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Methods of Analysis of Equity Securities Risk and Return: Issues and Prospects

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Abstract:

In In terms of capacities and characteristic features of macroeconomic policy in Russia today, the issue of more efficient use of the equity capital market potential where the main tools are shares or equity securities is highly relevant. More efficient use of the capitals of joint stock companies, obtaining reliable information for defining the cost of the business reinforce the need of more detailed theoretical and practical analysis of the equity securities. This is one of the most important prerequisites for creating favorable informational environment and improving the quality of stock market monitoring both at the national and international levels.
The author analysed opinions on this issue among Russian and foreign researches, applying the methods of theoretical knowledge and general logic. It systematizes various methodological approaches to the analysis of the equity securities and justifies the need of using the methods of fundamental and technical analysis of equity securities in the Russian context. We pay special attention to studying the rates of return and the risks of the equity securities and look at the opportunities to use this information for developing a scale of rating investment attractiveness of joint stock companies. The recommendations stated in the article may be used for operational management and development of strategic solutions to attract financial resources required for economic growth and modernization of production.

Key Words: *Corporation, investors, market securities, fundamental analysis, return, risk, technical analysis*

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1. Introduction

1.1 Introduce the Problem

In the modern environment of Russian economy growth, activation of the participants of corporate equity securities market is a highly relevant issue. A strong need for solving this problem is explained by a great role of this market in the process of creating and redistributing investment resources and by the stabilization of the country's economic growth. It becomes an especially important problem when regarding Russian Federation credit downgrade by the international rating agencies.

The basic quality criteria of a stock, as well as any other security, is its return and risk. Investing into equity securities, a real or a potential investor need to assess the stocks from two point of view: on the one hand, he needs to define the correlation between risk and return; on the other hand, he needs to explore qualitative and quantitative aspect of this correlation. Consequently, the main problem any financial analytic faces is to define certain characteristics and obtain the necessary information about stocks investment attractiveness which directly depends on the efficient use of available evaluation methods of equity securities risk and return.

1.2 Importance of the Problem

Theoretical and methodological aspects of equity securities studying may be presented as a scheme the main components of which are: categories; regulatory principles characterizing correlation between return, risk and market efficiency; as well as scientific techniques which contain the methods of fundamental and technical analysis of equity securities. The existence of many methods is the result of presence of fundamentalist and technocratic approaches to the evaluation of equity securities.

For effective monitoring and analysis of the market potential, forecasting equity securities investment attractiveness as concerns risk and return, a complex use of various methods of fundamental and technical analysis and development of the system of criteria for investment attractiveness evaluation by different groups of users is an acute problem. It is necessary to solve this problem with the aim to improve the quality of business culture in joint stock companies, make the business more transparent and create certain conditions for business growth in various spheres of the economy. Major methodological recommendations may be used for developing departmental regulatory instruments associated with the growth of the corporate equity securities markets in certain regions and territories. This research paper is devoted to this issue.

1.3 Relevant Scholarship

In Russian economic literature many authors pay attention to the problems of the development of corporate equity securities market in general, and to the stock market, in particular. Among them are Anesyants (2005), Grishaev (1997), Zhukov (2014), Kilyachkov (2015) and other economists.

The works of Galanov (2008), Ginzburg (2003), Karminskiy (2005), Kovalev (2007), Limitovskiy (2008), Litovtchenko (2013), Lyubushin (2013) and of the foreign authors Buffett (2013), Bernstein (1995), Graham (2008), Keynes (2011), Stephen (2000), Veale (2014), Fisher (2012), Sharpe (1999) and others provided the theoretical and methodological basis of our research.

However, in Russia the authors fail to pay enough attention to the development of equity securities market and associated issues, focusing on exploring the banking sector as the major source of financing of economy. In particular, there is lack of shared vision concerning methodology of equity securities research; evaluation of stock market value based on risk, return and the level of corporate culture in joint stock companies is not carried out; attention is not paid to increasing the quality of information management among the stock market participants. Among the less examined issues of the Russian economy are the use of methods of fundamental and technical analysis for monitoring and forecasting stock risk and return. These problems also require further conceptual development and a complex research.

1.4 State Hypotheses and Their Correspondence to Research Design

In the global economy there are different approaches to studying securities market and its financial instruments. The most widespread are fundamentalism, technocratic theory and the random walk theory. Each of the approaches has its followers and supporters.

Fundamental approach is the basis for fundamental analysis of equity securities and is predominantly of a strategic and long-term nature. The notion “fundamental analysis” originated and became widespread in the economic literature and in practice due to the fact that the majority of investors-fundamentalists support the view that there is a functional dependence between the a company’s stock prices dynamics and the indicators of the country’s economy.

The founders of the fundamental analysis are considered to be Graham and Dodd who published their work «*Security Analysis*» (Graham, 2008) in 1934. The supporters of the fundamentalism believe that the best results from the investment may be obtained only after a thorough assessment of the company’s report and the industry conditions in which it operates as well as the condition of the economy, in general Buffett (2013).

In Russian economic theory the notion “fundamental” as a characteristic of economic analysis has never been used, but a great popularity gained another notion “complex analysis of enterprise”. It means exploring all the aspects of production and commercial operations of a company and their interrelation for the purposes of the internal management (Sheremet, 1999).

