EMPIRICAL STUDY OF THE PERFORMANCE OF THE ISLAMIC INVESTMENT

ETUDE EMPIRIQUE DE LA PERFORMANCE DE L'INVESTISSEMENT ISLAMIQUE

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Abstract:

Sukuk is an investment certificate in line with the principles of Islamic finance. In the last decade, it has achieved higher growth in comparison to other segments in Islamic finance.

The purpose of our article is to evaluate the performance of these instruments in an international context based on seven performance measurement models and to explore the possibility of diversification benefits between Sukuk indexes. The data used in our Study are the serie of Dow Jones Sukuk index for a period from September 2007 until December 2015.

The results show that there is a weak significant correlation between Sukuk indexes, which does not hinder the possibility of diversification benefits.Secondly; the results also show that high quality Sukuk has outperformed the low quality Sukuk and this for the different performance measures of our study.In addition; the performance differs according to the rating of Sukuk .

Keywords: Sukuk, Performance, Paired t-test, Diversification

Résumé:

Sukuk est un certificat d'investissement en phase avec les principes de la finance islamique .Au cours de cette dérnière decennie, il a enregistré la croissance la plus importante par rapport aux autres segments de la finance islamique.L'objectif de ce papier consiste à évaluer la performance de cet instrument en utilisant sept models de mesure de performance dans un contexte international .L'échantillon de notre etude est composé de la série de Dow Jones Sukuk index pour une period allant du September 2007 jusqua'au December 2015 .

Les résultats indiquent l'existence d'une corrélation faible significative entre les indices Sukuk .Ce qui n'entrave pas la possibilité du gain de diversification .Les résultats ont montré également que les Sukuk de notation élevée ont surperformé les Sukuk de faible notation pour les différentes mesures de performance de notre étude .Par ailleurs, la performance diffère en fonction de la notation des Sukuk.

Mots clefs: Sukuk, Performance, Paired t-test, Diversification

Introduction:

Sukuk is the plural Arabic word of Sak which represents an investment certificate in line with Islamic principles. Indeed, Sukuk holders receive remuneration from the Sukuk underlying assets performance.While the conventional bond receives interest for money loaned.

This why,Sukuk are based on underlying transactions that create a close link between financial and productive flows.

Sukuk represent also a liquidity management tool for Islamic banks as well as insurance (Takaful), because of their negotiability unless the structure of sukuk retained does not represent pure debt instruments such as Sukuk Murabaha and Sukuk Salam.

The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) in its Shariah standard no. 17 has defined "investment sukuk" as "certificates of equal value representing undivided shares in ownership of tangible assets, usufruct, and services or in the ownership of the assets of particular projects or special investment activity."

On the basis of Islamic principles, (AAOIFI) has created more than 14 sukuk structure that can be grouped into two types, namely Asset-backed Sukuk and Asset-based Sukuk.

With this diversity of structure, Sukuk, like conventional bonds, have become a reliable financial instrument of financing for both companies and governments (Tahmours 2013).

The Sukuk market is the fastest growing and promising segment of Islamic finance. Indeed, the issuance of Sukuk is increasing considerably worldwide, especially in Malaysia, United Arab Emirates (UAE) and Saudi Arabia Fitriya. (2012).

Thus, the amount of international sukuk issuances has achieved in 2013, 26 trillion USD in 2013 (IIFM Sukuk Report 2014).And it is expected that this trend will continue especially with the entry of new regions into the sukuk market such as the regions of Africa and Europe.

Consequently, it can be said with confidence that the growth of the global sukuk market will continue, and especially when we see the evolution of this market from 2001 to July 2014, we find that this market has reached a very respectable total amount with 668 trillion USD (IIFM Sukuk Report 2014).

Despite the remarkable growth of the Sukuk, there are few studies that have investigated the performance of these new instruments.Most research is based on analyzing Sukuk risk and return and correlation of individual Sukuk issuance.Also; empirical studies have analyzed the risk-return and correlation of individual Sukuk issuance en comparison to conventional

Bond.Ariff& Safari. (2012) ; Ariff, Safari, & Mohamed. (2013) ; Safari, Ariff, &Mohamad.(2014) ,Fathurahman and Fitriati.(2013) Cakeir and Rai .(2007) Hassan . (2012).

At this stage of the research two questions must be asked : are the Sukuk indices rating impact their performance? Is there a diversification benefit between the Sukuk indices?

The assessment of the performance of investment requires a study of its risk-adjusted return. That's why we're going to use performance measurement models developed from the modern portfolio theory of Markovich, to study the performance of the Sukuk.

