ACTIVE MANAGEMENT: WHAT DIFFERENT STORY MEASURES TELL US IN BRAZIL?

GESTÃO ATIVA: QUE HISTÓRIAS NOS CONTAM DIFERENTES MÉTRICAS NO BRASIL?

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ABSTRACT

This paper extends the debate about the evaluating the active portfolio management in order to guide academics and practitioners undertaking researches about the contribution of active management on the performance in equity mutual funds in the Brazilian market. We present a comparison between two measures of active management: Churn Rate and Active Share. Using five year-data set covering the Brazilian equity mutual funds, between 2007 and 2011, we estimate econometric models to find the relation between active management and performance. The results evidence that Churn Rate presents a negative relationship to performance, while the Active Share has a positive effect for the same period. Based on our results we can state that a combined-measure analysis can lead us to a better understanding about the type of active management that the manager is involved, avoiding misleading interpretation about the role of each strategy on the portfolio performance.

Key words: Active Management. Mutual Fund Performance. Churn Rate. Active Share.

RESUMO

Este documento amplia o debate sobre a avaliação da gestão ativa de carteiras de investimentos, a fim de orientar acadêmicos e profissionais que realizam pesquisas sobre a contribuição da gestão ativa sobre o desempenho de investimentos em ações no mercado brasileiro. Apresentamos uma comparação entre duas medidas de gestão ativa: Churn Rate (medida de rotatividade da carteira) e Active Share (medida de distinção em relação à carteira benchmark). Usando o conjunto de dados de cinco anos abrangendo os fundos de

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investimento em ações brasileiros, entre 2007 e 2011, estimamos modelos econométricos para encontrar a relação entre gestão ativo e desempenho. Os resultados evidenciam que a métrica Churn Rate apresenta uma relação negativa com o desempenho, enquanto o Active Share tem um efeito positivo no mesmo período. Com base em nossos resultados, podemos afirmar que uma análise combinada de métricas pode nos levar a uma melhor compreensão sobre o tipo de gestão ativa com o qual o gestor está envolvido, evitando interpretações enganosas sobre o papel de cada estratégia no desempenho da carteira.

Palavras-chave: Gestão ativa. Desempenho dos fundos mútuos. Churn Rate. Active Share.

1. INTRODUCTION

Understanding the sources of mutual fund performance is always intriguing for managers, investors and academics, studies in this field can be useful to guide academics and practitioners undertaking researches in the Brazilian market. (Sharpe, 1966); Treynor & Mazui, 1966); Jensen, 1968; Ippolito & Turner, 1987; Carhart, 1995; Carhart, 1997; Fama & French, 2010; Jones & Wermers, 2011; Paulo & Itosu, 2012)

The decisions in allocation and selection of assets are the major aspects to achieve mutual fund performance. A manager devoted to active management seeks fundamentally excess of return by decisions in capital allocation in different classes and selection of assets. The literature is controversial and does not provide a conclusion about the contribution of the active management to the performance, which is frequently underperforming the benchmarks.

Different measures of active management can drive to misleading interpretation about the role of this strategy and its effects on the portfolio performance as documented in the international literature. A conservative way to identify active management in academic and professional mutual fund's studies trends to see this issue with portfolio's turnover measures (Ang, Chen & Lin, 1998; Chen, Jegadeesh, and Wermers, 2000; Barber and Odean, 2000; Rao, 2010; Bono Milan & Eid Jr.; 2014), but the conclusion about your effect on mutual fund's performance from investor point of view could cause a misleading interpretation. Pursuing these effects in the Brazilian market, the major contribution of this paper is to identify, in Brazil, the differences between two active management measures, and show that a measure-combined analysis leads to a better perception of the managers' strategy.

The literature presents different measures of active management, but two of them widely applied in academic studies, Churn Rate and Active Share. The Churn Rate (Gaspar, Massa & Matos, 2005) measures the level of buying and selling stocks in a portfolio, so called turnover ratio, while the Active Share (Cremers & Petajisto, 2009) estimates how a portfolio differentiate in weight, applied in each asset from the benchmark. We choose these measures to compare a more traditional style to assess active mutual fund's management with an innovative way to do it. Thus, this study compares these two measures and the results evidences that Churn Rate presents a negative relationship to performance, while the Active Share has a positive effect, shedding light on the potential misleading results obtained in many studies in this field .

Our results bring a new point of view to academic discussion about what can be considered an active management in mutual fund's market and even more, what kind of manger's effort has potential to produce better performance to investors.

This paper is organized as follows: The second part we develop the theoretical framework. Third section describes the methodology and data set used in the empirical analysis. The fourth section shows the results obtained and discussion. Finally, in section five, the paper presents the conclusion.

2. LITERATURE REVIEW

Outperforming the benchmark is the major purpose of an active management, but the literature is controversial and does not provide a conclusion about the contribution on the performance. Several studies have been evidencing active management underperforming the benchmarks over the last decade.

Primary studies presented by Sharpe (1966), Treynor & Mazui (1966) and Jensen (1968) identified that active management underperform passive management does not evidence the manager´s skills leading to a superior return under management.

