

# Investment in Today's Turbulent Markets

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*Abstract:* Investment can increase your wealth. However, not everyone knows the inherent risks involved in investing or how to strike a correct balance between risk taking and making a profit. There are two ways in which to achieve the target - either to ask professionals or consultants for their choice of what they believe to be the best investment alternative(s) or to determine our own strategies in selecting our own risk level and attempt to find our own best investment alternatives. This paper will briefly describe some possibilities for how prospective investments with the knowledge of mutual funds can be made; some basic methods for how to analyse such information, and how to create the right strategy given the investor's risk and return goals. This paper will present an alternative option, without the need to ask or pay for professional recommendations.

*Key-Words:* Investment, mutual funds, risk, stock, bond, market, own strategy, profit.

## 1 Introduction

The glory days of mutual funds are over. The brutal collapse of financial markets a few years ago did not exactly increase confidence in them [10]. However, this was not the end of mutual funds, because they remain a viable investment vehicle for many people; although they should be very cautious. In truth, mutual funds are still the best way to achieve long-term financial goals for many of us. From observing the history of financial markets, more information can be collected and we can hope that, after the passage of time, they will become stable once again.

One of the advantages of mutual funds is that they are diversified [11]. There are many such funds worldwide that offer a numerous variety of benefits and risks and which, when combined with the approach a client chooses, can offer a very good profit result, even in difficult times for investing.

Due to the short history of these investments in the Czech Republic, the comparison of funds based in the Czech Republic with those of foreign funds was chosen. Specifically, the performance of Czech, American and European funds was compared.

## 2 Problem Formulation

Mutual funds are good financial instruments if you know how to use them to your advantage. The first decision one has to consider is timing [2] Time plays a very important role, because mutual funds

are usually not short term investments, but rather long term investments, for the reason that one has to expect the possibility of changes in the market in the long term. It is also necessary to keep them long enough to ride out business cycles as they occur. This means holding them for at least 5 years, but it is, probably, better to keep them for 10 to 20 years. As one can see, investing in mutual funds is rather similar to investing in real estate.

The second step is to obtain enough information to decide which funds to choose. It is necessary to obtain reliable data in order to select the best funds in the market, both foreign and domestic.

The third step is to reduce the risk, with the help of diversification.

For all of these decisions, it is necessary to understand the performance of a fund and the risk for that investment.

The financial markets have been very uncertain, especially in the last five years [12]. What is the difference between risk and uncertainty? While it might seem like the same terminology, it is not quite so. Risk can be quantified, which means that there is a measurable probability of possible outcomes. The probabilities of outcomes can be attained either by deduction or induction. For example, economists induce probability distributions from stock market returns using the history of past returns.

Contrary to risk, uncertainty is not quantifiable. In terms of uncertainty, the situation around the world is not capable of being well charted. Our

world view might be insufficient, or the way the world operates might change, so that past observations become obsolete. Typically, when making an investment decision, both risk and uncertainty are present. Given that risk is quantifiable, most of the literature, on the subject of financial markets, deals predominantly with risk, but not with uncertainty. However, complete ignorance of uncertainty may result in poor investment.

Financial markets' uncertainty relates to imperfect information about how the world is behaving. It is important to ask oneself: how well understood are the processes and causes that generated certain historical returns when observing a certain financial security? A second question is: If there was perfect information available about these processes and causes, can one assume that the same relation between cause and effect will also apply for the future? Uncertainty relates to the basic question, whether the world will behave the same tomorrow as it has today.

## 2.1 Indicators showing performance and risk

### 2.1.1 Performance indicators

A fund's performance should be compared within the same category of funds. For example, there is big difference between funds that focus on stocks and those that focus on bonds. It is also better to do a comparison over a long time period, because the data is less affected by cyclical bull and bear markets if a longer period is chosen. It is necessary to know if fund costs and expenses, such as: management salaries, advertising, operating costs, duties and taxes etc. are deducted before the publishing of return results. If not, it might be that the profit will shrink because of these "invisible" costs and the fund might not be such an optimal choice.

### 2.1.2 Risks indicators

Time is the most important indicator. Time is very important in any financial activity and the longer the time period, often means, the greater the risk [3]. It works the same way in mutual funds. The risk can be further influenced by the interest rate and, of course, by changes in monetary markets, if some foreign currency is used. There is, more or less, only one risk-free investment – state bonds provided they are issued in some relatively safe country, but, in this case, it is not possible to talk about

investment in mutual funds. However, we should underline the adjective "safe", because....How do we define a "safe country" nowadays?

*Measurement of turnover.* It may not appear very relevant to cost, but if a particular fund trades its securities often, there are transaction fees applied which increases the cost of the fund and lowers its net profit.

*Management and its changes.* When there is a long time period associated with the favourable performance of a particular fund and the good performance was as a result of good management, a change in management can cause certain problems.

William J. O'Neil [4], author of the book, "How to Make Money in Stocks", suggests a different approach. His method of making money with mutual funds is based on his strategy, "CAN SLIM", which has to do with choosing the right growth stock based on indicators that show significant growth, e.g.: growing earnings per share, growing sales, being a leader in the industry or sector, and correctly timing the investment. When it comes to mutual funds, O'Neal suggests that the only type of fund worth investing in is a U.S. - based growth stock fund. He, also, suggests that the minimal time for investment should be at least 15 years, and that the fund must be one of the top performers in the growth fund group.

