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High-Dividend Portfolios with Filters on the Financial Performance and an Optimization of Assets Weights in a Portfolio

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Abstract

This paper is dedicated to the investigation of the strategies related to the high-dividend portfolio investment. The aim of this research is to increase the high-dividend portfolio efficiency by adding some filters and optimization weights of the assets in the portfolio. In order to achieve this goal, the authors complement the classical version of the «Dogs of the Dow» strategy with financial indicators ROA and P/E with equal and optimized weights of the assets in each portfolio. Two additional parameters are also used in the process of testing: the number of stocks and the month of the annual portfolio rebalancing. Thus, the obtained models have high-quality advantages in comparison with the traditional concept of high-dividend investing, eliminating its inherent disadvantages and providing higher rates of return.

Keywords: high-dividend models; «Dogs of the Dow»; portfolio investment.

JEL classification: G11.

1. INTRODUCTION

Investment strategies used by the participants of the stock market are traditionally divided into two main categories: active and passive. The first one involves more frequent involvement of the investor into the investment process and assumes the usage of fundamental and technical analysis elements. This type of strategy is more appropriate for active and aggressive investors trying to reach the highest possible rates of return in the short term. In contrast, the passive type of investing implies long-term funding and is based on the principles of the portfolio theory. It is obvious that passive strategy is more suitable

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for a conservative investor, but this does not mean this type of strategy is inferior to active investment in terms of profitability.

Taking into account the experience of the professional market participants and different academic studies, it may be noted the use of passive strategies during the long-term period often allows an investor to obtain higher returns in comparison with active operations. This is because the features of making short-term market operations: high transaction costs, the complexity of the market analysis, the presence of the requirement for a deep professional knowledge, etc. Nevertheless, passive strategies as a type of the conservative investing are not necessarily less profitable than active ones.

The traditional versions of the passive investment strategy imply the investment into the market index. But the choice of this strategy does not allow the investor to "beat" the market, having a yield above the whole market return. In this regard, different variations of the passive strategy which allows to obtain a yield above the market return have been being created since 1991. The main direction of this research lies in the formation and testing of the new passive investment models which implies using shares with high-dividend yields.

2. HIGH-DIVIDEND STRATEGIES AND THEIR MODIFICATIONS

The idea of investing in shares with high-dividend yield was first proposed by John Slatter (1988). However, this idea was studied in more details by Michael O'Higgins three years later (O'Higgins and Downes, 1991). A fundamental principle of the high-dividend investing is the annual purchase of stocks with the highest dividend yield at the end of the last year. Rebalancing of the portfolio occurs once a year on the basis of a new data on dividend yields, so this type of strategy can be attributed to the passive investing.

The concept of modeling the high-dividend strategies is based on the paper written by Lintner (1965) and on the principles of the signaling theory of dividend payments, formulated by S. Ross (1977). In the Lintner's study the author explained that managers tend to maintain a continuous level of dividend payments in order to avoid sending a negative signal to the stock market. The reason is that the market may have a more sensitive reaction to negative signals (decreasing dividends) in comparison with positive ones (growth of the dividend yield). Therefore, in most cases if a company's management is convinced about the opportunity to maintain a high level of dividend payments in the future, it tends to pay a high dividend in the next year. Later this idea was expanded by S. Ross and became a basic principle of the signaling theory of dividend payments.

Taking into account the fundamental ideas of the previous authors, Fama and French in their research paper (Fama and French, 1998) came to the conclusion that the dividend yield is one of the leading fundamental factors that has an influence on the share prices. That is why passive investment strategies which imply using dividend yields as an indicator of the future stock prices growth seem to be rather interesting.

A traditional and one of the most popular variation of the high-dividend strategy is the "Dogs of the Dow", suggested by Michael O'Higgins in 1991. It implies the annual purchase of ten shares with the highest dividend yield (in December), which are included in the Dow Jones Industrial Average Index. A great number of different modifications that have improved the efficiency of this strategy have taken place since 1991. The essence of the first modifications was to reduce the number of stocks included in a portfolio (Da Silva, 2001; Wang *et al.*, 2011; Qiu *et al.*, 2013; Yan *et al.*, 2013). Several researchers made attempts to

change the mechanisms and principles of the selection of stocks in the portfolio. For example, some of the authors tried to compile a portfolio of the cheapest stocks from the DJIA index or with the most liquid stocks on the whole market (Soomro and Haroon, 2015). There were also a lot of attempts to select stocks into portfolios in accordance with the level of the companies' capitalization (Brzeszczynski and Gajdka, 2007), or by changing the months of the portfolio formation (Volodin and Sorokin, 2014).

Taking into account the historical aspects mentioned above, it can be noticed that high-dividend models have undergone certain stages of evolution during the period of its existence that considerably increased its efficiency. Such a rapid process of the popularization of high-dividend strategies all around the world was caused by the possibility of obtaining yields above the market ones by using relatively simple methods of portfolio management available for the majority of market agents. Other advantages of this strategy are low commission costs and the possibility of using an unlimited number of shares, because the high-dividend strategy does not involve short sales.

