RISK-REWARD TRADEOFF AND BEHAVIOR OF ISLAMIC AND CONVENTIONAL STOCK MARKET INDICES IN BOSNIA AND HERZEGOVINA

Irfan Djedović[1], Edin Djedović[2]

ABSTRACT

This paper empirically examines tradeoff between risk and return for the Islamic stock market index in Bosnia and Herzegovina (BiH) (SASXBBI) and compares it with risk-return tradeoff of the conventional stock market index in BiH (SASX-30). Furthermore, it examines the eventual impact of the conventional stock market index in BiH on the SASXBBI. The study used daily index observations spanning in the period from October 2016 until December 2018. The data were obtained from the Sarajevo Stock Exchange database. The risk-reward ratio is used to investigate the tradeoff between risk and return of the indices, while Ordinary Least Squares (OLS) regression analysis is used to investigate the impact. The results show that there is better risk-reward tradeoff in the conventional index in BiH compared to the Islamic index in BiH. Also, the results suggest that conventional index return has a significant positive impact on Islamic index return in BiH.

Keywords: Islamic index, conventional index, risk-reward, impact, OLS, Bosnia and Herzegovina (BiH)

JEL Classification: G1

1. INTRODUCTION

In the last two decades we can witness that Islamic financial services around the world have grown rapidly. In the Islamic Finance Bulletin released by the World Bank Group (Islamic Finance Bulletin, 2018, pp.4), it is stated that "the Islamic finance industry is climbing to new heights on the back of strong global demand for sustainable and socially responsible investments".

When we focus on Islamic stock market as a part of Islamic finance pool, it can be seen that the most important global index providers have introduced Islamic stock market indices as counterparts to the already existing conventional indices. Islamic stock market indices provide options for investors to invest their money in accordance to their religious beliefs, and still have the possibility to earn profit. Furthermore, these indices are the option not only for Muslim investors, but also for all the traders in financial market.

Rapid introduction of Islamic indices comes mostly as a result of the need of a certain group of investors, more precisely Muslim investors who possess capital to invest based on the Shariah rules. Therefore, in order to attract this type of investors, global index providers created this alternative for Muslim investors. However, Islamic indices may also be a good and viable option for diversification to other investors too.

As El Khamlichi *et al*., (2014, p.1138.) state "Islamic indices were launched for the first time in the late nineties, the beginning was in April 1998 with the DMI 150 index (Dar al Mal al-Islami) launched jointly by two private banks (Faisal Finance and Bank Vontobel) in order to track the performance of 150 largest global publicly traded companies. Another index was created in November of the same year, it was SAMI (Socially Aware Muslim Index) which measured the performance of 500 Shariah compliant companies. Later on, the Dow Jones created the Dow Jones Islamic Market Index (DJIMI) in February 1999 and FTSE Group launched the Global Islamic Index Series (GIIS) at London Stock Exchange in October 1999." Besides the most important and developed financial centers such as the

1 *Master Vision d.o.o., Sarajevo, irfan_djedovic@hotmail.com*
2 *Cantonal Administration for Inspection Affairs of Tuzla Canton, e_djedovich@hotmail.com*

USA, the UK, Hong Kong, Japan, Germany, *etc*., we are witnessing the existence of Islamic indices in many developing countries including Turkey, Indonesia, Malaysia, Saudi Arabia, Kuwait, etc.

As Al-Khazali *et al*. (2013) state, the demand for Islamic financial instruments is growing at a fast pace and many individual and institutional investors, mainly from Islamic countries, seek to invest only in stocks that are compliant with Islamic laws. Based on this fact, in October 2016 the SASXBBI was introduced in Bosnia and Herzegovina (BiH). The index was introduced in cooperation between Bosna Bank International joint stock company and the Sarajevo Stock Exchange. It was introduced based on the need of Muslim investors from BiH as well as from abroad to have the opportunity to invest in accordance to their religious beliefs, as well as to be able to attract capital from other countries.

However, academic research regarding Islamic stock indices are still developing. This situation can be explained, as Fowler and Hope (2007) state, by short histories of Islamic indices and by some methodological difficulties due to differences in size and industry-weighting. As Abdalla (2012) states, "in finance theory, it is generally accepted that the expected return of the market is positively and proportionally related to the conditional volatility, meaning that if there are expectations of higher levels of risk associated with a particular investment, then greater returns are required as compensation for that higher expected risk." While there is much literature on the dynamic relationship between risk and returns of conventional stock markets (Abdalla, 2012), there is a lack of similar studies for Islamic stock markets. Thus, one of the contributions of this paper is to provide empirical evidence on this relationship in BiH.