### 2.1.3 Methodology

The chosen investment companies based in the United States are: Fidelity Investments, Vanguard Group, Morgan Stanley, and American Funds. All of these companies manage certain mutual funds. The data was collected from web pages at [www.finance.yahoo.com](http://www.finance.yahoo.com) [6] and verified on [www.morningstar.com](http://www.morningstar.com) [7, 15]. Prices were adjusted for dividends and operating costs.

In the Czech Republic, the following investment companies and their funds were chosen: Investiční společnost České spořitelny a.s. (ISČS), Investiční kapitálová společnost Komerční banky a.s., ČSOB Investiční společnost a.s., ČP Invest a.s. [8]. The historical prices were acquired from the web page of a particular fund and verified on the web pages at <http://trhy.mesec.cz/fondy>.

German mutual funds work under the management of the Deutsche Bank AG and the prices were acquired from their web page.

French funds are managed by the group BNP Paribas. Historical prices were mostly acquired from the official web pages of this bank, with the exception of one particular fund found in the pages [www.conseq.cz](http://www.conseq.cz).

British funds are managed by the group Barclays PLC. Prices were acquired from their official web page.

The last funds analysed are globally based. These funds are members of the investment group Franklin Templeton. They are specifically stock funds: FT Asian Growth Fund and FT Latin American Fund. These stock funds were added because they were recommended by an investment-consultant based on the web pages [www.investicni-konzultant.cz](http://www.investicni-konzultant.cz) [9] which offer advice on mutual fund investments. These two funds were specifically offered as a good investment opportunity.

The funds are measured with respect to absolute profit/loss without the consideration of risk, the standard deviation of a 5 years period recalculated to 1 year to emphasise the risk, beta coefficient, Sharpe ratio, Treynor ratio and coefficient of variation [2].

The purpose of all these calculations is to discover if a certain fund could be considered a good investment when taking risk into consideration [1].

The calculations are performed in the following manner:

1. Profitability of funds – arithmetic and geometric means. The arithmetic mean is calculated on a monthly basis and was used as the fund's average return in the Sharpe and Treynor ratios.
2. Standard deviation – is the rate of variability as the standard rate of total risk of individual assets and portfolios.

$$s_x = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2}$$

3. Beta coefficient – for this indicator it is necessary to have data from the broader market. Beta measures the systematic risk. There are many benchmarks used, such as the general market, e.g. the S&P 500 or EuroStoxx 50. The logic was to find a benchmark that is the most related to the assets of a certain fund. Beta shows changes in the value of a fund, if the market (the benchmark) changes. If the value of the coefficient is 1, then the fund will change in the exact same proportion as the market.
4. Coefficient of determination  $R^2$  - shows the percentage of changes that can be explained by the changes in the market (the benchmark). The higher the coefficient of determination, the more we can rely on beta.  $R^2 = \sigma_i / r_i$

$\sigma_i$  = standard deviation of assets  $i$

$r_i$  = average of profitability of assets  $i$

5. Sharpe ratio - calculated by dividing the excess average return by the standard deviation of a certain fund.

$$SR = (r_i - r^*) / \sigma_i$$

$r_i$  = average profitability of assets  $i$

$r^*$  = risk-free rate of profitability

$\sigma_i$  = the standard deviation of profitability of assets  $i$

6. Treynor ratio – calculated similarly to the Sharpe ratio of a fund, but instead of using the standard deviation, the excess return is divided by the beta, (i.e. the market risk).

$$TR = (r_i - r^*) / \text{Beta}_i$$

$r_i$  = average profitability of assets  $i$

$r^*$  = risk-free rate of profitability

$\text{Beta}_i$  = beta coefficient of assets  $i$

7. Coefficient of Variation –

$$CV = (\sigma_i / r_i)$$

$\sigma_i$  = standard deviation of profitability of assets  $i$

$r_i$  = average profitability of assets  $i$

### 3 Problem Solution

The following figure (Figure 1) shows an example of a bar graph which was made for all types of mutual funds (i.e. stock funds, mixed funds and bond funds). Figure 1 shows the performance results of all stock funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank, Franklin Templeton Asia, Franklin Templeton Latin (the same position as in the figure but the picture is too small for detailed reading).

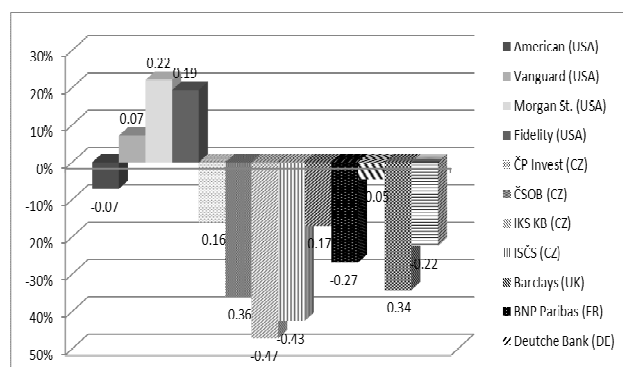


Fig. 1 – Performance of stock funds in the period 2007 – 2011, Source – the authors' own work

It is clear that the best results are shown by the American fund, Morgan Stanley.

The calculation of all coefficients and ratios were done for all types of funds. In total, there were 18 tables and 18 graphs.