In spite of all the benefits of high-dividend models, experts also reveal some disadvantages of these strategies. So, Jack Hough (2014) emphasized an extreme simplicity of these models, claiming that an investor focuses only on the dividend yield thereby neglecting the current financial situation in a company, which is able to affect the future dynamics of its share prices seriously (Hough, 2014). Indeed, classical high-dividend models do not take into account the current financial position and the stage of a business cycle of a certain company. As a result, in most cases it leads to making incorrect decisions, especially when high dividends are paid on the basis of internal preference of management that may be inconsistent with the current and projected financial situation. Such cases are more probable to occur in the countries with underdeveloped market conditions and corporate culture, therefore, another drawback of the classical high-dividend type of investment is the complexity of its applying in the emerging capital markets. The dividend yield itself in such models acts as the only reference point in making investment decisions that can also lead to the formation of incorrect predictions. For example, in case of a substantial fall in stock prices of the company with a small dividend rate, dividend yield can be excessively overpriced in comparison with similar companies which were exposed by the serious falls in prices. This fact can also promote filling the portfolio with stocks that are quite risky and might not show expected growth in the future.

However, despite all the shortcomings, high-dividend strategies arouse considerable interest among researchers and market participants, which acted as the stimulus for experts from different countries to continue doing researches on this issue.

3. THE EFFICIENCY OF HIGH-DIVIDEND STRATEGY

The majority of the researches on high-dividend strategy were conducted at the end of 1990s- beginning of 2000-ies, however, nowadays this direction still has not lost its relevance, especially between experts from America, Europe and Asia. The accumulated amount of studies confirms the fact that high-dividend strategies are extremely efficient and can be successfully applied to the portfolio management. However, the excess return over the market index are not always high enough, that is observed particularly in the US market.

So, one of the first researches conducted on the American market (McQueen *et al.*, 1997) demonstrated that the average return of a portfolio consisting of 10 stocks with the

highest dividend yield exceeded the yield of the market index during the period 1946-1995 by 3% per year. Similar results were obtained later in (Domian *et al.*, 1998) – the average yield on high-dividend portfolio was higher than the return of S&P 500 index by 4.8%. Later, Prather and Webb in their research achieved the comparable results: return of the classic "Dogs of the Dow" strategy during the time period 1961-1998 exceeded the return of the market index by slightly more than 4% (Prather and Webb, 2001). An analogous conclusion was demonstrated in the article written by Siegel (2007).

With regard to researches on the markets of other countries, in the majority of cases the results of the applying of high-dividend strategies were significantly better. However, at the same time the results often were statistically insignificant. Therefore, the results of applying this strategy seem to be unsustainable in time, so there was no evidence to state that they will provide the same excess return in the future. For example, Filbeck and Visscher (1997) could prove that investor who uses a high-dividend model is able to achieve a yield of 21.5% above the index (FTSE-100) on the UK market (Filbeck and Visscher, 1997), but at the same time, the results were insignificant. Another study (Da Silva, 2001), conducted in Latin America (Brazil, Mexico, Peru, Argentina, Chile, Colombia and Venezuela) showed that for all the countries (except Brazil) the use of the strategy "Dogs of the Dow" allows to obtain a yield above the market during the time interval 1994-1999, however, the results were insignificant at the 5% level.

Nevertheless, in many cases a high-dividend strategy stably demonstrated high results. On the Polish stock market during the period 1991-2004, the best portfolios showed a yield of 48.7% against the market yield of 12.1% (Brzeszczynski and Gajdka, 2007). Moreover, on the Thai market the return of a high-dividend strategy was by 15.6% above the market index Thai SET50 and by 38.5% higher than the KSE100 index during the period 1961-1998 (Soomro and Haroon, 2015). Considerably more stable results were obtained on the Japanese market – the average return of the strategy over the period from 1981 to 2010 was above the market index NIKKEI 225 by 6.9% (Qiu *et al.*, 2013).

So, taking into consideration all the mentioned various studies, it should be noted that in many cases high-dividend portfolios allow to get returns above the market return, however, the results are not always statistically significant. This fact, as well as a number of conceptual drawbacks of the classical high-dividend models, became the starting point to the formation of a new model of high-dividend investment presented in this research.

4. THE AUTHOR'S MODEL OF HIGH-DIVIDEND PORTFOLIOS WITH FILTERS ON THE FINANCIAL PERFORMANCE

A great number of the researchers who investigated the drawbacks of classical high-dividend models, came to the conclusion that the elimination of these disadvantages may be achieved by adding filters on a financial performance to the standard version of the model. This allows an investor to make more deliberate investment decisions, taking into account the financial situation of a certain company. It is worth noting that such a modification has already been partially implemented in a simplified version: Teplova and Halperin complemented the classical high-dividend model with one additional filter (profit of the company), which allowed to increase the average yield from 19.27% to 22.72% (Halperin and Teplova, 2012). However, the modified model is not quite comprehensive due to using only the classical version of the high-dividend strategy "Dogs of the Dow" with one

financial indicator. At the same time, there are few cases with the applying of the advanced versions of this model – for example, in the article written by Volodin and Sorokin (2014) the optional variables (month of the portfolio formation and the number of shares in the portfolio) were added to the traditional version of the strategy. Thus, in comparison with the classic "Dogs of the Dow" parameters (investing only in 10 shares annually in December), these crucial variables were optimized during the process of testing thereby creating a more adaptive model, which allows to provide a higher return on an investment (Volodin and Sorokin, 2014).

At the same time, an implementation of financial parameters as additional filters is rather controversial, because some of them may be applicable not to all companies. Therefore, the most appropriate way to select companies is to choose the basic indicators that can be used for the wide range of companies. The fundamental idea of the modified strategy formatting is based on the model of Joel Greenblatt (2006), which consists of P/E multiple and ROA coefficient. Due to the universal nature of these indicators, the modified model is suitable for the evaluation of the companies regardless of their industry sector. With regard to the practical applicability of this approach, the high level of the accessibility of such data for Russian companies gives investors the opportunity to use it during the portfolio formation process.

