

## Does Relative Performance of Socially Responsible Investing Increase With Financial Risk?

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The research paper positively verified the research hypothesis that the relative financial performance of investments in socially responsible indices against the performance of conventional indices may go up as the global financial risk, measured by the VIX index, increases. Socially Responsible Investing can be rational from the financial point of view. In addition to the ethical aspect, it may fulfill the function of protecting the investment portfolio in periods characterized by a high level of global risk. The hypothesis was tested using statistical research based on a comparative portfolio analysis of the geographically diverse SRI indices (RESPECT Index and DJSI) against the reference points which were the territorially relevant conventional stock indices (WIG20TR and DJITR).

**Keywords:** Socially Responsible Investments, RESPECT Index, investment performance.

## Czy relatywna efektywność inwestowania odpowiedzialnego społecznie wzrasta wraz z ryzykiem finansowym?

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W artykule pozytywnie zweryfikowano hipotezę badawczą, że relatywna efektywność finansowa inwestycji w indeksy odpowiedzialne społecznie względem efektywności indeksów konwencjonalnych może wzrastać wraz ze wzrostem finansowego ryzyka globalnego mierzonego indeksem VIX. Inwestowanie odpowiedzialne społecznie może być zatem racjonalne finansowo i pełnić, poza aspektem etycznym, funkcję ochrony portfela inwestycyjnego w okresach charakteryzujących się wysokim poziomem globalnego ryzyka. Weryfikację postawionej hipotezy przeprowadzono z wykorzystaniem badań statystycznych opartych na komparatywnej analizie portfelowej zróżnicowanych geograficznie giełdowych indeksów SRI (RESPECT Index i DJSI) względem punktów odniesienia, którymi były odpowiadające im terytorialnie giełdowe indeksy konwencjonalne (WIG20TR i DJITR).

**Słowa kluczowe:** inwestycje odpowiedzialne społecznie, RESPECT Index, efektywność finansowa inwestycji.

**JEL:** G11, G41

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## 1. Introduction. Research Problem

In recent years, there has been a dynamic development of the Socially Responsible Investment (SRI) market.<sup>1</sup> In a global world, an investor has access to a variety of SRI approaches. In short, you can divide them into secular and religious ones. The former can be based, among others, on: (i) the concept of CSR (Corporate Social Responsibility) that was born in the second half of the twentieth century, when Bowen (1953) described the social responsibility of the entrepreneur, or (ii) on the principles of responsible investment supported by the United Nations or other organizations such as EFAMA, EUROSIF and GSIA. In turn, the religious approach to SRI is related to religious values. Among the religious approaches in the financial world, investment approaches that are based on Christian, Muslim and Jewish faith dominate.<sup>2</sup>

According to the Global Sustainable Investment Alliance [GSIA], Socially Responsible Investments included assets worth USD 22.9 trillion in 2016, which meant a 25.5% increase compared to 2014. GSIA (2017) estimated that in 2016 Socially Responsible Investments comprised 26.3% of all assets under management, while in Europe their share accounted for 52.6% of all managed assets. However, it should be noted that apart from the market of assets under professional management, also other investors choose a strategy for investing in a socially responsible way. It is difficult to estimate the value of this market due to the lack of publicly available data.

When analyzing the growing SRI market, it is impossible not to ask why investors choose this type of investment. According to the neoclassical theory of utility, the investor aims to maximize the return (taking into account the accompanying risk), which becomes the basic measure of utility of the investment. From this perspective, the social responsibility of investment is only important if it translates into maximization of utility. According to the neoclassical school, investors will therefore choose investments that are socially responsible only if they (i) maximize (expected) profit at a given (expected) risk level or (ii) minimize (expected) risk at a given level of (expected) profit.

The aim of the research paper is to look for arguments that demonstrate the financial rationality of Socially Responsible Investments. The study verifies the research hypothesis related to the analysis of SRI performance under the conditions of differentiated global risk: H0: relative financial performance of investment in socially responsible indices against financial performance of conventional<sup>3</sup> stock indices may go up as the global financial risk measured by the VIX index increases.

The formulation of the hypothesis was inspired predominantly by the study of theoretical and empirical literature devoted to the subject. The hypothesis was tested using statistical research methods based on a comparative portfolio analysis of geographically diversified SRI indices (RESPECT

Index and DJSI) against reference points (benchmarks), i.e. territorially equivalent conventional stock market indices (WIG20TR and DJITR).

