

## EIC Fund Ratings

### Methodology

#### Group of funds involved

EIC differentiates between following types of funds: equity fund, bond fund, money market fund, balanced fund, real estate fund, commodity fund and alternative fund. Each fund type is subdivided into categories. Funds are assigned to one of the fund category. The fund assignment to a category depends on the description of the fund investment strategy. Fund restrictions in the investment strategy description assign a fund to a closer specified category and vice versa, general investment strategy description without restrictions assigns a fund to the widest specified category.

Following categories of funds are not included in rating: Alternative – Life Cycles, Alternative - Hedge Funds, Alternative - Capital Protected. Non-ranking is due to significant individualisation of investment strategy. E.g. Capital Protected (secured funds) has a specific individual maturity date and cannot be compared with other secured funds.

Each category has its specific reference currency, in which the funds are rated. The reference currency is most suitable for comparison and most corresponds to the currency character of assets in the relevant category, so that the impacts of the exchange rates are utmost eliminated. USD is applied as a reference currency to global funds and commodity funds. To clusters of countries (regions) USD is applied and to CEE countries (Central and Eastern Europe) EUR is applied.

In order to perform a fund rating in the relevant category, the category should contain at least two funds. Should a fund have more versions (e.g. denominated in different currencies, hedged to different currencies, distribution and capitalisation class), only one fund version is rated, namely the capitalisation and denominated ones in unhedged currency, whereas the denomination currency corresponding to the category reference currency is given preference. Unless a fund has a fund version denominated in the reference currency of the category, EIC converts the rates from the denomination currency to the reference currency. The fund version, applied to the assessment, is also mentioned for each version of the fund. The fund rating achieved is applied to its other versions as well.

In case of equity funds hedging is not considered and a fund is assigned to the relevant category in the reference currency, which results also in reflection of certain additional returns/costs of hedging to the fund performance. In case of bond funds, if there is only a hedged form of fund, focusing on bonds issued in other currencies, the rating is not performed.

Balanced unhedged funds are rated in denomination currency, which thus automatically becomes their reference currency, regardless of the currency composition of the assets in the fund. Should more currency variants of the balanced fund exist, they are rated independently in their reference currencies, thus also in different categories.

Average risk-free interest rate, calculated as an arithmetical average of one-day (overnight, e.g. EONIA) interest rates during the period from 1 January 2014 till 31 December 2014, is computed for each reference currency. Arithmetical average of one-month (EURIBOR 1M) interest rates is applied to the category REAL – CEE during the period from 1 November 2007 till 31 December 2014.

Names of rating categories consist of the name of the fund type and name of the category itself. In terms of language (Slovak or Czech), the entire name can be mixed and English names, established in professional practice, are not translated. Abbreviations of regions (e.g. CEE, ASEAN) stand for geographical demarcation of regions in English language, as they are usually used in professional practice.

#### Procedure in rating calculation

Funds are compared based on percentage daily price changes, monitored on working days throughout the year from 2 January 2014 till 31 December 2014, which represents 259 data. Exception is the category Real estate – CEE, where due to missing daily fund pricing the monthly price changes are used for comparison, whereas the monitoring period comprises the interval from 1 November 2007 till 31 December 2014, which represents 89 data. In case no price is available next to the certain date (e.g. due to holiday), last recorded price is applied.

First, the category index is created from prices of all funds, included in the relevant category, whereas each fund is given the same weight in the index.

Consequently, correlation coefficients between daily changes of fund prices and daily changes of the entire index are calculated. Correlation coefficient is calculated as a proportion between the covariance between the percentage price changes of the respective fund and index of the respective category and the product of standard deviations of the fund and index of the relevant category, as follows:

$$\rho_{X,Y} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y}$$

Unless the correlation coefficient achieves at least the value of 0.30, the fund is not rated, namely due to low dependence of price changes, compared to other funds in the respective category. There might be a problem in: i) incorrectly assigned fund to the respective category, ii) insufficient fund investments into the assets determined by the relevant category or iii) incorrect fund asset pricing.

After computing the correlation coefficient, Beta indicator of the fund is calculated for category index as a proportion between the covariance between percentage changes of index fund prices and variance of percentage changes of fund prices based on the following formula:

$$\beta = \frac{\text{Cov}(r_a, r_b)}{\text{Var}(r_b)}$$

Beta represents the rate of fund risk compared to the average risk of all funds in the respective category. Should it be higher than 1, the fund is more risky than the average, which, with the growing market, means the multiple of fund increase compared to the average and with the declining market the multiple of fund decrease.

Further, annual (p.a.) arithmetical average daily return of each fund and category index is calculated, where  $r_i$  represents daily percentage returns,  $n$  is the number of periods, i. e. 259 days and  $t$  means 365 days (in case of REAL – CEE category  $r_i$  are monthly percentage returns,  $n$  are 89 months and  $t$  are 12 months).

$$\bar{r} = \frac{1}{n} \sum_{i=1}^n r_i = \frac{1}{n} (r_1 + \dots + r_n) \qquad \bar{r} (p.a.) = (1 + \bar{r})^t - 1$$

After computing the basic indicators, Jensen's Alpha indicator itself is calculated, as follows:

$$\alpha_J = (R_i - R_f) - \beta_{iM} \cdot (R_M - R_f)$$

Where  $R_i$  is an average annual daily fund return,  $R_m$  is an average annual daily index return of the category,  $R_f$  is an average daily risk-free interest rate and  $\beta_{iM}$  is Beta of the fund for the category index. In case of REAL – CEE category all variables refer to monthly values.