Another innovation that has never been implemented previously was the use of optimizing weights of assets in the portfolio. It should be noted that the use of equal weights of assets in a portfolio in the previous studies cannot be considered as a priori optimal. According to the authors, the peculiarity of the high-dividend models functioning must also be reflected in the establishment of an arbitrary distribution of assets' weights in a portfolio, which may allow to improve its quality and make it more adaptive. Thus, the modified authors' model includes three variables: month of the portfolio formation, the number of shares in a portfolio and their weights, as well as two additional filters for the stocks selection – the P/E multiple and the ROA coefficient.

a) Research methodology and description of the empirical results

The authors performed testing of the original high-dividend model on the Russian stock market. In order to provide the practical applicability of this model, only liquid stocks were used in calculations[1]. The time period of this study was the interval from 01.01.2006 to 01.12.2016. It is important to underline that the data on the stock prices of the companies in the first year (2006) was applied only to the formation of the portfolio for the next year (2007) and the first results were obtained in 2008. The choice of this particular time period was justified by the availability of data on the indicators P/E and ROA used in the model[2]. As shown by the analysis, until 2006 only a very small number of companies provided data on such financial indicators, making it impossible to use the model on the time interval before 2006[3].

The number of shares in a portfolio during the process of testing varied from 1 to 10: portfolios are composed of 1, 3, 5, 7 and 10 the shares. All the companies which provided dividends and have metrics P/E and ROA and whose stocks were listed on the Moscow stock exchange were used in ranking. Months for the annual portfolio formation were selected from July to December. This is because the majority of the companies publishes the quantity of annual dividends and set a closure date of the register of shareholders until the

summer. Therefore, the selection of shares in accordance with their dividend yield for the future inclusion into the portfolio may be made only in the second half of the year.

As mentioned above, in order to create a portfolio for each year the authors ranked shares according to three criteria: dividend yield, P/E and ROA values (for the last year)[4]. The ranking was performed separately for each of the three indicators, and then the average rank for each stock was calculated (all three indicators were used with equal weights). Next, based on the average rank the final allocation of the companies which would be included into the portfolio for the next year was held and 1, 3, 5, 7 and 10 companies with the highest total rank were determined.

During the process of testing, the authors used equal weights for each share in the portfolio[5]. The portfolio was held for one year, from the month of the portfolio formation to the same month of the following year. This procedure was repeated for each year on the time span of 9 years, from 2007 to 2016.

As the basic benchmark for the estimation of the strategy efficiency the authors used the MICEX index (the strategy "Buy and hold"). This particular index was chosen because it was nominated in rubles, included stocks of the fifty largest Russian issuers and was the most commonly used indicator for assessing excess returns from the application of different investment strategies on the Russian market. Accordingly, the authors' model is recognized as efficient if the difference between the authors' portfolio returns and the yield of the MICEX index during the same period is positive.

The transaction costs were not considered in the calculation. This is primarily due to an extremely low influence while reshaping a portfolio once a year (the total exchange and brokerage Commission for the transaction of a purchase or a sale of shares is up to a total of 0.04-0.05% of turnover). Besides, they did not have a significant impact on the comparison of the yields generated by portfolios with a yield of index strategies "Buy and hold" (investing in the index also needs to do a periodic rebalancing of a portfolio to reflect changes in its structure). For the same reason taxes and possible tax deductions were not taken into account – due to the relatively small differences in investing in tested strategies and investing in the index. When calculating portfolio returns themselves dividend payments were also not included. This ensured the comparability of the calculations results with the yield benchmark – MICEX index dynamics which also do not consider dividend payments.

b) A dividend model with variables by a month of investment and a number of stocks in a portfolio

In order to evaluate the ability of the proposed by the authors elaboration of the basic model "Dogs of the Dow" to introduce an extra effectiveness, the set of strategies of selecting stocks by a dividend yield was tested. When testing the high-dividend model, all the chosen months of the portfolio constructing were used as well as all the options on stock quantity. Only the particular case of the constructed model – investing in 10 stocks in December, is the closest one to the basic strategy (adjusted for the fact that the choice was made from all the liquid shares traded and not only from those included in the market index, as it is peculiar to the traditional methodology "Dogs of the Dow").

As it can be seen from the diagram presented in Figure no. 1, the return on using the high-dividend model on the Russian market exceeds the return on investing in the market

index in almost all cases (except for the investing in one stock when constructing the portfolio in July and August).

During the conducted calculations it was determined that the best month for investing is December, taking into account the average results of all portfolios. It is clearly seen that the highest profits are reached by constructing portfolios closer to the end of the year. Although, it can be noticed that the MICEX index average returns themselves grow significantly at the end of the year. Thus, the increase in the total return when constructing portfolios closer to the end of the year is reached also by the growth of the whole market return.

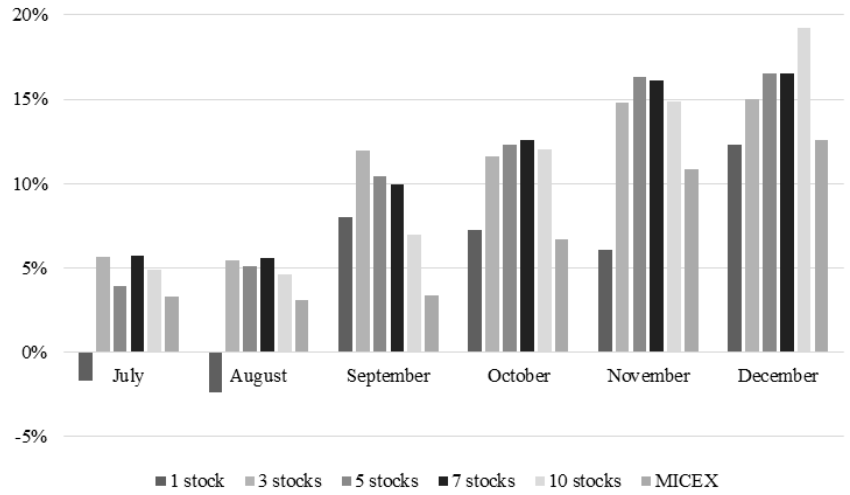

Figure no. 1 – The average annual return of the high-dividend model from 2007 to 2016, %

