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Impact of Momentum Index on Technical Analysis and Common Stock Pricing

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ABSTRACT

Purpose – For many international organizations, the phenomenon of variation has become a basis in the pricing of common stocks, as it has witnessed great developments over the past years because of the technological, economic, and health developments that have recently taken place in the world. Based on the integrated database of some Iraqi companies listed on the Iraqi Stock Exchange, a study aims to analyse stock price trends using the financial and technical tools of different sectors operating in Iraq.
Methodology/approach – An analytical cognitive framework for the nature of these trends and their impact on the pricing of common stocks has been found by identifying the best analysis index that serves Iraqi securities investors and compressing the risks resulting from that investment to the maximum extent. This is done by relying on the Momentum Index. In addition to the analysis of the reciprocal relationship between the two study variables for the period from 2018–2020, using the test of the relationship between the variables and statistically and quantitatively analysing them, the study problem was interpreted.
Findings – The major conclusion in this study is the ability Momentum Index to determine investors' views on the fair price of shares. In addition, the study concluded a set of recommendations; the most important one is adopting the Momentum Index for its ability to predict the direction of the stock prices of companies and its ability to show the signals of selling and buying the shares of those companies, which positively reflects on the stock returns.
Novelty/value – This study highlights the unique role of the momentum index in technical analysis and stock pricing, offering fresh insights to improve investment strategies.

INTRODUCTION

Today, financial markets have become a vital economic trend in most world countries due to their role in all businesses of companies, stakeholders, and investors. These markets provide opportunities for growth and provide opportunities for investors, through which stakeholders can finance their companies when they need to finance their investment projects. By issuing financial assets such as stocks and bonds and selling or repurchasing them from dealers in those markets, most investors resort to investing their money in the financial market to buy those financial assets and sell or repurchase them to achieve

a financial return. Then dealer trade these assets to others to become as an indicator of market activity and liquidity.

Iraqi joint-stock companies have been adversely affected by international restrictions on Iraq concerning trade, industry, and the financial market. The events that Iraq experienced at that time, which had a detrimental influence on industry, agriculture, service, and even health, caused these companies to continue suffering until 2010. Iraqi joint-stock companies started to revive throughout the last four years (2018–2021) www.isx.iq. This was favorably reflected in the way that its goods and services were gradually developed to keep up with the growth of regional and worldwide businesses. This was done by producing innovative products and services that could compete with the goods and services. Accordingly, the investors has to avoid making wrong investment decisions that may lead to bad consequences. Therefore, it is important resorting to technical financial techniques that reflect the true and fair value for the coming years. One of those techniques is the technical analysis. This analysis of calculating future stock prices and predicting their value is based on announced and disclosed information that is easy to obtain whenever the investor and financial analyst needs to get it. This information can be processed and transformed into facts regarding stock prices through technical financial analysis based on specialized tools in this regard, including indicators and maps. Therefore, the current study sheds the light on some indicators that the researcher believes are capable of predicting those future prices and their contribution to increasing their returns in the future. The financial sector has been significantly impacted by recent advances in AI and machine learning, particularly with regard to quantitative forecasting of stocks.

As a result, investors must develop an accurate method to forecast the movement of stock prices in order to take advantage of investment opportunities and lower the risks associated with trading those stocks. In light of the fact that various factors, including political and economic ones, have an impact on stock prices, the stock market is a highly complicated subject in any nation. Therefore, it is a challenge for traders in the financial market to gather and use enough information from numerous sources in order to improve the effectiveness of forecasting stock price changes. Quantitative indicators, such as past trade data and technical indications pertinent to our present research, were used for forecasting. Because the issue, diffusion, and absorption of information influence stock price movements, these indicators have shown to be useful for making predictions about such changes. In this regard, financial news is a crucial information source for investors as it has the potential to affect their attitudes and practices with regard to investing, which in turn has a direct impact on stock prices. Quantitative indicators, including daily prices and technical indicators like the Moving Average (MA), Williams Indicator (WR), and Relative Strength Index (RSI), have been employed in studies on predicting stock price fluctuations in both academia and business. Many people use the Momentum Index (IM) to forecast stock values.

LITERATURE REVIEW

Common Stocks Features

Through different measures, either directly or indirectly (Amanda et al., 2023), several nations are attempting to boost the expansion of the capital market. Therefore, among the most common forms of issued shares in the financial markets are shares, particularly ordinary shares. Joint stock corporations for investment by people and organizations frequently issue these shares. An ownership document with three values—nominal value, book value, and market value—is referred to as a common share. The shares documented or written worth is the first value, while the ownership rights' expressed value is the second. The number of common shares issued is multiplied by the total of reserves and retained earnings, and the market value is the price at which shares are traded on the stock market (Lo., & Wang, 2010). Shareholders are the most closely linked to the company because they are seen as the most advantageous parties when the joint-stock company is successful in the market, while also being the most harmed parties in the event of the company's failure in the market (Ball, 2009). Shares are the foundation for financing any company. A share is nothing more than a company's paid-up capital acquired in return for ownership as a security that confers certain rights on its bearer. The right to a portion of the company's rights is granted to the shareholder by virtue of shares, which are long-term ownership instruments issued in the form of a document by the joint-stock company and made available for private or public offering (Borrius, 2012). According to the researcher's review of the relevant

literature, market participants determine the value of a share on the stock exchange or stock market based on the degree of demand or supply in that market. With the exception of a few cases, which force these firms to issue ordinary shares categorized (A&B), which they do to fulfill their own purposes, the majority of joint stock corporations only issue one form of ordinary share. When small businesses seek fresh external sources of funding, they issue Class A common shares.

The holders of these shares get periodic dividends in exchange for abstaining from voting for a five-year period. If the company does not pay dividends to the owners of Class B ordinary shares for a period of five years to reach a specific level of its retained profits, the company will reserve the full voting rights for the founders in regards to this type of share (Brigham & Ehrhardt, 2013). Using (Keown et al., 2004) and (Chisholm, 2009) as references, we discover that common stocks have the following traits: (a) Rights to claim remaining net profit: This indicates that after bondholder and preferred share obligations have been satisfied, the ordinary shareholder has the right to claim any remaining net profit. After the corporation increases the share of common shareholders, this entitlement is paid out immediately to the common shareholders or preserved as retained profits to raise the company's capital and spend those funds. (b) The share's indivisibility does not exclude many owners; thus, only one person needs to represent them in front of the firm in this situation (Na, 2016). To put it another way, if a shareholder dies and leaves their shares to several heirs, the value of those shares is entitled to be split among them, but the heirs must pick a representative to represent them in the general assembly in order to exercise their rights (Jaffe, & Lane, 2004). (c) After the rights of holders of bonds and preferred shares have been met, holders of common shares are entitled to the residual assets in the case of a dissolving corporation. (d)Equal value: The capital of the joint-stock company is divided into shares of equal value. According to (Al-Sharif 1997), the wisdom behind this division is to make it easier to estimate the majority in general assemblies, as well as to make the process of profit distribution and share price regulation within the stock exchange more convenient. (e) Voting right: Ordinary shareholders vote on the members of the board of directors after the election of the board of directors at the general meeting, as well as voting on any change in the company law, which may include a license to issue new shares. (f) Share trading is regarded as a real benchmark for the joint-stock company since, without it, the joint-stock business loses the status for which it was founded as a joint-stock company (Aldous, & Condorelli, 2020).

Stock Value

Common stocks have values and characteristics that are changed according to the financial market conditions of any country. Moreover, some of their values are fixed and do not change with the change of those characteristics because they are proven in the historical records of the company, (Werner & Stoner, 2007), (Vasigh et al, 2010). It is clear that the common stocks include five types:

Par Value

we describe this value as the value written on the stock voucher and specified in the company's articles of incorporation. It also includes the legal value printed on the stock certificate, which shows the lowest value of it. (Revsine et al., 2005) noted that in order to draw in lower-income investors, the joint-stock business could be required to issue stocks with a nominal value below their market value.

It can be characterized as the fixed stock value used to calculate the shareholder's profit stock of the business. The stock may also be issued at a price more than its par value, known as the issue value or issue premium, but it is not permitted to issue it for less than its par value unless the capital is increased (Na, 2016). The par value, which is defined in accordance with corporate policy, reflects the sum investors pay to get one share in a relevant context.

Market Value

Market value is the amount an investor pays to buy a stock. Usually, this value reflects the trading value of the stock in the financial markets at a specific time. It can be defined as the price traded between the seller and the buyer wishing to acquire the assets of a company. (Wild 2017) defined this value as the

price at which shares are bought and sold. This price is affected by expected future profits, internal and external company factors, and other economic factors.

The common stock's dividends, the strength of the company's financial position, supply and demand for the stock, the dividend policy, the level of risk, and earnings per stock are just a few of the many variables that influence the market value and are significant in determining its value (Al-Masoti, 2018). Furthermore, the market value of stocks differs from their book value, in which should be mentioned. The difference arises from the fact that a stock's market value is determined by its trading value, but a stock's book value is determined by its historical worth.