The following figure below (Figure 2) shows the performance results of all bond funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

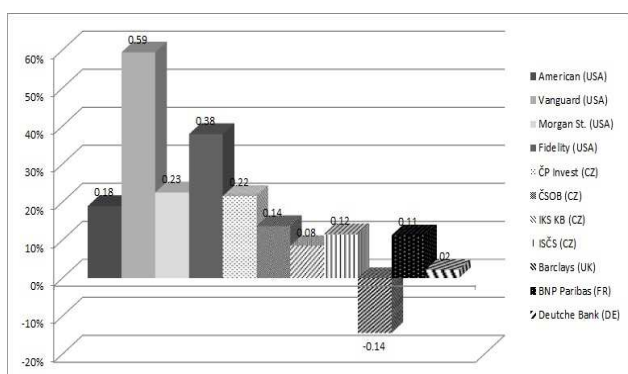


Fig. 2 – Performance of bond funds in the period 2007 – 2011, Source – the authors’ own work

The performance of the bond funds was calculated using the same formula as for the stock funds. The best performance is shown by the investment company Vanguard Group. The only fund that showed a loss was the British fund Barclays.

The following figure below (Figure 3) shows the performance results of all mixed funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

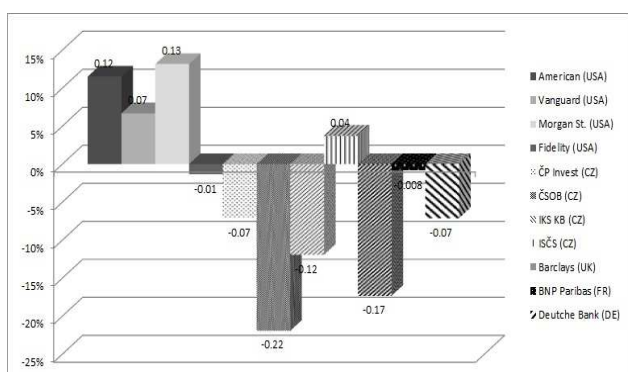


Fig. 3 – Performance of mixed funds in the period 2007 – 2011, Source – the authors’ own work

The performance of the mixed funds was calculated using the same formula as for the other two types of funds. Mixed funds are composed, mainly, of stocks and bonds and, also, sometimes

other types of securities. The best performance is shown by the investment company Morgan Stanley. The worst performing mixed fund in the time period analysed was a Czech fund of the company ČSOB. The Performance of the European mixed funds, altogether, lagged behind their American counterparts. The only European fund that showed profit was a Czech fund of the company ISČS.

The following figure below (Figure 4) shows the standard deviation of all stock funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank, Franklin Templeton Asia, Franklin Templeton Latin (the same position as in the figure but the picture is too small for detailed reading).

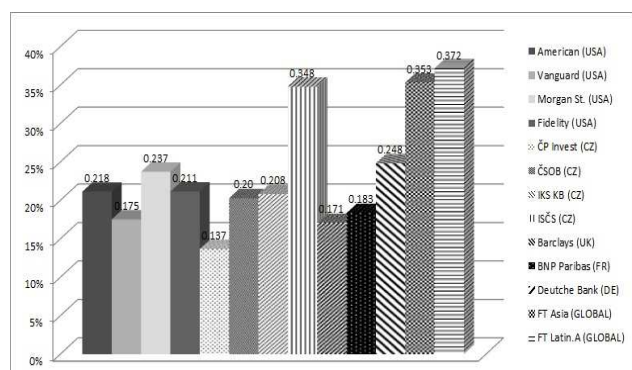


Fig. 4 – The standard deviation of stock funds in the period 2007 – 2011, Source – the authors’ own work

The standard deviation is used to determine the individual risk of each fund (also known as volatility). In this case, the standard deviation was calculated using the monthly net asset value, converted to yearly bases. The global funds of the company Franklin Templeton are the riskiest funds to invest in. These two funds invest, predominantly, in China and Latin America. It is necessary to point out that the standard deviation of the Czech investment companies is not publicised anywhere and has to be calculated from the net asset value in order to evaluate it. The least individual risk is associated with the investment company ČP Invest.

The following figure below (Figure 5) shows the standard deviation of all bond funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

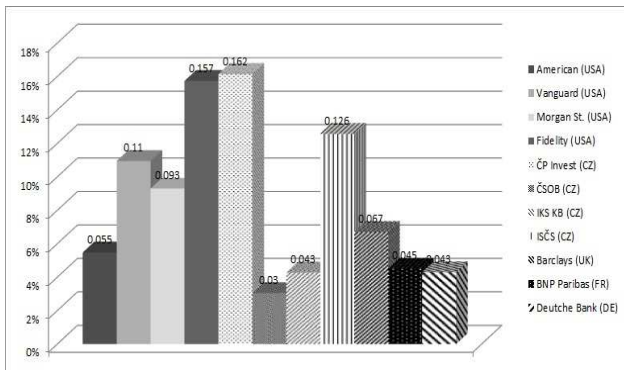


Fig. 5 – The standard deviation of bond funds in the period 2007 – 2011, Source – the authors’ own work

The standard deviation for the bond funds was calculated in the same way as for the stock funds. The riskiest of the bond funds is the fund of the company ČP Invest. The least risky is the fund of the company ČSOB.