However, this does not diminish the fact that the excess return over the index is quite high. The average return of the best December portfolio containing 10 stocks is 6.7% higher than the index return and accounts for 19.3% annually. Taking into account the overall picture of the results got on different market, this indicator may be considered as a good one, but at the same time it is far from the results got on some national markets. Thus, the applying of the classical high-dividend strategy with the selection of shares by the dividend yield and some additional variables (the month of construction and the quantity of included stocks) on the Russian market may be considered successful.

These results are consistent with previous works, performed by Russian specialists. The average annual return of the strategy "Dogs of the Dow" reached 19.3% in the paper written by Halperin and Teplova (2012). Meanwhile in Volodin and Sorokin's work (Volodin and Sorokin, 2014) it is 33.6% when constructing 10 stocks portfolio in October. The observed difference may be explained also by various testing periods – as it was shown in a number of papers, the results of the applying of high-dividend strategies are prone to fluctuate (Filbeck and Visscher, 1997; Domian *et al.*, 1998). However, taking into account the small duration, there were no significant shifts.

One of the benefits of the testing model is a slight increase in returns from August to December, which reflects the stability of the results that do not fluctuate much. The same is true for the quantity of stocks in a portfolio both for the best month and for the other ones –

the results of the investments do not shift significantly when the quantity of shares in a portfolio is changed (except for investments in one share).

It is remarkable that the return of the basic model "Dogs of the Dow" (investment in ten stocks in December) was the highest in this case. It differs from the results of Volodin and Sorokin's work (Volodin and Sorokin, 2014), which identified October as the best month. However, it is worth noting that in both papers months in the last quarter were the best ones for the portfolio construction. The slight difference in the results was explained by the various data periods used in the research, as well as changes on the Russian market and shifts in dividend policies of companies in recent years.

c) The model based on financial indicators P/E and ROA

In order to understand whether the use of chosen additional financial indicators was reasonable, it seemed helpful to assess how they would perform on the Russian market. If their use has led to negative results, it would have been irrational to include them in the high-dividend model for improving the results.

For this purpose, the authors performed a portfolio test. Portfolios were formed according only to P/E and ROA indicators without taking a dividend yield into account. In order to provide a comparability of the results for different models, the test was performed with the same conditions as the one for the high-dividend model was. In this case, stocks were ranged by P/E and ROA annually. The stocks with the lowest P/E and the highest ROA were given the highest rank, according to the traditional practice of their applying in the financial analysis. The results of the test are represented on the Figure no. 2.

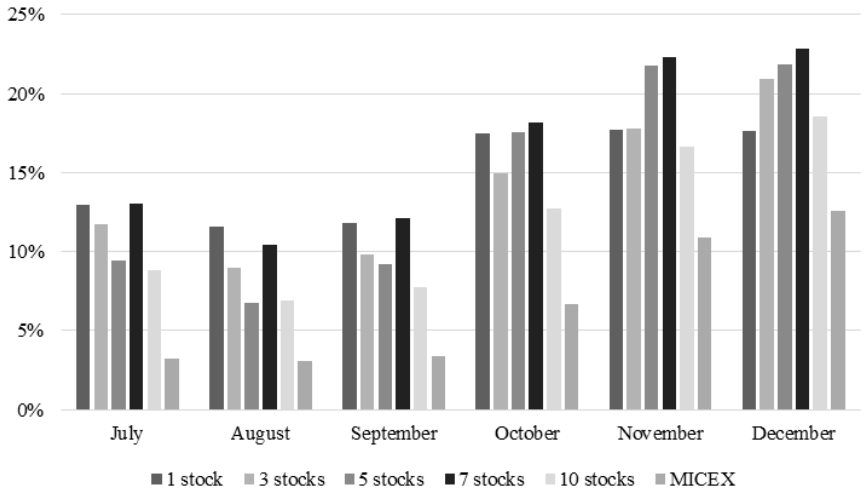

Figure no. 2 – The average annual return of the model with financial indicators P/E and ROA from 2007 to 2016, %

As it is shown on the diagram, the obtained returns of portfolios exceed the MICEX index returns in every case. It demonstrates the success of the Joel Greenblatt model not only on the American market, but also on the Russian one. Moreover, as in the dividend model, the significant advantage over index is observed even from July to September. The general level

of excess returns of the tested model is rather high and it demonstrates its effectiveness on the Russian market. The excess return of the best portfolio (December, 7 stocks) accounted for 10.3%, so that the final return (22.82%) was almost twice as high as the index return (12.6%).

