

THE STUDY OF THE MARKET OF MUTUAL INVESTMENT FUNDS IN THE RUSSIAN FEDERATION

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Abstract: *In the work, studies were carried out on the efficiency of the work of mutual open and interval investment funds (PIFs) using the methods proposed by domestic and foreign authors. Based on these methods, performance indicators of the most popular mutual funds for investors, such as Sberbank Consumer Sector, Uralsib-First, Uralsib-Perspective Investments, High Technologies, and Alfa Capital Technologies, have been calculated. Based on the results of calculations, conclusions were drawn about the most attractive mutual funds for investing in these mutual funds by investors.*

Keywords: mutual funds, mutual fund performance indicators, mutual fund performance, financial market, net asset value.

The financial market offers a wide range of possibilities for investing, but not every investor has a fundamental knowledge of how the financial market is structured and is functioning. For example, investing in equity securities requires specific knowledge, investor experience and large initial investments. At the moment, parallel to independent investment funds, there are also collective ones.

One example is mutual investment funds. In the international practice mutual investment funds are the most popular ones among investors. With their help Western countries solve some of their problems, such as financial security of enterprises, management of pension savings portfolios, etc. In Russia these processes develop more slowly. It can be said that mutual funds do not inspire a sufficient level of trust. Of course, the determining factor is the fact that people are unwilling to take risks. After all, in the light of the recent events and the current crisis, investments in Russian issuers are truly risky investments. Instead of taking risks the Russians prefer more reliable investments, where the level of profit is not very high.

The relevance of the work is that even with the earlier described problems the collective form of investing in Russia has the highest level of development. In many respects, it is due to the significant dependence of enterprises on the borrowed sources of financing, on the one hand, and reduction of the costs of investors for the management of their funds, on the other.

Materials and methods

The Federal Law “On Investment Funds” No. 156-FZ of November 29.11.2001¹ defines a mutual investment fund as the property complex which is in property of joint-stock company or in common ownership of physical persons and legal entities, use and the order which are performed by managing company only for the benefit of shareholders of this joint-stock company or founders of trust management.²

The purpose of this work is to study the efficiency of the mutual investment funds operating in Russia.

In assessing the effectiveness of mutual funds domestic and foreign sources of information were used.³

¹ The Federal Law, "On Investment Funds" №156-FZ (edition of July 3, 2016). *Article 10. Concept of the investment fund*, 2001. www.consultant.ru, accessed on 13.03.2018.

² The Order of the RSFSR of the Russian Federation №06-125/pz-n , "On the minimum value of property that makes up a unit investment fund, upon the achievement of which a unit investment fund is formed, 2006. www.consultant.ru, accessed on 14.03.2018.

³ R. Brayley, *Principles of Corporate Finance*, Moscow, Olimp-Business, 2009; A. N. Burenin, *Management of a portfolio of securities*, Moscow, Scientific and Technical Society named after academician S. I. Vavilov, 2016; A. A. Vershinina, A. V. Trofimovskaya, M. V. Fomin, *Investment fund on the stock market of Russia: Monograph*, Moscow, MESI, 2015; B. Graham, D. Zweig, *Reasonable investor*, Moscow, Williams, 2009; M. Capitan, D. Baranovsky, *Share Funds: A Modern Approach to Money Management*, St.-Peterburg, Peter, 2016; J. K. van Horn, J. M. Vahovich, Jr., *Fundamentals of Financial Management*. Moscow, OOO "I.D. Williams, 2007; N. I. Yashina, E. V. Poyushcheva, M. V. Ogorodova, L. V. Lavrenteva, E. A. Semakhin, O. I. Kuryleva, “Theory and practice of human capital assesment in the context of innovative economy development”, in *Man in India*, 97 (9), (2017), pp. 43-52; N. I. Yashina, E. V. Poyushcheva, M. V. Ogorodova, Z. V. Smirnova, S. N. Kuznetsova, Z. V. Chaykina, “Methods of estimation of bank system development in Volga federal district”, in *Academy of Accounting and Financial Studies Journal*, 21 (3), (2017), www.abacademies.org, accessed on 13.03.2018; S. N. Yashin, N. I. Yashina, M. V. Ogorodova, Z. V. Smirnova, S. N. Kuznetsova, I. N. Paradeeva, “On the methodology for integrated assesment of insurance companies' financial status”, in *Man in India*, 97 (9), (2017), pp. 37-42.

