Financial
Internet Quarterly

MUTUAL FUNDS' COST PERSISTENCE

Artur A. Trzebiński[1]

Abstract

The research aimed to check whether investment fund managers maintain costs similarly from period to period. The research verified the hypothesis that managers maintain costs in the subsequent periods at a similar level. The study used a method based on contingency tables which are used to analyse the persistence of performance. In this study, we replaced performance with costs, assuming that managers also control these values. Costs were defined as: (1) total costs, (2) total costs minus management fees and (3) active management costs (expressed as the active expense ratio). Based on the results obtained, it should be stated that managers maintain costs at a similar level from period to period in the case of the split using the median. On the other hand, the results indicate that the costs were not maintained at a similar level in subsequent periods when broken down into quartiles. Considering the detailed results for funds divided into quartiles, it is clearly visible that most managers keep the costs close to the average value. Less frequently, costs from period to period are changed to be allocated to the extreme quartiles.

Cite this:
Trzebiński A. A. (2022) Mutual funds' cost persistence. Financial Internet Quarterly 18 (2), pp. 13-20.

[1] Wroclaw University of Economics and Business, Poland, e-mail: Artur.Trzebinski@ue.wroc.pl; ORCID: https://orcid.org/0000-0002-1448-454X.

Introduction

The most important attribute of mutual funds is performance. This measure shows the relation between the rate of return and risk. What is more, transaction costs and management fees in the performance can be found. It means that costs can have some relations with the mutual funds' final results. However, most mutual fund studies are devoted to performance, attributes of mutual funds and their impact on performance, and assessment of managers' skills.

It can be assumed that the major objective of mutual funds is to achieve high performance and to maintain it from period to period. There are two ways to do that. Firstly, managers can maintain performance by their micro- and macroforecasting skills. Secondly, managers can change the costs.

In this paper, we pay attention to mutual fund costs from the managers' perspective. We examine whether investment fund managers maintain costs similarly from period to period or if they change their level. Therefore, we adopt Brown and Goetzman's (1995) and Malkiel's (1995) framework in order to analyse cost persistence. The study is based on contingency tables, which are usually used to analyse the persistence of performance. We replace performance with costs, assuming that managers also control these values. The hypothesis that managers maintain costs in subsequent periods at a similar level is verified. The second objective of the study is to determine which kind of costs should be used to assess cost persistence. That is why costs are defined as: (1) total costs, (2) total costs minus management fees and (3) active management costs (expressed as the active expense ratio). Total costs are chosen because of their construction. They consist of administrative cost, custody and legal fees, distribution fees, management fees, etc. Total costs minus management fees are selected to determine whether non-management fees are maintained at the same level from period to period (management fees are fixed). Active management costs, defined as the active expense ratio, are selected to examine whether active management has an impact on cost persistence.

This study's most important finding is that most managers keep the costs close to the average value. There are two groups of mutual funds. One of them is a group which keeps extremely high costs from period to period. The second one maintains extremely low costs. Most mutual funds choose an average level of

The rest of the paper is organised as follows. Section 2 presents a literature review. Section 3 describes the data and methodology framework. The obtained results are presented in Section 4. Finally, Section 5 concludes the paper.

Literature review

A great number of empirical studies are connected with performance and persistence of performance (see Vidal-García et al., 2016; Miguel & Chen, 2021). Chen et al. (2010) and Ferreira et al. (2012) discovered a positive mutual fund performance persistence. Whether persistence of performance exists or not, the most important thing is the kind of measure which was used. The most frequent group of methodologies covers the use of contingency tables (Elyasiani & Jia, 2011, Matallín-Sáez et al., 2016; Deb, 2019; Galloppo, 2021). Not so frequently used are cross-sectional regressions (Hermann & Scholz, 2013, Galloppo, 2021). The major disadvantage of this method is embracing some factors such as age, turnover and fee in the same equation.

Fewer studies are related to relation between performance and fees (Gil-Bazo & Ruiz-Verdú, 2009; Díaz-Mendoza, López-Espinosa & Martínez, 2014; Corzo Santamaría, Martinez de Ibarreta & Rodriguez Calvo, 2018; Fraś, 2018; Cooper, Halling & Yang, 2021; Sheng, Simutin & Zhang, 2021). The studies on the relation between performance and fees revealed a negative relation between the expense ratio and the future performance. However, attention is paid to managerial skills and fund characteristics. A slightly different approach was presented by Cooper et al. (2021). They used cross-sectional regressions and a wide range of mutual fund characteristics to consider and emphasise the investor's perspective. In the end, they supported the well-established negative relation between performance and fees.

