

COMPARISON OF PERFORMANCE OF ACTIVE AND PASSIVE FUND INVESTMENT STRATEGIES

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Bachelor thesis

on behalf of Lapis Asset Management Ltd.

Management summary

Starting position

Lapis Asset Management Ltd. (LAM Ltd.), with registered offices in Lugano, has specialised in the management of assets for private and institutional clients. The Lapis Core Portfolio strategy is LAM Ltd.'s unique passive investment strategy.

Since passive investments were introduced, there have been arguments for and against a passive or an active strategy. In a specific comparison, LAM Ltd. intends to test actively managed funds and the relevant passive indices from the Lapis Portfolio's strategy's four investment categories to show how the passive indices fare against the actively managed funds.

Project objectives

One of the objects of this project work is to produce comparisons within the four investment categories of equities, bonds, real estate and commodities. The project objectives will have been achieved (cf. page 1), if

- Global indices have been presented and analysed for each investment category (equities, bonds, real estate and commodities)
- Several performance comparisons per investment category have been produced with an index and a selection of active funds across different time horizons (short, medium and long-term)
- Various meaningful financial ratios or variables have been calculated and analysed on the individual indices and funds, for each investment category
- A conclusion has been reached and described based on the results from each individual investment category

How the paper is made up

Section 1, at the start of the paper, provides an introduction to the subject matter of the bachelor thesis. Section 2 contains various definitions of terms together with theoretic explanations of the principles. Sections 3, 4, 5 and 6 then describe the individual comparisons for the investment categories of equities, real estate and commodities. Section 7 sets out the key conclusions and results from this paper.

Definitions and methodology

The active funds were specified using precisely defined criteria (see page 11-12). Reference is made to the software Bloomberg Professional as a supplier of data and as a data source. All analysed funds that are quoted in foreign currency have been converted to Swiss francs (CHF) on a daily basis.

Findings from the equities investment category

A total of 54 tests were carried out in the equities investment category over three, eight and 14.75 years with 30 actively managed funds.

In these 54 tests, the active funds were only able to exceed the index in terms of yields and the Sharp ratio in just five cases. The following diagram shows the results of the tests schematically.

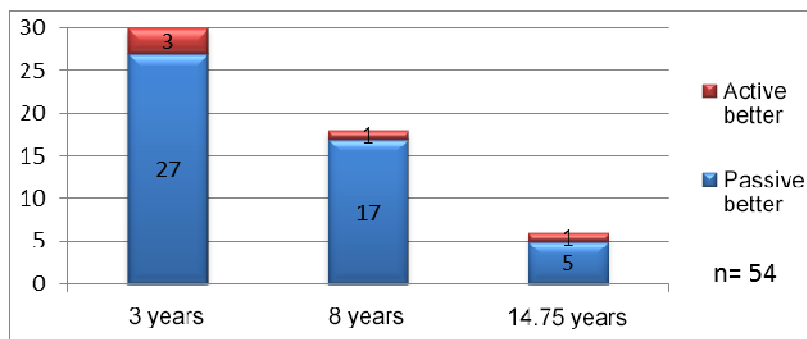


Figure: Comparisons within the equities investment category

Source: own illustration based on Bloomberg L.P. (2013)

It should be noted that none of the five cases in which an actively managed fund was able to exceed the passive index are the same fund.

Based on the results, at least one active fund has managed to beat the index in each period, even though the share over the three time periods is extremely small (9.3%). It can be assumed from the rate of less than 10% that actively managed funds are only able to beat a passive, global equity index in terms of returns and Sharp ratio by chance and temporarily (cf. p. 18-20).

Findings from the bonds investment category

Around 30 tests, again over three different time horizons were carried out for this paper in the bonds investment category. The 3-5 year US government bonds index (Bloomberg Ticker reference USG2TR), as well as the global index Barclays Global Aggregate (LEGATRUU) are used as passive indices. Only in two of the 30 tests carried out was an actively managed fund able to beat the two defined passive indices.

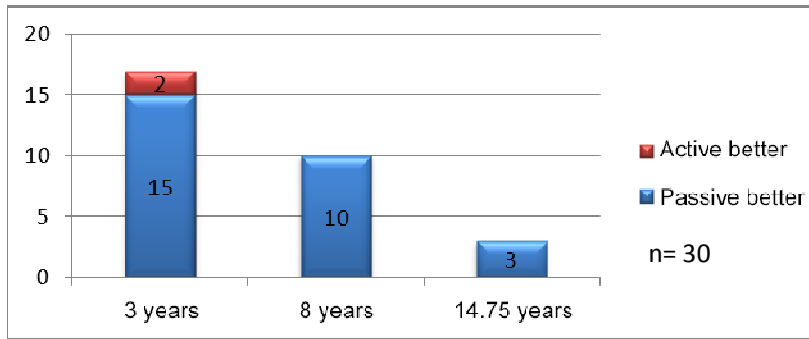


Figure: Comparisons within the bonds investment category

Source: own illustration based on Bloomberg L.P. (2013)

Active bond funds were only able to beat the two passive indices in 6.7% of all the comparisons carried out. Additionally, the active funds were only able to beat the index in the comparative period over 3 years. No actively managed fund has succeeded in exceeding the passive indices in either the medium-term (8 years) or long-term view (14.75 years).

Findings from the real estate investment category

A total of 46 comparisons were carried out between the passive index FTSE EPRA/NAREIT Developed Index (RUGL) and the actively managed real estate fund. Only one active fund was able to fare better in terms of average returns per annum. This was three for the comparison of Sharpe ratios. The following illustration shows the comparisons for the average returns per annum.

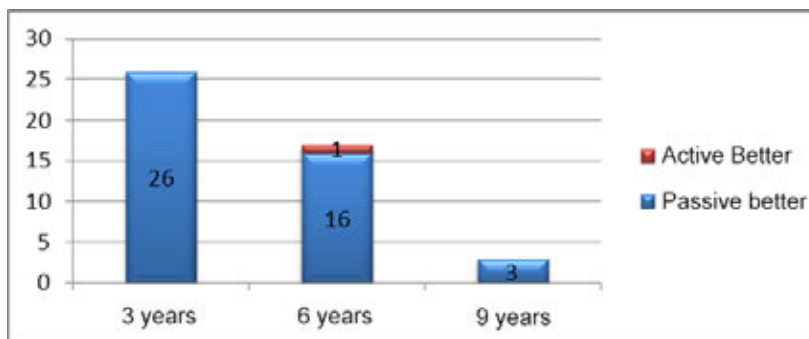


Figure: Comparisons within the real estate investment category

Source: own illustration based on Bloomberg L.P. (2013)

The success rate of the actively managed funds compared with the passive index stands at 2.2% in terms of returns in the real estate investment category, and 6.5% for the comparisons of Sharpe ratio.