Technical analysis appeared over three hundred years ago and was first applied by the Japanese who traded futures for rice supply. The forecasting model used on the

trades was named “the Japanese candlestick” and it became the base for the technical analysis charting. The technical analysis got its scientific basis due to the fractal geometry. According to it, many natural phenomena are not chaotic as it was thought earlier (Mandelbrot, 2006). Currently, technocrats and the followers of the random walk theory believe that the prices of financial assets reflect all the relevant information including the data about potential characteristics of securities that contradicts the main statements of the concept of market efficiency. This concept is basic for researches among the fundamentalists. Using the results of the technical analysis presented in the form of statistics, the analytics do their best to forecast short-term movement of security prices and give their recommendations on the time of concluding the deal or a certain type of stocks and the market of corporate equity securities. Taking into account the interest to the problem of developing scientific instrumentation for analyzing securities market, the main objective of the research is to identify capacities of the complex use of the methods of fundamental and technical analysis for risk and return evaluation and forecasting. Certain aspects of this issue are discussed in the paper.

Our research is aimed at solving the following problems:

- Exploring the methods of fundamental and technical analysis and their use for securities risk and return evaluation and forecasting;
- Identifying capacities of the complex use of the methods of fundamental and technical analysis for assessing the investment potential of securities of Russian joint stock companies;
- Identifying capacities of the use of risk and return criteria for creating Russian equity securities rating with the aim of improving corporate culture and making monitoring more efficient both at the national and international levels.

2. Method

In this paper the authors used the methods of theoretical knowledge and general logic to carry out their research.

2.1 Method of abstraction and generalization

Using the methods of abstraction and generalization, the authors identified the main characteristics of the methodology of the stock fundamental and technical analysis; characteristic attributes of research methods used by the followers of the fundamental and technocratic theories have been evaluated. The method of abstraction helped to identify the acceptability of the methods of fundamental and technical analysis for evaluating return and risk of equity securities; the authors revealed the most significant criteria for short-term and long-term risk and return forecasting when investing into equity securities.

The method of generalization enabled the authors to identify the most critical characteristics of the methods of stock fundamental and technical analysis; we have analyzed the most well-known criteria of information abstraction and generalization

about the growth of the equity securities market (stock index Dow Jones NYSE (DJIA) и Standard & Poor 's-500, McClellan Oscillator, ARMS Index-TRIN and the others); we proved the need for developing the method of complex use of fundamental and technical analysis to improve the quality of monitoring the equity market.

2.2 Idealization and modelling techniques

On the basis of the method of idealization a number of theoretical statements and assumptions on the issue of this research paper have been used for identifying connections and regularities when studying return and risk of equity securities. This allowed define one of the most acceptable ways of evaluating the criteria of corporate culture, equity securities return and risk, characterizing investment attractiveness of the Russian joint stock companies.

Applying the modelling approach, we managed to build a rating scale for assessing investment attractiveness of equity securities. The rating scale was based on a theoretic model of a joint stock company with a high level of corporate culture and efficient structure of equity capital management; having the information available for outside users and attracting additional resources for financing in the result of public offerings of securities with a high level of return and reliability.

2.3 Method of formalization

Using the method of formalization some of the theoretical statements and assumptions have been presented as formulas or certain actions. It was essential to obtain straightforward assessment, to use algorithmization and programming for information processing.

The method of formalization was used to explain the method of calculation of equity securities risk and return criteria and to identify recommended criterial values. Using the method of formalization we chose the method of calculating the rates of Stock Index Dow Jones NYSE and Standard & Poor's-500. We also formalized the Model Gordon – William’s and some others. Systematic methods and techniques borrowed from various sciences are used for analytical financial calculations.

2.4 Systems approach

The systems approach as a combination of general scientific methodological principles was used for building a rating scale of investment attractiveness of joint stock companies with regard to their corporate culture and risk and return of equity securities. Namely, equity securities risk and return profile is based on a regular interaction between all the factors affecting the stock quality.

When building a rating scale, we identified the extent of the impact of each criteria on the result of the study. On the base of the systems approach we proved the need for calculating risk and return criteria as major factors for assessing investment attractiveness of the securities issuer; we also evaluated the significance of this stock

analysis tool for reviving the Russian market of corporate securities, attracting additional funding sources, stabilizing Russian economy, and developing promising sectors of economy.

3. Results and Discussion

In order to realize the potential of a joint stock company and determine its investment attractiveness, it is necessary to carry out a comprehensive study aimed at identifying securities risk and return. The solution of this task is important even in case with efficient market. Consequently, the study of the main characteristics of securities plays a great role for making more accurate forecasts of equity capital market growth.

In the global practice there are two major approaches – fundamental or comprehensive analysis and technical analysis. They are a combination of general scientific and specific scientific methods and models for studying equity securities. The fundamental analysis is the most common and it is the base for securities analysis in a well-functioning capital market. Thus, the main aim of the fundamental analysis us to study various factors (political, social, psychological, ecological) which may influence financial and economic status of an issuer, return and risk of his securities. The prime postulate of his theory is “movement” from the future to the present. The supporters of this approach believe that analyzing the market situation, investment opportunities and dividend policy of the company, it is possible to forecast return and risk, define the fair value of the securities and, consequently, give recommendations on reasonability of sell and purchase (Damodaran, 2011).

