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**The relation between management fees and the mutual funds`
performance in Poland in 2015**

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Keywords: *mutual funds; fees; rates of return; risk; regression*

Abstract

Research background: The investor`s expectation of better performance in case of more expensive mutual funds seems natural and fully justified. However the arise of passive funds and their surprisingly good results, especially when compared to their low fees, triggered the discussion. Recent years brought more and more studies, conducted mostly for the American market, discrediting high-charging, aggressive funds. First analyses in Poland also indicate, that the level of fees is not always linked with the fund performance.

Purpose of the article: The purpose of the study is to investigate the relation between the fees imposed by the mutual funds and the funds` performance. The idea is to verify, whether higher management fees are associated with top performance and whether it is rational to pay more for capital management.

Methodology/methods: In the first step of the study, linearity and direction of the dependency has been explored using scatterplots and correlation analysis. In the second part the regression has been analyzed to verify the strength of the relation. One-factor models have been built with rate of return and standard deviation as an independent variables for 1-, 3- and 5-year time horizons. Moreover two-factor models, with both rate of return and risk included has been created, to compare the significance of rate of return and risk factor.

Findings& Value added: The results indicated, that more expensive Polish mutual funds in 2015 tended to perform worse in all tested time horizons – both in terms of lower rates of return and higher risk. Especially unexpected are the results of rates of return regression analysis – it turns out, that within a sample 1% higher fee implied over 0.6% lower rate of return before fees (in yearly period). Nonetheless risk turned out to be more important, explaining the charges variability much better than the rate of return. Another interesting finding of the study is that merely two

simple factors (return and risk) explain even as much as 60% of the management fee variability.

Introduction

Behind all the contemporary mutual funds lies the old idea of common investing, enabling virtually everyone to share the risk and the costs of professional advice. It opened the possibility to take part in global financial markets and benefit from them to the ordinary people, not only highly professional and knowledgeable, often international, institutional entities.

Mutual fund may be perceived as a financial product, with its price and the value it brings to the customer. A customer may expect, that for higher price he or she would buy better product. In case of mutual fund one may assume, that “better” is more convenient and probably bringing higher rate of return for lower risk.

The goal of the following research is not only to review the state of the art in the area of fees and the funds` results, but also to examine the relation on the Polish market. The main purpose of the article is to answer the question, whether (basing on the information available) it makes sense to the investor to pay more for the investment fund management.

At first, the general characteristics of the relations will be tested (the linearity and correlations). The null hypothesis is that as the management fee goes up, so does the rate of return, at least before fees. One can expect, that portfolio managed by better paid fund would outperform in terms of returns. Yet in case of risk the direction of the dependency on the theoretical level is not clear. On the one side, higher price would suggest better product, therefore higher charge for decreasing risk - the unwanted good (maintaining returns). However the observation of the management fees structure shows, that the things go the other way around – more aggressive funds are more costly in maintenance, and although exposed to higher risk, they also offer chances for higher returns (at least in theory). That is why initially we would rather endorse the hypothesis, that higher risk would imply higher charges, which we will try to verify in the study.

Past Research on Mutual Funds` Fees and Performance

In the past many researchers tried to investigate the topic of fees imposed by mutual funds on the investors, especially their impact on the rates of return, fund flows, risk and the incentives they rise for the fund manag-

ers. Due to strong switch towards cheap index funds on western markets, broad studies has been conducted to test whether the high charges levied by active funds with aggressive strategies are justified.

Already in 1995 it was proved, that stock mutual funds on average did not beat the benchmarks neither before, nor after fees. The conclusion was, that previous research, suggesting attractiveness of active management, was unreliable due to survivorship bias¹ (Malkiel, 1995). A year later another study was published, where M. J. Gruber posed a question, why active funds grow so fast, although their results had been worse than the index funds (Gruber, 1996). The author identified two types of investors – the “sophisticated” ones, pursuing the funds exhibiting best performance, and the “disadvantaged” ones, who follow advertisement and broker advice². Only thanks to “disadvantaged investors” the inferior active funds can operate.

Another interesting research on mutual funds shows, that the average stock holding portfolio in the sample outperformed the benchmark by 1.3%, however taking the fees into account, it lagged behind by 1.0% (Wermers, 2000). The 2.3% of the difference was credited partly to lower results of non-stock holdings of the funds (0.7%), whereas the rest was assigned to transaction costs and fund expenses. Wermers published his further analysis three years later, proving that more active funds tend to achieve better outcomes than the risk averse ones, however even demonstrating aggressive investment strategy they are unable to beat their benchmarks in a long run (Wermers, 2003).

