Natalia Sergeevna Erygina

Performance persistence of Russian equity funds

Master's thesis in Economics, in the specialty of Financial Economics, presented to the Faculty of Economics of the University of Coimbra for the obtainment of the degree of Master

Advisor: Professor Doutor Nuno Miguel Barateiro Gonçalves Silva

Coimbra, 2017

Resumo

Juntamente com o rápido desenvolvimento do Mercado acionista Russo, na indústria de fundos de investimento observou-se um crescimento significativo, no que diz respeito ao número de fundos a ao valor dos ativos sob gestão. Este trabalho pretende analisar a persistência no desempenho dos fundos de investimento, no período compreendido entre 2001 e 2016. Esta avaliação é feita com base nas metodologias usadas por Hendricks et al. (1993) e Carhart (1997). Encontrámos indícios moderados de presistência no desempenho dos fundos de ações Russos. Este tópico merece ser investigado mais profundamente, para que possam ser obtidos resultados mais conclusivos. Tal será possível no futuro, logo que novos dados se tornem disponíveis.

Palavras-chave: Russia, mercado de fundos de investimento, fundos de ações, persistência no desempenho, excesso de rentabilidade

Abstract

Along with the prompt development of the Russian equity market, the mutual fund industry has experienced significant growth in respect to the number of funds and net assets value. This research aims to analyze the persistence of the mutual fund performance over the period from 2001 to 2016. Our analytical technique is to apply the methodology of Hendricks et al. (1993) and Carhart (1997) to our returns dataset. We find mild evidence of performance persistence in the Russian mutual fund market. This topic should be further investigated to confirm or disprove our results. It will be possible with the advent of new data.

Keywords: Russia, mutual fund market, equity fund, performance persistence, excess return

JEL Classification: C10, G11, G17, G23

Contents

1. Introduction

Many investors prefer to put their money in mutual funds because of their advantages such as professional management, availability, diversification of risk and convenience. These collective investment schemes are considered as one of the cheapest diversification vehicles for potential investors. This is the reason the mutual fund industry is one of the most popular financial intermediaries in the world. Russian and foreign economists suggest that the steadily growing system of these funds promotes the investment activity in the country. Foreign and domestic experiences demonstrate the need to create a successful governance mechanism of mutual funds for innovative economic development that increases the investment activity of the population.

Investors tend to check the different ratings (compiled by [1]RAEX in Russia) of the best managers and look to historical estimates to make a decision. Successful fund managers are glorified in the media and turned to for investment advice for years to come. However, it takes a lot of time to evaluate managers and to understand whether we should trust past winners.

Our research objective is to analyze the phenomenon of persistence in performance of equity mutual funds in Russia. The purpose is to examine whether past winners are likely to have superior performance in the future and losers continue to perform poorly.

The phenomenon of persistence remains a topic of debate in the scientific literature. Some believe that mutual funds performance does not persist (Carhart, 1997, Busse et al., 2010) while others like Grinblatt and Titman (1992), Brown and Goetzmann (1995), Carpenter and Lynch (1999) found evidence of performance persistence. We seek to find out whether past performance of Russian funds is a predictive factor for future funds' returns using econometric tools. We applied two approaches: by Hendricks et al. (1993) who analyzed the quarterly persistence in mutual fund returns, using cross-section regressions and by Carhart (1997) who formed mutual fund quantiles in order to test return persistence over a 1-year horizon.

Performance persistence is a crucial issue for many reasons. This phenomenon has significant implications for investment strategies. It explains how to choose funds and answers the question: is chasing funds an effective way to earn money or not? In other words,

---

[1] RAEX (Expert RA) is the largest Russian rating agency working on the market for 19 years. RAEX (Expert RA) is the leader in ratings and survey-communication activity.

it shows that mutual fund performance persistence can be profitably exploited with a simple investment strategy. Also, this issue remains important from the point of view of the nature of markets. Gruber (1996), Fletcher and Forbes (2002) researched performance persistence and found at least two reasons why it is necessary to study this phenomenon. On the one hand, the persistence of top funds suggests that some managers have superior investment skills and explains why some mutual funds dominate the market despite evidence that the average fund underperforms passive benchmarks. On the other hand, information about past return provides essential knowledge to generate abnormal profits.

The remainder of this paper is organized in six chapters. In the next chapter, we provide a short presentation of the development and a characterization of the current status of the mutual fund industry in Russia. Chapter 3 is dedicated to the description of literature on the topic of performance persistence. Chapter 4 describes the dataset employed in the research and the methodology. Chapter 5 presents the results of our analysis. And finally, the last chapter provides the conclusions of the study. Our results have economic and practical implications for investment management. From an economic perspective, if past performance is a source of information to forecast future return, this is an important challenge to market efficiency. From a practical perspective, investors can turn to passive management of assets if there is no persistence in performance.

2. The state of the mutual fund market in Russia

Mutual funds represent one of the most interesting and available ways of investing money for individual investors. They allow investors to benefit from the access to professional management and risk diversification, which fosters the appeal of these investment instruments. Besides, there is a wide array of performance evaluation ratings that make it easier for an investor to choose among the set of available funds.

The activities of mutual funds started in 1996 in Russia due to certain reasons: first, was the need to invest available resources of the population in government securities for future financing programs, fiscal policy, and second, the distrust from [2]society voucher investment funds, which originated in the privatization process. So, the state securities were the first objects of investment.

The operation of mutual funds is regulated by the law No. 156-FZ "On investment funds" dated November 29, 2001. Mutual funds proved their reliability as an investment vehicle for a short period of time. Their attractiveness to investors increased, and their number doubled by 2005 according to statistics on [3]National League of Management companies website. The peak of their development, the period from 2003 to 2007, is distinguished by its stability.

The global financial crisis of 2008 – 2009 negatively affected the development of mutual funds and, in general, the field of collective investment. This period is characterized by the disappearance of many funds in the domestic financial market, and structural changes – the number of open-end funds decreased and the number of closed-end funds increased. The dynamics of the number of management companies is characterized by an increase to 549 by 2008 and a reduction after that year (Figure 1).