Ippolito & Turner (1987) noted that the funds activity has a negative impact on performance. Applying the CAPM to measure performance, the study states that the rates of returning is about 60-point basis lower in pension funds engaged in high stock turnover rate compared to those engaged in a passive management.

Carhart (1995) and Carhart (1997) debate the persistence of mutual fund performance. By a survivor bias free data set, including 1,892 funds from 1962 until 1993, the authors apply turnover rates to measure the fund activity and find a negative relation between activity and performance.

Ang, Chen & Lin (1998) examines whether fund managers are capable of responding actively to the pressure for perform. They find that high portfolio turnover is harmful to performance, and there is no association between the effort put into stock selection and the investment returns even when past performance was poor.

In contrast, Chen, Jegadeesh, and Wermers (2000) shows that funds with higher turnover rates are better in stock picking than funds with lower turnover rates. Besides, they find that stocks bayed by mutual funds had significantly higher returns than the stocks sold.

Barber and Odean (2000) concludes that the poor performance of the average household portfolio is cost associated with high turnover rates. Study displays that gross returns are consistent with the Efficient Market Hypothesis, but net returns are not positive after transactions costs. The average household portfolio turns over approximately 75 percent of its stocks annually.

Rao (2010) seeks the relationship between portfolio turnover rates and performance in the Indian market, measuring the changes in portfolios and absolute return relative to the benchmark. The findings imply that high portfolio turnover ratios do not necessarily improve the fund performance over time. The evidence does not support a significant relationship between portfolio turnover ratio and fund performance.

Using total returns of the funds and holdings' based risk-adjusted returns, Gupta-Mukherjee (2008) compares portfolio choices of mutual funds relative to their peers. The results indicate a negative relationship between the managers' deviating relative to their peers and the ability to generate superior performance.

Cremers & Petajisto (2009) introducing the Active Share measure, finding a positive relation between performance and activity portfolio management. The authors compute mutual funds

portfolios from 1980 to 2003 and apply Active Share with several characteristic of funds, such size, turnover and expenses.

The discussion about how mutual fund's management also take into account issues like luck or skill in mutual fund's return. Fama & French (2010) ague that actively managed U.S. equity mutual funds, in average, has high costs of management that cancel positive returns to investors. They concluded that there is strong evidence of manager skill, negative as well as positive. The authors made bootstrap simulations to asses if performance is cause by lucky or skill and they found that a few funds exhibit sufficient skill to produce positive returns to cover their costs, perhaps if compared to passively well managed mutual funds, their performance are similar. Thus, they conclude for the irrelevance of skill in the United States

Jones & Wermers (2011) made a survey on the literature about the value of active management and identify that it shows that the average active manager does not outperform but that a significant minority of active managers do add value. Further, studies suggest that investors may be able to identify superior active managers in advance by using public information. These investors who can identify better managers should be able to improve their overall Sharpe ratio by including a meaningful exposure to active strategies.

Bono Milan & Eid Jr. (2014) analysis the turnover rate in the Brazilian market by the Churn Rate measure by Gaspar, Massa & Matos (2005) to measure the effects of stock funds´ activity on the performance. Analyzing equity mutual funds from 2007 to 2011, they show funds with higher turnover rates delivering lower performance.

Borges & Martelanc (2015) verifies if funds' return in Brazil come from fund managers' ability or just the luck factor. They used the methodology of Fama and French (2010), The authors generated 10,000 bootstrap simulated funds and compared the simulated alpha with the actual ones. They showed there is ability to generate positive abnormal returns, especially by managers of large funds.

Petajisto (2013) analyses the relationship among different levels of activity in the mutual fund performance by Active Share and tracking error. The author evidences most active stock pickers outperforming their benchmarks.

These results can suggest that a mutual fund actively managed could be able to produce positive returns for your investors, if made a skill manager. On the other hand, the previous literature ins inconclusive about if active management could lead to outperform the market and generate top returns for investors.

Thus, maybe another active management measure can bring a different way to look how skill active manager use your ability and help us to understand the kind of active management behavior.

Understanding the controversial results obtained by different measures of active management, we argue that a measure selected to analyze active management plays a crucial hole in this point, demanding more studies to clarify the nuances of this process.

3. DATA AND METHODS

The main goal of the strategy is to compare the results from different measures of active management. Data have a period of 5 years from January 2007 to December 2011 and count for 47 equity mutual funds, following study from Bono Milan & Eid Jr. (2015).

All mutual funds are available in ANBIMA (Capital Market and Finance Brazilian Institution´s Association) classified by categories. ANBIMA is an auto-regulation agency in Brazilian capital market, which provides monthly data of mutual fund industry in Brazil.

We choose open and non-exclusive equity mutual funds, containing over five million *Reais* (R$ 5 million) in total asset and 50 or more individual investors (institutional or not). This study does not consider funds that has closed during the period, because they do not have reliable data to analyze. Table 1 shows the descriptive statistics of the sample.

Table 1: Descriptive statistics of Equity Mutual Funds.