Liquidation Value

The phrase "liquidation value" describes the amount of the company's worth that would remain after all receivables have been paid in the event that the company's operations were terminated and its assets were sold and allocated to shareholders. When a corporation is facing abrupt or gradual insolvency or is unable to fulfill its debts to others, it turns to liquidation as a last alternative. As a result, the assets of the corporation are liquidated at a price below their actual worth (Liu et al., 2019). This value, which in a similar context indicates the worth of the company's stocks upon its liquidation, is equal to the market value less the value of the company's debts. The stock per stock is calculated by dividing the stock's liquidation value by the total number of the stocks issued (Smart & Megginson, 2009). Investors must assess these assets to determine how much of their funds are still held by the business and are thus subject to legal recovery in the case of bankruptcy (Jackson, & Skeel, 2020). Because of the foregoing, the firm, regardless of its activity, may resort to immediate liquidation to avoid having to absorb more losses from its current operation (Li et al., 2020).

Book Value

According to (Chandra, 2013), this amount represents the proportion of paid-up capital, issue bonuses attributable to fresh issuances of the common stocks at a price higher than the par value of the stock, reserves, and retained earnings that belong to that particular one. Due to the fact that the assets of the company are recorded at historical cost rather than current market value. The book value of a stock also represents an individual's or a group of individuals' ownership in a portion of the company's net assets and is not the same as the amount that a shareholder would receive in the event that the company was liquidated (Needles et al., 2008). This value fluctuates constantly because of the relationship between the company's overall profitability and its retained earnings.

Intrinsic Value

The part of the joint-stock company's net assets that remains after subtracting its obligations or after adding earnings is known as the intrinsic value of the stock (Yu, 2019). The intrinsic value of the stock, which is supported by a study of the fundamental components of the stock's worth, can be used to convey the them as intrinsic value. The assets of the firm, anticipated income, prospective payouts, and anticipated growth rate can all be taken into account (Hampton, 2011). This value can be expressed as the real prices at which stocks are traded in the financial market. Which is achieved through the ideal and highly efficient return, and this will most often only be achieved when the financial market is efficient and in a strong form because it reflects the financial information necessary for investors and the possibility of building their investment decision on a sound analytical basis (Landsman, 2006).

The Concept of the Technical Analysis

There is a great difference between the concepts of financial analysis and technical analysis. The financial analysis refers to financial analytical procedures to evaluate the company’s performance in the past and the company’s ability to improve it in the future to advance the interests of its beneficiaries, such as management, owners, creditors, and suppliers (Kirkpatrick & Dahlquist, 2010). (Gitman & Zutter, 2012) said that financial analysis contributes in making better financial decisions for the company and its beneficiaries (Tickerchart Guide to Technical Analysis, 2005). In the age of globalization and the accompanying technological progress in the use of computers, companies, especially contemporary ones, now have many methods for forecasting, especially after the emergence of the term AI and some of the algorithms that accompany it.

Using technical analysis and associated indications, businesses are continuously looking for the best ways to make decisions, including financial ones (Hoshmand, 2010). Regarding the technical analysis, it may be summed up as ways of predicting that aid in making the best trading decisions (Rockefeller, 2011). The stock market in general and certain equities in particular are to be studied using specific data generated by the financial market in advance (Chandra, 2013). According to (Sharma et al. 2021), it is a method for estimating a stock's potential profit by examining patterns and previous results. Technical analysis is based on the idea that stock prices move in directions that are determined by changes in an investor's reaction to a variety of factors, such as economic and political factors and other factors affected by the financial market in that country. This allows technical analysts to identify stock price trends early on and get ready to move in the right direction (selling) in response. Alternatively, purchase and join the market knowing the course it would take beforehand. Investors are urged to promptly abandon the market if the image of that market is hazy and ambiguous while deciding whether to purchase or sell (Park & Irwin, 2004). Technical analysis is nothing more than a technique for monitoring and forecasting the movement of stock prices through the identification of buying and selling patterns with the goal of maximizing profit and minimizing risk of loss (Dash, & Dash, 2016).

Momentum Indicator

By tracking stock price changes (buying and selling) and producing signals to assure profitable trading chances in the stock market, it is one of the top indicators for enhancing the quality of financial decisions. This indicator's rate of growth or drop in stock price can be used to indicate it (Frankel, & Saravelos, 2012). By learning the charts and comprehending their technical indicators to help understanding and visualizing the historical market prices, the technical analyst attempts to predict stock prices in the financial market using a variety of indicators, including the momentum indicator (Sureshkumar & Elango, 2011). Historical stock prices are pre-processed by accounting them with appropriate indicators and entering them into the predictive model and one of these indicators is the momentum indicator (Anbalagan & Maheswari, 2014). Momentum indicators, as referred to by (Altarawneh et al. 2022), are used to predict market direction and thus provide important signals to investors before the stock price changes its direction towards a bear or bull market. Consequently, the investor draws a typical investment plan for technical analysis based on the signals mentioned above. While (Baker, & Wurgler, 2007) pointed out that, this indicator measures the extent of change in the price of a stock and predicts it in the event of a rise or fall (peak or bottom). It can be said that momentum starts to curve downward as soon as the stock price's rate of change slows down to reach stability or constancy. This curve, however, does not always mean that momentum is about to hit rock bottom; rather, it may be a sign that momentum has started to recover by returning to an average level through average to peak or trough (acceleration or deceleration). This indicator, as noted by (Achelis, 2005), reflects the amount of change in a security's price over a given period. According to (Pardo, 2011), he raised the prospect that this indicator might be a trading strategy that provides a daily entry and exit signal for securities investors that is extremely accurate. Additionally, when the indicator starts to fall toward the centerline from the positive side, it provides a signal to sell the investment. The indicator gives a purchase signal when it moves from the negative half of the chart to the centerline. From the above, it is concluded that, after referring to previous literature, that the momentum indicator measures the rate of change of the stock price, that is, the speed of its movement and the rates of its rise or fall. Through this indicator, the financial analyst can know whether the trend of the stock price is decelerating or accelerating; that is, it expresses momentum. Prices are calculated according to the following equation:

$$\textbf{\textit{Momentum}} = \textit{last closing price} - \textit{closing price for several past days}$$

For example, if today's closing price is 50 dinars and the closing price of the past ten days is 45 dinars, then the momentum for ten days is equal to 5 dinars. However, if the price difference is fixed with no significant change, then the momentum appears as an equal horizontal line

The relationship between technical analysis and stocks

Bear and bull wrestling was a special entertainment for miners in California when it was under Mexican rule, and this wrestling ended with the death of one of the combatants (the bull or bear). This type of wrestling stopped the Spanish writer Don Jose de la Vega, who was behind the launch of the term "bull and bear" in the year 1688, from competing with the competitors in the stock market (sellers ,bears) and buyers (bulls) to determine the direction of security prices in it (Sharp & Robert, 1989). the French stock market, the Financial Markets Regulator, the French use the term "bull" to refer to the team working to raise prices to achieve a profit and "bear" to refer to the team seeking to lower prices to the bull team in order to overthrow and inflict the greatest possible loss on them. (Nassirtoussi et al. 2014) have pointed out that the well-being of every developing economy, country, or society in the twenty-first century depends primarily on market economies and stock prices. It is obvious that the financial market is the focus of this regard (Göçken et al. 2016). The financial market is a venue for trading shares (property rights) and other financial instruments of publicly traded companies listed there. The performance of stock markets is tracked on a daily basis using some key indicators, such as the stock index. This index, which measures the performance of some stocks chosen from various market sectors, is crucial for gauging both the performance of stock market trading and the overall health of a nation's economy (Wanjawa & Muchemi, 2014).

By studying charts that show previous market prices and technical indicators, the technical analyst makes an effort to forecast the stock market based on the information presented above (Su & Cheng, 2016). It was noted that taking into account the internal and external factors of the company can lead to a more accurate prediction after reviewing prior studies and some technical analysis-related literature, such as a study (Renu & Christie, 2018) that found numerous studies that investigated increasing the accuracy of stock forecasting using the hybrid group machine learning method. An under percentage of market forecasts are made in the African market, despite the volume of articles on stock forecasts. In another study, (Martani & Khairurizka, 2009; Al-Omari et al., 2020) agreed that basic technical analysis indicators are useful for predicting stock returns. This study also confirmed that there is a positive relationship between technical analysis of stocks and stock returns. In addition, they discovered that the basic factors of profitability (net profit margin and return on equity), total asset turnover ratio, and market price per share to book value have a significant relationship with return on equity. However, leverage and company size have little to do with that return.

According to a hypothesis made by (Wijesundera et al. 2016), there is a considerable connection between stock return and fundamental analysis. Using Ordinary least squares (OLS) , they also discovered that return on equity, profits per share, and book value to market value are all positively correlated with stock performance. By employing book value to market value ratios and total asset turnover as the foundational indicators, (Khotimah & Murtaqi, 2015) have proposed that there is a statistically significant association between technical analysis and stock returns. Based on the conclusions they came at, which showed that the stock return is closely correlated with the book-to-market value and the overall asset turnover rate.