In 2009 Nobel Prize winners, Fama and French, using a bootstrapping simulations, provided an evidence that very few fund managers had the ability and skill to beat the benchmark (after fees). Moreover estimated alphas for the best active funds are no better than for large, efficient passively managed ones (Fama, French, 2009). Deep and sophisticated analysis were provided Petajisto in many of his research papers. Among others he unveiled that some funds declaring to be active are in fact so-called “closet indexers”, which means that their portfolios almost exactly reflect the benchmark composition. Those funds bring especially little value for the investors, while charging fees as high as genuinely actively managed funds (Petajisto, Cremers, 2009; Petajisto, 2013).

¹ Survivorship bias is a tendency to exclude failed companies from the studies, as they no longer exist.

²“Disadvantaged” clientele included also „institutionally disadvantaged”, mainly pension funds limited by restricted plan, and “tax disadvantaged”, holding funds long enough, that capital gain taxes would make it inefficient to withdraw the money.

Finally in a broad review of existing academic work on profitability of active management on mature markets Wermers and Jones conclude, that risk-adjusted actively managed funds' rates of return after fees are close to zero, however they have a very important role in the capitalist economies. They act as a catalyst for efficient market allocation mechanism multiplying general wealth of the society. Active funds sometimes achieve extraordinary rates of return. This enhances the investors to seek for the best performing ones and avoid those making losses (Jones, Wermers, 2011).

First research on the topic of mutual fund fees and performance in Poland was conducted last year by the author of this paper (Fras, 2017). The data from Poland and the UK from 2015 has indicated none or slightly negative correlation between the fees and the rates of return before fees. When it comes to the rates of return after fees the correlations were significantly negative. This outcomes, contrary to hypothesis, enhanced further study on the topic.

Concluding, many researchers in recent years have contested the idea, that more expensive and active funds are more likely to outperform and bring higher value for the investor. The natural mechanism that paying more one can expect better quality seems not to work here. This remains in contradiction with all we know about the economy and human decisions and may be the case in favor of behavioral explanations.

Method of the Research

The aim of the present study is to investigate the relation between Polish mutual funds' fees and their performance, taking into account both rate of return and risk factor.

The data has been downloaded from Thomson Reuters Eikon database and covers sample of 93 Polish open-ended mutual funds. The fees data was only available for 2015, which is the most significant limitation of the research. All the open pension funds have been excluded from the sample. Their quasi-public, obligatory character and imposed regulations result in different way of functioning. The fees will be confronted with 1-year, 3-year and 5-year rates of return and standard deviations. The full dataset was available for 93 mutual funds. All the calculations were performed in R language, using R Studio programming environment.

In general the analysis can be divided into two parts. The first one was to check the linearity of the relation. The very first tool for investigating the general shape of the relation was reviewing the scatter diagrams of the rates of return and the fees and also standard deviations and fees. The

next one was calculating the correlations and assessment of their statistical significance.

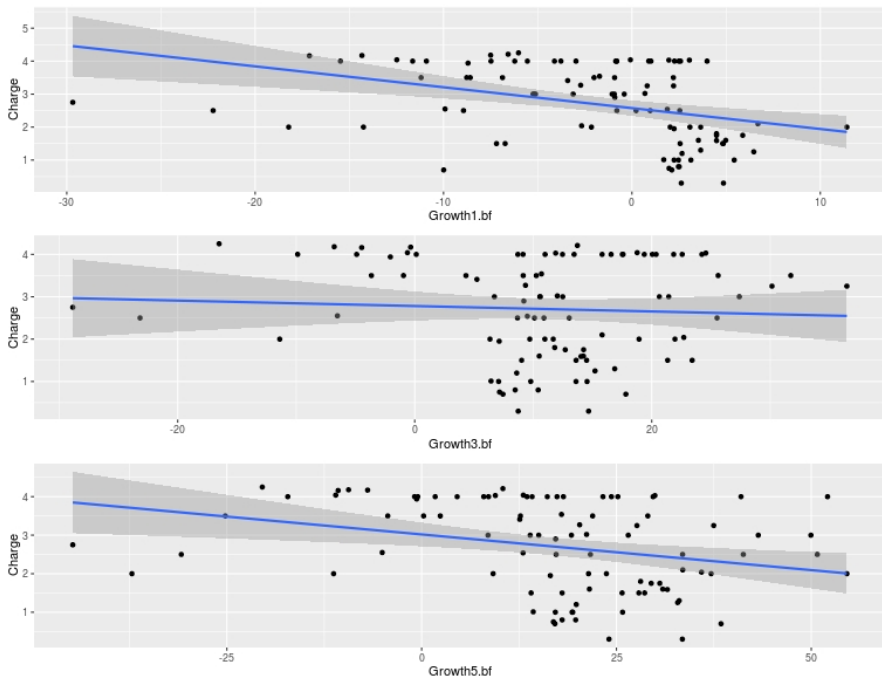
The second part of the research is evaluation of the strength of the relation. Simple regression model was built and parameters calculated, to check, whether the rate of return is statistically significant, what is the time horizon (1, 3 or 5 years) that matters the most and how firmly the results affected the fees. Then two-factor models including rate of return and risk has been created to compare, which of the factors impacts more the fees level and how well this simple models explain the charges variability. Finally, the parameters of the models had been assessed in terms of their significance and strength of impact.