The criteria for assessing profitability are, first of all, the actual earnings, which characterize the effectiveness of the asset in the past up to the present moment of time as well as other indicators, which are given below.

The calculation of the actual earnings is based on the statistical data of formula 1:

$$r = \frac{P_1 - P_0}{P_0}, \text{ where (1)}$$

r – profitability;

P_1 – estimated share value of investment fund at the end of the reviewed period;

P_0 - estimated share value of investment fund at the beginning of the reviewed period.

The second criterion of assessment is the expected profitability. In practice, in most cases, in calculating the expected profitability a simple average method is used. In this case, the formula for calculating the expected profitability will be the following:

$$\bar{r}_i = \frac{\sum_{t=1}^n r_{it}}{n}, \text{ where (2)}$$

r_{it} – the actual profitability of the i -th asset at time t ;

n – the number of values of the actual profitability.

The conversion of the expected monthly profitability into the annual equivalent is carried out according to the following formula:

$$\bar{r}_{years} = \bar{r}_{month} \times 12 \text{ (3)}$$

Then the variance is calculated – this is the average value of the square of deviations of the actual values of profitability of investments into the investment fund (r_i) of the average value of profitability of investments into the shares of investment fund (\bar{r}).

The variance is calculated with formula 4:

$$\sigma_i^2 = \frac{\sum_{t=1}^n (r_{ti} - \bar{r}_i)^2}{n}, \text{ where (4)}$$

r_{ti} – indicator of the return on investments into mutual funds for the i -th time interval;

\bar{r}_i – indicator of the average return on investment into mutual fund over the period of time (t);

n - the number of the i -th intervals in the period of time t .

Variance as a measure of risk was introduced into the theory of portfolio of securities by the founder of the modern portfolio theory G. Markovits. A certain disadvantage of this measure of risk is that it equally takes into account the deviations in the profitability of the asset from its average profitability both in the direction of its increase and reduction. At the same time, the investor, who invested his funds in the share, is concerned about the reduction of its profitability. In fact, for him the growth of profitability is not a risk as such. Therefore, later G. Markovitz proposed as a measure of risk the indicator of poly-variance. Selective poly-variance is determined with formula 5:

$$\text{Poly-variance} = \frac{\sum_{i=1}^n r_i < \bar{r} (r_i - \bar{r})^2}{n} \quad (5)$$

The standard deviation is calculated. The standard deviation is defined as a square root of the variance (formula 6):

$$\sigma = \sqrt{\sigma^2} \quad (6)$$

The conversion of the standard deviation into the annual equivalent is carried out according to formula 7:

$$\sigma_{\text{year}} = \sigma_{\text{mon}} \times \sqrt{12} \quad (7)$$

The growth of the share is calculated with the following formula 8:

$$\text{Growth} = \frac{P_c - P_0}{P_0} \times 100\% \quad (8)$$

P_c – the cost of investment share of the investment fund at the end of the reviewed period;

P_0 – the cost of investment share of the investment fund at the beginning of the reviewed period.

The drawdown of the share is determined with formula 9. The drawdown means the maximum reduction in the value of the share during the reviewed period. It is equal to the maximum loss that could be obtained by buying the shares at their "peak" and paying them off "at the bottom".

$$\text{Drawdown} = \frac{P_{\text{max}} - P_{\text{min}}}{P_{\text{max}}} \times 100\% \quad (9)$$

The covariance in the yields of shares of the mutual fund and the base index measures the degree of synchronism of changes in the indicators of the relative change in the estimated value of shares of the investment fund and the base index.