Seen from investors' perspective, the easiest way for them to make a well diversified portfolio is to invest in various indices. Therefore, the introduction of Islamic indices can help them in making a better diversified portfolio by including these indices in addition to the conventional ones. This is because Islamic indices in general have lower risks and are more transparent. However, as Bauer *et al*. (2005, pp. 33-48) state, "financial philosophy however casts doubt on the ability of Islamic indices to perform as well as the conventional ones due to the smaller size of the investment pools relative to the conventional asset markets. Given its lower diversification potential as well as the higher costs of Islamic compliant portfolio selection, one may suggest that these investments would underperform the conventional ones."

Therefore, the objective of this study was to investigate risk-return tradeoff of the SASXBBI and compare it to the SASX-30, and by doing that, be able to see how the Islamic index performs based on this ratio, compared to its conventional counterpart. To the best of author's knowledge, this was a pioneer study in BiH regarding the performance of the Islamic index compared to the conventional one. This can be valuable information for investors as well as for theory and academic research.

Furthermore, when we discuss the behavior of Islamic stock market indices, the theory in general states that macroeconomic variables cannot comprise all the information available to the capital market, while stock prices react quickly to publicly disclosed information. Therefore, it is recommended to investigate also the impact of financial market variables. Thus, the market index used in this study is the SASX-30, as a conventional counterpart index in BiH. Since the pool of companies that can constitute the conventional index in BiH is broader than the pool of companies that comply with Sharia'h criteria (can constitute the Islamic index in BiH), it is expected that the conventional index should have impact on the Islamic index in, as the Islamic index is a filtered version of the conventional one. Therefore, the other objective of the study was to investigate the impact of the SASX-30 on the SASXBBI return in BiH.

In order to fulfill the main research objective, this study applied the risk-return ratio method, which is a measure of return in terms of risk for a specific time period. Furthermore, the study applied the Ordinary Least Squares (OLS) regression method in order to explore the other research objective.

Based on the objectives of the study, two research hypotheses were postulated:

H_1: *Conventional stock market index has better performance (risk-reward tradeoff) than Islamic stock market index in BiH*

H_2: *Conventional stock market index in BiH has an impact on Islamic stock market index return*

The results of the study suggest that conventional stock market index return has a significant positive impact on Islamic index return. Also, the results suggest that the performance of conventional index in BiH based on the risk-reward ratio method of analysis is better than Islamic index performance.

2. LITERATURE REVIEW

Despite the growing interest in Islamic finance, there are not many empirical studies that investigate the performance of Islamic stock market indices. In this study we will mention several studies that deal with the performance of Islamic stock market indices.

A comparison of the risk-adjusted performance by Hussein (2004) provided empirical evidence that the FTSE Islamic Index performed as well as the FTSE All-World Index over the entire study period. Hussein and Omran (2005) examined the performance of the Dow Jones Islamic Market Index (DJIMI) and its 13 sub-indices. They used the data covering the period from 1996 to 2003. The results suggest that Islamic indices outperform their conventional counterparts in bull markets but underperform in bear markets.

Albaity and Ahmad (2008) investigated the performance of the Kuala Lumpur Syariah Index (KLSI) and the Kuala Lumpur Composite Index (KLCI). The study included the data in the period from 1999 until 2005. They did not find evidence of significant statistical differences in risk-adjusted returns between the two indices. Aka (2009) confirmed that the MSCI World Islamic Index significantly outperformed its conventional counterpart index during the period from 2004 until 2009. Also, they he found that the key advantages of the Shari'ah indices lied in the facts that they are less volatile and are less likely to experience large market swings.

Hassan and Girard (2011) found no significant difference in the performance between Islamic and conventional indices and they also found that both groups are poorly integrated. Also, they concluded that similar reward to risk and diversification benefits exist for both sets of indices. Furthermore, the study by Al-Rifai (2012) showed that the Dow Jones Islamic indices outperformed the conventional indices during the last global financial crisis.

