

Profitability of Sector Mutual Funds and ETFs During Market Development and Length of Investment Horizon

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Abstract: *This paper focuses on the profitability of investments into IT, finance, healthcare and consumer goods oriented active and passive mutual funds and ETFs and their profit/loss in different market situations (growing, stagnant and decreasing markets). The aim of the paper is to set recommendations for investors as regards which instrument (active or passive mutual fund or ETFs) brings higher return or lower loss over the time and market development and if investors can expect different results based on the sector orientation, which sector is more sensitive to bullish or bearish trends. Our results show that neither ETF nor passive mutual funds were able to beat the market, as the sector index brings better results than these investments in all situations. Within bearish trend, all sector ETFs and passive mutual funds bring the same results as sector index, only active managed mutual funds bring better results. The lowest loss during this period was achieved by active managed mutual funds focusing on healthcare. Bullish and stagnant markets bring quite the same results, but passive funds and ETF are more profitable than active mutual funds in growing markets.*

Keywords: *ETF, active investment, passive strategy, Sharpe ratio, risk*

JEL codes: *G11, G15*

Introduction

Active and passive portfolio management and/or differences in the returns of the active and passive managed funds (incl. the exchange-traded funds, or ETFs) have long been a subject of discussion not only in the investment world but maybe first of all in the academic sphere. Conclusions of the recently performed studies have

tended to suggest that the fund managers are not able to overcome the market in the long run and are lagging behind performance of the passive mutual funds and/or the benchmark copying ETFs.

This article is an extended version of Širůček et al. (2018), which was discussed at the international scientific conference European Financial System 2018. It uses the current literature review and also discusses the results achieved more deeply; it also tries to estimate the future development of selected investments.

The aim of this paper is to answer the question if active or passive management is better based on market developments and the structure of the portfolio. The research questions are if active or passive mutual funds or ETFs bring higher profit when the market grows or if the portfolio manager can, by an active approach, reduce the loss when the market falls; further if some branch is more sensitive to positive or negative developments. Is the reaction of portfolio managers of an active mutual fund faster when the market grows than the passive investment strategy? Can portfolio managers respond faster when the bubble bursts and reduce the loss in comparison with stable indexing? Is it worth paying higher fees for active managed investment to forerun higher losses on a declining market or gain higher profit when the market is growing? Is it worth focusing on active or passive managed investment focused on a certain sector? Is there any orientation of active or passive managed portfolio that brings better or worse results in a growing or a decreasing market? Is it possible to reduce losses when the market downtrends using a choice of some sectors? All these questions are topically tackled in the paper, as the existing literature generally focuses on the question if it is active or passive management that brings investors higher profits. We further included the elements of risk and sector analysis in our research.

1 Literature Review

According to ICI Factbook (2018), index mutual funds were first offered in the 1970s, followed by the index ETFs in the 1990s. At year-end 2017, index mutual funds and index ETFs together accounted for 35% of total net assets in long-term funds, up from 15% at year-end 2007. Nevertheless, active mutual funds were still the majority of fund assets (65%) in 2017. What are the reasons that investors prefer active managed funds?

Anadu et al (2018) mentioned that active strategies give portfolio managers discretion to select individual securities, generally with the investment objective of outperforming a previously identified benchmark but over the past couple of decades, there has been a substantial shift in the asset management industry from active to passive investment strategies. The shift to passive investing is a global phenomenon. According to Morningstar (2017) study, in the US, the shift has been especially evident among mutual funds (MFs) and in the growth of exchange-traded funds (ETFs), which are largely passive investment vehicles. As of December 2017, passive funds accounted for 37 percent of combined U.S. MF and ETF assets under

management, up from three percent in 1995, and 14 percent in 2005. The question is whether this shift is reasonable, whether passive investment strategy or index ETF is better than active management. It is a never-ending, not only academic question.

Jensen (1967) examined performance of 115 mutual funds for the period 1945-1964. Results of his study showed that the active fund managers were on average not able to overcome performance of the S&P 500 benchmark, as evidenced by the negative alpha coefficient. Only 39 funds had the alpha coefficient higher than 0. The same results were brought by Cox (2017), who used daily data since 1.3.2007 till 1.3.2017 on the US market. He stated that actively managed US funds significantly underperformed compared to their benchmarks, indicating that there is no benefit to active management in the US. Another study, dealing with comparison of performance of the passive and active investment strategy of the mutual funds, was done by Grinblatt, Titman (1989). The conclusion of their study, in principle, corresponds with Jensen's conclusion; the latter states that aggressive growth funds, growth funds and funds with a small volume of means may have the performance above average, but it is interesting that these funds at the same time reach the highest cost level and therefore their real performance, after deduction of the management costs, does not reach the performance above average. This suggests that the investors cannot benefit from capabilities of the portfolio managers managing these funds. A similar conclusion was reached by Malkiel (1995), who examined performance of the equity mutual funds in the period of 1971 and 1991. The conclusion of his study, therefore, confirms that the analysed active funds – after deduction of the total expense ratio (TER) - lagged behind the market performance, and he added that the investors pay to invest into the low-cost index funds rather than to rely on portfolio manager capabilities of the active mutual funds. One of the more recent studies concerning this issue was performed by Solin (2015). In his study, the author presents similar conclusions like the previous authors, namely that in the long-term investment horizon, most of the active managed mutual funds lag behind the risk-weighted benchmark yield. The author also pinpointed that, considering the taxes, the chance that an active mutual fund will beat a comparable passive mutual fund is almost zero.