Similar to the high-dividend model, a stability of results over months is observed (there are no significant fluctuations of the returns), as well as over portfolios with a different stock quantity. Moreover, in this case investing in one stock with the best P/E and ROA provides good results. Therefore, applying of this model does not require a wide diversification, contrary to the high-dividend one. Furthermore, average excess returns of the portfolios in this model (7.7%) outweigh those for the high-dividend one (2.95%). These circumstances, as well as other positive characteristics of testing the Joel Greenblatt model, definitely indicate that applying P/E and ROA may complement the model on the base of the high-dividend investing.

d) High-dividend model with additional filters on P/E and ROA

Thus, the analysis above showed that dividend models are rather successful on the Russian market. However, a really significant advantage, compared to investing in the index, may be reached only by forming a portfolio at the end of the year and only if the portfolio is widely diversified. At the same time, there are no such drawbacks in the model on the base of P/E and ROA. Besides, it provides comparatively higher returns of portfolios. Therefore, it seems reasonable to integrate all indicators (dividend yield, P/E and ROA) in one model. As it was already mentioned before, in this case the selection of stocks in a portfolio will be more reasonable, and it will allow to neutralize common disadvantages of the high-dividend model. This may assist to get higher results by applying the model in terms of overall and excess return.

In order to check this assumption, the authors constructed and tested portfolios on the base of the united model. The testing conditions were preserved for the comparability of the results. The obtained values of the average annual returns of the model are presented on Figure no. 3.

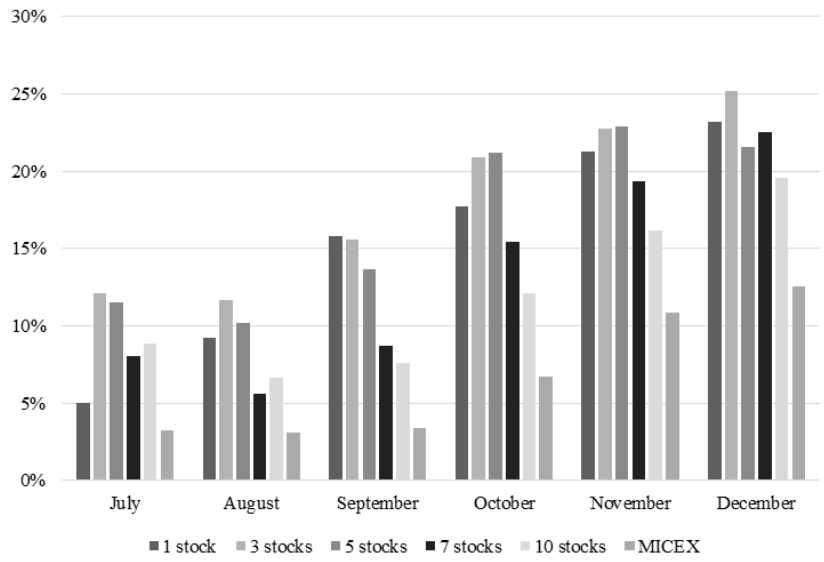

Figure no. 3 – The average annual return of the high-dividend model with filters on P/E and ROA from 2007 to 2016, %

The diagram demonstrates that the integration of all three indicators in one model was rather successful and it allowed to reach comparatively higher results of the investing. On the one hand, low returns in July and August inherent for the dividend model were mostly eliminated (the excess return of the index for these months increased significantly, Figure no. 6). But at the same time, the best results on absolute returns were also observed when forming a portfolio closer to the end of the year, and the best return were get in December (average return of all December portfolios accounted for 22.4%). This fact is not surprising since this month was also the best in the two previous models of the portfolio investing.

However, if we assess the trend of excess returns (Figure no. 6), we will get October as the best month for the united model (the average annual return of all portfolios constructed in October accounts for 10.8%), although high excess returns are also inherent in November and December. There can be also seen the overall superiority of the united model on the high-dividend one in terms of excess return, and the maximal difference refers to December, which is the best by the absolute returns.

Another important benefit of the integrated model is a comparatively lower dependence of the results on the portfolio diversification depth. In that case, the highest values are reached mostly for portfolios of three or five shares, and it concerns both the excess return over index and the absolute one. Whereas the maximal diversification up to 10 stocks decreases slightly the results in terms of excess return in all cases. Compared to the classical high-dividend model, the excess returns of investing in one stock also increased significantly. Thus, one more advantage of the united model is the fact deep portfolio diversification is unnecessary, as it is inherent in the usual high-dividend investing.

e) The optimization of the weights in a portfolio to improve its qualitative features

Despite the significant improvement in the results of the high-dividend model because of an inclusion of additional filters, it is quite interesting that the weights of assets could be redistributed arbitrarily for the improvement of the authors' model. The prerequisite for that was a clear advantage in terms of portfolio returns containing a small quantity of shares which were the best based on rankings when constructing portfolios. At the same time, portfolios of seven and ten stocks are diversified deeper, which allows to decrease the level of a specific portfolio risk and prevent excessive variance of returns. The combination of advantages that can be taken from portfolios with a small number of shares and those more diversified is possible when the weights of stocks in a portfolio are arbitrary.

For this purpose, the weights of shares with the highest rank were increased in the authors' model while those of stocks with the lower value of rank were declined. After several tests of models with arbitrary set weights, the best option was the distribution presented on Figure no. 4. Overall, during the tests it was noticed that indicators rise when the weights of the first stocks by ranks is increased, but in this case, a uniform improvement was observed in most cases.

10 stocks in the portfolio	1	2	3	4	5	6	7	8	9	10
Weight of each stock	20%	20%	15%	10%	10%	5%	5%	5%	5%	5%
7 stocks in the portfolio	1	2	3	4	5	6	7			
Weight of each stock	30%	20%	20%	10%	10%	5%	5%			
5 stocks in the portfolio	1	2	3	4	5					
Weight of each stock	35%	25%	25%	10%	5%					
3 stocks in the portfolio	1	2	3							
Weight of each stock	60%	30%	10%							

Figure no. 4 – The distribution of weights in the model with filters on financial indicators.