Hence, it can be concluded that there is no clear evidence that Islamic screened investment portfolios tend to underperform the conventional funds. Several past studies report that some Islamic indices perform as well as or even better than their counterpart conventional indices. Therefore, it is possible for religious investors to earn maximum possible returns. The argument that there is a financial penalty for being an Islamic investor is therefore debatable.

In general, it can be stated that the literature on the performance of Islamic indices is still very scarce. However, from the literature searched, it can be concluded that religious stock screens (Sharia-compliant) do not reduce financial performance in comparison to the conventional index investment around the world. Studies investigating the relationship between Islamic stock market indices and conventional indices are still rare and developing. Considering the fundamental differences between Islamic and conventional financial assets, one might argue against a potential transmission of risk or volatility across Islamic and conventional equities.

We will therefore mention several empirical studies that investigate the behavior of Islamic stock market indices and the relationship between conventional and Islamic stock market indices. Albaity and Ahmad (2008) examined the relationship between the Kuala Lumpur Sharia'ah Index (KLSI) and the Kuala Lumpur Composite Index (KLCI) in the period from 1999 until 2005. They found that the short-run causality is bi-directional between

the two indices. Hammoudeh et al. (2014) revealed a significant upper and lower tail dependence between the DJIMI and the major conventional markets. Bakri Abdul et al. (2014) found significant short-run bi-directional causality between the Malaysian Islamic stock market and the conventional stock market.

Nazlioglu *et al*. (2015) examined whether volatility/risk transmission exists between the Dow Jones Islamic Stock Index and three conventional stock markets for the USA, Europe, and Asia. They found that there is volatility spillover between the Islamic and the conventional indices. Bahloul, Mroua and Naifar (2017) examined the impact of conventional index return and volatility, the inflation rate and the short-term interest rate on the Islamic stock market return for the period from 2002 until 2014 (monthly data). They included ten developed and ten emerging markets. The results indicated that conventional index return has a significant impact on Islamic index return. Jebrana, Chenb and Tauni (2017) in their Pakistani study found significant long run and short run link between the Islamic and the conventional index. Furthermore, the study found asymmetric bi-directional volatility spillover between the Islamic and the conventional index. Thus, as Umar and Suleman (2017) state, the relatively sparse empirical literature which focuses on the issue of volatility spillover between Islamic and conventional indices shows mixed results.

3. DATA AND METHODOLOGY

This study used daily index observations in the period from October 2016 until December 2018. The data were obtained from the Sarajevo Stock Exchange (SASE) database. The risk-reward ratio method was used to estimate the performance of the Islamic and the conventional indices in BiH. The risk-reward ratio is a measure of return in terms of risk for a specific time period. This ratio is used to gauge the performance of an investment adjusted by its risk.

Since there are no official statistical data on monitoring and calculating the risk-free rate of return in BiH, we did not subtract the risk-free rate values from the expected portfolio returns, as formulated in the Sharpe ratio formula. We therefore used the following calculation process for the risk-reward ratio:

Equation 1. Risk-reward ratio (tradeoff) = *Expected portfolio return / Standard deviation of portfolio return*

Before estimating the risk-reward ratio of the indices and performing the second part of the analysis (OLS regression), the arithmetic return and volatility of the indices were calculated.

The arithmetic return of the indices was estimated by subtracting the index value at time t - 1 from the index value at time t and dividing it by the index value at time t as shown in Eq. (2), where Rt is the return at time t, Pt is the index at time t, and Pt-1 is the index at time t - 1.

Equation 2. $R_t = (P_t - P_{t-1})/P_{t-1}$

The next step was the calculation of the volatility of both indices. Volatility was measured as a square of the deviations from the mean. We considered that $\Delta \boldsymbol{y_t}$ indicates the series with deviations from the means.

As it can be seen in Eq (3), the volatility of the indices was estimated as:

Equation 3. $\Delta y_t^2 = (\Delta y_t - \Delta \bar{y})^2$

where $\Delta \bar{y} = \Sigma \Delta y_t / T$.

4. EMPIRICAL ANALYSIS AND RESULTS

This part of the study presents the graphs representing the movement of the two indices (price, return and volatility) over time. Furthermore, it brings the unit root tests for the time series used in the analysis, as well as the results of the risk-reward ratio and the OLS regression analysis.