We can therefore strongly suspect from this clear result that there is only a slight chance or low probability that actively managed real estate funds will beat a global investment index fund in terms of returns.

Findings from the commodities investment category

The commodities investment categories had the least data available compared with the other investment categories. Sixteen tests were carried out with a total of nine actively managed funds. And yet, not one of the active funds was able to exceed the passive index UBS Constant Maturity Commodity Index (UBS CMCI, Bloomberg Ticker reference CMCITR) in any one of the tests.

This result should be interpreted with care given the scarce data available. However, it does point to the trend in this investment category that the proportion of actively managed funds able to exceed the passive index is extremely low.

Conclusions

A total of 146 comparisons were carried out with different variables across all investment categories and all comparison periods. The clear results for the comparison of the average returns per annum are shown relatively and absolutely for each investment class and period and totalled at the end.

Discrete returns per annum					
	Index better than active fund		Active fund better than index		Total
	Relative	Absolute	Relative	Absolute	Absolute
Equities	90.7%	49	9.3%	5	54
Bonds	93.3%	28	6.7%	2	30
Real estate	97.8%	45	2.2%	1	46
Commodities	100%	16	0%	0	16
Short term	93.9%	77	6.1%	5	82
Medium term	96%	48	4%	2	50
Long term	92.9%	13	7.1%	1	14
Total	94.5%	138	5.5%	8	146

Table: Comparisons of all investment categories

Source: own illustration based on Bloomberg L.P. (2013)

The clear results from the table support the theory that actively managed funds are only able to exceed a passive index in the short term or by chance. No more than 10% of the active funds were able to exceed the passive index in either an investment category or in the same period. The active funds investigated as part of this paper were only able to compete with the performance of the passive indices in exceptional cases. The average of the actively managed funds was also significantly lower than the performance of the particular index.

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List of abbreviations

BfpB	Federal Central Office for Political Education
ETF	Exchange Traded Fund
Lhs	Left-hand scale (left axis in diagrams)
MSCI ACWI	Morgan Stanley Capital International All Country Index
Rhs	Right-hand scale (right axis in diagrams)
REIT	Real Estate Investment Trust
RICI	Rogers International Commodity Index
TE	Tracking error
TER	Total expense ratio
UBS CMCI	UBS Constant Maturity Commodity Index

1 Equities investment category

1.1 Comparison over three years

This subsection compares the actively managed funds with the index MSCI ACWI for the financial ratio, the Sharpe ratio. For the sake of clarity, the figures only list the individual actively managed funds in their abbreviated form.

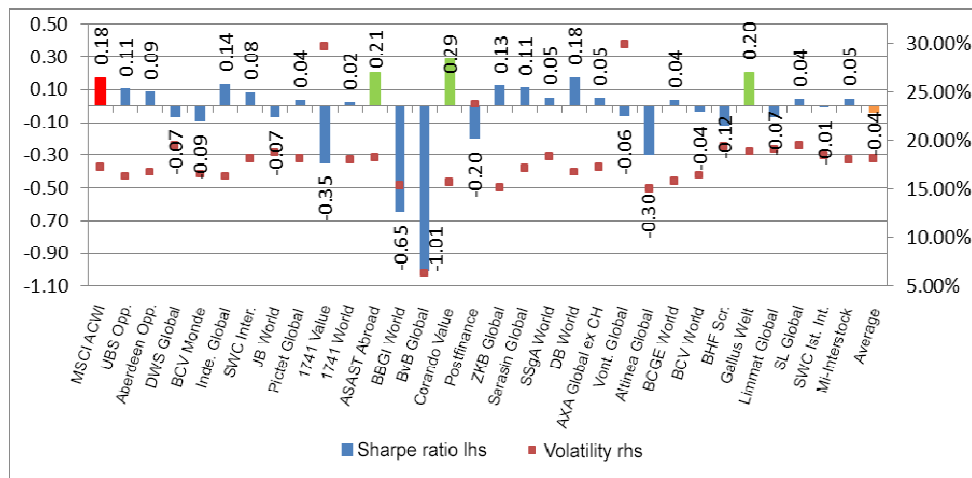


Figure 1: Sharpe ratio and volatility for equities over three years

Source: own illustration based on Bloomberg L.P. (2013)

As the Sharpe ratio is dimensionless, the value for the individual Sharpe ratio is meaningless. And yet it is still possible to compare Sharpe ratios with one another, where the higher the Sharpe ratio vis-à-vis the other funds, the better the corresponding fund. (Zimmermann 2012, page 367)

It is possible to see from Figure 1 that three actively managed funds were able to exceed the reference index MSCI ACWI. The volatility of each fund can be seen as an additional indicator in Figure 1. The funds fluctuated by 18.07% on average while the index shows a volatility of 17.30%.

Table 1 captures the findings from Figure 1 and summarises them in relative and absolute figures.

	Sharpe ratio	
	Relative	Absolute
Higher than benchmark index	10%	3
Lower benchmark index but above the average	53.3%	16
Low average	36.6%	11
Total	100%	30

Table 1: relative and absolute figures for equities over three years

Source: own illustration based on Bloomberg L.P. (2013)

1.2 Comparison over eight years

It is not just equity prices that saw strong falls as a result of the financial crisis, volatilities also took on extreme proportions. (BfpB, no date)

Figure 2 measures and compares the Sharpe ratio over the period 31.03.2005 – 31.03.2013.