The general fit of the two-factor models will be assessed with the coefficient of determination (R^2 ratio). In the literature there is a common consensus, that the ratio at the level of 0.6 is considered to be satisfactory.

Results

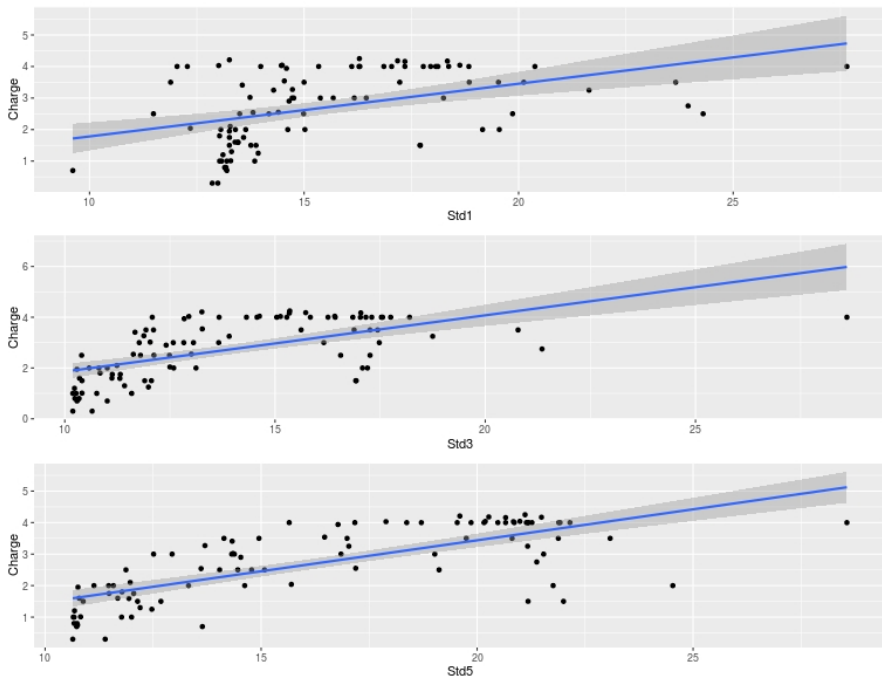
As the first stage of the analysis, the scatter diagrams have been generated. Figure 1 and 2 present the relation between fees and rates of return before fees and fees vs standard deviation. The negative slope is easily visible, especially for 1- and 5-year time horizon.

Figure 1. Scatter diagram: relation between fees in % and rates of return (before fees) in % (1-year, 3-years and 5-years) with regression line and its 95% confidence interval



Source: own calculations based on Thomson Reuters Eikon database

Figure 2. Scatter diagram: relation between fees in % and rate of return standard deviation (1-year, 3-years and 5-years) with regression line and its 95% confidence interval



Source: own calculations based on Thonson Reuters Eikon database

As the opposite to the rate of return, standard deviation seems to be positively linked with the level of fees. This observation is in line with the expectation – rising risk implies more managerial work to be done and more expenses incurred by the fund. However what is observed in Figure 1 remains in contradiction with the hypothesis stated.

Table 1. Correlations between fees and rates of return (before and after fees) and standard deviations in 1-year, 3-years and 5-years time horizons

	1-year	3-years	5-years
Rate of return before fees	-0.37	-0.06	-0.30
Rate of return after fees	-0.51	-0.27	-0.46
Standard deviation	0.44	0.60	0.73

Source: own calculations based on Thonson Reuters Eikon database

Table 1 contains all the calculated correlations. In all the tables the values, that turned out to be statistically significant within 95% confidence interval, are marked bold. In this case almost all the correlations are statistically significant. The strongest linearity can be observed for standard de-

vations, especially in 5-year time period. Moreover, the correlations are definitely positive in all cases. It indicates that more aggressive funds are likely to impose higher charges.

