

METHODICAL BASE OF THE SHORT-TIME INVESTMENT IN THE STOCK MARKET

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Abstract. The paper shows a methodical base of short-term investment in a stock market. The produced algorithm helps the potential investor to execute short-term purchase transactions in the stock market. For the selection of the best company stocks authors offer to use a comparative fundamental analysis of the company valuing 17 parameters in 5 grade system, which are obtained from profit or loses and balance items, in the end obtaining company's average rate. Authors of the paper offer the short-term investors to carry out a fractal technical analysis based on the average rates that are obtained from the highest values. In the fractal technical analysis authors have shown places in prices graph at certain values of tools, where short-term investors should proceed with purchase transactions.

Keywords: Securities, investments, stock exchange, fundamental analysis, technical analysis, tables – comparative fundamental analysis.

1. Introduction

To create a portfolio of shares for the period of up to one year, it is necessary to know the fundamental and technical method of market analysis. Each of these methods has its own methodology. The aim of this paper is to develop a sequence of algorithms allowing to combine both methods and to develop a portfolio of shares for the period of time of up to a year.

The object is stocks portfolio and goal of this publication is to create an algorithm of short term investing in stock markets, which can help the investors to create their portfolios.

The research methods used in the publication are the following: the research of literature sources, practical experience and Microsoft excel computer program.

Citizens of Latvia are ready to invest in financial markets to retain or increase their monetary funds; moreover, increasing number of private investors wish to manage their funds to increase the start capital as fast as possible. Investigation of statistical data of Latvia clearly shows that the level of income of Latvian citizens is increasing. It would certainly be not correct to draw on the basis of this a conclusion that people wish to invest their free funds in risky financial deals; however, in case of ignoring investigation of free funds at all, they loose their value with time

and cause loss to the owner of the funds as inflation and other factors that reduce the value of the free funds influence the value of the funds.

Potential investors can certainly invest their resources in funds and they can also create relatively high profitability. Latvian banks and investment management companies offer a large variety of investment funds with high, low and negative profitability (profitability can also be negative, although the aim of any fund is to achieve the highest possible level of profitability. It is an issue of market situation; however, funds are equally subject to risk as operations with fund shares are depending on a specific type of the funds considered to be risky operations.

Today's situation in Latvia due to the bank system, accessibility of brokers' services and modern information technologies allows the investors to create their own portfolio of investments without leaving the house. The use of the internet ensures access to almost any kind of information, financial markets and any kind of information concerning financial tools is no exception. It is possible to track changes in prices on the computer screen in real time online.

2. Theoretical basis of short-term investments

Having analyzed the available literature and summarizing the opinions of experts, the authors consider that the basis of successful investment in stock

market is selection of stocks using fundamental comparative method. For entrance in the market it is effective to use technical analysis of stock market. It must be mentioned that the correct choice of stocks gives only a small part of the investor's expectations as most of the experts and stock market profiteers think the profitability of the stock market around 70–80% is not determined by the stocks but by the general market tendency in a particular period of time.

The main objective of the fundamental analysis is considered to be the determination of unvalued stocks with the highest growth potential. A generally accepted practice comprises comparison of different fundamental rates thus determining the potential shares rise of a company against the fundamental field rates of other companies operating in the particular field. [1]. In other words, it is analysis, evaluation and comparison of various company parameters.

The basis of suggested and developed fundamental analysis is shares evaluation scale, developed by the authors, that is used to find the best shares in a particular field. The evaluation scale includes also the main conclusions of Victor Niederhoffer about the main parameters of shares, the so called „Condition of three signals” [2]. The scale is created on the basis of theoretical perceptions and those acquired in practice about the balance of the company and the estimate of losses and profit. The main task of the scale is considered to be the demonstrative way to value the operation of the company both for long – term and quarterly.

The number of technical analysis strategies used all over the world is extremely large; however, these

strategies can be grouped according to what was considered when creating the strategy. Many trading strategies are based on indicators or oscillators, although there exist also more exotic trading strategies, such as entering and leaving the market based on the cycles of the Moon; although similar strategies are not acceptable to most investors, there are investors in the world that not only supports this strategy, but also use it in practice. Summarizing the sources [1–6] the authors of the paper support the fractal technical analysis as the most perspective one. Each investor that develops his or her strategy has to choose a “support” (guidelines) that will serve as the basis of the strategy. Many researchers in the world acknowledge the perspectives of forecasting the financial market using fractal technical analysis as all the common forms of technical analysis lose their topicality as they fail to reach the desired results [7].