Ippolito (1989) arrived at the conclusion opposite to that of the authors mentioned above. The study examined 143 funds in the period of 1965-1984 and compared their performance with the S&P 500 index. Its results suggest that the risk-weighted returns of the active mutual funds defeated the index even after deduction of all charges and costs. Kon (1983) stated that managers of the active managed funds have a certain ability of market timing. However, the other tests stress that the fund managers have little or no special information concerning unexpected market returns. Brown, Goetzmann (1995) study contributed by the fact that, based on the past performance of specific funds, we can assume which funds to avoid in the future, but there is no indication that if some funds defeated the benchmark in the past, they will beat it in the future as well.

Sharifzadeh, Hojat (2011) were concerned with comparison of performance of the ETFs and the index mutual funds in the period of 2002-2010. With respect to the fact that ETFs and the index funds are very similar by their nature and are considered substitutes, the authors tried to justify why popularity of the ETFs had been growing so steeply since 2000. They included 34 ETFs in total, broken down into 12 different investment styles (U.S. Large Cap, U.S. REITS, ...), and 66 index funds with the same investment styles were affixed to these ETFs. The authors de facto compared the performance of 230 various pair combinations in total (58% of cases). Results of this study show that in terms of the Sharpe ratio, the ETF funds defeated the index funds in 134 cases out of 230 pair combinations in total. Conclusions of this study suggest that there is no statistically significant difference in returns between ETFs and the index funds at the level of individual funds, and that the investors choose between these funds depending on specific characteristics of individual products and the tax benefits. Agapova (2011) investigated whether or not the traditional index funds and the ETFs can be considered substitutes. The study was performed with a sample of 171 index mutual funds and 11 ETFs in the period of 2000 and 2004. ETFs can be preferred by the investors with a higher liquidity, higher business needs and a higher tax sensitivity, whilst the traditional index funds can be preferred by the investors with a lower liquidity, lower business needs and a lower tax sensitivity. According to this study, the traditional index funds and the ETFs can be considered substitutes, but not perfect ones. Agapova also came to the conclusion that ETFs have on average a lower tracking error and higher post-tax returns than the index funds. Park, Jung and Choi (2014) established that ETFs and the index funds are substitutes, as the investors choose between these instruments on the basis of their specific investment characteristics. Bello (2012) conducted a study comparing the equity ETFs and the stock index funds over a long period and on a relatively large sample of funds. In particular, he included 468 index funds and 337 ETFs in total into his study, and their performance was tracked for the period of 2001 to 2012. Bello established that ETFs outperformed the index funds, but with a higher volatility. Furthermore, ETFs had a lower expense ratio, a lower portfolio turnover and fewer shares included in the portfolio, thus being less diversified than the index funds. Bello came to the conclusion that the ETFs had a greater tracking error and tracking error volatility than the mutual funds, which contradicts Kostovetsky (2003) absolutely.

The study by Harper, Madura, Schnusenberg (2006) dealt with comparison of performance of the international ETFs and the closed-end funds investing into the closed-end country funds. The study was performed based on monthly data for the period of 1996-2001. The authors confirmed that the ETFs have a low tracking error compared with their benchmark, i.e. that ETFs replicate their underlying index almost exactly. The conclusions of their study confirm the hypothesis that the ETF funds achieve higher returns on average than closed-end country funds. This claim is justified mainly by the fact that the ETF funds have a lower expense ratio. The authors also stated that the ETF funds have a higher Sharpe ratio on average than the corresponding closed-end country funds and hence the ETFs earn higher returns

than the funds utilizing the active investment strategy, which the closed-end country funds are based on. Rompotis (2009) brought an interesting study; the author compared performance of the index mutual funds and the ETFs within a single Vanguard "family". His analysis included in total 20 equity ETFs and 12 index mutual funds, and values of historical performance from the beginning of trading of the relevant fund till the end of 2006 were taken for each individual fund. Results of the study show that the ETFs and the index funds have similar average return and risk rate values. This means that Vanguard approaches these two alternative investments in a similar way. Furthermore, ETFs and the index funds achieve lower return and risk rate than their benchmarks.

2 Methodology

To compare the performance of the ETFs, index (passive) and active managed mutual funds, funds from four economic sectors, with the highest representation - according to S&P Dow Jones Indices (2018) in the S&P Composite 1500 index by the GICS sector categorization - have been chosen. These sectors are as follows: Information Technology, IT (24.4%, S&P 1500 Information Technology benchmark), Financials, FIN (15.3%, S&P 1500 Financials benchmark), Health Care, HC (13.4%, S&P 1500 Health Care benchmark) Cons Discretionary sector, CD (12.7 %, S&P 1500 Cons Discretionary benchmark).

Performance and risk rate of the funds is assessed in context with market development and its trend. Individual stages were monitored within the following periods:

- Decline stage - period from 01.10.2007 to 31.01.2009.
- Growth stage – period from 01.09.2011 to 31.01.2015.
- Stagnation stage - period from 01.03.2015 to 30.04.2016.

These periods were chosen according to the Chow (1960) procedure (the same approach was used e.g. by Rapach, Wohar (2004)), to test the null hypothesis of no structural change ($H_0: \delta = 0$) against the alternative hypothesis of a structural break in period k ($H_1: \delta \neq 0$). The Chow (1960) test is based on the Wald statistic:

$$F_k = \frac{(T-2) \cdot \sigma_R^2 - (T-4) \cdot \sigma_k^2}{\sigma_k^2} \quad (1)$$

Where:

$\sigma_k^2 = \frac{(\varepsilon_k' \cdot \varepsilon_k)}{(T-4)}$, $\sigma_R^2 = \frac{(\varepsilon_R' \cdot \varepsilon_R)}{(T-2)}$ and ε_k is the vector of least-squares residuals from:

$$r = X\beta^0 + X_{0k}\delta + \varepsilon \quad (2)$$

and ε_R is the vector of least-squares residuals from equation (2) with the restriction $\delta = 0$. Intuitively, we reject the null hypothesis of no structural break if the sum of squared residuals corresponding to the model with no breaks is significantly greater

than the sum of squared residuals corresponding to the model with a break in period k .

