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The Role of Predictive Analytics in Knowing the Future Prices of Listed Stocks in The Market

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Abstract: This study aimed to identify the role of predictive analytics in knowing future stock prices listed in the market, where the researcher used the descriptive analytical method, and the study sample amounted to (13) of industrial companies listed on the stock exchange.

The study came out with results

1. The financial ratios derived from the income and financial position statements play an effective role in distinguishing between successful companies and failed companies.
2. The proposed model based on the financial ratios derived from the income and financial position statements was able to reclassify the sample of companies used in its design within the groups (successful companies) and (failed companies).
3. The proposed model based on the financial ratios derived from the income and position statements was able to predict financial failure in the sample of companies used in testing it within the groups (successful companies) and (failed companies).
4. With regard to the relationship between the dependent variable and the independent variable, there is a statistically significant effect on the dependent variable. In other words, an increase in the debt ratio leads to an increase in the value of the company.
5. With regard to the relationship between the dependent variable and the independent variable, the policy of distributions has indicated that there is no statistically significant effect on the dependent variable.

1. Activating the use of debt by companies that use a low debt ratio through profitability, as the more profitable companies can use more debt and thus reduce the risk of debt.
2. The impact on the distributions policy so that it is related to the degree of greater benefit from the funds between distribution and retention, as the higher dividends on the returns of alternative investment opportunities than investing in companies leads to an increase in the value of the company.
3. Increasing profitability rates by increasing efficiency by reducing costs and increasing sales, which is reflected in the value of the company.
4. Companies focus on maintaining a variable level of liquidity that suits
5. The company's need from time to time, while maintaining the minimum level all the time, in order to protect the company from potential risks and thus increase the value of the company.

Keywords: Predictive Analytics - Future Stock Prices - Listed Companies.

دور التحليلات التنبؤية في معرفة أسعار الأسهم المستقبلية المدرجة في السوق

ريم محمد العنزي

كلية الإدارة || جامعة تبوك || المملكة العربية السعودية

المستخلص: هدفت الدراسة للتعرف على دور التحليلات التنبؤية في معرفة أسعار الأسهم المستقبلية المدرجة في السوق، حيث استخدم الباحث المنهج الوصفي، وبلغت عينة الدراسة (13) شركة صناعية مدرجة في البورصة. وتوصلت الدراسة إلى العديد من النتائج أبرزها:

1. تلعب النسب المالية المستمدة من قوائم الدخل والمركز المالي دوراً فعالاً في التمييز بين الشركات الناجحة والشركات الفاشلة.

2.استطاع النموذج المقترح القائم على النسب المالية المستمدة من بيانات الدخل والمركز المالي من إعادة تصنيف عينة الشركات المستخدمة في تصميمه ضمن المجموعات (الشركات الناجحة) و (الشركات الفاشلة).

3.استطاع النموذج المقترح القائم على النسب المالية المستمدة من بيانات الدخل والمركز التنبؤ بالفشل المالي في عينة الشركات المستخدمة في اختباره ضمن المجموعات (الشركات الناجحة) و (الشركات الفاشلة).

4.يوجد تأثير ذو دلالة إحصائية على المتغير التابع. بمعنى آخر، تؤدي الزيادة في نسبة الدين إلى زيادة قيمة الشركة.

5.فيما يتعلق بالعلاقة بين المتغير التابع والمتغير المستقل، أشارت سياسة التوزيعات إلى عدم وجود تأثير ذي دلالة إحصائية على المتغير التابع .

وتوصي الدراسة بما يلي:

1. تفعيل استخدام الدين لدى الشركات التي تستخدم نسبة دين منخفضة وذلك من خلال الربحية حيث إن الشركات الأكثر ربحية تستطيع استخدام أكثر للدين ومن ثم تقليل مخاطر الدين.

2. التأثير على سياسة التوزيعات بحيث ترتبط بدرجة الاستفادة الأكبر من الأموال بين التوزيع والاحتجاز حيث إن ارتفاع التوزيعات عن عوائد الفرص الاستثمارية البديلة عن الاستثمار في الشركات يؤدي إلى زيادة قيمة الشركة.