Variables	Mean	Median	Std. Dev.	Mín	Max
Total assets (R$ millions)	191.4	124.4	170.9	14.6	729.5
Age (years)	11.4	10.2	6.4	4.9	32.0
Management Fee (%)	2.58	2.50	1.03	0.60	5.00
Performance Fee (%)	8.72	0.00	9.86	0.00	20.00
Initial Deposit (R$ thousands)	23.55	10.00	28.34	0.10	100.00
N. Investors	3060 8	422	136746	50	709944

Source: Prepared by the authors.

The quota value of each equity mutual funds and benchmarks came from Economatica®, allowing us to measure performance by different methods, all of them well known and traditionally used by academic studies: Sharpe ratio, Jensen's alpha and Treynor & Mazuy ratio.

In this paper, we use four performance measures in gross return and net return: simple return rate, Sharpe ratio (1966), Jensen's alpha (1968) and Treynor & Mazuy (1966). Gross performance is an estimation without fee effects, which means, adding the management and performance fees on the total return. Net performance is an estimation based on rate of return achieved by investors, after management and performance fees.

The use of several measures of performance, moreover in gross and net terms, possibly to compare our results with another studies about relation between active management and mutual funds' performance and provide robustness to our conclusion.

Rate of return is a simple return of a fund and follows Equation 1.

$$Rp = \frac{Qt}{Qt-1} - 1 \qquad (1)$$

Where,

R_p is the rate of return, Q_t is the quota value on date t and Q_{t-1} is the quota value on date t-1.

To consider a net return we use the market value of Q_t, directly extract from database. To consider a gross return we add management and performance fees to administration fee to net return, thus we could assess mutual funds' return before charge investors by costs of management.

Sharpe (1966) defines performance as the risk premium divided by standard deviation of its return and follow Equation 2.

$$Sharpe = \frac{Rp - Rf}{\sigma p} \qquad (2)$$

Where,

Sharpe is the Sharpe index; R_p is the rate of return, R_f is the risk free rate and σ_p is the standard deviation of fund return.

Jensen (1968), well known as Jensen's Alpha index, relies on Capital Asset Price Model as framework and follows Equation 3.

$$Alpha = Rp - [Rf + \beta p(Rm - Rf)] + \varepsilon \qquad (3)$$

Where,

Alpha is the intercept, the Jensen's Alpha index; R_p is the portfolio rate of return, R_f is the risk free rate and β_p is the beta coefficient the represents the systematic risk, R_m is the benchmark return of each fund.

Treynor and Mazuy (1966), seek the manager's market timing and follow Equation 4.

$$T\&M = Rp - [Rf + \beta 1(Rm - Rf) + \beta 2(Rm - Rf)^2] + \varepsilon \qquad (4)$$

Where,

T&M is the Treynor and Mazuy ratio, R_p is the portfolio rate of return, R_f is the risk free rate and R_m is the return of a market portfolio, the benchmark of each fund. The β vary on time according to a higher or lower risk exposition.

The benchmark return used for each mutual fund follows the categories defined by ANBIMA, according with each mutual fund's strategy. The number of the funds per benchmark is on table 2.

Table 2: Number of Mutual Funds by benchmark.

ANBIMA Category	Equity Fund	Benchmark
Dividends	7	IDIV
Ibovespa	14	IBOVESPA
IBrX	3	IBrX
Free	14	IBOVESPA

Sectorial	4	INDX
Small Caps	4	SMLL
Sustainability/Governance	1	ISE

Source: Prepared by the authors.

According to ANBIMA, mutual funds classified as Dividends follows IDIV index as benchmark. Funds classified as Ibovespa and IBrX category aim to overcome IBOVESPA market index and IBrX market index, respectively. In the Free category, there is not a specific benchmark, so and we apply IBOVESPA since it is the principal stock exchange index of Brazilian stock market. Funds in Sectorial category aims to overcome INDX index, Small Caps aim to overcome SMLL, and funds Sustainability/Governance intend to overcome ISE index. In this paper we use the CDI index (interbank interest rate in Brazil) as a risk free rate measure.

3.1. Active Management Measures

We apply the Churn Rate measure, used in Bono Milan & Eid Jr. (2015), and to bring new perspective to the active management debate, we added the Active Share measure to our dada set to compare the results.

The measure of turnover rate follows Gaspar, Massa & Matos (2005), called Churn Rate measure. Churn Rate is a portfolio turnover measure that evaluates the level of buying and selling assets in a portfolio. It presents the variation in percentage of the weight to a specific asset over a period. The model considers price and fund portfolio at the end of each month in the sample. According with point of view of this measure, a high churn rate valued means high levels of turnover and imply in active management. Equation 5 presents the Churn Rate measure.

$$CR_{i,t} = \frac{\sum_{j \in Q} |N_{j,i,t}P_{j,t} - N_{j,i,t-1}P_{j,t-1} - N_{j,i,t-1}\Delta P_{j,t}|}{\sum_{j \in Q} \frac{N_{j,i,t}P_{j,t} + N_{j,i,t-1}P_{j,t-1}}{2}} \qquad (5)$$

Where $N_{i,j,t}$ is the number of stocks j, on mutual fund i at moment t, $P_{j,t}$ is the price of stock j on moment t. $N_{i,j,t-1}$ is the number of stocks j, on mutual fund i at moment t-1, $P_{j,t-1}$ is price of stock j at moment t-1, and $\Delta P_{j,t}$ is price variation between moment t and t-1.

