

## **TECHNICAL ANALYSIS OF THE CAPITAL MARKET IN ROMANIA**

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### **Abstract**

*This paper presents a technical analysis of the capital market in Romania. In this respect, we used the closing values of the BET index. The BET index is a composite index of the Bucharest Stock Exchange, formed of the top ten most liquid listed companies. The technical analysis is performed on the following areas: trend indicators, moment indicators and volatility indicators. In many analyses of the Romanian capital market, it has been found that it has a low level of efficiency and can be an opportunity for many investors to obtain abnormal incomes. In this market are still many periods when the technical analysis is relevant to investors, the market is not efficient in a poor form.*

**Keywords:** technical analysis, trend indicators, moment indicators, volatility indicators

**JEL classification:** C61, C88, G12

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### **1. Introduction**

Technical analysis is relevant to investors when the capital market is not efficient in a weak form. In Romania, several studies have been conducted on the efficiency of the capital market weak form. Much of the results of these studies have highlighted the fact that this market has a low level of efficiency and this level is variable over time (Dragotă and Oprea, 2014). As a result, the capital market in Romania is a period in which investors using the technical analysis can obtain abnormal incomes from the trading of shares listed on the Bucharest Stock Exchange. However, it should be noted that efficiency tests performed over different periods of the Romanian capital market cannot be considered as effective instruments for abnormal gains (Dragotă and Oprea, 2014, p. 25).

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Our paper presents a technical analysis of the Romanian capital market. For this purpose, we used the closing values of the BET index. The BET index is a composite index of the Bucharest Stock Exchange, formed of the top ten most liquid listed companies. The technical analysis is performed on the following areas: trend indicators, moment indicators and volatility indicators.

By the concept of technical analysis, we mean "*a method of predicting price movements and market trends in the future, by studying the past market history graphs, which take into account the price of instruments, the volume of transactions and, where possible, unregulated positions (open interest) on instruments*" (Reuters, 2001, p. 18). Another definition that we find in Wilmott (2007, p. 628) is: "Technical analysis is a way of predicting future price movements based only on observing the past history of prices. This price history may also include other quantities such as volume of trade. ... Technical analysis is also called charting because the graphical representation of prices, etc. plays an important part. Technical analysis is thought to be particularly good for timing market moves; fundamental analysis may get the direction right, but not necessarily when the move will happen".

Technical analysis of the capital market, based on stock indices, may indicate relevant information on market trends as a whole, but it can also provide useful information to investors holding shares for which the coefficient  $\beta$ , of the single-factor regression function W. Sharpe, has a value greater than or less than 1. Thus, if the technical analysis of the stock index anticipates an upward or downward trend, then the shares having  $\beta > 1$  must be bought or sold. And for  $\beta < 1$  must be sold or bought. In this way, by means of technical analysis of the stock index, a higher return on the portfolio can be achieved than the increase in market profitability, respectively a decrease in the portfolio's profitability lower than the loss of profitability of the market.

## **2. Literature review**

The issue of the technical analysis of the capital market is a current one and we will outline some relevant articles as follows: Rossilo et al (2013) – Technical analysis and the Spanish stock exchange: testing the RSI, MACD, momentum and stochastic rules using Spanish market companies; Chiang et al (2012) – Are technical trading strategies still profitable? Evidence from the Taiwan Stock Index Futures Market; Vasiliou et al (2006) – How Rewarding is Technical Analysis? Evidence from Athens Stock Exchange; Mitra (2011) – How rewarding is technical analysis in the Indian stock market?; Abbondante

(2010) – Trading volume and Stock Indices: A test of Technical Analysis; Yamamoto (2012) – Intraday technical analysis of individual stocks on the Tokyo Stock Exchange; Chong and Ng (2008) – Technical analysis and the London Stock Exchange: testing the MACD and RSI rules using the FT30.

### **3. Methodology**

Our technical analysis is in the following areas: trend indicators, moment indicators and volatility indicators. Of the trend indicators, we will use SMA, EMA, MACD; of the moment indicators we will use RSI and Momentum; of the volatility indicators we will use the Bollinger Bands.

The SMA (Simple Moving Average) indicates the average value of a series of closing values over a period of time (the most common time intervals used are: 9, 20, 50, 100 and 200 days). It is obtained by summing a series of closing values and dividing the amount thus obtained over a number of periods. For simple mobile averages, the average of closing values is for a certain number of days (Reuters, 2001, p.117-108).

The EMA (Exponential Moving Average) is used in the same way as SMA, but it differs in the way it is calculated. The indicator gives a higher share of the latest data and responds to changes faster than the SMA (the SMA indicator gives the same share of all data used). Also, the indicator does not change in response to old data (Elder, 2014, p. 76). For both SMA and EMA, the buy signal occurs when the price intersects from the bottom up the moving average, and a sell signal occurs when the price crosses the top down the moving average.