---

[2] Voucher investment funds were created in Russia in the early 1990s and their main purpose was to help people to invest the privatization checks (vouchers) and to ensure the professional management of the assets. Federal securities Commission of Russia decided to transform voucher investment funds into mutual funds in 1998. The reason for that was the need to solve the problem of double taxation of income. However, the majority of voucher investment funds were closed or converted to other organizations by that time.

Privatization checks (vouchers) are state securities, intended to be exchanged for the assets of state enterprises transferred into private ones. They were used in the Russian Federation from January 1992 as an instrument of privatization and transition of state and municipal enterprises to private ownership.

[3] The National League of Management companies (NLMC) is a self-regulatory organization that brings together companies-asset managers of mutual investment funds (PIF), a joint-stock investment funds (AIF), pension reserves, pension savings and other assets.

Figure 1: <u>Dynamics of the number of management companies in Russia</u>
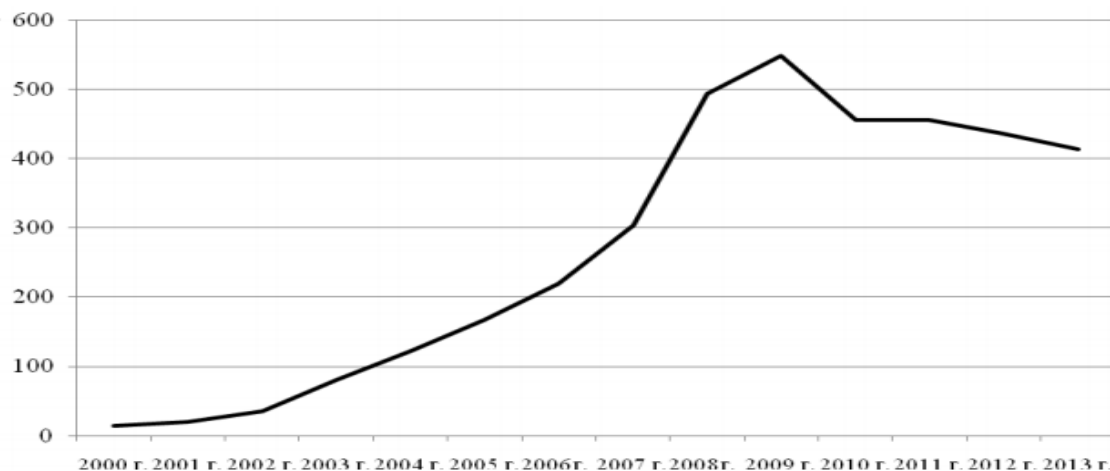
Source: National League of Management companies website

This situation is explained by the following reasons:

- the policy of the state financial regulator to eliminate "[4]shell companies" by the cancellation of their licenses;
- a lot of investors withdrew their money from mutual funds, which increased the number of unprofitable management companies.

Moderate growth in the profitability of mutual funds and a gradual return of confidence in the market for collective investments began in 2012. However, the current state of the market of investment units is characterized by significant problems in the development of mutual funds. Bower and Polteva (2015) identified the main difficulties:

- low investment potential of mutual funds without compensatory mechanisms and guarantees for the benefit;
- distrust on the part of private investors due to the low information transparency of management companies;
- the inability of many management companies to operate effectively in an unstable market;
- low financial literacy of the population.

In accordance with the legislation, it is possible to create mutual funds of three types in Russia: open-end, interval and closed-end (Table 1).

---

[4] Shell companies are created for the sole purpose of tax evasion, fraudulent transactions. These companies serve as a vehicle for business transactions without itself having any significant assets or operations. As a rule, the only result of their work is tax cuts for their legal partners or plundering of public funds.

Table 1: Types of mutual funds

Type / Parameter	Open-end	Interval	Closed-end
Right to buy/ sell unit	On any day	During some time periods (intervals)	The right to buy units only due to the formation (or additional issue), and the right to present a unit to maturity - at the end of the term of the contract of trust management
The resources transferred in trust management	Money resources	Money resources	Cash and other property, if it provided by rules of trust management
Number of shares issued by the management company	Not limited	Not limited	Specified in the rules of operation of this fund

Currently, considering the structure of the mutual fund industry, it should be noted that closed-end funds represent a large proportion (70%) of the number of mutual funds, the nature of which is not designed to attract medium and small investors. Open-end and interval funds represent 26,6 % and 3,4 % of the market respectively (Figure 2).

Figure 2: The structure of the mutual fund industry in Russia
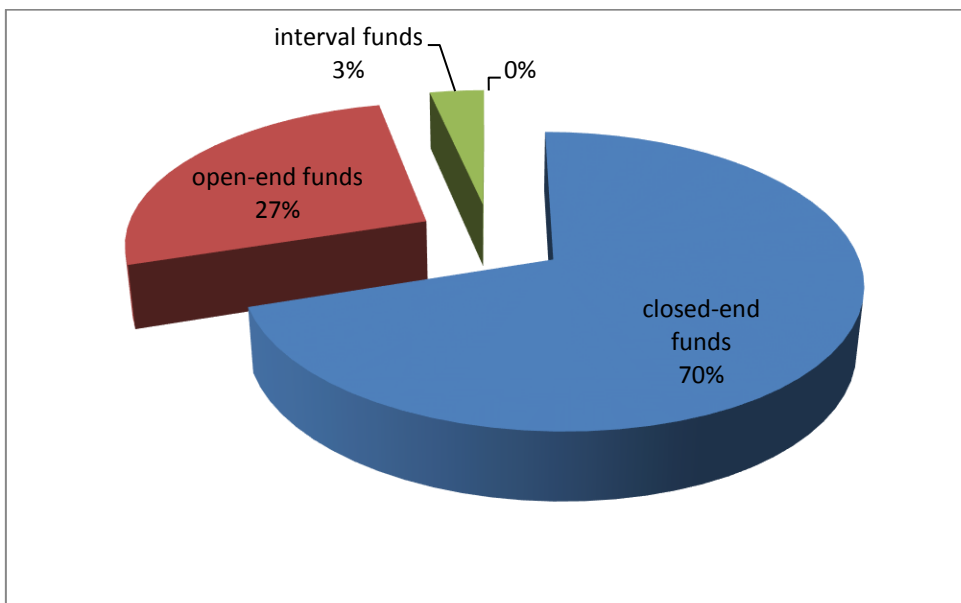
Source: National League of Management companies website

Open-end funds are the most attractive for small investors. These funds are considered as the most reliable and least risky in the long run due to the fact that the investor has the opportunity to sell them quickly. As for closed-end funds, SROs (self-regulating organizations) seek to improve the legislative framework in the interests of large customers, abstracting from the requests of small investors.