4.1. Graphical representation of the variables

In this section, we present the prices, return and volatility values of the SASX-30 and the SASXBBI in BiH, for the observed period of time.

Figure 4.1. presents the prices of the indices for the observed period of time. Figure 4.2. presents the return values of the indices. Furthermore, Figure 4.3. presents are the volatility values of the Islamic and the conventional indices for the observed period of time.

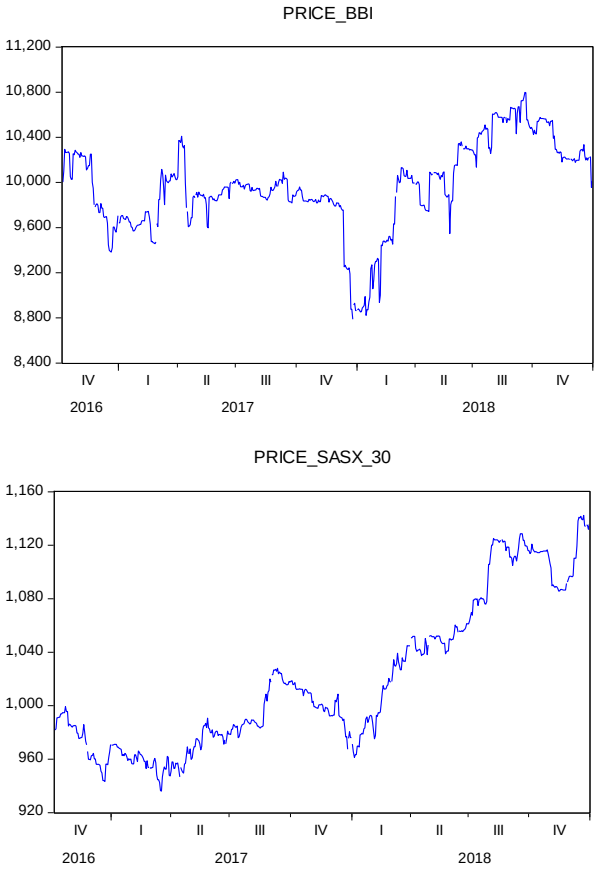

Figure 4.1. *Islamic and conventional index prices*

Source: Author's own work

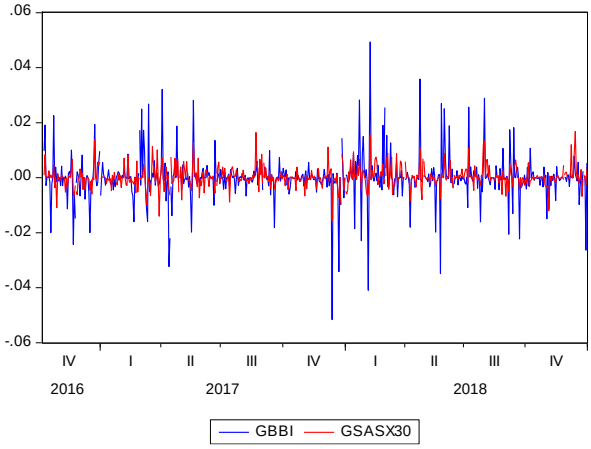

Figure 4.2. *Islamic and conventional index return rates*

Source: Author's own work

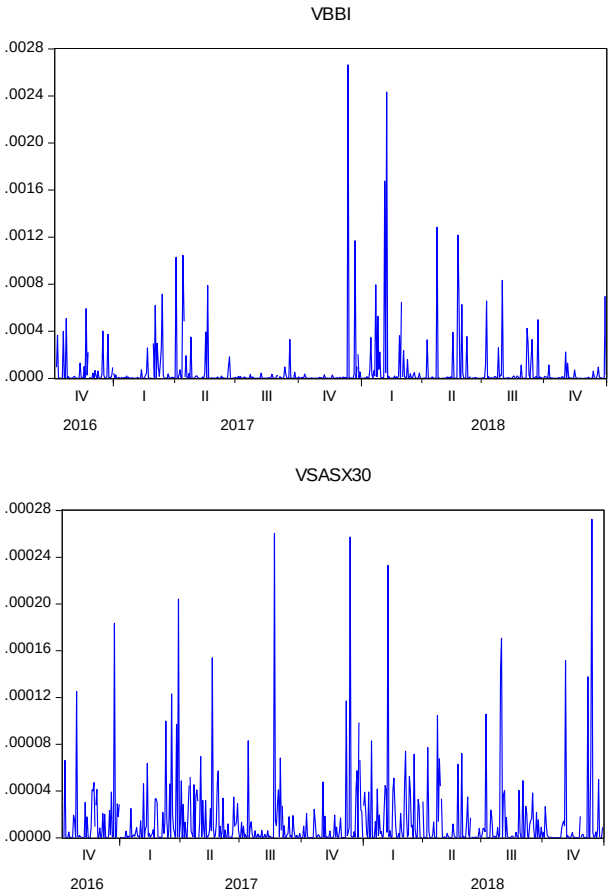

Figure 4.3. *Islamic and conventional index volatility*

Source: Author's own work

4.2. The unit root test

From the Augmented Dickey-Fuller and the Phillips-Perron unit root test results, given in Table 4.1., we can see that the three variables used in the study are stationary at levels.

Table 4.1 *Results of the Unit root test for the variables*

Respondents background	**ADF (Test Statistics)**	**PP (Test Statistics)**
Variables	**Level**	**Level**
Islamic index return (GSASXBBI))	0.0000*	0.0000*
Conventional index return (GSASX-30)	0.0000*	0.0000*
Islamic index volatility (VSASXBBI)	0.0000*	0.0000*
Conventional index volatility (VSASX-30)	0.0000*	0.0000*

Note: * indicates significance at 1%

Source: Author's own work

4.3. The risk-reward ratio analysis

In this section of the study the results of the risk-reward tradeoff are presented. Figure 4.4. and Figure 4.5. show descriptive statistics results for the risk-reward ratios of the Islamic and the conventional indices. These empirical results are summarized in Table 4.2.