Active Share, Equation 6, is a measure of active management introduced by Cremers & Petajisto (2009). It evaluates the differences between the weight in a stock in a given portfolio and the weight in the benchmark. Thus, as long as the portfolio differentiates from the benchmark, more active is the management.

$$Active\ Share_{i,t} = \frac{1}{2}\sum_{i=1}^{N} |w_{fund,i,t} - w_{index,i,t}| \qquad (6)$$

Where $w_{fund,i,t}$ is weight of asset i in the fund at period t and $w_{index,i,t}$ is weight of asset i in the benchmark at period t. It captures the overlap on assets between fund and benchmark.

Despite the fact that the active managers incur in stock selection to achieve the goal which should be outperform a benchmark, it is not enough to fully understand their abilities, because market timing plays a crucial role at the moment they select any asset to compose the portfolio. The Active Share is a good proxy for stock selection, because it considers the weight of all assets in the portfolio and the benchmark (Cremers & Petajisto, 2009). To view the market timing abilities, a reasonable proxy is tracking error, which includes the covariance matrix of returns, adding more weight on correlated active assets.

To analyze these two dimensions above and the ways to outperform the benchmark, we use the tracking error and Active Share. Equation 7 estimates the tracking error, as suggested by Cremers & Petajisto (2009).

$$R_{fund,t} - R_{f,t} = \alpha_{fund} + \beta_{fund}(R_{index,t} - R_{f,t}) + \varepsilon_{fund,t}$$

$$Tracking\ error = Stdev[\varepsilon_{fund,t}] \tag{7}$$

Where $R_{fund,t}$ is the return of the fund at moment t, R_f is risk free rate, R_{index} is the return of benchmark at moment t and the other parameters are obtained by regression.

Combining methods, we can deepen the analysis about active management by considering both stock selections and market timing. Figure 1 shows the matrix of active management and possible interpretations.
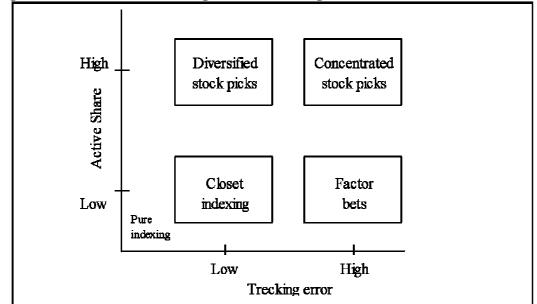
Figure 1: Matrix of Active Management considering stock selections and market timing.

Source: Prepared by the authors, Adapted from Cremers & Petajisto (2009).

As suggested by Cremers & Petajisto (2009), we argue that Active Share represents the fraction of portfolio holding that differ from the benchmark index, thus emphasizing stock

selection. Tracking error is the volatility of fund return in excess of the benchmark, so it emphasizes bets on systematic risk.

A comparison over the results obtained using Churn Rate and Active Share (associated with tracking error) provides us more robustness to identify nuances of active management. We addressed this by an amount turn over implemented (measured by Churn Rate) linked with stock selection and market timing practices performed (measured by Active Share and tracking error).

3.2. Active Management on Performance

We perform a regression seeking the relation between active management measures and the fund performance. The regression model follows Golec (1996) which find the impact of funds´ characteristics on funds´ performance.

Applying the same model to Brazilian market, econometric Equations 8, 9 and 10 defines the regressions and variables.

$$Performance_i = \beta_0 + \beta_1 ChurnRate_i + \gamma' X_i + \varepsilon_i \qquad (8)$$

$$Performance_i = \beta_0 + \beta_2 ActiveShare_i + \gamma' X_i + \varepsilon_i \qquad (9)$$

$$Performance_i = \beta_0 + \beta_1 ChurnRate_i + \beta_2 ActiveShare_i + \gamma' X_i + \varepsilon_i \qquad (10)$$

The variables for each mutual fund in the regression model are $Performance_i$ which correspond to the performance estimated of each fund i, measured by four ways previously presented (Rp, gross and net simple return rate; $Sharpe$, Sharpe ratio, 1966; $Alpha$, Jensen's alpha, 1968 and $T\&M$, Treynor & Mazuy, 1966) like previously explained, and both measures presented above: $ChurnRate_i$ and $ActiveShare_i$.

X_i corresponds to a vector of control variables, where: $TotalAsset$, that is a measure of size fund i (measured by mutual funds' total asset) ; $Benchmark$, that is return rate of benchmark index of fund i according to ANBIMA; $DClientClass$, is a dummy for a class of investors in fund i work wich is 1 if mutual fund's investors are specialized and zero otherwise; $FundAge$, that is age measured by years of fund i; $AdministrationFee$, that is a fee for management of fund i; $DPerformanceFee$, that is a dummy to indicate that fund i demands extra commission for performance; $InitialInvestment$, that is the initial amount required by fund i; $NumberShareholder$, that is a number of investors at fund i.