Table 2: <u>The number of mutual funds (23.03.2017)</u>

Category	Open-end	Interval	Closed-end	In total
Equity funds	112	9	24	145
Bond funds	70	0	1	71
Mixed investment funds	71	13	31	115
Money market funds	9	0	0	9
Index funds	20	0	0	20
Funds of funds	51	1	0	52
The funds of the commodity market		5	0	5
Hedge funds		12	15	27
Mortgage funds			7	7
Funds of art values			1	1
Venture fund			46	46
Real estate funds			566	566
Direct investment fund			120	120
Rental funds			81	81
Credit funds			60	60
In total:	333	40	952	1325

Source: National League of Management companies website

As for the type of investment funds, open-end and interval funds direct their investments mainly to the stock market (42-44 %) and mixed investments (24,9-33,9 %). Closed-end funds, in turn, prefer the most specialized investment objects: real estate operations, (performed by the real estate funds, private equity funds, and rent funds) occupy more than 60 %. This kind of funds attracts, mainly, large investors.

In the class of closed-end mutual funds, real estate funds capture a significant interest of professional investors. The fact, that investing in such funds is less risky compared to direct investment in real estate, increases their popularity. What is more, the activities of management companies are overseen by numerous regulatory bodies: the Bank of Russia,

specialized depositary institutions, [5]registrar and auditors. Besides, real estate funds are quite an advantageous choice for those investors who are not able to independently conduct market research to understand what segment of the real estate market is the most attractive at a given time.

The number of closed-end funds is gradually increasing, which implies that the market became more nontransparent and closed, because such funds do not disclose the data of its activities, according to the Russian legislation. It is necessary to change rules to make this information available to potential investors.

The classes of funds with the largest amount of assets under management are real estate funds (151,17 billion rubles) and rent funds (199,08 billion rubles), according to the National League of Management companies.

Table 3 reveals the latest net subscriptions data for several mutual fund classes. The only fund classes that experienced positive net inflows in March 2017 were bond funds (5 531,5 million rubles) and index funds (115,9 million rubles).

Table 3: Summary statistics for capital raised for open-ended mutual funds for March 2017

Category	Open-end funds, million rubles
Equity funds	-510, 8
Bond funds	5 531, 5
Mixed investment funds	-142, 2
Money market funds	-25, 5
Index funds	115, 9
Funds of funds	-304, 4
Subtotal	4 664, 5

Source: National League of Management companies website

Table 4 presents the average annual yield of open-end and interval funds. The yield is calculated as the growth of unit value applying the method average weighted NAV. In General, the average yield of public funds was 6,33 %.

---

[5] Registrar maintains the list of owners of units, store information about them, records the purchase, exchange, transfer and redemption of investment units.

Table 4: The average yield of mutual Funds over the period 31.03.2016 - 31.03.2017

Category	Open-end Funds	Interval funds
Equity funds	18,04%	6,25%
Bond funds	9,03%	-
Mixed investment funds	7,59%	10,37%
Money market funds	9,45%	-
Index funds	20,76%	-
Funds of funds	-11,05%	-
The funds of the commodity market		-13,49%

Source: National League of Management companies website

In conclusion, it should be noted the investors' interest in mutual funds as institutions for collective investment is increasing. At the same time, mass investors maintain a selective approach to investment choice because they are not ready for the high risks inherent in equity investment. They prefer bank deposits, bonds, and mixed strategies.

Table 5: Amount of assets under management by Russian mutual funds relative to the GDP

Year	GDP,billion $	Dollar rate	GDP, billion rubles	Amount of assets under management by Russian mutual funds, billion rubles	Share in the GDP, %
2000	383,4	28,03	10746,7	5,12	0,05
2001	402,9	29,16	11748,56	9,05	0,08
2002	422	31,4758	13282,79	12,7	0,10
2003	452,8	30,5547	13835,17	77,25	0,56
2004	485,3	28,9641	14056,28	108,26	0,77
2005	516,2	28,4244	14672,68	232,98	1,59
2006	558,3	26,9423	15041,89	418,77	2,78
2007	606	25,7297	15592,2	765,54	4,91
2008	637,8	24,4262	15579,03	540,06	3,47
2009	587,9	31,3733	18444,36	322,23	1,75
2010	614,4	30,4769	18725,01	443,71	2,37
2011	640,6	29,0075	18582,2	481,42	2,59
2012	662,6	31,1408	20633,89	532,45	2,58
2013	671,3	32,1561	21586,39	584,47	2,71
2014	675,3	35,989	24303,37	563,6	2,32
2015	649,64	62,5472	40633,16	598,16	1,47

Source: NLMC, CBR

Now one of the important tasks of Russia's economic development is the promotion of the mutual fund industry. In comparison with the leading foreign economies for which mutual funds represent [6]20% to 30% of GDP, the Russian collective investment market looks quite weak (Table 5). The net assets under management of the mutual funds represent a small share relative to the GDP which limits the possibilities for the financing of the economy.

---

[6] See (Friedman, 2015).

3. Literature review

Most potential investors try to forecast future returns from investing in mutual funds knowing their current and past historic performance. However, the phenomenon of persistence has been the object of dispute for many years. The literature on performance persistence is vast. A lot of research is focused on the U.S. market, but more recently scientists have become more interested in international markets. Among the first studies on this topic were Sharpe (1966) and Jensen (1968) papers. While Sharpe found a meaningful relationship between the present and the past performance of mutual funds over a 10-year period, Jensen concluded that future performance was unpredictable. Carlson (1970) found weak evidence of persistence for a 5-year horizon and no evidence of persistence over a 10-year period.

Grinblatt and Titman (1992) explored the relationship between the past performance and the future one. They examined 279 U.S. funds over the period from 1975 to 1984. The data containing monthly returns and investment goals were purchased from CDA Investment Technologies, Inc. The tests were based on an eight-portfolio benchmark, at the core of which was the size (4 portfolios), dividend yields (3 portfolios) and past returns (1 portfolio). In their study, they concluded that persistence exists and these findings are consistent with the ability of the management company to earn abnormal returns.

