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Alteen, C.; Wohlgemuth, V.

Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:

Alteen, C., & Wohlgemuth, V. (2016). Do actively managed funds perform better than index funds?: a test in the Canadian market. *European Journal of Management Issues*, 7, 163-169. <https://doi.org/10.15421/191616>

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The Bulletin of the Dnipropetrovsk university.
Series: Management of innovations

Issue 7, Volume 24 (2016)

DOI: 10.15421/191616

Received: 15 Sep 2016

Accepted: 25 Nov 2016

Published: 25 Dec 2016

УДК (UDC classification) 336

**Do actively managed
funds perform better
than index funds?
A test in the Canadian market**

C. Alteen[†]
V. Wohlgemuth[#]

Actuality of the study: Mutual funds are a favourite investment product among many investors. They provide a simple means of diversification, especially for those with smaller amounts of capital, and the popularity of mutual funds has increased with the success of the marketing efforts behind them.

Purpose: This study evaluates the performance of actively managed and index mutual funds within the Canadian equities market.

Findings: As index investing has increased in popularity, and other markets have become more connected and open, there is a need for research on equity mutual funds in countries outside the US.

Originality / Value: The majority of previous research on index funds and actively managed mutual funds is focused on the US market and related indexes such as the S&P 500.

Practical implications: This study suggests that, on average, active funds in Canada fail to beat their benchmarks net (but not gross) of the common fee or management expense ratio. Surprisingly, this research finds no positive relationship between higher fees and better gross performance. Actively managed funds also have poorer performance over the long term. This study finds that investors would be better off purchasing low cost index funds as they provide a more secure return.

Future research: This study endorses research on other markets with inclusion of additional variables in order to explain gross performance and secure returns.

Keywords: Funds; index funds; performance; equity; market index.

JEL Classification M10; N00; L2.

[†]Christopher Alteen, M.A.,
HTW University of Applied Sciences Berlin, Germany,
phone: +49 151 541 57377, e-mail: chrisalteen@gmail.com

[#]Veit Wohlgemuth, Dr. rer. pol., professor,
professor of international business,
HTW University of Applied Sciences Berlin, Germany,
phone: +49 30 5019 2548, e-mail: veit.wohlgemuth@htw-berlin.de

Чи є фонди активного керування ефективніші, ніж індексні? Дослідження канадського ринку

К. Алтеен, Ф. Вольгемут

Університет прикладних наук ХТВ, Берлін, Німеччина

Відкриті фонди – найбільш популярний інвестиційний продукт для багатьох інвесторів. Вони пропонують простий спосіб диверсифікації, особливо для тих, хто має невеликий капітал. Популярність відкритих фондів зростала завдяки успіху маркетингових інвестицій, пов'язаних із ними.

Ціль роботи – оцінити ефективність фондів активного управління та індексних відкритих фондів на канадській фондовій біржі.

Виявлено, що в той час як індексні інвестиції ставали більш популярними, а інші ринки ставали більш пов'язаними і відкритими, виникла необхідність в додаткових дослідженнях щодо відкритих фондів в країнах поза межами Сполучених Штатів.

Наукова новизна дослідження – попередні дослідження концентрувалися головним чином на індексних відкритих фондах та фондах активного управління на ринку США, а також пов'язаних із ними індексах, як-то S&P 500. Дане дослідження базувалося на показниках ефективності по загальній комісії або коефіцієнту управлінських витрат.

Практичне застосування – дослідження показало, що, в середньому, фонди активного управління в Канаді мають гірші нетто (але не брутто) показники ефективності по загальній комісії або коефіцієнту управлінських витрат. Водночас не виявлено позитивного відношення між вищою комісією і брутто показниками ефективності. Фонди активного управління також мають гірші показники ефективності в довгостроковій перспективі. Зроблено висновок, що інвесторам вигідніше інвестувати в недорогі індексні фонди, тому що вони забезпечують більш надійний дохід.

Напрямки майбутніх досліджень – це дослідження підтримує подальші дослідження на інших ринках із використанням додаткових перемінних з метою пояснити показники ефективності та надійність доходів.

Ключові слова: фонди; індексні фонди; ефективність; акціонерний капітал; ринковий індекс.