In the literature there is a lack of studies on cost persistence. Taking the results of the literature review into consideration, it should be stated that this research is an attempt to provide some information about persistent cost into mutual funds analysis.

Data and methodology

We analyse the cost persistence of 36 Polish universal equity mutual funds for 2017–2020. We use semimanual data which covers the frequency of published financial statements by Polish mutual funds.

Table 1: Descriptive statistics of the research sample (total costs only)

Year	Mean (%)	Median (%)	Standard deviation	Skewness	Kurtosis
1H 2017	3.69	3.83	0.014	-0.085	-2.007
2H 2017	3.73	4.01	0.014	-0.864	-1.616
1H 2018	3.69	3.82	0.021	2.725	10.575
2H 2018	3.74	4.08	0.015	-0.035	-0.053
1H 2019	3.53	3.58	0.017	1.337	2.570
2H 2019	3.50	3.58	0.015	1.302	4.125
1H 2020	3.23	3.15	0.017	1.826	3.312
2H 2020	3.31	3.14	0.019	2.824	9.329
2017–2020	3.55	3.59	0.017	1.584	5.144

Source: Own calculation.

In general, the costs are defined as total costs and total costs minus management fees (see equation 1). We also use active management costs, expressed as the active expense ratio, which is a measure of the cost of active fund management. Active management costs expressed as the active expense ratio are calculated according to the formula:

$$C_A = C_i + R(C_i - C_B) / \sqrt{1 - R^2} \qquad (1)$$

Where C_A = the active expensive ratio, C_i = the expense ratio for the mutual fund, R and R^2 = correlation coefficient between a fund and a benchmark, C_B = the expense ratio for the passive management fund.

There is no strong correlation between different kinds of costs. The Spearman's correlation coefficient between total costs and total cost minus management fees equals 0,37. The relation between total costs and active expense ratio – 0,40. The relation between total costs minus management fees – 0,12.

Following Brown and Goetzmann (1995) we use a nonparametric methodology based on contingency tables (see equation 2). The basis of a contingency table is a division of mutual funds into winners and losers. If a mutual fund's costs are under or equal to a definite level in the current year the mutual fund is identified as a winner. If not, the mutual fund is called a loser. The same parameter is used to identify a mutual fund as a winner or loser in the next period. Funds with the lowest costs in two consecutive years are described as winner-winner (WW). Funds with the highest costs are called loser-loser (LL). In the case where a mutual fund is a winner (or a loser) in period t-1 and a loser (or a winner) in period t, it is described as winner-loser (WL) (loser-winner; LW).

The next step is to calculate the cross-product ratio. CPR compares the odds ratio of the number of re-peat mutual funds to the number of those that do not repeat:

$$CPR = WWxLL / WLxLW \qquad (2)$$

The null hypothesis is that CPR is equal to 1. It means the cost in period t-1 is unrelated to the cost in period t. CPR above 1 correspondent to a rejection of the null hypothesis in favour of the alternative hypothesis – the cost in period t-1 is related to cost in period t.

Additionally, we use Malkiel's (1995) Z-test for re-peat winners (ZM-test equation 3). We extend this test to repeat losers. We check whether managers keep the costs low (winners) as well. We examine whether they keep the costs at a high level (losers). Therefore, the ZM-test was calculated as follows:

$$Z_M = Y - np / \sqrt{np(1-p)} \qquad (3)$$

Where Y = the number of persistently winning (losing) funds, n = the number of winner–winner and winner–loser (loser–loser and loser–winner), P = the probability that the winning (losing) fund continues to be such in the next period.

The robustness of CPR is checked by using two tests. The first one, Z-test:

$$Z = \ln CPR / \sqrt{(1/WW + 1/WL + 1/LW + 1/LL)} \qquad (4)$$

The second one, X^2 statistic:

$$X^2 = \frac{(WW - N/4)^2 + (WL - N4)^2 + (LW - N/4)^2 + (LL - N/4)^2}{\frac{N}{4}} \qquad (5)$$

where $N = WW + WL + LW + LL$

For Z-test, X^2 and ZM-test the null hypothesis sounds the same – there is no keeping the costs at the same level in two following periods.

Additionally, we use descriptive statistics (skewness, kurtosis, the quartile coefficient of dispersion and the coefficient of variation) to check the structure of the data and find possible explanations of the obtained results from the previous analyses.