As it is shown on Figure no. 5, significant improvements of the new model were observed, above all, in portfolios containing the maximal number of stocks (seven and ten). Thus, for the best in terms of absolute value portfolio of ten stocks the rise of 2.23% (from 19.57% to 21.8%) was observed. Whereas for the best portfolio in terms of excess return in October there was a maximal rise in average returns (from 17.42% to 19.4%). At the same time, the results for portfolios of seven and ten stocks showed the most significant growth in average returns (by 3.35% and 5.28% respectively).

Therefore, in the model with arbitrary distributed weights the results of portfolios containing different quantity of stocks are more uniform. The dependence on the stock quantity in a portfolio declined. It was shown before that an advantage of the model with filters on financial indicators was a lower dependence on the diversification depth, as reaching of high returns did not require constructing a portfolio with maximal number of stocks, as it was in the classical high-dividend model. In this case the results of the investing for the best portfolios in terms of month yield almost do not depend on the quantity of stocks in it. So it is suitable for applying by both individual investors who are oriented towards purchasing a small number of stocks up to one and portfolio managers who create more diversified portfolios.

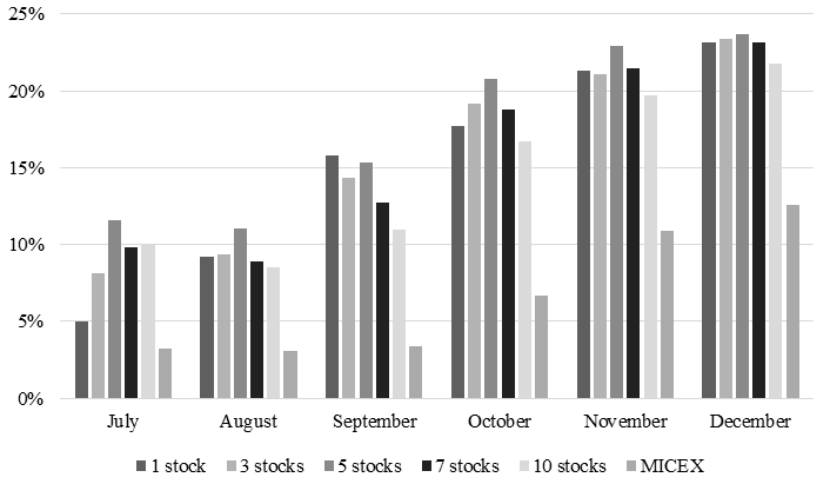

Figure no. 5 – The average annual return of the model with filters on P/E and ROA and the optimization of asset weights in a portfolio from 2007 to 2016, %

The diagram presented below in Figure no. 6 demonstrates that the model with increased weights for the first stocks by rank has the best characteristics in terms of excess return compared to other considered models. A significant improvement is observed in all months with the highest level of an excess return (from September to December). If we make overall comparisons between all three models by aggregated indicators, we may notice that the model with weights optimization leads by total excess return, averaged for all constructed portfolios and all considered months of investing. For the high-dividend model this indicator accounts for 2.95%, that for the united high-dividend one is 8.42% and the figure for the united high-dividend model with the weights optimization equals to 9.51%.

The advantages of the two authors' models may be well assessed by their comparison with other options of investing by the accumulated return over the whole period of the research.

The accumulated return of the best portfolio (December, 3 stocks) for the united model with equally distributed weights (186.2%) significantly overrun that for the best portfolio (December, 10 stocks) for the high-dividend model (35.0%) as well as the accumulated return for MICEX (18.2%). At the same time, the best high-dividend portfolio (which in this case refers to the classical strategy “Dogs of the Dow”) provides only a small advantage on MICEX, whereas the advantage of the authors’ model is quite significant.

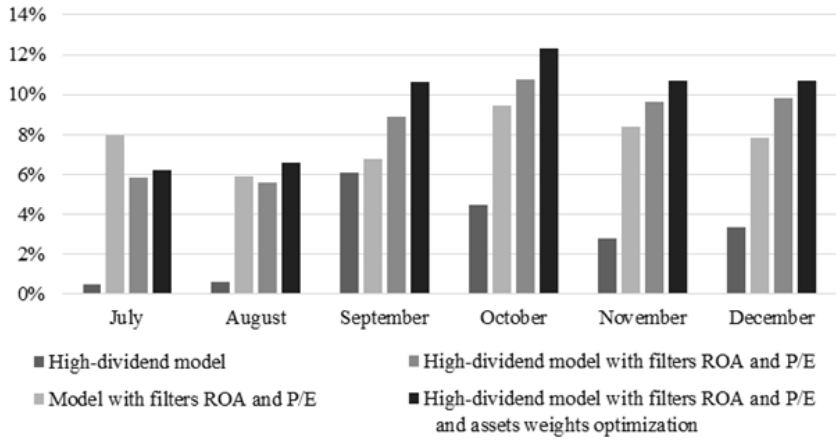

Figure no. 6 – The average excess return of each out of four models for different months of entering the market from 2007 to 2016, %

It is also worth noting that full accumulated return in the model with arbitrary distributed weights (169.8%) is marginally lower than that in the model with equally distributed ones (186.2%). This is conditioned by the fact that the best portfolio in the model with optimized weights has a slightly lower return than that in the model with equal weights. However, this case is not unique and does not testify to the advantage of the model with equal weights.