3. زيادة معدلات الربحية وذلك من خلال زيادة الكفاءة بتخفيض التكاليف وزيادة المبيعات التي تنعكس على قيمة الشركة.

4. تركيز الشركات على الحفاظ على مستوى متغير من السيولة والذي يلائم

5. حاجة الشركة من فترة لأخرى مع الاحتفاظ بالحد الأدنى طوال الوقت حتى تقي الشركة من المخاطر المحتملة وبالتالي تزيد من قيمة الشركة.

الكلمات المفتاحية: التحليلات التنبؤية- أسعار الأسهم المستقبلية- الشركات المدرجة في السوق.

Introduction.

The development that the banking industry has known in various fields, especially through the use of advanced automated media, has led to an increase and diversification of the services it provides. A dynamic environment and controlling all these variables are difficult, if not impossible.

The emergence of the financial crises that the global financial markets were exposed to and the financial and accounting failures of (Enron) energy company in 2001 and wordcom company) in 2002 in the United States of America had a great impact on the great interest in predictive analytics, especially in light of fluctuation in global stock prices from all sides In the presence of a continuously renewable and unstable environment characterized by rapid development and the presence of changes, economic institutions have become one of the most vulnerable to failure and bankruptcy, and for the purpose of protecting them from bankruptcy and future failure, interest has emerged in formulating future predictive analyzes based on financial accounting ratios in building models to predict the failure of these institutions.

The main feature that governs the activity of banks is how to predict risks, not avoid them, and here comes the role of predictive analytics in knowing, measuring and disclosing future stock prices in a way that enables users of financial statements to judge the extent of the bank's ability to predict and

control risks, and then enable these users to Making investment decisions and other decisions related to their dealings with the bank, so this study came to confirm what previous studies in this field had said.

Problem of the study:

The problem of the study lies in clarifying the ability of the public shareholding companies listed in the Palestine Financial Market to predict knowing the future prices of the shares listed in the market.

The problem of the study is manifested in arriving at the following main question:

What is the role of predictive analytics in knowing the future prices of listed stocks in the market?

The following sub-questions emerge from the main question:

1- How does predictive analytics contribute to knowing the future prices of listed stocks in the market?
2- What are the components of the process of forecasting the future prices of shares listed in the market?
3- What are the determinants of predictive analytics in determining the future prices of listed shares in the market?
4- What are the most important predictive analytical models used to predict the future prices of listed shares in the market?

Objectives of the study.

The study aims to:

1- Highlighting the role of predictive analytics in knowing the future prices of shares listed in the market.
2- Identify the elements of the process of forecasting the future prices of shares listed in the market.
3- Revealing the determinants of predictive analyzes in the field of determining the prices of future shares listed in the market.
4- Clarify the most important predictive analytical models used to predict the future prices of shares listed in the market.

The importance of studying.

The importance of the study stems from the fact that it contributes to evaluating a future vision about the prices of shares listed in the market, as well as reducing the risks of bankruptcy and financial default for institutions, and directing them in the future, in addition to the role it plays in facilitating ways to make decisions and predictions related to the ability to continue in the business arena, and thus Reducing the breadth of loss-making institutions.

Hypotheses Study:

1- There is a role for predictive analytics in knowing the future prices of listed stocks in the market.
2- There is a role for the components of the process of forecasting the future prices of shares listed in the market.
3- There is a relationship between predictive analytics and determining the future prices of listed shares in the market.

Approach Study:

The study used the descriptive approach and the analytical approach, which depend on analyzing and adapting data to serve the study, and the study used modern Arab and foreign sources and references, as well as published and unpublished reports, and modern Internet websites.

community study:

The study population consists of all 49 companies listed in the Palestine Financial Market.

