Are shariah (islamic) stock market returns stable ? evidence from the select islamic stock indices of emerging markets, USA, UK and Japan

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Are shariah (islamic) stock market returns stable ? evidence from the select islamic stock indices of emerging markets, USA, UK and Japan

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Abstract: This paper makes an attempt to address the following questions about four Islamic indices :(i) are the Islamic indices returns stable over time? (ii) Is there any covariance existing between the Islamic indices? (iv) Which Islamic index is dominant among the four indices? The wavelet approach (DWT and CWT) was used for the analysis. The findings found the returns for four Islamic indices relatively stable excepting the subprime crisis period 2008-2009. The analysis through discrete wavelet (DWT) generally found that the estimated beta and r-squares for five different dimension of time scales indicated that the beta is non monotonic. The volatility however, increases over time which further confirmed that shariah (Islamic) indices were still exposed to the economic uncertainty as the time frame increases. Wavelet coherence (CWT) specifically found the existence of causality elements between the indices as well as high covariance existing among these four indices which is represented by red colors. Although not always Islamic emerging market was leading, but still there are some evidences that Islamic emerging markets have had their own independence from the western economy. Finally, this analysis failed to deny the dominance of Islamic US index as the leader among the Islamic markets.

Keywords: Islamic stock indices, stability, wavelets (DWT, CWT) approaches

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Introduction

Fund raising activities in capital markets through share issuance are very common not only in the conventional markets but also in the Islamic markets as it portrays real economic value through equity participations. As a corporation, issuing shares is a cheaper source of fund instead of bank's borrowing this could be expensive depending on the amount as well as the maturity. In addition, the flexibility in terms of the periodic obligations would be less if the company does not bind under dividend Policy. However, it is believed that equity participations are healthy since it motivates the company to perform better over the periods. Performance basically offers the company to go beyond its normal ability to improve with a promise to share profits with shareholders. Ironically, shareholders will further invest in the company if consistent performance is shown by the company, while they would walk away if the performance deteriorated. Although investors love risk but excessive risks caused by future uncertainty due to internal and external factors somehow concern the investors as shareholders.

The recent financial crisis due to subprime caused serious panic to the market not only to the western countries but also worldwide. Series of bailouts taken by Federal Reserve to its banking system called fund management and investors to stay alert on the share performances as market breadth was a concern. The share prices of stocks especially indices will somehow be the important factor to gauge the market confidence in the market. Greed and fears are two important ingredients in drawing the market behaviors. Generally when the market participants lose confidence or panic due to rumors, market will move downwards or even spike temporarily while the selling activities reach the oversold level. However, the prices will slowly escalate if the market gained positive outlook on the markets.

Research problem

The central issues of the stock market performances widely discussed in various research papers. There are a number of research papers which discuss stock market behavior with exchange rate (*Chikli et al , 2011*), Credit ratings (*Christopher et al, 2012*), spillovers (*Bernie et al , 2010*), size, values and

liquidity (*Lischewski et al , 2012*), anomalies (*Ariss et al, 2011*) , changes in volatilities (*Wang and Moore, 2009*) , financial globalization(*Esqueda et al , 2012*) . Although there are a number of papers covering various aspects of factors in relation to stock markets performance, there are none of papers found to analyze the performance and the relationship of shariah stock globally covering various important giant players globally. Hence, this research tries to analyze the gap of the research which exists within the numerous existing research papers.

Research objectives

The research tries to match the following objective as follows:

1. To examine the returns for Islamic Emerging Markets, Islamic US, Islamic UK, and Islamic Japan.
2. To identify whether the estimated beta is consistent at different time interval.
3. To appraise the covariance between four Islamic market indices
4. To identify the lead lag relationship between the four Islamic market indices.