On the other hand, estimates of all the correlations for the rates of return (both before and after fees) are negative. That leads to the conclusion, that rate of return goes down with the rise of the fee. It is strongly observed for the rates of return after fees, which are the most important for the investor. Even on the level of portfolio performance (before fees) more expensive funds tend to deliver worse results.

Nevertheless, the correlation analysis results only provide the evidence on the linearity and the direction of the relation, not its strength. To assess the level of dependency in the next stage of the analysis the one-factor linear regression models has been build and its parameters estimated.

Table 2. Estimated parameters of the variables in one-factor models in 1-year, 3-years and 5-years time horizons

	1-year	3-years	5-years
Rate of return before fees	-0.63 (0.16)	-0.06 (0.11)	-0.19 (0.06)
Rate of return after fees	-0.80 (0.14)	-0.28 (0.10)	-0.27 (0.05)
Standard deviation	1.67 (0.35)	2.22 (0.30)	1.97 (0.19)

Source: own calculations based on Thonson Reuters Eikon database

Table 2 presents the estimated parameters of all the variables for all three time horizons. There are also standard error values included (below the estimates, in brackets).

In all cases the intercept for rates of return is between 2.3-3%, which can be understood as a rate of return when there is no fee. For 1-year time horizon on average 1% higher fee implies 0.63% lower rate of return (or 0.80% after fee). The drop is smaller for longer time horizons, however still the outcome seems counterintuitive. In case of standard deviation the intercept is between -0.50-0.11. When rising the fee, meaningful growth in risk level is observed for all the time horizons. Every 1% of rise in fees goes with circa 2% of increase in average deviation from the mean rate of return.

Author took a look at the interrelations between risk and rate of return. Three models (for each time horizon) has been built, including as an independent variable both rate of return and standard deviations. This way the author will try to see, which factor is more important for the fee level and how precisely this two-factor, simple models can predict the charge.

Table 3. Estimated parameters of the variables in two-factor models (rate of return and standard deviation) in 1-year, 3-year and 5-year time horizons

	Intercept	Rate of return before fees	Standard deviation	R ²
1-year	0.65 (0.68)	-0.03 (0.02)	0.13 (0.04)	21%
3-years	0.56 (0.48)	0.01 (0.01)	0.23 (0.03)	37%
5-years	-0.71 (0.41)	0.00 (0.01)	0.21 (0.02)	54%

Source:own calculations based on Thonson Reuters Eikon database

In all three models the only statistically important factor is the standard deviation, reflecting the level of risk. In case of 5-year time period this very simple relation explains even as much as over a half of the fees variability. Rate of return seems not important when linked with risk in one model, however one needs to bear in mind, that for one-factor models all the rate of return variables have been significant.

Conclusions

The study indicates, that for open-ended funds in the Poland the relation between rate of return and the fees is definitely negative, however the risk explains the charges variability much better than rate of return. One-factor linear regression models` parameters exhibit, that one percent higher charge is linked with even 0.6% lower rate of return before fees in a yearly time horizon. On the other hand the risk goes up together with the charges, which remains in line with the entry hypothesis.

One possible explanation of the conclusions above is that there is a lot of inefficiency in the Polish mutual funds market. The inefficiencies appear especially in those areas, where the investors are less educated and knowledgeable. Low market maturity implies lack of education in matter of entrepreneurship and capital management, no traditions of investing money, low mutual funds popularity and citizens` awareness.

The Polish market immaturity hypothesis may lead to the conclusion, that further research needs to be done in order to verify that idea. One conception could be to compare open-ended funds with more professional type of funds in Poland, e.g. closed-ended funds. Another idea to test the hypothesis of Polish market immaturity may be to compare the relation for Polish and some developed markets, like UK or Germany.

Another explanation for the counterintuitive outcomes of rate of return impact is the accuracy of the data and the sample size. The weakest part of the research is the fact, that due to the data availability the calculations are conducted for only one year, i.e. 2015. Admittedly, verified rates of return are also considered in 3- and 5-year time horizons, however revising the study with the charges data for a few years would for sure help strengthen the research credibility.

The last remark, that the author would like to emphasize is that at the end it is worth to come back to the initial idea. In the Introduction the Author described mutual fund as a product, which may be assessed basing on its performance. Clients are likely to pay more for better product, but what the research eventually demonstrates, is that for higher price one would receive lower rate of return and more risk. When continuing the research on that topic, for sure it would be worthy to check how fund efficiency ratios and risk-adjusted returns are related with the fee (e.g. Sharp ratio). So far it is not possible to say, why this phenomenon appeared and what is the reason, but further research may for sure bring more light to this outcomes.

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