Sample of the study:

For the purposes of conducting the study, a sample of industrial companies listed in the Palestine Financial Market between 2010-2020 was selected according to a set of conditions, including:

1- The date of incorporation and listing prior to the study period.
2- Trading of its shares in the financial market during the study period.
3- She did not have a merger or split during the study period.
4- Have financial data available throughout the study period.

For the purposes of conducting this study, a sample of 13 industrial companies was selected, representing 26.5% of the total companies listed in the Palestine Financial Market. Its consolidated financial data (Panel Data), which contains sectorial data and time series, was used.

Previous studies:

1- **Dongsae Cho (1988) study**; This study aimed to test the possibility of the impact of the company's risk management decisions on the company's value using the Gordon infinite growth model, assuming that the expected returns and expected losses grow at a constant rate and that the cash flows from the various risk management tools are measured assuming that the insurance premium is fair, and that The loss function is controlled and the cost of capital is evaluated after taking into account the fluctuations of cash flows, and it was found that the value of the company is determined by an appropriate discounting of cash flows in relation to the cost of capital in addition to the growth rate.

2- **(FAMA 1998) study;** The FAMA study entitled "Taxes, Financing Decisions and Company Value", which aimed to test the impact of taxes, distributions and debts on the value of the company, and adjusting profitability, shows that using sectoral regression analysis. (Cross-sectional regressions) The study concluded that the tax has an adverse effect on the value of the company, and the effect of distributions also has an inverse relationship on the value of the company, while the effect of debts gave a direct relationship with the value of the company, and concluded that distributions and debts give information about profitability.

3- **(Khacharma, 2000) Study;** This study aimed to apply the Altman model to seven joint stock companies in Jordan, and these companies included strong companies, weak companies, and bankrupt companies, in order to compare with those companies, and the results showed that weak and bankrupt companies got a value less than 1.81 and strong companies got At a value greater or equal to (2.99), where the researcher concluded that the real reasons leading to bankruptcy are many, including administrative, marketing, financial, accounting, legal, economic and political.

4- **(Hoori, 2006) Study;** This study aimed to analyze and estimate the financial risk in the Algerian industrial enterprises by building a model for estimating the financial risk and distinguishing between successful and failed enterprises based on a sample of fifteen enterprises belonging to the mechanical industry sector, including eight successful and seven failed, during the period 2000-2002 from Through the use of the discriminatory analysis method, this model included seven financial ratios that are the closest to the Algerian institutions, and the researcher concluded that it can be applied in the field of financial risk assessment in the institutions affiliated to the mechanical industry sector.

5- **(Romo & Walter, 2010)Study**. The researchers aimed in this study to find the possible means by which to rely on predicting failure by applying the Altman model to a sample of (17) Iraqi joint stock companies, from which data were obtained, and the study concluded that Altman data is accurate in predicting The failure of Iraqi joint stock companies and the possibility of using it on all industrial sector companies.

6- **(Naccur,2006) Study**; This study aimed to test the value creation process in the Tunis Stock Exchange using a sample that contains more than 90% of the companies listed in the market, in order to find determinants of procedures for estimating a set of data. The study concluded that the possibility of value creation in the future is positive and has a correlation Statistically significant with a political ratio of distributions and profitability factors. The results also suggested that the company's value is not affected by the type of industry or size.

Theoretical framework.

The term financial forecast appeared through the inability of companies to commit to paying their dues, when they are due, so the term prediction of financial failure means that the company has begun to walk the long road that ends with an event, which is financial hardship, in practice failure can be predicted Financial failure through two different angles, the first is that the financial failure occurs for purely economic reasons and without resulting in financial hardship that affects the external parties dealing with the economic unit, as is the case when the economic unit achieves investment returns less than the opportunity cost of funding sources and from this angle Failure takes an economic appearance and is usually called the term economic failure, and on the other hand, financial failure can occur for reasons that result in financial hardship that affects the external parties dealing with the economic unit, in the presence or absence of economic failure, as is the case when the unit fails Economic failure in the face of its owed obligations, and therefore financial failure is linked to financial hardship in the face of owed obligations. This term takes two basic forms:

1- Technical hardship: It is represented in the situation in which the economic unit is unable to meet its due obligations even though its assets exceed its obligations.
2- Real hardship: It is represented in the situation in which the economic unit is unable to meet its due obligations and its assets are less than the value of its obligations.