The following figure below (Figure 6) shows the standard deviation of all mixed funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

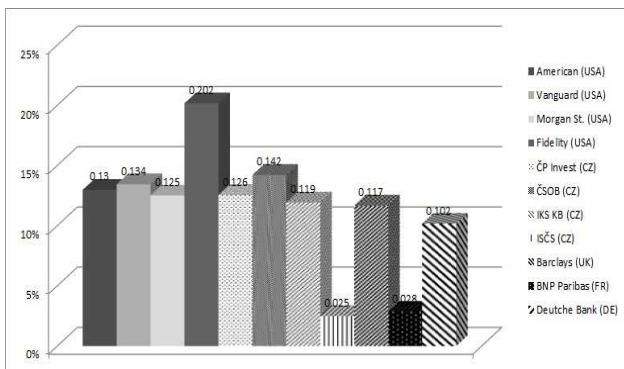


Fig. 6 – The standard deviation of mixed funds in the period 2007 – 2011, Source – the authors’ own work

The standard deviation for the bond funds was calculated in the same way as for the stock and bond funds. The biggest individual risk is associated with the fund of Fidelity Investments. The least risky mixed fund is the fund of the company ISČS.

The following figure below (Figure 7) shows the beta coefficient of all stock funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank, Franklin Templeton Asia, Franklin Templeton Latin (the same position as in the figure but the picture is too small for detailed reading).

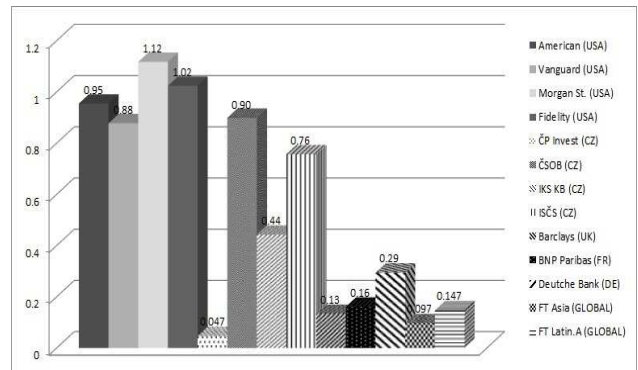


Fig. 7 – The beta coefficient of stock funds in the period 2007 – 2011, Source – the authors’ own work

The results of the beta coefficient comparison were quite different for each fund. The financial markets were very turbulent during this time period. The biggest systematic (market) risk is associated with the fund Morgan Stanley. This means that if the market moves up 1 %, this particular fund will move up 1.12 %.

The following figure below (Figure 8) shows the beta coefficient of all bond funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

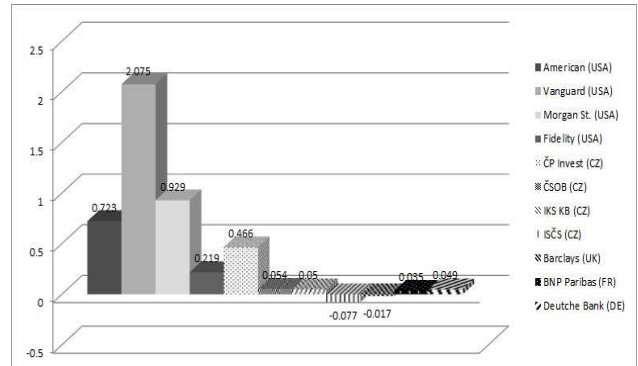


Fig. 8 – The beta coefficient of bond funds in the period 2007 – 2011, Source – the authors’ own work

The biggest systematic (market) risk is associated with the Vanguard Group bond fund. The beta coefficient is 2.075. The funds of the companies Barclays and ISČS show a negative beta coefficient and this means that they are negatively correlated with the broader market. They move in the opposite direction to the broader market movement.

The following figure below (Figure 9) shows the beta coefficient of all mixed funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest,

ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

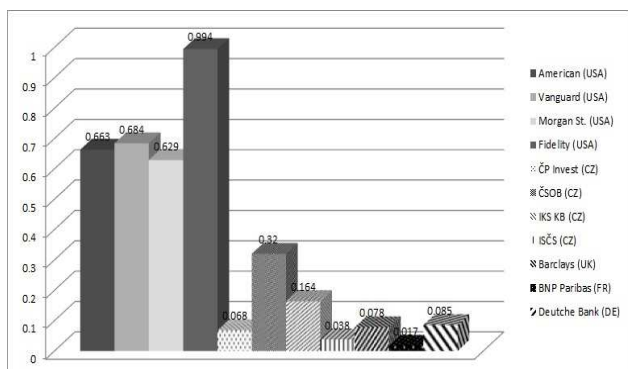


Fig. 9 – The beta coefficient of mixed funds in the period 2007 – 2011, Source – the authors’ own work

Based on the graph above, the funds based in the United States have a greater beta coefficient. The fund of the company Fidelity Investments has the greatest beta, closest to 1. This means that this fund moves nearly perfectly with the market. The European funds are not correlated very much with the broader market.

The following figure below (Figure 10) shows the coefficient of variation of all stock funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank, Franklin Templeton Asia, Franklin Templeton Latin (the same position as in the figure but the picture is too small for detailed reading).