Research Questions

1. Are the Islamic indices returns consistent over time?
2. Do Islamic indices change over time?

3 Is there any covariance existing between the Islamic indices?

4. Which Islamic return is dominant among the four indices?

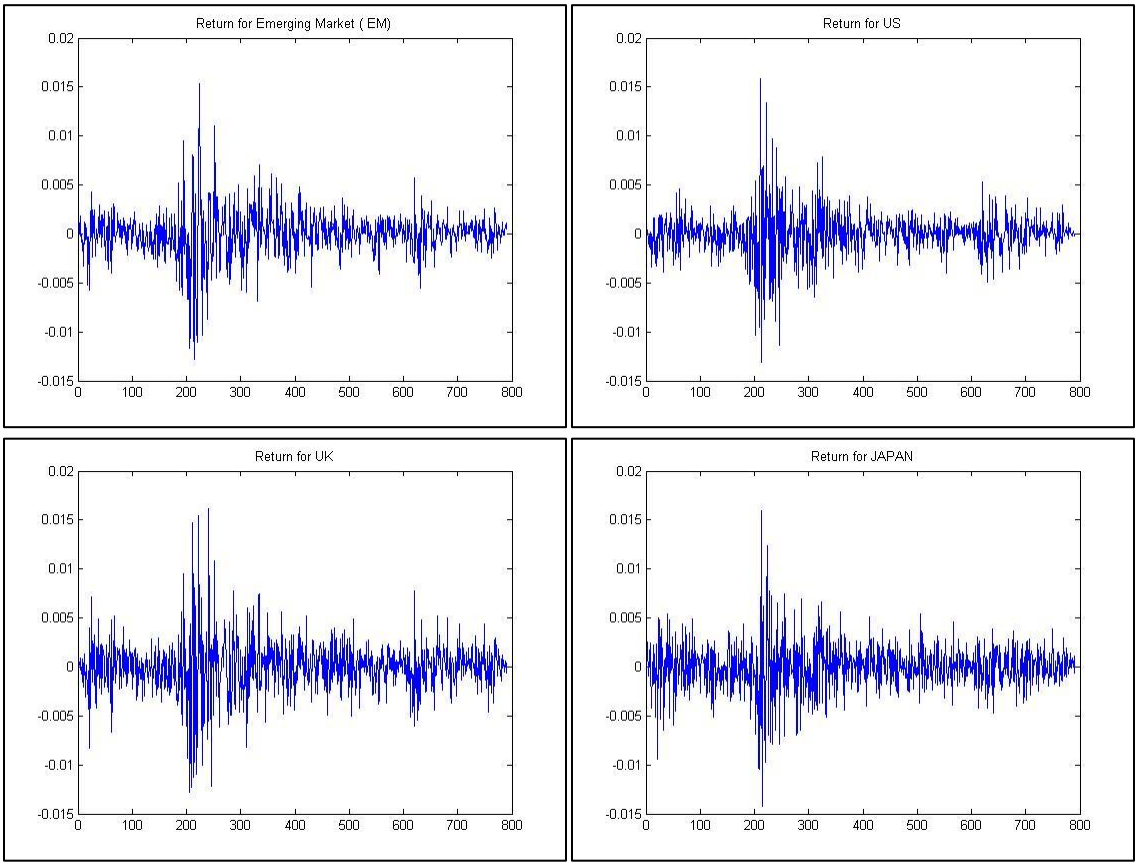
Methodology

Islamic indices were collected from the Datastream under Dow Jones Islamic Indices which consist of 792 observations starting from 2008 on Islamic Emerging market , Islam US, Islamic UK and Islamic Japan. The analysis on the return of the individual indices, the discrete wavelet transformation (DWT) , Continuous Wavelet, Cross Wavelet and Wavelet Coherence.

The index *i* at day *t* (Masih et al, 2010) calculated for the index value (S) as follows :

$$r_{it} = \ln\left(\frac{S_{it}}{S_{it-1}}\right)$$

Hence the return for the four differences indices look about the same pattern where the high fluctuation seen on the days 200 of the period and after 400 days Emerging market seem little bit stable with mild volatility in returns. Interestingly, although the subprime during 2008 affected US market more, but the reaction caused UK Islamic Indices to volatile more compared to the other market with the highest return was more than 1.5% in a single day.



Discrete Wavelet Analysis (DWT)

This analysis basically tried to understand the relationship between Islamic Japan which represents the Japan *halal* equity in Asia region with the Islamic UK, Islamic US and Islamic Emerging Market. The analysis depict two different tables for each analysis which consist of decompose table and recompose table for Islamic Japan with Islamic UK, Islamic Japan with Islamic US and Islamic Japan with Islamic Emerging Market.

Table A : OLS for R1 (Islamic Japan) with R2 (Islamic UK)