Являються ли фонды активного управления эффективнее индексных? Исследование канадского рынка

К. Алтеен, Ф. Вольгемут

Университет прикладных наук ХТВ, Берлин, Германия

Открытые фонды являются наиболее популярным инвестиционным продуктом для многих инвесторов. Они предлагают простой способ диверсификации, особенно для тех, кто имеет небольшой капитал. Популярность открытых фондов росла благодаря успеху маркетинговых инвестиций, связанных с ними.

Цель работы – оценить эффективность фондов активного управления и индексных открытых фондов на канадской фондовой бирже.

Выведено, что в то время как индексные инвестиции становились более популярными, а другие рынки становились более связанными и открытыми, возникала необходимость в дополнительных исследованиях на открытых фондах в странах отличных от Соединенных Штатов.

Научная новизна исследования – предыдущие исследования концентрировались главным образом на индексных открытых фондах и фондах активного управления на рынке США, а также связанных с ними индексам, как, например, S & P 500. Данное исследование базировалось на показателях эффективности по общей комиссии или коэффициенте управленческих расходов.

Практическое применение – исследование показало, что, в среднем, фонды активного управления в Канаде имеют худшие нетто (но не брутто) показатели эффективности по общей комиссии или коэффициенту управленческих расходов. В тоже время позитивное взаимоотношение между более высокой комиссией и брутто показателями эффективности не выявлено. Фонды активного управления также имеют худшие показатели эффективности в долгосрочной перспективе. Сделан вывод, что инвесторам выгоднее инвестировать в недорогие индексные фонды, так как они обеспечивают более надежный доход.

Направления для будущих исследований – данное исследование поддерживает дальнейшие исследования на других рынках с использованием дополнительных переменных с целью объяснить показатели эффективности и надежность доходом.

Ключевые слова: фонды; индексные фонды; эффективность; акционерный капитал; рыночный индекс.

Introduction

Mutual funds are a favorite investment product among many investors. They provide a simple means of diversification, especially for those with smaller amounts of capital, and the popularity of mutual funds has increased with the success of the marketing efforts behind them (Houge, & Wellman, 2006) [1]. Index funds also have the backing of many influential and well-known individuals within the investment community, such as Warren Buffet and John C. Bogle; but is there enough research to assume index funds are the superior choice in all countries?

The performance of actively managed mutual funds in the US market has been evaluated before by individuals such as Treynor, & Mazuy (1966) [2], Jensen (1968) [3], Malkiel (1995) [4], Bogle (2002) [5]. However, there are conflicting opinions on the performance of these funds, for example, Bogle (2002) [5] and Minor (2001) [6] debated the superiority of index funds over actively managed funds during different time periods. Furthermore, the majority of previous research on index funds and actively managed mutual funds is focused on the US market and related indexes such as the S&P 500. As index investing has increased in popularity, and other markets have become more connected and open, there is a need for research on equity mutual funds in countries outside the US. According to Sinha, & Jog (2005) [7] the Canadian mutual fund industry grew by more than ten times its size during the 1990s, and the increase in tax-deductible savings for retirement may grow this number ever further. Therefore, Canada is an appropriate research setting.

Research Question

Many individuals seek investment solutions through their banks and financial advisors, whom they rely on to provide sound investment advice, but who may often provide misleading or incorrect information as advisors promote mutual fund products with high expenses commonly associated with higher commissions paid to those advisors. This troubling conflict of interest introduces many important questions: Do actively managed funds beat their benchmark indexes gross or net of fees? Do the fees charged by actively managed funds result in superior performance? Are low cost active funds or low cost index funds the best option? By addressing these questions, this study seeks to provide the reader with information on the highest performing type of Canadian equity mutual funds, whether it be actively managed funds or index funds. This research evaluates the performance of actively managed mutual funds and index funds within the Canadian equities market by comparing the average measure of risk-adjusted return, gross return, and net return between key groups. Both five and ten-year periods are analyzed to determine consistencies and identify differences across both the medium and long term.

Method and Data

Data was obtained from Morningstar.ca, one of the most recognized and reliable databases in finance worldwide. Morningstar data has been used in a variety of other studies such as Bogle (2002) [5], Chevalier, & Ellison (1999) [8], Minor (2001) [6], Sirri, & Tufano (1998) [9], among many others. The period covered for the five-year analysis is 30 April 2011 to 30 April 2016 and for the ten-year analyses, 30 April 2006 to 30 April 2016. All MPT statistics were calculated by Morningstar and were obtained for this data set.