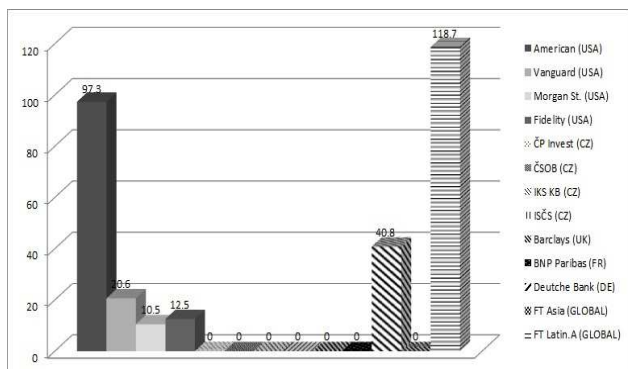


Fig. 10 – The coefficient of variation of stock funds in the period 2007 – 2011, Source – the authors’ own work

The coefficient of variation can be interpreted as units of risk per unit of profit. This means that the lower the coefficient, the better the results. If the profits were, in fact, negative, the results could not be interpreted. This is the case with all the funds where there is a zero instead of a number of units of

risk per unit of profit. According to the graph above, the best results were shown by the Morgan Stanley stock fund.

The following figure below (Figure 11) shows the coefficient of variation of all bond funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

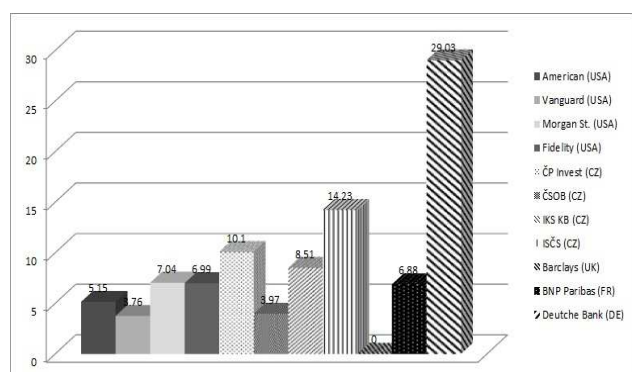


Fig. 11 – The coefficient of variation of bond funds in the period 2007 – 2011, Source – the authors’ own work

Based on the graph above, the best results are shown by the Vanguard bond fund, which has the lowest coefficient of variation. The only bond fund that did not yield any profit is the Barclays bond fund.

The following figure below (Figure 12) shows the coefficient of variation of all mixed funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

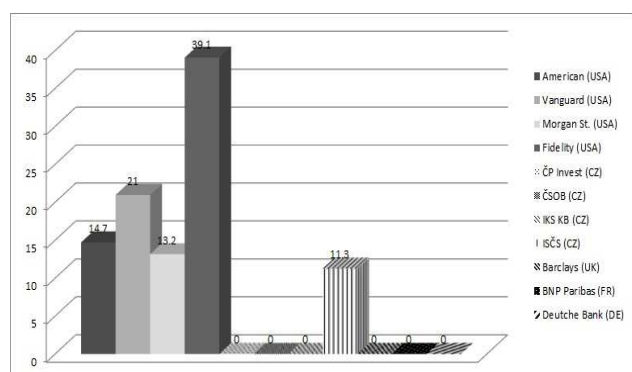


Fig. 12 – The coefficient of variation of mixed funds in the period 2007 – 2011, Source – the authors’ own work

Based on the graph above, the best results are shown by the ISČS mixed fund, based in the Czech

Republic. This is the only fund of the European mixed funds that had positive average profits.

The following figure below (Figure 13) shows the Sharpe ratio of all stock funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank, Franklin Templeton Asia, Franklin Templeton Latin (the same position as in the figure but the picture is too small for detailed reading).

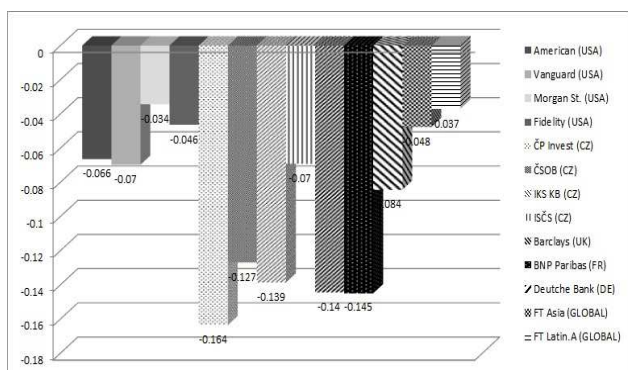


Fig. 13 – The Sharpe ratio of stock funds in the period 2007 – 2011, Source – the authors’ own work

The Sharpe ratio is negative for all of the funds in this time frame. This means that, based on this graph, the risk associated with investment is too great and it would be wiser to invest in a risk-free asset. This time period was affected by the economic crisis the most; the collapse of the stock markets is the immediate cause of such bad results for all of the stock funds. The American stock funds showed slightly better results than the European funds. The fund of the company Morgan Stanley has the highest Sharpe ratio.

The following figure below (Figure 14) shows the Sharpe ratio of all bond funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

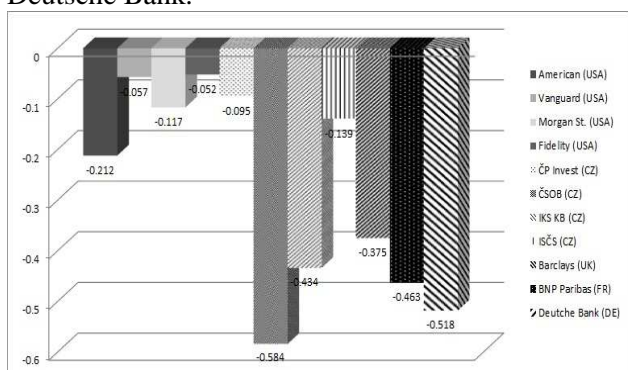


Fig. 14 – The Sharpe ratio of bond funds in the period 2007 – 2011, Source – the authors’ own work

The Sharpe ratio is negative for all of the bond funds in this time period. This means that, based on this graph, it would be safer to invest in a risk-free asset. The fund of the Czech company ČSOB has the worst Sharpe ratio. The best performing bond funds are the two funds based in the United States: Vanguard Group and Fidelity Investments.

