

National Research University Higher School of Economics

Tarassov Evgeni Borissovitch

**EXCHANGE TRADED FUNDS (ETF) AND CLOSET INDEXING OF THE
RUSSIAN MUTUAL FUNDS**

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Berzon N.I., Doctor of science (economics);
Suvorov A. D., PhD

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According to the Federal Reserve, the United States individual investors have been reducing direct investments in equity for several decades.¹ At the same time, there is a constant growth in equity investment via open-ended mutual funds. For the US individual investors the open-ended mutual funds, recently also exchange traded funds (ETF)², became the main financial instrument, used for middle term goals as well as for pension saving purposes.³ Index funds, also called passive funds, show the largest increase of market share. In 2015, the market share of the equity index fund asset under management (AUM) reached 34%, while in 1995 this share used to be only 4% (Bogle, 2016). Due to the rapid technology development that allows, among others, reducing the index fund management cost, some analysts argue that, latest, by 2024 the market share of passive funds exceed that of active ones.⁴

The active fund manager needs searching constantly for securities with highest / lowest growth potential, for the best moments to purchase / sale them in order to outperform the index return. Moreover, he also constantly monitors the securities proportions in fund portfolio to maintain the optimal "risk / return" ratio.

¹ <https://www.federalreserve.gov/releases/z1/20140306/annuals/a1985-1994.pdf>;
<https://www.federalreserve.gov/releases/z1/current/annuals/a1995-2004.pdf>;
<https://www.federalreserve.gov/releases/z1/current/annuals/a2005-2015.pdf>

² ETF (exchange traded fund) is a financial vehicle that assists an investor to gain the return corresponding to return of the selected index. In most cases, ETF provide this service even easier and cheaper than index mutual funds (Poterba & Shoven, 2002; Boehmer & Boehmer, 2003; Kostovetsky, 2003; Svetina, 2010 Agapova, 2010). The main difference between an ETF and a mutual fund is that shares of exchange-traded fund are listed on the stock exchange, in the same way as shares of any company. Investors may trade online in real time. In order to buy (or sell) the mutual fund units an investor needs to communicate the management company in advance without knowing the exact price.

³ <https://www.federalreserve.gov/releases/z1/current/annuals/a2005-2015.pdf>;
http://www.icifactbook.org/ch7/17_fb_ch7#retirement;

⁴ http://www.n3d.eu/_medias/n3d/files/PBC_1057026.pdf

The index fund manager does not need either to search for investment opportunities, nor needs he to think about index outperforming, neither about optimal securities proportion. He knows in advance about his portfolio structure: the shares of all issuers in the same proportion as the companies are included in index. Keeping this structure allows the index fund manager to provide investor with return close to that of the index.

It is obvious that fund money management service with active part costs significantly more than fund service without active option. On developed markets the total annual active fund investors expenses, in average, are almost 200% higher: 2.12% for active equity funds and 0.77% for index equity funds (Cremers et al., 2015). In the US, for example, in 2016, active fund fees are about 800% higher: 0.09% for index equity funds of 0.82% for active equity funds annually.⁵ In the case when investor knows which index the fund promises to outperform, it is easy to assess the past decision whether it made sense to pay for active management or not: one need to compare the index return with net investor's return. Since 1998, the Securities Commission (SEC) has been requiring the US active funds to name the index (benchmark), those return the fund plans regularly outperforming (Sensoy, 2009).

However, the investor is not always aware of all important details choice that he faces: for example, when a fund simply tracks its benchmark (to a large extent or completely) without declaring this fact, and keeping its fees on the active fund fee level, investor pays for active money management service without realizing its absence or reduced form. The individual investors behavior who invest in mutual funds pursuing the closet indexing (or the closet passive strategies) is researched in "libertarian paternalism" (Sunstein and Thaler, 2003) frame: if investors' mistakes are expected, we need developing measures to reduce the frequency of that mistakes. The "libertarian paternalism" concept is based on the theory of "bounded rationality" (Simon, 1953).