The paper uses methodology of calculation of the returns applied by Sharifzadeh and Hojat (2011). Returns of individual funds are calculated in the so-called Total Return form.

$$TR_m = \left\{ \frac{NAV_1 * \left(\frac{1 + Distribution}{Reinvestment\ NAV} \right) - NAV_0}{NAV_0} \right\} * 100 \quad (3)$$

Where:

| | |
|-------------------------|----------------------------------------------------------------------------------------|
| TR_m | monthly value of the Total Return |
| NAV_0 | value of the assets per one investment certificate at the beginning of the period |
| NAV_1 | value of the assets per one investment certificate by the end of the period |
| <i>Reinvestment NAV</i> | price of the share on the day when all capital and dividend profits are reinvested |
| <i>Distribution</i> | amount of dividend and capital gains that are reinvested within a given period of time |

The standard deviation was used to quantify the risk rate of individual funds.

$$Q_P = \sqrt{\frac{1}{n} * \sum_{i=1}^n (R_i - \bar{R})^2} \quad Q_A = Q_P \sqrt{12} \quad (4)$$

Where:

| | |
|-----------|--------------------------------------------------------------------|
| Q_P | monthly standard deviation |
| n | number of months |
| R_i | return on investment in month i |
| \bar{R} | average monthly e Total Return value of the investment in question |
| Q_A | annualized monthly standard deviation |

The Sharpe ratio is used to assess performance and risk rate. According to the Morningstar (2018), the arithmetic Sharpe ratio is calculated using the following formula.

$$Sharpe\ ratio_A = \frac{[\prod_{i=1}^n (1+R_i)]^{\frac{m}{n}} - [\prod_{i=1}^n (1+RF_i)]^{\frac{m}{n}}}{StDev_A} \quad (5)$$

$$StDev_A = \sqrt{\frac{1}{n-1} * \sum_{i=1}^n (R_i - \bar{R})^2} \quad (6)$$

Where:

| | |
|-----------|------------------------------------------|
| $StDev_A$ | annualized arithmetic standard deviation |
| R_i | return on investment for the period i |

| | |
|-----------|-----------------------------------------------------------------------------|
| RF_i | return on risk-free investment for the period i (risk-free interest rate) |
| m | number of periods (observations) per 1 year |
| n | total number of periods |
| \bar{R} | average return on investment over the reference period |

One of the components of the overall risk (standard deviation) can be reduced by a suitable diversification. The second non-diversifiable component is the rate of the systematic risk beta, measuring sensitivity of the investment to the movements of the selected market benchmark.

$$\beta = \frac{Cov(r_{Si}, r_m)}{(Q_m)^2} \quad (7)$$

Where:

| | |
|--------------------|----------------------------------------------------------------------------------------------------|
| $Cov(r_{Si}, r_m)$ | covariance between the rate of return of the investment and the rate of return of the market index |
| $(Q_m)^2$ | spread of market index return |

The Excess Return is the last indicator used for comparison of performance of individual funds. This indicator is calculated simply as the difference between the return of the fund and return of the benchmark, which the fund in question is compared with.

The coefficient of determination measures the relationship (correlation) between the fund and the selected benchmark and determines how many percent of the movements of the monitored fund can be explained by benchmark movements. According to Morningstar (2018), value of coefficient of determination 70-100% indicates a good correlation between the fund and benchmark returns, 40-70% indicates an average correlation between the fund and benchmark returns, and 1-40% indicates a low correlation. The coefficient of determination can also be interpreted so that in the case of high values of this coefficient, the market risk represents a high share in the total market risk and the chosen benchmark is suitable for comparison and vice versa.

Other important indicators for investors who decide to invest into mutual funds or ETFs is the Information ratio, which measures the added value of a portfolio manager. Goodwin (1998) defined the Information ratio as the average excess return per unit of volatility in excess return. Portfolio managers, mainly in active managed funds, can diversify their portfolio differently than the benchmark and can beat the benchmark. But if they do not replicate the benchmark, they get other profit than the benchmark and the tracking error measures it. It is the standard deviation of the difference between the profit reached and the benchmark profit. The information ratio measures if the tracking error achieved was successful, thus if it was redeeming or not.

$$IR = \frac{R_{MF} - R_B}{TE} \quad (8)$$

Where:

R_{MF} return of mutual fund
 R_B return of benchmark (index)
 TE Tracking error, calculated as:

$$TE = \sqrt{\frac{\sum_{i=1}^n (R_{MF} - R_B)^2}{n-1}} \quad (9)$$

3 Data

From each sector mentioned in methodology, 1 ETF, 1 index mutual fund (passive investment strategy), 1 active managed mutual fund (a large cap fund) and 1 active managed mutual fund (a small cap fund) were selected. Selection of the funds entering the analysis (for detailed list of funds see appendix) was performed objectively with strict adherence to the following criteria:

- Establishment of the fund before 2007 (i.e. adequate fund history).
- It must be a share (investment) fund.
- At least 90% of all fund assets are invested in US companies. At least 80% of all fund assets are invested in sector shares.
- ETF funds are designed, based on physical replication.
- The fund must have at least 3-star ratings by Morningstar on 28.02.2018.
- Option to choose automatic reinvestment of dividends or payment of dividends to the businessman account.
- Fund denominated in US\$.

4 Results

The profitability and level of risk of the selected active and passive mutual funds and ETFs were tested within three market stages –the growing market, stagnant market and during a period of decline. The aim was to find if there are differences between active and passive management and/or if there is another reaction within the selected sectors.

