High management fees with no relation to mutual fund performance. Case of Poland

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Abstract

Poland has a very fragmented open-end investment fund market with management fees which are the double of what fund participants pay in developed European countries. In this article, based on a deep analysis of financial statements of Polish funds of different types, we take a closer look at actual rate of management fees (ARMF) and its relation with before-fee fund performance. To determine the performance we apply commonly known model of Carhart (1997) as well as alternative panel data regression with some attributes of investment funds (including fund flows which equation we generalize by considering the volatility of fund quotes within a month). The second performance measure occurs to be a better fit for modeling management fees in all considered types of open-end funds. Our results show that in general high management fees of Polish open-end investment funds are not related to the performance. We reject the explanatory variables like cash flow (due to lack of statistical significance) and binary variable indicating banks with closed architecture (due to strict collinearity). We observe the strongest relationship of management fees with the size and the age of the funds.

Key words: mutual funds, management fee, fund performance, fund attributes, Poland

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Introduction

Poland is a unique example of an investment fund industry which is profitable due to very high management fees. The average asset-weighted ongoing charge for European funds was in 2016 only 1,00%[1]; whereas in the same time in Poland its main component[2] – a declared management fee was 1,95%[3]. This might be the result of the fact that Polish fund market is smaller and less developed than the West European markets. But with the net asset value of over 280 billion PLN (around 65 billion EUR) it is the biggest among CEE fund markets[4] and with over 60 local management companies offering more than 1400 funds and subfunds it is highly diverse.

The problem of why the clients of Polish funds are charged the double of what the investors in other European countries are has remained untouched since the industry was created in 1992. However in 2017, in the context of implementing MiFID II[5], especially its part concerning remuneration of fund distributors, it became a subject for a live discussion between the Polish Financial Supervision Authority (KNF[6]) and the fund industry representatives (especially associated in the Fund and Asset Management Chamber, IZFA[7]). On the meeting of KNF and IZFA on the 29th of March, 2017 KNF announced that it would force a regulation of a radical reduction of the maximum rate of the management fee to 2% and the reduction of the kickback value given to the fund distributors to 0,5% in relation to the net asset value (NAV) of funds [UKNF 2017a]. Taking into account the current rates of management fees (which in case of equity funds are on average 4% of NAV p.a.) and the level of kickbacks (up to 70%

[1] See Morningstar Inc (2016).
[2] In case of funds of funds (FoF), which portfolio consists mainly of other funds, an important element of asset-weighted ongoing charge are management fees charged by the funds. FoF are a special case, marginal for our study.
[3] Asset-weighted average declared rate of management fees for open-end investment funds at the end of 2016. Own calculations based on data from Analizy Online.
[4] See EFAMA Quarterly Statistical Release, December 2017, No. 71, p. 14.
[5] MiFID II is planned to be implemented in Poland in March-April, 2018.
[6] pol. Komisja Nadzoru Finansowego, www.knf.gov.pl.
[7] pol. Izba Zarządzających Funduszami i Aktywami, www.izfa.pl.

and, in extreme cases, even 100%[8]) this meant a real earthquake for the industry and related distributors. Right after that meeting the industry representatives started an intense lobbying against such solution. They claimed that a regulation forcing them to decrease the management fee so dramatically would hit (if not destroy) their sales, worsen their competitiveness or even reduce the development of the fund market in Poland. They reached their goal – two days after the first meeting, on the 31st of March, 2017 KNF announced that the restrictions about the maximum management fee in the amount of 2% would be in force since 2022 [UKNF 2017b].

At the end of 2016 the savings of Polish households reached 1281 billion PLN (around 300 billion EUR). As much as 70% of it is located in bank deposits and only 13% in investment funds [Analizy Online 2017]. The fund industry representatives suggest that such structure of savings indicates a high potential of growth for investment funds, since very low interest rates make them an attractive alternative for bank deposits. It seems, however, that Poles think differently – the structure of savings has been almost constant since many years. The question is why. We believe that a great part of the answer lies in high management fees which in Poland are too high to compensate their returns.

The subject of fees charged by management companies and the relation with the performance they provide is a subject of significant level of academic research. On the one side the researchers attempt to resolve the agency problem of an accurate level of a compensation for a fund manager (agent) paid by individual investors (principals) who become her clients. The logic is that managers who perform better should be paid more (in other words, they should charge higher fees). Better performance for higher fees should be more characteristic for actively managed and less liquid funds (e.g. for equity or closed-end funds) rather than for passively and more liquid funds (e.g. for index or open-end funds). The reality seems to be the

[8] See Morbiato (2017).

opposite. Carhart (1997) shows that the mutual fund fees are the main cause of underperformance of actively managed funds in comparison to the index funds. Gil-Bazo and Ruis-Verdu (2009) prove that higher fees are charged by the worse before-fee performing equity funds which realize the strategy of fee-setting in the presence of investors with different degrees of sensitivity to performance. Barras et al. (2010) find that 75% of funds exhibit zero alpha return (net of expenses), consistent with the Berk and Green (2004) equilibrium. Babalos et. al (2009) and Wongsurawat (2011) show that excessive fees are a fact not only for mature but also for emerging markets. Ferris and Yan (2009) conclude that higher fees are more common for public fund families, and not for private ones, because of their shorter-term focus. Khorana et. al (2008) add that fees vary substantially across funds and from country to country. Higher fees are characteristic for funds distributed in more countries and funds domiciled in certain offshore locations (especially when selling into countries levying higher taxes). Lower fees are typical for larger funds and fund complexes as well as funds operating in countries with stronger investor protection. Vidal et. al. (2015) find funds with both positive and negative relations with fees which show strong evidence of negative return predictability for their fees.