⁵ https://www.ici.org/pdf/2017_factbook.pdf

The objectives of the dissertation research is, firstly, to study the influence of mutual funds closet indexing on the investor net financial result, and secondly, to propose measures of economic policy aimed at reducing the frequency of investors mistakes related to the closet indexing.

Closet indexing is studied on the example of the Russian mutual fund market that is only 0.2% of Russia's annual GDP. In other BRICS countries, this open-ended mutual funds share of GDP is fundamentally higher: in Brazil - 45.3%, in India - 5.7%, in China - 5.2%, in South Africa - 40.7%. In the US, this figure reaches 89.4% (Inozemtsev, Simonov, Goryaev, 2016). On % of GDP, Russia is on the 64 rank out of 67 (Abramov, Akshentseva, 2015).

To identify the mutual funds following the closet index strategies and to measure the fund activity level, the Active Share / AS (Cremers and Petajisto, 2009) concept may be used. The Active Share concept was successfully used by Cremers, Ferreira, Matos, Starks, (2016) to explore the mutual funds in 32 countries (including those that do not possess highly developed financial markets, such as Poland).⁶

The Active Share shows how much the fund portfolio deviates from its benchmark (index) portfolio; it is calculated as shown in formula 1:

$$(1) \quad AS = \frac{1}{2} \sum_{i=1}^{No} |w_{fund,i} - w_{index,i}|,$$

where $w_{fund,i}$ and $w_{index,i}$ are weights of company i in the fund and index portfolios. The MFs whose Active Share is less than 60%, Cremers and Petajisto call closet indexers.

In contrast to the previously studied countries, the closet indexing in Russia is found in two forms: closet indexing of active funds and closet indexing of funds

⁶ <https://datamarket.com/data/set/28lb/mutual-fund-assets-to-dp#!ds=28lb!2rqc=1s&display=line>

of funds, whose portfolio consists of shares of one particular ETF.⁷ Moreover, there are two particular phenomena related to ETFs on the Russian market. I could not find similar examples in other countries.

The first phenomenon is the very low level of the ETF market development: the first ETF on the Moscow stock exchange appeared in 2013. This ETF tracks the Russian corporate bonds broad market (EMRUS; Bloomberg Barclays).⁸ In 2016 the first ETF tracking the broad Russian equity index (RTS) was listed.⁹

The second phenomenon is, on the contrary, the widespread use of the foreign ETFs by Russian mutual fund managers for the mentioned above closet indexing strategy.

The fund manager's action, whose portfolio consists almost entirely of one ETF shares and the fee level is perceived as the active fund fee level I suggest to call as "implicit indexing"¹⁰. I call the behavior of investors placing their money into such funds as "the Russian ETF paradox".

Survey shows the only one response to the question "why people invest in equity via mutual fund instead of doing it directly" - "because people think that fund managers are more educated, trained, experienced and have more time to follow the market to search for the most / least potentially profitable securities and for the best moments to buy / to sell them". Moreover, the survey shows that

⁷ Several funds-of-funds after my publication about the mutual funds, whose portfolio consists of shares of only one pre-selected ETF added to their portfolio several other securities included in the same index that the ETF tracks, or shares of several other ETFs tracking the same index. Thus, their Active Share increased from 2-3% to 5-10% which also corresponds to the criterion of closet indexing. Moreover, these fund-of-funds portfolio structure differ from those of active funds that typically do not invest more than 15% in securities of one issuer.

⁸ FinEx Russian Eurobonds ETF

⁹ FinEx Russian RTS Equity UCITS ETF

¹⁰ Aiming to underline the difference from explicit indexing (classical index mutual fund and ETF) and active fund closet indexing.

people are not ready to pay fund for the service if the fund does not conduct this permanent search. However, during the research period (2014 - 2015), the funds that do not conduct this permanent search raised more investors' money than any other funds group.