When investing fractal characteristics closer you can come to a new type of market analysis. With the help of fractals it is possible to achieve price forecasting with high forecast credibility [7]. The type of technical analysis provided by authors is to use fractal technical analysis to enter or leave the market. Authors will attempt to show how it is recommended to purchase shares and when to sell them, by using the fractal kind of technical analysis.

At first sight it seems that the nature of chaos excludes the possibility to manage it, however it is quite opposite, the chaotic unstable trajectories of the system makes it very sensible to influence. Main tools that the theory of chaos is provided with are attractors and fractals.

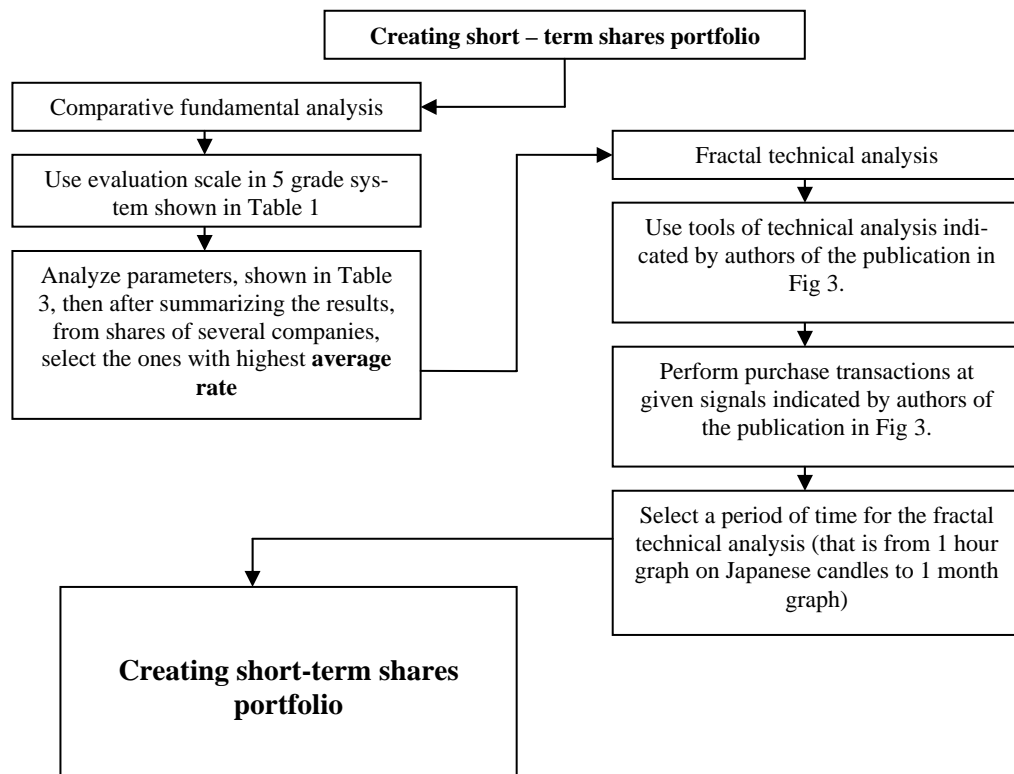


Fig 1. Algorithm for creating the portfolio of shares using the fundamental and technical method of analysis

After some time it is possible to get from the chaotic trajectory to any point in surrounding environment that belongs to the attractor – geometric structure that is characterized by its behavior in dimensions of phases in longer periods of time [8]. To clarify what an attractor is, it is necessary to understand dimensions (phases). Dimensions determine the amount of information that is necessary to assign point coordinates that belongs to attractor in the bounds of the established procedure. To make it simple: attractor is the final bound of the system, boundary of its oscillations and dynamics. Attractor is considered to be the solution field of that the system tends to, to what it is being attracted to. The uncertainty of the chaos is mostly explained with the start parameters, conditions called also the „butterfly effect”. One of the most important theories of the chaos is that it is not possible to forecast the future, because there will be always some mistake in the bench-mark data and because of unknown all factors and conditions.

3. Methods of generating action plan alternatives

Creating short-term portfolio of shares is complicated process consisting of many stages that use fundamental comparative and technical analysis. First stage in this algorithm is selection of the best companies using fundamental comparative analysis, which is followed by the second stage – performing fractal

technical analysis on the graph of prices (using „Japanese” candle graphs that are not less than 1 hour interval). Algorithm that enables to perform short-term investments in the shares of company is shown in Fig 1.

4. Comparative fundamental grade system for company evaluation

Basic analysis is based on financial parameters. Maximums of 17 parameters are being evaluated in total.

Table 1 summarizes evaluation criteria that are assigned with value at a particular outcome.