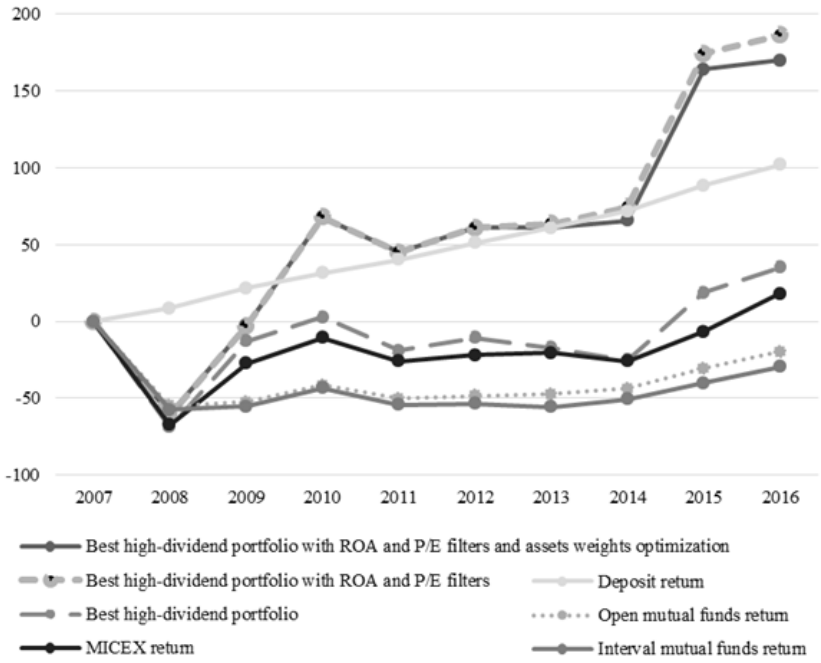

Figure no. 7 – The accumulated return of the MICEX index, deposits, equity investing funds and the best model portfolios without inflation, %

What about other possible ways of investing, it may be noticed that both authors' models (with equal and optimized weights) allow to get returns higher than investing in deposits[6] (102.1%, an excess of 84.1% and 67.7% respectively). At the same time, the usual high-dividend model is clearly losing to this type of investing (by 67.0%). The authors' models also have serious advantages in comparison with investing in Russian interval and open equity investing funds (excess return is -29.7% and -19.8% respectively).

But the most colorful advantage of the formed models may be seen after a correction of excess return results by inflation[7] (Figure no. 8). It is clearly seen that only authors' models with filters on the financial indicators allow to get the positive real (and not nominal) return for the chosen period of time (23.8% and 16.7% respectively), whereas other variants of investing get the negative real return[8]. For deposits the real accumulated return accounted for -12.6%, the investing in MICEX using "Buy and hold" strategy provides -48.9%, the classical high-dividend strategy "Dogs of the Dow" gives -41.6% and the indicators for open and interval equity funds are -65.3% and -61.8% respectively. While investments in deposits which are traditional and most popular among households lose to the inflation, the results shown by the authors' models seem to be quite attractive for private investors, especially, if the period of an investment is more than several years, since it allows to avoid potential time corrections connected with crisis conditions on the market.

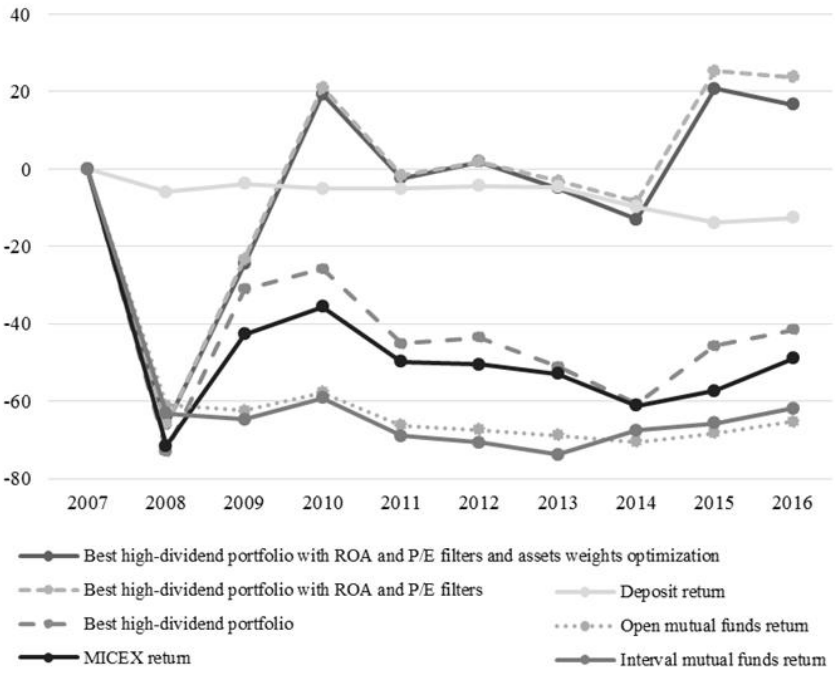

Figure no. 8 – The accumulated return of the MICEX index, deposits, equity investing funds and the best model portfolios with inflation, %

Therefore, we can confidently assert among the considered options of investing only the authors' models allow to effectively save and increase savings of households. Moreover, the assessments of the excess return results got by the authors' models with t-statistics showed that the results are significant. For portfolios constructed in December t-statistics for the model with equal weights was 3.27 with p-value equal to 0.002 while those for the model with optimized weights were 3.237 and 0.0023[9] respectively. Therefore, the advantage of the authors' models over the MICEX index, deposits and equity funds are not accidental.

It is known that while assessing different types of investing it is necessary not only to target indicators of absolute or excess return, but also to conduct an analysis of the relationship between risk and return. This is because strategies with higher returns may have a higher level of risk, which neutralize their advantage. For making such comparisons the Sharpe and Sortino ratios are usually considered. The calculation of these values showed that the authors' models have serious advantages over both classical high-dividend model and the index strategy "Buy and hold".