Alpha means achievement of absolute excess return or insufficient return, achieved by specific fund, depending on the risk size, with respect to the relevant category. The higher Alpha coefficient of the fund, the higher excess return was achieved by the fund in favour of its shareholders compared to its competitors.

To draw up a quality chart of Alpha coefficients achieved and fund arrangement into groups with similar quality, as well as rating assignment itself, we need to construct the SML- line of the security market line and display the achieved returns and risks of funds on the graph as qualitative borders of rating bands.

#### Assessment of funds

We draw the SML-line based on the following formula:

$$SML : E(R_i) = R_f + \beta_i [E(R_M) - R_f]$$

Using two known points (for risk-free rate and category index return): point  $R_f$  on y-axis for Beta = 0 on x-axis and point  $R_M$  on y-axis for Beta = 1 on x-axis. The SML-line determines what expected return, depending on the risk expressed by Beta coefficients, the funds of the relevant category should achieve. If they lie above the SML-line, they achieve positive Alpha (excess return), if they lie below the SML-line, then they achieved negative Alpha (insufficient return).

To determine rating by displaying the distance of additional Alpha return of each fund of the relevant category from the SML-line, we use a structure of six bands, which are created by drawing 4 lines, shifting the SML-line, depending on the market volatility (of the respective category).

Annual volatility of the category index is calculated as a standard deviation of daily index changes, multiplied by square root of the number of periods, i.e. 259 days (or 89 months for REAL – CEE category).

The first shifted SML-line is drawn if points  $R_f$  and  $R_M$  are increased by the index volatility value (SML +  $1.64\sigma$ ).

The second shifted SML-line is drawn if points  $R_f$  and  $R_M$  are increased by the index volatility value (SML +  $\sigma$ ).

The third shifted SML-line is drawn if points  $R_f$  and  $R_M$  are decreased by the index volatility value (SML -  $\sigma$ ).

The fourth shifted SML-line is drawn if points  $R_f$  and  $R_M$  are decreased by the index volatility value (SML -  $1.64\sigma$ ).

Funds on the graph are placed between the bands created by SML-line and other shifted lines. In total, 6 bands are created. EIC Fund Ratings assigns 1 – 6 stars to the funds, whereas the first 3 stars are gained by those funds which achieved negative Alpha and 4-6 stars by those funds which achieved positive Alpha.

6 stars are achieved by the fund if its return, compared to its Beta, is higher than the return on the first shifted line for respective Beta.

5 stars are achieved by the fund if its return, compared to its Beta, is higher than the return on the second shifted line for respective Beta.

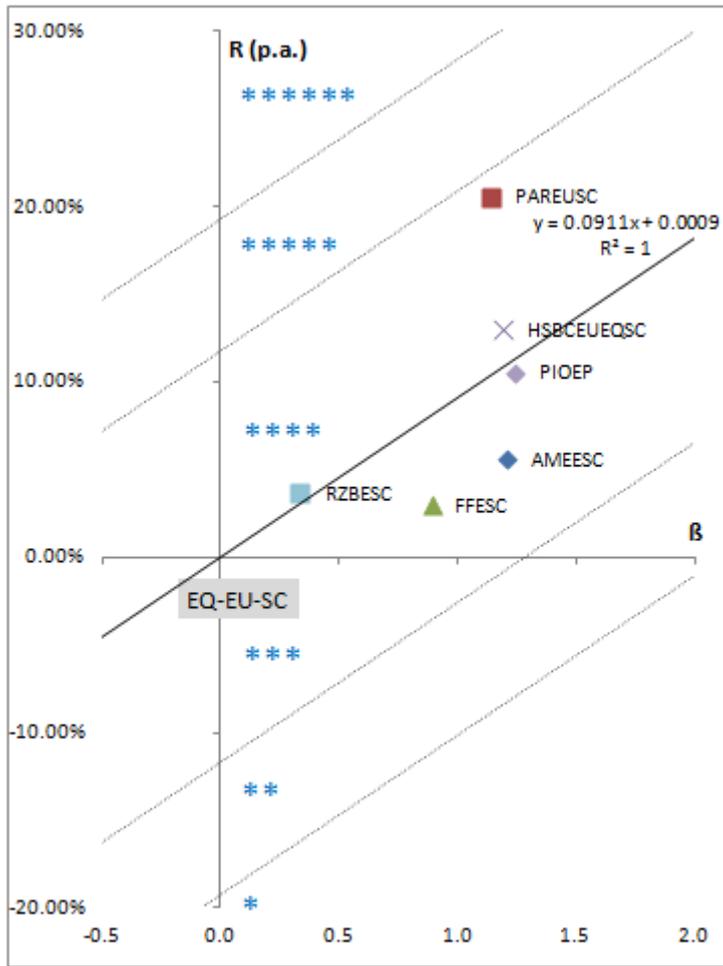
4 stars are achieved by the fund if its return, compared to its Beta, is higher than the return on SML-line for respective Beta.

3 stars are achieved by the fund if its return, compared to its Beta, is higher than the return on the third shifted line for respective Beta.

2 stars are achieved by the fund if its return, compared to its Beta, is higher than the return on the fourth shifted line for respective Beta.

1 star is achieved by the fund if its return, compared to its Beta, is lower than the return on the fourth shifted line for respective Beta.

For illustration we introduce the results of one specific category:



	$R_f$ (p.a.)	$R_m$ (p.a.)
SML + $1.64\sigma_{(R_m)}$	19.3659%	28.47%
SML + $\sigma_{(R_m)}$	11.8450%	20.95%
SML - $\sigma_{(R_m)}$	-11.6577%	-2.55%
SML - $1.64\sigma_{(R_m)}$	-19.1786%	-10.10%