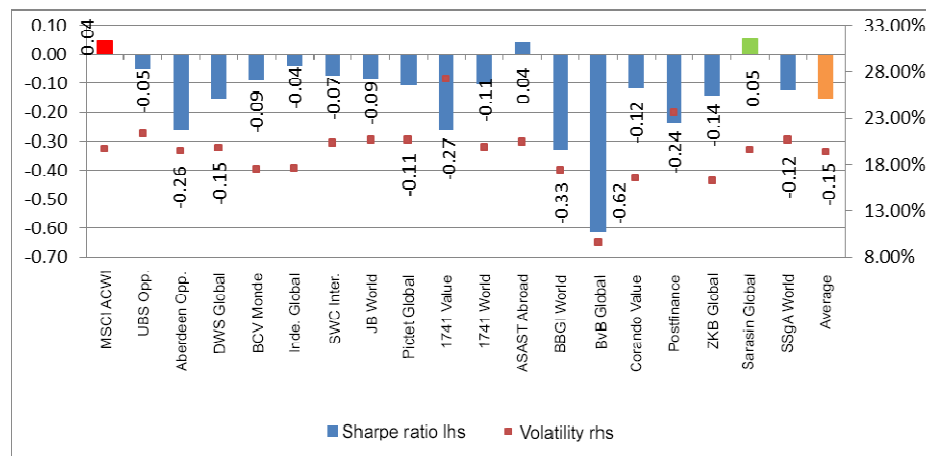


Figure 2: Sharpe ratio and volatility equities over eight years

Source: own illustration based on Bloomberg L.P. (2013)

As can be seen in Figure 2 only the "Sarasin Global" fund is able to beat the MSCI ACWI index. The volatilities were 19.38% on average, with the index being slightly above the average for all funds at 19.78%.

Table 2 compares the funds with the index and summarises the results from this comparative horizon.

	Sharpe ratio	
	Relative	Absolute
Higher than benchmark index	5.6%	1
Lower benchmark index but above the average	61.1%	11
Low average	33.3%	6
Total	100%	18

Table 2: relative and absolute figures for equities over eight years

Source: own illustration based on Bloomberg L.P. (2013)

When the figures are compared with those from Section 1.1 the share of actively managed funds that were able to beat the index falls by around a half when expressed as a percentage. Furthermore, not one of the actively managed funds was able to beat the index over three and eight years. The "Corando Value" fund that was able to beat the index over three years, performed significantly below average compared with the reference index.

1.3 Comparison over 14.75 years

The long-term comparison over 14.75 years includes the period from mid-1998 to the start of 2013. This period not only includes peaks, such as during 1995 – 1999, for example, or between 2003 – 2006 but also includes crises, such the dotcom bubble between 1999 – 2003 or the financial crisis of 2007-2009. Given the relatively long timespan, only a small

amount of data on the selected funds is available via Bloomberg Professional. The meaningfulness of this comparison is therefore more restricted.

The comparison of the Sharpe ratios between the actively managed funds and the index are presented in Figure 3.

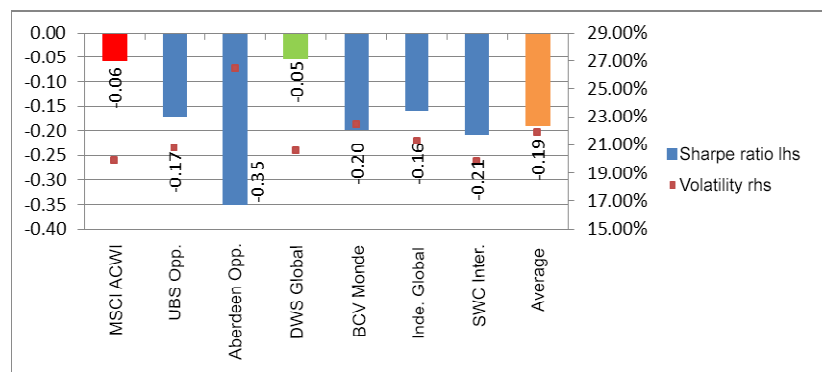


Figure 3: Sharpe ratio and volatility equities over 14.75 years

Source: own illustration based on Bloomberg L.P. (2013)

A list of the relative and absolute figures from the comparison with the Sharpe ratio is presented in Table 3.

	Sharpe ratio	
	Relative	Absolute
Higher than the benchmark index	16.7%	1
Lower benchmark index but above the average	33.3%	2
Low average	50%	3
Total	100%	6

Table 3: relative and absolute figures for equities over 14.75 years

Source: own illustration based on Bloomberg L.P. (2013)

1.4 Conclusions equities investment category

If we examine all three periods, there is at least one active fund in every benchmark period that was able to fare better than the benchmark index. However, no specific actively managed fund was able to fare better than the benchmark over two or three periods. This conclusion leads us to assume that an isolated better performance than the benchmark index is based on chance and does not follow any continuous trend.

The following Figure 4 shows the trend of the Sharpe ratio over the three selected periods, in each case for the benchmark, the best active fund and the average of all active funds.

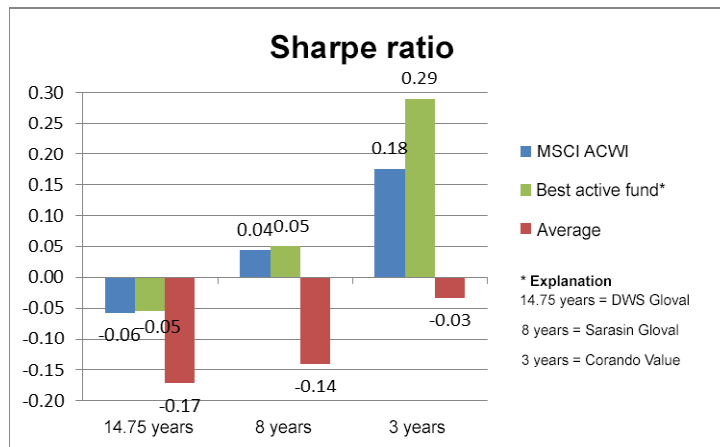


Figure 4: Progress of the Sharpe ratio for equities

Source: own illustration based on Bloomberg L.P. (2013)

From Figure 4 it is possible to see that the Sharpe ratio of the MSCI ACWI and each of the best active funds have witnessed a relatively similar performance. This is in contrast with the average of all funds that are listed significantly behind the first two mentioned funds. This fact supports the idea that the majority of actively managed funds are not able to beat the index over several benchmarks or terms. Individual outliers continue to be possible, however.

2 Bonds investment category

2.1 Comparison over three years

This subsection sets out the results from the comparison between the two previously defined indices and the actively managed bonds fund over three years.

In the same way as in the sections about equity valuations (see Section 1.1, 1.2 and 1.3), the Sharpe ratio and the associated volatility are also shown in each case for the bonds investment class to compare the return obtained with the risk taken in the following Figure 5.