Taking into account the survivorship bias Hendricks et al. (1993) continued to examine persistence in a short-term horizon. The authors designed their study based on the quarterly returns of 165 no-load growth-oriented U.S. mutual funds for the period comprised between 1974 and 1988. They measured the performance using Jensen's alpha and found that performance persists over a one-year evaluation period. That is in the near term recent poor funds do considerably worse than benchmark and portfolios of top funds do better. The authors came to the conclusion that significant benefits could be obtained by investing in last year winners. A strategy of selecting the last four quarters leaders can noticeably outperform the average mutual fund. They have also shown that the hot hand phenomenon is not due to known anomalies or survivorship bias.

Brown and Goetzmann (1995) considered long-run mutual fund performance persistence using absolute and relative benchmarks. The data were collected by hand from Mutual Funds Panorama of the Weisenberger Investment Companies Service. The sample ranges from 372 funds in 1976 to 829 in 1988. The increase in the number of funds was

mainly observed in the 1983-1988 period. The research aimed at studying annual returns of U.S. funds which were subsequently ranked in 8 groups, according to their 1976 performance. Then the researchers calculated the annual rate of return for each group in 1977. This process was repeated until the end of the sample. Their results show that approximately 60% of the past winners continued to beat the pack next year and this fact could not be justified by survivorship bias. The research concluded that there was 1-year persistence for the top and bottom funds, while for average funds performance was not predictable. The following results were announced at the end of Brown and Goetzmann study: 1) the authors found clear evidence of relative performance persistence, which is primarily attributable to funds that lag the S&P 500; 2) a probit analysis confirms that bad performance promotes the probability of fund disappearance. A poor record is the reliable predictor of attrition. By decomposition of the persistence phenomenon on an annual basis, the authors found that this effect depends on the period of observation and it is correlated across managers. Therefore, fund outperformance may be due to a general strategy that is not captured by standard style categories or risk adjustment procedures.

The paper of Carpenter and Lynch (1999) is also devoted to the research of U.S. mutual funds. The authors analyzed the impact of survivorship bias and attrition on measures of performance persistence. They conducted standard tests for performance persistence applying alternative return generating processes, survival criteria, and test methodologies. Their results reinforce previous findings that U.S. mutual fund performance persists.

Deaves (2002) examines the performance of Canadian mutual funds. Their dataset includes Canadian equity mutual funds for 1988–1998 and was constructed in a way that avoids biases. The author found evidence that success breeds success at least in a short period of time. It was noted that the strategy of chasing returns is viable, and it is best to chase the top funds over the near term.

Bollen and Busse (2004) used daily mutual fund returns and quarterly measurement periods to analyze the phenomenon of short-run persistence. Their data includes 230 U.S. equity funds whose investment objective was "maximum capital gains," "growth," or "growth and income" and their sample does not suffer from survivorship bias. The authors analyzed the performance over the period from 1985 to 1995. The tests of persistence were based on the four-factor model and on two timing models. The parameters of the regressions were estimated fund-by-fund on subsets of the data. Funds were ranked according to their quarterly

abnormal returns and on these basis deciles of funds were formed. Then they measured the performance of each decile in the following quarter. They found "the average abnormal return of the top decile in the post-ranking quarter is 39 basis points" and it disappears over longer periods. Their results showed that high performance is a short-term phenomenon which requires several fund evaluations per year to discover. But the economic significance of this phenomenon is a controversial issue and the slight persistence is probably too small to use in investment strategies. Bollen and Busse recommend using a buy-and-hold approach instead of a performance-chasing strategy, even with predictable short-run persistence.

Ferreira et al. (2010) evaluated performance persistence and explored its key determinants for a sample constructed from 5,773 open-end actively managed equity mutual funds across 22 countries, during the period 2003-2007. They concluded that there is statistically significant performance persistence in 13 out of 22 countries, and found that the strength of the flow-performance sensitivity to past performance raises persistence in the presence of increasing returns to scale. They also found that competitiveness in the field of funds leads to a decrease in persistence for best performers and enhances it among the worst ones. Thus tests of the phenomenon without taking into account factors such as returns to scale or competitiveness probably leads to incorrect conclusions.

Vidal-Garcia (2012) explored persistence in performance over a long time period. His sample consists of monthly returns of 1050 equity funds and relied on the six largest European mutual fund markets between 1988 and 2010. The research led to a proof of persistence in benchmark-adjusted returns and its statistic and economic significance over an annual period and up to 36 months, although this phenomenon was most noticeable for the top and bottom funds. Thus past performance provides useful information for investors to predict future performance for European markets.

Dawe et al. (2014) assessed the performance persistence of equity and mixed mutual funds in Kenya over time. Their sample consists of mutual funds daily returns over the period from 2006 to 2009. The methodology developed by Grinblatt and Titman (1993) was used to examine the phenomenon of persistence. Their conclusion was that both equity and mixed funds persist over the study period. Thus it can serve as a decision-making tool for investors.

While some scientists argue that the persistence exists, others conclude that it does not. Malkiel (1995) in his research examined this effect for U.S. funds on a long-term basis. The author used a dataset containing quarterly returns of all equity funds that existed each

year and the market benchmark. The data let him analyze more accurately the performance and the degree of survivorship bias. The methodology was based on the Fama and Macbeth (1973) approach of periodic regressions to test for cross-correlation and heteroscedasticity. Malkiel studied the hot hand phenomenon and found evidence that persistence existed during the 1970s, and then the effect was considerably destroyed during the 1980s, especially at the end of the decade. Thus, the use of persistence was an effective way to produce excess returns at the beginning of the observation period and then failed during the 1980s.

Carhart (1997) showed mutual fund performance can be explained by the investment style chosen by mutual fund managers. The database contains monthly U.S. equity funds over the period from 1962 to 1993 and it is free from survivor bias. The author employed the Capital Asset Pricing Model (CAPM) and Carhart 4-factor model (1995) to measure performance. He divided portfolios into deciles based on previous year's return with the best fund in decile 1 and the worst in decile 10. His results imply short-run performance persists and this persistence is mostly explained by common-factor sensitivities, expenses and transaction costs. A return of 8 percent per year can be obtained by an investor that buys last year's top-decile funds and sells bottom-decile funds.