TABLE A : wavelet R1 and R2 decomposed												
FIRM	**BETA**	**RSQ**	**D1**	**D2**	**D3**	**D4**	**D5**	**D1**	**D2**	**D3**	**D4**	**D5**
Mean	39.9905	0.1513	-17.6547	9.4709	71.38	53.98	-91.6695	0.0205	0.0196	0.0644	0.0700	0.140
Stdev	24.1913	0.3385	1.9743	2.9352	7.6741	10.20	23.3471	0.0810	0.0917	0.1929	0.1756	0.259
Skew	-0.6637	2.1075	9.2096	-1.6352	3.3749	-0.5322	-0.9248	9.0737	9.4966	3.7489	4.2448	2.207
Kurtosis	4.8101	5.4723	123.159	31.895	19.844	5.5160	7.2681	97.3416	100.119	15.970	22.249	7.096
Table AR : wavelet R1 over R2 recomposed												
Large			**Beta**					**RSQ**				
FIRM	**BETA**	**RSQ**	**D1**	**D2**	**D3**	**D4**	**D5**	**D1**	**D2**	**D3**	**D4**	**D5**
Mean	3.3229	0.0111	-17.1973	8.6270	71.673	67.319	-61.0708	0.0189	0.0126	0.0380	0.0723	0.168
Stdev	0.7154	0.0729	1.0830	0.8332	1.0813	0.9286	0.7545	0.0681	0.0785	0.1245	0.1340	0.299
Skew	4.2043	11.0468	11.1099	-1.1046	1.8052	0.3141	0.5841	9.4333	10.1227	5.7730	3.0345	1.377
Kurtosis	107.31	135.5512	195.641	73.639	24.736	7.4602	7.5608	111.553	114.459	37.312	15.493	3.081

The analysis depicts the estimating beta coefficients and R-squared for the regression between the Islamic Japan and Islam UK indices. The results from table A shown that the estimated beta and estimated R-squared from changes non-monotonically with the time scale. However, the R-squared for the recomposed results quite consistent over different time scale. In terms of volatility, the generally monotonic for the decomposed results where the it timely riskier over long run. Hence the results consistent with the market expectation over the long run, the particular investment may be exposed to numbers of uncertainty in investment.

Table B in addition estimates the beta and R-squared for the regression between Islamic Japan and Islamic US indices. The results depict the inconsistent beta and generally over 5 different crystals for the both model. However the R-squared for both model (decomposed and recomposed) consistent over

different time scales. The risk for both model larger over the period while the recomposed model however inconsistent.

Table B :OLS for R1 (Islamic Japan) with R3 (Islamic US)

TABLE B												
FIRM	**BETA**	**RSQ**	**D1**	**D2**	**D3**	**D4**	**D5**	**D1**	**D2**	**D3**	**D4**	**D5**
Mean	39.990	0.1513	-17.6547	9.4709	71.379	53.983	-91.669	0.0205	0.0196	0.0644	0.0700	0.140
Stdev	24.191	0.3385	1.9743	2.9352	7.6741	10.207	23.3471	0.0810	0.0917	0.1929	0.1756	0.259
Skew	-0.6637	2.1075	9.2096	-1.6352	3.3749	-0.5322	-0.9248	9.0737	9.4966	3.7489	4.2448	2.207
Kurtosis	4.8101	5.4723	123.159	31.895	19.844	5.5160	7.2681	97.3416	100.119	15.970	22.249	7.096
Table BR wavelet R2 over R3 recomposed												
Large			**Beta**					**RSQ**				
FIRM	**BETA**	**RSQ**	**D1**	**D2**	**D3**	**D4**	**D5**	**D1**	**D2**	**D3**	**D4**	**D5**
Mean	3.3229	0.0111	-17.1973	8.6270	71.673	67.319	-61.070	0.0189	0.0126	0.0380	0.0723	0.168
Stdev	0.7154	0.0729	1.0830	0.8332	1.0813	0.9286	0.7545	0.0681	0.0785	0.1245	0.1340	0.299
Skew	4.2043	11.0468	11.1099	-1.1046	1.8052	0.3141	0.5841	9.4333	10.1227	5.7730	3.0345	1.377
Kurtosis	107.314	135.5512	195.641	73.639	24.736	7.4602	7.5608	111.553	114.459	37.312	15.493	3.081