The real reasons behind the occurrence of financial failure:

Many researchers believe that the failure of companies is the result or outcome of a wide combination of factors that appear all or some of them in these companies, and these factors are represented in the presence of external factors that seek to control the administration by seeking to change exchange rates, as well as the increase in the prices of raw materials and supplies. Production and supply shortages, in addition to what is known as forced pricing of products, as well as the increase in the burdens associated with excess labor, as well as energy problems in general and their impact on operation and production.

With a state of general economic stagnation in the markets, as well as intense competition from large companies, and the government's imposition of a series of laws that affect the activity of companies, as well as the financial crises that debtors are exposed to.

It also includes internal factors related to the weak efficiency of the current management of the company, which is represented in the inefficiency of financial decisions related to financing in terms of over-reliance on debt financing, as well as the inefficiency of financial decisions related to investment in terms of the inadequacy of the asset structure, with the unplanned and unstudied expansion of the company's activity And its size, as well as the company's inefficiency in managing the working capital elements, as well as the company's inefficiency in managing its fixed investments in terms of not using it

to its maximum capacity, in addition to the inefficiency of the company's financial control systems and the inadequacy of its accounting systems, and this in turn is related to the low efficiency of the existing apparatus. On the quality review of the company's products, the inefficiency of the company's marketing decisions also weakens the efficiency of the company's collection system, and it is also concerned with the integrity of the company's organizational structure and the associated administrative functions, and the inability of companies to address changes and external influences when they occur occurs as a result of the lack of a system To control inventory, which causes a weakness in the efficiency of the company's purchasing system.

The importance of knowing the future forecast of financial failure:

Many locals consider forecasting future results and events as a major goal of financial analysis, which has received great attention by many researchers and financial analysts in the field of predicting financial failure, and the importance of this field is due to the benefits it achieves for all parties involved in financial analysis. Investors are interested in evaluating the soundness of their current and future investments, which requires a distinction between good investments and risky investments, and here predicting financial failure can be considered an early warning tool and can lead to decisions to dispose of risky investments or take actions that reduce potential losses. As for lenders, they are interested in knowing the probabilities of success or failure of companies that use their money, because of its impact on debt collection and on assessing the degree of potential risk. Here, forecasting of financial failure can be considered a tool to guide loans, determine their size, and determine the quality of guarantees required to be obtained.

As for management, it is concerned with early knowledge of the indicators that can lead to financial failure so that the necessary corrective actions can be taken in a timely manner, before the situation becomes difficult to treat. Within the framework of what is known as the analytical review procedures, the auditors are interested in the indicators that can lead to financial failure when testing the validity of the assumption of continuity, and although the auditor relies mainly on his personal estimates when judging the imposition of continuity, he uses indicators of financial failure when making his judgment. And last but not least, we find that public authorities are interested in early knowledge of cases that require intervention to correct the conditions of companies and institutions of special importance in the public and private sectors.

Many studies have shown that the choice of financing policy in companies or the ratio of debt-to-equity use affects the market value of those companies, so companies must choose the appropriate debt ratio that leads to achieving the strategic objective of financial management. (Heinkel, 1982), (Leland and Pyle, 1977) and (Harris, 1990) also proved in their studies that the value of the company and the size of the debt between them is a direct relationship and that the change in the level of debt used in companies

affects the market value of the company through the information it transmits. The change in the capital structure about the future outlook of the economy. As is the case in the study of (masulis, 1983), (Cornett and Travlos, 1989) and (Copeland and Lee, 1991), where they found that the announcement of reducing the number of common shares and replacing it with a long-term loan positively affected the market value of public shareholding companies.