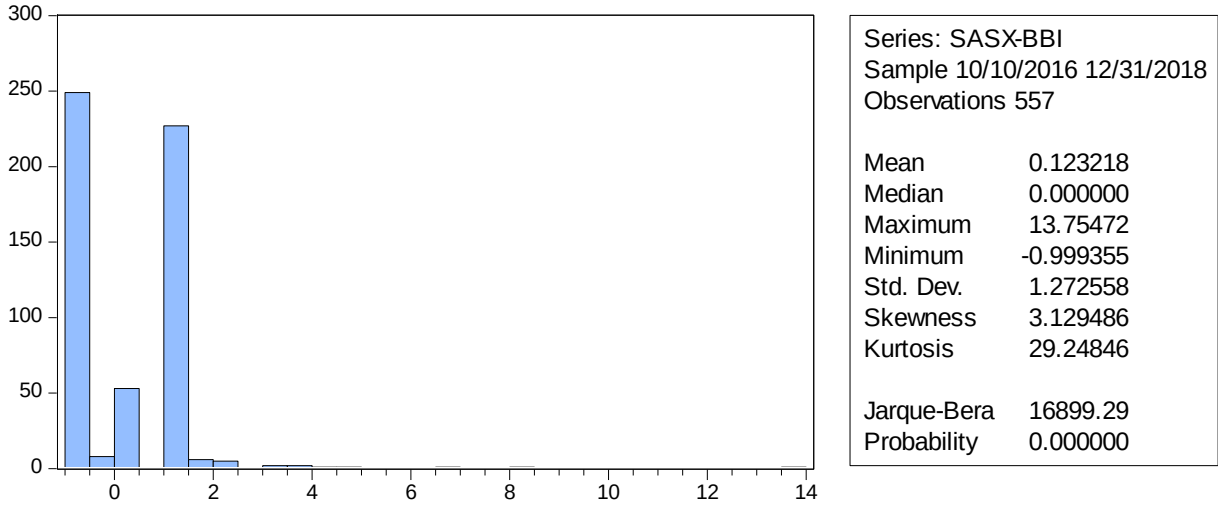

Figure 4.4. *The Risk-reward tradeoff of the Islamic index in BiH*

Source: Author's own work

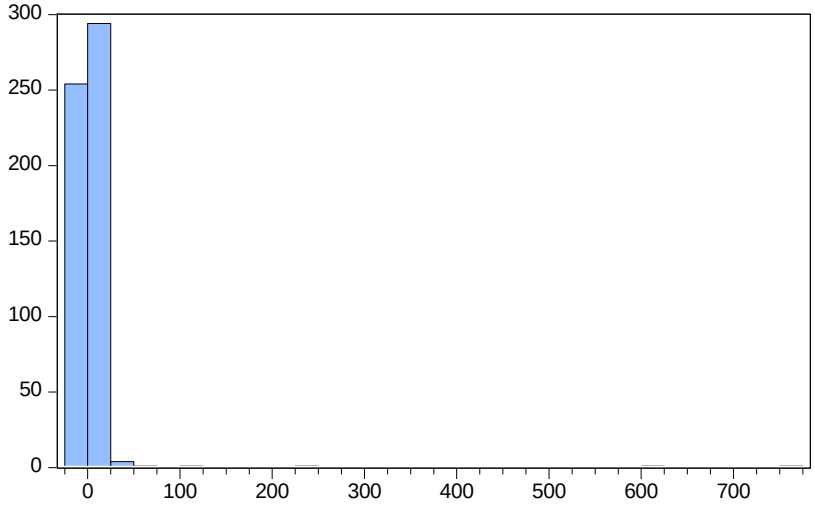

Figure 4.5. *The Risk-reward tradeoff of the conventional index in BiH*

Source: Author's own work

The results indicate that there is a better risk return tradeoff in the conventional index (3.816) in BiH, compared to the Islamic index (0.123) in BiH. The results suggest that the conventional index has 3,816 extra return for the additional risk, while the Islamic index gives 0,123 extra return for the additional risk.

Since this ratio is used to gauge the performance of an investment adjusted by its risk, the results suggest that the performance of investment in the SASX-30 when adjusted by its risk, is better than investment in the Islamic stock index when adjusted by its risk.

The higher the ratio, the greater the investment return relative to the amount of risk taken, and thus, the better the investment.

Table 4.2 *The risk-reward tradeoff of the Islamic and the conventional indices*

Respondents background	**Risk-reward tradeoff**
Islamic index (SASXBBI) **Conventional index (SASX-30)**	0.123 3.816

Source: Author's own work

4.4. OLS regression analysis results

In this section, the results of the OLS regression analysis are presented. The return and volatility of the SASX-30, are independent variables used to investigate the impact on the return of the SASXBBI. The empirical results summarized in Table 4.3. indicate that the return of the SASX-30 has a significant positive impact on the SASXBBI return in BiH. Hence, when the SASX-30 return increases, the SASXBBI return also increases, and vice versa. However, there is no impact of the SASX-30 volatility on the SASXBBI return in BiH. The given model satisfies serial correlation and heteroskedasticity assumptions after the variables were converted into the log values, in order to avoid serial correlation and heteroscedasticity problems (see Appendix A).