1. Literature review:

Despite the significant development of the Sukuk capital market, research in this segment of Islamic finance is still at an early stage.

Most researches have tried to study the sukuk from the point view of their structures and mechanisms in comparison with the conventional bonds.Indeed,Vishwanath and Sabahuddin .(2009), through their analysis of the sukuk structures and their comparison with classical bonds, the authors support the idea that sukuk is an ideal instrument for mobilizing funds and managing liquidity and their Asset backing, makes investment in sukuk more secure.

Tahmours.(2013) also attempted to study the structure of these islamic financial instruments as well as their return and risk characteristics in comparison with conventional bonds. The author supports the idea that sukuk financial instruments and conventional bonds are two instruments that have succeeded in draining funds both for companies and governments.

However, the author pointed out that there are fundamental differences between these two instruments.Conventional bonds are only an acknowledgment of debt whereas sukuk are instruments of sharing of gain and loss generated by the performance of an asset. In addition, these instruments meet the needs of investors who care about the principles of Sharia.

On the other hand, empirical studies in sukuk are not numerous.These studies revolve around the question of return and volatility characteristics of sukuk in comparison with conventional bonds, as well as the issue of sukuk diversification using different empirical models and methods.

Thus, Cakeir and Rai .(2007) studied the risk of the sukuk portfolio using value at risk VaR.In order to calculate this risk, the authors constructed two portfolios.The first contains conventional bonds whereas the second contains bonds plus sukuk.

The findings confirm that the VaR of the second portfolio is lower than that of the first. This allows them to conclude that the integration of the sukuk in the portfolio generates a diversification gain.

Hassan. (2012), on the other hand, assessed the risk of a portfolio of sukuk and conventional bonds with another that only contains conventional bonds for the same issuer. The results show that the addition of sukuk allows a diversification gain.These findings are in line with those of Cakier and Rai 2007.

Najeeb.Bacha and Masih.(2014) analyzed the possibility of occurrence of diversification within the Sukuk capital market.The findings confirm that the opportunity for diversification manifests between sukuk of local currency of both Malaysia and Emarate United Arabia where there is a weak correlation between the two markets.

Andrea, Alberto, Stefano and Sclip (2015) studied the correlation of Sukuk with several asset classes of conventional bonds by constructing a Sukuk index.The results confirm that Sukuk show a gain of diversification especially during the financial crisis.

Godlewski et al. (2013) examined the reaction of Malaysian market investors to the announcement of the issuance of conventional Sukuk and bonds.The results show that the market is neutral as to the announcement of conventional bonds, whereas it reacts negatively to the sukuk issuance.The author attributes this result to the high demand for Islamic investment certificates and adverse selection.

Fathurahman and Fitriati.(2013) studied Sukuk performance through an analysis of yield to maturity between Sukuk and conventional bonds in the Indonesian context. The results show that the yields of Sukuk and classical bonds are significantly different.And the yield to maturity of Sukuk is higher than that of the conventional bonds in three groups studied among ten.

Ariff and Safari (2012) have shown that Sukuk have a different performance from conventional bonds for the same issuer.The granger causality test confirms that the yield of conventional bonds does not cause that of the Sukuk. Consequently, this empirical result proves that the two instruments are not similar.

According to our knowledge, most studies have studied the performance of sukuk financial instruments with conventional bonds, using a separate analysis of their return and risk profile Ramasamy et al. (2011); Ariff and Safari (2012) Fathurahman and Fitriati (2013).

In addition, the majority of these studies have attempted to study this issue in a domestic context, particularly in Malaysia. Our study proposes to address this issue of performance in an international context by using the Dow Jones Sukuk index by rating, based on seven performance measurement models on the one hand. On the other hand, in order to enrich the debate on the question of diversification of the Sukuk, the majority of studies have tried to answer it by working on Sukuk portfolios; our study will address this issue by taking the case of the Sukuk index.

2. Data and Methodology:

2.1. Data of the Study:

The data used in this study are from the S & P Dow Jones Index website. Thus, we used the daily historical data of the Dow Jones Sukuk index series. It is an index that combines islamic bonds denominated in dollars issued on the international market.

In our study, we use the series of Dow Jones Sukuk index by rating. Indeed, the index retained by rating are Dow Jones Sukuk AAA,Dow Jones Sukuk AA, Dow Jones Sukuk A and Dow Jones Sukuk BBB.