Taking into account the Russian market particularities related to ETF, the ETF role in closet indexing strategies, and trying to find possible reasons for the "Russian ETF paradox", the **first chapter** of the dissertation research is devoted to the review of academic studies on exchange traded funds.

When writing the survey, I found only three reviews of ETF academic studies: Deville (2008), Charupat and Miu (2013) and Madhavan (2014)¹¹. The literature review presented in the first chapter is a logical supplement to the three previously published surveys. The paper introduces an alternative literature classification, covers articles not included in earlier published reviews, and suggests ETF type's classification and systematization of the market development stages. The survey provides a brief history of the market and a description of the fund working mechanism. Additionally, in conclusion, some ideas for further research are proposed. To my knowledge, this is the first dissertation research in Russia, related to ETF.

In the first part of the **second chapter** of the dissertation, I document the phenomenon of the second type of closet indexing (using one ETF) and its influence on the net investor financial result. Since 2014-2015, most Russian fund-of-funds have been investing only in one preselected Western ETF (Annex 1). If an investor buys shares in an ETF via a mutual fund rather than doing it directly, he overpays in fees up to one-third of the invested capital over a 10-year horizon (Annex 6). Their fee level is not perceived as different from the active fund fee

¹¹ After my review from the first chapter was published, there appeared another survey (Ben-David, Franzoni, Moussawi, 2017). The focus of that review is on the impact of ETF on asset prices; besides, the authors discuss the literature on a few other topics, including "ETF vs. index mutual funds" and "passive investment growth".

level. The funds do not say explicitly that they track an index. An investor expenses comparison between investing in the shares of the same ETF via a mutual fund and a discount-brokerage account is carried out according to the methodology of comparing investments in the same index via an ETF and index mutual fund (Kostovetsky, 2003).

The second part of the second chapter is devoted to the active fund closet indexing and its relation to the investors' net financial result, researched in line with the Active Share concept (Cremers and Petajisto, 2009). To assess the active fund closet indexing effect on the investor's risk-adjusted net return, I construct a panel database for the period from early 2011 to mid-2016 (1190 observations on 62 equity funds). The database consists only out of funds whose benchmark could be found among the Russian indexes.¹² Thus, in the sample there are only funds that invest more than 50% of their NAV¹³ in Russian assets. One-factor CAPM alpha is taken as the net risk adjusted financial result measure. The research result shows negative and significant correlation coefficient between the level of fund activity (Active Share) and investor net risk-adjusted financial result (alpha). This surprising result contradicts Cremers, Ferreira, Matos, Starks' (2016) observation based on the analysis of 32 markets. Obviously, it raises questions about the quality on the active money management service in Russia. In this dissertation I make an assumption that most managers do not deviate from index for reason others than to try outperforming it. The further investigation into other reasons, possibly, would shift the focus from managers skills problem to the agency issue. This would only add arguments to the urgent need to reconsider the whole business practice around this underdeveloped open-ended fund industry.

As fund commissions have an important impact on the shareholder's net profit, I built two multifactor regressions. In the first case, the dependent variable is the alpha, and independent ones are the fund's active share, the fund's size, its

¹² Due to the Active Share methodology, for all funds should be found a correspondent index

¹³ NAV – net asset value

cash inflow. In the second regression, the dependent variable is the size of fund total shareholders costs,¹⁴ and independent ones are the fund's active share, the fund's size, its cash inflow and its return. The level of Active Share has a positive and significant correlation with the level of total shareholder costs. Obviously, the more active fund managers try to ask for the better remunerations and, as the correlation shows, they apparently succeed in it. The Cremers and Petajisto's (2009) and Cremers, Ferreira, Matos, Starks's (2016) results do not give the clear picture on the researched markets. Regarding the relationship between total shareholder costs and fund size, the regression demonstrates negative and significant correlation coefficient. This is in line with international studies (Khorana, Servaes, Tufano, 2009), but contradicts the papers on the Russian market (Abramov, Akshenseva, 2015). The reason may be due to differences in the composition datasets. Usually, in Russian papers the funds are not divided into two groups, even if only half of equity funds invest in Russian assets. another half of open-ended mutual funds invest mostly in foreign assets.