The drawback of covariance as well as variance is that this indicator is not standardized. Its value can range from $+\infty$ to $-\infty$.

By calculating the covariance for a particular mutual fund one can understand only by the signs "+" or "-" whether the estimated value of the share has changed in one direction or in different directions with relative changes in the base index.

The covariance is determined with formula 10:

$$\text{cov}(r, \text{ind}) = \frac{\sum_{i=1}^n (r_i - \bar{r}) \times (R_i - \bar{R})}{n}, \text{ where} \quad (10)$$

r_i – indicator of the return on investments in the mutual fund for the i -th time interval;

R_i – indicator of the return on investments in the base index for the i -th time interval;

\bar{r} – indicator of the average return on investments in the mutual fund over a period of time (t);

\bar{R} – indicator of the average return on investments in the index for a period of time (t);

n – the number of the i -th intervals in the period of time t .

The correlation coefficient is determined with formula 11:

$$\beta = \frac{\text{Covariance}}{\sigma_r \times \sigma_R}, \text{ where} \quad (11)$$

covariance (r , R) is the covariance of the return on investments into the shares of the mutual fund (r) and the base index (R); σ_r is the standard deviation of the mutual fund yield; σ_R is the standard deviation of the base index yield.

Beta coefficient as a measure of the market (systematic) risk of investing into the shares of mutual funds is determined with formula 12. The coefficient shows the degree of influence of the index portfolio market on the yield of investment funds' shares.

Beta coefficient varies in the range from $+\infty$ to $-\infty$. The closer the value of the β -coefficient to "0", the less the yield of the mutual fund depends on the market situation.

The coefficient higher than 1 means that the yield of the mutual fund grows or falls faster than the return on the index portfolio. The coefficient smaller than one means that the yield of mutual funds grows or falls slower than the market.

If beta is negative - the profitability of the mutual fund changes in the opposite direction to the profitability of the index portfolio:

$$\beta = \frac{\text{Covariance}}{\sigma_R^2}, \text{ where (12)}$$

covariance (r, R) is the covariance of the return on investments into the shares of the mutual fund (r) and the base index (R); σ_R^2 - variance (variation) of profitability of the base index.

The coefficient alpha (α) is calculated with formula 13. Alpha coefficient is a measure of the non-market component of investment fund profitability, that is, the deviation of the actual profitability of the mutual fund from the profitability, which with a given beta coefficient would have been received by the fund under the current dynamics of the stock index.

Alpha coefficient is traditionally regarded as a coefficient characterizing the effectiveness of the active portfolio management strategy of the investment fund. The coefficient shows whether the fund managed to exceed the yield that it could rely on based on the existing level of coefficient β and the index's profitability.

The positive value of the alpha coefficient indicates a positive contribution of the portfolio manager to the mutual fund's profitability. If alpha has a negative value, it is a sign of poor efficiency of portfolio management.

$$\alpha = \bar{r}_{year} - \beta \times \bar{R}_{year}, \text{ where (13)}$$

\bar{r} - indicator of an average return on investments into mutual fund over a period of time (t);

\bar{R} - indicator of an average return on investments in the index for the period of time (t);

β - beta coefficient.

The profitability/risk coefficient is calculated with formula 14.

This coefficient is a ratio of the difference between the profitability of the mutual investment fund and profitability of the risk-free asset to the standard deviation of the mutual investment fund's profitability.

$$\text{The profitability/risk coefficient} = \frac{\bar{r}}{\sigma}, \text{ where (14)}$$

\bar{r} - indicator of an average annual return on investments in the mutual fund over a period of time (36 months);

σ - standard deviation of the annual profitability of the mutual investment fund.