Traditional methods of fundamental stock analysis are top – down forecasting approach and equivalent multi-level bottom-up forecasting as well as probabilistic forecasting, econometric modeling and the method of financial statements analysis based on coefficients. These methods are used to explore the regularities which will have their effect in the future and focus on the assessment of the expected return of certain shares and, probably, some market segments and the stock market, in general (Figure 1).

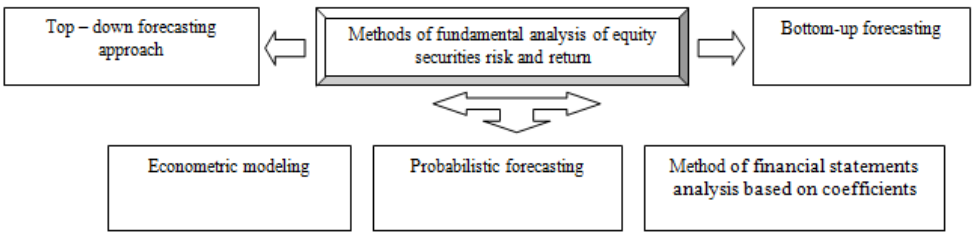

Figure 1. Classification of methods of fundamental analysis of equity securities risk and return

The top – down forecasting approach or bottom-up forecasting approach ensure the most full and objective assessment of securities return and risk in the long-term period. The top – down forecasting approach is the basic method of stock analysis and takes advantage of studying the economic situation of the territory or a country in stages, analyzing the sectors of the economy and, finally, exploring the financial situation of the companies and market value and return of their shares. The bottom-up forecasting approach implies an initial examination of the company and its securities with the aim of developing projections of the industry and country's economy growth. In our opinion, the bottom-up forecasting approach is less correct as return on shares and financial situation in one company cannot have a serious impact on the economy growth. The benefit of this approach is the possibility to systematize available information and obtain a holistic and uncontroversial picture (McKinsey & Company Inc., 2010). That is why in practice the combination of both approaches is used. On the one hand, the tendencies of economy growth are explored with the top – down forecasting approach; on the other hand, obtained information is used for forecasting securities return and risk in certain companies by the bottom-up forecasting approach. Multi-level forecasting methods are the base for fundamental stock analysis and include certain levels or stages: market conjuncture analysis, macroeconomic analysis and microeconomic analysis. The Table 1 shows the main stages of the multi-level forecasting of securities return and risk.

Table 1. Stages of the from the top – down forecasting approach or bottom-up forecasting approach

Stage forecasting	The main directions of analysis
A market conjuncture analysis	The combination of internal and external production factors and conditions, their interdependence and impact on demand, supply and prices are under analysis.
Macroeconomic analysis	Macroeconomic analysis may be of interest for long-term or medium-term forecasting. Macroeconomic analysis includes analysis of macroeconomic factors and industrial analysis.
Microeconomic analysis	Microeconomic analysis is based on the axiom – the price of shares is defined by the company's performance. That is why it also includes the analysis of issuer's financial situation, securities' market activity, their absolute and relative return and investment risk level.

When carrying out a market conjuncture analysis, it is necessary to take into account the following factors: variability and dynamism, irregularity and inconsistency, repetitive and unique character of economic conjuncture. It can be argued that a market conjuncture analysis is performed on the base of the results of macro- and

microeconomic research which in their own turn are independent elements of the fundamental stock analysis.

Among the main indicators of macroeconomic analysis are the gross domestic product, the level of inflation, unemployment, rate of exchange, internal and external turnover, state expenditures and debt reflecting the payment balance and, consequently, general economic climate in the country. In some countries, they use various complex (statistical) indicators for researches. For example, the Index of leading indicator in the USA is recalculated each month and published by the Ministry of Trade as 12 separate indicators (Sharpe, 1999). However, as evidenced by researches, macroeconomic analysis is time consuming because there are a lot of dynamically interrelated factors influencing the situation. The most famous comprehensive assessment of the economic growth in many countries is the method of the magazine "Euromoney". Twice a year on the base of this magazine the rating of investment risk and reliability of the countries is performed from the point of view of political and economic risk and the financial situation (Galanov, 2008). Unfortunately, in the Russian Federation there is no generally accepted indicator of further economic growth, but the Central Bank of the Russian Federation is making some attempts.

Industry analysis suggests studying and classification of economic sectors. The method of a rating agency "Expert-RA" designed by the Russian specialists on the basis of the local and international experience provides the most objective estimate of the main economic indicators of any region. According to the expert agency "Expert-RA" the economic condition of any region is estimated with the help of a complex system: investment potential which defines a certain number of statistical indicators; investment risk or a combination of investment factors; and legislative measures giving guarantees to real and potential investors (Expert-RA Rating agency, 2014).

Industry analysis is identification of the most promising and not promising sectors from the point of view of the business activity and the quality of production. Of the sector was recognized as not promising, it does not mean that there is no companies in this sector which may attract attention and stand out manufacturing specific products or having a flexible structure (Bernstein, 1995). Industrial analysis includes comparisons of indicators reflecting the production dynamics, sales volume, the amount of commodity and raw stock, price and salary level, profit and savings. The most significant factors influencing the level of business activity are a growth of output that allows evaluate development tendencies in any segment; and product profitability. On the base of the ration between output and product profitability all the segments are divided into three broad categories for the purposes of the fundamental analysis: sustainable industry, cyclical industry and growing industry. Sustainable industry segments are characterized by a high level of stability and are less vulnerable to the macroeconomic situation. Investments into securities of companies from the stable segments are defined by reliability, low risk level and

lower return on the investment. Business indicators of cyclic segments depend on the product life-cycle. Growing industry is characterized by a high pace of development in contrast to the dynamics of the dynamics of the gross domestic product. Investments into securities of companies from these segments are risky and have a potential possibility of capital growth in a short-term period (Keynes, 2011).