Funds were selected that had a history of at least five years of total return data and at least an 80 percent holding in Canadian equities. This process resulted in a sample of 181 Canadian equity mutual funds.

Next, the index fund sample was separated from the mutual funds sample, by selecting all funds that track or mirror the performance of the S&P/TSX Composite Index, This is the main

market index in Canada. This process resulted in a list of 37 index funds.

All remaining funds were classified as actively managed mutual funds as they do not claim to track any particular index. This resulted in a sample of 144 actively managed funds for the 5-year sample. The 10-year sample was smaller as not all funds had 10-year historical data available.

Low cost funds were filtered to only include those with a MER less than or equal to 1.49 percent, while high cost funds were filtered with an MER greater than or equal to 1.5 percent. A sensitivity analysis was included where high cost fund MERs were filtered to only include those greater than or equal to 2.5 percent. Low and high cost MER figure selections were based on Bogle (2002) [5] study.

Total return (net return) was calculated by Morningstar as follows: «Expressed in percentage terms, Morningstar's calculation of total return is determined by taking the change in price, reinvesting, if applicable, all income and capital gains distributions during the period, and dividing by the starting price» [10]. It is also important to note that Morningstar's calculation already accounts for the MER. Therefore, for the purposes of making gross return comparisons in this research, the MER was added back to the total return for each fund in order to arrive at a gross return figure.

MER is the fee charged to shareholders on an annual basis and is inclusive of administrative fees, 12b-1 fees, management fees, operating costs and any other asset-related costs that are incurred by the mutual fund [11]. This fee is expressed in a percentage form and is a vital component in this research in determining the gross return as well as comparing funds based on their respective costs.

Annualized standard deviation is calculated separately for two different uses. First, standard deviation is calculated for individual sample groups and displayed in the results to analyze the spread for each sample group's MER, gross and net return, and Sharpe Ratio. Secondly, it is calculated by Morningstar for individual mutual funds in order to calculate the Sharpe Ratio. Standard deviation is «the statistical measurement of dispersion about an average, which depicts how widely a stock or portfolio's returns varied over a certain period of time» (Bogle, 2002) [5; 12].

The Sharpe Ratio is one of the most commonly used ways of measuring not only risk-adjusted return but also the performance of mutual fund managers (Goetzmann et al., 2002) [13]. High raw returns may not be the result of good management decisions, but rather the idea that management may have taken extra risk in order to reach those returns. The higher the Sharpe Ratio, the better the risk adjusted performance and, therefore, the more attractive the portfolio or asset. Morningstar's calculated annualized Sharpe Ratios for mutual funds were utilized.

After retrieving the data for net return, MER and Sharpe Ratio, and calculating the gross return for each fund, averages of the different sample groups were calculated in order to make comparisons between the means of each grouping. If the data was parametric a T-Test was performed, if the data was non-parametric a Mann Whitney U Test was performed.

Results and Discussion

This study has contributed to previous research on the Canadian equities mutual fund industry along with Deaves (2004) [14], Sinha, & Jog (2005) [7]. It has also drawn some connections with research focused on the US market such as Jensen (1968) [3], Malkiel (1995) [4], Bogle (2002) [5]. Jensen (1968) [3] found that actively managed funds failed to outperform their benchmark indexes and Treynor, & Mazuy (1966) [2] claim that active fund managers have no ability to outguess the market. This research found that actively managed Canadian Equity mutual funds do, on average, beat the market gross of fees, but not net

of fees, providing some support for *Wermers (2000)* [15]. When observing these funds gross of fees, of the 144 large capitalization, blended Canadian equity funds, only 26 funds, or 18 percent, were unable to meet or exceed their benchmark over the five-year period. Over the ten-year analysis these actively managed funds performed less favourably, but on average were still able to beat their benchmarks gross but not net of fees. In terms of gross figures, 17 funds or 30 percent of the 56 funds analyzed failed to beat their benchmark return of 4.33 percent. These figures suggest the performance of actively managed funds worsens over longer periods, as we see a 12 percent increase in the number of funds unable to beat the benchmark gross of fees between the five- and ten-year periods.