The Sharpe ratio is calculated with formula 15. This coefficient is a ratio of the difference between the profitability of the mutual investment fund and the profitability of the risk-free asset to the standard deviation of profitability of the mutual investment fund.

$$K_{\text{Sharpe}} = \frac{\bar{r} - r_f}{\sigma}, \text{ where (15)}$$

\bar{r} – indicator of an average return on investments into the mutual investment fund for the i-the time interval;

r_f – indicator of the average profitability of federal loans for the i-the time interval;

σ – standard deviation in profitability of the mutual investment fund for the period of time t.

The Sortino ratio is calculated with formula 16. Unlike the Sharpe ratio, the Sortino ratio takes into account only negative fluctuations in profitability.

The semi-variance indicator in the denominator ignores positive changes in profitability, which are not supposed to create any risk of losses for the shareholders. The higher this ratio, the more effectively the mutual investment fund is managed in terms of profitability and risk.

The formula for calculating the Sortino ratio is similar to the formula for the Sharpe ratio, except that the denominator uses a semi-variance indicator of negative fluctuations in the monthly profitability of the mutual fund.

$$K_{\text{Sortino}} = \frac{\bar{r} - r_f}{\sigma(\text{semi-variance})}, \text{ where (16)}$$

\bar{r} – indicator of the average profitability of investments into the mutual fund for the i-the time interval;

r_f – indicator of the average profitability of federal loans for the i-the time interval;

σ (semi-variance) – standard deviation in profitability of the mutual fund calculated taking into account the negative deviations of profitability r_i from \bar{r} .

The Traynor coefficient is calculated with formula 17.

It is a ratio of the difference between the mutual fund's profitability and profitability of the risk-free asset according to the beta coefficient.

$$K_{\text{Traynor}} = \frac{\bar{r} - r_f}{\beta}, \text{ where (17)}$$

\bar{r} – indicator of the average profitability of investments into the mutual fund for the i -the time interval;

r_f – indicator of the average profitability of federal loans (OFZ) for the i -the time interval;

β - beta coefficient.

The monotonicity index is determined with formula 18. The values of the monotonicity index lie in the range from -1 to + 1. This ratio is calculated as a ratio of the difference in the value of the share at the end and at the beginning of the period to the sum of the modules of daily changes in the value of the shares.

$$\text{Monotonicity} = \frac{P_1 - P_0}{\sum_{i=1}^n |p_1 - p_0|}, \text{ where } (18)$$

P_1 – the value of the share at the end of the reviewed period;

P_0 - the value of the share at the beginning of the reviewed period.

p_1 and p_0 - the value of the share for each month during the reviewed period.

The more the share's value fluctuated over the period, the more unstable the mutual fund's management was – the closer the indicator was to zero.

The main factors that are used to analyze the efficiency of the mutual fund's operations and to compare them among themselves are as follows:

- 1) actual profitability; expected profitability;
- 2) standard deviation;
- 3) covariance; correlation;
- 4) the Sharpe ratio; the Sortino rate; the Traynor rate.

Results and Discussion

The practical analysis of the indicators of profitability and risk of the analyzed mutual funds: “Sberbank Consumer Sector”, “Uralsib-First”, “Uralsib-Perspective Investments”, “High Technologies”, “Alfa Capital Technologies” was carried out on the basis of the information base of these mutual funds, which is reflected in the relevant sources.⁴

In performing the practical part of this work mutual funds of the open and interval types were investigated, since the initial data (the value

⁴ *Investment Tools*. www.investfunds.ru, accessed on 13.03.2018; *Moscow Interbank Currency Exchange*. www.moex.com, accessed on 13.03.2018; *Official site of the Bank of Russia*. www.cbr.ru, accessed on 13.03.2018.

of shares) for the selected study period were available only for these types of mutual funds.

Table 1 presents the rating of the analyzed open and interval mutual investment funds as of 01.11.2016 according to the value of net assets, in which the object of investment is shares.

