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DOES VALUE-BASED ACTION GENERATES AN ADDITIONAL VALUE FOR INVESTORS? – THE ANALYSIS PERFORMED ON THE BASIS OF INVESTMENTS MADE IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

Summary: The main objective of the article is to assess profitability and effectiveness of the companies listed within socially responsible stock indices in Central and Easter European countries (CEECs) as well as to compare the results with conventional indices. The analysis involves the companies included in such socially responsible indices as CEERIUS, VONIX and RESPECT. Daily and weekly log returns were applied to assess profitability whereas to assess performance the following indices were used: Sharpe ratios, modified Sharpe ratios, Sharpe – omega ratios, Sortino ratios, Omega ratios and RoVar for daily and weekly returns. The obtained results were further analyzed to answer the question if investors acting pursuant to the principles of social responsibility may benefit financially from the increased value of assets. Also, the structure of the indices in question was analyzed in terms of their components and, consequently, the results were profoundly discussed.

Keywords: value based investing, socially responsible investing, Central and Eastern European socially responsible indices, effectiveness of value based financial investment, value based portfolios.

JEL Classification: G11, G15, Q01.

Introduction

The concept of Socially Responsible Investing (SRI) is not a new phenomenon since its roots date back to the modern history of the world, namely the beginning of the 18th century. At that time it was driven mainly by religious values. Consequently, the idea as such meant following specific ethical, social and economic criteria, beside risk-income interrelations, in capital allocation and its management. Since an investment process considers quality criteria first, they constitute the sine qua non of investment selection. Only then are quantitative criteria taken into account. The contemporary concept of SRI is an element of a broader idea, i.e. Corporate Social Responsibility (CSR), and in recent years the value-based action (VBA) approach has been widely observed. This approach emphasizes ethical values also with regards to the economic criterion.

Classical models of assessing portfolios of assets assume that the rate of return on a portfolio is strictly connected with the risk level of the portfolio whereas an optimal portfolio is well diversified. The process of selecting companies to the VBA portfolio considers the following criteria: economic, social and environmental. The diversification process may therefore be realized only on the basis of an earlier selected sample. Hence, there exists a high probability that in VBA portfolios there will not be any possibility of selecting their components pursuant to the classical principles. So, the portfolios of assets selected on the basis of VBA should achieve rates of return lower than portfolios without any limitations due to a smaller spectrum of investment opportunities. However, the research does not entirely confirm this kind of interrelation. The literature discussing such investments presents three hypotheses concerning the behavior of VBA portfolios against the conventional ones. The first two hypotheses concern the risk-adjusted rate of return (α), the third one refers to the risk exposure of socially responsible companies' shares portfolios (β) [Renneboog, Horst and Zhang, 2007]. The first hypothesis says that the portfolios of VBA shares have lower profitability indicators than conventional portfolios. It may refer to thematic portfolios, which naturally are less diversified, e.g. the portfolios of the companies based on renewable energies. The second hypothesis says that the portfolios of VBA shares have higher profitability indicators than the portfolios of conventional shares. The third hypothesis says that VBA portfolios have risk exposure different than conventional portfolios. It particularly concerns the companies functioning in the environmental protection industry. Such companies may have their pricing indicator against their book value[1] lower than those

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[1] Such companies absorb strongly capital and are often not appreciated by investors due to e.g. market regulations.

which operate in a different sector [Dowell, Hart and Yeung, 2000]. Consequently, a given portfolio selected pursuant to environmental criteria may have a lower rate of return in the Fama-French [Fama and French, 1993] model than in the conventional one.

1. Method

The methodology of composing VBA portfolios has been developed by the Global Reporting Initiative (GRI – G4)[2]. Entities eager to adjust to international standards apply this methodology widely though modified in some cases. The reason lies in the difficulties to meet the requirements often due to macroeconomic surrounding the companies operate in. It is observed in the companies qualified to the RESPECT index (companies listed on the Warsaw Stock Exchange). The selection process is not a subject of such high environmental requirements, which is next reflected in the index components.

In order to compare the analyzed indices (see Table 1), daily and weekly log returns were calculated. To measure effectiveness, classical equations were used such as the Sharpe ratio and the modified Sharpe ratio.

The Sharpe ratio was defined as:

$$SR = \frac{\mu - r_f}{\sigma},$$

where:
μ – average logarithmic rate of return,
σ – standard deviation of logarithmic rate of return,
r_f – average logarithmic risk-free rate of return, defined as follows:

$$r_f = \frac{\sum_{i=1}^{n} \ln\left(1 + r_{free}^i\right)}{k},$$

where r_{free}^i is the risk-free rate of return in i − this period, and k stands for the number of base periods in a year. The improved Sharpe ratio was calculated by replacing the standard deviation with a standard semi-deviation.