The following figure below (Figure 15) shows the Sharpe ratio of all mixed funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

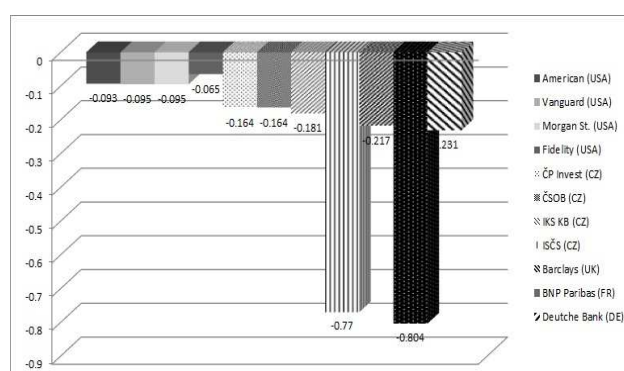


Fig. 15 – The Sharpe ratio of mixed funds in the period 2007 – 2011, Source – the authors’ own work

The Sharpe ratio is negative for all of the mixed funds in this time period. This is the same case as with stock and bond funds. Based on this graph, a risk-free asset seems like a better investment. The funds based in the United States are, again, performing slightly better than their European counterparts. The fund of the company Fidelity Investments has the best ratio, while the worst Sharpe ratio is found in the French fund of BNP Paribas.

The following figure below (Figure 16) shows the Treynor ratio of all stock funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank, Franklin Templeton Asia, Franklin Templeton Latin (the same position as in the figure but the picture is too small for detailed reading).

Based on the negative Treynor ratios of all stock funds in this time period, it would make more sense to invest in a risk-free asset. The cause of ratios being negative, in this time frame, is the low average profits of each fund. Also, the market risk, which is used to calculate the Treynor ratio, was

very high in this time period. The best performing stock fund is Morgan Stanley. The worst investment would have been the ČP Invest stock fund, during this time period.

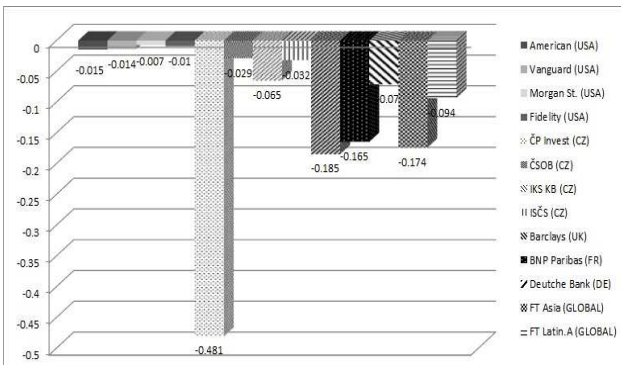


Fig. 16 – The Treynor ratio of stock funds in the period 2007 – 2011, Source – the authors’ own work

The following figure below (Figure 17) shows the Treynor ratio of all bond funds, i.e. American, Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank

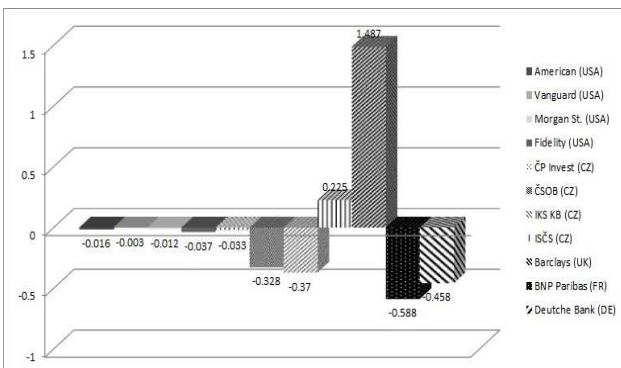


Fig. 17 – The Treynor ratio of bond funds in the period 2007 – 2011, Source – the authors’ own work

The Treynor ratios of the bond funds conclude in similar results as the stock funds in this time period. It is necessary to exclude the funds Barclays and ISČS. These funds are negatively correlated to the broader markets, so their Treynor ratios are positive. However, this is not a result of average profits exceeding the risk; the profits are actually negative, thus resulting in a positive number when negative average profits are divided by the negative beta coefficient. The best ratio is shown by the bond fund of the company Vanguard Group. The worst performing fund, in this time frame, is BNP Paribas.

The following figure below (Figure 18) shows the Treynor ratio of all mixed funds, i.e. American,

Vanguard, Morgan Stanley, Fidelity, ČP Invest, ČSOB, IKS KB, ISČS, Barclays, BNP Paribas, Deutsche Bank.