For the purposes of our study we retain as risk-free assets S & P / BGCantor US Treasury Bill Index and as a market portfolio the Dow Jones Sukuk index.The data cover a period starting from September 2007 to December 2015, corresponding to daily data of 2158 observations.

2.2. Methodology:

2.2.1 Correlation of sukuk indexes return

The objective of this analysis is to determine the relationship between the return of two indices (i and j).The correlation ρ_{ij} is obtained by calculating the covariance cov (i, j) and the standard deviations σ_i and σ_j .This is obtained by the following formula :

$$\text{Pij} = \frac{\text{cov}(\,i, j)}{\delta i \ \delta j}$$

2.2.2 Performance measurement models:

Our research is based on seven performance measurement models that are detailed in the table below.

Table 1 : Performance measurement models

Performance measurement models	Calculation Formula
Return	$$Rit = ln\frac{Ii}{It-1}$$
Risk	$$\sigma(n) = \sqrt{\frac{1}{n-1}\sum_{I=1}^{n}(Ri - \vec{R})^2}$$
Beta	$$\beta i = \frac{COV\ (Ri, Rm)}{\sigma 2_m}$$
Sharpe	$$Sharpe = \frac{Rp-Rf}{\sigma p}$$
Treynor	$$Treynor = \frac{Rp-Rf}{\beta}$$
Alpha	$$Alpha = Rp - ((Rf + Bp, m *(RM-Rf))$$
SharpeS/K	$$SharpeS/K = \frac{Rp - Rf}{\sigma p} + \frac{Skew}{Kurt}$$
M²	$$M^2 = \frac{\sigma\ m}{\sigma p}(Rp - Rf) + Rf$$
MRAP	$$MRAP = \frac{\sigma\ m}{\beta p}(Rp - Rf) + Rf$$
Esdar	$$Esdar = \frac{\sigma\ m}{\beta p}(Rp - Rf) + Rf - RM$$

3. Empirical Results and Discussion:

3.1. Sample Characteristics:

Table 2 : Descriptive statistics of Sukuk Index

	Sukuk A	Sukuk AA	Sukuk AAA	Sukuk BBB	Sukuk Market
Mean	0.013	0.017	0.013	0.006	0.0155
Median	0.018	0.0097	0.008	0.012	0.0184
Maximum	8.10	2.85	3.70	7.57	7 ,5159
Minimum	-18.56	-2.558	-4.97	-10.61	-15, 5903
Std. Dev.	0.6	0.19	0.2	0.46	0.5084
Skewness	-14.784	-0.8710	-3.4858	-8.6991	-11.37889
Kurtosis	526.5779	57.69696	234.3429	261.4871	473.3468
Jarque-Bera	24727815	269281.7	4816669.	6035054	19947722
Probability	0.000000	0.00000	0.0000	0.00000	0.0000
Sum	27.94776	35.75941	26.99852	12.80572	33 .4738
Sum Sq. Dev.	765.4226	77.72089	90.89860	471.9017	557.6937
Observations	2157	2157	2157	2157	2157

Source: author's calculation

Descriptive statistics have shown that there is a difference in return between the different Sukuk indexes. This is more evident between Sukuk AAA AA A with Sukuk BBB. To confirm this result, we will apply the Paired T-test on the Sukuk indexes.

3.2. Test of significance of the Difference in the Sukuk Indexes Mean Return:

Variables Definition: The variables of the paired t-test of our study are as follow:

Pair 1: Represents the Sukuk A index with Sukuk AAA.
Pair 2: Represents the Sukuk A index with Sukuk AA.
Pair 3: Represents the Sukuk A index with Sukuk BBB
Pair 4: Represents the Sukuk A index with Sukuk Market
Pair 5: Represents the Sukuk AA index with Sukuk AAA
Pair 6: Represents the Sukuk AA index with Sukuk BBB
Pair 7: Represents the Sukuk AA index with Sukuk Market
Pair 8: Represents the Sukuk AAA index with Sukuk BBB.

Pair 9: Represents the Sukuk AAA index with Sukuk Market.
Pair 10: Represents the Sukuk BBB index with Sukuk Market.