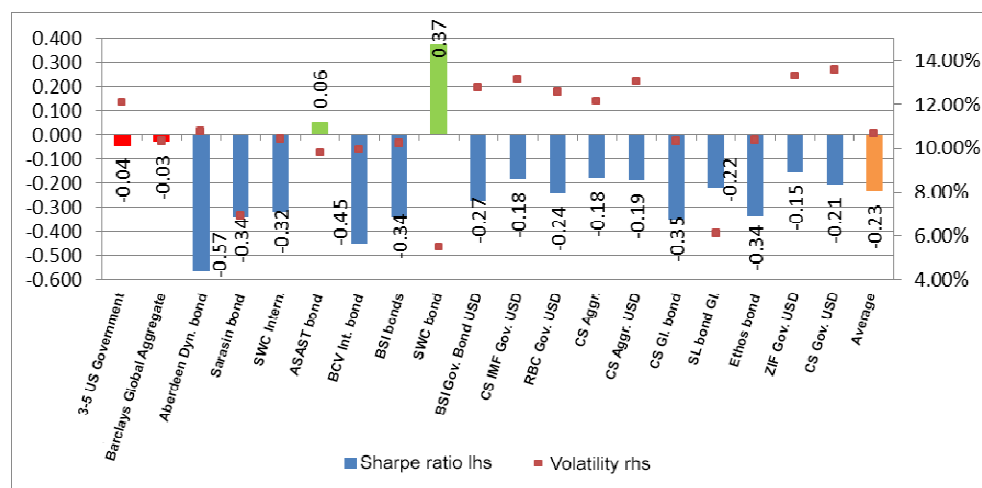


Figure 5: Sharpe ratio and volatility for bonds over three years

Source: own illustration based on Bloomberg L.P. (2013)

The Swisscanto bonds fund, in particular, is convincing over three years with an extraordinarily high average return per annum and low volatility. And yet this fund has only a minor impact upon the average of all active funds, as can be seen in Table 4.

	Sharpe ratio	
	Relative	Absolute
Higher than the benchmark index	11.8%	2
Lower benchmark but higher than average	35.3%	6
Low average	52.9%	9
Total	100%	17

Table 4: relative and absolute figures for bonds over three years

Source: own illustration based on Bloomberg L.P. (2013)

Table 4 shows a summary of the results from the comparison of the Sharpe ratio. Expressed relatively a little more than 10% of all active funds could beat the indices. The next section compares the same financial ratios over the time horizon of eight years.

2.2 Comparison over eight years

Consistently as for the equities investment category, a comparison is also carried out over eight years for bonds. In contrast with equities, bond holders were able to benefit from sharply falling interest rates in the US and Europe towards the end of the financial crisis. Indeed, the historically low interest rates have meant lower incomes from interest from bonds for 2 to 3 years. (Iconomix, 2010)

In Figure 6 there follows a comparison of the Sharpe ratio over eight years.

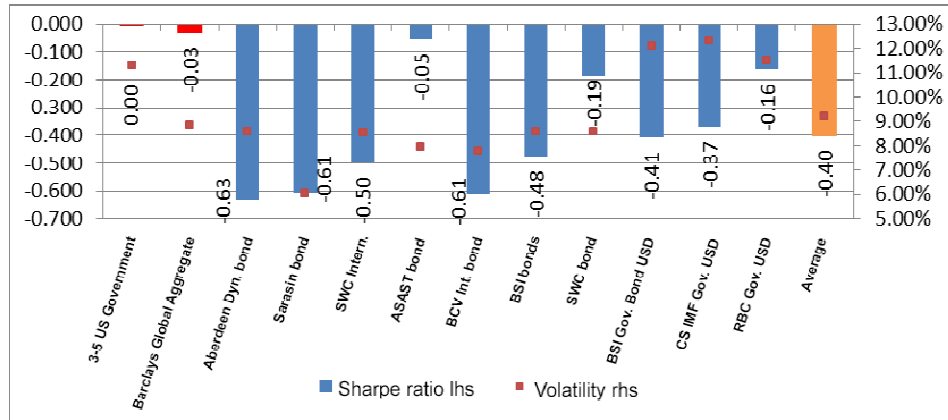


Figure 6: Sharpe ratio and volatility for bonds over eight years

Source: own illustration based on Bloomberg L.P. (2013)

Figure 6 indicates that only a few active funds were able to come close to the Sharpe ratio for both indices. The average of all active funds is certainly listed well below the Sharpe ratio for both indices, as can already be seen from the comparison over three years.

Table 5 presents and summarises the relative and absolute figures on this medium-term comparison.

	Sharpe ratio	
	Relative	Absolute
Higher than benchmark index	0%	0
Lower benchmark index but above the average	40%	4
Low average	60%	6
Total	100%	10

Table 5: relative and absolute figures for bonds over eight years

Source: own illustration based on Bloomberg L.P. (2013)

The results from this subsection can be summarised easily, as no active bond fund has succeeded in beating the two benchmark indices. In addition, the average of the active funds is considerably below the Sharpe ratio for the indices in both cases.

2.3 Comparison over 14.75 years

As usual, Figure 7 again compares the Sharpe ratios to obtain a financial ratio adjusted for the unsystematic risk.

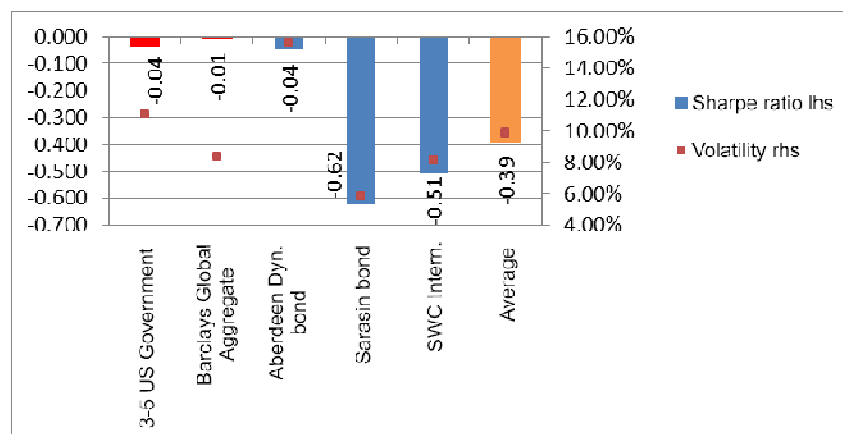


Figure 7: Sharpe ratio and volatility for bonds over 14.75 years

Source: own illustration based on Bloomberg L.P. (2013)

Not one of the active funds has been able to exceed one of the two indices over this long time period (cf. Figure 7).

Table 6 shows the relative and absolute figures for the comparisons over 14.75 years and describes them in the following.