There is also academic evidence that the relation between fees and fund performance is not consistent or does not exist. Ferreira et al. (2013) conclude that higher priced management can generate higher gross returns, but returns are not high enough to cover the fees. Also, Garyn-Tal (2015) who considers funds classification finds that within each classification group there are no such consistent relations (and mostly no relations at all) between the expenses and loads the funds charge and the alphas they earn. As far as closed-end funds are concerned Cullian and Zheng (2012) suggest that investments in the least liquid securities result in higher management fees charged by those funds.

On the other side the researches try to find the determinants of excessive fees. Iannotta and Navone (2012) analyze factors impacting the cross-section of equity mutual fund fee dispersion. Haslem (2015) extends their research and analyzes mutual fund fee dispersion explained by observable heterogeneity in decisions concerning fund and investor attributes. Adams et al. (2012) claim that the market competition limits mutual fund's ability to charge excessive fees relative to shareholder services. They found that excessively high fees are prevalent in index funds with multiple share classes and weak governance structures. Overall, agency considerations and competition (as also shown by Khorana et al. (2009), Wahal and Wang (2011) or Cremers et al. (2016)) are important determinants of fund fees. Brown and Pomerantz (2017) add to this list the legal matters.

In our study we relate to both of the issues connected to the management fees: agency problem and factors which may determine those fees. If the fees of the Polish open-end investment funds are so high (and higher than elsewhere), the managers should provide positive performance independently whether their funds are young or old, big or small or distributed via well paid banks or not. Only then the decision of Polish fund market supervisor about postponing the dramatic decrease of the maximum management fee will be justified and the consequences of MiFID II will not be too severe for the Polish fund industry. We think that higher fees of Polish open-end funds do not mean better performance and we will try to find the determinants of such situation.

We contribute to the literature in few ways. Firstly, for best of our knowledge this is the first study on management fees considering open-end investment funds in one of the CEE countries, which are additionally divided into the subcategories concerning their investment style. Secondly, we analyze the relationship between the management fees and fund performance from a different perspective than the literature where often the fees are one of the factors predicting the fund performance. In our study we do the opposite, which is connected

with our thoughts on the cause-and-effect nature of this phenomenon. Thirdly, we relate the fees to the fund performance which is based on 4-factor Carhart's (1997) model using a unique set of local data of Warsaw Stock Exchange and NewConnect market to determine local risk factors as well as well as alternative regression with some attributes of investment funds, including cash flows which indicator we generalize by taking into account the volatility of fund quotes within each month. We find that the second model of fund performance occurs to be a better fit for modeling management fees in all considered types of open-end funds. Finally, our sample is free of survivorship bias and we take into account individual and panel data on returns, fees and other attributes of all equity, mixed and debt funds providing their services in Poland in 2012-2016 and not only chosen types of funds like in other studies on Polish fund market (see Jackowicz and Filip (2009), Swinkels and Rzezniczak (2009), Białkowski and Otten (2011), Pietrzyk (2014) or Urbański et al. (2016)).

The article is divided in four parts. In section I we present the details on our data set. In section II we explain how we calculate the fund performance and in section III – how we relate the management fee to the performance and other factors that may determine it. In section IV we conclude.

I. Data

We use the data from Analizy Online (main Polish fund-data provider) to obtain the data on the attributes of Polish open-end investment funds that were active for at least one year from January 2012 to June 2016 and which had more than PLN 1 m assets under management in a given month. We collect information about *size* represented by net asset value (NAV), age in months, *real rates of management fee* disclosed in semi-annual and annual financial statements of funds and *price* of the funds which is the net asset value per share. The analysis is carried out for four peer groups (segments) due to the asset class: equity, mixed, fixed income and money market open-end investment funds which are further divided into domestic and

foreign funds. We also analyze three groups of alternative funds: capital protection, absolute return and commodity funds. Additionally, "Polish equity" and "Polish mixed" funds for which we apply the Carhart (1997) model are divided into more groups (see Table 3 for details).

Our sample is free of survivorship bias. We take into account the changes in the fund's investment policy. We also exclude from our sample observations from periods for which no financial statements were published. Finally, this leads us to a dataset of 21,618 monthly observations for 500 open-end investment funds from 33 investment fund companies (IFC[9]) divided into 11 peer groups (subsamples). More details are displayed in Table 1.

The actual rate of management fee (ARMF) disclosed in the financial statements takes into account the total income of the IFC, i.e. both asset-based fee called *management fee* and performance-based fee called *success fee*[10] or *incentive fee* or *performance fee*. We believe that this is an optimal indicator of the cost of managing an investment funds in Poland, although it is not ideal (e.g. it does not contain information on the management costs of the underlying funds in the case of *funds of funds).* Other cost indicators you may encounter include: (1) *Total operational cost* factor (TOC) disclosed similarly to the ARMF in financial statements, which additionally incorporates other limited and unlimited operating expenses of the investment fund[11]. (2) *Total expense ratio* (TER[12]) indicated in the information prospectus of the investment fund. This factor reflects the share of costs not directly related to the fund's investment activity, therefore, in particular excluding transaction costs or interest paid on loans

[9] pol. TFI („Towarzystwo Funduszy Inwestycyjnych")
[10] For some reason especially this name is very popular in Poland.
[11] Full catalog of operating costs can be found in *Rozporządzenie Ministra Finansów z dnia 24 grudnia 2007 r. w sprawie szczególnych zasad rachunkowości funduszy inwestycyjnych* (Dz.U. 2007 nr 249 poz. 1859). Apart from the cost categories mentioned in this regulation, a fund is obligated to list all cost items representing at least 5% of the total cost.
[12] pol. WKC („Współczynnik Kosztów Całkowitych")

or credits[13]. (3) *Ongoing charge* factor (OCF) given in the Key Investor Information Document (KIID) – mandatory document at European Union level, which includes among others costs of managing the underlying funds whose shares are included in the investment portfolio of a given fund[14]. All three indicators are reported in relation to the NAV on a yearly basis.