## 2. Review of Past Research

The scientific debate on the performance of Socially Responsible Investments was started in the 70s of the 20th century by the researchers Moskowitz and Markowitz.<sup>4</sup> When stating research hypotheses, it would seem that – from the neoclassical perspective – the reduction of diversification possibilities due to the adoption of additional limiting criteria in the form of social responsibility of investments should reduce the performance of SRIs in relation to the so-called market portfolio. In opposition to Markowitz's view or the theoretical perspective of CAPM, Moskowitz came to the conclusion that SRI portfolios may, however, have a more efficient risk-return profile than conventional portfolios. Moskowitz assumed that the market is not fully efficient. According to him, the process of selecting socially responsible assets is based on information that is not included in market prices due to the focus of financial markets in the short term. Good practices in the field of social responsibility translate into better business performance.

The analysis of empirical literature on Socially Responsible Investments points to a large interest in the topic of researching the financial performance of Socially Responsible Investments in relation to the performance of conventional investments.

The studies, however, do not indicate the unambiguous direction of this relationship, which may vary depending on inter alia: (i) the time of research, (ii) analyzed financial instruments or (iii) countries. Depending on comparative financial performance of SRIs, scientific papers can be divided according to three groups of dependencies (Table 1).

Comparative financial performance of sri	Selected research papers
higher performance of SRI than performance of conventional investments	D'Antonio, Johnsen and Hutton (1997); Kempf and Osthoff (2007); Cai (2014); Khan, Serafeim and Yoon (2016); Bilbao-Terol et al. (2016)
lower performance of SRI than performance of conventional investments	Teper (1992); Entine (2003); Girard, Rahman and Stone (2007); Climent and Soriano (2011); Sanchez and Sotorrio (2014)
no difference in performance between socially responsible and conventional investments	Hamilton, Jo and Statman (1993); Gueard (1997); Scholtens (2005); Blanchett (2010); Humphrey, Warren and Boon (2015)

Tab. 1. List of selected research papers dedicated to the comparative financial performance of SRI. Source: Authors' own work.

In the face of these ambiguous results, a number of scientific studies on SRI performance also analyze more complex hypotheses. They assume that the relationship between SRI and conventional investments may be more complex due to for example: (i) economic trends and risk perception on the capital market, (ii) various subtypes or SRI strategies, (iii) various stages of the SRI market maturity, and (iv) different types of investment instruments.

The analysis of the conclusions of the conducted research on the financial performance of socially responsible indices in relation to conventional stock indices (Table 2) indicates no systematic predominance of comparative performance of SRI indices.

Research paper	Selected conclusions reached by the authors
sauer (1995)	Comparative analysis of the Domini 400 Social Index showed that reducing the number of potential investments due to SRI screening does not need to have a negative impact on SRI performance.
Havemann and Webster (1999)	The performance of ethical indices is similar to that of the conventional FTSE All-Share Index.
Schröder (2004)	Diversification opportunities are reduced for indices that check companies for ethics; the result is a lower adjusted rate of return for SRI indices than that for conventional indices.
Statman (2006)	The results of socially responsible indices are higher than of conventional ones; however, the low statistical significance of the data does not allow rejecting the hypothesis that the results of investments in socially responsible companies are the same as those in conventional companies.
Barwick-Barrett (2015)	Based on the analysis of 14 SRI indices in the U.S, he stated that their financial performance does not differ systematically compared to conventional indices.
Rana and Akhter (2015)	The Pakistani KMI-30 index based on sharia law turned out to underperform its conventional counterpart.
Janik and Bartkowiak (2015)	Based on the analysis of SRI indices in Central and Eastern Europe, they found that the RESPECT index performance was higher than the performance of the WIG20TR index, while no such dependencies were identified for indices from the Vienna Stock Exchange.
Śliwiński and Łobza (2017a)	Based on the analysis of 4 SRI indices, it was found that capital indices determined as socially responsible do not differ in terms of performance in neoclassical terms from general capital indices.

Tab. 2. List of selected research papers on comparative financial performance of socially responsible indices. Source: Authors' own work.

Nevertheless, a number of scientists have undertaken research on comparative analysis of the Socially Responsible Investment performance in various periods of operation of the stock exchange, often related to investors' perception of global risk. The works presented in Table 3 show that the relationship between the financial performance of investments defined as socially responsible and conventional ones does not necessarily have to be straightforward. Most articles, however, emphasize the possible positive impact of social responsibility on the lower risk of investments in periods of high risk, which is usually accompanied by a downturn on the stock market.