Table 1 shows that at the decline stage, outbreak of the financial crisis, a large uncertainty prevailed in the US stock market, with an average monthly standard deviation of around 5.74%. During this period, the US stock market recorded the average monthly losses of -3.40 %. At the growth stage, the US stock market recorded an average monthly return of about 1.5 %, with the lowest volatility compared to the decline and stagnation periods. From the results calculated for the stagnation phase, it follows that during this period the US stock market recorded only negligible returns, but with a high average monthly volatility of ca 3.89%.

Table 1 Performance of the S&P Composite 1500 Index in Individual Market Stages

| | Bearish market | Bullish market | Stagnant market |
|-------------------------------------|-----------------------|-----------------------|------------------------|
| Total return (p.a., %) | -35.32 | 17.95 | 0.34 |
| Average monthly profit (%) | -3.40 | 1.44 | 0.10 |
| Standard deviation (p.a., %) | 19.89 | 11.60 | 13.47 |
| Average monthly st.dev. (%) | 5.74 | 3.35 | 3.89 |
| Sharpe ratio | -1.87 | 1.54 | 0.02 |

Source: Author's own calculation

Table 2 shows the return and risk indicators of the analysed funds and their development in the period when the US stock market experienced a steep decline. We can say that the ETFs and the index mutual funds are developed nearly identically during the period of market decline, reaching similar monthly losses and monthly standard deviations. From the overall view, during the decline stage of the US market, the active managed mutual funds were doing better compared with the ETFs and the index mutual funds.

Table 2 Risk and Profit Profile of Funds on Bearish Market

| Fund | Sector | Total return (p.a., %) | Av. month. loss (%) | St. dev. (p.a., %) | Av. month. st. dev. (%) | Sharpe ratio (p.a.) | Excess return (%) | Beta | R² (%) |
|----------------------------|---------------|-------------------------------|----------------------------|---------------------------|--------------------------------|----------------------------|--------------------------|-------------|--------------------------|
| ETF | IT | -35.71 | -3.36 | 25.08 | 7.24 | -1.50 | -0.38 | 1.17 | 85 |
| | FIN | -61.19 | -7.08 | 33.92 | 9.79 | -1.86 | -25.86 | 1.30 | 58 |
| | HC | -18.77 | -1.60 | 16.95 | 4.89 | -1.22 | 16.55 | 0.68 | 63 |
| Passive MF | CD | -37.39 | -3.58 | 24.34 | 7.03 | -1.61 | -2.07 | 1.13 | 85 |
| | IT | -36.25 | -3.38 | 27.08 | 7.82 | -1.41 | -0.92 | 1.26 | 86 |
| | FIN | -55.63 | -6.11 | 31.84 | 9.19 | -1.80 | -20.30 | 1.24 | 59 |
| | HC | -19.12 | -1.62 | 17.94 | 5.18 | -1.17 | 16.21 | 0.73 | 65 |
| Active large cap MF | CD | -40.49 | -3.95 | 26.06 | 7.52 | -1.62 | -5.16 | 1.22 | 87 |
| | IT | -28.19 | -2.43 | 26.41 | 7.62 | -1.14 | 7.13 | 1.13 | 72 |
| | FIN | -52.70 | -5.76 | 26.00 | 7.50 | -2.10 | -17.38 | 1.07 | 67 |
| | HC | -19.79 | -1.61 | 22.80 | 6.58 | -0.95 | 15.54 | 0.95 | 68 |
| Active small cap MF | CD | -32.23 | -2.95 | 24.08 | 6.95 | -1.41 | 3.09 | 1.09 | 80 |
| | IT | -35.74 | -3.34 | 26.13 | 7.54 | -1.44 | -0.42 | 1.11 | 71 |
| | FIN | -32.53 | -3.10 | 17.59 | 5.08 | -1.95 | 2.80 | 0.41 | 21 |
| | HC | -26.28 | -2.37 | 18.59 | 5.37 | -1.51 | 9.05 | 0.70 | 56 |
| | CD | -35.04 | -3.28 | 24.40 | 7.04 | -1.51 | 0.29 | 1.07 | 76 |

Source: Author's own calculation, according to Morningstar (2018)

On average, the active managed funds had lower monthly losses and lower monthly standard deviation values; this fact is also linked with a better Sharpe ratio. We can therefore say that active managed mutual funds are more suitable for a declining market than ETFs and the index mutual funds, because they can better reallocate the assets and record lower losses. If we compare individual sectors, we can claim that the funds focused on the Financials sector were the worst. These funds reached the highest monthly losses with the highest volatility. In this case, however, the result is not surprising, as the Financials sector was at the start of the financial crisis. On the other hand, the funds from the Health Care sector reached the best results in the period when the US stock market declined steeply. The average monthly loss of the funds from this sector was only ca -1.80%, with the average monthly volatility of 5.5%, and the annualized excess return reached 14.34% on average. The ETFs, the index mutual funds as well as the active managed mutual funds developed almost identically within the Health Care sector. Interesting findings follow from the coefficient of determination. All analysed funds from the IT sector and the Cons Discretionary sector exceed 70%. Furthermore, based on the classic Beta indicator, which is higher than 1.0 for all these funds, we can state that in the declining market the funds from these sectors develop in the direction of the market, but with a significantly higher volatility. Funds from the Financials and Health Care sectors reach the absolutely opposite results; all funds from these sectors have the coefficient of determination lower than 70%, which means that the market explains less than 70% of their volatility, and hence the return on these funds is influenced and affected by other factors.