Cuthbertson et al. (2007) examined the ex-post performance of open-end mutual funds investing primarily in UK equity (at least 80% must be in UK equity) and show that standard tests may give mistaken findings, especially in the tails of the performance distribution. Their sample consists of 935 equity Unit Trusts and Open Ended Investment Companies over the period April 1975 to December 2002. The authors used a cross-section bootstrap methodology to distinguish between 'skill' and 'luck' for individual funds. It allows for non-normality in the idiosyncratic risk of the funds – a significant question when considering investors of the funds which proved to be very good or very bad. This study indicates the existence of stock picking ability for a small number of top funds. As for the worst funds, most of them showed poor management. The temporal stability in the subsequent effectiveness of the best and worst portfolios was also evaluated through the application of Recursive estimation and Kalman "smoothed" coefficients. Persistence in performance was found only among the bad funds, not among the top funds.

Busse et al. (2010) examined performance persistence of 4,617 active U.S. equity products offered by 1,448 investment management firms over the period from 1991 to 2008. They used two approaches in the methodology: 1) following Carhart to form deciles based on

benchmark-adjusted returns, they assessed performance and tested if there is persistence; 2) estimated Fama–MacBeth (1973) regressions of future returns on lagged returns and control variables. They found that there is little evidence of persistence in the three-factor models, and estimates of persistence derived from four-factor models are almost zero. Active management is likely not to provide superior risk-adjusted returns, even for large investors. The persistence which was observed by scientists is due to the momentum of stocks in portfolios and expenses.

Thus the phenomenon of persistence is a controversial issue and it attracts the attention of investors when making investment decisions: whether to rely on past performance as useful information for future returns and whether the performance-chasing strategy is effective. The research theme was raised by the studies of several scientists, but their conclusions differed from one another. While some of them found evidence of persistence, others concluded that persistence doesn't exist.

4. Methodology of the empirical study

4.1 Data

The sample consists of simple quarterly rates of returns of actively managed Russian equity funds and the MICEX for the period from January 2001 until the end of 2016. Russian mutual fund industry dates back to 1996, but it was only in the 2000s, with the recovery of the Russian stock market from the 1998 crisis, that these funds were given a strong boost and developed rapidly. So we could not analyze the performance persistence in the Russian mutual fund industry since its inception because in the early years the number of funds available was too low. As expected, the number of funds increased over time, ranging from a minimum of 15 funds in 2001 to a maximum of 125 funds in 2016. The data was collected manually from the home page of the National League of Management companies and official websites of mutual funds.

As a main benchmark for the analysis, we used the MICEX index that has quite long history and includes the 50 most liquid shares of the biggest and most dynamic Russian issuers (with a large turnover and high liquidity) listed on the Moscow Stock Exchange. It was difficult to select the risk-free interest rates for the Russian market before the start of the year 2007. We used Russian Ruble Overnight Deposit - Middle Rate as a proxy for risk-free investment rate because we couldn't find a quarterly one for the whole sample. The Russian MICEX index and the risk-free rate of Central Bank were downloaded using the database Thomson Reuters Eikon.

Table 6 presents descriptive statistics for the cross-section average of quarterly mutual fund returns and the MICEX quarterly returns. It also displays statistics for the excess return (that is, for the difference between the return and the risk-free rate) for both the average of funds and the MICEX.

The mean rate of return of the average fund and the MICEX index are positive and their standard deviations are quite high. The average fund underperforms the MICEX by approximately 0,8% and it is slightly less risky. The difference between the minimum and maximum values is quite high. The equity premium, that is, the excess MICEX return over the risk-free rate is positive, which means that investors are rewarded through a higher expected return if they are willing to take risk.

The average fund and the MICEX have negative skewness. So the distribution of fund's return and the MICEX return are left-skewed. The mass is concentrated on the right-

side. The excess kurtosis close to 2, which means that the distribution is leptokurtic. The distribution is less concentrated than the normal distribution, that is, the probability of getting extreme return values is higher than in the normal distribution. According to the Jarque-Bera test, the hypothesis that the returns follow a normal distribution is rejected for all conventional significance levels.

Table 6: Descriptive statistics

Variable	Mean	Standard deviation	Max	Min	Skewness	Excess kurtosis	Normality test (Jarque-Bera)
average fund	4,19%	13,44%	35,34%	-39,53%	-0,61	1,91	12,8706 p-value = 0,0016
excess return of the average fund	2,84%	13,62%	33,47%	-41,97%	-0,61	1,98	13,5415 p-value = 0,0011
MICEX return	4,97%	14,76%	37,77%	-42,70%	-0,64	1,70	11,3015 p-value = 0,0035
excess MICEX return	3,62%	14,98%	37,52%	-44,70%	-0,62	1,77	11,5928 p-value = 0,003

Source: Author's calculations

The correlation between fund's return and MICEX return was also analyzed and it takes the following values: 0,9407 and 0,9426 for raw and excess returns respectively that means variables are highly correlated.

Figure 3 shows the evolution of fund's return and MICEX return during the period from 2002 to 2016. As the figure shows, there were big oscillations in fund's return during this time horizon. However, these oscillations seem to have followed MICEX return. As can be seen, the lowest return was approximately - 40% in 2008 as a consequence of the financial crisis. The largest one was observed in 2005 and 2009 due to a rapid recovery after the crisis.

