Eastern Journal of Economics and Finance

Vol. 2, No. 1, 9-15, 2016
e-ISSN: 2305-9095

Relationship between Risk and Return: Evidence from Dow Jones Sukuk Price Index

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ABSTRACT

The objectives of this study are to identify the different types of risk embedded in the sukuk structure and to find the relationship between the identified risks and the returns of sukuk among dow jones sukuk price index. Data were collected from 2005 to 2015 on a periodic monthly basis and analyzed using descriptive, correlation analysis and multi-regressions analysis. Dow Jones (DJ) price sukuk return is exposed 90% to risk. F statistics shown that the models are significant at the 5% level and all models are acceptable. Findings confirmed that the regression model based on Dow Jones price sukuk return is slightly higher exposed to risk in the sukuk structure. For DJ price sukuk returns, while the DOR has a negative relationship with return IRD, CPI, CCI, MPR, SMB, HQR, RIR and have positive relationships. Of these positive relationships, CPI has the highest positive relationship. Contrarily, RIR has the least positive relationship. According to the results, impact of IRD and CPI are significant at the 1% level, and other all risks in this category are significant at the 5% level. Results confirmed the significant influence of market risk, credit risk, operational risk and liquidity risk on the sukuk returns in different ways. Findings of this study recommend to maintain inflation- rate risk at an optimal level, hedging their interest- rate risk with Libor, and taking necessary measures to provide a conducive environment to promote secondary markets for sukuk.

Keywords: Price index, Return, Risk, Sukuk, Liquidity.

DOI: 10.20448/809.2.1.9.15

Citation | Ahamed Lebbe Abdul Rauf (2016). Relationship between Risk and Return: Evidence from Dow Jones Sukuk Price Index. Eastern Journal of Economics and Finance, 2(1): 9-15.
DOI:

Funding : This study received no specific financial support.

Competing Interests: The author declares that there are no conflict of interests regarding the publication of this paper.

History : **Received:** 22 June 2016/ **Revised:** 11 July 2016/ **Accepted:** 18 July 2016/ **Published:** 22 July 2016

Publisher: Online Science Publishing

1. INTRODUCTION

The Islamic financial market is fast growing and expanding despite the recent financial crisis that swept through the global financial market. In the past, even Muslim countries were reluctant to accept Islamic finance, but, now the situation has changed (Oakley, 2009). The 57 Muslim countries are growing at a higher rate than the rest of the country in the World (SESRIC). As these countries grow and modernize, banking and financial sector will grow as well, but in line with the Islamic principles. Woodruff, J *at el*, (2007) reported that major financial centers around the world have also adopted the Islamic financial system. They are in competition among them to accommodate Islamic finance. Some of these countries are even working to issue

their own sovereign sukuk. They are opening their financial system to Islamic finance. Not only is the licensing of new financial institutions becoming common in many countries, but also the conversion of some conventional financial institutions into the Islamic financial system. One of the most remarkable growths in the Islamic finance is the development and growth of its capital market product known as the sukuk.

A lack of confidence in the conventional bond market has resulted in an investor appetite for investments that offer greater transparency and an alternative risk profile (Abdulkader, 2007). With a differentiated approach to investing, focusing on tangible assets, sukuk is becoming an attractive investment choice for an increasingly large pool of investors. In the past two years, in particular, the Islamic finance industry has gained momentum and researchers have seen increased interest in the market along with a diversification of Shari'ah products and services that have been a catalyst for investment. As this change takes place, the underlying investment vehicles will continue to benefit from investor confidence as investment volumes bring additional liquidity and opportunities for creating an ever more innovative and dynamic investor market.

Moreover, according to Percy (2015) recent economic and political shocks in previously stable markets have changed the dynamic for retail investors, indicating that good ethics can result in smart investing. Indeed, a shift in Western investor sentiment towards Islamic finance is only one small indicator of the future prospects of Shari'ah compliant funds for investors. In addition, Rafique (2008) stated that overall economies across Muslim countries have been experiencing a high boom leading to demand for infrastructure to boost productivity and improve living standards.

Many researchers pointed out the risk associated with sukuk. For instance Haral (2010) stated that sukuk market is presently facing the challenge of risks. Some other researchers also of the same view (Firoozye, 2012; Alawsat, 2008; Baeshen, 2009; Tariq, 2004; Quqa, 2008). At the same time number of researchers argued about the impact of risk on return (Haral, 2010; Al-Amine, 2012; Nanaeva, 2010; Firoozye, 2012; Alaswsat, 2008; Cheema, 2010; Khan, 2012). Although these evidences are available, a systematic study on this relationship is not done so far. Therefore, this study has two important objectives (a) identifying the risks associated with the sukuk return (b) test the relationship between identified risks and return.