Table 1: The rating of mutual investment funds according to the value of net assets

Number	Type of fund	Name of the fund	Management company	Category	The value of net assets, rubles.
1	Open	Sberbank Consumer Sector	Sberbank Asset Management	Shares	2767625557,61
2	Open	Uralsib-First	Uralsib	Shares	2656453890,00
3	Interval	Uralsib-Perspective Investments	Uralsib	Shares	2494018154,00
4	Interval	High Technologies	Capital	Shares	652866414,91
5	Open	Alfa Capital Technologies	Alfa Capital	Shares	589015916,43

As can be seen from Table 1, the open mutual fund "Sberbank - Consumer Sector" had the maximum value of net assets as of November 1, 2016. The minimum value of net assets in the amount of 589015916,43 rubles was observed for the open investment fund "Alfa Capital-Technologies".

In the analysis of investments into securities of investment funds the biggest attention is paid to profitability and risks.

The fullest algorithm for calculating investment characteristics is given for "Sberbank Consumer Sector".

Table 2 shows the values of shares of Sberbank - Consumer Sector (the category - shares) managed by Sberbank Asset Management on the last business day of each month from December 2013 to November 2016.

The following basic assumptions will be used in calculations: the minimum time interval for measuring the actual profitability of a share is 1 month: this indicator is analyzed for a period of 36 months or three years.

Based on the monthly values of the share shown in Table 2 it is possible to calculate its actual monthly profitability by using formula 1.

$$r_{\text{January 2014}} = (1120,61 - 1213,66) / (1213,66) \times 100\% = - 7,6669 \%$$

$$r_{\text{February 2014}} = (1153,64 - 1120,61) / (1120,61) \times 100\% = 2,9475 \%$$

...

$$r_{\text{October 2014}} = (2219,38 - 2251,89) / (2251,89) \times 100\% = - 1,4437 \%$$

**Table 2: The value of assets of the mutual fund
“Sberbank - Consumer Sector”**

Period	Estimated value of the share
December 2013	1213,66
January 2014	1120,61
February 2014	1153,64
March 2014	1055,27
April 2014	1040,61
May 2014	1162,71
June 2014	1180,6
July 2014	1190,23
August 2014	1198,84
September 2014	1252,34
October 2014.	1339,68
November 2014	1405,65
December 2014	1307,1
January 2015	1499,03
February 2015	1566,62
March 2015	1604,62
April 2015	1649,17
May 2015	1611,06
June 2015	1595,97
July 2015	1735,79
August 2015	1802,45
September 2015	1783,61
October 2015	1857,86
November 2015	2014,35
December 2015	2094,46
January 2016	2088,72
February 2016	2095,01
March 2016	2057,58
April 2016	2012,63
May 2016	2028,36
June 2016	1998,99
July 2016	2182,17
August 2016	2298,82

September 2016	2251,89
November 2016	2252,56

$$r_{\text{February 2016}} = (2252,56 - 2219,38) / (2219,38) \times 100\% = 1,4950 \%$$

The minimum (the maximum negative) value of the actual profitability was observed in March 2014 and was 8,5269%, which means that the investor received losses in March 2014 as a result of reduction in the value of the share during this month.

The maximum value of the actual profitability was observed in January 2015 and amounted to 14,6837%, that is, by buying a share in December 2014 and selling it in January 2015 the investor received slightly more than 14 cents per ruble of the invested funds.

Based on the actual monthly returns for 36 months it is possible to calculate the monthly expected profitability of the share (as of December 2016) by using the following formula:

$$\bar{r} = \frac{(-7,6669) + 2,9475 + \dots + (-1,4437) + 1,4950}{35} = 1,9057\%$$

That is, for a ruble of the invested funds the investor can get on average about 2 kopecks a month.

The expected annual profitability is calculated with formula 3:

$$\bar{r} = 1,9057\% \times 12 = 22,8684\%$$

That is, annually for one ruble of the funds invested in the purchase of a share, on average, the investor expects to receive slightly more than 22 kopecks of income.