Apart from classical methods of measuring effectiveness, there were also applied alternative measures which use lower partial moments – LPM – to measure risk or the Value at Risk − *VaR*.

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2   The forth modification of the methodology.

The lower partial moment was derived from the equation:

$$LPM^n = \frac{1}{n} \sum_{i=1}^{n} \max (MAR - r_i, 0)^n$$

where n is the order determining the type of a lower partial moment, r_i is the rate of return on investment in i-this period, and MAR is the *minimum accept-able return*, which may equal 0 or may be equal to the risk-free rate of return or may have any average rate of return on a standard investment. In the paper, MAR is the risk-free rate of return. The order n is interpreted as the level of investor's aversion to loss, and the higher the loss is, the higher the order is [Perez, 2012].

The following ratios applying the lower partial moment were used in the paper as well:
− Sortino ratio,
− Omega ratio.

The Sortino ratio was calculated as follows:

$$Sortino = \frac{\mu - MAR}{\sqrt{LPM^2}}.$$

whereas the Omega ratio was proposed by Shadwick and Keating [2002] and was calculated as follows:

$$Omega = \frac{\mu - MAR}{LPM^1} + 1.$$

The value at risk (VaR) is a defined number in such a way that the possibility of loss higher than VaR, in a given time horizon, is equal to the given in advance number α. Assuming that the rate of return on a given investment has a normal VaR distribution in a given t – time, it can be calculated as follows:

$$VaR = \mu - c \cdot \sigma,$$

where c is the constant whose value depends on the adjusted level of α significance and is equal to:
− $c = 1.645 \ for \ \alpha = 0.05$,
− $c = 2.326 \ for \ \alpha = 0.01$.

The *RoVaR* is the relevant expected return divided by the *VaR*. The *RoVaR* provides the information to choose the investment portfolio with the highest expected rate of return over *VaR*. This measure was proposed by Dowd [2000]:

$$RoVaR = \frac{\mu - r_{free}}{VaR}.$$

The following risk-free rates were applied in the analysis: for daily returns EONIA (EUR) and WIBOR ON (PLN), and for weekly returns EURIBOR SW (EUR) and WIBOR 1W (PLN). These rates were simultaneously treated as the minimal value accepted by the MAR investor. Additionally, the research was

done to analyze the components of the VBA index pursuant to the methodology proposed by the Industry Classification Benchmark (ICB).

2. Empirical studies

2.1. Descriptions of data

There were three stock exchange indices included in the analysis, i.e. the VBA of the companies listed in CEECs (CERRIUS, VONIX and RESPECT). The research period which was chosen for the analysis encompasses the years 2010-2014. Such a short research period results from a short period the indices here above are listed on the stock exchange (see Table 1). VBA indices of the companies were compared to the classical indices of the companies listed on the Vienna Stock Exchange. Table 1 below presents the characteristics of the VBA companies' indices and classical indices of the companies listed on the Stock Exchange in CEECs.

Table 1. The characteristics of sustainability indices and classical indices

	Indices	Composition	Characteristics	First quotation date
Sustainability indices (value-based indices)				
Index companies quoted in CEECs				
CEERIUS	CEE Responsible Investment Universe	13 securities	Selected from the companies listed on the Stock Exchange in CEECs	Since January 2009
Index companies listed on the Vienna Stock Exchange				
VONIX	VBV-Österreichischer Nachhaltigkeitsindex	20 securities	Selected from the companies listed on the Vienna Stock Exchange	Since June 2005
Index companies listed on the Warsaw Stock Exchange				
RESPECT	RESPECT	24 securities	Selected out of 140 of the companies listed on the WSE	Since December 2008
Classical indices				
Index companies listed on the Vienna Stock Exchange				
ATX	Austrian Traded Index	20 securities	biggest and most liquid companies	Since January 1991
ATX Prime	Austrian Traded Prime Index	39 securities	companies listed on the Prime Market	Since October 1995
ATX Five	Austrian Traded Five Index	5 securities	biggest and most liquid companies	Since January 2004
WBI	Wiener Borse Index	74 securities	a wide index of all companies	Since December 1967
Index companies listed on stock exchanges in CEECs				
NTX	New Europe Blue Chip Index in EUR	30 securities – New Europe Blue Chip Index	biggest and most liquid companies	Since January 2005

Source: The author's own analysis.

2.2. Results

The structure of all the indices of the VBA Industry indicates a high share of the Financial Industry. Utilities (39.36%), for example, have the greatest share in the RESPECT index. The classification hereabove includes companies operating in the energy as well as Basic Materials (16.01%)[3] sectors. These are the sectors which are modified against the guidelines given by the Global Reporting Initiative. They are high-emission sectors, and the qualification of these companies to the indices of VBA companies poses a radical change if not bearing the signs of socially responsible investing. Table 2 presents the percentage structure of Industry with regard to the three indices of the VBA companies.

