Predicting Stock Price Movements Using Technical Analysis

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ABSTRACT

This study attempts to use technical analysis to see if whether future price movements can be anticipated to make profitable returns in the stock market. This study entails candlestick and chart patterns, as well as a variety of technical indicators to decide on the consensus of whether a particular stock, or the stock market index for that matter, is driving towards bullish or bearish zone. BTM Resources Berhad (7188) is used as a case study for a time period of 3 years from the technology sector is chosen where technical analysis is carried out to study stock price behavior of companies. Daily and 30-minute timeframe charts are used to detect any indication of bullish or bearish signals, which will be confirmed with actual market price return or losses to prove on the validity of the technical tools used to project stock price movements. The results show that technical analysis generally helps in the prediction of future price movement despite the various false signals that can exist. Using technical analysis does not guarantee stock return, but instead helps investors to maximize returns or minimize losses by knowing when to enter or exit a stock position.

Key Words: Technical analysis, Future price movements, Indicators, Candlestick charts and patterns.

INTRODUCTION

Technical analysis (TA), up till this date has been largely ignored by the academicians, particularly in the Malaysian context. There is not much evidence being documented on technical analysis although it is widely used by the practitioners. The principle foundation that technical analysis uses past prices to predict future returns is contrary to the widely documented efficient market hypothesis, endorsed by Fama (1970) which states that it is impossible to beat the market, or particularly impossible to predict future stock price movements because stock market efficiency causes existing share prices to always incorporate and reflect all relevant information available (Bloomfield, 2002; Fifield, Power, and Knipe, 2008). The theory is substantiated by the random walk theory which contends stock price changes have the same distribution and are independent of each other, so the past movement or trend of a stock price or market cannot be used to predict its future movement. (Fama, 1963).

In fact, the traditional approach commonly used to anticipate stock performance was based on fundamental analysis (FA) that utilizes companies’ financial data such as balance sheets, income statements, cashflow statements and analysts’ opinions as an investment tool by measuring the intrinsic value of the security derived from the financial data (Robinson, 2013).
In this approach, if the security price trades below its intrinsic value, then the stock is considered to be underpriced, and therefore a profitable investment. This in turn leads to the general buy and hold strategies rather than time the market as propagated by technical analysis to determine investment decisions.

However recently, more studies have come to challenge market efficiency theory. Past studies using other research methodologies have also challenged this predictability market theory (Marshall, Qian, & Young, 2009; Marshall, Young, & Rose, 2006). For example, Fox (2009) propagated that no one model can explain the market in that sometimes the model fits the efficient market framework while others sometimes follow the behavioral finance framework. In fact, Brock et al. (1992) found that by using simple TA trading tools, consistent positive returns resulted which demonstrated predictive power. Kahneman, Slovic, and Tversky (1982) reiterated that investors do not behave rationally in situations of uncertainty. This justifies why prices vary dramatically during sustained periods of time, hence allowing for abnormal returns to be made.

With respect to FA, it is a long-term approach to analyzing the market as compared to TA. It looks at data over a number of years, so it can take a long time for a company's value to be reflected in the market. As financial data are released over long periods of time where financial statements are generally filed quarterly, changes in earning per share (EPS) cannot be obtained on a daily basis like price and volume information. TA, on the other hand, is short-term in nature based on shorter timeframes. This allows for the opportunity to maximize returns by determining the best timing to enter/exit a market for a particular stock. It helps to understand the stock price behavior with regards to past trends, the signals given by them and the major turning points of the market price. Of paramount importance, TA helps both investors and traders or even punters to forecast future direction of prices to optimize profit-making opportunities in investment decisions.

This study attempts to analyze the performance of selected companies, with particular focus on penny stocks in the Malaysian stock market, by using TA to predict the future trends in its share prices. The study will attempt to translate chart interpretations into buy or sell signals as a basis for investment decision makings. In order validate the buy and sell signals according to the guidelines or benchmarks as set by TA, the outcome of the buy and sell signals will be confirmed with the actual market price returns or losses according to the time frame chosen.

**LITERATURE REVIEW**

Basically, according to Baskarn (2014), TA can be defined as an art and science of forecasting future prices based on an examination of the past price movements. It is not an astrology for predicting prices. It is based on analysing current demand-supply of commodities, stocks, indices, futures or any tradable instrument. It involves putting stock information like prices, volumes and open interest on a chart and applying various patterns and indicators to it in order to assess the future price movements. The time frame in which TA is applied may range from intraday (5-minute, 10-minutes, 15-minutes, 30-minutes or hourly), daily, weekly or monthly price data to many years. The time frame used in technical analysis may range from intraday (5-minute, 10-minutes, 15-minutes, 30-minutes or hourly), daily, weekly or monthly price data. TA does not attempt to measure a security’s intrinsic value. It ignores the fundamentals of the
stock and believes all information is accounted for in the stock price. In this approach, if future prices are expected to increase, an investor would currently lock-in position in order to make foreseeable returns in the future. This involves buying low and selling high or buying high and selling higher. It involves analysis on prices, volumes, candlestick patterns, chart patterns and technical indicators to determine future price movements.