Research paper	Selected conclusions reached by the authors
Hussein and Omran (2005)	Muslim indices are more profitable both during the entire period under study (and during the bull market). Muslim indices are less profitable than conventional ones, but only during the bear market.
Abdullah, Hassan and Mohamad (2007)	Muslim funds achieve better results than conventional ones during bearish economic trends. Muslim funds achieve worse results than conventional ones during bullish economic trends.
Amenc and Le Sourd (2010)	In the 2007 crisis, socially responsible investments were more risky than conventional investments (indices).
Ortas, Moneva, Buritt and Tingey-Holyoak (2014)	Based on the behavior of the FTSE4Good-Ibex index in Spain during the 2008 crisis, they stated that SRI can provide protection to investors during crises.
Nofsinger and Varma (2014)	SRI funds achieve better results than conventional ones in times of crisis and worse than conventional ones in other periods.
Becchetti, Ciciretti, Dalò and Herzel (2015)	Socially responsible funds played the role of "insurance" achieving higher efficiency than conventional funds during the global financial crisis in 2007.
Śliwiński and Łobza (2017b)	No systematic dependencies have been found indicating greater comparative performance of SRI indices in periods of upward or falling global risk.

*Tab. 3. List of research papers on comparative financial performance of SRI – complex conclusions in the area of financial performance. Source: Authors' own work.*

Analyzing the research papers on the comparative performance of Socially Responsible Investments, it can be concluded that there is a need for further research on socially responsible indices, including periods characterized by different perceptions of financial risk in the world, and especially on the performance of the only Polish socially responsible index – RESPECT Index. The analysis of the performance of socially responsible indices seems to be very much needed, especially in the context of the growing market of ETFs, whose aim is to faithfully reproduce stock indices.<sup>5</sup>

### 3. Research Methodology

Selection of indices and research periods. The study was conducted on two different markets in terms of the development level according to the MSCI: the developed US market and – included in the markets only aspiring to this group – the Polish market.<sup>6</sup> The analyzed US indices were the S&P Dow Jones family indices. The study also included indices of the Polish stock market published by the Warsaw Stock Exchange.<sup>7</sup> Table 4 compares stock exchange indices on both markets.

Country/ region	Socially responsible index	Conventional stock index (benchmark)
USA	Dow Jones Sustainability™ United States Index Total Return (DJSI US TR)	Dow Jones Industrial Average Total Return (DJITR)
Poland	RESPECT Index (stock index published in Poland as total return index)	Warsaw Stock Exchange Index WIG20 Total Return (WIG20TR)

Tab. 4. List of indices under comparative analysis. Source: Authors' own work.

The research period for each market starts with the first available data for all indices identified as socially responsible, which determines the introduction of the RESPECT Index in Poland, and ends with data available online at the moment of study writing. The test period for all indices began therefore on November 20, 2009 and ended on June 30, 2017. Data sources are: <http://www.stooq.pl/>, <http://www.sustainability-indices.com> and <http://djindexes.com>.

Selection of risk-free rates and global portfolio. A risk-free rate was chosen for both markets. These were the rates of return for: (i) one-month US Treasury bills and (ii) Polish one-year bonds. The global portfolio adopted for study purposes represents the portfolio constructed by prof. Kenneth French and described in the online database published by him at: [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). This page also provides data on rates of return from one-month US Treasury bills. In turn, the rates of return on Polish annual bonds were collected from <https://www.investing.com/>.

Breakdown of periods of global risk. The CBOE Volatility Index (VIX), which measures the expected 30-day volatility of the S&P500 index, was selected as a measure of global market risk. The VIX is considered as an approximation of the global risk aversion of investors despite the fact that it is calculated on the basis of the American market (Ananchotikul & Zhang, 2014). Interpreting the VIX, it was assumed that the ratio below the level of 12 points is low and is then an approximation of low risk aversion, and above 20 points is high, demonstrating high global risk (S&P Dow Jones, 2017). In contrast to the approach presented by Śliwiński and Łobza (Śliwiński & Łobza, 2017b), where the general rule was adopted that the risk is low, as