The variance of profitability of the share of the mutual investment fund "Sberbank - Consumer Sector" is calculated by using formula (4):

$$\sigma_i^2 = \frac{(-7,667 - 1,9057)^2 + \dots + (1,4950 - 1,9057)^2}{35} = 25,214\%$$

The standard deviation of the share's monthly profitability is calculated with formula 6:

$$\sigma = \sqrt{25,214} \approx 5,021\%$$

The annual standard deviation according to formula 7 makes:

$$\sigma_{\text{year}} = 5,021 \times \sqrt{12} = 17,395\%$$

The growth of the share was calculated by using formula 8:

$$\text{Growth} = \frac{2252,56 - 1213,66}{1213,66} \times 100\% = 85,60\%$$

The value of actual profitability of the share for 3 years was obtained (with the purchase of a share in December 2013 and its sale in November 2016 the investor received a profit of 85 cents per ruble of funds invested in the acquisition of the share).

To calculate the drawdown of a share it is advisable to construct a schedule of changes in the monthly value of a share.

The schedule of changes in the monthly value of a share of the mutual investment fund "Sberbank - Consumer Sector" from December 2013 to November 2016 is shown in Figure 1.

It can be seen from the schedule that the maximum value of the share is observed in August 2016 - 2298, 82 rubles. The following minimal cost is observed in October 2016 - 2219, 38 rubles.

The drawdown of the share is calculated with formula 9:

$$\text{Drawdown} = \frac{2298,82 - 2219,38}{2298,82} \times 100\% = 3,455\%$$

Then the maximum amount in percentage that an investor might lose when buying a share at the peak of its value and then selling it at the maximum decline (loss) is 3,455%

The calculated values of the MOEX Russia Index, its profitability and standard deviation are given in Table 3.

The covariance of profitability of the share of the mutual investment fund and the MOEX index is calculated according to formula 10:

$$\frac{\text{cov}(r, \text{ind})}{35} = \frac{(-7,667 - 1,9057) \times (-3,300 - 1,092) + \dots + (1,4950 - 1,9057) \times (5,794 - 1,092)}{35} = 17,958\% \text{ } ^2$$

Indicator 17,96 is positive indicating that relative changes in the estimated value of share of the mutual fund "Sibbank-Consumer Sector" and the MOEX base index occurred in one direction rather than in different directions.

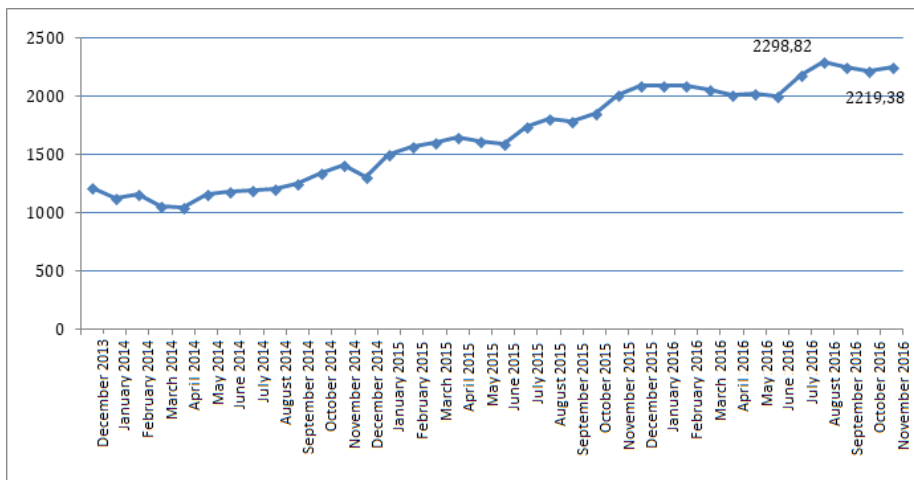


Figure 1: The schedule of changes in the monthly value of a share of the mutual investment fund "Sberbank - Consumer Sector" from December 2013 to November 2016

