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Article

Evaluation of The Trading Strategy Using The "Moving Average" in The Iraqi Stock Market

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Abstract: This paper aims to evaluate the trading strategy using simple moving average with different lengths of "10 days, 20 days, 50 days, 100 days, 150 days, 200 days" on the Iraq Stock Exchange (ISX60) index during (109) trading days, and compare it with the simple buy and hold strategy. The findings show that, despite the Iraq Stock Exchange's lack of efficiency at the basic level, trading with moving averages may predict price movement and, after subtracting trading expenses, produces profits that are higher than those of the buy and hold strategy. Additionally, compared to other moving averages, the 20-day simple "moving average" is more predictive.

Keywords: Moving Averages, Trading Strategy, Stock Market

1. Introduction

Profiting in the financial markets is what investors ultimately want. Trading in stocks, bonds, foreign exchange, and precious metals are examples of traditional investing opportunities. The most common option for financial investments among these options has been stock market trading. Investors have discovered that feelings and intuition alone cannot ensure profitable returns. However, when there are many investors trading against one another in the market, it is also challenging to make money.

According to the efficient market theory, when other investors have access to the same kind of market knowledge, their benefits could be countered [1]. Then, investors thought that past data would offer clues about future price changes. As a result, most investors now place a high priority on trading rules based on technical analysis [2].

Technical analysis has a good reputation among the sectors but is seen as risky and unreliable, and suitable only for speculation rather than as a means of accurately predicting price movements. (Thomsett,2012:9) Although technical analysis is widely used by practitioners in financial markets, its popularity in the academic community does not reflect this, as academics have considered it an obscure, unscientific technique (Dumiter& Turcaș,2023:3). This hasn't, however, made market players less interested in financial trading. The growing body of research showing that technical trading is lucrative over extended periods of time has contributed significantly to the recent surge in scholarly interest in technical analysis. Furthermore, a lot of experts still use technical trading rules to support their fundamental research. According to a survey by Robert Strong, most investment experts think that using technical analysis improves investment success. According to Allen and Taylor (1990), almost 90% of traders in the Hong Kong and London markets use technical trading techniques to forecast currency values. Technical analysis is predicated on the following key tenets [3]:

1. All factors that could influence an asset's price are taken into account and discounted.

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2. Prices follow patterns.
3. History repeats itself.

These ideas go against the weak version of the efficient market theory, and many studies have shown that technical analysis doesn't work to make risk-adjusted returns that are higher than a simple "buy and hold" trading strategy.

Bachelier (1900) discovered that there is no pattern in prices and that past price movements cannot be utilized to forecast future ones. He came to the conclusion that the speculator has no mathematical expectation. Created the phrase "market efficiency" and contended that a filter-based strategy should be a buy-and-hold strategy [4]. Used charts to assess thirty-two investing methods and came to the conclusion that they could not produce returns greater than those of the market [5]

Nonetheless, a few recent studies have offered some proof that technical trading can be profitable. Found that long-term returns reverted to the mean. Future returns are higher for stocks that have historically produced low returns [6]. Stocks with larger returns over the preceding five years had lower relative returns (than the market index) in the following three years, stocks having lower returns over the preceding five years had higher relative returns. It has been demonstrated by [7], [8], [9], Jegadish and Titman (1993) that returns may be forecast based on historical returns. Simple moving average trading rules have been utilized by [10], [11] and a few others to demonstrate that these methods generally produce larger returns than buy-and-hold strategies.

Literature Review

Technical analysis has experienced a resurgence in academia and on Wall Street since the early 1990s. Several well-known studies have demonstrated the value of a few fundamental trading principles in forecasting stock market outcomes. Brock, Lakonishok, and LeBaron (1992) examined moving averages and trading range breakouts on the Dow Jones Industrial Average from 1897 to 1985. To generate buy and sell signals, they employed various short- and long-term moving averages of prices, utilizing short-term moving averages of one, two, and five days, as well as long-term moving averages of fifty, one hundred, and two hundred days in their testing. They state that "their results are consistent with technical rules having predictive power" and that "all the buy/sell differences are positive."