The investor in general, and the investor in the financial market in particular, always tries to predict the future prices of stocks and the investment tools in which he put his money in order to be able to make the investment decision that he deems right, either by selling when he feels that it is time to obtain profits from the tool that he had previously purchased, and when His feeling that the market is heading for more losses, so he is forced to get rid of what he owns to get the least possible losses, or to buy when he feels that he will make gains in the future. Investors differ in terms of the way they rely on analyzing and evaluating their conditions, but they can be classified into two main directions of analysis: one is based on fundamental analysis, which is based on analyzing assets and financial statements of companies, and the other is based on technical analysis or the so-called graphic analysis. The stream of technical analysis relies heavily on charts used to represent the behavior of an asset and to help investors make their decisions.

Analytical models to predict the future failure of institutions:

Many researchers stressed the need to find models that help distinguish between failed institutions and successful ones through a set of characteristics and advantages, namely:

Beaver Model: This model is based on the use and selection of distinct financial performance ratios known as quantitative ratios, and this model is characterized by predictive power that makes it able to predict future failure five years before it occurs. Working money to total assets: the current ratio and the quick ratio.

Altman Model: This model shows the real ratio analysis, that is, the effect of financial ratios is subject to the role and opinion of the financial analyst.

Kedah Model: This model is based on five independent variables of financial ratios.

Sherrod's model: It is characterized by its use as a tool for assessing credit risk when granting bank loans in the bank.

Results and Hypothesis Testing.

For the purposes of statistical analysis, the SPSS program was used, with a significance level of 0.05.

Descriptive Statistics:

Before conducting the tests, the researcher made descriptive statistics for variables such as (arithmetic mean - median - standard deviation) in order to know the characteristics of the data, and the results were as shown in the following table:

Variables	Mean	Median	standard deviation
capital structure	0.302	0.287	0.158
Distribution Policy	0.542	0.592	0.400
Profit margin	0.093	0.092	0.132
Liquidity	4.182	2.050	8.016

Testing The Extent to Which the Variables Are Normally Distributed:

For the purposes of testing that the data related to the variables follow a normal distribution, the Kolmogorov-Smirnov Test was used at a significance level of 0.05 for the (independent and dependent) variables, which is based on the following hypothesis:

Ho: The distribution is normal

H1: The distribution is abnormal.

We accept the null hypothesis (Ho) that the distribution is normal if the P-value is greater than 0.05.

The Analysis' Results:

The (z) value of all variables was greater than 2.00 and the (p-value) less than 0.05 and equal to zero except for one variable, which is the capital structure, so we reject the null hypothesis and accept the alternative hypothesis [H1], that the distribution is not normal, so a transformation must be made Transformation of data related to variables, using the natural logarithm (LN).

The Result of the Analysis.

The value of (z) was low for some variables, and the value of (p-value) was greater than 0.05 for the same variables. Thus, we accept the null hypothesis and reject the alternative hypothesis [H1], meaning that the data became a normal distribution (Log-Normal Distribution) as it approached the normal distribution, Thus, the data was relied upon after the conversion for the purposes of conducting analysis and discussing the results.

Testing for A Normal Distribution Using a Histogram:

Also, this can be observed through the histogram for each of the variables, as shown in the study.

Multicollinearity Test:

The case of Multicollinearity was tested between the independent variables to find out the degree of correlation between them, and it was found that there is a correlation between the independent variables. To make sure that the results of the multiple regression of these variables are not affected by this correlation, another test was conducted, which is the VIF (Variance Inflation Factor), where it was found that the value of VIF is less than 10 and this indicates that there is no problem with Collinearity. Therefore, the results of the regression model are not due to the existence of an overlapping correlation between the independent variables. The test was used in the study (Myers, 1990) and the study of (Belsely & Welsch, 1980).