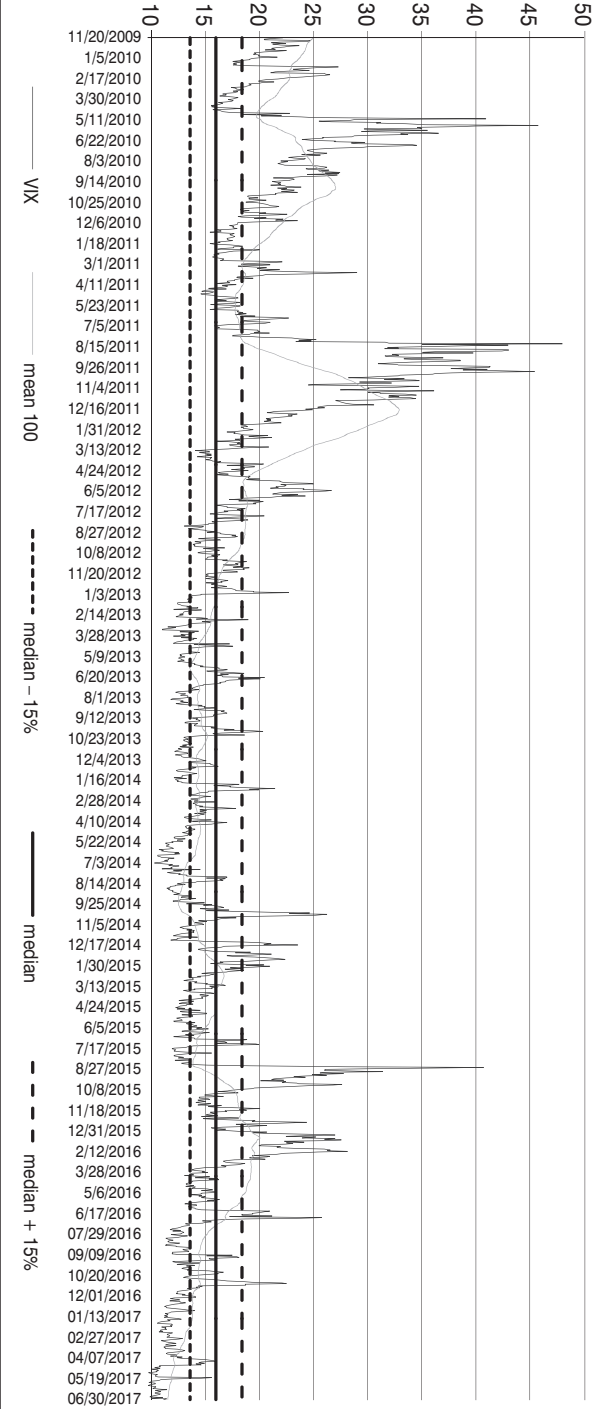


Fig. 1. VIX and its 100-day average in the period from November 20, 2009 to June 30, 2017. Source: Authors' own work.

the VIX decreases, and high, as the VIX grows, the following methodology for dividing risk periods has been used for the study.

Based on the daily VIX values, the median<sup>8</sup> for the VIX for the period covered by the study was calculated, and the periods of global risk were divided into high – when the 100-day average for the VIX is more than 115% of the median, low – less than 85% of the median, and medium – in other cases.<sup>9</sup> Figure 1 shows the VIX in the period from November 20, 2009 to June 30, 2017. Also, the median and lines separating periods of low and high risk from its medium values were marked. Data source: <http://www.stooq.pl>.

Research tools. The hypothesis was tested using the following tools: basic portfolio analysis, including the comparison of the financial performance of socially responsible indices with the financial performance of the corresponding general stock indices in individual periods in terms of average return and risk (standard deviation), extended portfolio analysis aimed at comparison of the financial performance of socially responsible indices against the financial performance of the corresponding general stock indices in periods of high, unidentified and low global risk using Sharpe, Treynor and Jensen's alpha coefficients, which are widely used by researchers assessing investment performance (Bidisha et al., 2017).

Formula 1	Formula 2	Formula 3
$Tr = \frac{r_i - r_f}{\beta_i}$ ,	$Sh = \frac{r_i - r_f}{SD_i}$ ,	$r_{it} - r_{ft} = \alpha_i + \beta_i \times (r_{mt} - r_{ft})$ .