Figure 3: <u>Dynamics of return of the average fund and MICEX return for the period from 2002 to 2016</u>
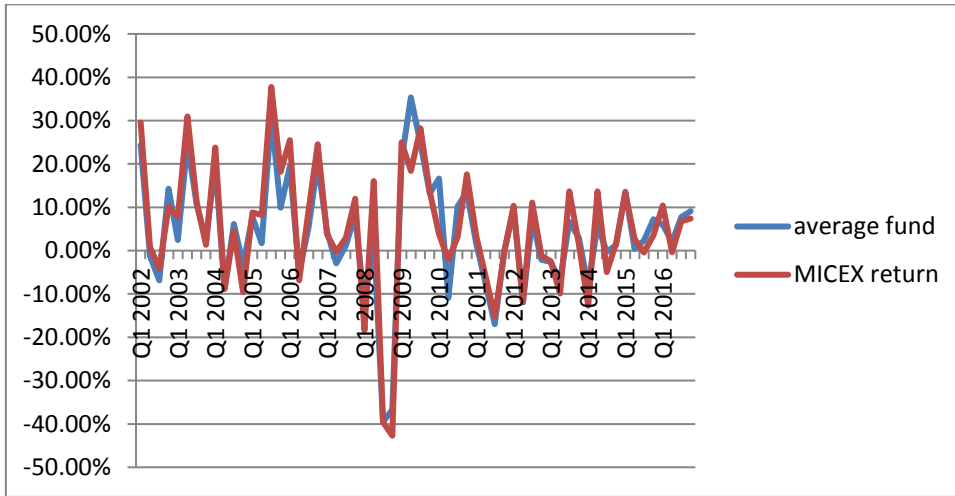
Source: Author's calculations

4.2 Methodology

In the empirical part of our research regarding the analysis of mutual funds performance persistence, we relied on two main approaches, by Hendricks et al. (1993) and Carhart (1997).

Among all existing different tests to analyze the mutual funds' persistence, we chose the most traditional and common method of evaluation, that is the linear regression estimated by ordinary least squares with robust standard errors. We used Microsoft Excel and Gretl as software support.

i. Short-run performance persistence

We estimate persistence, using quarterly returns over the period from 2001 to the end of 2016.

In our analysis of short-term persistence, we follow Hendricks et al. (1993), who estimate the cross-sectional regression, given by equation 1, for each quarter (this methodology is based on Fama and Macbeth, 1973 and Jegadeesh, 1990).

$$r_{it} - M_{t-1}(r_{it}) = k_t + \sum_{j=1}^{J} \alpha_{jt}[r_{it-j} - M_{t-j-1}(r_{it-j})] + u_{it} \; ; \; i = 1, \dots, N_t \qquad (1)$$

where r_{it} is net return in excess over the risk-free rate (proxied by Russian Ruble Overnight Deposit - Middle Rate in our empirical work) for mutual fund i in quarter t, $M_{t-1}(r_{it})$ represents the market's expected r_{it} value given the available information in the market at t-1, k_t is a constant, α_{jt} are the coefficients that reveal the influence of the funds' past residual returns on their current residual returns, u_{it} is the error term in quarter t, N_t is the number of funds for which we have excess return data from quarter t-J until quarter t.

In this estimation, we apply the null hypothesis of market efficiency (rational expectations), according to which past funds returns do not predict current returns. Under this null hypothesis, the α's should be zero. Assuming that α-estimates are independent in different quarters, we can compute t-statistics for each of the J sets. In our analysis, we use 4 lags of the residual return to estimate the regression.

For each quarter we estimate the cross-sectional regression by OLS where the dependent variable is the value of the residual performance for fund i in the quarter and the independent variables are the lags 1 to 4 of the dependent variable. We implement this approach in two ways: in the first one, we use demeaned mutual fund returns and use them as the residuals (that is, we computed the difference between each mutual fund excess return and its time series average), in the second one, we extract the residual mutual fund returns from a linear regression, where the dependent variable is the actual return of the fund, and independent variable is a market benchmark index return (MICEX) (equation 2).

$$r_{it} = \alpha + \beta * r_{it}^{Micex} + e_{it} \qquad (2)$$

We test the significance of the regression coefficients α1-α4 over the period from 2002 to 2016 (that is 60 observations) using the following standard t-statistic.

$$\text{T- statistic} = \frac{\bar{\bar{\alpha}}_i}{\sqrt{(\hat{\sigma}_i^2 / N)}} \qquad (3)$$

where N is a number of observations, $\bar{\bar{\alpha}}_i$ denotes the time series average value of the estimated coefficients for lag i, and $\hat{\sigma}_i^2$ represents their variance. It follows a t-distribution with degrees of freedom equal to N-1.

Finally, we perform an overall significance test. The F-statistic tests the joint hypothesis that the slope coefficients for lags 1 to 4 are zero. We calculate this statistic according to the formula 4.

$$F = \left(\frac{N\,(N-4)}{4\,(N-1)}\right)\hat{\alpha}'\hat{\Sigma}^{-1}\hat{\alpha} \tag{4}$$

where N is a number of quarterly cross-sections (N = 60 in our sample), $\hat{\alpha}$ is the 4 * 1 mean vector of persistence coefficients, and $\hat{\Sigma}$ is the sample covariance matrix of the coefficients. It follows an F distribution with degrees of freedom for numerator equal to 4, and for denominator equal to 56.

ii. One year performance persistence

Our analytical technique is to apply the methodology of Carhart (1997) to our returns dataset. On January 1 of each year, we sort all mutual funds based on their return over the last year, from the highest to the lowest one. Then the full set of sorted funds is divided into four equal-size portfolios. We hold the portfolios for one year and re-form them at the beginning of the following year. This process was repeated until the end of the sample, which led to a time series of quarterly returns for each quantile from 2002 to 2016. The difference between our approach and that of Carhart is that he divided the sample into deciles and reformed them on a monthly basis, and we decided to restrict the number of quantiles to four because the number of funds available in the Russia is much lower than in the U.S.

Then we compute the excess quarterly return for each quantile and difference between the first and the fourth quarterly excess returns. Using these data, we calculate the mean excess returns and standard deviations for all the portfolios.

Finally, we estimated their performance relative to the Capital Asset Pricing Model (CAPM) of Sharpe (1964) and Lintner (1965) according to the equation 5.

$$r_{it} = \alpha_{iT} + \beta_{iT}MIC_t + \varepsilon_{it} \qquad t = 1,2,\dots,T \tag{5}$$

where r_{it} is the return on a portfolio in excess of the risk-free rate, MIC is the excess return on the MICEX index, α_i is a constant which reveals each portfolio's risk-adjusted performance, β_i is the estimated slope coefficient which measures the exposure of each portfolio to the Russian stock index, and ε_{it} is the error term. We estimate this equation by

OLS, with robust standard errors, and record the estimated coefficients and the adjusted R-squared.

5 Results

In this section, we present our empirical results obtained from regression analysis and consider whether mutual fund performance is persistent. First, we estimate this phenomenon in the short term, and then we investigate it for a one-year horizon.