In TA, there are several assumptions to be made. One of the first and most important assumptions of TA is that the market discounts everything. This assumption implies that the existing price and the trade frequency level of a stock embodies all available information about that security and therefore represents the fair value of that security. Sudden changes in how a stock trades in terms of price and volume often precedes major news about the company that issued the stock. This implies that whatever major and current news before it is known to the public is already taken into account by the market.

The second assumption of TA is that price movements can be charted to identify trends and therefore be used to make predictions about future price movements. Hence, with the aid of TA, an investor or trader will then be able to position himself in the market by buying low and selling high or buying high and selling higher in an upward trend to make security gains. By adjusting investment timeframes such as intraday, daily, weekly or monthly price movements of the stock, an investor or trader will also be able to identify short- and long-term trends and therefore make better and a more precise prediction of future price movements according to the timeframe he has chosen.

The third assumption of TA is that history repeats itself and this is with respect to human behavior. It is assumed that traders will react the same way to conditions as they did in the past when those conditions repeat themselves. The ultimate impact of investor behavior is assumed to be accurately reflected in a security’s price behavior and as such, the past price behavior is assumed to follow the same behavior pattern in the future. This implies that traders and investors are able to use the knowledge of how other traders reacted in the past to profit each time those conditions repeat them.

**RESEARCH METHODOLOGY**

A case study on BTM Resources Berhad (7188) is carried out where TA is undertaken to study the company’s stock price behavior. The research design is descriptive and analytical in nature. For TA, the daily and 30-minute share price movements are used for a period of 3 years, i.e. Jan 2011 to Dec 2013. The daily price chart is to identify existing stock trend (bullish or bearish) and the 30-minute chart is to identify stock entry or exit signals. The closing stock prices were taken and the future price movement was analyzed using various tools. Data were collected from Jupiter Investment trading platform.

The major tools and techniques selected and used in this study to generate buy and sell signals are as follows:

1. **Candlestick chart**
   Candlestick charts provide information on opening price, highest price, lowest price and closing price that provides a visual indication of market psychology, market sentiment and potential weakness of the stock.
2. **Support & Resistance**
Support represents price floor while resistance represents price ceiling. When the price breaks through a resistance, it assumes that the price will have the strength to move up to a higher level and vice versa, when the price breaks below the support, it assumes that the price will have the momentum to go lower. In addition, when the resistance level is broken, that level then becomes the new support level (vice versa).

3. **Moving Averages**
Stock prices move in random, and therefore it is difficult to identify overall trends based on price movements alone. The common method used to identify trends is through moving averages which is the average price of a security over a specified period of time.

Moving averages smooth the price data to form a trend following indicator. They do not predict price direction, but rather define the current direction with a lag. Moving averages lag because they are based on past prices. Despite this lag, moving averages help smooth price action and filter out the noise. The two most popular types of moving averages are the Simple Moving Average (SMA) and the Exponential Moving Average (EMA). These moving averages can be used to identify the direction of the trend or define potential support and resistance levels.

This study uses the EMA
Exponential Moving Average (EMA)
EMA is the moving average that is formed by applying weight to the recent price changes.

\[ EMA \text{(current)} = ((price \text{(current)} - EMA \text{(prev)} \times Multiplier) + EMA \text{(prev)} \]

The formula for the smoothing constant is:
\[ K = \frac{2}{1+N} \] where, \( N = \text{number of periods for EMA} \)
The study uses EMA 6 and EMA 18 to monitor average price changes.

4. **Moving Average Convergence Divergence (MACD)**
MACD is a momentum indicator. MACD fluctuates above and below the zero line (the centre line) as the MA converge, cross and diverge. Standard MACD = the 6-day EMA minus the 18-day EMA. A 9-day EMA of MACD represents the signal line to identify turns in the indicator. The MACD histogram represents the difference between MACD and its 9-day EMA, the signal line.

5. **Momentum (MO)**
The momentum indicator compares where the current price is in relation to where the price was in the past.
Momentum = current price minus the price n-periods ago

If the current price is higher than the price in the past, then the momentum indicator is said to be positive and therefore bullish. In contrast, when the current price is lower than the price in the past, then the MO indicator is negative, hence bearish. The study uses 15-day MO to monitor the momentum of price movement.