We test for multicollinearity and homoscedasticity including all control variables as proposed by Golec(1996). The White Test resulted in a p-value rather than 0.57, does not reject the null hypothesis of homoskedasticity of the error term. We performed a variance inflation factor (VIF) that resulted in 1.76 to the model and maximum individual variance 2.19, indicating absence of multicollinearity.

To test the assumption of normal distribution of error term εi and absence of serial autocorrelation of the model, we adopted the Jarque Bera and Durbin Watson test, respectively. The Jarque Bera test, which has as null hypothesis the normality, presented p-value of 0.533, not rejecting the null hypothesis of normality. The Durbin Watson test presented a result of 1.8211, indicating that it was in the absence region of serial autocorrelation.

4. RESULTS

We apply four performance measures in gross return and net return: simple return rate, Sharpe ratio (1966), Jensen ratio (1968) and Treynor & Mazuy (1966) aiming robustness and comparability with another studies. Table 3 shows the performance by each measure.

Table 3: Descriptive Statistics of the Performance of the Funds

Variables	Mean	Median	Std. Dev.	Min	Max
Return Gross	0,4912	0,4608	0,2641	-0,0196	1,0616
Return Net	0,4892	0,4648	0,2622	0,0017	1,0634
Sharpe Gross	-0,1301	-1,0824	4,6041	-7,9828	18,1689
Sharpe Net	-0,0404	-0,9918	4,9690	-7,5038	22,2150
Jensen Gross	0,0000	-0,0008	0,0050	-0,0118	0,0121
Jensen Net	0,0000	-0,0009	0,0050	-0,0118	0,0121
Treynor&Mazuy Gross	0,0017	0,0011	0,0056	-0,0109	0,0126
Treynor&Mazuy Net	0,0010	0,0002	0,0056	-0,0113	0,0128

Source: Prepared by the authors.

Gross performance is an estimation without fee effects, which means, adding the management and performance fees on the total return. Net performance is an estimation based on rate of return achieved by investors, after management and performance fees.

Table 4 shows the list of mutual funds in the sample and their respectively Churn Rates and Active Share rates. The first fund of the list is the most active by each measure, on the left side we have the Churn Rate list of funds and Active Share on the right side. The mutual funds are identified by a code, Anbid Id, and its list is organized in descending order by each measure: Churn Rate and Active Share.

We can see that several funds classified as high active by Churn Rate received lower classification by Active Share measure. In addition, we can find funds with higher Active Share and lower Churn Rate. There are only few funds with higher Churn Rate and Active Share or lower classification in both measures.

Table 4: List of Mutual Funds' Churn Rate and Active Share Estimation organized by descending order each measure

Anbid Mutual Fund Id	Churn rate (Mean)	#Position descending order	Anbid Mutual Fund Id	Active Share (Mean)
1988	35,830	1	176524	245,372
86010	31,606	2	111821	107,297
157661	31,139	3	160091	103,559
176524	30,778	4	52213	102,846
130680	29,954	5	94684	102,15
108081	28,639	6	67229	101,76
61395	28,465	7	70203	101,754
176559	28,352	8	141690	101,512
131679	27,828	9	108081	99,406
67229	26,486	10	153907	99,185
46124	25,898	11	167061	98,232
13684	25,642	12	175889	98,165
47872	25,600	13	131180	98,105
7412	25,438	14	40819	97,823
94684	24,843	15	1856	97,599
2331	24,665	16	123889	96,869
131180	24,622	17	116157	96,563
93386	23,376	18	131679	96,486
127531	23,034	19	173061	94,691
1856	22,081	20	150207	94,551
25127	21,995	21	60526	94,02
111821	21,583	22	48577	93,877
107034	21,573	23	93386	93,784
147753	19,643	24	127531	93,019
141690	19,630	25	125377	92,901
150207	19,593	26	25127	92,804
119873	19,478	27	86010	92,596
160091	18,969	28	141720	90,346
48577	18,669	29	127582	90,064
175889	18,186	30	44253	89,826
125377	17,327	31	171379	89,731
44253	17,092	32	147753	89,505
141720	16,651	33	157661	89,392
40819	16,304	34	46124	89,299
95664	15,328	35	1988	88,553
173061	15,153	36	61395	88,208
70203	14,326	37	2331	88,03
171379	13,982	38	119873	85,709
60526	13,581	39	107034	85,627
116157	13,069	40	78778	85,553
123889	12,163	41	95664	85,147
134066	11,286	42	47872	84,68
52213	9,994	43	176559	82,233
78778	9,695	44	13684	80,524
127582	9,261	45	134066	79,531
167061	8,696	46	7412	77,279
153907	4,447	47	130680	76,584

Source: Prepared by the authors.

Each measure displays discordant classification due the strategy adopted by each manager. Some managers follow the asset on the benchmark only inching in high turnover rate, but

keeping the portfolio closer to the benchmark. For funds with high Active Share ratios, the manager holds a distinct portfolio from the benchmark, and can display a lower Churn Rate. Important to highlight that a high Churn Rate mutual fund can rotate the assets in the portfolio but displays lower Active Share ratio.