Table 3: The values of the MOEX Russia Index at the end of the month from December 2013 to November 2016

Date	CLOSE	The actual monthly yields of the MOEX index	R index (mecc.)
30.12.2013	1504,08	-	
31.01.2014	1454,45	-3,300%	1,092%
28.02.2014	1444,71	-0,670%	
31.03.2014	1369,29	-5,220%	
30.04.2014	1306,01	-4,621%	
30.05.2014	1432,03	9,649%	
30.06.2014	1476,38	3,097%	
31.07.2014	1379,61	-6,555%	
29.08.2014	1400,71	1,529%	
30.09.2014	1411,07	0,740%	
31.10.2014	1488,47	5,485%	
28.11.2014	1533,68	3,037%	
30.12.2014	1396,61	-8,937%	
30.01.2015	1647,69	17,978%	
27.02.2015	1758,97	6,754%	
31.03.2015	1626,18	-7,549%	
30.04.2015	1688,34	3,822%	

29.05.2015	1609,19	-4,688%	
30.06.2015	1654,55	2,819%	
31.07.2015	1669	0,873%	
31.08.2015	1733,17	3,845%	
30.09.2015	1642,97	-5,204%	
30.10.2015	1711,53	4,173%	
30.11.2015	1771,05	3,478%	
30.12.2015	1761,36	-0,547%	
29.01.2016	1784,92	1,338%	
29.02.2016	1840,17	3,095%	
31.03.2016	1871,15	1,684%	
29.04.2016	1953,05	4,377%	
31.05.2016	1899,01	-2,767%	
30.06.2016	1891,09	-0,417%	
29.07.2016	1944,62	2,831%	
31.08.2016	1971,59	1,387%	
30.09.2016	1978	0,325%	
31.10.2016	1989,64	0,588%	
30.11.2016	2104,91	5,794%	

That is, the monthly profitability of mutual funds and the monthly profitability of the MOEX Index changed in one direction.

The correlation of the monthly profitability of the share and the monthly profitability of the MOEX Index is determined with formula 11:

$$\beta = \frac{17,958}{5,021 \times 5,110} = 0,6999$$

The correlation coefficient of profitability of the mutual fund “Sberbank - Consumer Sector” and the MOEX base index is 0,69, which is close to the maximum value of the correlation coefficient 1. This indicates a high level of synchronism in the changes of the two indicators.

Beta coefficient was calculated with formula 12:

$$\beta = \frac{17,958}{26,11} = 0,6878$$

If the coefficient is less than one - the profitability of the mutual fund grows or falls slower than the market (MOEX Index).

Alpha coefficient was calculated with formula 13:

$$\alpha = 22,8687 - 0,6878 \times 13,10 = 13,8556\%$$

A positive value of the alpha coefficient indicates a positive contribution of the portfolio manager to the profitability of the mutual fund.

The profitability/risk coefficient is calculated with formula 14:

$$\text{The profitability/risk coefficient} = 22,8687 / 17,395 = 1,3146$$

The Sharpe ratio is calculated with formula 15:

$$K_{\text{Sharpe}} = \frac{22,8687 - 9,6471}{17,395} = 0,7601$$

This ratio shows the size of profitability of the share of the investment fund "Sberbank - Consumer Sector" to the profitability of a zero-coupon bond with a maturity of up to 1 year per risk unit.