Cost performance

CPR

Following Brown and Goetzmann (1995) we use a nonparametric methodology based on contingency tables (see equation 3). The results of using this method do not give an ambiguous outcome. It can be stated that the cost persistence can be observed for all kind of costs divided by median (Table 2). It means that managers have been keeping costs at the same level from period to period. The differences in the number of winner-winner and loser-loser are similar for total costs and active expense ratio. The bigger difference between numbers of winner–winner and loser–loser is for total cost minus management fees. It is very important to note that the number of winner-winner is higher than the number of loser-loser are similar for total costs and active expense ratio. The bigger difference between numbers of winner–winner and loser–loser is for total cost minus management fees. It is very important to note that the number of winner-winner is higher than the number of loser-loser. In this case, it means that there are more funds with low costs than those with high costs. Moreover, managers of mutual funds rarely decide to rapidly change the amount of costs. This is evidenced by the small number of cases of winner–loser and loser–winner.

It should be stated that the outcomes are predictable. In this case, there are only two possible solutions. Managers of mutual funds can reduce or increase costs and maintain it around the average of the competing funds.

Table 2: Tests of persistence of costs divided by median

Total costs							
Year	WW	LL	WL	LW	CPR	Z	Chi^2
2H 2017	14	13	3	3	20.22***	3.33	13.35
1H 2018	15	14	3	2	35.00***	3.61	17.00
2H 2018	16	15	2	2	60.00***	3.85	20.82
1H 2019	14	13	4	4	11.38***	3.02	10.30
2H 2019	16	15	2	2	60.00***	3.85	20.82
1H 2020	15	14	3	3	23.33***	3.51	15.10
2H 2020	16	14	3	2	37.33***	3.68	17.88
Total costs - management fee							
Year	WW	LL	WL	LW	CPR	Z	Chi^2
2H 2017	14	12	5	4	8.40***	2.74	8.24
1H 2018	13	11	5	6	4.77**	2.14	4.80
2H 2018	15	14	3	3	23.33***	3.51	15.10
1H 2019	16	12	5	2	19.20***	3.21	12.89
2H 2019	16	12	2	5	19.20***	3.21	12.89
1H 2020	17	13	4	1	55.25***	3.41	18.32
2H 2020	15	11	3	6	9.17***	2.73	8.41
The cost defined as the active expense ratio							
Year	WW	LL	WL	LW	CPR	Z	Chi^2
2H 2017	15	14	2	2	52.50***	3.71	18.93
1H 2018	14	13	4	3	15.17***	3.18	11.81

Year	WW	L	WL	LW	CPR	Z	Chi²
1H 2018	14	13	4	3	15.17***	3.18	11.81
2H 2018	16	15	2	2	60.00***	3.85	20.82
1H 2019	16	15	2	2	60.00***	3.85	20.82
2H 2019	16	15	2	2	60.00***	3.85	20.82
1H 2020	15	14	3	3	23.33***	3.51	15.10
2H 2020	16	15	2	2	60.00***	3.85	20.82

*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Source: Own calculation.

In the second test the set of data divided by quartiles is used (Table 3). In this case, most outcomes could not be calculated because there are empty groups of winner–loser and loser–winner. It can be explained by how managers change the amount of the costs from the highest or the lowest into the middle level.

Considering the obtained results, only with three outcomes calculated is it not possible to assess whether cost persistence can be observed.

Table 3: Tests of persistence of costs divided by quartiles

Year	WW	L	WL	LW	CPR	Z	Chi²
Total costs							
2H 2017	6	4	2	1	12.00*	1.79	3.75
1H 2018	6	5	1	2	15.00**	1.98	4.67
2H 2018	6	6	2	0	N/a	N/a	7.88
1H 2019	5	7	1	2	17.50**	2.11	5.40
2H 2019	6	7	1	0	N/a	N/a	10.50
1H 2020	7	6	0	1	N/a	N/a	10.50
2H 2020	8	7	0	0	N/a	N/a	15.00

Year	WW	LL	WL	LW	CPR	Z	Chi²
Total costs - management fee							
2H 2017	8	9	0	0	N/a	N/a	17.00
1H 2018	4	5	3	0	N/a	N/a	4.29
2H 2018	7	8	1	0	N/a	N/a	12.44
1H 2019	6	5	0	1	N/a	N/a	8.57
2H 2019	8	6	0	0	N/a	N/a	14.00
1H 2020	8	7	0	0	N/a	N/a	15.00
2H 2020	7	7	0	0	N/a	N/a	14.00

Year	WW	LL	WL	LW	CPR	Z	Chi²
The cost defined as the active expense ratio							
2H 2017	7	5	0	0	N/a	N/a	12.00
1H 2018	6	5	0	0	N/a	N/a	11.00
2H 2018	7	7	0	0	N/a	N/a	14.00
1H 2019	7	7	0	0	N/a	N/a	14.00
2H 2019	5	6	1	0	N/a	N/a	8.57
1H 2020	5	6	0	1	N/a	N/a	8.57
2H 2020	7	7	0	0	N/a	N/a	14.00

*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Source: Own calculation.