Once an active management seeks to outperform benchmark and offers to investors a higher rate of return as possible, the activity only matters if related to a higher performance. The analysis of the Churn Rate and Active Share Rate list lead us to a comprehension about the effects on the performance. From this table we can suppose that active management alone does not imply better performance and discuss the ways of active management can produce good results, since we can see some mutual funds displaying higher Active Share and higher performance, and others having higher Churn Rate and lower performance and vice versa.

In order to understand the relation between both measures on the performance, we run the regression models defined by Equations 8, 9 and 10. First, only with Churn Rate to confirm that high levels of turnover have a negative impact on performance as supported by Bono Milan and Eid Jr. (2015). Table 5 evidences the results.

Table 5: Regression: Churn Rate Measure on Performance.

	Return Gross	Return Net	Sharpe Gross	Sharpe Net	Alpha Gross	Alpha Net	T&M Gross	T&M Net
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	P-value	P-value	P-value	P-value	P-value	P-value	P-value	P-value
C. Rate	**-0.0150**	**-0.0149**	-0.1204	-0.0912	**-0.0000**	**-0.0000**	**-0.0241**	**-0.0240**
	0.006	**0.006**	0.255	0.428	**0.018**	**0.019**	**0.000**	**0.000**
A. Share	-	-	-	-	-	-	-	-
Total	**7.8001**	**7.5721**	**8.2431**	7.0300	5.9700	5.6000	**1.0800**	**1.0700**
Asset	**0.000**	**0.001**	**0.052**	0.132	0.164	0.190	**0.000**	**0.000**
Benchmark	-0.0351	-0.0390	-0,4920	-0.3957	0.0010	0.0001	-0.0968	-0.9773
	0.680	0.651	0.769	0.829	0.543	0.573	0.322	0.308
Inv. Class	0.0779	0.0636	1.2453	1.1013	0.0022	0.0019	0.1342	0.1222
	0.312	0.404	0.399	0.497	0.136	0.192	0.122	0.149
Fund Age	**-0.0084**	-0.0077	-0.1820	-0.1954	-0.0001	-0.0001	-0.0024	-0.0013
	0.020	0.233	0.151	0.166	0.137	0.165	0.746	0.857
Manag Fee	-0.0686	-0.0677	-0.8032	-0.7227	-0.0010	-0.0010	-0.1160	**-0.1150**
	0.100	0.107	0.325	0.420	0.202	0.212	0.015	**0.014**
Perf Fee	**0.1362**	**0.1389**	1.9062	2.0513	0.0022	0.0023	0.1131	0.1168
	0.072	**0.064**	0.190	0.199	0.131	0.113	0.183	0.161
Initial Inv.	1.0001	9.1001	0.0000	0.0000	2.6800	2.5400	2.2500	1.4900
	0.432	0.472	0.151	0.123	0.281	0.304	0.876	0.915
N. Invest	-1.3701	-1,3707	-1.4000	-1.0600	-3.1800	-3.2400	-1.8100	-1.9700
	0.631	0.627	0.789	0.859	0.565	0.556	0.572	0.530
Constant	0.8291	0.8321	3.0517	2.5059	0.0053	0.0053	0.5362	0.5287
	0.000	0.000	0.307	0.445	0.077	0.076	0.002	0.002
R-Sq.	0.4505	0.4459	0.325	0.3011	0.416	0.4143	0.4773	0.4815

Source: Prepared by the authors. The table shows the results for Churn Rate measure on performance of the funds (Equation 8). The dependent variables are gross return, net return, Sharpe gross and net ratio, Treynor & Mazuy gross and net return. The variable of interest is Churn Rate - control variables: total asset, benchmark, Investor class, fund age, management fees, performance fees, initial investment required and number of shareholders/investors. All regressions apply the White Robust Matrix. Values under coefficients of each variable models represent the p-value of each test. The model included the application of the VIF-Variance Inflation Factor test, with a total average score of less than 2.2 for all models.

The results are consistent to Bono Milan and Eid Jr. (2015). The Churn Rate has a negative coefficient indicating a negative relationship between performance and high turnover rates. Moreover, the coefficient has statistical significance in all regressions, except to gross and net Sharpe ratio. Possibly the Churn Rate estimates capture part of volatility that is one of the parameters of Sharpe ratio calculation making weak the negative relationship with this performance measure.

Once the active management goal is to achieve better performance, a high turnover rate is harmful for investors based on the negative relationship with performance.

The second regression model applies only Active Share measure. We aimed to identify the relationship between Active Share and performance. Table 6 shows these results.

Table 6: Regression: Active Share Measure on Performance.