2. METHODOLOGY

Market risk, operational risk, credit risk and liquidity risk are identified from the literature. A number of research evidence is available to support these risks. From the literature market risk includes interest rate risk, inflation rate risk and the dollar rate risk. Operational risk includes consumer confidence risk and legal and Shari'ah compliance risk. Credit risk includes credit risk and maturity risk. Liquidity risk includes liquidity and reinvestment risk (eg., Amine, 2012; Firoozye, 2012; Haral, 2010; Haider & Azhar, 2011)). These risks are most used in bond markets, which are suitable to sukuk market too. Hence, this study too considered all theses four groups of risks. In this study change in sukuk return is the dependent variables which are hypothesized to be influenced by four groups of risk factors. This relationship is expected from the literature review process. Based on the conceptual model researcher developed the following model for this study.

$$R_{s-rf} = \alpha_t + \gamma_1 \Delta IRD_t + \gamma_2 \Delta CPI_t + \gamma_3 \Delta DORt + \gamma_4 \Delta CCI_t + \gamma_5 \Delta MPRt + \gamma_7 \Delta SMB_t + \gamma_6 \Delta HQRt + \gamma_8 \Delta RIRt + \varepsilon_t.$$

IRD_t is stand for interest rate risk, CPI_t is stand for inflation rate risk, DOR_t is stand for dollar rate risk, CCI_t

is stand for consumer confident risk, MPR_t is stand for maturity risk, SMB_t is stand for credit risk, HQRt is stand for Shari'ah compliance risk, and RIR_t is stand for the reinvestment risk used to measure liquidity risk. Data were collected from the secondary sources such as Daw Jones sukuk price index and other independent risk factors are obtained from each country which are dominated by sukuk market period from January 2005 to December 2015 on Monthly basis. Initial data were converted into average and variance and logs are found for converting data. Ordinary least squares (OLS) analysis is used to analyze the data.

3. ANALYSIS AND FINDINGS

To test the impact of risk on sukuk return on the basis of global sukuk structure, sukuk indices was derived in meeting the objectives of the study as dependent variables. The multivariate regression analyses were done separately for each of this dependent variable as an overall analyses are executed in order to unveil the risk factors underlying the type of sukuk. Risk factors are considered as independent variables. This study presents descriptive analyses which have been conducted using descriptive statistics mean and standard deviation for dependent variables into main data stream of Dow Jones sukuk index covers global based index. Descriptive analysis of independent variables are also presented in the Table 1.

Table-1. Descriptive Analysis for Variables

Dow Jones Sukuk Return	Dependent variable	Mean	Standard Deviation	Minimum	Maximum
Global Basis	ΔGPRsRf	0.1250	0.0210	-0.0750	0.1622
Risk Factor	Independent variable	Mean	Std. Deviation	Minimum	Maximum
Market Risk	ΔIRD	0.0431	0.0111	-0.0118	0.0564
	ΔCPI	0.1089	0.0059	-0.0989	0.1200
	ΔDOR	0.0819	0.0046	-0.0721	0.0927
Operational Risk	ΔCCI	0.0985	0.0096	-0.0749	0.1140
	ΔHQR	0.1096	0.0078	-0.0800	0.1214
Credit Risk	ΔMPR	0.0965	0.0128	-0.0500	0.1170
	ΔSMB	0.1198	0.0142	-0.0989	0.1444
liquidity Risk	ΔRIR	0.1077	0.0117	-0.0705	0.1241

Number of observations = 132

Source: Analysis output

Table 1 shows that the mean, standard deviation, minimum value and the maximum values of sukuk return for ΔGPRsRf are 0.1250, 0.0210, -0.0750 and 0.1622 respectively. Based on the above descriptive analysis, it is possible to conclude that over the period from 2005 to 2013, the average returns of sukuk have shown a considerable degree of variation. The descriptive analyses of the independent variables. These independent variables are the risk factors in the sukuk market and they are categorized into four, namely market risks, operational risks, credit risks and liquidity risks as suggested by the literature. Market risk consists of interest rate risk, inflation rate risk and dollar rate risk. Consumer confident rate risk and Shari'ah compliance risk are sub components of operational risks. Credit risks cover maturity risk and credit risk. A liquidity risk includes reinvestment rate risk. Table 1 presents mean values for ΔIRD, ΔCPI, ΔDOR, ΔCCI, ΔHQR, ΔMPR, ΔSMB, and ΔRIR are 0.0431, 0.1089, 0.0819, 0.0985, 0.1096, 0.0965, 0.1198 and 0.1077 respectively. This refers to that average sukuk return for these variables vary between 0.0431 and 0.1198. They have the standard