Multiple Regression Test:

After the researcher confirmed the validity of the data for regression by performing the necessary tests (aforementioned), he performed a multiple regression test between the independent variables and the dependent variable. Depending on the results, the explanatory ratio of the model as a whole was (R2 21.5%), that is, the independent variables explain an amount of 21.5% of the dependent variable, while the adjusted R2 was 19.9%, and the ANOVA table indicates that the value = 13.239 and that the p-value) = 0.00 which is less than 0.05, i.e.

we accept the alternative hypothesis and reject the null hypothesis.

This indicates the existence of a statistically significant effect of the set of independent variables with the dependent variable.

Stepwise Regression Analysis:

The researcher entered the variables within the Stepwise regression method, and the results lead to the selection of five variables, on which the results of the sub-hypotheses will be built.

This is shown in the results below and the explanatory ratio of the model is almost the same. (Multiple regression was (R2 21.5%) and gradient regression had (R2 20.8%).

Hypothesis testing:

The main hypothesis: Based on the F-test and the value of P = 0.00 less than 0.05, the main null hypothesis was rejected and the alternative hypothesis was accepted that there is a statistically significant effect of the set of independent variables on the value of the company.

The first sub-hypothesis: Depending on the T-test value and the P value of 0.000 is less than 0.05, we reject the null hypothesis that there is no statistically significant effect of the capital structure on the value of the company and accept the alternative hypothesis.

The Second sub-hypothesis: Depending on the value of the T-test and the value of P = 0.122 is greater than 0.05, we accept the null hypothesis that there is no statistically significant effect of dividend policies on the value of the company and reject the alternative hypothesis.

The third sub-hypothesis: Depending on the value of the T-test and the value of P = 0.003 less than 0.05, we reject the null hypothesis that there is no statistically significant effect of the profit margin in companies on the value of the company and we accept the alternative hypothesis.

Fourth sub-hypothesis: Depending on the value of the T-test and the value of P = 0.001 less than 0.05, we reject the null hypothesis that there is no statistically significant effect of liquidity in companies on the value of the company and accept the alternative hypothesis.

Fifth sub-hypothesis: Depending on the value of the T-test and the value of P = 0.008 less than 0.05, we reject the null hypothesis that there is no statistically significant effect of the turnover rate of working capital in companies on the value of the company and accept the alternative hypothesis.

Results.

1- The financial ratios derived from the income and financial position statements play an effective role in distinguishing between successful companies and failed companies.
2- The proposed model based on the financial ratios derived from the income and financial position statements was able to reclassify the sample of companies used in its design within the groups (successful companies) and (failed companies).
3- The proposed model based on the financial ratios derived from the income and position statements was able to predict financial failure in the sample of companies used in testing it within the groups (successful companies) and (failed companies).
4- With regard to the relationship between the dependent variable and the independent variable, there is a statistically significant effect on the dependent variable. In other words, an increase in the debt ratio leads to an increase in the value of the company.
5- With regard to the relationship between the dependent variable and the independent variable, the policy of distributions has indicated that there is no statistically significant effect on the dependent variable.
6- With regard to the relationship between the dependent variable and the independent variable, the profit margin has indicated that there is a statistically significant effect on the dependent variable.
7- With regard to the relationship between the dependent variable and the independent variable liquidity, it indicated the existence of a statistically significant effect on the dependent variable.
8- With regard to the relationship between the dependent variable and the independent variable, the working capital turnover rate has indicated a statistically significant effect on the dependent variable.

Recommendations.

1- Activating the use of debt by companies that use a low debt ratio through profitability, as the more profitable companies can use more debt and thus reduce the risk of debt.

2- The impact on the distributions policy so that it is related to the degree of greater benefit from the funds between distribution and retention, as the higher dividends on the returns of alternative investment opportunities than investing in companies leads to an increase in the value of the company.
3- Increasing profitability rates by increasing efficiency by reducing costs and increasing sales, which is reflected in the value of the company.
4- Companies focus on maintaining a variable level of liquidity that suits
5- The company's need from time to time, while maintaining the minimum level all the time, in order to protect the company from potential risks and thus increase the value of the company.

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