Potential investors analyze the parameters using 5 grade evaluation scale that is displayed in Table 1. Maximum that one parameter can achieve is 5 grades and the minimum is 1 grade. Parameters must be evaluated against the same period in the previous year (quarter). Evaluations for each parameter, as shown in

Table 1, are obtained from theoretical knowledge [1–6, 9–11], as well as from personal experience and have to be considered as subjective determined by authors, because no reference source determines the best or worse rise of fall of the parameters. The scale of parameters is a subject of update and enhancement by adding new parameters or removing the less important ones, according to the opinion of the investor. The criteria of evaluation can be adjusted according to the needs of each investor.

Table 1. Evaluation table of 17 parameters (created by authors, used [1–6, 9–11])

Name of the parameter (its increase or fall that is being rated)	Granting points according to the group of parameter value or its dynamics				
	1	2	3	4	5
1. Income+/-, %	from -50 to -100	from 0 to -50	From 1 to 10	From 10 to 30	from 30 and more
2. Barrowed capital /Joint capital, %	from 80 to 100	from 50 to 80	from 30 to 50	from 0 to 15	from 15 to 30
3. Net gain +/-, %	from -50 to -100	from 0 to -50	from 1 to 30	From 30 to 100	more than 100
4. Dividends +/-, %	from -70 to -100	from 0 to -70	from 1 to 30	From 30 to 100	more than 100
5. P/E +/-, %	from 100 to 100+	from 50 to 100	from 0 to 50	from 0 to -50	from -50 to -100
6. EPS +/-, %	from -30 to -100	from 0 to -30	from 0 to 30	from 30 to 100	from 100 to 100+
7. Money +/-, %	from -50 to -100	from 0 to -50	from 0 to 30	from 30 to 100	from 100 to 100+
8. Income/ Stocks +/-, %	From -50 to -100	From -10 to -50	From -10 to 10	from 10 to 30	from 30 to 100+
9. Debtors +/-, %	from 80 to 100+	from 30 to 80	from 0 to 30	from 0 to -45	from -45 to 80
10. Debtors/Assets, %	from 50 to 100	from 30 to 80	from 20 to 30	from 10 to 20	from 0 to 10
11. Balance value per share +/-, %	From -70 to -100	from 0 to -70	from 1 to 30	from 30 to 100	from 100+
12. EV +/-, %	From -30 to -100	from 0 to -30	from 0 to 30	from 30 to 100	from 100+
13. EV/EBIT	from 80 to 100+, also if negative	from 30 to 80	from 20 to 30	from 10 to 20	from 10 to 20
14. Trends (In price graph)	Down	–	neutral	–	up
15. ROA, %	from 0 to -100	from 0 to -10	from 10 to 25%	from 25 to 40	from 40 to 100 +
16. ROE, %	from 0 to -100	from 0 to -10	from 10 to 25%	from 25 to 40	from 40 to 100 +
17. ROS, %	from -100 to 0	from 0 to -10	from 10 to 20%	from 20 to 40	from 40 to 100

The average rate serves as basis for basic evaluation of the company. Assumptions for the action according to the obtained number are as follows:

- From 1 to 2, recommendation – Sell
- From 2 to 3, recommendation – Sell or Hold
- From 3 to 4, recommendation – Buy or Hold
- From 4 to 5, recommendation – Buy

As it can be seen from the assumptions at particular average rate shown above, then investor can make a decision on his own, although in this case authors of the paper used whole numbers, investor can adjust them according to his/her needs. Table 2 summarizes information what numbers from profit and losses and balance items are necessary to calculate the necessary evaluation criteria. Data of the company that is the subject of the research from the last quarter (year) are being compared to the same period of time from the last year.

5. Example of comparative fundamental evaluation of the company

Researches of authors proved that the selected list of evaluation parameters and grades in the evaluation system can be used to prepare lists of potential investments. We will examine and example in a Table 3 of 17 parameters evaluation based on bench-mark data of imagined joint stock company AA. To obtain all these 17 parameters, investor has to summarize data from balance and calculation of profits and losses in the current period, as shown in Table 2 The financial information about companies whose stocks are

quoted in the stock exchange should be freely available in public. The main objective of the fundamental analysis is considered to be the determination of unvalued stocks with the highest growth potential. A generally accepted practice comprises comparison of different fundamental rates thus determining the potential shares rise of a company against the fundamental field rates of other companies operating in the particular field [1]. In other words, it is analysis, evaluation and comparison of various company parameters.