	Sharpe ratio	
	Relative	Absolute
Higher than the benchmark index	0%	0
Lower benchmark index but above the average	33.3%	1
Low average	66.6%	2
Total	100%	3

Table 6: relative and absolute figures for bonds over 14.75 years

Source: own illustration based on Bloomberg L.P. (2013)

No active fund was able to fare better than the passive indices in this subsection or comparison either. Nevertheless, it is important to mention at this point that just three actively managed funds have such a lengthy track record. This result should therefore be interpreted with caution.

2.4 Conclusions bonds investment category

If we examine all three periods, in the first comparison over three years just 10% of the active funds were able to fare significantly better than the indices in the first comparison.

The following Figure 8 shows how the Sharpe ratio performs over the three selected periods, in each case for the benchmark indices, the best active fund and the average for all active funds.

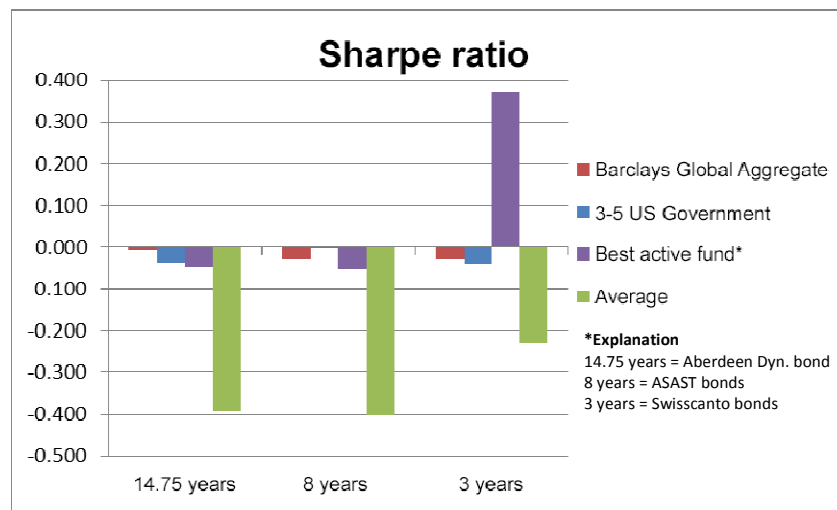


Figure 8: Course of the Sharpe ratio for bonds

Source: own illustration based on Bloomberg L.P. (2013)

Figure 8 clearly illustrates, once again, that the average of all active funds compared over all the periods is significantly poorer than the two indices. In total, 30 comparisons were carried out with 17 funds over three different time horizons in the bonds investment class. Only two active funds have been able to outperform the two selected indices. This result is clear and supports the theory that active funds also only outperform the index by chance in the bonds asset class.

3 Real estate investment category

3.1 Comparison over three years

Figure 9 compares the Sharpe ratio of actively managed real estate funds with the specific index over three years.

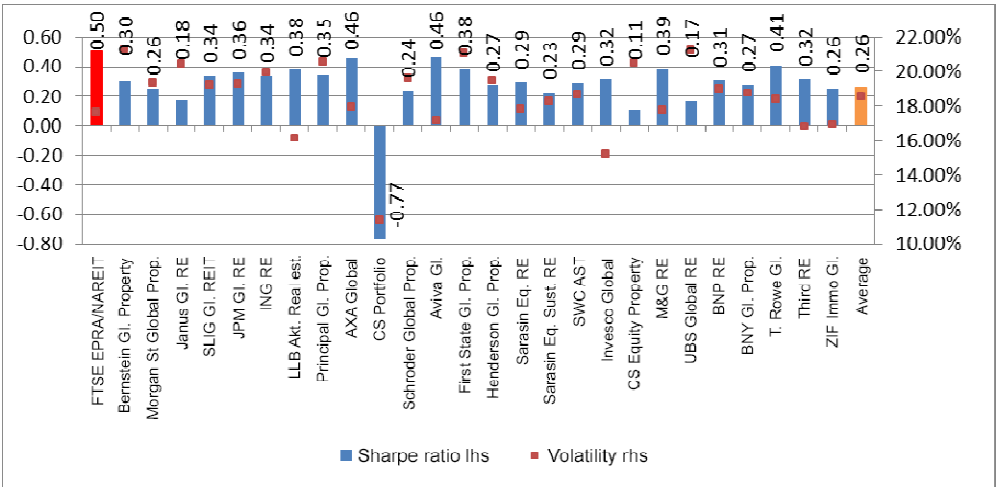


Figure 9: Sharpe ratio and volatility for real estate over three years

Source: own illustration based on Bloomberg L.P. (2013)

No active fund was able to outperform the passive index in this period.

Table 7 summarises and then describes the relative and absolute figures for this subsection.

	Sharpe ratio	
	Relative	Absolute
Higher than the benchmark index	0%	0
Lower benchmark index but above the average	65.4%	17
Low average	34.6%	9
Total	100%	26

Table 7: relative and absolute figures for real estate over three years

Source: own illustration based on Bloomberg L.P. (2013)

No actively managed fund has succeeded in beating the index in either of the comparisons, as mentioned above. However, the vast majority was also able to demonstrate an attractive Sharpe ratio. Only one fund had a negative Sharpe ratio in this period.

3.2 Comparison over six years

Figure 10 compares the Sharpe ratios and volatilities for this period.

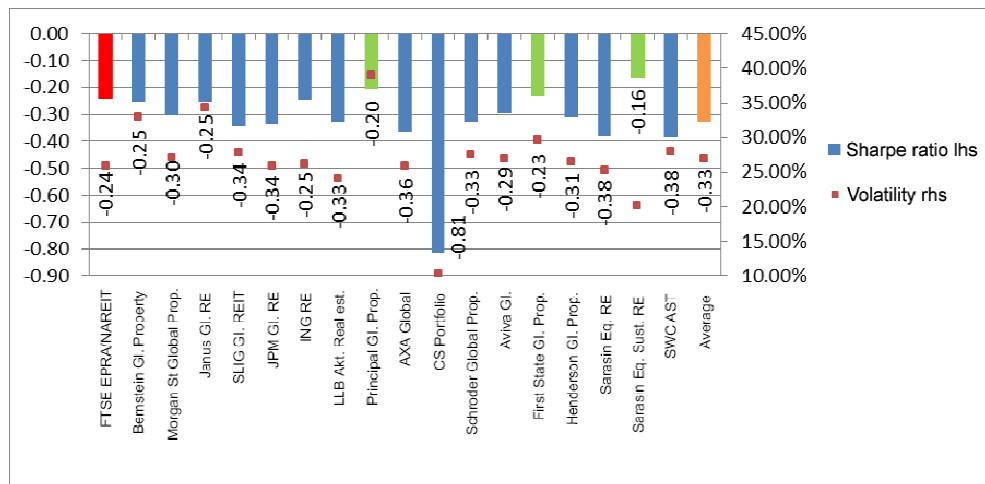


Figure 10: Sharpe ratio and volatility for real estate over six years

Source: own illustration based on Bloomberg L.P. (2013)

Given the real estate bubble in the US, the volatilities in this comparative period were significantly higher in this comparison than over three years (cf. Section 3.1). Based on Figure 10 the average achieved a level of 26.90%; the maximum value was measured at just below 40% at 38.93%. These figures clearly illustrate the considerable fluctuations in this period.