Some variations of BLL moving averages have been used by other researchers to investigate whether a basic form of technical analysis can be utilized to anticipate stock market indicators. According to [12], BBL criteria were effective in forecasting changes in stock prices in Japan, Hong Kong, South Korea, Malaysia, Thailand, and Taiwan; the latter three markets exhibited the highest predictability. [13] tested two technical methods for trading with moving averages across four Asian markets. Their findings indicated that moving average rules can identify recurrent price patterns for profitable trading and possess predictive value.

Metghalchi, Marcucci, and Chang, [14] examined the profitability of several fundamental technical trading principles across sixteen European stock markets between 1990 and 2006. Their findings suggest that incremental moving average rules can accurately predict recurring price trends that enable profitable trading. Explored the advantages of moving average-based trading rules in India over a ten-year span [15], from December 2000 to November 2010. He utilized the Nifty and Junior Nifty stock indices, which collectively represent the top 100 stocks traded in the Indian market. To identify the optimal trading strategy, [16] examined the performance of the Moving Average Convergence Divergence (MACD-4) approach on extended samples from the German, Russian, and Japanese markets. The author concludes that the MACD-4 trading method exhibits predictive power before accounting for expenses.

2. Materials and Methods

Traders seek to predict the movement of stock prices to make profits and try to test several tools and strategies to achieve this, one of these tools is the standard moving average, as investors and traders in the Iraqi Stock Exchange, which is not efficient at the weak level according to the study [17], [18], [19] lack testing these strategies that depend on moving averages of different lengths.

This paper is based on the hypothesis that trading rules using variable length moving average (SMA) models are useful for traders to predict the movement of the Iraq Stock Exchange index and achieve profitability that exceeds the profitability of the buy and hold strategy.

The aim of this is to measure the profitability of trading rules based on the moving average in the Iraq Stock Exchange. The importance of this study is highlighted by the fact that it seeks to test technical trading rules and the possibility of benefiting from them in the Iraqi market.

Before testing the hypothesis, the questions were whether indicators or stocks should be used, and which market should the study be conducted on. First, the indices were chosen because they are more free from the bias of sample selection than individual stocks, as well as many other technical studies that use indices to test trading rules, not individual stocks, and the design of the indices reflects market standards because they include a number of established stocks.

Second, to determine the market on which the study is conducted, when reviewing previous studies. We note that trading rules based on moving averages have been tested on stock indices of developed countries with semi-strong markets, but have not been sufficiently tested in semi-weak markets.

The Iraq Stock Exchange was chosen by extracting the daily closing prices of the Iraq Stock Exchange Index (ISX60) from daily reports published for the period from 14/5/2024 to 31/10/2024. In this study, we use short "moving averages" of 10 and 20 and long "moving averages of 50, 100, 150 and 200". The "moving averages" are calculated according to the following equation:

$$\text{SMA} = \frac{1}{M} \sum_{i=0}^{M-1} P_{t-i}$$

Where P stands for the closing prices and M for the moving average's number of days.

The difference between the purchase price at the start of the term and the selling price at the conclusion of the period is used to calculate the buy and hold strategy.

The technique contrasts the stock price's simple moving average with its most recent closing price. The trader enters a long investment position (buy) if the current price is higher than the moving average. On the other hand, a short position (sell) is made if the current price is below the moving average. If you buy, the return the following day will equal the difference between the closing price the day after and the closing price the day before, and if you sell, the opposite will be true.

Understanding the potential trading costs for the trader is necessary to assess the profitability of trading regulations. The difference between the ask and bid prices, relevant commissions, taxes, short selling fees, and other spot costs are all included in the total cost of trading. According to the trading rules, the trader on the Iraqi Stock Exchange must pay the brokerage firms' fees, which total (0.006), and the difference between the selling and buying prices, which is approximately (0.01), since the sum of these expenses equals (0.016) for every transaction.

3. Results and Discussion

Using the Iraq Stock Exchange (ISX60) index for 109 trading days, we attempt to evaluate the Simple Moving Average Trading Rules method with varying lengths and compare it with the quarterly 50.87 (1044.3 - 993.43) profitability of the buy and hold strategy for 2024.