Table 3 Risk and Profit Profile of Funds on Bullish Market

| Fund | Sector | Total return (p.a., %) | Av. month. loss (%) | St. dev. (p.a.,%) | Av. month. st. dev. (%) | Sharpe ratio (p.a.) | Excess return (%) | Beta | R ² (%) |
|---------------------|--------|------------------------|---------------------|-------------------|-------------------------|---------------------|-------------------|------|--------------------|
| ETF | IT | 17.51 | 1.41 | 11.69 | 3.37 | 1.49 | -0.44 | 0.88 | 76 |
| | FIN | 19.31 | 1.59 | 16.33 | 4.71 | 1.18 | 1.36 | 1.29 | 84 |
| | HC | 26.10 | 1.99 | 10.07 | 2.91 | 2.59 | 8.15 | 0.71 | 67 |
| | CD | 21.82 | 1.73 | 13.08 | 3.78 | 1.66 | 3.86 | 1.06 | 88 |
| Passive MF | IT | 18.32 | 1.48 | 13.47 | 3.89 | 1.36 | 0.36 | 1.03 | 79 |
| | FIN | 18.58 | 1.53 | 15.40 | 4.44 | 1.20 | 0.62 | 1.24 | 88 |
| | HC | 27.00 | 2.06 | 10.55 | 3.04 | 2.55 | 9.04 | 0.74 | 67 |
| | CD | 22.03 | 1.75 | 13.76 | 3.97 | 1.60 | 4.07 | 1.12 | 89 |
| Active large cap MF | IT | 17.13 | 1.42 | 14.97 | 4.32 | 1.14 | -0.82 | 1.06 | 67 |
| | FIN | 17.12 | 1.44 | 16.86 | 4.87 | 1.01 | -0.84 | 1.32 | 82 |
| | HC | 35.79 | 2.66 | 13.90 | 4.01 | 2.57 | 17.8 | 0.83 | 48 |
| | CD | 22.14 | 1.77 | 14.60 | 4.22 | 1.51 | 4.18 | 1.03 | 66 |
| Active small cap MF | IT | 14.93 | 1.25 | 14.48 | 4.18 | 1.03 | -3.02 | 1.10 | 78 |
| | FIN | 18.22 | 1.52 | 16.63 | 4.80 | 1.09 | 0.27 | 1.27 | 78 |
| | HC | 27.84 | 2.11 | 10.29 | 2.97 | 2.70 | 9.89 | 0.71 | 63 |
| | CD | 18.78 | 1.52 | 13.58 | 3.92 | 1.38 | 0.83 | 1.03 | 78 |

Source: Author's own calculation according to Morningstar (2018)

Based on the calculated results in Table 3, we can state that the large cap active managed mutual funds reached the highest monthly return from all monitored funds at the growth market stage, on average and across all sectors. However, these large cap active managed mutual funds also revealed the highest risk rate, as their average monthly volatility was ca 4.35%. Taking in view the Sharpe ratio, we can say that on average and across all sectors, the ETFs and the index mutual funds clearly outperformed the active managed mutual funds. It can also be claimed that at the growth stage, the ETFs and the index mutual funds were less volatile and hence less risky than the active managed mutual funds. The previous claim can be supported by the Excess Return indicator, according to which the ETFs and the index mutual funds were on average and across all sectors (except the funds investing in the Health Care sector) more successful in reaching higher excess returns than the active managed mutual funds. In this case, the active mutual funds were able to bring higher excess returns to the investors than ETFs and the index mutual funds. When analysing individual sectors, the funds from the Health Care sector followed by the funds from the Cons Discretionary sector again reached the best results. Both in the period of decline and in the period of growth, the funds from the Health Care sector seem to be the most advantageous investment, taking in view the Sharpe ratio. On the other hand, funds from the Financials sector were once again the worst in this period, in terms of the Sharpe ratio, mainly due to a high volatility of these funds. Funds from the IT sector are relatively surprising, because at the growth stage they were unable - in the majority of cases - to beat average returns of the US stock market. From the point of the coefficient of determination, we can say that none of the analysed funds from the Health Care sector reached the eligibility limit of 70%, and it can be stated that the returns of the funds focused on this sector cannot be explained primarily by development of the US stock market, it means that there are even other active variables ensuring such good results of this sector. On the contrary, movements of all funds from the Financials sector are explained - from 70% as a minimum - by movements in the US stock market.

The stagnation stage was chosen for the period when a considerable uncertainty regarding future development on the US stock market was prevailing, and the S&P 1500 return index for this period was finally only 0.40%. During this period, 2 sharp drops were recorded, but they only had a short duration of several tens of days. In particular, the first drop in August 2015 was caused primarily by the fall of the Chinese stock and the US market responded by a drop as well. The second drop was reported at the beginning of 2016, when the negative mood lasting from summer of 2015 really hit; reports of the slowing Chinese economy and fall in oil prices did not have a positive impact on stock markets. Then there was a sharp rise in stocks till the end of 2017.

It was again confirmed that both the ETFs and the index mutual funds are developed almost identically, and there are only slight differences in their performance. If we compare performance of the funds from the point of the Sharpe ratio, we can say that the ETFs and the index mutual funds achieve slightly better results than the active managed mutual funds during the stagnation period across all sectors. Furthermore, it cannot be claimed explicitly that the ETFs and the index mutual funds would be less volatile than the active mutual funds, taking in view

the standard deviation indicator. In this period, the funds from the Cons Discretionary sector were explicitly the best, when (with a single exception) all the small cap active managed mutual funds reached a positive Sharpe ratio value. Further on, the funds focused on this sector showed the lowest volatility and the highest excess return values. Quite surprising is performance of the funds from the Health Care sector. The Health Care sector achieved the best results in the period of decline and even in the period of growth. However, during the stagnation period, this sector, together with the Financials sector, ranked among the worst ones.