deviation between 0.0046 and 0.0142.This study also presents the relationship between independent variable and dependent variables graphically using line charts. Charts are drawn to explain the relationship between dependent variability of sukuk return which represent a global sukuk market and its related risk factors. The Figure 1 presents the fluctuation between Dow Jones price sukuk return (GPRSRF) and its related risk factors. Variation and fluctuation in the dependent variables with the change in each of the independent variables - interest rate risk, inflation risk, dollar rate risk, consumer confidence rate, maturity risk, credit risk, Shari'ah compliance risk and liquidity risk are presented using above line charts.

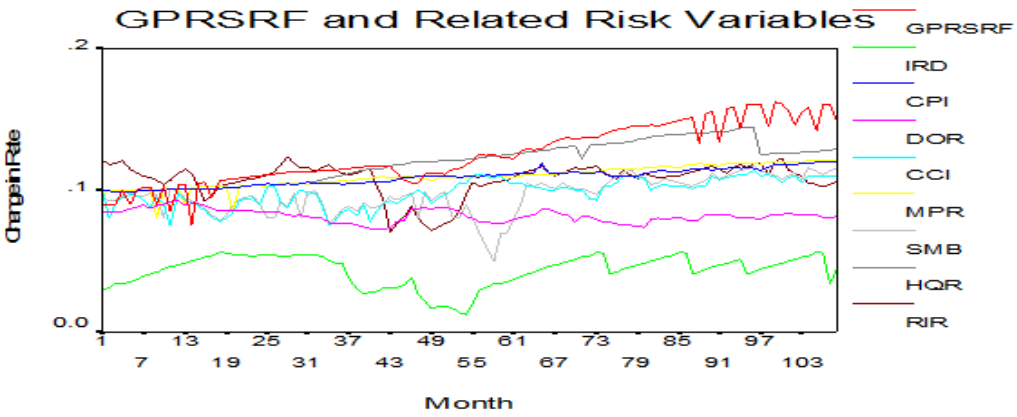

Figure-1. Fluctuation between Global Sukuk Return (GPRSRF) and its Related Risks

Source: Analysis output

The correlations are carried out to know the strength of association between sukuk returns and its related risks in support of the results of the descriptive analysis and graphical presentations. The values of correlation between interest rate risk, inflation rate risk, dollar rate risk, consumer confidence rate risk, maturity risk, credit risk, Shari'ah compliance risk, liquidity risk and DJ price sukuk return vary from -0.437 to 0.896. According to Table 2 correlation values proved the strengths of the association between Dow Jones and their risk variables. Almost all the independent variables have strengths of association with sukuk return. Followed by the correlation analyses, next section outlines the regressions for variables.

Table-2. Correlation between Dow Jones Sukuk Returns and Risk Variables

	ΔGPRSRF	**ΔIRD**	**ΔCPI**	**ΔDOR**	**ΔCCI**	**ΔMPR**	**ΔSMB**	**ΔHQR**	**ΔRIR**
ΔGPRS RF	1								
ΔIRD	.260**	1							
ΔCPI	.896**	.084	1						
ΔDOR	-.437**	.064	-.335**	1					
ΔCCI	.706**	-.014	.734**	-.191*	1				
ΔMPR	.884**	.104	.901**	-.451**	.658**	1			
ΔSMB	.604**	.307**	.526**	.003	.406**	.540**	1		
ΔHQR	.865**	.021	.873**	-.465**	.698**	.854**	.509**	1	
ΔRIR	.254**	.555**	.047	-.138	.118	.090	.240*	.060	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Analysis output

Data were screened to test the auto correlation, multicollinearity and heteroscedasticity. The value of Durbin-Watson (d) is 1.988, which indicates no autocorrelation problem. To test the multicollinearity TOL and VIF were used. The TOL varies between 0.123 and 0.600 while VIF varies between 1.668and 8.139. These values reflect that there is no multicollinearity. Results of residual analysis white heteroscedasticity test have shown a p value of 0.932 which is more than 0.05. This ensures that the variance of the residual is constant, which means there is no heteroscedasticity issue in the data.