The Sharpe ratio had also suffered during the financial crisis. As can be seen from Figure 10, all the test results were negative. At the same time, only three active funds were able to exceed the index in the Sharpe ratio financial ratio.

Table 8 summarises the relative and absolute figures for the comparisons for this time period.

	Sharpe ratio	
	Relative	Absolute
Higher than benchmark index	17.6%	3
Lower benchmark index but above the average	29.4%	5
Low average	53%	9
Total	100%	17

Table 8: relative and absolute figures for real estate over six years

Source: own illustration based on Bloomberg L.P. (2013)

3.3 Performance over nine years

3.3 compares the Sharpe ratio of selected active funds with the benchmark index FTSE EPRA/NAREIT in a long-term comparison between 31.03.2004 and 31.03.2013. The following tests only have limited significance because of the lack of data.

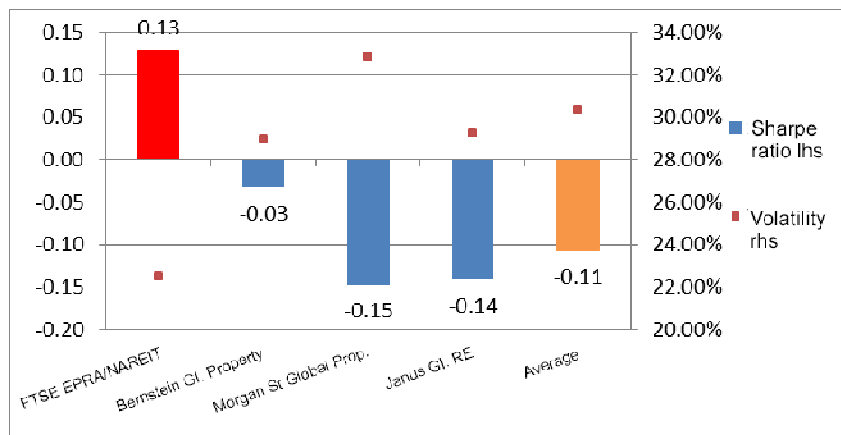


Figure 11: Sharpe ratio and volatility for real estate over nine years

Source: own illustration based on Bloomberg L.P. (2013)

No actively managed fund has managed to exceed the passive index in this time period (cf. Figure 11). The volatilities in the real estate investment class remained relatively high in this last comparison. The average stands at 30.34%.

Table 9 summarises the results from this subsection.

	Sharpe ratio	
	Relative	Absolute
Higher than benchmark index	0%	0
Lower benchmark but higher than average	33.3%	1
Low average	66.6%	2
Total	100%	3

Table 9: relative and absolute figures for real estate over nine years

Source: own illustration based on Bloomberg L.P. (2013)

3.4 Conclusions for the real estate investment category

Figure 12 presents the course of the Sharpe ratio of the index, the best actively managed fund and the average for three, six and nine years.

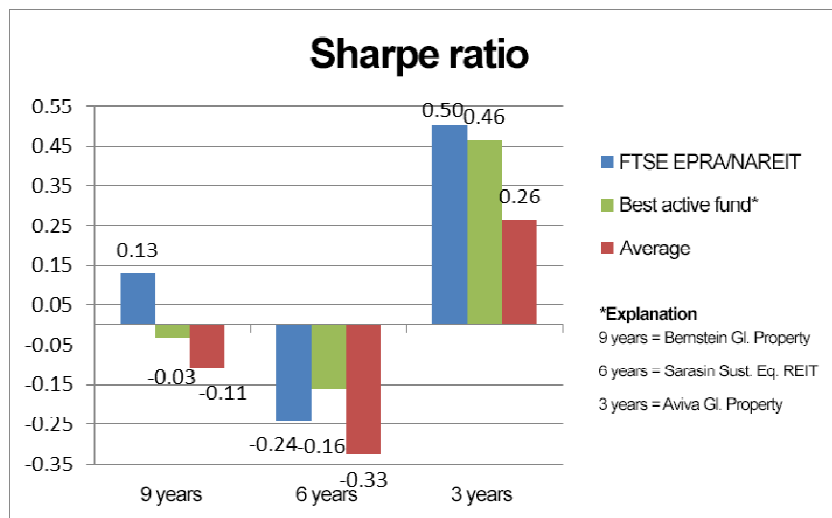


Figure 12: Course of the Sharpe ratio for real estate

Source: own illustration based on Bloomberg L.P. (2013)

As we already know from the previous subsections 3.1, 3.2 and 3.3, the active funds were only able to beat the index in the comparison over six years. This is also the only period in which the average of all active funds is in relative proximity to the index. In the other two comparisons the average of all funds lies significantly below the Sharpe ratio of the index FTSE EPRA/NAREIT and, enables it to be deduced once again that active funds are only able to exceed a passive index by chance.

4 Commodities investment class

4.1 Comparison over three years

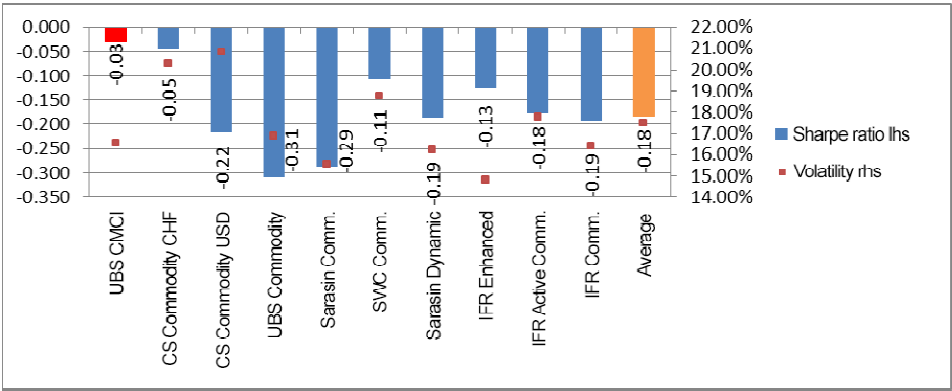


Figure 13: Sharpe ratio and volatility for commodities over three years

Source: own illustration based on Bloomberg L.P. (2013)

No fund has succeeded in beating the index in this comparison (see Figure 13). The average of all actively managed funds deviates sharply from the Sharpe ratio of the index.