Malkiel Z-Test

Using the extended Malkiel's Z-test (1995 see equation 3) for repeat winners and losers provides additional information (Table 4 and Table 5). Most outcomes are statistically significant. It means that managers of mutual funds keep the costs at the same level for a long time. The observations consider winners and losers, and don't depend on the method of division.

Table 4: Results of ZM-tests for the costs divided by median

	Total costs	Total costs - management fee	The cost / the active expense ratio	Total costs	Total costs - management fee	The cost / the active expense ratio
	Winners			Losers		
2H 2017	2.67***	2.06**	3.15***	2.50**	2.00**	3.00***
1H 2018	2.83***	1.89*	2.36**	3.00***	1.21	2.50**
2H 2018	3.30***	2.83***	3.30***	3.15***	2.67***	3.15***
1H 2019	2.36**	2.40**	3.30***	2.18**	2.67***	3.15***
2H 2019	3.30***	3.30***	3.30***	3.15***	1.70*	3.15***
1H 2020	2.83***	2.84***	2.83***	2.67***	3.21***	2.67***
2H 2020	2.98***	2.83***	3.30***	3.00***	1.21	3.15***

*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.
Source: Own calculation.

Table 5: Results of ZM-tests for the costs divided by quartiles

	Total costs	Total costs - management fee	The cost / the active expense ratio	Total costs	Total costs - management fee	The cost / the active expense ratio
	Winners			Losers		
2H 2017	3.27***	4.90**	4.58***	2.84**	5.20**	3.87***
1H 2018	3.71***	1.96**	4.24***	2.84***	3.87***	3.87***
2H 2018	3.27***	4.08***	4.58***	4.24***	4.90***	4.58***
1H 2019	3.30**	4.24**	4.58***	3.66**	3.30***	4.58***
2H 2019	3.71***	4.90***	3.30***	4.58***	4.24***	4.24***
1H 2020	4.58***	4.90***	3.87***	3.71***	4.58***	3.71***
2H 2020	4.90***	4.58***	4.58***	4.58***	4.58***	4.58***

*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.
Source: Own calculation.

Descriptive statistics

The lack of unambiguous outcome for cost persistence of the cost divided by quartiles and cost persistence for winners and losers can be explained by the shape of the distribution of the data.

For total costs skewness is found positive except for three subperiods. It this case it means that more funds have costs below the average. Kurtosis is also positively skewed except for three subperiods. This means that most of the observations are centred around the average.

Additionally, quartile coefficients of dispersion and coefficient of variation are also weak. All in all, a high level of concentration around the mean can have an impact on few winner-loser and loser-winner.

For total costs minus management fees skewness and kurtosis are very similar. Both are positive. Considering two measures of variability, it can be stated that in this case it is much bigger than for total costs.

Last but not least, for active expense ratio, the obtained results are different than for total costs and total costs minus management fees. Skewness is found positive, but kurtosis is found negatively skewed. The quartile coefficient of dispersion and the coefficient of variation are strong.

Table 6: Descriptive statistics for total costs, total costs – management fees and active expense ratio

Total costs				
Year	**Skewness**	**Kurtosis**	**Quartile coefficient of dispersion (%)**	**Coefficient of variation (%)**
1H 2017	-0.085	-2.007	16	36
2H 2017	-0.864	-1.616	13	35
1H 2018	2.725	10.575	16	56
2H 2018	-0.035	-0.053	14	36
1H 2019	1.337	2.570	13	48
2H 2019	1.302	4.125	12	43
1H 2020	1.826	3.312	14	54
2H 2020	2.824	9.329	17	62
Total costs - management fees				
Year	**Skewness**	**Kurtosis**	**Quartile coefficient of dispersion (%)**	**Coefficient of variation (%)**
1H 2017	2.952	7.712	74	234
2H 2017	2.708	4.890	68	279
1H 2018	2.806	5.593	58	216
2H 2018	2.373	2.205	60	232
1H 2019	2.443	2.599	62	261
2H 2019	2.579	3.624	82	247
1H 2020	3.911	14.845	70	363
2H 2020	4.072	16.186	80	358
Active expense ratio				
Year	**Skewness**	**Kurtosis**	**Quartile coefficient of dispersion**	**Coefficient of variation (%)**
1H 2017	0.636	-3.259	64	81
2H 2017	1.013	-1.108	55	78
1H 2018	0.647	-3.010	63	80
2H 2018	0.462	-3.653	59	76
1H 2019	0.661	-3.059	57	77
2H 2019	0.514	-2.908	50	63
1H 2020	0.453	-3.744	57	68
2H 2020	0.630	-3.366	47	72

Source: Own calculation.