Table 4 Risk and Profit Profile of Funds on Stagnant Market

| Fund | Sector | Total return (p.a.,%) | Av. month. loss (%) | St. dev. (p.a.,%) | Av. month. st. dev. (%) | Sharpe ratio (p.a.) | Excess return (%) | Beta | R ² (%) |
|---------------------|--------|-----------------------|---------------------|-------------------|-------------------------|---------------------|-------------------|------|--------------------|
| ETF | IT | 0.12 | 0.11 | 16.65 | 4.81 | 0.00 | -0.22 | 1.12 | 82 |
| | FIN | -1.73 | -0.05 | 15.68 | 4.53 | -0.12 | -2.07 | 1.07 | 84 |
| | HC | -1.47 | -0.03 | 15.50 | 4.48 | -0.10 | -1.81 | 0.96 | 69 |
| | CD | 5.29 | 0.51 | 14.35 | 4.14 | 0.36 | 4.95 | 1.02 | 91 |
| Passive MF | IT | -2.33 | -0.09 | 17.13 | 4.95 | -0.14 | -2.66 | 1.19 | 87 |
| | FIN | -0.97 | 0.01 | 15.13 | 4.37 | -0.07 | -1.31 | 1.03 | 84 |
| | HC | -2.88 | -0.13 | 16.62 | 4.80 | -0.18 | -3.22 | 1.00 | 66 |
| | CD | 2.54 | 0.28 | 13.81 | 3.99 | 0.17 | 2.20 | 0.99 | 92 |
| Active large cap MF | IT | -1.24 | 0.03 | 19.00 | 5.49 | -0.07 | -1.58 | 1.10 | 60 |
| | FIN | -5.67 | -0.40 | 14.94 | 4.31 | -0.39 | -6.01 | 1.04 | 87 |
| | HC | -7.83 | -0.52 | 19.76 | 5.70 | -0.40 | -8.17 | 0.97 | 43 |
| | CD | 9.76 | 0.85 | 13.41 | 3.87 | 0.72 | 9.42 | 0.87 | 75 |
| Active small cap MF | IT | -0.91 | 0.02 | 16.25 | 4.69 | -0.06 | -1.25 | 1.11 | 85 |
| | FIN | -8.27 | -0.62 | 15.85 | 4.58 | -0.53 | -8.61 | 0.95 | 65 |
| | HC | -5.81 | -0.37 | 17.62 | 5.09 | -0.34 | -6.15 | 0.93 | 50 |
| | CD | -3.77 | -0.26 | 12.73 | 3.68 | -0.31 | -4.11 | 0.81 | 73 |

Source: Author's own calculation, according to Morningstar (2018)

The paper focuses on the comparison of performance of individual funds at the stages of decline / growth and stagnation of the US stock market. Based on the results achieved for all monitored indicators, the active managed mutual funds prospered better than ETFs and the index mutual funds. Compared with the passive funds, the active managed mutual funds have, on average, lower monthly losses and even lower volatility values, resulting in better Sharpe ratio values. Thus, we can conclude that active managed mutual funds appear to be more suitable for a declining market than the ETFs and the index mutual funds, as managers of these funds are able to reallocate assets better and record lower losses. Moreover, the assumption and conclusion of the Sharifzadeh and Hojat (2011) study was also confirmed, as even in the declining market the ETFs and the index mutual funds are developing very similarly and the differences in performance are only negligible.

From this finding, we can conclude that ETFs and the index mutual funds can be considered substitutes.

If we consider the large cap and the small cap mutual funds one complex whole, we can also conclude from the achieved results that in the analysed period of growth, the active funds reached almost identical returns as the passive funds. However, the passive funds reached this return with a lower risk rate compared with the active mutual funds, and therefore had better Sharpe ratio values. Based on this finding, we can also claim that ETFs and the index mutual funds appear to be more suitable for the growth market. If we consider "large cap" and "small cap" mutual funds separately, then it can be stated that the "large cap" mutual funds achieved on average the highest returns, volatility and excess return (exceeding the benchmark) compared with all other analysed funds. In any case, thanks to their high volatility, the Sharpe ratio values were low, i.e. the passive funds were a better choice in this case as well.

During the stagnation period, both the ETFs and the passive mutual funds were, on average, slightly better than the active mutual funds, as they achieved better results in terms of the Sharpe ratio.

If we analyse the whole observed period, we divided it into three sub-periods because we also want to measure if the active or passive management brings investors better results in short (3 years) term, medium (5 years) term and long (10 years) term investment periods. This was measured by the Information ratio, which measured whether it is advisable for the active manager to replicate the benchmark or not.

The tracking error (TE) is a significant variable, especially for investors who prefer passive managed funds or ETFs, because the aim of these funds is the highest tracking of benchmark and so the value should be the lowest. Our analysis confirms this, as all funds or ETFs from all sectors reached very low values of the tracking error. If we compare these values with active funds, their TE was 4-5 times higher. The highest TE was brought by the active small cap mutual fund focused on health care sector, but this deviation from benchmark brings investors only 0.38 % of added profit.

Considering the Information ratio, as a variable important for investors choosing funds, it was negative in many cases. From this point of view, only active large cap managers from health care and consumer discretionary on the medium- and long-term investment horizon can beat the market and their deviation from the benchmark brings added value and is worth for investors, because they were successful by set-up their portfolios. Grinold, Kahn (1995) mentioned that if the Information ratio is around 0.5, the investment can be called "good". If the Information ratio is closer to 1 or higher, they named these situations "exceptional".