The results of the benchmark analysis confirm that actively managed Canadian equity mutual funds beat their benchmark index, on average, gross but not net of fees. Given the foregoing, it is expected that index tracking assets would not provide a superior return to actively managed funds gross of fees. This was evident in the results of the five-year period. Table 1 shows that actively managed funds enjoy a superior gross return to index funds. Perhaps surprisingly, index funds on average also had a higher management expense ratio and a poorer risk-adjusted return. These results provide some support for *Minor (2001)* [6] argument that one simply cannot assume over a short time period that index funds provide superior performance. Furthermore, the ten-year results were similar to those of the five-year results, yielding higher gross returns for actively managed funds at 4.98 percent to index funds 4.42 percent. However, the performance of actively managed funds over the longer period suffered in comparison to index funds, as noted in the benchmark results. The most significant discovery in comparison between all index funds and actively managed funds was the high management expense ratios associated with Canadian equity index funds. Due to the nature of index funds, there is little reason to include a high

fee. They are, after-all, passively managed index-tracking assets that do not require the same amount of oversight and control as an actively managed fund. They are generally expected to be low cost. However, considering the unsophistication outlook of many mutual fund investors, and despite the fact that high fees are unnecessary to ensure performance, some of these high cost index funds have thrived (*Randall, 2014*) [16]. Index funds during the five- and ten-year periods in this research had higher fees on average than actively managed funds. These high fees caused net returns to suffer, providing superior returns for actively managed funds as outlined in Tables 1 and 2 in the results. Considering index fund gross returns are consistent with the index, there is a low standard deviation between funds. The return of index funds was impacted the most by the fee associated with them.

Therefore, it does not make financial sense to purchase high cost index funds as there are no benefits in doing so compared to that of purchasing a low cost index fund.

In fact, index funds that have charged higher fees in the US have only done so to provide commissions to the brokerages that sell them (*Randall, 2014*) [16]. Actively managed funds, on the other hand, may include a variety of reasons for purchase and the fee they charge, such as management expertise or focusing on different industries or sectors. A sensible investor would expect that with higher fees come higher returns. However, this study confirms just the opposite. The significant and negative impact of mutual fund expenses becomes clear when analyzing higher cost actively managed funds with low cost index funds. The results in Tables 1 and 2 show that index funds are a clear winner net of expenses during both the five and ten-year analyses. The net return earned by low cost index funds was 0.65 percent more during the five-year period and even greater at 1.55 percent more during the ten-year period. Index funds also had higher risk adjusted returns, with a more favourable Sharpe Ratio.

Table 1

Comparison of Performance (5 year)					
	Avg. Gross Return %	Avg. MER %	Avg. Net Return %	Avg. Sharpe Ratio	Sample Size
Actively Managed Funds	4.63 Std. Dev.: 2.15	2.03 Std. Dev.: 0.93	2.61 Std. Dev.: 2.54	0.23 Std. Dev.: 0.24	144 AMF
High Cost AMF: MER ≥ 1.5%	4.25 Std. Dev.: 2.25	2.61 Std. Dev.: 0.60	1.65 Std. Dev.: 2.43	0.14 Std. Dev.: 0.22	91 AMF
High Cost AMF: MER ≥ 2.5%	3.69 Std. Dev.: 2.55	3.06 Std. Dev.: 0.42	0.63 Std. Dev.: 2.60	0.05 Std. Dev.: 0.22	49 AMF
Low Cost AMF: MER ≤ 1.49%	5.29 Std. Dev.: 1.80	1.03 Std. Dev.: 0.40	4.26 Std. Dev.: 1.77	0.39 Std. Dev.: 0.19	53 LC AMF
S&P/TSX Comp. Idx.	3.05	-	3.05	0.27	1
Index Funds	3.01 Std. Dev.: 0.13	2.46 Std. Dev.: 0.95	0.56 Std. Dev.: 0.98	0.02 Std. Dev.: 0.10	37 IF
Low Cost IF: MER ≤ 1.49%	3.06 Std. Dev.: 0.06	0.76 Std. Dev.: 0.27	2.30 Std. Dev.: 0.28	0.19 Std. Dev.: 0.03	7 IF
Comparison AMF vs. IF	T-Test t Value: 8.892 p-value: .000	T-Test t Value: -2.503 p-value: .013	T-Test t Value: 7.719 p-value: .000	T-Test t Value: 8.329 p-value: .000	144 AMF 37 IF 181 Total
Comparison High Cost AMF: MER ≥ 1.5% vs. Low Cost IF: MER ≤ 1.49%	T-Test t Value: 5.041 p-value: .000	T-Test t Value: 15.245 p-value: .000	Mann Whitney U Score: 269.50 p-value: .499	T-Test t Value: -2.059 p-value: .043	91 AMF 7 IF 98 Total
Comparison A High Cost AMF: MER ≥ 2.5% vs. Low Cost IF: MER ≤ 1.49%	T-Test t Value: 1.731 p-value: .090	Mann Whitney U Score: 000.00 p-value: .000	Mann Whitney U Score: 86.50 p-value: .035	T-Test t Value: -4.303 p-value: .000	49 AMF 7 IF 56 Total
Comparison High Cost AMF: MER ≥ 1.5% vs. Low Cost AMF: MER ≤ 1.49%	Mann Whitney U Score: 1794.0 p-value: .011	T-Test t Value: 18.787 p-value: .000	T-Test t Value: -6.848 p-value: .000	T-Test t Value: -6.869 p-value: .000	91 HC AMF 53 LC AMF 144 Total