To build risk factors from the Carhart's (1997) model we use data on capitalization and book-to-market ratios derived in semiannual statistics from the Warsaw Stock Exchange (GPW)[15] and the NewConnect market (NC)[16] for 2011H2 to 2015H2. Returns from stock companies were calculated according with the daily changes available in the official GPW archive[17], during the period from end of December 2010 to end of June 2016 (the first year is related to the construction of the momentum factor). Table 2 contain summary statistics about this stock data. WIBID 1M[18] was adopted as risk-free rate and Warsaw Stock Exchange Index (WIG) was used to calculate return from market portfolio.

II. Fund performance

We calculate the open-end investment fund performance in the following way: take any fixed time period t, which in our case is a calendar month. Let $u(t)$ mean any fixed valuation day of month t and $L(t)$, $\Xi(t)$ – the number of valuation and calendar days in the month t, respectively. In general considerations we omit the argument t and we simply write u, L or Ξ. Furthermore i denotes a unique designation for the investment fund.

[13] cf. attachment 1 to *Rozporządzenie Ministra Finansów z dnia 22 maja 2013 r.* w *sprawie prospektu informacyjnego funduszu inwestycyjnego otwartego i specjalistycznego funduszu inwestycyjnego otwartego oraz wyliczania wskaźnika zysku do ryzyka tych funduszy* (Dz.U. 2013 poz. 673)
[14] Full catalog of costs included in OCF can be found in *CESR's guidelines on the methodology for calculation of the ongoing charges figure in the Key Investor Information Document*.
[15] https://www.gpw.pl/statystyki_polroczne [Access in 28 Mar 2017]
[16] http://www.newconnect.pl/index.php?page=statystyki_polroczne [Access in 28 Mar 2017]
[17] http://infostrefa.com/infostrefa/pl/index/ [Access at different days from 28 Mar 2017 to 12 Apr 2017]
[18] WIBID 1M is the reference interest rate of 1 month deposits on the Polish interbank market.

From daily *quotations* (prices) of investment funds $QT_{i,u}$ we can calculate monthly[19] or daily returns marked as $r_{i,t}$ and $r_{i,u}$ respectively. The first step of the analysis is to calculate the before-fee return and for this purpose we propose a simple operating model of the an investment fund change of NAV, defined by two equations:

$$NAV_u = (1 + r_u)NAV_{u-1} + NF_u \,, \tag{1}$$

$$NAV_u = NAV_{u-1} + RM_u + NF_u \,, \tag{2}$$

where NAV_u denotes NAV, NF_u means *net flows*[20] and RM_u is *result of management*[21], all on a given day u. From the comparison of the above formulas we get $RM_u = r_u NAV_{u-1}$ and one of the components of this result of management is *charged management fee*:

$$CMF_u = \xi_u \frac{RMF_t}{365} NAV_{u-1} \,, \tag{3}$$

where RMF_t denotes a rate of management fee and ξ_u means the *weight of the valuation day*, i.e. the number of calendar days since the last valuation day (note that $\sum_u \xi_u = \Xi$).

To calculate before-fee return r_t^* we use an alternative scenario of flows, where $RM_u^* = RM_u + CMF_u$, and from here we get:

$$r_t^* = \prod_{u=1}^{L} \left(1 + r_u + \xi_u \frac{ARMF_t}{365}\right) - 1 = \prod_{u=1}^{L} \left(\frac{QT_u}{QT_{u-1}} + \xi_u \frac{ARMF_t}{365}\right) - 1 \,, \tag{4}$$

where we take actual rates of management fee $ARMF_t$ disclosed in semi-annual and annual financial statement for the semester containing given month t as rate of management fee (RMF_t). In our opinion, ARMF is the best of real commonly available values that describe the costs of management. We also believe that the use of daily values for fast-changing valuation processes and semi-annual values (from statements) for low-changing cost processes in one formula is the optimal way to analyze fund performance, and at the same time the only possi-

[19] We calculate returns at the end of the given month.
[20] Net flows mean any flow associated with a change in the number of shares, such as gross sales, redemptions and conversions.
[21] Result of management is any flow associated with a change in the value of share (price), so that mean the result from the investment portfolio as well as unlimited and limited costs (include charged management fee).

ble description of the process using all available data. This is an equation for any open-end investment fund i from our sample: if $u \to (i,u)$ then $t \to (i,t)$.