Table 2. Industry Structure of CEERIUS, VONIX, RESPECT indices after December 2014 by Industry Classification Benchmark (ICB)

INDUSTRY	CEERIUS	VONIX	RESPECT
Basic Materials	–	–	16.01%
Industrials	2.29%	20.67%	6.71%
Health Care	14.29%	41.80%	0.49%
Telecommunication	24.97%	–	5.01%
Utilities	0.82%	–	39.36%
Financials	54.46%	37.53%	32.41%
Others	2.99%	–	–

Source: The author's own analysis.

Tables 3 and 4 present the results of the quantitative analysis. Log returns as well as the standard deviation for daily and weekly returns were calculated for the indices enumerated in Table 1. Also, the data indices discussed in chapter 1 were calculated for the same data. The obtained results were presented in percentages.

Both daily and weekly rates of return for the RESPECT index are significantly higher than other indices, i.e. CEERIUS and VONIX, and have positive values. Respectively, risk measured by the standard deviation is the highest for the VONIX index whereas risk for the RESPECT index is lower than for the CEERIUS but higher than for the VONIX. It may be due to a greater spectrum of available investments caused by the modification of qualifying the companies to the RESPECT index discussed in chapter 2.2. Simultaneously, it is not confirmed by the behavior of the indices of conventional companies listed within

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[3]   Only in the RESPECT index there is a representation of the companies from the Basic Materials Industry.

CEE indices since the results are worse than for the RESPECT index. Rates of return (daily and weekly) for the indices of conventional companies are negative and, additionally, all of them present a higher risk measured by the standard deviation than the RESPECT index (therefore this portfolio is better diversified). It should be mentioned here that in the same period WIG20 Index recorded negative values both for daily and weekly returns, which equaled -0.005% and -0.032% respectively. Within the years 2010-2014 a considerable increase of the value of Basic Materials Industry could have influenced the behavior of the RESPECT index (e.g. KGHM). The analysis of the subsequent period may confirm this hypothesis because only in 2015 the prices of raw materials have fallen significantly. Also, effectiveness indicators were higher for the RESPECT index than for the remaining ones.

Table 3. Profitability and effectiveness measures from standard indices versus sustainability indices (daily returns) 2010-2014

	CEERIUS	VONIX	RESPECT	WBI	ATX	ATXPrime	ATX five	CECEx	NTX
mean return	-0.02904	-0.01433	0.034023	-0.00886	-0.01165	-0.00598	-0.01396	-0.01175	-0.01447
SD	1.007686	1.315516	1.180755	1.226627	1.404103	1.328524	1.696078	1.249699	1.250071
semi_SD	0.734778	0.96578	0.864644	0.896866	1.015997	0.964309	1.217239	0.916209	0.907442
SR	-0.02975	-0.01161	0.020926	-0.00799	-0.00897	-0.0045	-0.00823	-0.01016	-0.01158
SR*	-0.0408	-0.01581	0.028576	-0.01093	-0.0124	-0.00621	-0.01147	-0.01385	-0.01595
LPM1	0.384811	0.486593	0.415154	0.443395	0.522216	0.490057	0.637225	0.451536	0.449905
LPM2	0.562513	0.947469	0.726196	0.81234	1.044491	0.935906	1.499362	0.850812	0.837191
Sortino	-0.03997	-0.01569	0.028994	-0.01088	-0.01232	-0.00716	-0.01217	-0.01376	-0.01685
HPM1	0.354831	0.499276	0.439862	0.43359	0.509621	0.48313	0.622322	0.438845	0.434491
Omega	0.922092	1.026065	1.059515	0.977886	0.975883	0.985866	0.976613	0.971893	0.965739
Sharpe-Omega	-0.07546	-0.03138	0.081952	-0.02211	-0.02412	-0.01413	-0.02339	-0.02811	-0.03426
Var	1.686682	2.178351	1.908319	2.026664	2.321402	2.191407	2.804009	2.067504	2.070839
RoVaR	-0.01777	-0.00701	0.012948	-0.00484	-0.00543	-0.00316	-0.00531	-0.00614	-0.00744

SD – standard deviation, SR – Sharpe ratio, SR* – modified Sharpe ratio, LPM – lower partial moments, VaR – Value of Risk.

Source: The author's own analysis.