Microeconomic analysis involves examination of the company's operation, evaluation of its financial situation and the position on the stock market. To perform examination the methods of financial statements analysis are used. Company's financial statements reflect the results of its operation within a given period of time. Analytical coefficients calculated on the base of the financial statements allow reach the intended goal and to make a well-argued administrative decisions (Kogdenko, 2015). We should note that the coefficients would be useless if to analyze them separately. To obtain an understanding about the company's policy on profit distribution, capital generation and accumulation, it is necessary to calculate the indicators of the market activity (Gorbunova, 2014). Among the indicators of the market activity of the equity securities issuer are earnings per share, earnings ratio/price, dividend payout, and market-to-book ratio. They are major market indicators of equity securities. The Table 2 describes the main indicators of the market activity of the equity securities issuer.

Table 2. Key indicators of market activity of the issuer of equity securities

Indicators of market activity	Main characteristics
Earnings per share, EPS	Influences a market price per share and may be interesting for the holders of ordinary shares. Indicator increase improves investment attractiveness of the shares of a joint stock company.
Earnings Ratio/ Price	A ratio of a profit to security market value, allows identify the main tendencies of a joint stock company development.
Price/ Earnings Ratio	The dynamics reflects the investors' desire to reach more rapid capital growth of the issuer in contrast to other joint stock companies.
Dividend Payout	Coefficient characterizes the investment policy of the company and reflects the net profit distributed among the shareholders in the form of dividends.
Market – to-book Ratio	If the ratio value is less than one, potential investors agree to purchase the shares for the price higher than their earning value at the moment. The earning value may be expressed as a nominal cost, value of own capital or net working capital.
Price to sales ratio	It is a very important indicator for evaluating the

	performance of a joint stock company. It is widely used in the global practice. However, for the Russian Federation there is a serious obstacle – a weak information base.

The final stage of the multi-level forecasting in the course of fundamental stock analysis is examination of the securities rate of return on the base of absolute and relative indicators. Absolute return of the share is its value which highly depends on the stage of a life-cycle, namely on emission, i.e. initial placement or trading on stock exchanges. If the stock value is calculated on the base of the financial statements, then it is considered to be an earning value; in the result of supply and demand relationships, we speak about the market value. Model Gordon – William's is a traditional approach to define a relative yield (Kovalev, 2007). This model is shown below:

$$K_t = K_d + K_c = D_1 / P_0 + P_1 - P_0 / P_0 \quad (1)$$

where K_t is a total return of equity securities; K_d is a dividend yield (YLD); K_c is a capitalized yield; D_1 is a dividend for the accounting period; P_1, P_0 is a sale price and a purchase cost.

Model Gordon – William's shows that the earnings per share contain two components: dividend yield (YLD) and capitalized yield. Depending on the strategy of the development of the company issued equity securities, the significance of each component will be different. In foreign practice there are three models of identifying the EPS depending on the dividend growth rate: zero growth model, the constant growth model and variable growth model.

Zero growth model implies that the amount of dividends distributed each year is a constant value. This model is used for identifying the cost of high quality preferred stock. It is explained by the fact that the majority of preferred shares give their holders fixed dividends regardless the company's profit. Thus, Zero growth model can be expressed by the following formula:

$$V_t = D / P_m \quad (2)$$

where V_t is a current (internal) cost of the share; D is an expected dividend; P_m is a current market price of the share.

Constant growth model implies that the amount of the dividends change with a constant growth rate. Formalization of this situation is:

$$V_t = D_0 (1+g) / P_0 + g = D_1 / P_0 + g \quad (3)$$

where D_0, D_1 is obtained and expected dividend at the time of share valuation; P_0, P_1 is the price of the share at the time of valuation and estimated price; g is the dividend growth rate.

Constant growth model is an essential part of the variable growth model. The variable growth model is one of the most widespread models and it is based on discounting net investment cash. Investment share price is calculated by the formula shown below:

$$V_t = D/P_0 + (P_1 - P_0)/n \quad (4)$$

where n is the period of shareholding in years.

When analyzing return and risk of the share, market participants are interested in obtaining information not only about the return of a certain security but about the capital of a joint stock company as well. It is necessary for evaluation of efficiency of equity capital use and its impact on the well-being of the shareholders.

Another popular method of fundamental analysis of equity securities is probabilistic forecasting. Using this method, an analyst focuses on solving general economic issues, as uncertainty present at this level is very important for identifying risk and return of the security. This process shows a possible behavior of certain shares on tendencies in the economy. For this reason, it is sometimes called a what-if analysis. This is the most appropriate method for analyzing securities risk and return in the context of exploring the probability of various scenarios (Litovchenko, 2013).