To estimate before-fee risk-adjusted performance we apply two independent approaches. The first one is a well-known four-factor model proposed by Carhart (1997) as an extension of three-factor model of Fama and French (1993). As we use data of Polish stocks, only two peer groups (segments) can be taken into account: Polish equity and Polish mixed, and only investment funds that are active for at least three years over the examined period are considered. The model is given by:

$$r_{i,t}^{\#} = \alpha_i^{Carh} + \beta_i^M r_t^M + \beta_i^S SMB_t + \beta_i^H HML_t + \beta_i^W WML_t + \varepsilon_{i,t}\,, \qquad (5)$$

where $r_{i,t}^{\#} = r_{i,t}^{*} - r_t^F$ denotes excess before-fee return and $r_t^M = r_t^{WIG} - r_t^F$ denotes excess market portfolio return, which are calculated with using the market portfolio return r_t^{WIG} and risk-free rate r_t^F. Using quotations of listed companies (GPW and NC) we calculate differential weighted returns from portfolios representing risk factors related to the size, value of companies and momentum effect. First, we divide companies into *small* (S) and *big* (B) using the median of market capitalization from the reference market (GPW only). These portfolios are divided to *high* (SH and BH, top 30%), *middle* (SM and BM, middle 40%) and *low* (SL and BL, bottom 30%) portfolios due to book-to-market ratio. SMB_t (*small minus big*) is the difference between arithmetic mean of weighted returns from small and big portfolios, while HML_t (*high minus low*) is similar difference build on high and low portfolios (in this case we do not use return from middle portfolios). To calculate momentum WML_t first we calculate the returns for the previous 11 months to defined the ranking of *winners* (W, top 30%) and *losers* (L, bottom 30%) and then we take the difference. All portfolios are capitalization-weighted and rebalanced in every half year. Table 2 presents statistics for excess risk factors used in equation (5).

As a result of the regressions we receive estimation of before-fee risk-adjusted performance α_i^{Carh} known as Carhart's alpha. Some of the funds from the underlying sample are rejected due to the insufficient number of observations during the period considered (restriction min. 36 observation). Both all investment funds as well as asset-weighted fund portfolios are examined. We receive an average Carhart's alpha for 78 Polish equity funds +0,47% and +0,31% for asset-weighted portfolio. It is worth noting that in case of division into smaller groups we observe three times higher ratios for funds of small and medium-sized companies than for universal equity funds (groups of sector and others Polish equity funds are unrepresentative). The portfolio of 61 Polish mixed funds show an identical alpha value as equity funds portfolio, but in the case of the average we get +0,25% and this is twice lower value than for Polish equity funds. Based on the indicators for equity universal, mixed balanced and stable growth groups of funds we can say, that when the equity share in the investment portfolio falls, then both the impact from stock market (measured by β^M) as well as the quality of the fit of the model also falls, what seems to be intuitive. Coefficient of determination (R^2) for equity portfolios (especially universal) are very high just like in Otten and Bams (2002). In case of average calculated for all coefficients of determination from a given segment (or group) we receive significantly higher R^2 values than in the cross-market study of frontier markets conducted by Blackburn and Cakici (2017). This allows us to hypothesize that the impact of local factors is very important and should be taken into account as widely as possible when designing risk factors. In the case of mixed funds portfolios we have low statistical significance for additional risk indicators. Additional data can be found in Tables 3 and 4.

In the second approach we describe excess before-fee return by the characteristics of investment funds, which, regardless of fund manager, can influence the returns. One of them are relative cash flows $CF_{i,t} = NF_{i,t}/NAV_{i,t-1}$, value of which depends only on the decision of the fund's participants and it can be assumed that it is often associated with the emotions re-

sulting from the current situation on the capital market. To calculate cash flows the recursive equation (1) of the operating model of the fund is used.

Let's assume a uniform daily distribution of net flows for a given month, i.e. $NF_u = NF_t/L$ for each $u \in t$. Now, from a general solution for equation (1) we obtain:

$$\frac{NF_t}{L} = \frac{NAV_t - NAV_{t-i}\prod_{u=1}^{L}(1+r_u)}{\left[\sum_{u=1}^{L-1}\prod_{j=u+1}^{L}(1+r_u)\right]+1}, \tag{6}$$

It is easy to see that $\prod_{u=1}^{L}(1+r_u) = (1+r_t)$ and $1+r_u = QT_u/QT_{u-1}$, so we can write the cash flows formula as:

$$CF_{i,t} = \frac{L}{QT_L\sum_{u=1}^{L_t}QT_k^{-1}}\frac{NAV_{i,t} - NAV_{i,t-i}(1+r_{i,t})}{NAV_{i,t-i}}. \tag{7}$$

In the limit of very small valuation changes ($r_{i,u} \approx 0$) we receive an equation commonly used in literature:

$$CF_{i,t}^{\lim} = \frac{NAV_{i,t} - NAV_{i,t-i}(1+r_{i,t})}{NAV_{i,t-i}}, \tag{8}$$

where $CF_{i,t}^{\lim} = \lim_{r_{i,u}\to 0,\ u\in t} CF_{i,t}$. Thus equation (7) is a generalization of equation (8) by taking into account the volatility of fund quotes within a month. Thanks to this we include the influence of sudden changes in a fund valuation during a month on a NAV change as a result of relatively slow-changing net flows. In other words, the generalization of equation (8) allows us to assess the dynamics of fluctuations in cash flows in relation to the examined period and changes in a fund valuation in this period. The value of the introduced correction varies from 0,634 to 1,180, and its arithmetic mean is 0.998. However, in 90,8% of cases, the coefficient is in the range of 0,975 to 1,025.