The Treynor's ratio ( $T_r$ ) is given by Formula 1, where  $r_i$  is the average rate of return on assets  $I$ ,  $r_f$  is the rate of return on a risk-free asset, and  $\beta_i$  is the beta factor of the asset and the market portfolio. Sharpe's ratio ( $Sh$ ) is presented in Formula 2, where  $SD_i$  is the standard deviation of the asset  $i$ . From Jensen's perspective, as in the models described above, the rate of return and risk play a key role in the analysis of the performance of investment funds. The method presented by him is an extension of the CAPM model (so-called Jensen's alpha).<sup>10</sup> In Formula 3,  $r_{it}$  expresses the rate of return on assets and in the period  $t$ ,  $r_{ft}$  – rate of return on risk-free assets in period  $t$ ,  $\alpha_i$  – surplus of return (also called Jensen's alpha),  $\beta_i$  – index of beta assets  $I$ ,  $r_{mt}$  – market rate of return in the period  $t$ .

#### 4. Research Results

In order to conduct a comparative performance analysis of the socially responsible indices against the territorially corresponding conventional indices, periods of high, medium and low financial risk were identified in accordance with the methodology set out in item 3 of the research paper. They are listed in Table 5.



No.	Subperiod	Risk level (vix)	Mean	Median	Number of index quotations in subperiod (usa/poland)
1	20.11.2009–12.04.2011	H1: high	22.47	22.76	350/343
2	13.04.2011–28.07.2011	U1: medium	18.02	18.02	74/71
3	29.07.2011–14.09.2012	H2: high	23.72	22.14	286/277
4	17.09.2012–27.06.2014	U2: medium	14.96	14.48	447/428
5	30.06.2014–17.10.2014	L1: low	12.92	12.96	78/77
6	20.10.2014–08.12.2015	U3: medium	15.70	15.73	283/274
7	09.12.2015–12.05.2016	H3: high	19.21	19.24	107/104
8	13.05.2016–03.02.2017	U4: medium	15.02	14.49	187/190
9	06.02.2017–30.06.2017	L2: low	12.31	12.12	108/105
<b>3, 7</b>	<b>combined periods of high risk</b>	<b>H: high</b>	22.48	22.01	743/724
<b>1, 2, 4, 6, 8</b>	<b>combined periods of medium risk</b>	<b>U: medium</b>	15.41	15.10	991/963
<b>5, 9</b>	<b>combined periods of low risk</b>	<b>L: low</b>	12.57	12.47	186/182
1–12	whole period	H+L+U	17.54	16.00	1920/1869

Tab. 5. List of periods of high, medium and low global financial risk from November 20, 2009 to June 30, 2017. Source: Authors' own work.

Table 6 compares the two SRI indices with the corresponding conventional indices in terms of: (i) mean, (ii) standard deviation (SD), and coefficients: (iii) Sharpe's and (iv) Treynor's, and (v) Jensen's alpha. The list allows observation of the behavior patterns of these indices in terms of performance.

DJSI US (TR, USD)					
period	mean [%]	SD [%]	Sharpe	Treynor x 100	Jensen's alpha [%]
H1	0.053	0.968	0.0537	0.0584	0.001
U1	0.007	0.803	0.0088	0.0089	0.013
H2	0.048	1.300	0.0368	0.0508	0.025
U2	0.074	0.678	0.1089	0.0746	0.008
L1	-0.050	0.738	-0.0682	-0.0434	0.071
U3	0.033	0.981	0.0335	0.0292	0.021

Tab. 6. Cont.