(Hassan et al., 2015) tested the relationship between four basic indicators and stock return and found that the book value of stocks and sales to the its price in the market have a significant, direct relationship with stock return. While there is an inverse relationship between company size and stock return, there is no statistically significant relationship between credit to equity and stock return. In a study conducted by (Anwaar 2016), he studied the effect of the basic variables of companies, namely earnings per share, quick ratio, return on assets, return on equity, and net profit margin, on stock returns based on his findings. While there is an inverse link between profit per stock and return on equity, there is a large direct relationship between net profit margin and return on assets and return on stock. In contrast, there is no connection between return on stock and quick ratio. In three Asian markets, (Ahmed et al. 2000) used five different moving average stock trading models to examine the effectiveness of technical trading methods. They reinforced the notion that the trading model's capacity to anticipate future stock returns is due to the strong serial correlation between stock returns brought about by the trading model's efficacy based on their findings (Sehgal & Garhyan 2002). Technical analysis in general can produce a positive return on the Indian Stock Exchange using several technical indicators on balance volume, which is the strongest among other technical indicators that can be used in different stages of the market

(bull or bear). To assess the accuracy of the technical trading rule in forecasting stock market returns, (Metghalchi et al., 2007) implemented two moving average rules on the Austrian Stock Exchange. They discovered that the moving average beats the buy-and-hold approach and has a higher degree of predictive power. The study by (Sakhare et al., 2023) dealt with the struggle of investors in determining the direction of stocks, thus helping them decide whether to buy or sell certain stocks and avoid falling into the trap of a bull market facing a bear and vice versa, through a new algorithm based on historical data to predict the trading decision. The proposed algorithm based on historical data has higher prediction accuracy than other algorithms, according to their study's results, so 75 technical parameters were calculated using stock trading data (open, high, low, and closing prices) in order to implement and test the algorithm based on this. Priority was given using a feature ranking strategy based on that group. The Decision Tree and Naive Bayes algorithms are two other well-known machine-learning methods. In a study (AL-Hisnawi et al., 2018), they considered technical analysis an important tool in the financial markets through its influence on investors' decisions regarding determining stock prices and their trends in the future.

As for the study (Pushpa et al., 2017), the problem revolved around the ability of the technical analysis indicators used in it to interpret and identify investment areas that could achieve the least risk in the future. This can be achieved through using some relevant statistical methods to investigate the relationship between the two study variables in selected companies listed on the Indian Stock Exchange through the ability of technical analysis tools as part of the investor's investment decision-making process to predict future stock prices that can help in formulating buying and selling decisions. In addition, the study's findings—the most notable of which is that the majority of the stocks in the study sample showed a strong technical position from an analytical standpoint—provided clarity of vision for the investor in identifying trend reversals at an early stage to develop a buying or selling strategy. One of the biggest challenges facing the study (Audelino & Guilherme, 2020) was predicting stock prices in the stock market for a sample of selected companies listed on the stock exchanges of North America, India, China, Brazil, South Korea, Germany, Belgium, and Morocco. These companies' time series are volatile and non-barometric in nature. The study aimed to create predictions for the financial market, verify and gain insight into the validity of the model in interpreting the results based on the deep learning model, and predict stock prices using historical data. This happened through the use of some technical indicators that reached results, the most notable of which is that complex financial disturbances can be predicted through the use of hybrid models, including long-term memory (LSTM) technology. This technology has softened the way of performing the analysis and discussions based on four perspectives represented by (predictor technique, trading strategy, profitability metrics and risk management). It has been noted that the LSTM technique is able to solve the problem of vanishing gradient data.

METHOD

The data published on the official website of the Iraq Stock Exchange (www.isx-iq-net) was adopted in measuring the research variables that pertain to the companies in the research sample. As for the time horizon for that data, it was determined based on the analysis of cross-sectional data for the sample, which amounts to four sectors. Mainly represented by companies (industrial, service, and communications), in addition to the banking sector. Intentional sample was used to weed out businesses that would experience data loss or interruption at rates higher than 20% of all time series observations. In addition, by concentrating on analysis and diagnosis and then discussing the outcomes, we rely on the analytical research technique, one of the scientific research methods built on the pillars of quantitative analysis of financial data. While the analysis phases concentrated on statistical description and hypothesis testing, which necessitated using a variety of sophisticated statistical models in the analysis, measurement, and testing stages.

Hair et al. (2010) state that while choosing the sample size for the basic regression model, it is important to consider that the sample size (20%) is useful. However, in order to

preserve the statistical power of the study's analysis in the multiple regression model, it is important to notice the sample size within 50%. The following is the sampling ratio equation:

$$\%50.52 = 100 \times \frac{48}{95} = \frac{sample\ size}{community\ size} = \ sampling\ ratio$$

Based on the result of the equation, the percentage of the research sample reached (50.52%) of the total research community, which is a statistically acceptable percentage. Perhaps the research community from which the sample was drawn using the non-random sampling method (intentional) that ensures the possibility of generalizing the results of analysis and testing to the research community. From the above, Table 1 shows the stages of building the research model and its financial methods:

Table 1. Sample Building

$$\boldsymbol{SP_t = C + MI_t + \sum_{k=1}^{K} \beta_k X_t^k + \epsilon_t \ldots\ldots\ (1)}$$

Where:
SP_t: represents the level of common stock prices for the studied sectors at time t, where (t=1, 2,…,n).
C: represents the constant of the function,
MI_t: represents our targeted independent variable, which is the momentum index at time t,
(X_t^k): represents the vector of control variables, which represent potential determinants of common stock prices other than the momentum index,
ϵ_t: represents the error term with its usual characteristics.
As for the control variables, we relied on macroeconomic variables, in line with previous studies. Thus, we controlled the exchange rate, the inflation level, in addition to the real interest rate, and finally the fiscal policy followed by the state. We also verified its good description, i.e. whether these variables in their relationship to common stock prices follow a linear or non-linear form. Accordingly, the Auxiliary regression test for non-linearity test - squared terms)) was used to test non-linearity and describe the model. Which showed that all independent and control variables follow a linear form in their relationship with common stock prices in the four sectors.
In the model building part's application section, the equation was thoroughly presented to make the connection between the momentum index and stock prices clear.

$$\boldsymbol{SP_t = \beta_0 + \beta_1 MI_t + \beta_2 Exc_t + \beta_3 Inf_t + \beta_4 RIR_{.t} + \beta_5 FP_t + \epsilon_t} \ldots\ldots (2)$$

Where:
SP_t: represents the common stock price of the studied sector, and here it will be expressed using four main sectors; *i*) Industries (SPI_t), ii) Services (SPS_t), iii) Communications (SPT_t), iv) Banks (SPB_t).
(β_1): represents the regression coefficient of the targeted independent variable here, which is the momentum index (MI_t), while the remaining coefficients from (β_2) to (β_5) express the regression coefficients of the control variables, which are the exchange rate (Exc_t), inflation (Inf_t), interest rate (RIR_t), and the level of fiscal policy (FP_t).
(β_0): Fixed part regression coefficient.
(ϵ_t) represents the error term with its usual characteristics. Here, theoretically, the sign of the coefficient (β_1) is expected to be positive in the four sectors, given the importance of technical financial analysis within the framework of the momentum indicator in studying, analyzing, evaluating and pricing common stock prices in the future, and its great potential in predicting the fair value of stocks in the future. As for the rest of the controlling variables, their effect is ambiguous, and is determined based on the stock price variable used, as the different economic sectors do not respond to the same degree to changes in the macroeconomic variables.

Equation (2) shows that the authors used the auxiliary regression for non-linearity test (squared terms), which is used to test non-linearity and characterize the model.

The authors used (BTA) The Bounds Testing Approach that is based on the use of the Autoregressive Distributed Lag (ARDL) in line with the following steps:

- Augmented Dickey-Fuller (ADF): This test is used to verify the stationary of time series and to determine the degree of integration of each series in the model to avoid fake regression in it.
- Co-integration test with ARDL: This test is used to test whether there is a long-term relationship between study variables, i.e., co-integration, within the framework of the Unrestricted Error Correction Model (UECM) by comparing the calculated F-stat value with tabular values within critical limits.
- Long – short-term sample with ARDL: Along with estimating the error correction model, this method is used to estimate the models' long-term connection. This is accomplished by employing residuals derived from the long-run relationship and approximated with a single lag time, $\_\varepsilon_{t-1}$.
- Effect size: It is used to determine if a connection has a little, medium, or big practical relevance in the Iraqi financial context, or how significant it is in actuality.

3

Financial techniques	
Uses	**Financial techniques**
M = LCP – CPP **M= last closing price - closing price prior to the number of days** **Source**:(Al-hisnawy, 2017) **Or** $M_t = P_t - P_{t-n}$ **Source:** (Kaufmann, 2019) **M: momentum** **Liquid Crystal Polymer LCP** **Closing Price Prior CPP**	Momentum index: it measures the alteration in the movement of stock prices up and down, as it reflects the acceleration in the movement of the stock price when the trading range in a specific time is higher than in the previous time.

As a field for implementing the research, which at the same time took into account the whole research community, the industry, services, communications, and banking sector in Iraq was selected. This decision was based on the following justifications:

- Given the continuous stages of development, investing in these areas is seen as involving significant levels of risk and future uncertainty.
- Throughout the study time, firms conduct regular trading.
- Stock price fluctuations during the study period must be manageable from a financial standpoint.
- According to Table 2, the analytical component of the study is most richly supported by financial facts and the essential information about them.

Table 2, Analytical Component of the Study

No.	Sector of researched companies	No. of companies under research	Sample Type	period of data analysis
1	Industry listed on the Iraq stock exchange	15	Intentional	2018 – 2021
2	Services listed on Iraq stock exchange	5	Intentional	2018 – 2021
3	Communication listed on Iraq stock exchange	1	Intentional	2018 – 2021
4	Banks listed on Iraq stock exchange	27	Intentional	2018 – 2021

The period from (1/2/2018) until (12/31/2021) was set as time limits for the research. The authors justified the choice of this period because it is the most recent and most active period for the Iraqi stock market. In addition, specifying this period was in line with the requirements of The Naïve and Hold Strategy, which requires its actual application for no less than one financial year until all profit shares are reinvested (Francis, 1991; Yuan& Zhou, 2023).