Table 2

Comparison of Performance (10 year)					
Ten Year Period Ended – 30 April 2016					
	Avg. Gross Return %	Avg. MER %	Avg. Net Return %	Avg. Sharpe Ratio	Sample Size
Actively Managed Funds	4.98 Std. Dev.: 1.39	1.95 Std. Dev.: 0.99	3.03 Std. Dev.: 1.87	0.18 Std. Dev.: 0.13	56 AMF
High Cost AMF: MER ≥ 1.5%	4.71 Std. Dev.: 1.40	2.62 Std. Dev.: 0.74	2.08 Std. Dev.: 1.59	0.11 Std. Dev.: 0.11	32 AMF
High Cost AMF: MER ≥ 2.5%	4.61 Std. Dev.: 1.64	3.21 Std. Dev.: 0.55	1.40 Std. Dev.: 1.77	0.06 Std. Dev.: 0.12	16 AMF
Low Cost AMF: MER ≤ 1.49%	5.35 Std. Dev.: 1.33	1.06 Std. Dev.: 0.41	4.29 Std. Dev.: 1.42	0.27 Std. Dev.: 0.11	24 LC AMF
S&P/TSX Comp. Idx.	4.33	-	4.33	0.27	1
Index Funds	4.42 Std. Dev.: 0.08	2.50 Std. Dev.: 1.03	1.91 Std. Dev.: 1.02	0.09 Std. Dev.: 0.07	30 IF
Low Cost IF: MER ≤ 1.49%	4.39 Std. Dev.: 0.06	0.76 Std. Dev.: 0.27	3.63 Std. Dev.: 0.27	0.22 Std. Dev.: 0.02	7 IF
Comparison AMF vs. IF	Mann Whitney U Score: 522.50 p-value: .004	T-Test t Value: -2.407 p-value: .018	T-Test t Value: 3.581 p-value: .001	T-Test t Value: 3.893 p-value: .000	56 AMF 30 IF 86 Total
Comparison High Cost AMF: MER ≥ 1.5% vs. Low Cost IF: MER ≤ 1.49%	T-Test t value: 1.290 p-value: .207	T-Test t Value: 11.221 p-value: .000	T-Test t Value: -5.167 p-value: .000	T-Test t Value: -5.168 p-value: .000	32 AMF 7 IF 39 Total
Comparison A High Cost AMF: MER ≥ 2.5% vs. Low Cost IF: MER ≤ 1.49%	T-Test t value: 1.434 p-value: .172	T-Test t value: 14.273 p-value: .000	T-Test t value: -4.908 p-value: .000	T-Test t value: -5.048 p-value: .000	16 AMF 7 IF 23 Total
Comparison High Cost AMF: MER ≥ 1.5% vs. Low Cost AMF: MER ≤ 1.49%	T-Test t value: -1.744 p-value: .087	T-Test t value: 10.129 p-value: .000	T-Test t value: -5.375 p-value: .000	T-Test t value: -5.514 p-value: .000	32 HC AMF 24 LC AMF 56 Total

Of course, as many past studies suggest, some high cost Canadian equity funds managed to beat the index funds' return, but in this study, only 41 percent of actively managed funds were able to achieve this result. During the sensitivity analysis, where even higher cost funds were put to the test, only 24 percent were able to beat the index funds' average return over a five-year period. These findings confirm there is little chance of a positive result for investors paying a higher fee; in fact, just the opposite, as higher fees resulted in worsened performance gross and net of fees. These findings are consistent with *Gil-Bazo, & Ruiz-Verdú (2009)* [17]. Still, some active funds performed better than their benchmark net of fees.