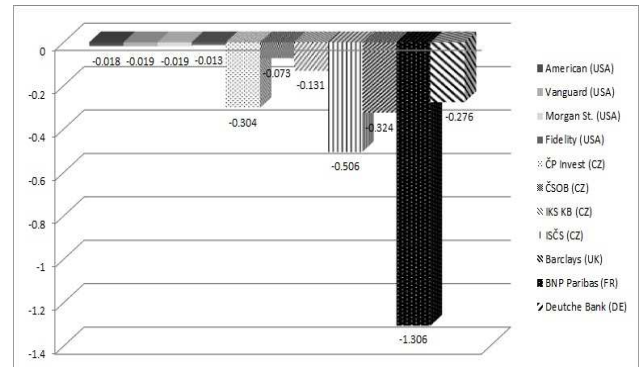


Fig. 18 – The Treynor ratio of mixed funds in the period 2007 – 2011, Source – the authors’ own work

Based on the graph above, it is clear that the best results are shown by the funds based in the United States. The best one of these funds is the mixed fund of the company Fidelity Investments. The fund BNP Paribas has the lowest Treynor ratio, which makes it the worst fund to invest in, when considering the market risk relative to average profit.

The following figure below (Figure 19) shows the final comparison of the best stock fund, mixed fund and bond fund using the Sharpe ratio during the period of 2007 – 2012. In this case, the best fund throughout the different fund types is the Morgan Stanley stock fund. It is, also, apparent that the best funds compared in this figure are all based in the United States. This means that the overall performance of the American based funds is better than their European counterparts.

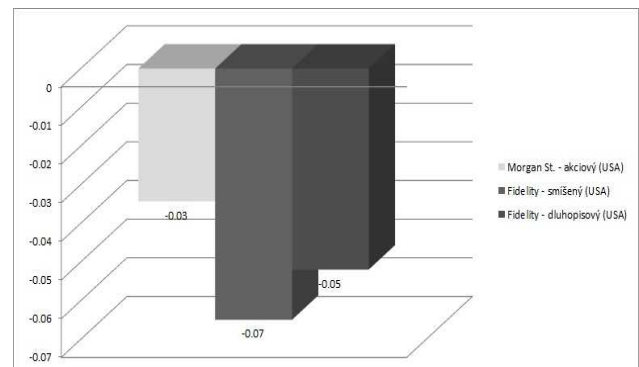


Fig. 19 – Sharpe ratio of three best funds in each category (Morgan Stanley - stock, Fidelity Investments – mixed, Fidelity Investments – bond), Source – the authors’ own work

The figure below (Figure 20) is the comparison of the best stock fund, mixed fund and bond fund,



using the Treynor ratio. In this case, the best performing fund is the Vanguard bond fund. Just like the last case, all of the best performing funds are based in the United States.

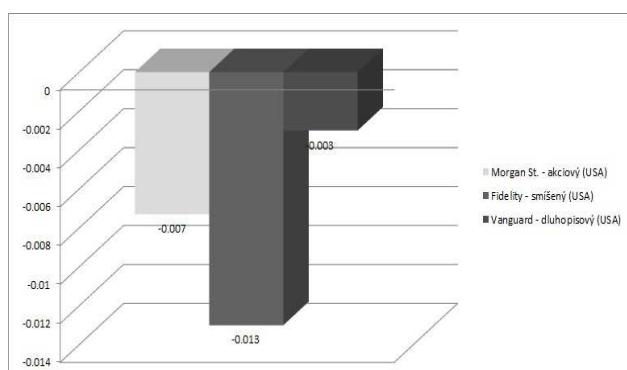


Fig. 20 – revealed the Vanguard fund to be the best - bond, Morgan Stanley was the second, as in the previous category - stock and Fidelity Investment – mixed were the third. The result was influenced by changes in the stock market, which were more dynamic than changes in the market of bonds, Source – the authors' own work

American funds seemed to be superior, in the comparison of all categories. The reason is, probably, because of their long history, knowledge, and experience in the practice of such business.

## 4 Conclusion

The main purpose of this market survey was to compare bond, stock and mixed funds domiciled in the United States and select countries of the European Union. Modern portfolio indicators were used as the main scale for comparison purposes. Standard deviation and profitability were used as the supporting indicators.

The period being monitored was 2007 – 2011, which was impacted by the current financial crisis. However, a longer period is necessary to minimise all the side effects and to help mitigate the disposition of showing better results by fund a fund's management. The importance of this can be demonstrated by the sample used in comparing official results of the Czech ISČS stock fund, published on the web site, which showed a profit percentage of 140 % in 2011. However, when we calculate the same fund during a 3 year period, it was much less (60.64 %).

### 4.1 The stock funds

The American, Morgan Stanley, fund revealed the best results during 2007 – 2011 –profitability was 22.06 %.

The standard deviation was similar for American and European funds, but it is clear from the results, that there is a higher risk in emerging markets funds. The results ranged from 13.68 % (ČP Invest) and 37.19 % (Franklin Templeton Asia).

The market risk analysed by the Beta coefficient was higher in the United States. This was, probably, caused by the strategy of European funds, which is based on diversification of risk between more countries. The greatest Beta coefficient was revealed in American funds, which was approximately 1, meaning that the fund movements copy the market.

The variation coefficient gives the units of risk per unit of returns. The best fund is the fund with the lowest value. In our sample, it was the American fund, Morgan Stanley (10.51). In general, American funds were better in this comparison as, on the other hand, global funds, recommended by professionals, had the worse results within the sample.

The results of variation coefficient were proved by the Sharpe ratio as well. It is composed of the average excess return, divided by the standard deviation of a fund. Because of the long time period and the influence of the financial crisis, all funds seemed to be worse investments than the risk-free rate and the value of the Sharpe ratio was always lower than 0. The best performing funds of all was, again, the American fund, Morgan Stanley (-0.034), with the greatest Sharpe ratio.