Table 10 summarises the tests compiled in this section and shows the relative and absolute size of the results.

	Sharpe ratio	
	Relative	Absolute
Higher than benchmark index	0%	0
Lower benchmark index but above the average	44.4%	4
Low average	55.5%	5
Total	100%	9

Table 10: relative and absolute figures for commodities over three years

Source: own illustration based on Bloomberg L.P. (2013)

4.2 Comparison over six years

Figure 14 presents the Sharpe ratio and the volatility to put the returns achieved in proportion to the risk taken or fluctuation.

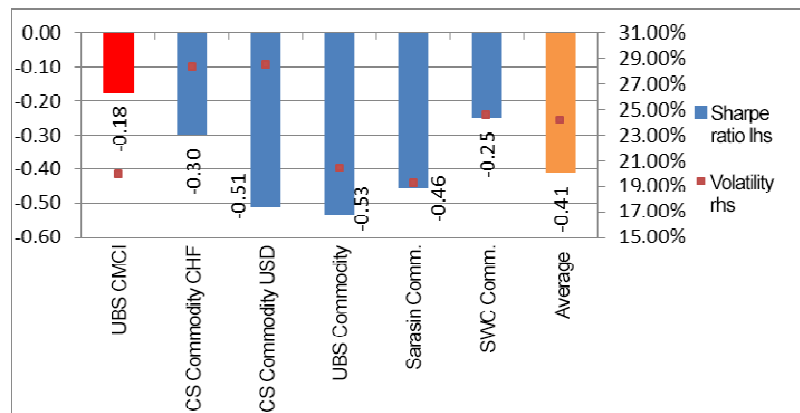


Figure 14: Sharpe ratio and volatility for commodities over six years

Source: own illustration based on Bloomberg L.P. (2013)

No active fund is able to beat the index in this comparison either. The average of all active funds stands at less than a half behind the Sharpe ratio of the UBS CMCI Index. The index is also convincing with the lowest measured volatility.

Table 11 summarises the results from this section in relative and absolute figures.

	Sharpe ratio	
	Relative	Absolute
Higher than benchmark index	0%	0
Lower benchmark index but above the average	40%	2
Low average	60%	3
Total	100%	5

Table 11: relative and absolute figures for commodities over six years

Source: own illustration based on Bloomberg L.P. (2013)

4.3 Comparison over nine years

As the commodities funds still do not have an extensive history, there were still only two active funds in this comparison following the restrictions from Section **Error! Reference source not found.** The findings gained from this section should be interpreted with caution.

As we have already seen from the previous section, Figure 15 shows the Sharpe ratio and the volatilities of the investigated positions.

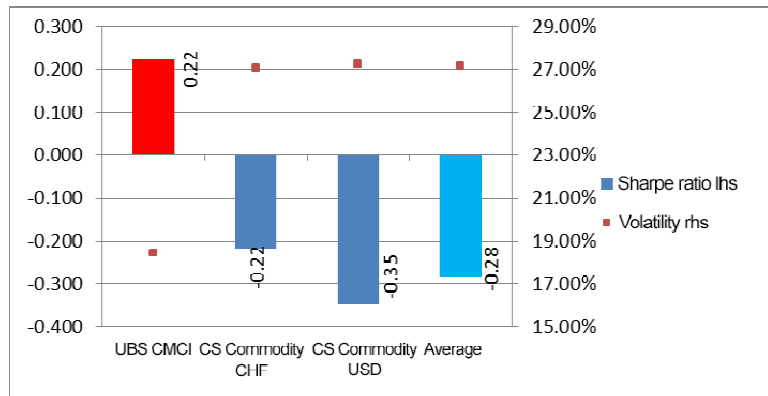


Figure 15: Sharpe ratio and volatility for commodities over nine years

Source: own illustration based on Bloomberg L.P. (2013)

As it was only possible to compare two active funds with the index because of the lack of historical data in this section, we have dispensed with the usual tabular form of summary with relative and absolute figures. Neither of the active funds were able to beat the index compared with the Sharpe ratio.

The following subsection explains the conclusions about the investment category for commodities.

4.4 Conclusions about the commodities investment category

The market for actively traded commodity funds that are replicated using futures is still in its infancy.

For this reason the author of this paper only had a few objects for comparison. A track record over a relatively low number of three years only identifies nine active funds.

Not a single active fund succeeded in exceeding the selected index in the commodities investment category in 16 comparisons over three different comparative periods. Even though this result is clear, it must be interpreted carefully as mentioned above, as there is little historical data available.

The author therefore recommends repeating comparisons in the commodities investment category in two to three years to confirm or refute the trend that has resulted from this series of tests.

Figure 16 shows the course of the Sharpe ratio of the index, the best active fund and the average Sharpe ratio.

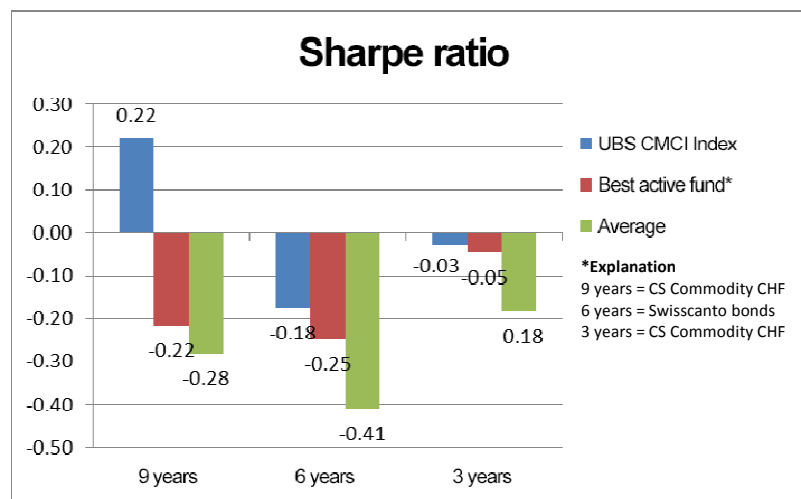


Figure 16: Course of the commodities Sharpe ratio

Source: own illustration based on Bloomberg L.P. (2013)

As can be seen in Figure 16, the average Sharpe ratio of the actively managed fund is significantly below the index. The best active fund in each case is able to compete closely with the Sharpe ratio with the exception of the comparison over nine years.