Statistical methods in the context of risk and return fundamental analysis may be used in the econometric model. The econometric model is the means of forecasting the values of certain variables, namely endogenous variables. Exogenous variables serve as source data. For example, β – coefficient and $\acute{\alpha}$ – coefficient, standard deviation on the base of changes in stock return and market indices characterizing stock exchange quotations. The econometric model is based on the economic interrelation between the analyzed parameters and on obtaining quantitative assessment of this interrelation using statistical methods. However, it is recommended to revise the econometric models as overseen factors may lead to an unsatisfactory forecasting result (Limitovskiy, 2008).

Thus, fundamental analysis of equity securities is a complex, time-consuming and typically a long-lasting process based on studying major economic factors influencing the investment attractiveness evaluation of the shares. The main problem of the analysis is the need to identify the correspondence between the market and internal price of the equity security because if the market underestimates the share at the moment, it is possible it will not make the same thing in the future. Consequently, current costs may not be repaid and there are no guarantees that the market will confirm the forecast of the analytics. Methods of the fundamental

analysis of return and risk are acceptable but not in all the situations. Studies suggest that fundamental analysis of equity securities is a quantitative but not qualitative by its nature, and it helps to identify certain tendencies in equity securities return and risk changes and their dynamics in a long-term period. Additional studies are needed for a quantitative interpretation. Technical analysis is the methodological base of a quantitative study of the main indicators of equity securities investment attractiveness.

Two investment strategies serve as a methodological base for return and risk research with the use of technical analysis tools. They are momentum investing and contrarian investing as well as fixed – length moving average strategy and RSI Trend-line break strategy (Sharpe, 1999).

Momentum investors apply a simple way of research: they study EPS for a just finished period to identify the possible variants of buying or selling stock. Momentum investors strive to find the shares the value of which considerably grew in the hope that their price will continue to grow in the result of upward shift of their demand curve. In case with contrarian investing, investors purchase the shares which are ignored by the other investors and sell the shares which other investors are willing to buy. Contrarian investing is efficient for a very short (a week, a month) and long periods (three, five years). These strategies may be applied by investors if securities have a high degree of liquidity in order that expected return covered a significant part of transaction expenses.

Fixed – length moving average strategy studies relation between the short-term stock market rate and its rate in a long-term period. Fixed – length moving average strategy classifies each day as the day of sell or purchase of the security. In this case, the signals about sell or purchase will appear only when the relation changes in the exact opposite direction.

Trend-line break strategy studies changes in minimum and maximum price for a given period. It is still a controversial issue if the strategies for evaluating risk and return of equity securities are beneficial as in the context of efficient market all the participants are under equal conditions, and the possibility of obtaining surplus profit is excluded.

Thus, for developing research methods technocrats suggest moving from the past to the present and offer three main principles: market action discounts everything, price move in trends, and history tends to repeat itself.

The principle of market action discounts everything means that all the current events (economic, political, social and psychological) have their effect on the prices. The principle of price move in trends shows that prices are changing in accordance with supply and demand for securities, but they do not change until the opposite event happens. The principle of history tends to repeat itself includes identification of the

situation models which appear on the market from time to time. These models allow interpreting the changes that have already happened and forecast the future price movement (Stephen, 2000).

Research methods of technical analysis are difficult and diverse. Among the main methods are configuration methods, ffiltration and oscillatory methods, correlation methods, methods of neuron networks use for forecasting, cyclical methods (Figure 2).

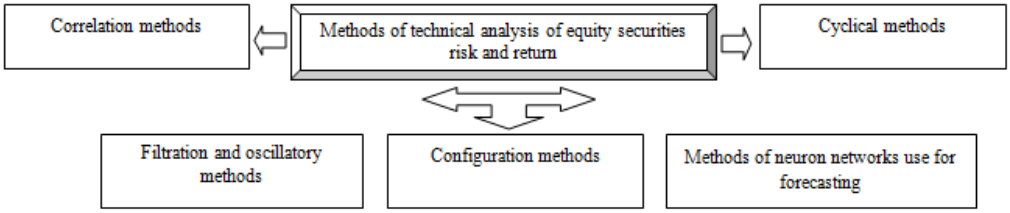

Figure 2. Classification of methods of technical analysis of equity securities risk and return

Configuration methods of technical analysis are based on the assumption about the repetition of market situations and their presentation in the form of various graphical figures. Configuration methods are simple for forecasting but cannot provide high probability result. This is particularly visible when unique factors contributing to the situation are stringer than natural phenomena, even the most evident picture of a well-recognized figure may lead to false conclusions. That is why, it is better to configuration methods in combination with some other methods of the technical and fundamental analysis.

Filtration and oscillatory methods are based on extracting the trends from the real asset curve and oriented toward forecasting the future price change. The most appealing for the research is the combination of different filters which smooths the minor fluctuations but keeps the majority of significant changes. Oscillatory methods use not trends but oscillators as indicators. The graphs of the oscillators fluctuate between several values (near 0; 100% or others). Currently many different oscillators have been designed and they reflect the situation on the stock market. For example, “time demand-offers” provide high probability of forecasting for one day; the price range moment is the measure of risk of securities or the market, in general. For instance, oscillator Moving Average Convergence/Divergence is a technical analysis indicator developed by Gerald Appel for evaluation and forecasting price fluctuations on stock and currency exchange (Fisher, 2012). While filtration methods guarantee reliable forecasting, they often reflect stock market performance over the past periods. It proves the need to carry out additional research.