The section gives a brief description of the Russian market Active Share and shows the market shares of mutual fund pursuing all three index strategies (explicit, closet and implicit indexing). Data are compared with selected foreign markets. The share of completely passive funds (explicit and implicit indexing) reaches 30%, making the Russian market one of the most passive in the world. The level of closet indexing is not distinguished from the general world statistics. This section introduces the Active Share concept to the Russian speaking academic field and partly contributes to available studies on 32 markets (Cremers, Ferreira, Matos, Starks, 2016).

In order to make a better understanding of the Russian active money management service, I conduct the test whether the Russian mutual funds outperform the main home index, MICEX, (non-risk adjusted benchmark-adjusted

¹⁴ TSC (total shareholder cost) as in Khorana, Servaes, Tufano (2009)

return)¹⁵ during the post crisis period (2010 - 2016). In average, active funds do not outperform the index funds and obviously the index. The results contradict the conclusions of Abramov, Akshenseva, Radygin (2015) and Volodin and Kuznezova (2015) who show that active fund non-risk adjusted return slightly higher those of index funds. Once again, the reason may lie in sample difference. To my knowledge, this is the first research in Russia that do not consider mutual fund that invest mostly in foreign assets when the question is whether Russian mutual funds outperform the Russian index. Furthermore, the second part Volodin and Kuznezova's research demonstrates fund negative result if the studied return would be risk adjusted.

All these, together with very low development level of the Russian open-ended mutual fund industry (Abramov, 2011; Abramov, Akshenseva, Radygin 2015; Inozemzev, 2016) allows to conclude that new approaches to the industry revival are strongly needed.

The purpose of the **third chapter** is to formulate possible measures of economic policy aimed at reducing the frequency of investor-made mistakes associated with closet indexing. Since, according to the results, the active funds closet indexing in Russian at least does not cause economically significant damage to investors, further research focuses on the funds-of-funds closet indexing.

Unfortunately, the research shows that even fairly objective and simple to understand existing fund descriptions do not allow the majority of even financially highly educated people to realize that active money management is not needed not

¹⁵ Volodin and Kuznetsova (2015) propose before analyzing the risk-adjusted fund return to test one without taking risk into account. Abramov, Akshentseva and Radygin (2015) show that it is almost no difference in Russian mutual funds result if testing the return with risk or without risk consideration. Since the research into relationship between the return and Active Share level aims to complete the other countries survey (Cremers, Ferreira, Matos, Starks, 2016) I follow the key principles of their methodology, taking risk into account.

only for funds-of-funds whose portfolio consists of one pre-selected ETF shares, but also for index funds.

In this study I use the experimental method whose popularity greatly increased in recent years.¹⁶

During the period 2004 – 2010 (the period of index investment popularity explosion), literature emerged investigating why an individual investor invests in index funds with higher commission while there are mutual funds tracking the same index and taking much lower commissions for the same work. The fee dispersion among mutual funds investing in the same index is not smaller than those dispersion among actively managed funds aiming to outperform this index (Choi, Laibson, and Madrian, 2010). Almost all authors consider the investors choice among the approximately 80 US index funds tracking the S & P 500 index.¹⁷ In general, index fund researchers argue that in the rational investor view index funds tracking the same index are commodity goods¹⁸ (Elton, Gruber and Busse, 2004; Hortacsu and Syverson, 2004; Boldin and Cici, 2010; Choi, Laibson and Madrian, 2010).

The researched phenomenon has two aspects. The first is the fact of substantial part of investors chose the high fee index funds among funds tracking

¹⁶ For example, the journal "Society for experimental finance", the Journal of Behavioral and Experimental Finance, released for the first time in 2014, as early as 2016, entered the Q2 rating of SCOPUS in the "finance" section. Moreover, two of the last three studies of a similar topic described below use the experimental method (Choi, Laibson, and Madrian, 2010; Müller, Weber, 2010).