DJSI US (TR, USD)					
period	mean [%]	SD [%]	Sharpe	Treynor x 100	Jensen's alpha [%]
H3	0.028	1.073	0.0258	0.0256	0.035
U4	0.067	0.665	0.0986	0.0805	0.021
L2	0.065	0.441	0.1407	0.0689	-0.006
H	0.047	1.111	0.0432	0.0508	0.015
U	0.056	0.771	0.0779	0.0578	0.014
L	0.016	0.566	0.0531	0.0218	0.026
H+L+U	0.049	0,913	0.0529	0.0507	0,013
DJITR (TR, USD)					
period	mean [%]	SD [%]	Sharpe	Treynor x 100	Jensen's alpha [%]
H1	0.064	0.941	0.0672	0.0737	0.008
U1	0.010	0.804	0.0124	0.0128	0.016
H2	0.056	1.266	0.0442	0.0617	0.034
U2	0.060	0.656	0.0915	0.0639	-0.003
L1	-0.025	0.713	-0.0354	-0.0231	0.089
U3	0.040	0.946	0.0418	0.0368	0.028
H3	0.023	0.998	0.0226	0.0231	0.029
U4	0.073	0.628	0.1138	0.0947	0.030
L2	0.078	0.435	0.1739	0.0885	0.011
H	0.055	1.074	0.0519	0.0618	0.021
U	0.053	0.744	0.0756	0.0581	0.014
L	0.035	0.551	0.0861	0.0417	0.044
H+L+U	0.052	0.883	0.0583	0.0566	0.018
RESPECT Index (TR, PLN)					
period	mean [%]	SD [%]	Sharpe	Treynor x 100	Jensen's alpha [%]
H1	0.133	1.269	0.0957	0.1506	0.084
U1	-0.032	0.943	-0.0472	-0.0703	-0.047
H2	0.001	1.408	-0.0081	-0.0152	-0.021
U2	0.035	1.062	0.0250	0.0397	-0.010
L1	0.025	0.818	0.0237	0.0401	0.074

Tab. 6. Cont.

RESPECT Index (TR, PLN)					
period	mean [%]	SD [%]	Sharpe	Treynor x 100	Jensen's alpha [%]
U3	-0.078	1.049	-0.0791	-0.1059	-0.095
H3	0.019	1.300	0.0114	0.0192	-0.004
U4	0.117	1.097	0.1030	0.1354	0.065
L2	0.097	1.032	0.0895	0.0992	0.023
H	0.066	1.327	0.0439	0.0684	0.031
L	0.013	1.056	0.0041	0.0073	-0.022
U	0.065	0.938	0.0605	0.0731	0.045
H+L+U	0.038	1.161	0.0261	0.0398	0.007
WIG20TR (TR, PLN)					
period	mean [%]	SD [%]	Sharpe	Treynor x 100	Jensen's alpha [%]
H1	0.076	1.205	0.0541	0.1013	0.029
U1	-0.044	0.841	-0.0528	-0.0771	-0.060
H2	-0.001	1.609	-0.0004	-0.0008	-0.025
U2	0.023	1.049	0.0222	0.0303	-0.027
L1	0.035	0.837	0.0423	0.0654	0.091
U3	-0.081	1.020	-0.0796	-0.1073	-0.097
H3	0.012	1.310	0.0091	0.0133	-0.014
U4	0.093	1.122	0.0830	0.1117	0.041
L2	0.117	1.069	0.1092	0.1155	0.037
H	0.038	1.375	0.0268	0.0497	0.002
L	0.001	1.039	0.0014	-0.0023	-0.036
U	0.081	0.967	0.0797	0.0934	0.060
H+L+U	0.023	1.182	0.0174	0.0182	-0.011

Tab. 6. Results of asymmetrical portfolio analysis for selected indices. Source: Authors' own work.

Based on the analysis of the results of the asymmetrical overall portfolio analysis (Table 6), it can be concluded that:

- i. Throughout the analysis period (H+L+U), DJITR proved to outperform the corresponding DJSI index, unlike in Poland, where the RESPECT index outperformed the corresponding WIG20TR index;

- ii. DJITR turned out to outperform the corresponding DJSI index at low (L) and high (H) global risk levels, while the RESPECT index outperformed the corresponding WIG20TR index at high (H) and medium (U) global risk levels.

The above observations indicate that there is no universal pattern of behavior of socially responsible indices towards their conventional counterparts. Investments based on socially responsible indices can outperform investments in which the factor of social responsibility is not taken into account, but not necessarily. Also, analyzing the financial performance of indices in periods characterized by different perceptions of global financial risk based on the analysis of results presented in Table 6, it cannot be concluded that in the situation of high, medium or low global risk socially responsible indices systematically outperform (in terms of risk and return) and are more profitable and less risky than the corresponding conventional indices.