Table 5 Relative yield on selected periods

| Fund | Sector | Tracking Error (%) | | | Information ratio | | |
|---------------------|--------|--------------------|------|-------|-------------------|-------|-------|
| | | 3Y | 5Y | 10Y | 3Y | 5Y | 10Y |
| ETF | IT | 2.07 | 2.42 | 2.69 | -0.18 | -0.26 | -0.23 |
| | FIN | 1.22 | 1.26 | 1.70 | -0.67 | -0.03 | -0.53 |
| | HC | 0.61 | 0.67 | 0.96 | -0.62 | -0.84 | -0.58 |
| | CD | 1.08 | 0.91 | 1.17 | 0.37 | 0.14 | 0.07 |
| Passive MF | IT | 0.87 | 0.97 | 0.82 | -0.95 | -0.32 | -0.18 |
| | FIN | 0.70 | 0.78 | 1.46 | -0.12 | -0.51 | 0.50 |
| | HC | 1.75 | 1.47 | 1.21 | -0.21 | 0.00 | 0.04 |
| | CD | 0.77 | 0.88 | 1.14 | -0.73 | -0.17 | -0.14 |
| Active large cap MF | IT | 7.61 | 7.15 | 6.60 | 0.48 | -0.05 | 0.08 |
| | FIN | 3.05 | 4.10 | 6.92 | -1.39 | -0.65 | -0.07 |
| | HC | 7.75 | 7.70 | 7.07 | 0.08 | 0.59 | 0.63 |
| | CD | 4.61 | 5.26 | 6.82 | 0.75 | 0.48 | 0.52 |
| Active small cap MF | IT | 4.06 | 3.94 | 6.80 | -0.67 | -0.22 | 0.33 |
| | FIN | 4.57 | 4.54 | 10.50 | -1.56 | -0.70 | 0.38 |
| | HC | 5.06 | 4.46 | 4.37 | -0.12 | -0.05 | -0.38 |
| | CD | 4.92 | 4.53 | 5.74 | -1.07 | -1.24 | -0.49 |

Source: Author's own calculation, according to Morningstar (2018)

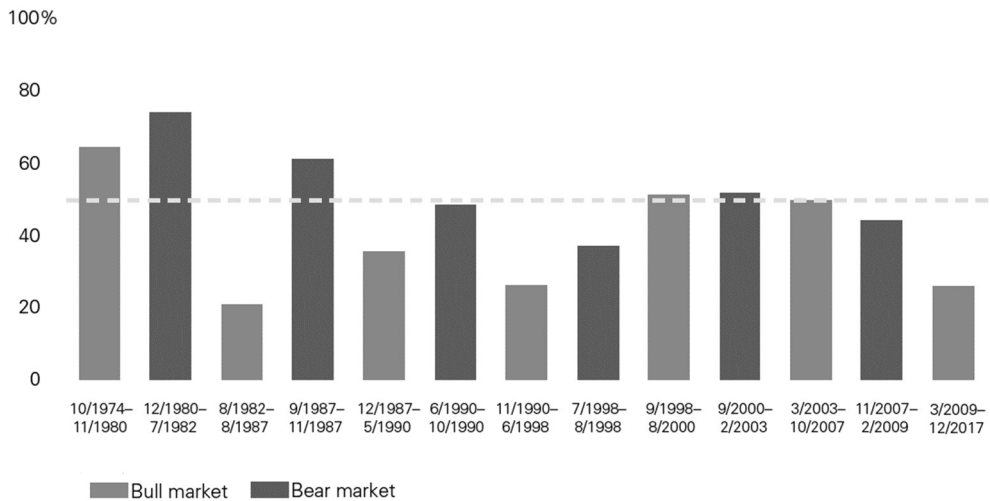
Conclusion and Discussion

Based on the performed analysis and the obtained results, the following investment recommendations can be defined.

The active managed mutual funds seem to be a more appropriate product for declining markets, as at the stage of decline they were able to reallocate assets more flexibly and to record lower losses than ETFs and the index funds. Passive funds lose this ability due to their specific design. This was also confirmed by Sun, Wang and Zheng (2009), who mentioned that the reason why investors may favour active funds is their flexibility in portfolio selection, which may be especially important during the down market. While index funds face the rigid requirement of holding onto a certain portfolio (e.g. S&P 500 index), even when it suffers a dramatic downturn, active funds can avoid further losses by cutting their positions in the losing stocks. Therefore, active funds are more likely to beat the passive index funds during the down market. On the contrary, the funds with passive portfolio management performed better on the bullish market. In the period of stagnation with a high uncertainty about future market development, ETFs or the index mutual funds are also more suitable, because during this period the portfolio managers can respond quickly to short-term steep changes in the market by rapidly changing their asset portfolio and may not always have a "good luck" when

selecting the shares. This was confirmed in the Vanguard (2018) study, which focused on the period from 1974 to 2017 and found that there have been some bear markets during which more than half of active managers outperformed and others during which they did not. More recently, 52% of active managers outperformed during the dot-com crash. However, just 44% of active managers outperformed during the global financial crisis.

Figure 1 Percentage of Active Managers Outperforming During Market Cycles



Source: Vanguard (2018)

If the investor wishes to invest only and exclusively in some of the passive managed funds, we recommend selecting the ETFs or the index funds rather in terms of their availability, brokerage fees and tax impacts. Based on the achieved results, the difference in performance and risk rate between these funds is only negligible, and these funds can be considered substitutes (see Sharifzadeh, Hojat (2011)).

If the investor wishes to invest only and exclusively in active managed mutual funds, it is more advantageous to select the funds that have been on the market for a long time and have low TER indicator values (up to 1.0%), high ratings from various agencies such as Morningstar, and a very high volume of managed assets (in the order of billions of US\$). We also recommend selecting the funds from the sectors that have a long-term growth potential (we are not speaking about the Cons Discretionary sector). This was also confirmed by Vanguard (2018), who mentioned that index funds are a great place to start, but active managed funds can play an important role in building a diversified portfolio. This can be compared with our results and recommendation that actively managed funds bring better results in the growing period. Rowley (2017) added three keys to success with active management: choose top talent, at a low cost (compare with our recommendation regarding TER), and then practice patience through the inevitable ups and downs in the markets.