Because the calculation of the Treynor ratio is similar (except instead of using the standard deviation, the beta coefficient is used), Morgan Stanley won in this calculation too (-0.007). However, generally speaking, it is now better to invest in risk-free assets, because of the overall poor performance of the stock market during this time of financial crisis.

### 4.2 Mixed funds

The results shown were as expected because American funds included, approximately, 70 % of stocks in their portfolio, so they made a better profit. In particular, Morgan Stanley was shown to be the best performer at 13.16 %. In comparing Europe, the Czech ISČS had a better result and a small profit of only 3.72 %.

However, the standard deviation showed that American funds had a greater risk and volatility than their European counterparts. The greatest value appeared in the Fidelity Investment at 0.2017, which was caused by a greater number of stocks in their portfolios.

The Beta coefficient was lower in mixed funds, because part of the portfolio was composed of bonds with the greatest coefficient by American Fidelity Investment at 0.994. This fund is very dependent on changes within the stock market. The European funds have a smaller risk because of a higher share of bonds in their portfolio. The BNP Paribas fund had the best result of beta coefficient at 0.017.

The variation coefficient is not easy to evaluate, because many funds had negative results. The Czech fund ISČS was the best and even better when compared with American funds showing positive results. This fund achieved a variation coefficient of 11.25.

According to the Sharpe ratio, all funds did not exceed the risk-free rate. Currently, the best investment is a risk-free rate. Relatively speaking, the best results were shown by the American fund, Fidelity Investments (-0.065).

The Treynor ratio had the greatest ratio and generally the best values for American funds, particularly for Fidelity Investments (-0.013).

### 4.3 Bond funds

Surprisingly, the profit in this category was better in some funds than in the mixed funds. The American fund, Vanguard, showed superior profitability (59.4 %) while Barclays was in the red (-14.4 %).

The standard deviation was the greatest by Czech ČP Invest at 16.16 showing this fund to be a high-risk investment.

The coefficient Beta was again greater in the American funds. Vanguard had the highest value (2.075), while the European funds had a very low beta coefficient.

The variation coefficient was the lowest by the American fund, Vanguard, at 3.76. Apparently, bond funds, in general, had less units of risk to units of profit.

According to the Sharpe ratio, the American fund, Fidelity Investment, was the best (-0.052).

The Treynor ratio was the best within the American funds with the winner being Morgan Stanley (-0.012).

### 4.4 General results across categories

Stock funds were assessed as the most profitable. However, only the Sharpe and Treynor ratios were calculated, which are able to compare, not only profitability, but also profitability to risk of investment as well. Of course, the right calculation depends on the correct choice of a benchmark. Regarding American funds, the benchmark

recommended by the American corporation, Morningstar [1], is in most cases the S&P 500 for stock funds. However, Morningstar uses a different risk-free rate than that used in this study. They do not calculate the risk-free rate, but, instead, look at different securities they believe are risk-free. With regard to European funds, the best index for each category was chosen as a benchmark.

In general, American funds were revealed as the best investments. Within the sample, the American stock fund Morgan Stanley was the best one according to the Sharpe ratio.

According to the Treynor ratio, the American bond fund, Vanguard, was the best (-0.013). However, the risk-free security seems to be a better investment in the current period (2007 – 2011). The success of American funds is evident from the assessment in the monitored period of 2007 – 2011. Of course, considering this result, we had to consider that the condition of such investments from abroad - taxes, fees, currency - were not calculated, as only net profit was calculated.

This research demonstrates the superior profitability of stock funds in comparison with other funds, but they also have a higher risk for the investor as well.

In addition, the results of this analysis prove that financial consultants in the Czech Republic, usually, only calculate the profit of funds with no respect to risk and with no consideration, either, to market risk or to individual (fund) risk. We would recommend that any potential investor do their own calculation using the ratios and coefficients as demonstrated in this paper. E.g. global funds Franklin Templeton had the worst result in the discrepancy of the recommendation from financial consultants. A second problem could be the same as Simon Lack described in his book [3] about hedge funds. He describes the behavior of the staff of these funds, which keep all profit for themselves and clients are provided with only five percent of the profit.

As was mentioned before, the best comparison is made when using the results of a longer time period. A five year period was chosen in our analysis, but that was not really long enough. However, unfortunately, some figures were not available prior to 2007. To see the differences between shorter time periods, please check the following table (Table 1). Results of calculations for three and five year periods are shown. Unfortunately, the results are influenced by the economic and financial crisis.

Table 1 – The comparison of periods in the stock market

	2009 – 2011	2007 – 2011
Profitability	Morgan Stanley 109.8 %, the worse global funds	Morgan Stanley 22.06 %, second Fidelity Investments 19.34 %
Decisive difference	ČP Invest 13.78, the worse global FT funds	ČP Invest – 13.68, the worse global funds FT funds
Beta coefficient	BNP Paribas – 0.035	ČP Invest – 0.047
Variation coefficient	Morgan Stanley – 2.97	Morgan Stanley – 10.57, but by some funds it was not calculated because of negative results
Sharpe ratio	Morgan Stanley – 3.0	Morgan Stanley – (-3.4)
Treynor ratio	Morgan Stanley – 0.06	Morgan Stanley (-0.007)

Source – the authors' own work

#### Recommendations before buying a fund:

1. What does the fund own?
2. How risky has the fund been in the past?
3. What does the fund cost?
4. Calculate a long time period average of their results.
5. Compare figures obtained with figures from the market.
6. Follow information about changes in the market.

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