



Study On The Comparison Of Different Technical Indicators to Predict The USA Stock Market

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Abstract : The Stock Market is a non linear time series. In this market, buyers, or shareholders, will be able to hold ownership or equity of a firm listed in the exchange. The stock market includes an element of risk, as money may be gained or lost. Although there are theories such as the Random Walk Theory which suggests that the past movement of the share prices do not determine the future value of the stock, there are numerous indicators designed to predict the future value of the share prices with a relatively high degree of accuracy. The purpose of this research is to analyse the concept behind these technical indicators and see how they compare and contrast.

Keywords - Stock Market, Technical Indicators, Random Walk Theory, RSI, Aroon Indicator, NYSE.

I. INTRODUCTION

The evaluation of a particular stock to determine if the future price of the shares will rise or not is determined by the Fundamental and Technical Analysis. [2] The Fundamental Analysis comprises methods to determine the intrinsic value of a stock with financials of the publicly listed company. Financial Statements and Balance sheets will be used in order to look at revenues, profits and assets when Fundamental Analysis takes place. Technical Analysis of a stock is solely based on past trends of share prices. Technical Analysis could be done using Candlestick Chart Patterns, or using 'Technical Indicators' [3] such as RSI (Relative Strength Index), Stochastic Oscillator, Aroon Indicator, MACD (Moving Average Convergence Divergence) and many more. A combination of Both Technical and Fundamental Analysis makes a great prediction of the intrinsic value of the stock. Although Fundamental Analysis may provide a great medium to evaluate share prices, this study focuses on Different Technical Indicators, how they compare to predict the USA Stock Market.

II. SCOPE OF THE STUDY

The Scope of this research is limited to The US Stock Exchange: NYSE; Hence, 3 different stocks from different industries were taken, namely Apple Inc. (AAPL), Walmart Inc. (WMT), and Coca-Cola Co (KO).

Furthermore, the different Technical Indicators used for this study will be RSI (Relative Strength Index) and the Aroon Indicator

III. LIMITATIONS

Firstly, Only 3 companies are selected for comparison and evaluation. Secondly, only Technical Analysis is taken up for analysis, which may be valid for only a particular period of time like 10 days [1]. Secondly, there is always a degree of uncertainty in predictions of share prices as, according to the Random Walk Theory, future prices are Independent of Past prices of shares.

IV. RESEARCH METHODOLOGY

4.1 Objectives

The main objectives are to analyse how the prices have been fluctuating, to predict future prices through the use of RSI and Stochastic Oscillator, and to see if there are any differences in forecasting of the aforementioned technical indicators.

4.2 Calculation Of RSI

RSI Could be calculated as follows:

$$RSI = 100 - [100 / (1 + RS)]$$

Where RS equals the ratio of the Average Upward price movement to the Average Downward price movement [4].

If the RSI values are below 30%, then the stock is oversold, whereas if the RSI value is greater than 70%, it claims that the stock is overbought and overvalued.

4.3 Calculation of Aroon Indicator

There are 2 different Aroon Indicators: Aroon Up and Aroon Down Indicator. When the Aroon Up value is greater than the Aroon Down value, it forecasts bullish price behaviour of the shares. But when the Aroon Down value is greater than the Aroon Up, it will forecast a bearish price behaviour for the stock instead. This could be represented in a formula as shown below:

$$\text{Aroon}_{\text{UP}} = [(10 - \text{Periods since 10 period High}) / 10] \times 100$$

$$\text{Aroon}_{\text{DOWN}} = [(10 - \text{Periods since 10 period Low}) / 10] \times 100$$

4.4 Secondary Data Source

Yahoo Finance was used to obtain secondary data of all three stocks: KO, AAPL, and WMT. The time period of data was from 1st June to 10th June 2021.

V. DATA ANALYSIS AND INTERPRETATION

5.1 The Technical Analysis of Apple Inc.

AAPL	High	Low	Close	Change in price from previous to current day	Upward Movement	Downward Movement
1/6/21	125.35	123.94	124.28	-		
2/6/21	125.24	124.05	125.06	0.78	0.78	0
3/6/21	124.85	123.13	123.54	-1.52	0	1.52
4/6/21	126.16	123.85	125.89	2.35	2.35	0
7/6/21	126.32	124.83	125.90	0.01	0.01	0
8/6/21	128.46	126.21	126.74	0.84	0.84	0
9/6/21	127.75	126.52	127.13	0.39	0.39	0
10/6/21	128.19	125.94	126.11	-1.02	0	1.02
11/6/21	127.44	126.10	127.35	1.24	1.24	0
14/6/21	130.54	127.07	130.48	3.31	3.31	0

Table 5.1: AAPL share Price from 1st June to 10th June

Calculating RSI:

$$\text{RSI}_{\text{AAPL}} = 100 - [100 / (1 + \text{RS})]$$

Average Upward Price Movement: $8.92/9 = 0.991$

Average Downward Price Movement = $2.54/2 = 1.27$

$$\text{RS} = 0.991/1.27 = 0.7803$$

$$\text{RSI}_{\text{AAPL}} = 100 - [100 / (1 + 0.7803)]$$

$$\text{RSI}_{\text{AAPL}} = 43.829\%$$

An RSI of 43% shows that the stock is marginally oversold, and that future prices of this stock will increase.