The next independent factor is logarithm of NAV. It was included in this way, because the smaller fund may be more agile in implementing investment decisions and the pace of loss of ability is inversely proportional to NAV. On the other hand, increase of the age of investment fund should have a positive impact on its performance when the effects of a long-term investment strategy are manifested. In addition, the first phase of the fund's operation is the

process of building the investment portfolio and this is a reason for using the logarithmic pace of change. The influence of fund characteristics on before-fee risk-adjusted performance is described by:

$$r_{i,t}^{*} = \alpha_i^{char} + \beta^{C} CF_{i,t} + \beta^{N} \ln NAV_{i,t-i} + \beta^{A} \ln AGE_{i,t-i} + \nu_{i,t} \,, \qquad (9)$$

where $AGE_{i,t}$ is age of the given investment fund counted in months and $\nu_{i,t}$ is an total random error consisting of random $\varepsilon_{i,t}$ and individual components u_i. We use the ordinary least squares method (OLS) and then, as suggested by Kufel (2013) and Osińska *et al.* (2007), on the basis of Wald and Breusch-Pagan test we adjudge on the validity of the introduction of individual effects: fixed (FE) or random (RE). A better variant is indicated using the Hausman test. The results are presented in Tables 5 and 6. The tests most often indicate a model with fixed individual effect, but we obtain very low values of determination factor in all cases. Consequently, we abandon α_i^{char} as a measure of performance by taking as an alternative to α_i^{Carh} the usual before-fee rate of return $r_{i,t}^{*}$, while the funds' characteristics from above equation were used directly in the analysis of the management fees. This approach allows us to explore the performance-fee relationship in all segments, not just for the Polish equity and Polish mixed investment funds. The rationale, however, is that the use of the strategies of the four-factor model (SMB or WML) is an investment objective of some groups of funds and should then be included in the management price.

III. Fund management fees and their determinants

The fees charged by investment funds can be divided into handling (*loads*) and operating costs. Loads are one-off fees charged in the event of certain circumstances associated with an investment in a fund. The most popular in Poland is the upfront fee called the *purchase fee* or the *distribution fee* (as it is often associated with distributor costs). This fee is charged at the entry to the fund and its amount is determined in relation to the value of the investment. Other

types of loads are redemption fees or fees for conversion of units between investment funds. The amount of those fees usually drops to 0% after a certain period of time from the acquisition or conversion of units, as they are intended to limit the over-activity of participants expecting a quick profit, for example through a speculative investment style. The loads are not included in our analysis of relationship between management fees and performance because they are individual and therefore are not included in the general cost indicators.

The primary source of IFC revenue is the management fee that is the subject of this study. This is the fixed fee charged on each valuation day and success fee which is calculated according to the chosen algorithm, e.g. in relation to the benchmark (included fixed level) or according to the high-water mark (HWM) principle. Fixed fees for management in Polish investment funds appear to be higher than similar rates in developed Western European countries. This, however, is linked to the structure of the fund's operating costs (e.g. for custodian or transfer agent), which are usually covered by the IFC rather than by the investment funds (as we can observed in developed countries). This situation is slowly changing[22] and this process can significantly accelerate due to the regulations proposed by the KNF to significantly reduce the maximum fixed management fee (up to 2%).

The main goal of the study is to find relation between the level of the management fees of Polish open-end investment funds and the before-fee performance (measured by Carhart alpha α_i^{Carh} and before-fee return $r_{i,t}^*$). To investigate this relationship we modify approach proposed by Gil-Bazo and Ruiz-Verdú (2009). We assume that the level of management fee is a dependent variable whereas the fund performance is an independent variable:

$$ARMF_{i,t} = \delta_t + \delta^P PER_{i,t} + \nu_{i,t}\,, \tag{10}$$

[22] See in: https://investors.pl/informacje-i-dokumenty/ogloszenia/limitowane-koszty-pokrywane-z-aktywow-subfunduszy-nj0HIu [Access in 20 Apr 2017], https://investors.pl/informacje-i-dokumenty/ogloszenia/zmiany-w-statutach-investor-parasol-fio-oraz-investor-parasol-sfio-syMXtJ [Access in 20 Apr 2017].

where $PER_{i,t}$is measure of performance (α_i^{Carh}or $r_{i,t}^*$). The optimal model is chosen according to the procedure described above. Since the OLS model appears not to be optimal in any case, in Table 7 we present the results of the estimation only of the value of the Hausman test, based on which we choose between the individual fixed or random effects (FE and RE). The superiority among these choices (FE vs RE) could only arise from the choice of significance level. In almost all cases, we obtain a weak positive correlation between the level of fees and the performance. However, for equity and mixed foreign funds we do not obtain statistical significance. This effect is so negligible that even with a high monthly before-fee returns (e.g. 2-3%) its impact on the level of management fee is not noticeable, of the order of several basis points. These constant, however, oscillate around the average rates of management fee for particular groups (compare Tables 1 and 7). This is a prerequisite for extending the study on management fees and their relation to other fund characteristics as we do further.

Then we examine the relationship (10) in a broader context. Similar to Otten and Bams (2002) or Balbos *et al.* (2009) we use wide range of fund characteristics in the method:

$$ARMF_{i,t} = \delta_t^* + \delta^E PER_{i,t} + \delta^C CF_{i,t} + \delta^N \ln NAV_{i,t-i} + \delta^A \ln AGE_{i,t-i} + \delta^T OAUM_{i,t} + \delta^B BANK_{i,t} + \nu_{i,t}\,, \tag{11}$$

where $OAUM_{i,t}$ is a total "open" asset under management[23] of a IFC managing the fund i in a given month t given in PLN bn and $BANK_{i,t}$ is a binary variable indicating an IFC which belongs to banking capital group with a closed architecture of the distribution. Also in this case we carry out procedure for assessing validity of introduction the individual effect. The results again show that there is no significant correlation between the level of management fees and the fund performance. Almost every time CF and the binary variable indicating banks with closed architecture appear among the rejected explanatory variables – the first one due to lack of statistical significance and the latter due to strict collinearity (it does not happen

[23] "Open" because we take into account only the assets of open-end investment funds.

only in case of Polish mixed funds and Polish money market funds where $BANK_{i,t}$ adds to rates of management fee nearly –40 bp and +18 bp respectively). We observe the strongest relationship of management fees with the size and the age of the funds.