¹⁷ Due to various (often technical) factors, passive funds rarely reflect the dynamics of index price changes with absolute accuracy. There is always a tracking error. Therefore, investors always see different returns of index funds tracking the same index. The average active share level of index funds in the US varies around 4% (Cremers et al., 2016).

¹⁸ Products with the same characteristics. Practically the only criterion for choosing among them is their price. For example, Brent crude oil, one wheat type of, one type of cheese (before it is packaged for retail), etc.

the same index. The second is the theoretical conclusion that index fund investors chose index funds because they know about poor results of active funds performance: it is not more than 2% of active funds that outperform their benchmarks (Fama, French, 2010). Therefore, apparently, index funds investor do not want to overpay for “not much promising” active money management service. Researchers pose the question how to explain that these apparently rational investors make such a non-optimal choice among index funds (Boldin and Cici, 2010; Müller, Weber, 2010).

Choi et al. (2010), summing up the results of previous studies in their experiment demonstrate the insufficiency of previously well-founded hypotheses (described in chapter 3). However, the authors do not answer the question about the reasons. Boldin and Cici (2010) agree that there is no reasonable motivation for an investor to choose high fee index funds. They call this behavior Index Fund Rationality Paradox. Debating with Choi et al. (2010), Boldin and Cici (2010) argue that this paradox exists due to the naïve investors that are easy influenced by financial advisors.

Taking into account the above mention academic discussion, for my experiment I invited participants who should not be called naïve investors. I test the *hypothesis that people with high level of financial education (or investment experience) fully understand the difference among three major groups open-ended mutual funds: active funds, index funds and fund-of-funds, those portfolio consist almost out of shares of one pre-selected ETF.*

The design of the experiment aims to exclude as far as possible all known rational factors that have the potential to influence the decision-making process. The starting point for developing the methodology is the design of the Choi et al. (2010) experiment, conducted in the Harvard Business School. In addition to creation of even more favorable conditions for participants and to participants level of financial education or experience, I develop the speed test to check the participant ability to identify passive funds from the general list by asking them to

compare the fund manager skills and efforts (workload) needed to execute their tasks regarding the portfolio management.

The research results allow to believe that an important obstacle to full understanding of the difference between passive and active funds is the people's natural predisposition to automatic categorization of surrounding world. Categorization is an unconscious information simplification process that exists for two reasons (Rosch and Mervis, 1975): first, the limitations of human cognitive resources and the permanent need for their optimization; secondly, people's need for a constantly well-structured picture of surrounding world. Categorization is the first reaction of our mind to any stimulus (Bruner, 1957).

Therefore, in the conclusion I propose several changes in economic policy in line with "libertarian paternalism" (2003) aiming at increasing the chance of better understanding the key points of the service provided by mutual funds. For example, following the US regulator idea, it is possible to require all active funds to specify an index (benchmark) those return a fund plans to outperform. Otherwise, most people barely realize that the key goal of each active fund is to provide its investors with the return higher than the index's one (exactly to say that of index funds), rather than that of an bank deposit, as the overwhelming majority of Russian investors thinks today.

Contribution

The dissertation thesis expands research into Russian open-ended mutual fund industry. In particular, this is the first Russian dissertation related to new products for the Russian market - exchange traded funds (ETF). This is also the first study of the Russian market, where a new mutual funds assessing methodology is applied - the "active share" (Cremers and Petajisto, 2009). A new approach was also applied when searching for the answer whether the funds outperform the Russian main index: e.g., funds that invest mostly in foreign assets are excluded from the data-set, as in Fama and French (2010), for example, and

guided by the principles of general logic. The paper identifies two types of closet indexing used by Russian mutual funds, documents and researches into the individual investors behavior who buy fund units whose portfolio consists of shares of one pre-selected ETF. The formation of proposals for market regulation in the paradigm of "libertarian paternalism" (nudging) is also a scientific and practical contribution of the thesis.