CONCLUSIONS

The main goal of the study is to examine whether investment fund managers maintained costs similarly from period to period or they changed their level. The results obtained for mutual funds divided by the median revealed cost persistence. On the other hand, the result for mutual funds split into four groups (by quartiles) do not support cost persistence. There were not enough winner-loser and loser-winner to calculate CPR. That is why another test was used in this study – Malkiel's Z-test which indirectly confirmed that cost persistence existed. According to this test, the number of winners and losers is steady from period to period.

The second objective of the study was to determine which kind of costs should be used to assess cost persistence. According to the outcome it can be stated that it is not possible to indicate which kind of cost is the best. Similar results were obtained for variously defined costs. From the investor's perspective can be pointed out that the total costs should be used in assessing cost persistence because it covers all costs and fees.

Another conclusion drawn is that managers of mutual funds keep total costs at the same level and so they are not likely to change over longer periods. Knowing that the costs are steady, investors can pay attention to the performance of the mutual funds.

References

Brown, S.J. & Goetzmann, W.N. (1995). Performance Persistence. The Journal of Finance, 50(2), 679-698.

Chen, Y., Ferson & W., Peters, H. (2010). Measuring the Timing Ability and Performance of Bond Mutual Funds. Journal of Financial Economics, 98(1), 72–89.

Christensen, R. (1990). Log-Linear Models. New York: Springer.

Cooper, M.J., Halling, M. & Yang, W. (2021). The Persistence of Fee Dispersion Among Mutual Funds. Review of Finance, 25, 365-402.

Corzo Santamaría, T., Martinez de Ibarreta, C. & Rodriguez Calvo, J. (2018). Timid Performance Fees in Mutual Funds. Journal Asset Management, 19, 64–77. https, //doi.org/10.1057/s41260-017-0061-8.

Deb, S.G. (2019). Persistence in Performance of Actively Managed Equity Mutual Funds: New Indian Evidence. IIMB Management Review, 31(2), 145-156.

Díaz-Mendoza, A.C., López-Espinosa, G. & Martínez, M.A. (2014). The Efficiency of Performance-Based Fee Funds. European Financial Management, 20, 825-855.

Elyasiani, E. & Jia, J. (2011). Performance Persistence of Closed-end Funds. Review of Quantitative Finance and Accounting, 37(3), 381–408.

Ferreira, M.A., Keswani, A., Miguel, A.F. & Ramos, S.B. (2012). The Flow Performance Relationship Around the World. Journal of Banking & Finance, 36(6), 1759–1780.

Fraś, A. (2018). Are the Highest Mutual Fund Fees Justified by Their Performance? Management Issues, 2(74), 62-73.

Galloppo, G. (2021). Asset Allocation Strategies for Mutual Funds. Evaluating Performance, Risk and Return. Palgrave MAcmillan.

Gil-Bazo, J. & Ruiz-Verdú, P. (2009). The Relation Between Price and Performance in the Mutual Fund Industry. The Journal of Finance, 64(5), 2153–2183.

Herrmann, U. & Scholz, H. (2013). Short-term Persistence in Hybrid Mutual Fund Performance: The Role of Style-shifting Abilities. Journal of Banking & Finance, 37(7), 2314–2328.

Malkiel, B.G. (1995). Returns From Investing in Equity Mutual Funds 1971 to 1991. The Journal of Finance, 50(2), 549-572.

Matallín-Sáez, J.C., Soler-Domínguez, A. & Tortosa-Ausina, E. (2016). On the Robustness of Persistence in Mutual Fund Performance. The North American Journal of Economics and Finance, 36, 192–231.

Miguel, A.F. & Chen, Y. (2021). Do Machines Beat Humans? Evidence From Mutual Fund Performance Persistence. International Review of Financial Analysis, 78.

Sheng, J., Simutin, M. & Zhang, T. (2021). Cheaper Is Not Better, On the 'Superior' Performance of High-Fee Mutual Funds. Rotman School of Management Working Paper, 2912511.

Vidal-García, J., Vidal, M. & Boubaker, S. (2016). The Short-term Persistence Of International Mutual Fund Performance. Economic Modelling, 52, 926-938.