Table 4.3 *The results of the OLS regression analysis*

Dependent Variable: LOG(GSASXBBI)				
Method: Least Squares		Included observations: 179		
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	*-3.368.495*	*0.479175*	*-7.029.784*	*0.0000*
LOG(GSASX-30)	*0.543161*	*0.114527*	*4.742.664*	***0.0000***
LOG(VSASX-30)	*-0.046751*	*0.045065*	*-1.037.408*	*0.3010*
R-squared	*0.195576*	Mean dependent var		*-6.341.029*
Adjusted R-squared	*0.186435*	S.D. dependent var		*1.698.418*
S.E. of regression	*1.531.936*	Akaike info criterion		*3.707.560*
Sum squared resid	*4.130.419*	Schwarz criterion		*3.760.980*
Log likelihood	*-3.288.266*	Hannan-Quinn criter.		*3.729.221*
F-statistic	*2.139.508*	Hannan-Quinn criter.		*1.736.908*
Prob(F-statistic)	*0.000000*			

Source: Authors' own work

5. SIGNIFICANCE AND CONTRIBUTION OF THE STUDY

This is one of the rare studies on the performance and behavior of the Islamic stock market index in BiH. Therefore, it can be stated that the study partially fills the gap regarding the Islamic stock market in BiH. However, more studies should be conducted in the future covering the issue of the Islamic stock market in BiH. This study contributes to the existing international literature on Islamic indices behavior and performance. Also, it provides valuable information to potential investors who can better understand the relationship between conventional and Islamic indices, and the performance of the Islamic stock market index compared to its conventional counterpart.