The Sortino ratio is calculated with formula 16:

$$\sigma(\text{semi - variance}) = \sqrt{\frac{(-7,667 - 1,9057)^2 + \dots + (-7,667 - 1,9057)^2}{19}} \times \sqrt{12} = 16\%$$
$$K_{\text{Sortino}} = \frac{22,8687 - 9,6471}{16} = 0,826$$

The Traynor ratio is calculated with formula 17:

$$K_{\text{Traynor}} = \frac{22,8687 - 9,6471}{0,6878} = 19,223\%$$

The monotonicity index is calculated with formula 18:

$$\text{Monotonicity} = \frac{2252,56 - 1213,66}{|1120,61 - 1213,66| + \dots + |2252,56 - 22219,38|} = 0,4752$$

Therefore, for the calculation of profitability and risk indicators with analytical coefficients of mutual funds we chose a period from December 2013 to November 2016.

The final indicators of efficiency for all open and interval types of mutual funds are presented in Table 4.

Table 4: The final indicators of efficiency for all open and interval types of mutual funds "Uralsib-First", "Uralsib-Perspective Investments", "High Technologies", "Alfa Capital Technologies"

Mutual fund \ Indicator	Sberbank Consumer Sector	Uralsib-First	Uralsib-Perspective Investments	High Technologies	Alfa Capital Technologies
\bar{r}_{month}	1,91%	0,26%	2,50%	1,07%	1.3677%
\bar{r}_{year}	22,87%	3,14%	30,01%	12,85%	16,41%
Σ	5,02%	4,76%	5,33%	2,934%	5,82%
σ_{year}	17,40%	16,50%	18,45%	10,16%	20,15%
Growth	85,60%	5,34%	126,22%	43,14%	51,983%
Drawdown	3,46%	9,83%	4,04%	0,32%	4,17%
cov (r, ind)	17,958% ²	21,743% ²	18,615% ²	11,962% ²	9,643% ²
ρ	0,6999	0,89	0,68	0,797	0,324
B	0,6878	0,8327	0,7129	0,4581	0,369
α	13.8556%	-7,77%	20,67%	6,85%	11,57%
Profitability/Risk	1,31	0,1902	1,626	1,264	0,814
K Sharpe	0,7601	-0,3944	1,1035	0,3155	0,3357
K Sortino	0,826	-0,545	1,196	0,419	0,376
K Traynor	19,22%	-7,82%	28,56%	7,00%	18,32%
Monotonicity	0,4752	0,0453	0,63	0,54	0,23

Conclusions about the results of the study of the mutual investment funds:

1) The highest growth for 3 years was demonstrated by the mutual investment fund "URALSIB Perspective Investments".

2) The biggest dependence of the profitability of a share on the profitability of the MOEX index is observed in the case of the mutual investment fund "URALSIB First". However, it should be noted that all the examined mutual funds were changing uni-directionally with the changes of the MOEX index.

3) The closest connection with the MOEX index according to the value of correlation was demonstrated by the mutual investment fund "URALSIB First".

4) According to the Sharpe ratio, the most attractive is the mutual investment fund "URALSIB Perspective Investments" as in this case profitability to a great extent compensates risks.

5) According to the alpha coefficient, the most attractive is "URALSIB Perspective Investments", since this fund is characterized by better management. The negative value of this coefficient in the case of "URALSIB First" indicates low management efficiency (the average profitability is lower than profitability of the benchmark portfolio).

6) According to the Sortino ratio, the mutual fund "URALSIB Perspective Investments" has the highest value (its portfolio proved to be better in relation to the concomitant risk).

7) According to the profit/risk ratio, the value of the mutual fund "URALSIB Perspective Investments" is optimal.

8) According to the Traynor coefficient, this mutual fund is also preferable.

9) Of all the examined mutual funds an investor should buy a share of the interval mutual fund "URALSIB Perspective Investments". The final indicators of the effectiveness of this fund are optimal for investors. The main indicator of the fund's efficiency is the profit/risk ratio, which is one of the highest (1,26), Table 4.

However, if the investor believes that the funds that he invested to purchase a share may be needed by him on any day, it is more expedient to choose an open mutual fund "Sberbank-Consumer Sector". This is one of the conditions of the fund's management.