Test échantillons appariés									
		Différences appariées					**t**	**ddl**	**Sig. (bila térale)**
		Moyenne	**Ecart-type**	**Erreur standard moyenne**	**Intervalle de confiance 95% de la différence**				
					Inférieure	**Supérieure**			
Paire 1	SA-SAAA	0,0004398	0,4902681	0,0105537	-0,0202567	0,0211365	,042	2157	0 ,967
Paire 2	SA - SAA	-,0036198	,5872142	0,0126406	-0,0202567	0,0211693	-,286	2157	0 ,775
Paire 3	SA - SBBB	0,0070166	0,6115662	0,0131649	-,0188005	0,0328339	,533	2157	0 ,594
Paire 4	SA - SM	-0,0025397	0,1742090	0,0037501	-,0098939	0,0048144	-,677	2157	0 ,498
Paire 5	SAA - SAAA	0,0040597	0,2427625	0,0052258	-,0061884	0,0143079	,777	2157	0 ,437
Paire 6	SAA - SBBB	0,0106365	0,4373955	0,0094156	-,0078280	0,0291011	1,130	2157	0 ,002
Paire 7	SAA - SM	0,0010801	0,4900793	0,0105497	-,0196085	0,0217687	,102	2157	0,918
Paire 8	SAAA - SBBB	0,0065768	0,4799681	0,0103320	-,0136849	0,0268386	,637	2157	0,524
Paire 9	SAAA - SM	-0,0029796	0,4121808	0,0088728	-,0203798	0,0144205	-,336	2157	0 ,737
Paire10	SBBB - SM	-0,0095564	0,4697776	0,0101126	-,0293880	0,0102751	-,945	2157	0,345

Source: author's calculation

3.3. Analysis of the Sukuk indexes Return Correlation:

Table 3 :Sukuk Indexes Correlation

		Sukuk A	Sukuk AA	Sukuk AAA	Sukuk BBB	Sukuk Market
Sukuk A	**Pearson**	1	0,20**	0,64**	0,36**	0,96**
	Sig		0,000	0,000	0,000	0,000
	N	2158	2158	2158	2158	2158
Sukuk AA	**Pearson**	0,20**	1	0,25**	0,36**	0,3**
	Sig.	0,000		0,000	0,000	0,000
	N	2158	2158	2158	2158	2158
Sukuk AAA	**Pearson**	0,64**	0,23**	1	0,16**	0,60**
	Sig	0,000	0,000		0,000	0,000
	N	2158	2158	2158	2158	2158
Sukuk BBB	**Pearson**	0,36**	0,36**	0,16**	1	0,54**
	Sig. (bilatérale)	0,000	0,000	0,000		0,000
	N	2158	2158	2158	2158	2158
Sukuk Market	**Pearson**	0,96**	0,3**	0,60**	0,54**	1
	Sig.	0,000	0,000	0,000	0,000	
	N	2158	2158	2158	2158	2158

Source: author's calculation

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

The table above shows the results of the Pearson correlation between the Sukuk indexes based on their ratings and the market. The results of the correlation of the sukuk return by rating show a significant positive correlation between the Dow Jones Sukuk index which represents the market index with the return of the Sukuk indexes of different ratings.

The results also show that there is a strong correlation between the return of the Sukuk A index and the return of the market with a value of 0.96. The return of the sukuk index BBB and AAA respectively have a moderate significant positive correlation of 0.54 and 0.6 with the return of the Sukuk market index. On the other hand, the sukuk AA index showed a weak correlation of 0.3.

For the correlation of the sukuk index by rating, it is found that there is a significant positive correlation between the different indexes. Thus, the return of the Sukuk AAA index with that of sukuk A showed a significant moderate correlation of 0.64. While, for the other index, there is a significant weak correlation that does not exceed 0.23 between Sukuk AAA and Sukuk AA, 0.13 between sukuk AAA and Sukuk BBB, 0.25 between sukuk AAA and Sukuk AA and 0.36 between Sukuk BBB and AA. This weak correlation shows that there is potential for diversification gain between these Sukuk indexes.

3.4 Analysis of Sukuk Indexes Performance:

3.4.1. Traditional Measurement Performance:

Table 4 : Sukuk indexes Performance (1)

	Sukuk A	Sukuk AA	Sukuk AAA	Sukuk BBB	Sukuk Market
Return	0,013	0,017	0,013	0,006	0,015
Risk	0,6	0,19	0,2	0,47	0,5
Risk-free assets	0,0022	0,0022	0,0022	0,0022	0,0022
Beta	0,011	0,001	0,0025	0,005	1
Sharpe	0,018(4)	0,0778(1)	0,054(2)	0,0080((5)	0,0256(3)
Treynor	0,9818(3)	14,8 (1)	4,32(2)	0,76 (4)	0,0128 (5)
Jensen	0,0106 (3)	0,0148 (1)	0,0108 (2)	0,00381(4)	-

Source: author's calculation

The table above shows how the performance of the sukuk indexes varies according to the rating of each index. Thus, the Sukuk AA index reached the highest level of performance for the three performance measures used, such as the ratio of Sharpe with 0.0778, Treynor ratio with 14.8 and Jensen's alpha with 0, 0148 during the period of our study.

