.

According to the above, the relative weights of the stocks included in building the optimal portfolio vary in the percentages allocated for investment in them, meaning that the investor wishing to build the optimal portfolio during the research period should allocate a percentage of (36%) of his money in the (DAIMLER) stock and distribute the remaining investment amount among the shares of the remaining companies included in the portfolio .

Table (4): The optimal total investment portfolio in light of allowing short selling

Wi	Zi	β/σ2ei	(R – Rf)β – C*	C*	CI	∑β2 /σ2ei	β2/σ2ei	∑(Ri – Rf)/ β/σ2ei)	(Ri – Rf)/ β/σ2ei)	∑(Ri – Rf)/β	(R – Rf)/β	الشركات
0.9	2.9	98.4	0.03	-0.0009	0.003	50	50	1.4	1.4	0.007	0.438	DAIMLER AG
0.04	1.37	58.4	0.03	-0.0009	0.001	78.8	29.2	2.05	0.65	0.005	0.107	DISNEY
0.03	1.06	54.9	0.02	-0.0009	0.0008	100.2	21.4	2.4	0.003	0.003	0.1	BOEING
0.01	0.4	23.4	0.02	-0.0009	0.0003	109.7	9.49	2.58	0. 13	0.002	0.005	TESLA
0.04	1.3	89.7	0.014	-0.0009	0.002	191.9	82.1	3.7	1.09	0.01-	(-0.041)	AT&T
0.01	0.34	35.8	0.0009	-0.0009	0.0007	231	36.1	0.31	0.0009	0.0009-	(-0.1)	GOOGLE
0.04	1. 1	185.3	0.006	-0.0009	0.002	512	284	5.5	1. 5	0.01-	(-0.1)	APPLE
0.02	0.60	107	0.006	-0.0009	0.0005	559	46.5	5.7	0.22	0.0009-	(-0.162)	CISCO
0.02	0.07	71.02	0.0009	-0.0009	5.08	744	104	5.84	0.14	0.002-	(-0.2)	JPMORGAN
-0.003	-109	201	-0.0006	-0.0009	-0.0009	1116	372	5.03	-0.06	0.005-	(-1.8)	BMW

Source: Prepared by the researcher based on data from the companies included in the research.

Fifth: An optimal portfolio is built according to the ((Simple Ranking model in light of allowing short selling

According to Linter's definition, global financial markets allow short selling, which explains the differences between the returns and risks of the optimal portfolio in light of allowing and not allowing short selling. When building the optimal portfolio in light of short selling, the investor introduces negative weights to the portfolio (short position) and raises positive weights (long position) to more than (100%) so that the weight of the portfolio is equal to one, by selling stocks that are expected to perform poorly (short selling), and then investing the proceeds of the short sale in purchasing stocks with a high expected return.

The optimal portfolio was built from the common shares of the companies (research sample), based on the results of the statistical analysis in Table (5), and using the ((Simple Ranking model in light of allowing short selling to extract the optimal weights for the optimal portfolio through the market index model.

The procedures used to calculate the optimal portfolio, especially when short selling is allowed, are closely related to the procedures in the event that short selling is not allowed. The Treynor (Ri-RF/B) is calculated exactly as in the previous case. The cutoff rate for stocks *C has a different meaning as well as a different calculation procedure. When short selling is allowed, all stocks will be either held long or sold short or both and then all stocks will be included in the optimal portfolio. What can be said is that all stocks affect the cutoff rate according to equation (6):

$$Ci = \frac{\sigma 2m \sum_{j}^{i} = 1 \ \frac{(R_j - R_f)\beta_i}{\sigma_{ei}^2}}{1 + \sigma 2m \sum_{j}^{i} = \frac{\beta_i^2}{\sigma_{ei}^2}} \quad \ldots\ldots\ldots\ldots (6)$$

The above equation represents the cutoff rate, the numerator and denominator of this equation are now added over all stocks. Because of the new cutoff rate *c, (zi) changes and must be calculated for all stocks, a positive value indicates that the stock will be held for a long period i.e. a long position, a negative value indicates that it will be sold short. Thus, the effect of (*(c) changes, and the stocks with a Turnier ratio higher than *c are kept, and now the stocks with a Turnier ratio lower than (*(c) are sold short (Elton, et al. 2014:185-186).

