Active vs. Passive ETFs

Besides the distinction between physical and synthetic, ETFs can also be differentiated into actively and passively managed categories. Since actively managed ETFs are one of the newest financial innovations (the first actively managed ETF in the ~~US~~U.S. was in 2008), there hasn't been a lot of literature about this topic so far. This can be explained by the small number of actively managed ETFs. Out of the 1,493 ETFs that have their availability in the United States, ~~are~~ only 65 of them are actively managed. That accounts for only $26 b~~B~~illion compared to over $3.7 t~~T~~rillion in passively managed ETFs.

However, the structural difference between these two kinds of ETFs can be described. While the passive ETFs just track a certain benchmark, the goal of actively managed versions is to beat their benchmark in order to offer investors an above-~~-~~average return. The concept of beating, and sustainable outperforming of the benchmark by portfolio managers, already created a discussion in the field of mutual index funds.

Rompotis (2013) transferred this question to the ETF segment in 2012 by comparing ~~the differences between~~ actively and passively managed ETFs. His main focus ~~herby~~ is the performance comparison between these two investment approaches. In particular, Rompotis (2013) compares the adjusted returns of nine pairs of ETFs by using the Jensen's model. His first findings show~~,~~ that the active ETFs have a ~~way~~ higher expense ratio (0.86%) compared to their passive counterpart~~sy~~ (0.16%). Furthermore, he discovers that the actively managed ETFs underperform their passively managed counterparties with an average return of 0.016% compared to 0.033%. Rompotis (2013) attributes this to a higher volatility of the active ETFs, ~~what~~ which also exposed to investors to a higher level of risk.

calculations based on the last trade prices, while his second method uses the last ask-bid prices. Both methods result in a negative average daily performance of the ETFs, which is between -0.041% and 0.391%. Similar results are found for the iIndex fFunds and Iindices with -0.047% and -0.044% respectively.

With help of the regression model, an indicator for risk is estimated. Besides the slope, the intercept and R-Ssquareds are calculated. The results show that the average beta for ETFs is almost one, which means that they track their indicesindex very closely. Index funds, on the other side, have a slightly lower beta, whichat makes them less sensitive the changes in the index.

In the second section of his research, Rompotis (2005) adapts the three different methods Frino and Gallagher (2001) established in their study from 2001 to measure the tracking error for the ETFs and iIndex fFunds. His first approach is to use the standard errors of the residual of the return regression. Secondly he calculates the standard deviation of return differences between the fFund and its benchmark, and lastly he calculates the average absolute return difference. While the first two methods come to the result that ETFs and Index Fundsindex funds have a very similar tracking error, shows the last method shows a significant tracking advantage for Index Fundsindex funds.

In the last section the returns and expenses are analyzed by regressing alphas and the average absolute return on the expense ratios. Additionally, the percentage spread of ETFs is calculated, since this can be seen as an other expense that isn't included in the expense ratio. The calculations show that ETFs have, oin average, a significantly lower expense ratio (0.228%) than the compared Index Fundsindex funds (0.423%). Additionally, a trace of positive relation between the performance and the expense ratio of ETFs can be found.

Performance

First, we analyze the performance of ETFs, mMutual fFunds and their benchmark indices. Therefore, the daily percentage returns have to be calculated. We calculate the daily returns for the ETFs, mMutual fFunds and iIndices by using the last price in equation (1):

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100\% \quad (1)$$

where R_t is the percentage return on day t and P_t the closing price of the fund or index on day t. Since ETFs can be traded during the day and have a spread, we want to apply a second approach. This time the mMid-point between the bBid and aAsk pPrice used as shown in equitation (2):

$$R_t = \frac{\frac{B_t + A_t}{2} - \frac{B_{t-1} + A_{t-1}}{2}}{\frac{B_{t-1} + A_{t-1}}{2}} \times 100\% \quad (2)$$

where, R_t is the percentage return on day t, B_t is the bBid price and A_t the aAsk price of the ETF. With the second approach we try to find confirmation for the results for the ETF returns that were calculated with the last price in equation (1). However, Aber et al., (2009) highlight in their study, that most of the trading during the day happens around the mMid-price. Nevertheless, for further calculations regarding the ETFs, the returns resulting from equation (1) are used, based on the assumption that the last price is equivalent to the mMid-price over a period of 12 years.