The first step in conducting a comparative analysis of fundamentals is to choose suitable evaluation criteria as shown in Table 1. The second step involves collecting of information about the company and its financial indicators that are necessary for the analysis. And finally the third step is the actual evaluation of financial data obtained before. The example of evaluating financial indicators is done in Table 3. After rating and comparing several companies the investor should have gathered general information and chosen those companies that are worth to invest in purely based on fundamental analysis. The further action will be selecting the best companies that meet the highest average evaluation. After completing the comparative analysis of fundamentals investor has to choose the form of technical analysis. The authors of the publication recommend using fractal technical analysis to define the best moments when to enter the market, teoretically, when the price is the best.

Table 2. Bench-mark data of joint stock company AA, necessary to obtain 17 parameters for evaluation [1–6, 9–11], in USA dollars – \$

Name of the parameter	Year 2006	Year 2007
Capitalization,\$	35 359	54 925
Income,\$	6 733	10 108
Own capital, \$	6 386	8 682
Borrowed capital, \$	3 725	5 229
Total assets, \$	10 111	13 911
Number of shares (usual)	849	876
Number of shares (privileged)	no	no
Price of a share (usual), \$	41,67	62,72
Price of a share (privileged), \$	no	no
EBIT (Income before payments of interest and taxes),\$	864	1 436
Net income,\$	585	975
Dividends per share , \$		
P/E	60,44	56,33
EPS, \$	0,69	1,11
Money, \$	2 254	6 346
Stocks, \$	164	204
Debtors, \$	888	861
Balance value per share (calculated as Own capital + Borrowed capital/Total number of shares),\$	11,92	15,89

Table 3. Example of fundamental analysis table (composed by authors)

Name of parameters	Year 2006	Year 2007	Evaluation
1. Income (increase or decrease in percents),%		50,13	5
2. Barrowed capital/Total capital (in percents), %	36,84	37,59	3
3. Net income(increase or decrease in percents), %		66,67	4
4. Dividends (increase or decrease in percents)			2
5. P/E (increase or decrease in percents), %		-6,80	4
6. EPS (increase or decrease in percents), %		61,50	4
7. Money (increase or decrease in percents), %		181,54	5
8. Income/Stocks (increase or decrease in percents), %		20,69	4
9. Debtors (increase or decrease in percents), %		-3,04	4
10. Debtors/Assets (Proportion of debtors against total assets)	8,78	6,19	5
11. Balance value per share (increase or decrease in percents)		33,31	4
12. EV (increase or decrease in percents)		46,10	4
13. EV/EBIT (Value of company against the income before interest and taxes), ?	42,63	37,47	3
14. Trends (on price graph of the week – determined visually)		Up	5
15. ROA (increase or decrease in percents), %	5,79	7,01	3
16. ROE (increase or decrease in percents), %	9,16	11,23	3
17. ROS (increase or decrease in percents), %	8,69	9,65	2
		Sum	64
		Number	17
		Average rate	3,7647059
	Decision on shares of the particular company		Hold/Buy

6. Fractal technical analysis as a decision making method in shares purchase

The authors of the paper suggest using fractal technical analysis as a method of technical analysis [7]. The word fractalis is derived from a Latin word fractus meaning consisting from separate fragments. It was first presented by Benoît Mandelbrot in 1975 when it was used to describe irregular, recurring structures [7, 8]. The author will attempt to show how shares should be acquired and when they should be sold when the fractal technical analysis method is

used. The fractal technical analysis method can be used only under the condition that the traded share is highly liquid. It should be noted that the fractal technical analysis is only one in the range of numerous methods of practical technical analysis and all the rest technical analysis are general.

The strategy envisaged selecting indicators and oscillators, correlations between them were sought describing the fractal formation on the price graph are showed in Fig. 2, and they are:

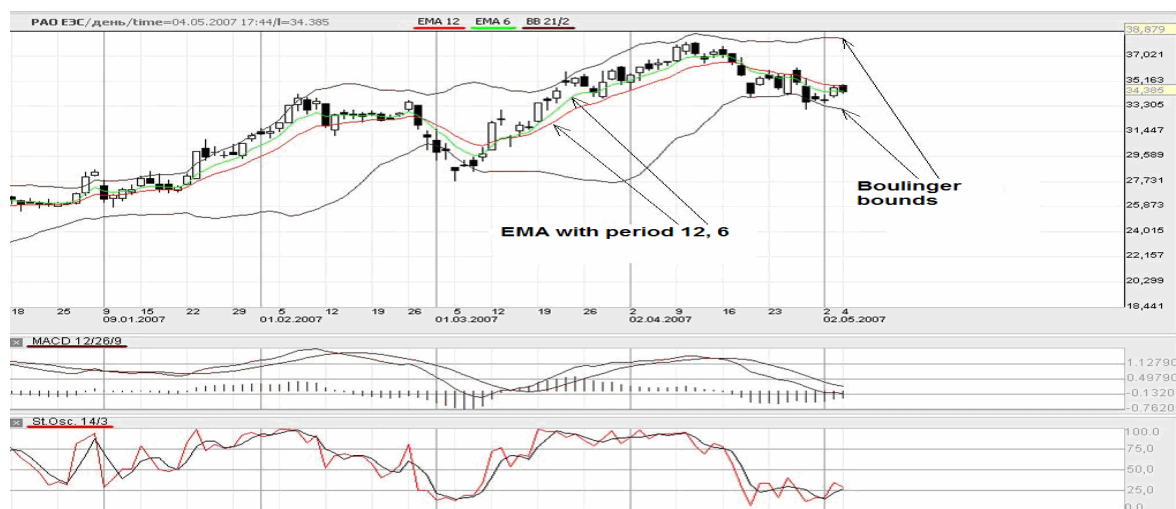


Fig 2. Tools, used in technical analysis

- Boulinger bounds with values – average 21, standard deviations 2.00.
- Moving average (exponential) – periods 12 and 6.
- Stochastic (linear) – Observation period 14, averaging slow 3, averaging fast 3.
- MACD (Moving average convergence/ divergence (exponential) – first EMA period 12, second EMA period 26, signal EMA period 9.

Authors want to pay attention to the fact that assumptions of these encryptions can be found in most of the trading systems of technical analysis programs. Tools are shown in Fig 2, but the bay signals on those tools are showed in Fig. 3.

Authors can assert that if Stochastic rates are above 75, MACD has positive expansion at positive MACD side, and price reaches sliding average bound, there should be a momentarily price jump back from the sliding average. That makes it possible to determine that a purchase deal should be made. Deals of shares purchase using the fractal technical analysis are shown in Fig 2. As shown in Fig 3, after price touching the exponential sliding average (being between EMA 6 and 12), price has a trend to momentarily jump back from them.

The divergence of the price from its fractal price strategy is the main assumption to earn in stock market. If stochastic is 75–100 and MACD expansion is at positive MACD side (the width of the expansion is also important, because if it is higher then also the possibility of jump back of the price from the exponential sliding average is higher, moreover, at wide

MACD expansion price can not always go till the sliding average 12, so the purchase can be made when the price is closing to the sliding average 6, as well as contrary, if the expansion is not very wide then the price can slightly cross the sliding average, so the purchase must be done strictly on the sliding average or slightly under it) then the fractal price is at Boulinger upper bound, to what it is tending towards after jumping back from the sliding average. We can assert that attractor must be at Boulinger bound. Boulinger bound in Fig 3 is presented as place where investor should fix the income, because then we can consider the price as correct. The presence of trend does not last forever and by observing the price graph it was determined that starting from 3–6 jump backs from the exponential sliding average, investor should be very careful. Indications of end of the trend can be cross of the MACD parameters (extension between MACD lines is reducing), or they cross each other at the moment when current Japanese candle is approaching the exponential sliding average. By observing the graphs we can conclude that the end of a trend usually ends with correct transition of the fractal from one level to another.

There were cases in the graph when the price sharply crossing the exponential sliding average line with period 6, still returned in its fractal price. Price in these cases somehow „resisted” the news and tries to recover from the „damage”. Then, if the MACD expansion is big and Stochastic rates are high (75–100), price of the share will try to return in its normal position – fractal price, with higher possibility [7, 8].



Fig 3. Set of all components with signals to buy

7. Conclusion

When using the algorithm described above, investor first selects the best shares by using the fundamental comparative method, after that performs transactions with best selected shares by using the fractal technical analysis. As test on shares graphs have proven, the best results in up going market are achieved by shares that have shown the best result in fundamental comparative analysis, but in uncertain or falling market the only effective method is fractal technical analysis.

The main idea of this paper was – to show potential investor the way, which one investor have to follow to reach good results in stock markets.

Anyway, algorithm, showed by authors doesn't guarantee results in stock markets, but it could be a good road-sign for investor.

Fundamental comparative and technical fractal analysis showed in this publication was a summary of all bibliography in reference list, and was created by authors.

As authors to be of the opinion that algorithm is very flexible and could be adapting for any investor needs.

The evaluation table (Table 1), or any other evolution parameters in comparative fundamental analysis of company are not static, and could be change by investor, but most important is to understood have can company could be evaluate.

Fractal technical analysis is only one of many kinds of technical analysis in stock markets, but for this case can be useful best.

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