RESULT AND DISCUSSION

Descriptive statistics:

It is important to note the terms used in the analytical portion of this research, namely the bear market and the bull market, before moving on to the applied portion. Strong Market Investors who think stock prices would decline and lose value gave the term "The Bear" its origin. The bear fights by standing upright and using his hands to strike downward, hence the name. The name “The Bull” is given to the investor who expects that stock prices will rise. This name also comes from the way the bullfights, where it lowers its head and raises it up with its horns during combat. The bear market often disguises itself as a bull market and vice versa, which exposes investors to a situation called a trap (Berg, 2011). Based on all of the above, the research community is represented by four important sectors: industry, services, communications, and banking, as follows:

The Analysis of the market status according to MI of 2018

Table 3 shows that there are significant monthly variations in the momentum rates of the shares of the analyzed sectors, with some sectors recording towards the bear market and others towards the bull market. The bear market describes the status of the market when it is in a downward trend, whereas a bull market describes the situation when the market is in an upward trend. Investors must completely understand what each market means to them since both the bear and the bull markets have an impact on their portfolios.

Table 3. Mean of monthly stock prices for each sector according to MI of 2018

Months	**sectors**				**MI**
	Industry	**services**	**communications**	**Banks**	
1	0.8	0.1	0.7	0.08	0.42
2	0.55	0.1	0.1	0.05	0.2
3	**0.1**	**-0.04**	**-0.4**	**-0.02**	**-0.09**
4	-0.25	-0.04	-0.2	-0.05	-0.14
5	-0.31	-0.1	-0.6	-0.1	-0.28
6	**-0.4**	**-0.1**	**-0.4**	**-0.1**	**-0.25**
7	-0.2	-0.03	-0.2	-0.1	-0.13
8	-0.2	-0.03	-0.1	-0.07	-0.1
9	**-0.3**	**-0.07**	**-0.2**	**-0.05**	**-0.16**
10	0.6	-0.3	-0.3	-0.03	-0.01
11	0.4	-0.1	0.1	-0.04	0.09
12	**0.6**	**0.3**	**0.1**	**0.01**	**0.253**
Mean	**0.12**	**-0.03**	**-0.12**	**-0.04**	**-0.015**

Table 3 shows that the telecommunication sector, which had the highest number of surveys, had the lowest prices in 2018 with an average of -0.12. Moreover, it should be mentioned that during the third month of 2018, the share price progressively decreased to close at (-0.4). It kept experiencing negative prices until the third quarter of 2018, when it managed to incur a loss of 0.05, before settling at the same price as the first quarter. The stock of the telecommunications industry did, however; bounce back in the last quarter of the same year to reach an upward level at a price of (0.01). Consequently, we discover that the telecoms industry reflected a bear market pattern throughout 2018. In contrast, we find that the industrial sector recorded an upward trend during the first quarter of 2018 in the momentum of its stock prices compared to the general average. However, this did not last long, and prices tended to decline, achieving negative momentum during the second and third quarters by (0.4) (0.3) successively. Even if stock momentum improved in the fourth quarter of 2018, recording (0.6), this shows that a bull market has been reflected by the stock price. The momentum of the stock prices in the banking and services sectors was identical, signifying a bear market. The overall price momentum index for all sectors declined in the first, second, and third quarters, reaching (-0.09), (-0.25), and (-0.16), respectively. However, it increased once more to break the trend line to the zero level in the fourth quarter. An increasing momentum of 0.235 was attained in the final quarter of 2018.

Analysis of the market condition according to MI of 2019

Table 4 shows that all the analyzed sectors have seen a decline in stock prices and a change in the direction of stock prices relative to the year 2018 in line with predictions made about the movement of the index. It should be mentioned that, particularly in the second and third quarters compared to the previous year, the industrial and services sectors have shown a minor improvement in a slow rising trend. Table 5 makes it very evident that the manufacturing sector has started to report average momentum (-0.08). In February of the same year, it reached (-0.3), then it recovered in an upward trend in the second, third, and fourth quarters, forming a path resembling the movement of a snake, so that this sector concluded its average share prices according to the index with an average of (0.67). The general average for this sector was 0.18. This average is better than the average stock price according to the momentum index if measured in the previous year.

Table 4. Mean of monthly stock prices for each sector based on MI of 2019

Month	**sectors**				**MI**
	Industry	**Services**	**telecommunication**	**Banks**	
1	-0.08	-0.19	-0.41	-0.02	-0.175
2	-0.3	0.05	-0.2	-0.02	-0.118
3	**-0.04**	**0.23**	**-0.07**	**-0.04**	0.02
4	-0.01	0.17	-0.27	-0.03	-0.035
5	0.04	0.3	0.2	0.02	0.14
6	**0.15**	**0.18**	**0.58**	**0.01**	0.23
7	0.26	0.23	0.6	-0.01	0.27
8	0.15	0.67	0.4	0.01	0.308
9	**0.41**	**0.64**	**0.22**	**0.01**	0.32
10	0.53	0.61	-0.05	-0.001	0.272
11	0.37	0.34	0.02	0.01	0.185
12	**0.67**	**-0.2**	**0.52**	**0.014**	0.251
Mean	**0.18**	**0.25**	**1.54**	**-0.004**	**0.14**

Table 4 shows that the services sector's average prices were (-0.19) in January, which shows that since this sector's shares are in the bottom region, assistance is needed. Then, in February, stock prices rebounded with an upward trend and an average record of 0.05, according to the studied index. It

continued to rise in the resistance area (top) until November, recording an average of 0.34. Then the decline returned to the bottom area in December, recording an average of -0.2. The general average for the services sector recorded an average of 0.25, and this average is much better than the general average for this sector if compared to the year 2018. The telecoms sector began in the support area (bottom) with an average of (-0.41) and remained there through April with an average of (-0.03). This shows that the stock of the industry gained speed in the first three months of the current year (2019) near the bottom support area. The stock of the telecoms industry needed four months to recover and increase steadily, recording an average velocity of (0.2) in May to be in the resistance region (top). It stayed in this state with slight fluctuation until September, recording an average of 0.22. In the month of October, the company's stock recorded an average of -0.05, bringing the stocks of this vital sector back to the support area (bottom). While the average momentum for the months of November and December was (0.02) and (0.52), respectively, with which the stock concluded the company is in the resistance area (top). Table 5 shows that the overall average for the telecommunications industry was 1.54 according to MI, which is much better than the average of the prior year (2018), which was -0.12. With an average of (-0.02) when it began in the support zone (bottom), the banking sector's level of momentum persisted while recording shifting averages. It persisted until April, when an average of -0.03 was seen. Following that, the index started to rise by an average of 0.02 toward the resistance zone (top). The price can move to the same level but in the opposite direction after reaching the lowest anticipated level, as shown in Table 5; this is what happened in the months of May, June, July, August, and September, with an average of (0.02, 0.01, -0.01, 0.01, 0.01), respectively. In particular, when the stock is experiencing a rebound movement (rise and fall), this sends a strong signal to investors to purchase rather than sell.

The analysis of the market condition based on MI of 2020

The COVID-19 virus was initially detected in the Chinese city of Wuhan in December of 2019; from there, it traveled around the world until it was declared a pandemic in March of 2020. Based on this, all sectors experienced a fall and standstill in this year's momentum rates. Working in the researched industries (industry, services, communications, and finance), as well as the Iraqi environment. When noting Table 5, we find that the industrial sector recorded an average momentum in January of (-0.06), in contrast to what ended the year 2019 when it recorded an average momentum of (0.67). Namely, the industrial sector shifted within one month of the pandemic crisis from the maximum area of resistance (top) to the maximum area of support (bottom). This sector also remained in the bottom zone from January until June, recording average momentum levels of (-0.06, -0.14, -0.16, -0.42, -0.1, -0.09) respectively. The recovery of this sector, however, in the face of the pandemic through the lifting of the total curfew, adherence to the Supreme Committee's directives to address the Corona crisis. Moreover, the gradual return of life also contributed to a change in momentum from the bottom to the top, with significant increases beginning in the months of July and continuing through December, with averages recorded that reached (0.135, 0.87, 1.17, 0.27, 0.2, and 0.15, respectively).

Table 5. Mean of monthly stock prices for each sector based on MI of 2020

Month	**Sectors**				**MI**
	Industry	**Services**	**Telecommunication**	**Banks**	
1	-0.06	-0.67	-0.19	0	-0.230
2	-0.14	-0.55	-0.15	-0.011	-0.213
3	**-0.16**	**-0.441**	**-1.12**	**-0.011**	**-0.433**
4	-0.42	-0.4	-2.2	-0.029	-0.762
5	-0.1	-0.21	-0.1	-0.02	-0.108
6	**-0.09**	**-0.11**	**0.2**	**-0.11**	**-0.028**
7	0.135	0.14	0.5	0.029	0.201
8	0.87	0.3	0.51	0.036	0.429
9	**1.17**	**0.9**	**0.25**	**0.017**	**0.584**
10	0.27	0.6	0	0.004	0.219
11	0.2	0.6	-0.004	-0.005	0.198
12	**0.15**	**0.2**	**0.36**	**0.01**	**0.180**
Mean	**0.152**	**0.03**	**-0.162**	**-0.006**	**0.003**

With a rate of momentum in the support zone (bottom), the services sector started the month of January with an average of -0.67. This low rate persisted during the first and second quarters of the studied year, with the average momentum for the months of January, February, March, April, May, and June being, respectively, (-0.67, -0.55, -0.441, -0.4, -0.21, -0.11). The momentum rate progressively grew again from the bottom region to the top area. The pandemic's impacts are to blame, yet from July to December, positive momentum averages of 0.14, 0.3, 0.9, 0.6, 0.6, and 0.2 were recorded, respectively. It is also clear from Table (6) that the telecommunications sector has witnessed momentum in the support area (bottom), and this gives an explanation for the decline in price movement to a minimum, as it reached in the month (January, February, March) (-0.19, -0.15, 1.12). It continued to decline to the maximum recorded momentum in the months of April and May (-2.2, -0.1), respectively. The momentum then headed beyond the zero line and stabilized at the resistance area (top) from June until December with an average momentum of 0.36. The researcher might infer from the banking sector's average momentum reading of (0) in January that the movement of its shares was marked by a strong standstill. Following this, the stock prices' momentum fell below the zero line and downward, resulting in average momentum readings for the months of January, February, March, April, June, and May of (0, -0.011, -0.011, -0.029, -0.02, -0.011), respectively. In other words, this sector finished the first and second quarters of 2020 in the support zone (bottom), quickly recovered from the pandemic-related health issues, and then resumed a gradual, erratic rise in the third and fourth quarters, ending the year with an average momentum of (0.01) in December.