The results show that a larger fund active share is associated with higher fee (which is consistent with the results for other countries), but does not lead to a greater net return (it does not in line with other countries research). The results showing the lack of a complete understanding by most investors of the main difference between active and passive funds due to the natural people's predisposition to automatic categorization of the surrounding world are also a contribution to the world academic theory of investment funds. Finally, the paper presents a comprehensive survey of the academic literature on ETF, which also includes a review of the papers which were not included in reviews previously published. For the first time, the stages of ETF market development are systematized and their classification is proposed.

Main Findings

First. There are two types of closet indexing strategies on the Russian market:

1. Active fund indexing: when an active fund mostly tracks its benchmark instead to try outperforming it ("closet indexing");
2. Fund-of-funds indexing: when a fund invest all money into shares of one pre-selected ETF ("implicit indexing").

Second. The study of the active fund indexing shows a negative correlation coefficient on significant level between a fund activity level (Active Share) and its risk-adjusted net return (alpha): the active fund manager who tracks its benchmark more, on average, provide his investors with better net risk-adjusted financial result than the fund manager actively seeking this index outperform.

Third. Calculation of the fund-of-funds indexing ("implicit indexing") impact demonstrates that investors expenses on the mutual funds fee over a 10-year period could reach up to 36% of the invested capital, whereas expenses on investing via discount broker account for the same period do not exceed 2-3%.

Fourth. On average, active funds which invest mostly in broad Russian market do not outperform the index funds and, obviously, the broad market index (MICEX) during the period starting at the end of 2010.

Fifth. The behavioral phenomenon of non-optimal choice of the way by investing in ETF – via mutual funds, rather than directly – I attribute to a manifestation of the index funds irrationality paradox. Experimental research shows that, even in spite of high level of financial education (or investment experience), additional supporting information, people view all funds as representatives of one category, without dividing them according to the "active / passive" criterion. Perhaps, they have it difficult to overcome the natural people's predisposition to automatic categorization of the surrounding world.

Sixth. I propose several changes in economic policy in line with "libertarian paternalism" (2003) aiming at increasing the chance of better understanding the key points of the service provided by mutual funds. For example, following the US regulator action, it is possible to require all active funds to specify an index (benchmark), those return a fund plans to outperform.

The main results of the dissertation research were presented on the conferences listed below

1. XIII interuniversity conference "Stock market: current issues and opportunities for individual investor", Moscow Stock Exchange, 2016.
2. «Seventh International Research Meeting in Business and Management» Nice, 2016;
3. «Third Russian Economic Forum», New economic association, Moscow, 2016

4. «Experimental Finance conference», Nice, 2017;
5. PhD workshop "Financial Markets and Corporate Strategies: Comparative Studies", XIX international conference, Moscow, 2018.

Publications

1. Tarassov E. B. ETF: history, mechanism, academic literature review and research perspectives // Journal of Corporate Finance Research. 2016. Vol. 38, no. 2, pp. 89-108.
2. Tarassov E. B. The Index Fund Rationality Paradox and Categorical Thinking // HSE Economic Journal, 2017. vol. 21, no. 3, pp. 412 - 433.
3. Inozemtsev E.V., Tarassov E. B. Actively managed Russian mutual funds: Good or bad for investors? // Voprosy Ekonomiki, 2018, no. 3, pp. 64—79. (in Russian)
4. Tarassov E. B. The Russian ETF puzzle and its possible reasons //Algorithmic Finance, 2017. vol. 6, no. 3-4, pp. 93-102.
5. Tarassov E. B. Exchange Traded Funds (ETF): Anomaly on the Russian Market // Stock market: current issues and opportunities for individual investor. XIII interuniversity conference, Moscow 2017, pp. 317 – 331.

Structure. The dissertation research is written on 167 pages, includes 20 tables, 20 pictures and consists out of introduction, three chapters, list of the literature and six annexes.