Values of the regression results of R, R square, and adjusted R square indicate that interest rate, inflation rate risk, dollar rate,consumer confidence risk, maturity risk, credit risk, Shari'ah compliance risk and liquidity risk collectively explain 90% to 95% of the variation on sukuk return. Unexplained variation ranges between 5% and 10%. Results of ANOVAshow a significance value of F statistics,which indicates that the model is significant at the 5 % level and the variables taken in this study explain the model. Since the value of F statistics is less than 0.05, it is concluded that there is a significant relationship between interest rate, inflation rate risk, dollar rate, consumer confidence risk, maturity risk, credit risk, Shari'ah compliance risk and liquidity risk and DJ price sukuk return. These results are presented in the Table 3.

Table-3. OLS Regression Results for DJ Price Sukuk Returns and Its Independents

	Coefficients			**Multicollinearity**		
Model	Beta	Std. Error	t	Sig.	TOL	VIF
Constant	-.128	.025	-5.198	.000		
ΔIRD	.260	.074	3.508	.001	.597	1.675
ΔCPI	1.367	.303	4.517	.000	.123	8.139
ΔDOR	-.555	.186	-2.984	.004	.558	1.791
ΔCCI	.219	.104	2.101	.038	.402	2.485
ΔMPR	.462	.213	2.166	.033	.146	6.832
ΔSMB	.180	.068	2.658	.009	.540	1.851
ΔHQR	.280	.107	2.624	.010	.176	5.690
ΔRIR	.141	.070	2.011	.047	.600	1.668
R	.954					
R Square	.909					
Adjusted R Square	.902					
F	124.306			.000		

Number of Observation = 132; Durbin-Watson (d) = 1.988

Source: Analysis output

For DJ price sukuk returns, while the DOR has a negative relationship with return IRD, CPI, CCI, MPR, SMB, HQR, RIR and have positive relationships. Of these positive relationships, CPI has the highest positive relationship. Contrarily, RIR has the least positive relationship. According to the results, impact of IRD and CPI are significant at the 1% level, and other all risks in this category are significant at the 5% level. As shown in the Table 3 coefficient values of dollar rate is negative, which means when the dollar rate rises rate of return declines or vice versa. Further, interest rate risk, inflation rate risk, dollar rate risk, credit risk and maturity risk influence the DJ price sukuk return significantly. Beta values of interest rate, inflation rate risk, dollar rate, consumer confidence risk, maturity risk, Shari'ah compliance risk, credit risk and liquidity risk differs. This is because sukuk are priced based on the risk premium required by investors above the risk free rate. Until

recently, conventional risk free rates, such as US Treasury bill rate, Libor and US swap rates were being used to price sukuk. Recently, Thomson Reuters introduced Islamic inter bank benchmark rate (IIBR). It could potentially be an alternative to Libor for pricing sukuk in the near future. In the last decade, sukuk prices were mostly driven by global and regional events affecting the whole capital market.

4. CONCLUSION AND RECOMMENTATION

Dow Jones global wise pice sukuk return is exposed 90% to risk. F statistics show that the models are significant at the 5% level and all models are acceptable. The results confirmed regression model based on Dow Jones price sukuk return is slightly higher exposed to risk in the sukuk structure. Thus interest rate risk, inflation rate risk, dollar rate risk, consumer confidence risk, maturity risk, credit risk, Shari'ah compliance risk and liquidity risk influence the DJ price sukuk return significantly and findings of this study are consistent with the previous findings.

For the DJ price sukuk returns, while the DOR has a negative relationship with return IRD, CPI, CCI, MPR, SMB, HQR and have positive relationships. Of these positive relationships, CPI has the highest positive relationship. Contrarily, RIR has the least positive relationship. Interest rate risk and inflation risk in market risk have a positive relationship with return. Whereas, dollar rate risk in market risk has a negative relationship to return. Credit risk and maturity risk in credit risk have a positive relationship with sukuk return. Legal and Shari'ah compliance risk and consumer confidence risk in operational risk shows a positive relationship with return. Liquidity and reinvestment risk in liquidity risk has a positive relationship to return.

This study focuses number of recommendations on the bases of research findings. Numbers of risk factors have been identified to have significant impact on sukuk return in a global type of sukuk structures. Thus, it can be recommended that inflation rate risk should be controlled at an optimal level for the benefit of macroeconomic stability. Government regulators and policy makers should pay attention on these issues periodically. Sukuk issuers consider LIBOR rate as a benchmark to maintain a higher level of return rate for avoiding interest rate risk. The interest rate introduced by Thomson Reuters is far better than the Libor rate as this interest rate has been formulated especially for the Islamic finance industry. Sukuk market has been emerged not only in Islamic countries but also non- Muslim countries. Above findings indicate that various risk factors influence sukuk returns. To study these results in depth further analysis is to be done at different ways maturity basis, rating basis, sectorial and countries sukuk markets.

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