IV. Conclusion

In this paper we examine the relationship between performance and rates of management fees of Polish open-end investment funds. Our findings show no significant relationship for these variables. Those results are contradictory with the model of the rational market described by Berk and Green (2004). However, we get evidence of the relationship between the amount of the fee charged and the size of the fund. This leads to the conclusion that the rates of management fees on the Polish investment funds market are raised by the largest players. It is possible, among others, due to the lack of widespread transaction platforms allowing open competition. At the same time high kickback values from a management fee for fund distributors make them uninterested in creating a truly competitive environment. Upcoming regulatory changes are expected to put an end to such practices. In particular, a distributor will have to justify their share of the revenue from a management fee through a demonstrable improvement in the quality of service, or directly charge a fee for investment advice. This may have a positive impact on investor awareness, who will start looking for cheaper solutions or products delivered without intermediaries. However, the key action to support this natural process, or even decide on its success, will probably be a mandatory limitation of the management fee (if it happens in the nearest future, according to the recommendation from KNF). This can also lead to a common practice of charging a performance fee, which in turn will lead to a real link between the performance and the management fees of Polish open-end investment funds.

Where can the investor find added value for an investment in open-end funds, in a connection with the fee, if not at the competitive rates? The answer to this question can be sought by analyzing the level of regulation of the investment fund industry which grows both: from the

inside due to the development of the local market of investment products and with the increase of experience of Polish legislator or financial supervisor, as well as from the outside in accordance with the regulations adopted at the EU level. In addition, a strong catalyst for tightening regulations was probably financial crisis of 2007–2008. As a result, fund management fees could be linked not only to the performance, but also to the level of risk at which the return on investment is derived.

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Appendix

Table 1: Summary statistics for sample

The table contains the characteristics of the test sample and subsamples. The first three columns show the number of funds, the number of observations and the NAV at the end of June 2016. In subsequent columns there are annualized average monthly rates of return across the research panel (before-fee and after-fee) and the appropriate average actual rate of management fees.

	# funds	# observations	NAV*	mean before-fee return**	mean fee***	mean after-fee return****
total Polish industry	**500**	**21 618**	**115,9**	**+6,11%**	**2,56%**	**+3,42%**
Polish equity	88	4 225	17,6	+8,48%	3,62%	+4,62%
foreign equity	98	4 107	6,6	+6,93%	3,38%	+3,37%
Polish mixed	75	3 454	17,0	+5,90%	2,90%	+2,87%
foreign mixed	39	1 565	2,0	+4,98%	2,37%	+2,52%
Polish fixed income	77	3 328	32,6	+5,77%	1,32%	+4,38%
foreign fixed income	27	985	4,3	+5,59%	1,63%	+3,88%
Polish money market	49	2 150	30,1	+3,94%	0,91%	+3,00%
absolute return	22	788	2,8	+6,86%	2,94%	+3,76%
commodity	10	378	0,69	-3,03%	3,21%	-6,09%
Polish capital protection	9	399	1,9	+3,33%	1,63%	+1,65%
foreign capital protection	5	239	0,22	+4,74%	1,71%	+2,97%

notes: *in PLN bn at the end of June 2016, **annualized arithmetic mean across the panel (using all observations) of monthly before-fee returns, ***arithmetic mean across the panel (using all observations) of actual rates of management fee from financial statements, ****annualized arithmetic mean across the panel (using all observations) of monthly returns (after fee)

Table 2: Summary statistics for risk factors

The table contains factors based on the monthly rate of return of listed companies (GPW and NewConnect) over the period from Jan 2012 to Jun 2016 and its correlations. As risk-free rate we assume WIBID 1M. The market factor is calculated based on WIG quotations. Pervasive risk factors SMB and HML are difference between excess returns from respectively: portfolios of small vs big company due to size measured by median of capitalization (GPW only) and portfolios of high (top 30%) vs low (bottom 30%) book-to-market value.WML represents the momentum effect and is calculated on the basis of the company ranking according to the rate of return for the last 11 months with one month delay. Portfolios are weighted by capitalization and rebalanced in every 6 months.

factor	mean excess return	standard deviation	cross correlations			
			market	SMB	HML	WML
market	+0,19%	4,02%	+1,0000	-0,4638	+0,5370	-0,1941
SMB	-0,37%	3,45%	+0,0471	+1,0000	+0,0471	-0,3680
HML	+0,02%	3,59%	+0,5370	+0,0471	+1,0000	-0,6540
WML	+0,72%	6,70%	-0,1941	-0,3680	-0,6540	+1,0000

Table 3: Summary statistics for Carhart (1997) model – asset-weighted portfolios

The table contains an estimate of the parameters of the four-factor model for regression performed according to the equation (5):

$$r_{i,t}^{\#} = \alpha_i^{Carh} + \beta_i^M r_t^M + \beta_i^S SMB_t + \beta_i^H HML_t + \beta_i^W WML_t + \varepsilon_{i,t} ,$$

for asset-weighted portfolios on a given segment/group. In addition, the value of the coefficient of determination and the number of funds in a given portfolio can be found below.