The MACD (Moving Average Convergence-Divergence) indicator is an indicator of two exponential moving averages for 12 and 26 days respectively, for determining the MACD line and a 9-day exponential moving average for signal line determination (Elder, 2014, p. 81). When the MACD line crosses the signal line up, the signal is buying, and when the MACD intersects down the signal line, the signal is for sell. MACD intersection with the signal line may indicate a reversal of the previous trend. Also, moving MACD up, above level 0, indicates a buy signal, and MACD passes down below level 0, indicating a sell signal.

The RSI (Relative Strength Index) measures the relative changes between increasing and decreasing closing values (compares a tool only with its own previous performance). Indicator values range from 0-100. The buy signal is passing RSI up, above level 30, and the sell signal is passing RSI down below the level of 70 (Reuters, 2001, p. 134).

The Momentum indicator measures the change in the rate of increase or decrease in prices. Increasing the indicator above level 0 indicates that the ascending trend is gaining momentum, while lowering the indicator below 0 indicates that the downward trend is gaining momentum. If the pointer crosses level 0, it is a signal to open or keep the position only in the direction of the current trend (Brătian, 2016, p. 274).

The Bollinger Bands indicator is made up of two bands that wrap a simple moving average - usually the average of 20 periods. The two bands are two standard deviations above and below average. Using two standard deviation, statistically, 95% of the prices are within those bands. As a rule, when prices reach the upper band, it is considered that the market is overbought, and when prices reach the lower band, the market is considered to be oversold. Bollinger Bands are also sensitive to market volatility. When the market is volatile, the two bands move away from each other, and when the market is a little volatile, they tend to get closer.

#### **4. Technical analysis of the Romanian Capital Market**

In the following, a technical analysis of the Romanian capital market is presented using the indicators presented above. The data from the technical analysis are the daily closing values of the BET index of 2018. We used the TradingView.com platform for the calculation of the indicators and the results obtained are presented in graphs 1, 2, 3, 4, 5, 6. For each graph I have made a brief interpretation.

**Graph 1. SMA (9)**



Source: own analysis using the TradingView.com platform

**Graph 2. EMA (9)**



Source: own analysis using the TradingView.com platform

At the beginning of December 2018, graphs 1 and 2 do not give us a clear buy / sell signal, the value of the BET index being in line with the calculated moving averages (blue lines). In the short term, the upward trend of the index will continue until it appears a significant upside-down intersection of the moving average by the value of the BET index.

**Graph 3. MACD and MACD Histogram**



Source: own analysis using the TradingView.com platform

The MACD indicator (blue line) is both above the signal line (red line) and above level 0. This suggests that in the short term the upward trend of the BET will continue, at least until the MACD crosses the line signal or will go below 0.

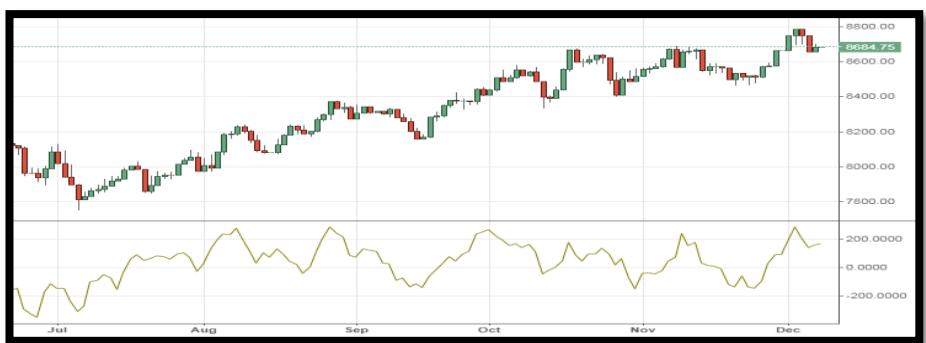
**Graph 4. Relative Strength Index (RSI)**



Source: own analysis using the TradingView.com platform

For the BET index, we do not have a strong signal of reversing the upward trend, so that until new emerging elements, strictly according to this technical analysis indicator, we find it inappropriate to enter the market at sell positions.

**Graph 5. Momentum**



Source: own analysis using the TradingView.com platform

The Momentum indicator suggests an increasing evolution of the BET index, with the oscillator having a positive value. Against this background, short-term trend is expected to continue.

**Graph 6. Bollinger Bands**



Source: own analysis using the TradingView.com platform

From the analysis of the Bollinger Bands chart, it is noticeable that BET index volatility has declined from one day to the next. By the time the course does not come out of the Bollinger Bands, a significant trend shift is not expected. As a result, in the near future, the trend will continue to rise.

## 5. Conclusions

On the basis of the results obtained with the above mentioned technical analysis indicators, we conclude that the upward trend of the BET index will continue in the short term. As a result, until the appearance of new items or extreme events, we find it inappropriate to enter the market on sell positions. It is also appropriate to purchase shares for which the coefficient of the single-factor regression function W. Sharpe is greater than 1 ( $\beta > 1$ ).

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