	Return Gross	Return Net	Sharpe Gross	Sharpe Net	Alpha Gross	Alpha Net	T&M Gross	T&M Net
	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value
C. Rate	-	-	-	-	-	-	-	-
A. Share	**0.0042** **0.003**	**0.0041** **0.003**	**0.1370** **0.000**	**0.1611** **0.000**	0.0000 0.126	0.0000 0.135	0.0010 0.591	0.0007 0.670
Total Asset	**5.7200** **0.003**	**5.0005** **0.005**	**8.0003** **0.002**	**8.0001** **0.002**	2.0008 0.600	1,0072 0.663	**6.0005** **0.011**	**6.0003** **0.012**
Benchmark	-0.0397 0.643	-0.0435 0.611	-0.6835 0.564	-0.6167 0.594	0.0009 0.570	0.0009 0.600	-0.0955 0.396	-0.0960 0.387
Inv. Class	0.1022 0.177	0.0879 0.245	**1.7351** **0.098**	1.6357 0.115	**0.0025** **0.097**	0.0022 0.140	0.1570 0.115	0.1443 0.141
Fund Age	**-0.0150** **0.012**	**-0.0143** **0.016**	**-0.2200** **0.008**	**-0.2160** **0.008**	**-0.0003** **0.013**	**-0.0002** **0.017**	**-0.0137** **0.079**	**-0.0127** **0.100**
Manag Fee	**-0.0787** **0.061**	**-0.0777** **0.064**	**-1.1615** **0.046**	**-1.1481** **0.046**	-0.0011 0.178	-0.0011 0.189	**-0.1167** **0.0034**	**-0.1151** **0.034**
Perf Fee	**0.1486** **0.046**	**0.1513** **0.042**	**2.0229** **0.049**	**2.1493** **0.035**	**0.0024** **0.109**	**0.0025** **0.095**	0.1320 0.177	0.1357 0.159
Initial Inv.	-1.0009 0.141	-2.0004 0.125	**-0.0003** **0.079**	**-0.0003** **0.063**	-1.0001 0.662	-1.0002 0.642	-2.0001 0.229	-2.0008 0.227
N. Invest	-1.0006 0.569	-1.0006 0.567	-2.0002 0.562	-2.0007 0.590	-3.0004 0.552	-3.0045 0.544	-1.0081 0.624	-1.0096 0.590
Constant	0.3186 0.088	0.3243 0.082	-9.7673 0.000	-12.044 0.000	-0.0010 0.790	-0.0009 0.812	0.2005 0.414	0.2117 0.381
R-Sq.	0.4605	0.4549	0.6605	0.7129	0.3773	0.3741	0.3060	0.3032

Source: Prepared by the authors. The table shows the results for Active Share measure on performance of the funds (Equation 9). The dependent variables are gross return, net return, Sharpe gross and net ratio, Treynor & Mazuy gross and net return. The variable of interest is Churn Rate - control variables: total asset, benchmark, Investor class, fund age, management fees, performance fees, initial investment required and number of shareholders/investors. All regressions apply the White Robust Matrix. Values under coefficients of each variable models represent the p-value of each test. The model included the application of the VIF-Variance Inflation Factor test, with a total average score of less than 2.2 for all models.

The results show that Active Share presents statistical significance coefficient for a positive relationship between Active Share and performance. Thus, once a portfolio differentiates from the benchmark, regarding the asset selection and allocation, it tends to lead to a higher performance. It suggests manager´s ability to outperform the benchmark by a distinct

portfolio, betting on specific assets. These findings are in line with studies that brings evidences that skilled managers can deliver superior results for investors.

A mutual fund is active even in low levels of turnover rate, but choosing a set of assets that differentiates from the benchmark. Thus, the winner active management strategy seems to be pick and hold assets in weight and proportion differentiating from the benchmark, not only rotating the assets in the portfolio keeping a similar weight.

Based on our results we can state that an appropriate analysis of active management should consider both measures, Active Share and Churn Rate; in order to understand what king of strategy the manager is involved and the expected return from it.

To provide robustness on analysis, we run the third regression: the full regression model using Active Share and Churn Rate together to identify the combined-measure relationship on the performance. Table 7 shows these results.

Table 7: Regression: Churn Rate and Active Share Measures on Performance.

	Return Gross	Return Net	Sharpe Gross	Sharpe Net	Alpha Gross	Alpha Net	T&M Gross	T&M Net
	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value	Coefficient P-value
C. Rate	**-0.0179**	**-0.0178**	**-0.2077**	**-0.1925**	**-0.0000**	**-0.0002**	**-0.0253**	**-0.0251**
	0.000	**0.000**	**0.003**	**0.005**	**0.006**	**0.006**	**0.000**	**0.000**
A. Share	**0.0049**	**0.0049**	**0.1458**	**0.1692**	**0.0000**	**0.0005**	0.0020	0.0018
	0.000	**0.000**	**0.000**	**0.000**	**0.038**	**0.042**	0.200	0.245
Total	**9.0002**	**8.0009**	**1.0002**	**1.0001**	**7.0005**	**7.0001**	**1.0001**	**1.1200**
Asset	**0.000**	**0.000**	**0.000**	**0.000**	**0.07**	**0.085**	**0.000**	**0.000**
Benchmark	-0.0429	-0.0467	-0.7210	-0.6614	0.0009	0.0000	-0.1001	-0.1006
	0.566	0.531	0.506	0.544	0.561	0.594	0.297	0.287
Inv. Class	0.0896	0.0752	**1.5887**	1.5000	**0.0023**	0.0020	0.1391	0.1266
	0.176	0.255	**0.097**	0.119	**0.099**	0.146	0.101	0.130
Fund Age	-0.0063	-0.0056	-0.1194	-0.1227	-0.0001	-0.0001	-0.0015	-0.0005
	0.267	0.318	0.147	0.138	0.177	0.212	0.837	0.944
Manag Fee	**-0.0822**	**-0.0812**	**-1.2021**	**-1.1858**	-0.0012	-0.0011	**-0.1217**	**-0.1201**
	0.025	**0.027**	**0.024**	**0.026**	0.128	0.137	**0.010**	**0.009**
Perf Fee	**0.1347**	**0.1375**	**1.8626**	**2.0007**	**0.0022**	0.0022	0.1124	0.1163
	0.039	**0.034**	**0.048**	**0.035**	**0.116**	0.101	0.178	0.157
Initial Inv.	-8.0064	-9.0047	-0.0000	-0.0000	5.4500	4.5900	-5.5900	-5.4900
	0.471	0.429	0.257	0.203	0.833	0.859	0.719	0.716
N. Invest	-1.6900	-1.7001	-2.3600	-2.1800	-3.5500	-3.6000	-1.9400	-2.0900
	0.489	0.488	0.505	0.541	0.502	0.494	0.536	0.498
Constant	0.4413	0.4467	-8.3492	-1.0730	0.0009	0.0010	0.3736	0.3837
	0.008	0.007	0.001	0.000	0.797	0.776	0.080	0.067
R-Sq.	0.5882	0.5839	0.7166	0.7543	0.4658	0.4624	0.4954	0.4963