	α^{Carh}	β^M	β^S	β^H	β^W	R^2	#funds
Polish equity	**0,31%*** **	**0,95*** **	**0,13*** **	**-0,08****	**-0,03***	**0,98**	**78**
universal	0,23%***	0,94***	0,09***	-0,06**	-0,03**	0,98	51
SME	0,90%***	1,02***	0,47***	-0,19**	-0,07	0,86	21
sector	0,84%***	0,83***	0,45***	-0,19**	-0,04	0,81	2
others	-0,53%**	1,28***	-0,43***	0,20*	0,02	0,93	4
Polish mixed	**0,31%*** **	**0,45*** **	**0,00**	**-0,06**	**-0,02**	**0,88**	**61**
balanced	0,27***	0,58***	0,01	-0,08**	-0,03*	0,94	14
stable growth	0,19%**	0,36***	-0,02	-0,06*	-0,02	0,87	29
asset allocation	0,09%	0,58***	0,07**	-0,05	-0,03	0,94	16
others	3,11%*	0,25	-0,16	0,03	-0,00	0,01	2

notes: *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level

Table 4: Summary statistics for Carhart (1997) model – arithmetic mean

The table contains arithmetic mean of the parameters estimated of the four-factor model for regression performed according to the equation (5):

$$r_{i,t}^{\#} = \alpha_i^{Carh} + \beta_i^M r_t^M + \beta_i^S SMB_t + \beta_i^H HML_t + \beta_i^W WML_t + \varepsilon_{i,t} ,$$

for investment funds from a given segment/group (with restriction of at least 36 observation). In addition, arithmetic mean of the value of the coefficient of determination and the number of funds in a given portfolio can be found below.

	α^{Carh}	β^M	β^S	β^H	β^W	R^2	#funds
Polish equity	**0,47%**	**0,93**	**0,24**	**-0,11**	**-0,04**	**0,86**	**78**
universal	0,31%	0,97	0,15	-0,09	-0,04	0,89	51
SME	0,89%	1,03	0,47	-0,17	-0,05	0,80	21
sector	0,92%	0,93	0,53	-0,21	-0,05	0,72	2
others	0,14%	-0,13	0,02	-0,06	-0,02	0,93	4
Polish mixed	**0,25**	**0,46**	**0,02**	**-0,05**	**-0,02**	**0,75**	**61**
balanced	0,28%	0,60	0,03	-0,08	-0,03	0,87	14
stable growth	0,24%	0,36	0,01	-0,06	-0,03	0,78	29
asset allocation	0,00%	0,57	0,07	-0,03	-0,02	0,67	16
others	2,03%	0,16	-0,08	0,01	0,00	0,07	2

Table 5: Summary for regression: performance to fund characteristics – model selection and elimination of non-significant variables

The table contains the p-values of Wald, Breusch-Pagan and Hausman statistical tests for the model described by equation (9) broken down into by segments of Polish investment fund industry (due to asset class). Based on the tests, we indicate the optimal model: ordinary least squares (OLS), with individual fixed effect (FE) or with individual random effect (RE). The last column contains non-statistically significant variables that have been eliminated through the step regression procedure. In the absence of statistically significant variables ("all"), regression is not considered.

	p-values of tests			optimal model	eliminated characteristics
	Wald	Breusch-Pagan	Hausman		
Polish equity	0,0000	0,0343	0,0000	FE	CF
foreign equity	0,4432	0,0159	0,0000	OLS	all
Polish mixed	0,0000	0,0000	0,0000	FE	CF
foreign mixed	0,2589	0,0820	0,0000	OLS	all
Polish fixed income	0,0002	0,6140	0,0000	FE	---
foreign fixed income	0,0284	0,1384	0,0000	FE	CF, $\ln AGE$
Polish money market	0,0000	0,0000	0,0000	FE	---
absolute return	0,0027	0,3793	0,0000	FE	CF, $\ln AGE$
commodity	0,5210	0,2473	0,0588	OLS	all
Polish capital protection	0,0143	0,2898	0,0202	FE	CF, $\ln NAV$
foreign capital protection	0,1640	0,9653	0,0921	OLS	CF, $\ln NAV$

Table 6: Summary for regression: performance to fund characteristics – values of estimated parameters

The table contains an estimate of the parameters for regression performed according to the equation (9):

$$r_{i,t}^{*} = \alpha_i^{char} + \beta^C CF_{i,t} + \beta^N \ln NAV_{i,t-i} + \beta^A \ln AGE_{i,t-i} + \nu_{i,t} \ .$$

The analysis results for segments with at least one statistically significant variable are reported.. In the case of a model with individual fixed effect (FE) the value of coefficient of determination for the corresponding LSDV estimator is given.

	α^{char}	β^C	β^N	β^A	R^2
Polish equity	+20,3%***	---	-0,0093***	-0,0066***	0,05
Polish mixed	+7,95%***	---	-0,0027***	-0,0056***	0,05
Polish fixed income	+3,07%***	0,0017***	-0,0012***	-0,0009	0,05
foreign fixed income	+7,07%***	---	-0,0037***	---	0,04
Polish money market	+1,92***	-0,0001**	-0,0006*	-0,0009***	0,16
absolute return	+8,71***	---	-0,0046***	---	0,06
Polish capital protection	+1,31***	---	---	-0,0029***	0,05
foreign capital protection	+1,30***	---	---	-0,0026	0,03

notes: * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

Table 7: Summary for regression: rate of management fee to performance

The table contains an estimate of the parameters for regression performed according to the equation (10):

$$ARMF_{i,t} = \delta_t + \delta^P PER_{i,t} + \nu_{i,t} .$$

The first part contains the results on the assumption that the measure of performance is Carhart's (1997) alpha. In the next lines, the data is given on the assumption that the measure of performance is before-fee return. In all cases, one of the models with an individual effect turned out to be optimal, so only the p-value of the Hausman test is given. Based on the test, we indicate the optimal model: with individual fixed effect (FE) or with individual random effect (RE). In the case of a model with individual fixed effect (FE) the last column contains coefficient of determination for the corresponding LSDV estimator.