The sukuk AAA index comes in second place for the three traditional measures of performance. Sukuk A is ranked third with the measure of Treynor and the Jensen's alpha, while when we use the measure of Sharpe this index becomes in fourth place after the market index.

The index Sukuk BBB achieved the lowest performance during the period of our study compared to the other Sukuk index. Nevertheless, using the Jensen's alpha the latter has outperformed the market portfolio.

We explain this difference in ranking of the latter two index by the fact that one takes into account the global risk (the Sharpe index) and the other takes into account the specific risk (The Treynor index) .

In order to have more precision on the performance of the indexes studied, we have chosen to introduce other performance measures in addition to traditional measures that are not sufficient in some cases, such as this one, to conclude on performance of these indexes.

3.4.2.Other Performance Measures:

Table 10 5 : Sukuk indexes Performance (2)

	Sukuk A	Sukuk AA	Sukuk AAA	Sukuk BBB	Sukuk Market
M²	(4)0,0112	(1) 0,0411	(2)0,0292	(5)0,0062	(3) 0,015
Sharpe S/K	(4)-0,01	(1) 0,06	(2) 0,04	(5)-0,025	(3) 0,0016
ESDAR	(2) -0,09	(1) 1 ,00	(3) -0,4	(4) -0,9	0
Mrap	(3) 0,9840	(1) 14,8022	(2) 4,3222	(4) 0,7622	(5) 0,015

Source: author's calculation

The results of the table above show that the sukuk index AA has achieved the best performance compared to the other indexes including the market index. This result confirms that obtained by the three traditional performance measures.

Sukuk AAA ranks second with Mrap and Sharpe S / K and M², while according to the ESDAR model, this index is ranked third in terms of performance. The sukuk A is ranked second with ESDAR, then third according to the Mrap measure and fourth according to the models M² and Sharpe S /K.

The index of sukuk BBB is ranked fourth by two performance measures that are ESDAR and Mrap.

Finally, the results show that the market index obtained its best ranking of three via the two performance measures that are Sharpe S/K and M² and Sharpe. However, using the other performance measures the sukuk market index was ranked last.

Indeed, we conclude that the performance of the index differs according to the sukuk rating. The results also show that for different performance measurement models, Sukuk of high quality such as Sukuk AAA AA and A are better performing than low quality sukuk such as sukuk BBB.

Conclusion:

Our research analyzed the performance of Sukuk financial instruments based on the Dow Jones Sukuk index of different rating for a study period from September 2007 to December 2015.

First, we discussed the significance of the correlation of sukuk indexes returns and, in a second step; we examined the performance of these indexes according to their rating.

The results of the correlation show that there is a significant weak positive correlation between the sukuk indexes of different ratings. This result is more evident between Sukuk AAA and Sukuk BBB, sukuk AA and sukuk A and sukuk AAA and sukuk AA with values of correlation respectively of 0.16, 0.20 and 0.23.

This leads us to conclude that there is the possibility of diversification benefits between Sukuk indexes. For this reason, our results confirm those of previous research, notably that of Najeeb.Bacha and Masih (2014).

In a second step, we examined the performance of these sukuk indexes by applying seven performance measures.

The results indicate that the performance varies according to the sukuk rating. Thus, for the various performance measures,sukuk AA has outperformed other sukuk indexes, including the market portfolio. The sukuk AAA index comes second, except for Esdar.

Sukuk A is ranked third by three performance measures such as Treynor, Jensen Alpha and Mrap, while using Sharpe S / K, M² and Sharpe this index has been classified in fourth position. However, according to the eSDAR measure Sukuk A was ranked second in terms of performance.

The BBB Sukuk index is ranked fourth by four performance measures such as Jensen's alpha, Treynor Esdar and Mrap, while with Sharpe S / K and M² sukuk BBB are ranked in fifth position.

The results also show that high quality Sukuk has better performance than low quality Sukuk and this for the different performance measures of our study. Indeed, we conclude that the performance differs according to the rating of Sukuk.

Our findings are relevant for several institutional investors, regulatory authorities, academic community, and particularly for those who wish to make alignment between their investments and religious &ethical beliefs.

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