The value of the Sharpe ratio for the best portfolio (December, 3 stocks) for the model with equal weights was 0.3, while that for the model with optimized ones accounted for 0.28. At the same time for the high-dividend model it equaled 0.17, whereas the value for the MICEX index in December was only 0.1. The Sortino ratio allowed to assess the volatility which decreased returns on investment more precisely. It demonstrated a similar situation, since the values for the best portfolio for the authors' models with equal (1.15) and optimized (1.13) weights were significantly higher than those for the high-dividend model

(0.75) and for the passive index strategy (0.51). Thus, the calculations of risk and returns coefficients totally confirmed the results of analysis of absolute and excess returns. Consequently, we can assert the authors' high-dividend models with additional filters on P/E and ROA provide higher results than usual high-dividend models do.

Similar conclusions were obtained while assessing a high-dividend portfolio with a filter by profit in a research performed by Halperin and Teplova (2012). The values of the Sharpe and Sortino ratios (0.16 and 0.22 respectively) were slightly higher than those for the index strategy "Buy and hold" (0.12 and 0.16). Meanwhile for the models with filters on financial indicators presented in the paper the excesses are rather significant both for the Sharpe and Sortino ratios. Comparatively higher excess for the Sortino ratio demonstrates the advantage of the authors' models as it reflects an extremely low "negative volatility" of its returns. Therefore, the formed models appear as a development of the high-dividend investing area, allowing to reach higher rates compared to models of this type formed before.

5. CONCLUSIONS

During the presented research, new models were formed and tested. They allow to form high-dividend portfolios, under which the classical model was completed with filters on P/E and ROA as well as optimized assets weights in portfolios. First of all, it allowed to eliminate the common drawbacks of the traditional high-dividend portfolio investing connected with a neglect of a current financial situation in a company and its business-cycle stages and provided an opportunity to reach the higher rates of return from investments.

For the assessment of the authors' models their testing on the Russian stock market from 2006 to 2016 was conducted. It showed the models' advantages over the classical high-dividend model: the average return for the model with equal weights were 25.2%, while that for the model with optimized ones accounted for 23.7% against 19.3% for the classical model (for the best December portfolios). It was also set that average returns for the authors' model with equal and optimized weights exceeded those for December index return by 12.7% and 12.3%. The benefits of the authors' models over investing in deposits were also noticed (average returns were 17.15% and 16.75% higher respectively), as well as over investing in open equity funds (by 24.04% and 23.67%) and in interval ones (by 24.96 and 24.56% respectively).

It is worth noting that during the considered period only the authors' models were able to demonstrate positive real return (excess return accounted for 23.8% for the model with equal weights and 16.7% for the model with optimized ones). The authors' models also showed higher results in comparison with a similar model with a filter by profit, which was presented in Halperin and Teplova (2012), nevertheless the considered period in it (2003-2011) included a rapid growth of the Russian market (2005-2007).

An analysis of excess returns of the authors' models[10] demonstrated that the best month for constructing portfolio on the Russian market for both of them was October, whereas that for absolute returns is December. However, high results were noticed for all months from September to December. In these three months the authors' models with equal and optimized weights also had serious advantages over the usual high-dividend model in terms of excess return (by 6.5% and 6% respectively).

The advantage of the models with filters on financial indicators over usual high-dividend ones was also confirmed in the analysis applying risk and return coefficients (the

Sharpe and Sortino ratios), whereas t-statistics showed obtained excess returns were not accidental. Therefore, the formed models may be recommended for applying by private and corporate investors, as well as by portfolio managers in order to get returns higher than the market index. At the same time, the model with equal weights is more suitable for investors who are aimed at maximizing an absolute return and do not seek a wide portfolio diversification. The model with optimized weights is, on the one hand, more versatile, as its results do not almost depend on the quantity of stocks in a portfolio. On the other hand, it allows to increase the results of an investing in terms of excess return over the index one. Therefore, it is more suitable for those investors and portfolio managers whose aim is to reach the best rates of an excess return which does not depend on the market fluctuations.

Thus, in addition to advantage in total rates of return, the authors' models allowed to eliminate the requirement of a wide portfolio diversification, which is inherent in the classical high-dividend model. It especially concerns the model with the optimized weights, since it is equally suitable for applying for a small number of stocks, up to one. At the same time, in comparison with the classical high-dividend model, the selection of stocks in a portfolio became more reasonable and accurate, due to taking into account the current financial situation in a company and not only the level of dividend yield. So, the presented models with filters on financial indicators are a new step of development of the high-dividend investing theory and practice, since they assign a path for the following researches in this area.

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Notes

[1] The Thomson Reuters data was used.

[2] According to Bloomberg, only 24 companies provided data on P/E for 2005 year.

[3] According to Bloomberg, only 24 companies provided data on P/E for 2005 year.

[4] The dividend yield by a stock price was calculated for the shareholder register closing day. When calculating the annual dividend yield, all the intermediate dividends were summed, if they were paid by the issuer.

[5] The data for the month closing was used.

[6] The data on the average annual deposit rates for banking deposits for households on 1 year (except for demand deposits) were taken from the CB site www.cbr.ru/statistics/?PrtId=int_rat.

[7] The data on the average annual inflation were taken from the CB site www.cbr.ru/statistics/?Prtid=macro_sub.

[8] The calculation of the real return was performed using Fischer's formula.

[9] When the null hypothesis is that the mean of the excess return of a portfolio on the market index return equals zero.

[10] The averaged for all portfolios and all months used in the testing.

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