The next stage after arranging the stocks according to the Turnier ratio in descending order is to calculate (ci) and includes all the stocks of the sample companies, and then we extract the optimal cutoff rate of (-0.0009), through which this stage is completed by determining the weights of the optimal portfolio combination in light of allowing short selling as in Table (5).

The final stage for building the optimal investment portfolio in light of not allowing short selling is determining and calculating the weights of the stocks of the optimal portfolio of the sample companies, through which the relative weight of the stocks is extracted, and in light of the aforementioned definition of Linter.

From Table (5) according to the definition of (Linter), the investor must take a long-term position (buy) four shares of the sample companies that have a positive value for (Zi) and take a short-term position, i.e. short selling six shares of The stocks of the research sample companies that have a negative value, and the

weights of the stocks of the companies included in the construction of the optimal portfolio in light of allowing short selling as shown in Table (5). According to this definition, short selling is a use of funds for the investor, but the investor receives a risk-free rate on the funds employed in short selling, which is translated into the following restriction:

$$\Sigma|Xi|=1$$

The appropriate method for determining proportions is as follows:

$$Xi=Zi\div\Sigma|zi|$$

According to the results that the research was able to reach, it leads to accepting the content of the first main hypothesis, which states that it is possible to build an optimal investment portfolio using the Trenor model, which is based on the single-index market, while short selling is not allowed. The second main hypothesis, which is that it is possible to build an optimal investment portfolio using the Sharpe model, which is based on the single-index market model, while short selling is allowed, is rejected, as well as the third main hypothesis, which is that the optimal portfolio, while short selling is allowed, outperforms its counterparts in the optimal portfolio, while short selling is not allowed, and the market portfolio.

Table (5): The optimal investment portfolio in light of allowing and not allowing short selling

olio when short sell allowed	o when short selli allowed	Market portfolio	Financial indicators
0.03	0.02	0.006 –	RP
0.021	0.003	0.035	RF
0.03	0.002	0.004	Systematic risk
0.04	0.005	0.001	unsystematic risk
0.02	0.004	0.005	Total risk
0.08	0.09	0.05	$\sigma 2$
0.019	0.012	0.765	Sharpe

Source: Prepared by the researcher based on the financial indicators in the previous tables.

Section Four: Conclusions and Recommendations

This section deals with a presentation of the most important conclusions reached by the research in light of theoretical discussions and applied analyses, according to which appropriate recommendations were determined according to the following:

1. The financial behavior of the companies studied tended towards a risky policy by acquiring shares that are unstable in their prices and are volatile.

2. The climate of the international financial markets environment was more attractive to investors, speculators and hedgers due to the financial benefits they obtain from these markets that are characterized by a moderate environmental climate.

3. The formation of an efficient investment portfolio that maximizes the return as much as possible with the least possible risk, it is possible to choose companies that have the highest rate of return per share with the least total risk, which are represented by the companies TESLA, BOEING, DISNEY, DAIMLER AG.

4. The highest average share price was in BOEING with an average price of $206.61, followed by DISNEY with an average of $112.91, then JPMORGAN with an average of $97.53, then DAIMLER AG with an average share price of $83.34, then TESLA with an average share price of $74.57, then AT&T with an average share price of $72.62, and CISCO with the lowest average share price of $38.06. 5. The results showed that the real value in AT&T, TESLA, and BOEING companies was higher than the market value, which indicates that the value stocks are less than the fair (real) value, i.e. undervalued. The remaining global companies' shares have been valued higher than they should be, meaning that their prices in the stock market are higher than their fair or real prices, and hence these companies seek to achieve sustainable development.

From the practical aspect of the study and the conclusions reached, the research and scientific necessity requires that these conclusions be completed with a set of recommendations that can be summarized as follows:

1. It is necessary for investment operations to be directed towards the shares of companies whose real values exceed their market values, because buying them will achieve capital gains whose value is determined by this difference between the two values.

2. It is necessary for investors when the real prices of shares fall below their market prices for these shares to sell and dispose of them because they are subject to a decline to reach their fair or real values and thus expose investors to capital losses.

3. It is better for the companies included in the study to immediately disclose to investors their financial statements and any decisions taken by their boards of directors, including positive and negative decisions.

4. The necessity of maintaining market stability through a price ceiling policy that prevents prices from fluctuating by a predetermined percentage from their previous price to avoid the so-called market bubble that can cause financial crises due to rumours and false information, in addition to providing some protection for investors and speculators.

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