5.1 Econometric results on short-run performance persistence

Following Hendricks et al. (1993) the first analytical technique that we use in this paper is to test if residual returns are persistent, that is if they can be predicted from their lagged values. The results of the study of performance persistence in the short term are set out in Table 7.

Table 7: <u>Persistence estimates from stacked cross-sectional regressions</u>

Dependent variable[7]	Time-average of cross-sectional coefficients (T-statistics in parentheses)					F-test of zero coefficients[8]
	$\widehat{\alpha 1}$	$\widehat{\alpha 2}$	$\widehat{\alpha 3}$	$\widehat{\alpha 4}$	$\sum \widehat{\alpha_\iota}$	Lags 1 to 4
$r_{it} - \overline{r}_t$	0,12 (2,62)	-0,01 (-0,28)	0,05 (1,19)	-0,003 (-0,07)	0,157	1,97 (0,11)
Market model residual using MICEX	0,06 (1,51)	0,05 (1,33)	0,05 (1,15)	-0,003 (-0,08)	0,157	1,34 (0,27)

The results with demeaned r_{it} are shown in the first row of Table 7. The t-statistics (greater than 2,001 at lag 1) indicates that the null hypothesis of non-autocorrelated residual returns can be rejected at the significance level of 0,05.

The α-coefficients for the first, third lags and their sum are positive and all of them are weakly significant (the F-statistic that jointly tests if the t-statistics associated with lags 1 to 4

---

[7] For the first row of results in the table, the residual return of fund *i* is calculated as the excess return of that fund in quarter *t* minus its mean over the entire period. For the second row, the residual return is the residual from a preliminary regression of the excess returns of fund *I* on the excess return of the benchmark portfolio. T-statistics are shown in brackets; the 1 % (5%) critical value is 2,662 (2,001).

[8] Under the null hypothesis, the statistic is distributed $F_{4,56}$ for a large number of funds per cross-section. The p-values on the $F_{4,56}$ are given in parentheses; the 1% (5%, 15 %) critical value is 3,67 (2,53; 1,76).

are zero has a p-value of 11 %). The F-statistic doesn't clearly reject the null hypothesis at the 5 % significance level but rejects it at the 15% significance level.

We confirm this pattern using alternative residual returns, which were obtained from the market model regression with the choice of MICEX as a benchmark. The α-coefficients for the first free lags are positive and all of them are weakly significant. The F-statistic, that test whether the autocorrelation at lags 1 through 4 is zero, accepts the null hypothesis of no predictability in residual returns (p-value of 27%) at the significance level of 0,05.

The results show weak evidence of short-term performance persistence for four quarters.

5.2 Persistence in one year return-sorted mutual fund portfolios

In the second method of our analysis, we implement an analytical approach on the reported mutual fund returns to analyze performance persistence for a one-year period. Table 8 shows returns and CAPM estimates for 4 quantiles of mutual fund returns in our sample. Consistent with Carhart (1997), there is some evidence of persistence in returns. Monthly excess returns decrease monotonically in portfolio rank, but the differences are not as high as in Carhart. The top quantile portfolio outperforms the bottom quantile portfolio by 3,76% annually.

The CAPM explains none of this persistence. The CAPM betas on the best and worst portfolios are almost identical, and the alphas replicate dispersion to the same extent as the excess returns. Moreover, the performance estimates show negative abnormal returns of about 15 basis points per quarter (0,6 percent per year) for the previous year's best portfolio, and much more considerable negative abnormal returns of 111 basis points per quarter (4,44 percent per year) for the worst portfolio. This alpha difference is primarily driven by the second and bottom quantiles. Assuming that risk exposure is correctly measured by CAPM, both top and bottom quantile funds underperform a passive investment strategy that replicates the MICEX index. These results are consistent with Carhart who shows that, on average, funds underperform the market index.

Negative alphas indicate how much worse portfolios perform than market index. All portfolios underperform the market over the selected period of time.

The quality of the fit is given by the statistical number <u>R-squared</u>. An r-squared of approximately 0,8 means that the model fits the data quite well. From that, we can conclude that 80% of the fund's performance is explained by its risk exposure to the MICEX.

Table 8: <u>Portfolios of mutual funds formed on lagged 1-year return</u>

Mutual funds are sorted on January 1 each year from 2001 to 2016 into quantile portfolios based on their previous year's returns. Portfolio returns represent equal-weighted (by fund) holdings returns. VWRF is the excess return on the MICEX value-weight market proxy. Parameter estimates are from OLS regressions. The t-statistics are in parentheses.

Portfolio	Quarterly excess return	Std deviation	CAPM		
			Alpha	VWRF	R-sq
1			-0,15%	0,86	
	2,97%	14,20%	(-0,19)	(16,53)	0,822
2			-0,78%	0,88	
	2,40%	14,18%	(-1,11)	(19,06)	0,860
3			-0,75%	0,85	
	2,35%	14,17%	(0,92)	(16,05)	0,813
4			-1,11%	0,87	
	2,03%	15,04%	(-1,10)	(13,14)	0,744
1-4 spread			0,97%	-0,007	
	0,94%	6,96%	(1,04)	(-0,12)	-0,017

Table 9 directly compares our study to the research of Carhart. Each row summarizes the analysis on the spread between the top and bottom portfolio. The first row is taken directly from Table 3 of Carhart. The second row is the Table 7 estimation of mutual fund returns in our sample. This table shows that, even though the differences in alphas between the top and bottom quantiles have the same sign, the annualized differences are higher in Carhart (1997) and they are statistically significant.

Table 9: Date range comparison of our study with the results of Carhart (1997)

Mutual funds are sorted on January 1 each year of the given date range into portfolios based on their previous year's return. Portfolio returns represent equal-weighted fund returns. Parameter estimates are from OLS regressions. The t-statistics are in parentheses.

Portfolio	Dates	Source	Time range	Excess return	CAPM		
					Alpha	VWRF	R-sq
(1) 1-10		Carhart			0,67 %	0,01	
	1963-1993	(1997)	Monthly	0,67%	(4,68)	(0,39)	-0,002
(2) 1-4		Our	Quarterly		0,97%	-0,007	
	2001-2016	analysis		0,94%	(1,04)	(-0,12)	-0,017

6. Conclusions

The collective investment market has a unique and interesting, but relatively short history in Russia. Its establishment is largely determined by the features of national economy and policy. Currently, mutual funds are one of the best tools of investment in the stock market. For investors, mutual funds provide the opportunity to accumulate a small capital with the purpose of making a profit.