	average x 100 (DJSI U.S.-DJITR)	SD x 100 (DJSI U.S.-DJITR)	Sharpe (DJSI U.S.-DJITR)	Treynor x 100 (DJSI U.S.-DJITR)	Jensen's alpha x 100 (DJSI U.S.-DJITR)
<b>Period of high risk H</b>	-0.766	3.695	-0.874	-1.103	-0.590
<b>Period of medium risk U</b>	0.298	2.664	0.234	-0.032	0.069
<b>Period of low risk L</b>	-1.835	1.434	-3.299	-1.989	-1.757
<b>Whole period: H + L + U</b>	<b>-0.320</b>	<b>3.024</b>	<b>-0.544</b>	<b>-0.595</b>	<b>-0.481</b>
	average x 100 (DJSI U.S.-DJITR)	SD x 100 (DJSI U.S.-DJITR)	Sharpe (DJSI U.S.-DJITR)	Treynor x 100 (DJSI U.S.-DJITR)	Jensen's alpha x 100 (DJSI U.S.-DJITR)
<b>Period of high risk H</b>	2.840	-4.797	1.712	1.870	2.895
<b>Period of medium risk U</b>	1.143	1.764	0.558	0.959	1.407
<b>Period of low risk L</b>	-1.555	-2.905	-1.921	-2.025	-1.485
<b>Whole period: H + L + U</b>	<b>1.550</b>	<b>-2.083</b>	<b>1.357</b>	<b>2.160</b>	<b>1.739</b>

Tab. 7. Results of comparative asymmetrical portfolio analysis for selected indices (in %).  
Source: Authors' own work.

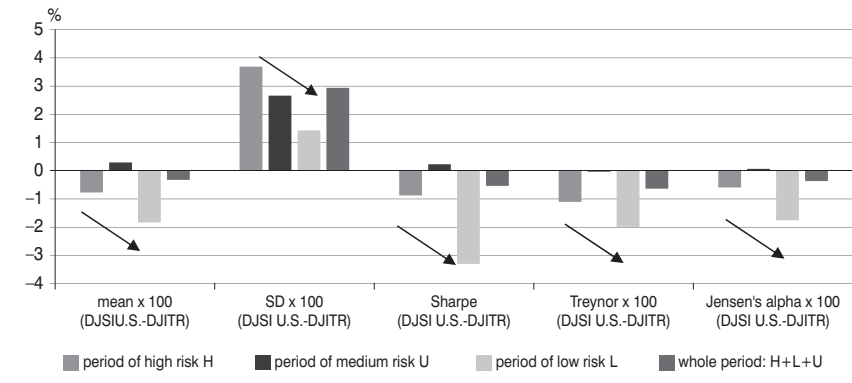


Fig. 2. Comparison of results of asymmetrical portfolio analysis for American indices. Source: Authors' own work.

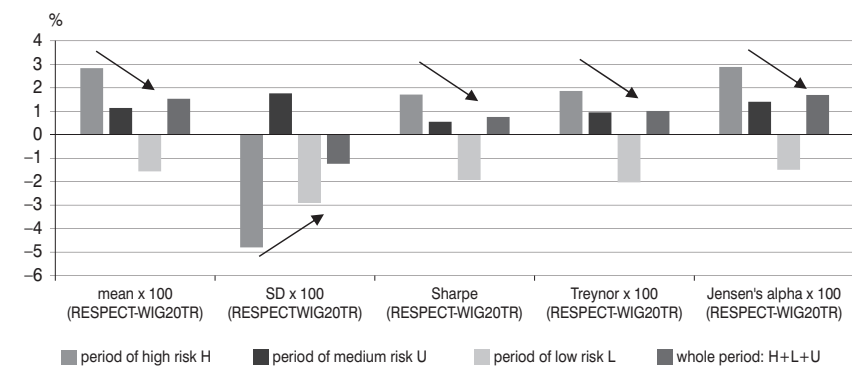


Fig. 3. Comparison of results of asymmetrical portfolio analysis for Polish indices. Source: Authors' own work.

However, the most interesting conclusions can be drawn from the analysis of results of the asymmetrical comparative portfolio analysis, which is summarized in Table 7, and illustrated in Figures 2 and 3:

- i. For DJSI US and DJITR indices, by comparing rates of return and their volatility, it can be seen that in high-risk periods, the predominance of the conventional index over the socially responsible index in terms of historical returns was lower in the high-risk period with a larger difference between the standard deviations of the indices studied. In turn, relative measures that track both profitability and risk (composite ratios: Sharpe, Treynor and Jensen's alpha) show that the relative advantage of the financial performance of the DJITR index over the DJSI US index

decreases during a high-risk period compared to periods characterized by low VIX indicators.