Source: Prepared by the authors. The table shows the results for Churn Rate and Active Share measure on performance of the funds (Equation 10). The dependent variables are gross return, net return, Sharpe gross and net ratio, Treynor & Mazuy gross and net return. The variable of interest is Churn Rate - control variables: total asset, benchmark, Investor class, fund age, management fees, performance fees, initial investment required and number of shareholders/investors. All regressions applies the White Robust Matrix. Values under coefficients of each variable models represent the p-value of each test. The model included the application of the VIF-Variance Inflation Factor test, with a total average score of less than 2.2 for all models.

The last econometric equation provides us more robustness, once the full regression model improves the results displaying higher coefficient of determination (R^2) for all measures of performance, which indicates a better model adjustment. Moreover, the coefficients from Churn Rate and Active Share remain statistical significant, following the individual estimations, and the coefficients obtained by the control variables extend the effects for Churn Rate measure, consistently improving the analysis.

Again, our results indicate a positive effect by Active Share and negative by Churn Rate on mutual fund performance. Total asset is an important aspect and can directly affect performance. Chen et al. (2004) argue that a fund with large net asset counts for gains in scale, improving the fund net profitability. The performance fee imposes a positive effect and indicates the manager's beliefs in their personal ability to outperform the benchmark, and the effort in conducting operational activities, following Wermers (2000). The results obtained by control variables follow major part of the studies in the literature and do without to analyze them allowing us to concentrate in our contribution.

Once Churn Rate evaluates the level of buying and selling assets on a portfolio, not telling if the portfolio is differentiating from the benchmark, Active Share evaluates the differences between the weights in a stock in the portfolio and the benchmark. Thus, as long as the portfolio differentiates from the benchmark, more active is the management to Active Share measure. A combined-measure analysis can lead us to a better understanding about the type of active management that the manager is involved, avoiding misleading interpretation about the role of each strategy on the portfolio performance.

5. CONCLUSION

Different measures of active management can drive to misleading interpretation about the role of this strategy and its effects on the portfolio performance as documented in the international literature. Pursuing these effects in the Brazilian market, the major contribution of this paper is to identify, in Brazil, the differences between two active management measures, and show that a measure-combined analysis leads to a better perception of the managers' strategy.

The literature presents different measures of active management, but two of them traditionally applied in academic studies, Churn Rate and Active Share. The Churn Rate measures the level of buying and selling stocks in a portfolio, so called turnover ratio, while the Active Share estimates the stock picking and holding that differentiates from the benchmark. This study compares these two measures and evidence that Churn Rate presents a negative relationship to performance, while the Active Share measure has a positive effect, calling attention for the potential misleading results in some studies.

The results show that fund with high Churn Rate imposes a negative impact on the performance. Once the active management goal is to achieve better performance, a high turnover rate is harmful for investors. On the other hand, mutual funds involved in high Active Share rate impose a positive effect on the performance. Thus, once a portfolio differentiates from the benchmark, regarding the asset selection and allocation, it tends to lead to a higher performance. It suggests manager´s ability to outperform the benchmark by a distinct portfolio, betting on specific assets.

A mutual fund can be active even in low levels of turnover rate, but choosing a set of assets to differentiate the benchmark. Thus, the winner active management strategy seems to pick and hold assets in weight and proportion differentiating from the benchmark, not only rotating the assets in the portfolio, keeping similar weight.

Based on our results we can state that a combined-measure analysis can lead us to a better understanding about the type of active management that the manager is involved, avoiding misleading interpretation about the role of each strategy on the portfolio performance.

Despite the evidences obtained, there are some questions that have to be pointed out, such as the limited number of mutual funds in the sample and the analyzed period. These questions do not invalidate the evidences obtained, although they serve as a warning for the possibility of new evidences improving the amount of data.

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