The analysis of the market condition based on MI of 2021

The Iraqi stock market was involved in trading of (930) billion shares worth (812) billion dinars over the course of (226) sessions, during which (114,467) transactions were carried out, and as a result of which the trade index increased to (596) points at the end of the last session of 2021. The researcher identifies the occurrence of variations that were represented in the index under investigation through his analysis of stock prices. The banking sector, which accounted for 95% of the trading volume, was followed respectively by the other sectors (business, services, communications, insurance, agriculture, and lodging).

Table 6. Average monthly stock prices for each sector based on MI of 2021

Month	Sectors				MI
	Industry	Services	Telecommunication	Banks	
1	-0.2	0.0	0.4	0.0	0.05
2	0.65	0.65	1.9	0.061	0.82
3	**0.9**	**0.81**	**1.4**	**0.065**	0.79
4	2	2	0.93	0.079	1.25
5	1.82	0.82	0.59	0.048	0.82
6	**1.3**	**1.3**	**0.34**	**0.038**	0.74
7	0.3	0.3	0.0	0.01	0.15
8	0.0	0.1	0.0	0.036	0.03
9	**0.1**	**0.02**	**0.4**	**0.017**	0.13
10	-0.1	0.1	-0.3	0.046	-0.06
11	0.02	-0.29	-2.52	0.025	-0.69
12	**0.05**	**-0.5**	**0.0**	**0.0**	-0.11
Mean	**0.57**	**0.44**	**0.26**	**0.04**	**0.33**

The industrial sector began in the bottom support region (with an average momentum of -0.2) and soon proceeded to the top resistance area (with an average momentum of 0.65, 0.9, 2, 1.82, 1.3, 0.3, 0, 0, and 0.1) from February until September. The greatest average momentum of (2) was recorded in the month

of April. We can observe that the industrial sector saw more peaks than lows by looking at the average momentum. With an average momentum of (0.05) and an overall average of (0.57), this sector finished the month of December. The services sector began between the areas of peaks and troughs and on the zero-line barriers, recording an average momentum of 0 in January. Then the index headed towards the resistance area (the summit), recording an average of (2) in the month of April. Momentum rates continued to fluctuate in the resistance area (the summit) until the month of November, recording an average momentum of (-0.29), while this sector concluded with a rate of momentum in the area. Support (bottom) reached -0.5.

Model Building

In order to accomplish the study's objective—that is, to determine whether the momentum indicator, a technical financial analysis indicator, has a long- and short-term impact on the trend of common stock prices in relation to the Iraqi stock market—we must first answer the question: Does the momentum index contribute to the analysis of the trend of Iraqi common stock prices? The applied study will depend on monthly time series data for the Iraqi market from 2021 to 2018—a total of 48 monthly observations—to achieve this. which were gathered from the Central Bank of Iraq in addition to company financial records. The availability of the data informed the selection of this sample. The following general model in linear form will be relied upon to explain the relationship between the momentum index and stock prices, according to the following function (1):

$$\boldsymbol{SP_t = C + MI_t + \sum_{k=1}^{K} \beta_k X_t^k + \epsilon_t} \qquad (\mathbf{1})$$

Where (SP t) represents the level of common stock prices for the sectors investigated at time t, where (t = 1, 2,…,n), C represents the function constant, and (MI t) represents independent variable, which is the momentum index over time t. But (X_t^k) represents a vector of control variables, which represent potential determinants of common stock prices other than the momentum index. Finally, (ϵ t) represents the error term with its usual characteristics. As for the control variables, we relied on macroeconomic variables, in line with previous studies. Moreover, the exchange rate, the level of inflation, the real interest rate, and finally the financial policy followed by the state were controlled. The fineness of its description was also confirmed, i.e., whether these variables in their relationship with common stock prices follow a linear or non-linear form. Accordingly, the auxiliary regression for non-linearity test—squared terms—was used to test non-linearity and characterize the model. Which showed that all-independent and control variables follow a linear form in their relationship to common stock prices in the four sectors. The empirical model in its final form is thus defined as follows:

$$\boldsymbol{SP_t = \beta_0 + \beta_1 MI_t + \beta_2 Exc_t + \beta_3 Inf_t + \beta_4 RIR._t + \beta_5 FP_t + \epsilon_t} \quad (\mathbf{2})$$

Where (SP t) represents the common share price of the sector under investigation, and will be expressed using four main sectors that include industry (iii , SP_ I t), services (ii , SP _S t), communications (iv ,SP_ T t) sinks (SP_ B t). However, β_1 represents the regression coefficient of the independent variable targeted here, which is the MI. While the rest of the coefficients from (β 2) to (β 5) express the regression coefficients of the control variables, which are the exchange rate (Exc t), inflation (Inf t), interest rate (RIR t), and the level of fiscal policy (FP t). Finally, (β 0) expresses the regression coefficient of the fixed part, and (ϵ t) represents the error term with its usual characteristics. Moreover, theoretically, the sign of the coefficient (β 1) is expected to be positive in the four sectors, given the importance of financial technical analysis within the framework of the momentum index in studying the analysis, evaluation, and pricing of common stock prices in the future and its great potential in predicting the fair value of stocks in the future. The impact of the other control factors is unclear and dependent on the stock price variable employed since various economic sectors do not react to changes in macroeconomic variables in the same way.

Data

The analysis relied on the financial bulletins published on the official websites of the Iraqi Stock Exchange and the Federal Ministry of Planning of Iraq. The common stock price indices for the examined sectors as well as the MI will be calculated. Furthermore, the study relied on the official website of the Central Bank of Iraq to determine the macroeconomic variables (control variables), Finally, Table 7 presents a brief description of the variables used in the econometric analysis, their symbols, and data sources, while Tables 8 display the statistical description of the variables and the correlation matrix between them.

Table 7. Data definition and sources

Variables	***Definitions***	***Source***
Stock Price, Industry	Common stock prices of the industrial sector	ISM
Stock Price, Services	Common stock prices of the service sector	ISM
Stock Price, Telecom	Common stock prices of the telecom sector	ISM
Stock Price, Banks	Common stock prices of the banking sector	ISM
Momentum Index	The change in the movement of share prices up and down, as it reflects the acceleration in the movement of the share price when the trading range in a specific period is higher than in the previous period	ISM
Exchange rate	Official exchange rate (IQD per US$, period average)	CBI
Inflation rate	Inflation, prices paid by consumers (annual %) (2012=100)	CBI
Real interest rate	Interest-Rate on Saving Deposits in IQD	CBI
Financial policy	Surplus & Deficit (Million ID) as proxy of financial policy	CBI

Table 8. Descriptive statistics for variables, 2018M1 - 2021M12

	Obs.	***Mean***	***Median***	***Std. Dev.***	***Min***	***Max***	***Normality test***
Dependent Variable:							
Stock Price, Industry	48	0.2543	0.1175	0.533	-0.42	2	[24.409] ***
Stock Price, Services	48	0.1748	0.1	0.488	-0.67	2	[27.820] ***
Stock Price, Telecom.	48	0.0278	0	0.706	-2.52	1.9	[50.845] ***
Stock Price, Banks	48	-0.0028	0.002	0.045	-0.11	0.08	[2.5759]
Independent Variable:							
Momentum Index	48	0.1131	0.11	0.376	-0.762	1.25	[4.6977] *
Control Variables:							

Exchange rate	48	1251.7	1182	117.0	1182	1450	[10.817] ***
Inflation rate	48	1.6938	0.6	2.779	-1.6	8.4	[10.702] ***
Real interest rate	48	3.5671	3.57	0.183	3.28	3.88	[2.5635]
Financial policy	48	3.7945	2.3454	9.685	-16.59	25.69	[0.6980]

Note: - *, **, *** indicate significance at 10%, 5% and 1% respectively.