Tracking Error

The tracking errors measure the fund's ability to track or mirror its benchmark. In the previous literature, different approaches for the calculation of tracking errors have been used. Aber et al., (2009) and Svetina and Wahal (2008) used the standard deviation of differences

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EMPIRICAL RESULTS

In this section of this paper, the empirical results are presented. In detail we compare~~,~~ performance, risk, tracking errors, and expenses. To investigate possible differences between ETFs and ~~Mutual Funds~~mutual funds, we created a sample of 61 ETFs and 61 ~~Mutual Funds~~mutual funds plus all their corresponding indices. All funds are traded in ~~US~~U.S.-~~D~~dollar and available in the United States.

Performance

We begin the analyses of ETFs and ~~M~~mutual funds by comparing the performance over the last ~~twelve~~12 years. Table 2~~.~~ presents the average daily returns of ETFs, ~~Mutual Funds~~mutual funds, and their underlying indices. The sample is hereby grouped into the four categories of large-cap, mid-cap, small-cap, and fixed-income~~Large Cap, Mid-Cap, Small Cap, and Fixed Income~~. Taking a look at the average of each segment, the returns of the ETF clearly outperforms the ~~Mutual Funds~~mutual funds by 0.011% per day. However, on the other side, ETFs underperform their benchmark by in 0.01% on a daily basis. These results are contrary with the findings from Poterba and Shoven (2002), Gastineau (2004), and Chang et al. (2015) who stated that ~~Mutual Funds~~mutual funds have higher returns than ETFs. Since all daily average returns are positive, it also does not confirm Rompotis's (2005) results, who only found negative average performances. Milonas and Rompotis's (2006) statement~~,~~ that ETFs underperform their benchmark is consistent with our findings. Therewith, we partially have to reject the hypothesis that ~~Mutual Funds~~mutual funds outperform their benchmark since our findings show an underperformance in all four classes by 0.015% to 0.03% per day. The second part of our hypothesis has to be accepted since the average performance of ETFs is below the

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Expenses

In this section we are going to evaluate the different expense factors~~,~~ that have~~has~~ to be ~~taking~~ taken into consideration during the purchase, holding, and redemption of ETFs and ~~Mutual Funds~~mutual funds.

First, we take a look at the ~~Bid/Ask Spreads~~bid-ask spreads for ETFs that are displayed in Table 5. For the calculation of Spread 1 we used equation (7), while equation (8) was used for Spread 2. Both methods lead to very similar results although Spread 2 tend to be slightly lower.

The average ~~Spread~~ spread ranges between 0.45% for ~~Fixed~~ fixed-income~~Income~~ and 2.657% for the equity mid-~~-~~cap segment. The median on the other side is significantly lower and ranges from 0.11% to 1%. The lower median indicates that the average is driven by some much larger spreads. This statement finds confirmation in the maximum spread that reaches up to 16.69%. By measuring the average spread for the bottom 80% of our samples (these numbers are displayed in parentheses) we find a lower average spread across all categories. Such impact on the average spread by the top 20% can be caused by a very low trading volume of the ETF or a higher degree of illiquidity in the underlying asset on some days which leads to higher spreads (Agrrawal & Clark. 2009).

The area of ETF ~~Spread~~ spread analysis has not been completely explored, ~~what~~ which makes it more difficult to classify these results. A few somewhat comparable studies found spreads between 0.01% and 0.03% in the ~~US~~U.S. ~~Large Cap~~large-cap section (Ivanov, 2016), 0.082% to 0.794% for a broader range of ~~US~~U.S. equity (Engle & Sarkar, 2002) and 0.009% to 1.27% (Agrrawal & Clark, 2009). A possible explanation for higher spreads in our study could be the much longer observation period.

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Table 5. Spread Analysis