



# Calibration of Bollinger Bands Parameters for Trading Strategy Development in the Baltic Stock Market

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## Abstract

In recent decades there was a robust boom in investment sector in Lithuania, as more people chose to invest money in investment funds rather than keep money in the closet. The Baltic States Market turnover has increased from 721 MEUR in 2000 to 978 MEUR in 2008 (with peak 2603 MEUR in 2005). When difficult period appeared in global markets, a lot of attention was dedicated towards the managing of investments. Investment management firms in Lithuania gain significance in personal as well as in business section increasingly; even though these firms are considerably young (the first one in Lithuania was established in year 2000). Successful investment begins with the financial analysis of stock, asset or index, which you are going to invest. Professionals can be divided into two groups as far as this point is concerned: supporters of fundamental analysis and the supporters of technical analysis. Fundamental analysts try to determine a company's value by looking at the balance sheet, cash flow statement and income statement. Technicians, on the other hand, assume that all these fundamentals are accounted for in the stock's price and analyses charts of price movements and various indicators derived from the price and volume. Technical analysis suffered major criticism when Fama (1965) presented his efficient-market hypothesis (EMH), which states that past prices cannot be used to profitably predict future prices. However, many researches showed that EMH is not adequate in many aspects. With this background the "Quantitative Behavioral Finance" theory was introduced (see recent works of Gunduz Caginalp, Vernon Smith, David Porter, Don Balenovich, Vladimir Illieva, Ahmet Duran, and Ray Sturm). This theory includes some topics of classical theories, but mainly it is based on behavioral analysis of market agents and helps to understand behavioral biases in conjunction with valuation. This means that there is no reason to criticize the technical analysis, but in difficult cases (e.g. crises) it should be supplemented by behavioral analysis of agents. In this paper some methods of technical analysis are used to create an investment strategy trading in Baltic States stock market. The main objectives of this research are: adapt Bollinger Bands to the Baltic market, determine which investment period with – long term or short term – Bollinger Bands is more efficient, research the efficiency of Bollinger Bands depending on the parameters. In this paper the optimal parameters are calibrated and the expected profit is estimated without the information about the transaction costs. "Bollinger plotter" was developed using the most popular mathematical toolbox MatLab in order to solve stated problems. Application is capable of charting Bollinger Bands and 6

other technical indicators with desired period of time. This software is not a fully automated decision making system, as decisions are usually made based on value judgment. Since the stock returns usually have distributions with fat tails, then less than 95% of data fit in the Bollinger trading channels. However the Bollinger bands trading signals were supported by additional indicators (e.g. %b), so the loss of data is not significant. Our calibration results show that short term investor should apply 10 days moving average and use a trading channel with the width of 1.8 standard deviations, for the Bollinger bands.

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