Table 4. Profitability and effectiveness measures from standard indices versus sustainability indices (weekly returns) 2010-2014

	CEERIUS	VONIX	RESPECT	WBI	ATX	ATXPrime	ATX five	CECEx	NTX
mean return	-0.16057	-0.07142	0.168429	-0.04453	-0.06342	-0.03598	-0.07504	-0.06303	-0.07453
SD	2.345558	3.233615	2.503817	2.987886	3.386684	3.238938	3.937765	2.719168	2.838487
semi_SD	1.759127	2.424959	1.911531	2.286263	2.550287	2.447396	2.963294	2.03145	2.136573
SR	-0.07455	-0.02439	0.016362	-0.0174	-0.02295	-0.01552	-0.02269	-0.02843	-0.03129
SR*	-0.0994	-0.03253	0.021431	-0.02274	-0.03047	-0.02054	-0.03015	-0.03806	-0.04157
LPM1	0.981835	1.237386	0.862181	1.117189	1.285539	1.221075	1.479745	1.042894	1.096275
LPM2	3.421607	6.071948	3.335522	5.34149	6.700201	6.110952	9.040791	4.284638	4.755217
Sortino	-0.09453	-0.03201	0.022431	-0.02249	-0.03002	-0.02033	-0.02971	-0.03735	-0.03418
HPM1	0.806979	1.158509	0.96266	1.065204	1.207831	1.170806	1.390416	0.965575	1.007458
Omega	0.821909	0.936256	1.116541	0.953467	0.939552	0.958833	0.939632	0.925861	0.918983
Sharpe-Omega	-0.17809	-0.06374	0.047515	-0.04653	-0.06045	-0.04117	-0.06037	-0.07414	-0.08102
Var	4.019011	5.390717	3.95035	4.959602	5.634514	5.364032	6.552663	4.536062	4.743838
RoVaR	-0.04351	-0.01463	0.01037	-0.01048	-0.01379	-0.00937	-0.01363	-0.01705	-0.01872

SD – standard deviation, SR – Sharpe ratio, SR* – modified Sharpe ratio, LPM – lower partial moments, VaR – Value of Risk.

Source: The author's own analysis.

Conclusion

The analysis of the portfolios belonging to the companied qualified to the VBA type requires paying a lot of attention since there are many factors which influence increasing or decreasing their values. Certainly, numerous analyses conducted so far may well confirm this fact. However, they do not provide the answer if such portfolios are more preferable by investors or not. Undoubtedly, investors are looking for profits and will not invest in undertakings which generate loss even if the companies included in the portfolio represent acceptable and promoted by investors values. Therefore, without any doubts, fundamental factors determine investments in VBA companies. The conducted analysis indicates higher profitability and effectiveness of one of VBA indices, namely the RESPECT Index. Nevertheless, it cannot be unambiguously confirmed if it is caused by increased interest investors have in this idea or if it is due to the components of the index and its considerably higher diversification which results from qualifying companies operating in high-emission sector to the index. Additionally, the short period of analysis due to still young VBA indices may lead to an erroneous deduction. Within the analyzed five-year-long period, the RESPECT Index recorded a positive rate of return, whereas the rest of the indices, including both VBA and conventional ones, recorded a negative rate of return.

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CZY DZIAŁANIA MOTYWOWANE WARTOŚCIAMI PRZYNOSZĄ DODATKOWĄ WARTOŚĆ DLA INWESTORÓW? – NA PRZYKŁADZIE INWESTYCJI W KRAJACH EUROPY ŚRODKOWO-WSCHODNIEJ

Streszczenie: Celem artykułu jest ocena dochodowości i efektywności spółek notowanych w ramach społecznie odpowiedzialnych indeksów giełdowych w krajach Europy Środkowo-Wschodniej i porównanie wyników z indeksami spółek klasycznych. Analiza obejmuje spółki odwzorowane w indeksach społecznie odpowiedzialnych CEERIUS, VONIX, RESPECT. Do oceny dochodowości wykorzystano dzienną i tygodniową logarytmiczną stopę zwrotu, a do oceny efektywności wskaźniki: Sharpe, zmodyfikowany Sharpe, Sharpe – omega, Sortino, Omega, RoVar dla dziennych i tygodniowych stóp zwrotu. Uzyskane wyniki poddano analizie w celu odpowiedzi na pytanie, czy inwestorzy działający zgodnie z zasadami społecznej odpowiedzialności mogą uzyskać korzyść finansową w postaci zwiększonej wartości aktywów. Dokonano także analizy struktury badanych indeksów pod względem ich składu oraz przeprowadzono szeroką interpretację wyników.

Słowa kluczowe: inwestowanie motywowane wartościami, społecznie odpowiedzialne inwestowanie, indeksy społecznie odpowiedzialne w krajach Europy Środkowo--Wschodniej, efektywność inwestycji w indeksy spółek społecznie odpowiedzialnych.