- ii. In the case of the RESPECT and WIG20TR indices, it can be noticed that the predominance of the financial performance of the Polish SRI index goes up with the increase of global risk. The advantage of the RESPECT Index, in terms of the average rate of return, standard deviation and measures taking into account the rate of return and risk, was most marked during periods of high risk and less in periods of medium risk. In low-risk periods, the WIG20TR index showed better performance as measured by composite factors and the rate of return, with higher risk observed as measured by standard deviation.
- iii. In both cases, the socially responsible indices outperformed conventional indices in medium risk periods, taking into account measures including the average rate of return, standard deviation, Sharpe and Jensen's alpha. Only the comparative analysis of the Treynor's ratio in the US sample did not show the supremacy of the SRI index over its conventional counterpart.

## 5. Conclusions

Diversified results of the current research lead to general conclusions that we are not dealing with a rule that would suggest supremacy of financial performance of socially responsible indices over territorially equivalent conventional stock indices. Also, it cannot be deduced that, in a situation of increased global risk, socially responsible indices systematically outperform (in terms of risk and return) and are more profitable and less risky than the territorially corresponding conventional indices.

Therefore, the question arises whether there are rational, in the neoclassical sense, motives for the selection of SRI. The research paper attempts to look for arguments indicating that Socially Responsible Investing can be financially sound. On the one hand, this statement is supported by the relative higher financial performance of the RESPECT Index throughout the period considered, as well as by DJSI US in the period of medium global risk. On the other hand, on the basis of the conducted research, the hypothesis was confirmed that the relative financial performance of investments in socially responsible indices against performance of conventional indices may go up with the increase of the global financial risk measured by the VIX index. Therefore, Socially Responsible Investments can be used to protect the investment portfolio in periods characterized by a high level of global risk, which is an important practical implication of the conducted research.

However, the growing market of Socially Responsible Investments cannot be analyzed only through the prism of simplified rational choices or the theory of utility that is adopted by neoclassical economics. To fully understand the growth of the SRI market, one must go beyond the restrictive

assumptions of the neoclassical theory. The analysis of this phenomenon should include, apart from taking into account the rate of return and risk, behavioral economics, but also the philosophy of morality (ethics).

### Endnotes

- <sup>1</sup> The idea of Socially Responsible Investment assumes that an investor who acts in good faith and is guided by her/his internal moral compass may, through investment activities, contribute to the good not only of his/her own, but of the wider society, which goes beyond the strictly utilitarian understanding of good.
- <sup>2</sup> Other religions also relate to a financial sphere. However, there is relatively a small number of investment instruments directly referring to them.
- <sup>3</sup> A conventional investment means an investment that does not accept the criterion of social responsibility. This does not mean that it is socially irresponsible, but it means only that it has not been given a label of being socially responsible.
- <sup>4</sup> Broader: Van Liedekerke, De Moor and Vanwalleghem (2007).
- <sup>5</sup> At the end of 2016, over 10% of the total market capitalization of assets and more than 30% of the total volume of transactions on US stock exchanges were ETFs (Ben-David et al., 2017).
- <sup>6</sup> On September 24, 2018, the decision of the FTSE Russell index agency, announced in 2017, entered into force. It has reclassified the Polish market from developing to developed. In turn, according to the American MSCI, whose decisions are much more important for the markets, Poland is included in the group of countries aspiring to the group of developed countries.
- <sup>7</sup> S&P Dow Jones publishes indices referred to as socially responsible drawn up according to different methodologies (see <http://www.sustainability-indices.com/> and <http://djindexes.com/>). The RESPECT Index is prepared by the Warsaw Stock Exchange. The partner of this project is Deloitte. More on the methodology of its creation: <http://www.odpowiedzialni.gpw.pl/>.
- <sup>8</sup> Due to the occurrence of asymmetric data distribution with outliers taking values significantly standing out from the rest of the results (the maximum VIX in the analysed period had 80.86 points and the minimum VIX had 9.09 points), the median was chosen rather than the arithmetic mean to determine periods differing in perceived risk.
- <sup>9</sup> If we were to take the spread against the median (16.0) in the amount of  $\pm 25\%$ , then the limit values would be 12 and 20 for the low and high risk periods, respectively, and would be in line with the interpretation given by S&P Dow Jones (2017). Such an approach would significantly reduce the number of observations in these periods. Hence the decision to adopt a spread in relation to the median of  $\pm 15\%$ .
- <sup>10</sup> In the situation where alpha is positive, it can be assumed that the fund is outperforming the market portfolio and *vice versa*.

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