This raises the question of whether there is any possibility in selecting the highest performing funds in advance, perhaps based on past performance? Performance persistence among active funds has been researched by others including *Carhart (1997)* [18] who found, among other important discoveries, that funds with a history of higher returns in the past do not result in long term high performance, and even sophisticated investors (i.e. active managers) should pursue an active investment style carefully.

The chance of consistently identifying the correct high-performing fund is very low, similar to findings by *Cuthbertson et al. (2010)* [19]. As noted by *Bogle (2002)* [5], it is not possible to know which active fund will achieve the highest returns in advance. Although this study did not carry out this specific analysis on performance persistence, previous research has been consistent in regards to less-sophisticated investors, for which this research is aimed.

When speaking in terms of risk adjusted returns net of fees, if: firstly, the majority of actively managed funds do not beat the market index; secondly, there is no way to identify which actively managed funds will beat the market in advance; thirdly, index funds provide a return nearly equal to the market index; and, finally, index funds cost less than actively managed funds, then a reasonable investor could assume that pursuing a low cost index fund would likely provide a higher long term return than an actively managed fund. The results of this study's low cost index funds versus high cost actively managed funds analyses in Canadian equities supports index fund proponents such as *Jensen (1968)*, *Malkiel (1995)*, *Bogle (2002)* [3; 4; 5], among many others.

Table 3

Time Period:	Superior Net Return		Superior Sharpe Ratio		Overall Winner	
	5 year	10 year	5 year	10 year	5 year	10 year
AMF vs. BM	BM	BM	BM	BM	BM	BM
AMF vs. IF	AMF	AMF	AMF	AMF	AMF	AMF
HC AMF vs LC IF	LC IF	LC IF	LC IF	LC IF	LC IF	LC IF
HRC AMF vs LC IF	LC IF	LC IF	LC IF	LC IF	LC IF	LC IF
HC AMF vs. LC AMF	LC AMF	LC AMF	LC AMF	LC AMF	LC AMF	LC AMF

Since it has been determined that high cost actively managed funds did not outperform index funds net of fees, the final test in assessing active fund fees was to analyze the performance of low cost actively managed funds. The results show that low cost actively managed funds do indeed outperform high-cost actively managed funds over both the five-year and ten-year periods.

These low cost funds outperform in both gross return and net return as well as risk adjusted return. Low cost actively managed funds were top performers. The results are a clear indication that high fees do not result in a higher return. These results are comparable to research by *Barber et al. (2003)* [20] who found households with investments in higher cost mutual fund assets

did not result in new money in comparison to lower cost funds. Further comparisons to Gil-Bazo, & Ruiz-Verdú (2009) [17] are warranted; they found higher fees resulted in poorer performance. There are also consistencies with Bogle's (2002) [5] study, where he analyzed the low cost quartile of funds and found similar results with low cost funds outperforming in both return and Sharpe Ratio (Sharpe, 1994) [21].

A comparison of low cost index funds to low cost actively managed funds was unnecessary in the analyses underwriting these findings, as there are a variety of reasons to not choose a low cost actively managed fund over a low cost index fund. The standard deviation of gross returns for low cost funds is 1.80 percent, which is extremely high in comparison to index funds. Furthermore, as noted above, many studies have concurred that it is not possible to choose the best performing funds based on prior performance (Mamaysky, 2007) [22]; choosing a high-performing low cost active fund in the long term is improbable. Particularly applicable to less sophisticated investors is the fact that many of the low cost actively managed funds have high initial investment requirements or high contribution requirements that would not be financially possible for investors with lower amounts of capital. This study also found a decrease in the performance of both low and high cost active funds between the five- and ten-year periods including lower returns and Sharpe Ratios, implying poorer performance of both high and low cost actively managed funds over the long term.

Conclusion

This research has contributed to literature on Canadian equity mutual funds by concluding that:

1. Actively managed funds do not beat their indexes, on average, net of fees.
2. Actively managed funds performed worse, on average, over longer periods, than low cost index funds.
3. Higher fees on average do not result in better actively managed fund performance. In fact, it is just the opposite as low cost actively managed funds performed better net of fees than high cost actively managed funds.
4. Low cost index funds are the recommended choice among Canadian equity mutual fund investors as they provide a more secure long term return than active funds and have low capital and contribution requirements for investment.

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