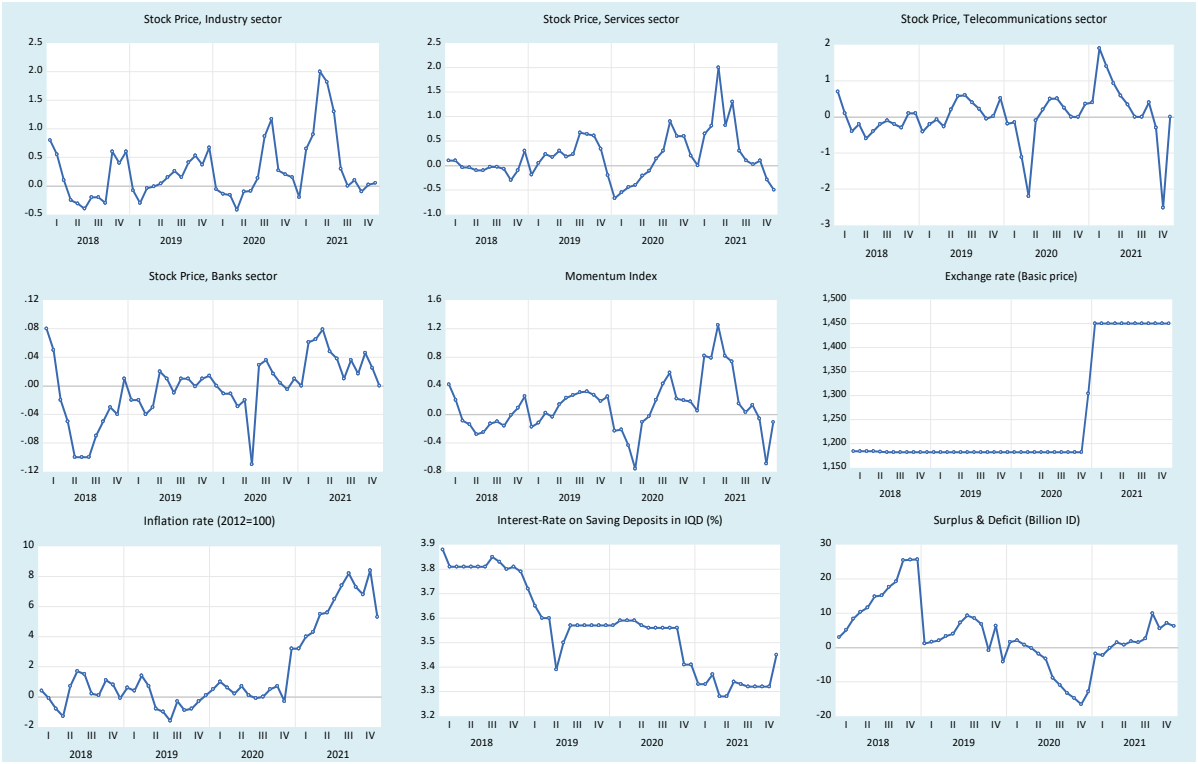

Figure 1. Variables trend during the period, 2018M1 - 2021M12

It is evident from Table 8 the statistical summary of all the study variables with the normal distribution test statistic was statistically significant for the majority of the variables. Accepting the alternative hypothesis and rejecting the null hypothesis reveals that these variables do not follow a normal distribution, reflecting the variability of these variables' performance throughout the course of the study period. In other words, we discover significant variations that expel these time series outside of their mean. For the dependent variables, we find, that common stock prices were highest in the industrial sector with a positive general average of (0.254), followed by the services sector (0.175). Consequently, the telecommunication sector (0.028), and finally the banking sector with a negative general average (-0.003). In addition, we find that the MI (the independent variable) ranges between 1.25 and -0.762, with an overall average of 0.113. Namely, on average, the last closing price is 0.113 degrees greater than the closing price in previous months. Finally, for the control variables, we find that there was a violent fluctuation in the exchange rate during the month of December 2020, which led to an increase in the exchange rate from 1,182 Iraqi dinars per dollar to 1,450 dinars. Likewise, the inflation rate ranged between -1.6% and 8.4%, depending on economic fluctuations and crises, whether local or international. Therefore, the average inflation rate in Iraq reached 0.6% annually. The change in the real interest rate that serves as a proxy for monetary policy and the size of the budget deficit or surplus, which serves as a proxy for fiscal policy in Iraq on the other hand, showed more consistency.

Regarding Table 9, it displays the zero-order correlation analysis between the research model's variables. Bivariate correlations are used to accomplish this. We can initially confirm the predicted

associations using these bivariate correlations, as well as rule out the potential that the research model has multicollinearity issues. The table in this case makes it obvious that there are positive correlations between the four sectors' common stock prices. For instance, we discover a connection between the industrial sector stock price index and the stock prices of the services, communications, and banking sectors of 75.7%, 52.5%, and 65.2%, respectively. All of these correlations are statistically significant at the 1% level, which reflects the homogeneity of the performance of common stocks among the different sectors. The increase in the prices of common stocks for the industrial sector is largely linked to the increase in the stock prices of the rest of the sectors, which is logical, because the economic recovery that any sector is going through will be reflected necessarily on the performance of other sectors. It is seen that the MI correlates favorably, strongly, and statistically substantially with the standard stock price indices for the four sectors. With a correlation value of 86.6%, the industrial sector's stock prices and MI have the strongest association, followed by the services sector (85.8%), the telecommunication sector (84.2%), and the banking sector (61.6%). this suggests that the study's central premise—that the momentum index has a role in assessing the values of common stocks that might be verified. As for the control variables, we find that their correlation with the stock price variable varies depending on the sector used, meaning that these correlations are not homogeneous from one sector to another. This gives an indication of the possibility that the impact of these variables on common stock prices may differ depending on the sector studied. Finally, as for the correlation coefficients between the independent and control variables with each other, it is clear that they ranged between weak and moderately strong, with the exception of the exchange rate's correlation with the inflation rate and interest rate variables, which was strong.

Table 9 Correlation matrix between variables, 2018M1 - 2021M12

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Stock Price, Industry	(1)	1								
Stock Price, Services	(2)	0.757[a]	1							
Stock Price, Telecom.	(3)	0.525[a]	0.535[a]	1						
Stock Price, Banks	(4)	0.652[a]	0.491[a]	0.414[a]	1					
Momentum Index	(5)	0.866[a]	0.858[a]	0.842[a]	0.616[a]	1				
Exchange rate	(6)	0.342[b]	0.322[b]	0.204	0.505[a]	0.336[b]	1			
Inflation rate	(7)	0.239	0.191	-0.006	0.379[a]	0.155	0.926[a]	1		
Real interest rate	(8)	-0.335[b]	-0.414[a]	-0.221	-0.569[a]	-0.375[a]	-0.769[a]	-0.678[a]	1	
Financial policy	(9)	-0.191	-0.271[c]	-0.181	-0.365[b]	-0.253[c]	-0.102	-0.044	0.504[a]	1

Note: - a, b, c indicate significance at 1%, 5% and 10% respectively.

DISCUSSION AND CONCLUSIONS

Econometrics analysis and results

The current study will employ time series analysis to look at cointegration and the long-term dynamic influence of the momentum index on common stock prices in Iraq. Based on the usage of autoregressive-distributed lag (ARDL), this strategy by following these stages:

Unit root test for stationary

Although one advantage of the ARDL method is that it can be applied regardless of the degree of integration of the variables. Whether they are integrated to the same degree, that is, of degree I (0) or I (1), or integrated to different degrees, i.e., I (0) and I (1). But the only condition for applying this test is that the time series should not be integrated into degree I (2). Therefore, the first step in the analysis is to verify the stationarity of these series and determine the degree of integration of each series in the model in order to avoid vague regression. One of the most significant and well-known techniques for stationarity testing is the unit root test, which determines if a time series is stationary. Despite the abundance of unit root tests, stationarity is most frequently found using the Augmented Dickey-Fuller (ADF) test in applied research. Unit root tests are not always reliable, as demonstrated by Fuller (1976), and it is preferable to employ numerous tests. Thus, the findings integrity will be ensured using the Philips-Perron (1988) (PP) test. In studying unit root tests for time series, Perron (1989) and the time series literature, emphasize the significance of structural breaks (breakpoints) tests. Perron went on to explain that the traditional ADF test is biased against rejecting the null hypothesis because of the presence of breaks or structural breaks in time series. In other words, it favors the erroneous unit root. Here, the Dickey-Fuller with breakpoint test and the Zivot & Andrews (1992) test will be relied upon, which represents a development of the Perron test when there is only one structural break that is internal (endogenously), that is, unknown. However, Nunes et al. (1997) and Bai & Perron (1998) draw attention to the necessity of confirming in advance if a chain break exists. When a unit root test is run for it in the presence of a structural break but there is no break point (structural change), the outcome will be a bogus break. Even if the breaking point does not truly exist, the unit root test in this case has a tendency to estimate one in the middle of the series. Therefore, unit root tests are unreliable in the following cases: i). When there is a breaking point (structural change) and it is not included in the test regression. ii). If the breakpoint does not exist, it is included in the test regression. iii) Using an incorrect date for the break point in the test regression (this is, of course, in tests where the break point is exogenously determined). In order to establish assumptions about the nature of time series, the study by Shrestha and Chowdhuiy (2005) showed that the researcher must use specific judgments based on economic theory. Therefore, all model variables will undergo the standard unit root tests, with the exception of the exchange rate variable, based on Figure 2. It will be evaluated for stability in the event of a structural shift, as we infer from the figure that the shock of exchange rate liberalization in November 2020 will be the cause of the structural break in 2020–12. This led to a violent break in the exchange rate chain. Below are tables of the results of various unit root tests. Table 10 summarizes the results of the unit root with a structural break for the exchange rate series. while Table 11 summarizes the results of the traditional unit root. In addition to Figure 2, shows the structural break point of the chain.