$PER = \alpha^{Carh}$	p-values of Hausman tests	optimal model	δ	δ^P	R^2
Polish equity	0,0411	FE	3,64%***	0.0501***	0.67
Polish mixed	0,0760	**FE** / RE	2,96%***	0.0081***	0.91
$PER = r^*$	p-values of Hausman tests	optimal model	δ	δ^P	R^2
Polish equity	0,0127	FE	3,61%***	0,0150***	0.69
foreign equity	0,7617	RE	3,35%***	0,0024	---
Polish mixed	0,5676	RE	2,83%***	0,0071***	---
foreign mixed	0,0087	FE	2,36%***	0,0235	0.39
Polish fixed income	0,0794	**FE** / RE	1,31%***	0,0163***	0.86
foreign fixed income	0,0811	**FE** / RE	1,63%***	0,0081*	0.79
Polish money market	0,2536	RE	0,89%***	0,0157**	---
absolute return	0,0589	**FE** / RE	2,91%***	0,0031***	0.70
commodity	0,2818	RE	3,15%***	-0,0079***	---
Polish capital protection	0,1456	RE	1,69%***	-0,0007	---
foreign capital protection	0,4824	RE	1,68%***	0,0268*	---

notes: * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

Table 8: Summary for regression: rate of management fee to fund characteristics – model selection and elimination of non-significant variables

The table contains result for regression performed according to the equation (11). The first part contains the results on the assumption that the measure of performance is Carhart's (1997) alpha. In the next lines, the data is given on the assumption that the measure of performance is before-fee return. In all cases, one of the models with an individual effect turned out to be optimal, so only the p-value of the Hausman test is given. Based on the test, we indicate the optimal model: with individual fixed effect (FE) or with individual random effect (RE). In the case of a model with individual fixed effect (FE) the last column contains coefficient of determination for the corresponding LSDV estimator.

$PER = \alpha^{Carh}$	p-values of Hausman tests	optimal model	eliminated characteristics	R^2
Polish equity	0,0116	FE	$BANK*$, CF	0,67
Polish mixed	0,0050	FE	$OAUM$	0,91
$PER = r^*$	p-values of Hausman tests	optimal model	eliminated characteristics	R^2
Polish equity	0,0019	FE	$BANK^\star$, CF	0,70
foreign equity	0,6261	RE	$BANK$	---
Polish mixed	0,0009	FE	$OAUM$, CF	0,92
foreign mixed	0,0407	FE	$BANK^\star$, $OAUM$, r^*, CF	0,41
foreign mixed **	0,0000	FE	---	0,84
Polish fixed income	0,0685	FE	$BANK^\star$, $OAUM$, CF	0,86
foreign fixed income	0,0000	FE	$BANK^\star$, CF, $\ln NAV$	0,81
Polish money market	0,3961	RE	r^*, CF	---
absolute return	0,0008	FE	$BANK^\star$, $\ln AGE$, CF	0,72
commodity	0,0000	FE	$BANK^\star$, CF , $\ln AGE$, $OAUM$	0,82
Polish capital protection	0,0380	FE	$BANK^\star$, CF , $\ln AGE$, r^*	0,74
foreign capital protection	***	FE	$BANK^\star$, r^*, CF, $\ln NAV$	0,79

notes: * variable omitted due to strict collinearity, **excluding an outlier, *** it is not possible to test because of too few degrees of freedom

Table 9: Summary for regression: rate of management fee to fund characteristics – values of estimated parameters

The table contains an estimate of the parameters for regression performed according to the equation (11):

$$ARMF_{i,t} = \delta_t^* + \delta^E PER_{i,t} + \delta^C CF_{i,t} + \delta^N \ln NAV_{i,t-i} + \delta^A \ln AGE_{i,t-i} + \delta^T OAUM_{i,t} + \delta^B BANK_{i,t} + \nu_{i,t} .$$

The first part contains the results on the assumption that the measure of performance is Carhart's (1997) alpha. In the next lines, the data is given on the assumption that the measure of performance is before-fee return.

$PER = \alpha^{Carh}$	δ	δ^E	δ^C	δ^N	δ^A	δ^O	δ^B
Polish equity	2,05%***	0,0540***	---	0,0013***	-0,0015***	-0,0002**	---
Polish mixed	3,17%***	0,0075***	0,0001*	0,0004***	-0,0019***	---	-0,0039***
$PER = r^*$	δ	δ^E	δ^C	δ^N	δ^A	δ^O	δ^B
Polish equity	2,36%***	0,0149***	---	0,0010***	-0,0012	-0,0002**	---
foreign equity	2,12%***	0,0033**	0,0000**	0,0006***	0,0016***	-0,0005***	---
Polish mixed	3,19%***	0,0051***	---	0,0002*	-0,0012***	---	-0,0038***
foreign mixed	8,04%***	---	---	-0,0043	0,0038	---	---
foreign mixed*	0,16%	0,0096%***	0,0001***	0,0021***	-0,0010***	-0,0015***	---
Polish fixed income	0,47%***	0,0187***	---	0,0005***	-0,0004*	---	---
foreign fixed income	1,45%***	0,0079*	---	---	0,0016***	-0,0005***	---
Polish money market	0,97%***	---	---	-0,0001***	0,0003***	-0,0001***	0,0018**
absolute return	2,90%***	0,0375***	---	0,0007**	---	-0,0048***	---
commodity	1,91%***	-0,0076**	---	0,0008***	---	---	---
Polish capital protection	-0,05%	---	---	0,0013***	---	-0,0005***	---
foreign capital protection	2,44%***	---	---	---	0,0005**	-0,0006***	---

notes: * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level, * excluding an outlier