Table 1. "Moving average" results for the Iraqi market index.

Trading Rule (1)	Buy (2)	Sell (3)	Buy + Sell (4)	Nb (5)	Ns (6)
SMA (10 day)	154.9	-3.5	151.4	62	47
SMA (20 day)	174.24	11.7	185.94	63	46
SMA (50 day)	154.39	-8.98	145.41	44	65
SMA (100 day)	111.92	-44.79	156.71	40	69
SMA (150 day)	-15.84	-63.73	-79.57	48	61
SMA (200 day)	18.29845	-38.03	- 19.7315	44	65
Average	99.65141	-24.555	123.9457	50.16667	58.83333

Table (1) shows the results of the "moving average" of the Iraq Stock Exchange index for daily trading during the period from 5/14/2024 to 10/31/2024, where column (1) represents the rules of trading moving averages with different lengths ("10 days, 20 days, 50 days, 100 days, 150 days, 200 days"), column (2) represents the total returns gained from buy signals, column (3) represents the total returns gained from sell signals, column (4) represents the combined result of buy signals and sell signals, column (5) represents the number of buy deals, and column (6) represents the number of sell deals.

From Table (1) we notice that the "moving average" strategy "(10 days)" and the "moving average" "(20 days)", "(50 days)", "(100 days)", "(200 days)" predicted the buy signals in column (2) and achieved positive returns in the bull market. Only the "moving average" (150 days) achieved negative returns and did not correctly predict the buy signal in the bull market. The average returns of the buy signals were (99.65141), which means that following the strategy based on moving averages is able to predict the direction of the bull market. We notice in column (3) that all the moving averages did not predict the sell signals in the bear market as they achieved negative returns except for the moving average (20 days) which achieved positive returns, and the average returns of the sell signals were (-24.555), which means that these rules are unable to predict the direction of the bear market. The aggregated result of the returns resulting from the buy and sell signals in column (4) shows that the moving average strategies (10 days), (20 days), (50 days), (100 days) have achieved positive returns, and when subtracted from the trading costs, these returns amount to (149.656), (184.196), (143.666), (154.966) respectively. It is observed that the moving average strategy of 20 days yielded the highest aggregated result of returns, whereas the moving average methods of 150 and 200 days yielded negative aggregated results.

According to the average total returns from buy and sell transactions, which came to 123.9457, trading rules based on moving averages can forecast the direction of price movement and generate profits that are higher than those of the buy and hold strategy, which came to 50.87. Table (1)'s columns (5) and (6) show how many buying days (buy signals) and selling days (sell signals) were produced using moving averages during the course of the trading period of 109 days. We see that all strategies' average buying days (50.16667) are lower than their average selling days (58.83333). This indicates that the

trader is in the market 50.16667% of the time (buying days) and out of the market 58.83333% of the time (selling days).

Table 2. Standard deviation of buy and sell signals.

Trading Rule (1)	Buy (2)	Sell (3)	SDb (4)	SDs (5)
SMA (10 day)	0.498983	-0.453	17.74123	19.00507
SMA (20 day)	-0.32794	-1.645	19.09774	17.15021
SMA (50 day)	-0.99182	-1.53046	22.48581	14.82578
SMA (100 day)	0.8035	-0.19507	29.03098	6.754734
SMA (150 day)	-0.33	-1.04475	26.56003	6.950251
SMA (200 day)	0.234596	-1.22677	21.05124	7.421221
Average			22.66117	12.01788

The standard deviation of buy and sale returns can be seen in Table (2), columns (4) and (5). It is interesting to see that the average standard deviation of buy returns is higher than the average standard deviation of all returns, which is 12.0178. This means that the Iraqi market is less unpredictable when p eople are selling (a bearish market) than when they are buying (a bullish market).

4. Conclusion

This study found that using a trading strategy based on "moving averages" of different lengths on the Iraq Stock Exchange index is able to predict price movements and achieve positive returns, although the Iraqi market is not efficient at the weak level. Additionally, it performs better than the purchase and hold approach. Also, trading rules using the moving average (20 days) achieved the highest returns, whether the market was rising or falling. Therefore, this indicator can be relied upon more than other indicators.

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