Table 10. Unit root test results

Variables	*Augmented Dickey-Fuller*			*Phillips-Perron*			***Results***
	Intercept	*Intercept & trend*	*None*	*Intercept*	*Intercept & trend*	*None*	
Stock Price, Industry	-2.9124[c]			-2.9124[c]			I (0)
Stock Price, Services	-3.0508[b]			-2.7278[c]			I (0)
Stock Price, Telecom.	-4.1029[a]			-4.1395[a]			I (0)
Stock Price, Banks	-3.2325[b]			-3.3112[b]			I (0)
Momentum Index	-2.7650[c]			-2.9096[c]			I (0)
Inflation rate	-0.9664	-2.0475	-0.4771	-0.9664	-1.9741	-0.4771	
D (Inflation rate)	-7.2700[a]			-7.2680[a]			I (1)
Real interest rate	-1.6735	-2.1374	-1.2299	-1.6681	-2.3100	-1.3314	
D (Real interest rate)	-7.0407[a]			-7.0399[a]			I (1)
Financial policy	-1.8297	-2.1209	-1.6808[c]	-1.8164	-2.2605	-1.6605[c]	I (0)

Note: - a, b, c indicate significance at 1%, 5% and 10% respectively.

Table 11. Breakpoint Unit root test results

Variables	*Dickey-Fuller*			*Zivot and Andrews*			***Results***
	Intercept	*Intercept & trend*	*Year of Break*	*Intercept*	*Intercept & trend*	*Year of Break*	
Exchange rate	-269.63[a]		2020M12	-269.63[a]		2020M11	I (0)

Note: - a, b, c indicate significance at 1%, 5% and 10% respectively.

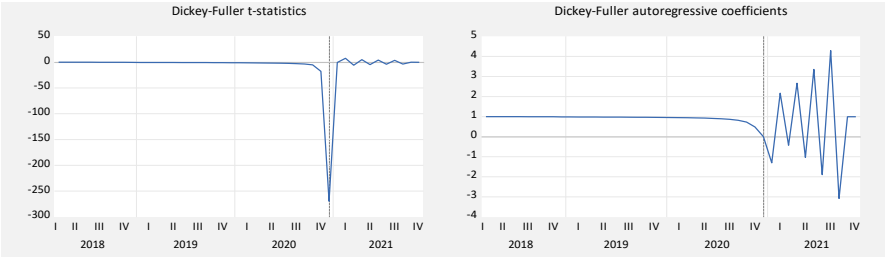

Figure 2. Unit root test with structural breakpoint

The results of the stationarity tests (ADF) and (PP) showed that the financial policy, momentum index, and common stock prices for the four sectors were stationary at the level (Level), which means that they are integrated at degree I (0). The results of the two tests likewise concurred that the inflation and interest rates were not stationary at the level. However, they did become stationary when the first difference was obtained, or integrated of degree I (1). The Zivot and Andrews test and the Dickey-Fuller test both concluded that the exchange rate variable is stable at the level, that is, it is integrated of degree

I (0), as shown by the unit root test in the presence of structural change in Table 12. The breach occurred in November and December of 2020, as seen in Figure (2)this shows the impact of the exchange rate liberalization shock. The research model must be modified to include a dummy variable for the 2020–12 period. Since the variables are a mixture of I (0) and I (1), the results of the stationary tables demonstrate that the variables are stationary at both the level and the first difference, which further supports the application of the autoregressive distributed lag (ARDL) approach.

Co-integration test with ARDL

To conduct co-integration between variables according to the ARDL approach, we first test whether there is a long-term relationship between the study variables, i.e., co-integration, within the framework of the Unrestricted Error Correction Model (UECM). This is done by comparing the calculated stat-F value with tabular values within critical limits. If the calculated stat-F value is greater than the tabulated upper limit value, then, in this case, the null hypothesis is rejected and the alternative hypothesis is accepted. That is, there is a co-integration relationship between the variables. Instead, if the calculated stat-F value is between the upper and lower bound values, the result is inconclusive because it is impossible to decide whether there is co-integration between the variables. However, if the calculated stat-F value is less than the tabulated lower bound value, the null hypothesis is accepted, indicating that there is no co-integration between the variables. The outcomes of the co-integration test utilizing the ARDL technique are displayed in Table 12.

Table 12. Bounds testing results:

Regressors: (k = 5)			*F-statistic*
Reg (1): $SP\_I_t = (MI_t, Exc_t, Inf_t, RIR_t, FP_t)$, ARDL *(3, 0, 0, 0, 0, 0)*			22.365***
Reg (2): $SP\_S_t = (MI_t, Exc_t, Inf_t, RIR_t, FP_t)$, ARDL *(4, 4, 3, 4, 4, 1)*			37.765***
Reg (3): $SP\_T_t = (MI_t, Exc_t, Inf_t, RIR_t, FP_t)$, ARDL *(4, 4, 4, 4, 4, 4)*			34.110***
Reg (4): $SP\_B_t = (MI_t, Exc_t, Inf_t, RIR_t, FP_t)$, ARDL *(4, 0, 0, 1, 3, 2)*			23.330***
Significant level	Critical values bound		
	Lower Critical Bounds (LCB)	Upper Critical Bounds (UCB)	
10%	2.276	3.297	
5%	2.694	3.829	
1%	3.674	5.019	

Note: - *** indicates significance at 1%. – K indicate to No. of independent variables.

The findings shown above make it abundantly evident that the F-statistic values generated for the four models surpass the appropriate upper bound (UCB) values. Inferring that there is a long-term equilibrium link between the momentum index and the common stock prices of the four sectors, the null hypothesis is thus rejected and the alternative hypothesis is accepted. This means that at the 1% level, there is a co-integration connection. In order to acquire estimators of the long run and short-run parameters, we can finish the study.

Long-run and short-run model estimation using ARDL

This necessitates estimating the long-term connection of the models in addition to estimating the error correction model since the variables of the models in the second phase of the applied research have a co-integration relationship. The residuals derived from the long-term relationship and approximated with a single lag time ε_(t-1) are used for this term. Here, the error correction model (UECM) has two important aspects: the first is that it estimates short-term coefficients, while the other is the error correction term (ECT), which is represented by the coefficient (γ) in the previous equation. It measures

the speed of adjustment of the imbalance from the short term towards equilibrium in the long term, which must be significant and negative in order to provide evidence of the stability of the relationship in the long term (i.e., that an error correction mechanism is present in the model). But before using the ARDL model to estimate parameters, it is necessary to ensure the quality of the models used in the analysis are free from various measurement problems in order to be confident about the results obtained. As evidenced by the diagnostic tests shown in Table 13.

Table 13. Diagnostic Tests results:

Diagnostic Tests	**Tests used**	***F-statistic (Prob.)***			
		Reg (1)	***Reg (2)***	***Reg (3)***	***Reg (4)***
Heteroskedasticity	Breusch –Pagan -Godfrey	1.4375 (0.203)	0.6633 (0.828)	0.8449 (0.664)	0.7975 (0.656)
Serial Correlation	Breusch-Godfrey LM test.	1.1834 (0.319)	2.0274 (0.178)	9.9647 (0.009) [a]	1.2641 (0.301)
Normality	Jarque-Bera	1.8399 (0.399)	0.4212 (0.810)	3.1139 (0.211)	2.3979 (0.302)
Function Form	Ramsey RESET Test	5.5841 (0.024) [b]	1.8660 (0.197)	0.0046 (0.948)	0.0650 (0.801)
Autocorrelation	a. Correlogram -Q- statistics	No	No	No	No
	b. Correlogram Squared Residuals	No	No	No	No
Stability test	a. CUSUM	stability	stability	stability	stability
	b. CUSUM of Squares	stability	stability	stability	stability
	R-squared	92.2%	99.6%	99.8%	94.8%
	Adjusted R-squared	89.6%	98.6%	98.9%	91.1%
	Durbin-Watson stat.	2.1611	1.9809	2.8359	1.5610
	F-statistic (*Prob.*)	35.488 (0.000) [a]	102.51 (0.000) [a]	119.08 (0.000) [a]	25.565 (0.000) [a]

The diagnostic tests show that the calculated standard models are free of the non-stationarity of variance and serial correlation between the residuals issues in this respect. It also shows that the residuals have a normal distribution and that the models are correctly specified their functional form is valid. In addition, the data used is free of any structural changes (no jumps or sudden changes in the data over time), due to the graph of the Cumulative Sum of Residuals (CUSUM of Squares) test being located within the critical limits are at the level of 5%. Therefore, there is stability and consistency in the model used between the long-term results and the short-term results. In addition to the general statistics, which show a high value of the adjusted coefficient of determination ($R\bar{}^2$), which indicates a high explanatory power of the model, The proposed study model explains between 92.2% and 99.8% of the changes that occur in the prices of common stocks for the four economic sectors. The remaining portion of the percentage results from random error, which results from measurement mistakes and other factors not taken into account by the model. A further confirmation that there is no serial correlation between the first-order residuals comes from the fact that the computed Durbin-Watson test value (DW-stat) was higher than the tabular (DW) value. The (Fisher) test also shows that the alternative hypothesis—that there is statistical significance for the model as a whole at the level (1%) —is accepted and the null hypothesis is rejected. A determination on the suitability of utilizing this model to estimate the long-term and short-term relationship may be made based on the outcomes of these tests, as shown in Table 15. This comprises four regressions, the first of which (Reg 1) is about the prices of regular industrial

sector shares. While the second regression (Reg 2) concerns the common stock prices of the services sector, the third regression (Reg 3) concerns the common stock prices of the telecommunications sector, and finally the fourth regression (Reg 4) concerns the common stock prices of the banking sector.