The Health Care sector can be included among the sectors suitable for investing. Health is the most valuable commodity and we may assume that this sector will maintain long-term stable returns and low losses in the periods of crisis. Moreover, renewable resources, etc. can be included among such sector(s). A small investor without a profound investment experience should keep well clear of the volatile sector(s) such as the Financials sector, which seems to be the riskiest according to our findings. Naturally, these results were affected by the financial crisis which occurred during the period observed. However, for the future, we (and investors) may expect that - despite certain regulations in this sector - new or even exotic investment instruments, which may cause further future financial crises, will appear. PWC (2018) found, that regulatory compliance is the most important challenge that US and European banks will have to solve in the future. EY (2018) study added that banks also expect growing costs in the following several years, related to the implementation of new legislative rules or with robo and fintech instruments (AI).

From the point of diversification, ETFs and the index mutual funds are explicitly more appropriate than the active managed mutual funds, as the passive funds offer a wide diversification with the minimum costs (low TER), precise reference index copying and low market volatility.

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Appendix

| Ticker | Fund name | Sector | Issuer | Founded | NAV | Benchmark | Morningstar rating | Sector share | US stock share | Cash share | Exchange |
|--------------------------------------|-------------------------------------------|---------------------------|---------------|---------|---------------|------------------------------------|--------------------|--------------|----------------|------------|-----------|
| ETF | | | | | | | | | | | |
| XLK | Technology Select Sector SPDR Fund | IT | SSGA | 1998 | 21.9 bil. USD | S&P Technology Select Sector TR | **** | 82.40% | 98.00% | 0.11% | NYSE ARCA |
| XLF | Financial Select Sector SPDR Fund | Finance | SSGA | 1998 | 33.0 bil. USD | S&P Financial Select Sector TR | *** | 99.78% | 99.84% | 0.16% | NYSE ARCA |
| XLV | Health Care Select Sector SPDR® Fund | Health care | SSGA | 1998 | 16.3 bil. USD | S&P Health Care Select Sector TR | *** | 99.37% | 99.68% | 0.32% | NYSE ARCA |
| XLY | Consumer Discretionary Select Sector SPDR | Consumption Discretionary | SSGA | 1998 | 13.9 bil. USD | S&P Consumer Disc Select Sector TR | ***** | 88.20% | 100.19% | -0.19% | NYSE ARCA |
| Passive mutual funds | | | | | | | | | | | |
| VITAX | Vanguard Information Technology Idx Adm. | IT | Vanguard | 2004 | 20.9 bil. USD | MSCI US IMI/Info Tech 25-50 GR | **** | 86.59% | 97.39% | 0.31% | Nasdaq |
| VFAIX | Vanguard Financials Index Admiral | Finance | Vanguard | 2004 | 8.9 bil. USD | MSCI US IMI/Financials 25-50 GR | **** | 98.32% | 99.93% | 0.07% | Nasdaq |
| VHCIX | Vanguard Health Care Index Admiral | Health care | Vanguard | 2004 | 8.2 bil. USD | MSCI US IMI/Health Care 25-50 GR | **** | 98.55% | 99.54% | 0.31% | Nasdaq |
| VCDAX | Vanguard Consumer Discretionary Idx Adm. | Consumption Discretionary | Vanguard | 2005 | 2.9 bil. USD | MSCI US IMI/Consumer Disc 25-50 GR | **** | 86.09% | 97.79% | 0.85% | Nasdaq |
| Active large cap mutual funds | | | | | | | | | | | |
| SLMCX | Columbia Seligman Comms & Info A | IT | Columbia | 1983 | 6.7 bil. USD | S&P North American Technology TR | **** | 91.32% | 89.90% | 1.43% | Nasdaq |
| FIDSX | Fidelity Select Financial Services Port | Finance | Fidelity | 1981 | 1.3 bil. USD | S&P 500 TR | *** | 98.04% | 98.91% | 1.09% | Nasdaq |
| PRHSX | T. Rowe Price Health Sciences Fund | Health care | T. Rowe Price | 1995 | 12.0 bil. USD | S&P 500 TR | ***** | 96.57% | 95.18% | 0.29% | Nasdaq |
| FSPRPX | Fidelity Select Retailing Portfolio | Consumption Discretionary | Fidelity | 1985 | 2.3 bil. USD | S&P 500 TR | ***** | 88.74% | 90.22% | 4.39% | Nasdaq |
| Active small cap mutual funds | | | | | | | | | | | |
| STPAX | Saratoga Technology & Comm. A | IT | Saratoga | 1997 | 57.1 mil. USD | S&P 500 TR USD | **** | 82.01% | 91.54% | 1.62% | Nasdaq |
| HILFNX | Hennnessy Large Cap Financial Investor | Finance | Hennnessy | 1997 | 38.4 mil. USD | Russell 1000 Financial Services TR | **** | 94.70% | 97.92% | 2.08% | Nasdaq |
| IGHCX | ICON Healthcare Fund Class S | Health care | ICON Funds | 1997 | 73.6 mil. USD | S&P 1500 Health Care TR | *** | 97.40% | 98.69% | 1.31% | Nasdaq |
| RYRIX | Rydex Retailing Fund Class Investor | Consumption Discretionary | Rydex Funds | 1998 | 32.2 mil. USD | S&P 500 TR | *** | 71.12% | 95.11% | 0.00% | Nasdaq |