6. Relative Strength Index (RSI)
RSI is an oscillator that measures current price strength in relation to previous prices. It oscillates between zero and 100 and is calculated based on 14 days values. It is used to generate buy and sell signals, show overbought and oversold conditions, confirm price movement and warn of potential price reversals through divergences.

\[
\text{RSI} = 100 - \frac{100}{1+\text{RS}}
\]

where,
\[
\text{RS} = \frac{\text{average of upward price change over a select number of days}}{\text{average of downward price change over the same number of days}}.
\]

All in all, the selected tools and techniques used to generate buy and sell signals can be summarized as follows:

| Table 1 |
|---|---|
| **BUY/SELL SIGNALS** | |
| **Candlestick** | 1. Candlestick above EMA6 & EMA18 : Bullish  
2. Candlestick below EMA6 & EMA18 : Bearish |
| **Support & Resistance** | 1. Price breaks resistance : Bullish  
2. Price breaks support : Bearish |
| **EMA** | 1. EMA6 > EMA18 : Bullish  
2. EMA6 < EMA 18 : Bearish |
| **MACD** | 1. EMA12 & EMA26 above EMA 9 : Bullish  
2. EMA12 & EMA26 below EMA 9 : Bearish  
3. EMA12 > EMA 26 : Bullish  
4. EMA12 < EMA 26 : Bearish |
| **MO** | 1. 15-day MO > 100 : Bullish  
2. 15-day MO < 100 : Bearish |
| **RSI** | 1. RSI crosses above 20 : Bullish (Oversold)  
2. RSI crosses below 80 : Bearish (Overbought) |

**CHART ANALYSIS**
BTM Resources Berhad (7188) is used as a case study in the use of TA to study stock price behavior. The company engages in logging, saw milling, and trading sawn timber and logs in Malaysia. The company also involves in the trade of plywood; Kiln-drying operations, molding
timber, and manufacture of finger jointed timber and lamination boards; and letting of plant and machinery. BTM Resources is based in Kuala Lumpur, Malaysia.

**Chart 1: Daily Chart of BTM Resources Berhad**

Based on the daily chart for the period of 1 year (refer to chart1), starting from mid-September to the 3rd of November, prices are in a period of downtrend, followed by a trend of sideways. This is a reflection of bearish signals which implies that no position should be taken on this stock. On the 4th of November, price closes at 19.5 sen.

**Chart 2: 30-minute Chart of BTM Resources Berhad**
Based on the 30-minute chart (refer to chart2), on the 5th November, the candles start to move above EMA6 & EMA18. This represents a bullish signal according to table 1 buy and sells signals. In addition, when indicator EMA6 is above EMA18, this also represents a bullish signal. On the 6th of November, there is a volume spike. The price breaks resistance at 20.5 sen and both indicators EMA12 & EMA26 are above EMA 9, which again represent bullish signals. Simultaneously, the indicator MO(15) is above 100 which signal the strength of the upward price movement. The RSI of 70 is also considered a bullish signal yet to enter into the overbought boundary of 80 and above. When RSI reaches the boundary of 80 and above, and maintain in that boundary for a specific period of time, it is the start of a signal that warns of price reversal.

**CHART INTERPRETATIONS & RECOMMENDATION**

On the 6th Nov, entry was made at 21sen upon resistance break, which is one bid higher than resistance price. On the 7th Nov, candles start to fall below EMA6 which indicate bearish signals. MACD EMA6 also starts to fall below EMA 18 which also indicate bearish signals. On this 7th Nov, a tight exit should be implemented at 26.5 sen. Simultaneously, MO(15) & RSI also starts to fall that compliments the above bearish signals. Finally, on the 10th Nov, when EMA6 falls below EMA18, a tight stop loss or exit should be followed at 25 sen.

All in all, based on the above tools used to evaluate investment opportunities, when Entry is made at 21sen and Exit is made at 26.5sen, then a return of 26.2% is made can be obtained for a 2-day investment strategy.
LIMITATIONS OF THE STUDY

The limitations of the study can be categorized as the followings:

<table>
<thead>
<tr>
<th>Limitations</th>
<th>Future Potentials</th>
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</thead>
<tbody>
<tr>
<td>1. Study is based on a case study on 1 company</td>
<td>1. Research may proceed to include more samples to produce more substantial results on the validity of the technical tools used.</td>
</tr>
<tr>
<td>2. Research is only descriptive and analytical in nature.</td>
<td>2. Research may proceed to an empirical study to obtain more robust results on the validity of the technical tools used.</td>
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<tr>
<td>3. Research is only limited to the study on technical analysis in analyzing investment opportunities.</td>
<td>3. Research may proceed to other areas of TA such as: • False signals that may arise from TA • Detection of Syndication in Bursa Malaysia • Use of TA to study on the Behavioral Aspects of Investors/Traders</td>
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CONCLUSIONS

Technical analysis is a technique which gives an idea about future share prices of selected companies in which we invest. However, the technician also requires fundamental knowledge of the company to have a clearer idea about the investment decision. At best, using both Technical and Fundamental analysis can help in a more accurate investment decision in the stock market.

REFERENCES