Correlation methods study subjects and phenomena identifying relations between different tools: basic indicators (prices and trading volume), various financial and

economic factors and technical indicators (filters, oscillators). Analysis of correlation between the issuers enables to solve the problems using the technical methods which traditionally constitute the area of fundamental research. Comparing the curves of stock prices by different issuers, we may identify their various characteristics, particularly, risk and return within a certain period.

Methods of neuron networks use for forecasting is a research area involving development of computing systems which consist of a great number of operating in parallel simple elements (neurons). Neurons perform consistent computing actions and do not require external control. Methods of use of neuron networks to forecasting are beneficial for analytics as they allow solving various "intellectual" tasks associated with pattern recognition, adaptive management, forecasting and diagnostics.

Cyclical methods constitute a base of the price movement theory and include creation of technical indicators and instruments for identifying extreme time limits of stock market rate changes. Among the most popular cycles are Elliott wave; Kondratieff Wave-54 year business cycle and some others (Veale, 2014).

The methods of technical analysis are an efficient instrument for risk analysis of equity securities. The main indicator of changing the level of systemic risk is statistic data analysis of relation between the stock price and the general condition of the market. This relation is known as a market model:

$$R_j = \acute{\alpha}_{jy} + \beta_{jy} + E_{jy} \qquad (5)$$

where R_j is return of equity securities *(j)* during the reporting period; R_y is return on the market index *(y)* during the same period; $\acute{\alpha}_{iy} - \acute{\alpha}$ is a coefficient or a shift factor in the market model; β_{jy} is β - coefficient; E_{jy} is a random error in the market model.

β - coefficient measures stock return response to a market index's return. A share with return that mirrors a market index's return will have a β – coefficient equal to 1. It corresponds to a market model $R_i = r_y + E_{iy}$. Consequently, a share with β – coefficient more than 1 has greater volatility than market index and is known as aggressive stocks. On the contrary, a share with β – coefficient less than 1 has less volatility than market index and is known as defensive stocks.

If systemic risk is associated with price and return volatility on the global market and may be assessed by different indices, then non-systemic risk is related to a specific character of supply and demand for a certain security. That is why evaluation of non-systemic risk by studying the processes on the base of a priori assessment is not always acceptable. The only option of scientific foreknowledge is the use of probability and statistical methods which define the level of diversified risk with the help of such indicators as mathematical expectation of an event, dispersion, mean square deviation, and coefficient of variation. However, β – coefficient and indicators of a diversified risk cannot give a final answer on the

question about the risk level of investing into equity securities as the results of the study are to some extent relative and based on approximate characteristics and assumptions. Thus, the main problem of the equity securities risk evaluation is the use of a unified method which will systematize the results of objective and subjective risk evaluation. Definitely, this is not a perfect method; therefore we should treat analysis results with that degree of certainty which is anchored in the practice of circulation of securities on stock market, i.e. the level of their liquidity, restrictions on operations with securities, in possible price manipulation for some stock market players.

Statistical calculation of coefficients of own and market risks is known as simple linear regression or a least square method. The given data for risk evaluation is indicators of securities return changes; a market indicator is information about changes in a market index. The main indicators of risk of investments into equity securities are coefficients of technical analysis correlation methods: β – coefficient, $\acute{\alpha}$ – coefficient, standard deviation *(r)*, the correlation coefficient *(R)*, the coefficient of determination (R^2). Their functional purpose and calculation formulas are shown in Table 3.

Table 3. The main coefficients of own and market risks of equity securities

Risk Indicators	Main characteristics
β – coefficient	Shows changes in the return of a certain share regarding market price changes. Dependence criteria of a security on the level of market risk. Calculation formula: $\beta = (T \sum XY) - (\sum Y \sum X) / (T \text{ x } \sum X^2) - (\sum X)^2$ where T is a period of observation in years, weeks, days; Y is return of equity securities; X is a profitability index
$\acute{\alpha}$ – coefficient	It is expressed in percent and reflects the average level of price changes for the company's shares. Negative value $\acute{\alpha}$ – coefficient shows losses of the investors in the context of unfavorable tendencies of stock market growth. Calculation formula: $\acute{\alpha} = (\sum Y / T) - [\beta (\sum X / T)]$
Standard deviation	Shows market risk (undiversified) magnitude. Calculation formula: $r = [\sum Y^2 - (\acute{\alpha} \sum Y) - (\beta \sum XY)] / T\text{-}2$
Standard deviation β – coefficient and $\acute{\alpha}$ – coefficient	Shows an error which appears during evaluation of β and $\acute{\alpha}$ coefficients due to the limited data set. Calculation formula: $\beta_K = r / \sum X^2 - [(\sum X)^2 / T]$ $\acute{\alpha}_K = r/T - [(\sum X)^2 / \sum X^2]$
The correlation coefficient (R)	Shows relation between return of a certain share and market index return, ranges from -1 to +1. Calculation formula: $R = (T \sum XY) - (\sum Y \text{ x } \sum X) / [(T \sum Y^2) - (\sum Y)^2] [(T \text{ x } \sum X^2) - (\sum X)^2]$

Thus, a prerequisite for research of equity securities risk and return is the use of scientific instrumentation. Depending on the method of stock analysis in the global

practice, there are two approaches - fundamental analysis and technical analysis. The main problem of practical use of fundamental analysis methods is the need to systematize all the obtained information in order that the research results contributed to the creation of a favorable information environment on the corporate stock market but not just present facts about the issuer's performance. The distinctive feature of technical analysis is that it provides the possibility to combine several methods, thus any stock market participant may develop his own algorithm of processing the information about stock return and risk. Nevertheless, technical analysis methods are subjective by nature and do not always provide logical explanation about some fact or event. Complex use of different methods of stock analysis provides more objective information about risk and return of equity securities. Among the main methods of integral evaluation of investment attractiveness of equity securities are indices analysis, market indicators analysis, ratings and models building. Let us discuss their distinctive features.