6. LIMITATIONS AND RECOMMENDATION FOR FUTURE STUDIES

The main limitation of the study is the shortness of the time series used in the study. The main reason for this limitation is that the Islamic index in BiH was introduced in October 2016. Therefore, a relatively short period of index movement could be observed. So, in the future, new studies should observe a longer period of index movement, thus strengthening the reliability of the results. Furthermore, future studies may also observe the potential impact of the macroeconomic variables in BiH on the Islamic index.

7. CONCLUSION

This research had two main objectives. The first objective of the study was to investigate the performance of the SASXBBI compared to the SASX-30. The second objective of the study was to investigate the potential impact of the the SASX-30 return and volatility on the the SASXBBI return. In order to fulfill the objectives, the risk-reward ratio and the OLS regression methods were used. The results of the risk-reward ratio analysis indicate that the conventional stock market index in BiH has a better performance than the Islamic index in BiH. Therefore, we can confirm the first hypothesis (H1), which states that the conventional index has better performance than the Islamic index in BiH. Furthermore, the results of the OLS regression analysis indicate that conventional index return in BiH has a significant positive impact on Islamic index return. Therefore, we can also confirm the second hypothesis (H2), which states that the conventional index has impact on the Islamic index in BiH. The results suggest that when there is a higher return in the conventional index, Islamic index return will also be higher.

As Djedovic and Ergun (2018, p. 12) mention, "in a market economy, the value of a firm can be influenced both directly and indirectly.

Also, Islamic scholars have made some concessions on the permissible degree of the financial leverage and the level of interest income in relation to Islamic indices constituent firms. Thus, Islamic indices could be expected to be sensitive to the conventional stock index changes". However, our analysis showed that there is no significant impact of conventional index volatility on Islamic index return in BiH. Therefore, it can be stated that Islamic index return is immune to the conventional index volatility.

Our results are in line with the most of the existing literature and research, which also found a relationship between conventional and Islamic indices (Majdoub and Mansour (2014); Bakri Abdul et al. (2014); Nazlioglu et al. (2015); Kim and Sohn (2016); Bahloul, Mroua and Naifar (2017); Djedovic and Ergun (2018). Also, the results on index performance analysis are in line with those of Warrick and Yaksick (2004) and Mansor and Bhatti (2011). Warrick and Yaksick (2004) compared the performance of the Dow Jones Islamic Market Titans 100 Index, with the Dow Jones World Index. They found that the conventional index overperformed the Islamic index. Mansor and Bhatti (2011) found that the Kuala Lumpur Shari'ah Index (KLSI) marginally underperformed the Kuala Lumpur Composite Index (KLCI). However, there are several other studies that found similar performances of the conventional and Islamic indices (Natarajan and Dharani (2012); Hassan and Girard (2011)), while some of the studies found that Islamic indices outperformed the conventional ones (Aka (2009); Al-Rifai (2012)).

Based on the results of the study on the performance of indices in BiH, we can state that the Islamic index in BiH (SASXBBI) is not a very good option for potential investors, since the performance of the Islamic index is lower than the performance of the conventional index (SASX-30). Therefore, potential investors would prefer investing in the conventional stock market index, since they get more extra return for the extra risk taken, compared to the Islamic index.

Also, the results from the OLS regression analysis suggest that there is no diversification possibility, since there is a significant positive impact of the conventional index on the Islamic index in BiH. However, another result of the study suggests that Islamic index return is immune to volatility changes of the conventional index. This means that the Islamic index is stable, which is generally in accordance to the theoretical presumptions regarding Islamic stock indices. Hence, potential investors may be interested to monitor the performance of the Islamic index when there is turmoil in the conventional stock market in BiH.

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Appendix A

Table A.1. *Serial Correlation test result*

Breusch-Godfrey Serial Correlation LM Test:			
Obs*R-squared	*0.000000*	Prob. Chi-Square(2)	***1***

The results from Table A.1. indicate that there is no serial correlation problem in this model.

Table A.2. *Heteroskedasticity test result*

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	*1.041.758*	Prob. F(2,176)	***0.3550***
Obs*R-squared	*2.094.239*	Prob. Chi-Square(2)	***0.3509***
Scaled explained SS	*2.090.518*	Prob. Chi-Square(2)	***0.3516***