Table 14. Momentum index and Stock Price in Iraq: Empirical results:

Dependent Variable: Stock Price

Method: ARDL with HAC standard errors

Model selection method: Schwarz criterion (SI)

Variable	*Reg (1)* *Stock Price, Industry*	*Reg (2)* *Stock Price, Services*	*Reg (3)* *Stock Price, Telecom.*	*Reg (4)* *Stock Price, Banks*
Long-run coefficients:				
Momentum Index (MI)	**1.108 [8.201] *****	**1.304 [18.64] *****	**1.544 [28.23] *****	**0.016 [3.081] *****
Exchange rate (Exc)	-0.002 [-2.078] **	0.001 [0.893]	0.002 [3.382] ***	-1.1e-5[-0.219]
Inflation rate (Inf)	0.114 [3.376] ***	0.005 [0.198]	-0.098 [-4.358] ***	-0.001 [-0.676]
Real interest rate (RIR)	-0.039 [-0.089]	0.473 [2.284] **	0.358 [3.138] **	-0.207 [-9.631]***
Financial policy (FP)	-6.9e-9[-1.321]	-4.1e-9[-1.844] *	-2.3e-9[1.575]	1.9e-10[0.802]
Constant	2.620 [1.104]	-2.542 [-1.601]	-4.098 [-3.884] ***	0.744 [6.448] ***
Error correction coefficient:				
ECM (-1)	-0.841 [-13.60] ***	-1.321 [-19.66] ***	-2.476 [-19.95] ***	-1.488 [-14.23]***
Short-run coefficients				
Stock Price (-1)	-0.841[-10.71] ***	-1.321[-13.66] ***	-2.476[-11.35] ***	-1.488[-11.88] ***
Momentum Index (MI)	**0.932 [8.769] *****	**1.723 [10.50] *****	**3.823 [10.34] *****	**0.024 [3.174] *****
Exchange rate (Exc)	-0.001 [-2.066] **	0.001 [0.916]	0.006 [3.689] ***	-1.6e-5[-0.219]
Inflation rate (Inf)	0.095 [3.203] ***	0.007 [0.197]	-0.242 [-4.798] ***	-0.002 [-0.679]
Real interest rate (RIR)	-0.033 [-0.089]	0.625 [2.453] **	0.887 [3.117] **	-0.308 [-7.64] ***
Financial policy (FP)	-5.8e-9[-1.311]	-5.5e-9[-1.957] *	5.7e-9[1.608]	2.9e-10[0.802]
Constant	2.204 [1.103]	-3.357 [-1.686]	-10.15 [-4.168] ***	1.107 [5.691] ***

Note: - ***, ** indicate significance at 1% and 5% respectively.

Table 14 displays a number of intriguing findings, including the first regression's (Reg 1) findings on the industrial sector. This demonstrates that the momentum index has a favorable long-term and short-term influence on the values of common shares in the industrial sector. The regression coefficient indicates that a one-degree increase in the momentum index raises the prices of industrial sector common stocks by 1.108 over the long term and 0.932 over the short term. The matter was no different when moving to the following regressions, as we also find a positive long- and short-term effect of MI on the ordinary stock prices of the services sector in the second regression (Reg 2). The stock prices of

the telecommunication sector in the third regression (Reg 3), and the stock prices of the banking sector in the fourth regression (Reg 4). This specifically indicates the strength and stability of this relationship. In comparing these regressions, it becomes clear that MI has the greatest possible impact on ordinary stock prices for the telecommunications sector with a long-term impact factor of 1.544, followed by the services sector (1.304), then the industrial sector (1.108), and finally the banking sector (0.106). Moreover, the effect had no differences in the short term.

This outcome is in line with the correlation matrix, which showed a high positive connection between the momentum index and the common stock price indices for the four sectors. This conclusion confirms the study's main finding, which is that the technical financial analysis indicator MI may predict the price of common shares of the businesses in the research sample. Thus, these results confirm the importance of technical financial analysis in giving a clear scientific image to investors about investing in the common shares of the companies under study and obtaining the highest possible return in terms of buying and selling. In addition to providing relevant companies and academics with in-depth knowledge about the use of new financial and statistical tests, which helps them predict common stock prices correctly and fairly. Regarding the control variables, we find that their effect on the common stock prices of the four sectors is not homogeneous, as expected from the correlation matrix. Depending on the researched industries, stock prices react differently to changes in macroeconomic factors. Ordinary share prices, for instance, in the industrial sector are impacted by changes in inflation and currency rates. Changes in interest rates, fiscal policy, and other factors influence the pricing of common shares in the service sector, but the fact that the ECM error correction factor (-1) was considerable and negative, demonstrating the existence of the error correction mechanism in the model, demonstrates the relationship's long-term stability.

Effect Size in determining the significant of the relationship

The strength of the results may be evaluated using the effect size rather than just statistical significance tests alone since it gives a quantifiable measurement of the extent of the link between variables. Namely, it demonstrates the degree to which the relationship has practical meaning in the real world, i.e., whether the relationship has minor, medium, or big practical value in the financial environment of Iraq. Reporting effect sizes in quantitative research has been the norm in a number of scientific fields; with the most significant reason, possibly being that statistical significance is the least intriguing aspect of the findings. Statistical significance (p) is not sufficient because it only tells us that there is a stronger relationship between two variables (rejecting the null hypothesis); that is, it simply tells the reader that the relationship between the variables is unlikely to be the result of pure chance. Moreover, the size of the effect tells us the extent of its influence (the strength of the relationship in practice). For example, the statistical significance value may be less than 0.05, but the effect size is small. Here, it may not be worth investing in intervention or drawing conclusions to develop theory. The effect size thus promotes a more scientific approach. We summarize that the effect size brings us additional information for the inferential decision to accept or reject the null hypothesis, which is why we found extensive discussion under the name Null Hypothesis Significance Testing (NHTS). Therefore, the American Psychological Association (APA) recommends in Chapter 1.01 Design and Preparation of Research Reports that all published statistical reports should also include effect sizes, APA Fifth Edition Manual section (2002). The effect magnitude is computed here using the long-term partial correlations between MI and the prices of common stocks. It controls the remaining factors in the model since they also have an impact on the dependent variable and assesses the correlation between the dependent and independent variables.

Table 15. Practical significance for Momentum Index

	Reg (1)	***Reg (2)***	***Reg (3)***	***Reg (4)***
Effect Size (Cohen's d)	2.5615	5.8248	8.8124	0.9624
Effect Size (r)	0.7882	0.9458	0.9752	0.4336
Confidence interval (%95)				
Lower	0.6115	1.5324	2.3534	0.1141
Upper	0.8802	0.9204	0.9866	0.4294
Interpretation	***Large Effect***	***Large Effect***	***Large Effect***	***Large Effect***

Note: ***, **, * indicate significance at 1%, 5% and 10% respectively.

The table 15 makes it abundantly evident that MI, whether measured in terms of the partial correlation coefficient (r) or the Cohen's d coefficient, has practical significance in the Iraqi financial environment. But in order to avoid the problem of small study bias, further research and studies applying bigger samples are needed before acting to build theories or policies based on this conclusion. That is, research with small samples provides more information about the impact size than studies with larger samples.

This summary describes the emphasis on the theoretical and practical aspects of the research. Moreover, it clarifies the findings in terms of developing a thorough theoretical picture and having a clear understanding of the conclusions that were generated and came from theoretical and applied accumulations, both parts of the descriptive analysis of the research variables, and testing the two research hypotheses and supporting them through data extraction, tabulation, classification, and analysis. This is evident in the research's conclusions and suggestions, and as a result, in the ability of technical analysis indicators, such as MI, to forecast future stock prices and value based on announced information that is available to investors and financial analysts whenever they need it. They are transformed into stock price truths by technical financial research using specialized instruments, such as indicators and maps. The researcher is confident in this model's capacity to forecast these prices in the future and in how it will help boost future profits. The forecast is made using quantitative indicators, including historical trading data and technical indicators relevant to our current research. These indicators have proven effective in predicting stock price movements because the movements of these prices are affected by the issuance, dissemination, and absorption of information.

In this regard, financial news is a crucial source of information for investors that may influence their attitudes and investing practices. As a result, these metrics, including MI, are viewed as a "black box" that rationally explains the connection between the two research factors in the examined sectors and their potential success through their direct influence on stock prices. The analytical indication shown above can therefore gauge an investor's compass toward the fair price of shares during the purchasing or selling process. Technical financial analysis is crucial for offering investors a clear scientific image of how to invest in the common shares of the firms under investigation and get the best return on purchases and sales. Additionally, it gives relevant businesses and academics in-depth information on the use of new financial and statistical tests that aid in the accurate and fair prediction of common stock values. The results of the current study confirmed this by using monthly time series data for the Iraqi market during the period 2021–2018, with a total of 48 monthly observations for four main sectors (industrial, service, telecommunications, and banking). According to the study, MI has both a long-term and short-term favorable impact on the values of common shares in the four sectors. The telecommunications industry, the services sector, the industrial sector, and lastly, the banking sector are the ones that are most affected by MI on the value of common shares. The presence of a significant impact size of MI in the Iraqi financial environment was also confirmed by the partial correlation coefficient (r). Moreover, Cohen’s (d) coefficient necessitates relying on the management of the Iraqi stock market to determine its future policies on MI.

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