Our study focuses on mutual fund performance persistence. Such phenomenon is an important issue for investment advisors, financial planners and other managers who use mutual funds as a vehicle for investing their clients' money. It takes a lot of time for potential investors and their advisors to analyze the past performance of funds in which they are considering investing.

A number of essential studies have been published since 1966 which shed light on the question of performance persistence. Since the topic is controversial, some of them find evidence in favor of this phenomenon (Grinblatt and Titman, 1992, Vidal-Garcia, 2013), while others suggest the opposite (Malkiel, 1995, Busse et al., 2010) after testing the persistence of mutual fund total returns over periods ranging from 10 to 31 years. From our literature review, we conclude that there is a lack of investigation of Russian fund performance persistence. The majority of assessments aimed at the U.S. market.

In our research, we use quarterly data to examine whether past returns are consistent with future ones. Two different approaches – suggested by Hendricks et al. (1993) and Carhart (1997) – were employed to our returns dataset. Our results show mild evidence of performance persistence in the Russian mutual fund market. Given that the Russian mutual fund industry is still in its infancy, this topic deserves further research, as new data becomes available, to confirm or disprove our conclusions. If we accept the hypothesis that the past performance carries valuable information about future returns, then it's necessary to regulate the provision of clear information on performance measures from the management companies.

Regarding the possible future research in the field, it would be interesting to explain the persistence phenomenon. Further study could employ the 4-factor model of Carhart (to the best of our knowledge, these factors are currently unavailable in the Russian market) to explain most the spread in portfolio returns in the second method of our analysis.

References

Bollen, N.; Busse, J. (2004) "Short-Term Persistence in Mutual Fund Performance" *The Review of Financial Studies*. (2), 569-597.

Bower A.; Polteva T. (2015) "Problems of development of Russian market of mutual investment funds" *Economics, management, finance: materials of the IV International scientific conference (Perm, April 2015).* 88-91.

Brown, S.; Goetzmann, W. (1995) "Performance Persistence" *Journal of Finance*. (2), 679-698.

Busse, J.; Goyal, A.; Wahal, S. (2010) "Performance and Persistence in Institutional Investment Management" *Journal of Finance*. (2), 765-790.

Carhart, M. (1997) "On Persistence in Mutual Fund Performance" *Journal of Finance*. (1), 57-82.

Carlson, R. (1970) "Aggregate Performance on Mutual Funds, 1948-1967" *Journal of Financial and Quantitative Analysis*. (5), 1-32.

Carpenter, J.; Lynch, A. (1999) "Survivorship bias and attrition effects in measures of performance persistence" *Journal of Financial Economics.* (540), 337-374.

CBR: Central Bank of Russia. http://cbr.ru [20 April, 2017].

Cuthbertson, K.; Nitzsche, D.; O'Sullivan, N. (2008) "UK mutual fund performance: Skill or luck?" *Journal of Empirical Finance*. (15), 613-634.

Dawe, M.; Mwaura, M.; Pokhariyal, G. (2014) "The Performance Persistence of Equity and Blended Mutual Funds in Kenya" *International Journal of Economics and Finance*. (8), 153-160.

Deaves, R. (2004) "Data-conditioning biases, performance, persistence and flows: The case of Canadian equity funds" *Journal of Banking & Finance*. (28), 673-694.

Ferreira, M.; Keswani, A.; Miguel, A.; Ramos, S. (2010) "What Explains Mutual Fund Performance Persistence? International Evidence" *SSRN Electronic Journal*. 1-28.

Fletcher, J.; Forbes, D. (2002) "UK unit trust performance: does the benchmark or the measure matter?" *Journal of Financial Services Research*. (21), 195–218.

Friedman, A. (2015) "The development of investment funds in the world and their place in the economy" *Economic journal.* (4), 68-84.

Jensen, M. (1968) "The performance of mutual funds in the period 1945-1964" *Journal of Finance*. (2), 389–416.

Grinblatt, M.; Titman, S. (1992) "The Persistence of Mutual Fund Performance" *Journal of Finance*. (5), 1977-1984.

Gruber, M. (1996) "Another Puzzle: the Growth in Actively Managed Mutual Fund" *The Journal of Finance*. (3), 783-810.

Hendricks, D.; Patel, J.; Zeckhauser, R. (1993) "Hot Hands in Mutual Funds: Short-Run Persistence of Relative Performance, 1974-1988" *Journal of Finance*. (1), 93-130.

Malkiel, B. (1995) "Returns from Investing in Equity Mutual Funds 1971 to 1991" *Journal of Finance*. (2), 549-572.

NLMC: National League of Management companies "Ranking of mutual funds according to profitability, the number of mutual funds, ranking by NAV" http://nlu.ru [10 April, 2017].

RAEX: Expert Rating Agency. http://raexpert.ru [28 April, 2017].

Sharpe, W. (1966). "Mutual fund performance" *Journal of Business*, (1), 119-138.

Thomson Reuters: Database Thomson Reuters Eikon [11 February, 2017].

Vidal-García, J. (2013) "The persistence of European mutual fund performance" *Research in International Business and Finance*. (28), 45-67.

Appendix

Table 1: <u>Summary statistics for the net asset value of mutual funds for March 2017, million rubles</u>

Category	Open-end	Interval	Closed-end	In total
Equity funds	36194,90	1965,40	39269,70	77430,00
Bond funds	78254,19	0,00	0,00	78254,19
Mixed investment funds	10523,45	3718,44	87494,15	101736,04
Money market funds	1797,62	0,00	354,02	2151,64
Index funds	2454,59	0,00	0,00	2454,59
Funds of funds	11478,61	0,00	0,00	11478,61
The funds of the commodity market		253,75	42,00	295,76
Mortgage funds			6530,81	6530,81
Real estate funds			151170,13	151170,13
Rental funds			199079,69	199079,69
In total:	140703,36	5937,59	483940,52	630581,46

Source: National League of Management companies website