Calculating Aroon Indicator:

High of last 10 periods: 14/6/21 = \$130.54

$$\text{Aroon}_{\text{UP}} = [10/10] \times 100 = 100$$

Low of last 10 periods: 3/6/21 = \$123.13

$$\text{Aroon}_{\text{DOWN}} = [10 - 6/10] \times 100 = 40$$

$\text{Aroon}_{\text{UP}} > \text{Aroon}_{\text{DOWN}}$; this suggests that the forecast for AAPL in the future will be bullish, the price of AAPL shares will rise.

5.2 The Technical Analysis of Walmart Inc.

WMT	High	Low	Close	Change in price from previous to current day	Upward Movement	Downward Movement
1/6/21	142.80	141.27	141.66	-		
2/6/21	141.71	140.09	141.35	-0.31	0	0.31
3/6/21	141.85	140.75	141.60	0.25	0.25	0
4/6/21	142.29	141.25	141.85	0.25	0.25	0
7/6/21	141.97	140.39	140.90	0.05	0.05	0
8/6/21	140.90	139.81	139.83	-1.07	0	1.07
9/6/21	140.01	139.03	139.08	-0.75	0	0.75
10/6/21	140.19	139.08	139.88	0.8	0.8	0
11/6/21	140.85	139.86	140.75	0.87	0.87	0
14/6/21	140.93	140.03	140.56	-0.19	0	0.19

Table 5.2: WMT share Price from 1st June to 10th June

Calculating RSI:

$$RSI_{WMT} = 100 - [100/(1+RS)]$$

Average Upward Price Movement: $2.22/5 = 0.444$

Average Downward Price Movement: $2.32/4 = 0.58$

$$RS = 0.444/0.58$$

$$RS = 0.7655$$

$$RSI_{WMT} = 100 - [100/(1+0.7655)]$$

$$RSI_{WMT} = 43.35\%$$

An RSI of around 43% again shows that the stock is marginally oversold, and that future prices of this stock will increase.

Calculating Aroon Indicator:

High of last 10 periods: 1/6/21 = \$142.80

$$Aroon_{UP} = [1/10] \times 100 = 10$$

Low of last 10 periods: 9/6/21 = \$139.03

$$Aroon_{DOWN} = [10-3/10] \times 100 = 70$$

$Aroon_{UP} < Aroon_{DOWN}$; this suggests that the forecast for WMT in the future will be bearish, the price of WMT shares will decrease, according to the calculated value of the Aroon Indicator.

5.3 The Technical Analysis of Coca-Cola Co.

KO	High	Low	Close	Change in price from previous to current day	Upward Movement	Downward Movement
1/6/21	55.65	55.10	55.28	-		
2/6/21	55.56	55.26	55.50	0.22	0.22	0
3/6/21	55.74	55.10	55.64	0.14	0.14	0
4/6/21	56.48	55.78	56.24	0.6	0.6	0
7/6/21	56.34	55.81	56.04	-0.2	0	0.2

8/6/21	56.25	55.55	55.65	-0.39	0	0.39
9/6/21	55.92	55.48	55.48	-0.16	0	0.16
10/6/21	56.12	55.76	55.91	0.43	0.43	0
11/6/21	56.21	55.66	56.16	0.25	0.25	0
14/6/21	55.71	55.20	55.55	-0.61	0	0.61

Table 5.3: KO share Price from 1st June to 10th June

Calculating RSI:

$$RSI_{KO} = 100 - [100/(1+RS)]$$

Average Upward Price Movement: $1.64/5 = 0.328$

Average Downward Price Movement: $1.36/4 = 0.34$

$$RS = 0.328/0.34$$

$$RS = 0.9647$$

$$RSI_{KO} = 100 - [100/(1+0.9647)]$$

$$RSI_{KO} = 49.101\%$$

The Calculated RSI value of 49% shows that the stock is sold more than bought, and that future prices of this stock will increase as it is undervalued as of 14/6/21.

Calculating Aroon Indicator:

High of last 10 periods: 4/6/21 = \$56.48

$$Aroon_{UP} = [4/10] \times 100 = 40$$

Low of last 10 periods: 3/6/21 = \$139.03

$$Aroon_{DOWN} = [7/10] \times 100 = 70$$

$Aroon_{UP} < Aroon_{DOWN}$; this suggests that the forecast for KO in the future will be bearish, the price of KO shares will decrease, according to the calculated value of the Aroon Indicator.

VI. CONCLUSION

Here, one could see that although the same data has been taken for the same time period, the Technical Indicators do not necessarily agree with each other. On one hand, in AAPL, both RSI and the Aroon Indicator had forecasted a bullish nature. But, on the other hand, there were different varied forecasts for the WMT and KO stocks. In WMT, the RSI had predicted a bullish future price while the Aroon Indicator predicted otherwise. Again in the Forecasts of KO, the RSI had again predicted a somewhat bullish nature of the stock, while the Aroon Indicator predicted a bearish nature. This shows that there is always uncertainty in the prediction of the stock market. The predictions can be probable, but not certain. The differences in forecasts between 2 technical indicators may reinforce the argument of the random walk theory: that future prices of shares are independent of past price trends.

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