From the results from Figure 16 and the entire Section 4 it is possible to assume that the active commodities fund is not able to beat a passive commodities index in terms of performance ratios or is only able to beat it by chance.

5 Conclusion and closing remarks

This section includes the closing remarks and conclusion to this paper.

If you total all the comparisons that were carried out, there were around 146 comparisons over four investment categories, each with three different periods (short, medium and long term).

The majority of comparisons were carried out in the equities investment category because of the availability of data (cf. Figure 17). In addition, it was only possible to test a meagre number of funds in the commodities investment class because of the small number of actively managed funds.

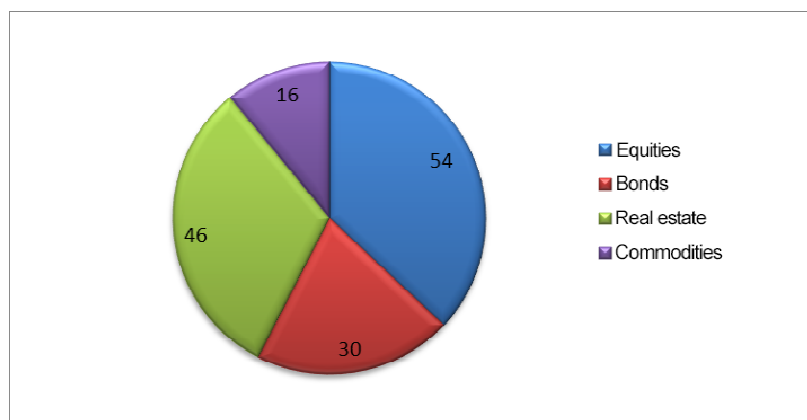


Figure 17: Number of comparisons by investment category

Source: Own illustration

A breakdown by comparable horizon was produced in Figure 18. The time span of three years was described as short term, six and eight years as medium term and nine and 14.75 years as long term.

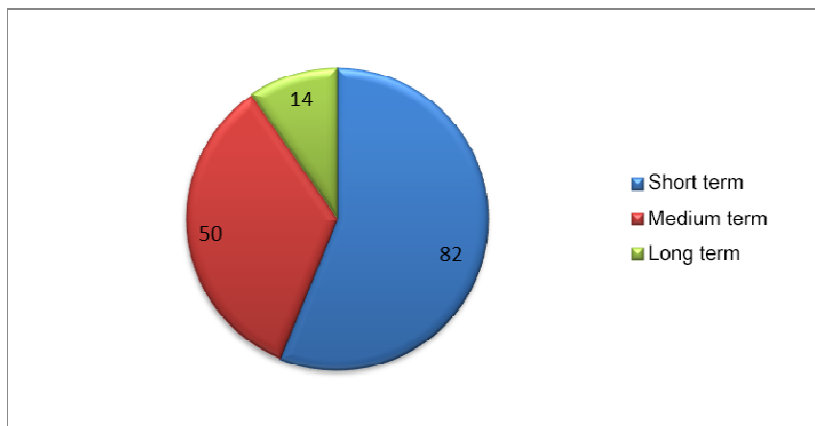


Figure 18: Number of comparisons by time horizon

Source: Own illustration

As can be seen from Figure 18 around 56% of all comparisons concern the short-term comparison, 34% are made up of medium-term comparisons over six and eight years and just 10% fall within long-term comparisons. It should be stressed at this point that the results from the long-term comparisons only highlight possible trends because of the low volume of data available.

After the distributions were broken down by investment category and also by the examined time periods in the two aforementioned figures, attention is now drawn specifically to the number of actively managed funds that are able to beat the index. Table 12 illustrates the relative and absolute figures for each investment category and the examined period. The figures relate to the average returns per annum.

Discrete returns per annum					
	1 Index better than active fund		2 Active fund better than index		3 Total
	Relative	Absolute	Relative	Absolute	Absolute
Equities	90.7%	49	9.3%	5	54
Bonds	93.3%	28	6.7%	2	30
Real estate	97.8%	45	2.2%	1	46
Commodities	100%	16	0%	0	16
Short term	93.9%	77	6.1%	5	82
Medium term	96%	48	4%	2	50
Long term	92.9%	13	7.1%	1	14
Total	94.5%	138	5.5%	8	146

Table 12: relative and absolute figures for all investment categories

Source: own illustration based on Bloomberg L.P. (2013)

As can be seen from Table 12 the proportion of actively managed funds that were able to beat the corresponding index could never be more than 10% in any comparison. The rate of the active funds that outperform the index is just 5.5% across all 146 comparisons.

Before a final conclusion is made across all the comparisons, in Table 13 first follow the relative and absolute figures for the comparison of the Sharpe ratio.

Sharpe ratio					
	Index better than active fund		Active fund better than index		Total
	Relative	Absolute	Relative	Absolute	Absolute
Equities	90.7%	49	9.3%	5	54
Bonds	93.3%	28	6.7%	2	30
Real estate	93.5%	43	6.5%	3	46
Commodities	100%	16	0%	0	16
Short term	93.9%	77	6.1%	5	82
Medium term	96%	46	8%	4	50
Long term	92.9%	13	7.1%	1	14
Total	93.2%	136	6.8%	10	146

Table 13: relative and absolute figures for all investment categories

Source: own illustration based on B

loomberg L.P. (2013)

If the figures of the average returns per annum and the Sharpe ratio are compared, it is only possible to identify minimal differences. Only in the class of medium-term real estate are there two funds with slightly lower returns per annum than the index, although they do have a lower Sharpe ratio. Otherwise the results for returns per annum and Sharpe ratio are identical.

From the two previous tables, as well as from the results from the individual sections in the investment categories, a clear trend emerges that there is a very low probability that actively managed funds will be able to beat an index. Of all 99 funds that have been checked in 146 comparisons, not one fund has succeeded in beating the index in two or even three comparative periods.

The author of this paper therefore assumes that a one-off outperformance of the index is based on chance and is not sustainable. The performance of the indices should be put into perspective to take account of the ETF provider's TER that is not included in the comparisons. A selection of ETFs on the indices handled in the aforesaid sections can be taken from Appendix E.

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