Stock indices are used to obtain information about dynamics of stock markets in general, its sectors, segments, areas and securities of certain issuers. As stock indices record the average information in its dynamic, their creation requires comparison of current average values with data from the previous periods. We can take any previous period for comparison and uniquely determine it for the index creation. Traditional indices widely used in the global practice are *Index Dow Jones NYSE and Standard & Poor's-500. Index Dow Jones NYSE*, and they are defined as:

$$(DJIA) = \sum P/D \quad (6)$$

where P is a price of the i-th share; D is some divider reflecting the restructuring of companies and changes in the number of shares.

The quantitative value of the index reflects the cost of an average share, excluding the procedure of issue and consolidation of equity securities. In case with consolidation (reduction of number of shares) divider D increases; in case with issues and splits it reduces.

Index Standard & Poor's - 500 includes the rates of 400 manufacturing, 20 transport, 40 financial and 40 public utility companies. Calculation is based on weighing the number of shares in the company. *Index Standard & Poor's - 500* is presented as follows:

$$S\ \&\ P\text{-}500 = \sum P_i\, Q_i / \sum P_{ібаз}\, Q_{ібаз} \quad (7)$$

where Q is the number of assets at the moment; P is a price of the i-th share.

Alongside the most popular indices (*DJIA*) and *Standard & Poor 's- 500* each country and even each stock market create their own stock indices and use them for obtaining accurate information about the situation on the stock market (Ginzburg, 2003).

At present, the Russian school of processing the stock market information is being formed. The main Russian indices are *"Russian index skate PRESS*", *"ASP-*

General", the stock index *"AK&M"*, *"Interfax index"* and some others. Service for Financial Markets of the Russian Federation made attempts to create new indices: *DJ Rusindex Titans* and *Index NFA-7*. The index *DJ Rusindex Titans* was developed in cooperation with the company *Doy Jones Indexes* and the Russian index agency "Russian Index". Creation of a new index is a positive sign as in this case very important indicators such as free float and liquidity are considered. On the other hand, a passive investor is offered a standard product – an index portfolio *Index NFA-7*, oriented towards conservative investors who count on the growth of the stock market in the context of a long-term investment. Index *Index NFA-7* is unique because it enables creation of minimal portfolios (2-3 thousand dollars) and it gives access to a stock market both to small investors and large investors having several investment portfolios (Zhukov, 2014).

The method of market indicators makes technical and fundamental analysis of securities even more detailed. Currently, there is a great number of various stock indicators. Professional participants use only those indicators which give the most accurate information about the stock conjuncture, allow carry out analysis and forecast future changes. We should note that many indicators are based on one and the same source information and in accordance with this feature they can be divided into three categories: monetary stock market indicators, psychological stock market indicators and dynamic stock market indicators.

Monetary stock market indicators provide economic data and help to evaluate general economic situation which, in its own turn, affects business profitability and stock price dynamics. Among these indicators are advance/decline index and coefficient of inflation expectations. The need for calculating an interest rate index is explained by the fact that interest rate changes or expectation of the future level has far-reaching consequences. Interest rates growth leads to reduction in consumption and, consequently, to sales decrease. This all causes loss of income, eventual fall of stock prices and cash outflow from the equity capital market (Timothy, 2015).

Psychological stock market indicators determine investors' expectations. The main psychological indicator is Stochastic Oscillator. It is determined as smoothed difference between the number of rising and declining stock and shows when the market is overbought and decline is due or forecasts potentially reverse situation.

Dynamic stock market indicators show what is happening with the prices at the moment. The main dynamic indicators are the volume index, business activity index and cumulative index. The main indicators of business activity index are absolute breadth index, McClellan Oscillator, ARMS Index-TRIN and STIX oscillator. They all are the instruments of a short-term trading and characterize the ratio between rising and declining shares in which the market participants invest. Cumulative index evaluates stock market condition in terms of the number of equity securities which have reached maximum and minimum price. Identification of these

regularities is a prerequisite for making a decision about sale or purchase of shares (Kilyachkov, 2015).

Thus, the results of equity securities risk and return analysis using various methods of fundamental and technical analysis provide all the market participants with abundance of information which requires systematization. Major instrument for solving this problem is rational use of one of the methods of integral stock evaluation related to building security rating, i.e. assignment of a category or a rank demonstrating the quality of an equity security. One of the options to solve this problem is to select analytical standards required for evaluation and interpretation of the equity securities risk and return values. In a global practice it is achieved by building a rating system. While ratings may be a subjective opinion of a specialist, their use in combination with other analytical methods present a source of information valuable for any stock market participant.

In general, we would like to note that rating system originated in America and has a 70-year historic development in this country. Virtually all financial instruments on the USA stock market include ratings and it is not a coincidence that the elite of the international rating agencies are a few American companies such as “Standard & Poor’s Corporation”, “Moody’s Investor’s Service”, “Fitch IBCA”, “Duff & Phelps Credit Rating Go” (“D&P”) (Kovalev, 2007). International agencies use a complex approach for ranking corporations. They take into account the following indicators: financial and economic (cost-effectiveness, turnover, profitability, financial responsibility, liquidity); stock indicators (capitalization, profitability); production (amortization, fixed asset value); prospective indicators (growth rate, image); complex (dividend yield, earning per share). Some American agencies prefer ratings of many companies using the one criteria to the integral rating of one company on the base of several criteria. For example, they may resort only to the criteria of development dynamics or sales volume and capitalization. Such specified ratings are very useful for the analysis, especially for a saturated stock market.

In Russia there is no clear agreement on the rating system among the economists. The main drawback of any rating system is subjective opinions and judgements of the experts (Zhukov, 2014). Rating is a specific information product. It is the result of a professional data processing in a short and often ordered form (Karminskiy, 2005). The benefit of the rating system is absolutely anything can serve as a subject matter of the study. In principle, the point of views of both authors are right as absolute orientation on the rating results does not always lead to the positive results. Nevertheless, using rating in combination with other analytical methods may be a valuable source of information for real and potential investors. It is not a coincidence that in the global practice return on good quality shares is over 10% and outsider securities is over 50% (Kilyachkov, 2015).

Currently, on the Russian market there is practically no any serious rating activity, instead different market participants evaluate the companies. This situation may be

explained by a number of objective and subjective reasons. The objective reason is that the majority of shares of Russian companies became illiquid in the result of 2008 crisis and worsening economic situation in 2014-2015. For this reason, it is impossible to give a clear and adequate definition to securities capitalization. The subjective reason is the lack of information transparency in many Russian corporations and reluctance of issuers to bear the costs of performance analysis carried out by outside experts. When they need to place Russian securities on foreign stock markets, they usually call on the services of international rating agencies. The largest rating agency is "Expert - RA" which publishes the ratings of 200 largest Russian companies since 2005. The rating is based on the sales volume and capitalization, profitability and productivity. In 2003 the rating agency "Expert - RA" under the National Council for Corporate Governance and Consortium of the Russian Institute of Directors (RID) developed and published the method of evaluation of the Russian companies corporate behavior. The method is aimed at creating an ideal model of a functioning, transparent joint stock company open for investments (Expert RA Rating agency, 2014).

Thus, there is a strong need in a rating scale for investment attractiveness evaluation of equity securities with regard to risk and return indicators shown in Table 4.

Table 4. The main criteria of investment attractiveness rating of a joint stock company on the base of corporate culture, return and risk of securities

Rating Criteria	Criteria description
Corporate culture of the issuer	Shareholders' rights: restrictions on purchase and sell of company's shares, concentration of shareholders' rights, voting rights, the right to receive dividend payment, the document with insider information. The level of disclosing financial information: information policy, transparency of the equity capital structure, transparency of accounting reports, effectiveness and the quality of disclosing information to shareholders and other parties involved. Work of the governing and control bodies: Board of Directors, introducing the Members of the Board to the business, relation between the awards of the Members of the Board and the performance of the joint stock company; the system of financial and economic control; notification of shareholders and the management about the conflict of interest.
Risk and return analysis of equity securities	Criteria for equity securities return: earnings per share, price earnings ratio, dividend yield, capital yield, dividend payout, market to book ratio. Criteria for equity securities risk: β – coefficient, $\acute{\alpha}$ – coefficient, standard deviation standard deviation β – coefficient and $\acute{\alpha}$ – coefficient the correlation coefficient, coefficient of determination, coefficient of no

	determination Indicators of efficient use of equity capital. Indicators of efficiency are necessary for defining a relative wealth of the shareholders with regard to a market rate and equity ratio.

This method of evaluation of stock risk and return is beneficial for an issuer as it provides an opportunity public equity securities sale and, consequently, because an issuer can determine its cost. Besides, the rating allows an issuer raise liquidity of his shares because on a mature market all the financial instruments have rating and it is difficult to engage in sale and purchase of securities if they do not have any rating. For any investor, rating is the main information factor for evaluation of the share's quality in the process of comparing different securities as investment objects and, consequently, when financing issuing companies. Information about profitability, risk and the level of corporate culture of a joint stock company guarantees him access to the information and provides independence, stimulates attraction of additional financial resources required for economic stability and further country's economic growth. Major theoretical and methodological recommendations may be used for making departmental decisions on the issues of corporate stock market development in certain regions and territories.

5. Conclusion

To obtain more objective information about risk and return of equity securities, there is a need of a complex use of methods of fundamental and technical analysis in the context of applying the methods of integral stock evaluation. One of the most convenient instruments for aggregating results of risk and return analysis is rating of the investment attractiveness of equity securities with regard to issuer's corporate culture, risk and return of his securities.

Corporate behavior rating allows the market participants identify if a joint stock company observes the interests of all the holders; if the structure of management and equity capital is efficient; if the company is informationally transparent for outside users.

Market price rating demonstrates risk and return of equity securities; assesses their investment potential, which depends not only on the country's economic state but on the market activity of joint stock companies on the stock market.

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