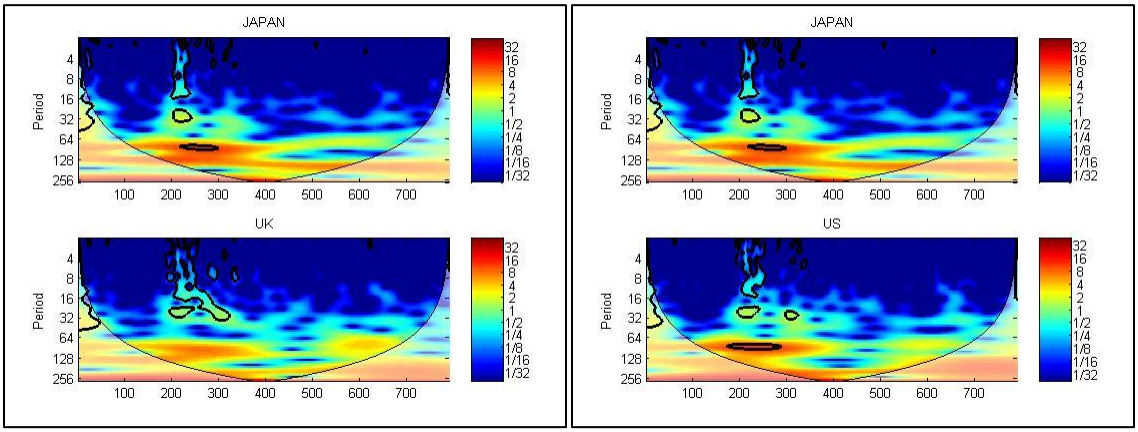
The analysis for table C shown the estimated beta inconsistent for both model while the estimated R-squared the consistent over different time scales. In addition, the volatility consistent over different time scales which again consistent with the previous results. The economic intuition from the results agreed that longer time interval exposed to the uncertainty in the investments

Table C :OLS for R1 (Islamic Japan) with R4 (Islamic Emerging Market)

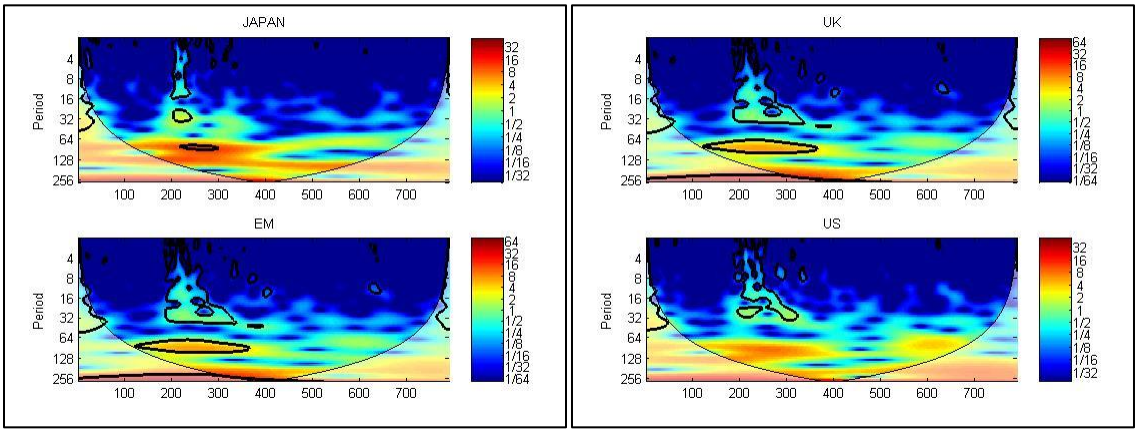
TABLE C												
FIRM	**BETA**	**RSQ**	**D1**	**D2**	**D3**	**D4**	**D5**	**D1**	**D2**	**D3**	**D4**	**D5**
Mean	-44.38	0.1962	-64.3292	74.864	28.886	20.837	-149.8569	0.0191	0.0673	0.0680	0.0948	0.165
Stdev	21.305	0.3426	3.0059	2.4443	4.4246	8.7828	21.1600	0.0990	0.0901	0.1602	0.2074	0.206
Skew	-1.081	1.7616	7.2282	-3.3380	4.6607	-1.4709	-0.2861	9.2279	8.4011	4.0118	2.9285	3.172
Kurtosis	6.8535	4.4544	78.6298	21.261	34.587	9.5547	5.0555	87.5737	87.8171	20.661	11.728	13.36
Table CR wavelet R1 over R4 recomposed												
Large			**Beta**					**RSQ**				
FIRM	**BETA**	**RSQ**	**D1**	**D2**	**D3**	**D4**	**D5**	**D1**	**D2**	**D3**	**D4**	**D5**
Mean	5.6518	0.0089	-62.6356	74.113	26.587	33.044	-86.0524	0.0111	0.0630	0.0473	0.0574	0.129
Stdev	0.7490	0.0790	1.4852	0.7960	0.5850	0.6781	0.7937	0.0491	0.0689	0.1444	0.1428	0.216
Skew	-7.143	11.7070	8.3468	-4.5757	2.7619	-1.5734	-0.4806	17.6978	9.4743	5.3371	4.4344	1.737
Kurtosis	159.52	144.3661	109.497	44.433	32.896	13.444	8.6597	338.473	128.077	32.940	24.581	4.765

Continuous Wavelet

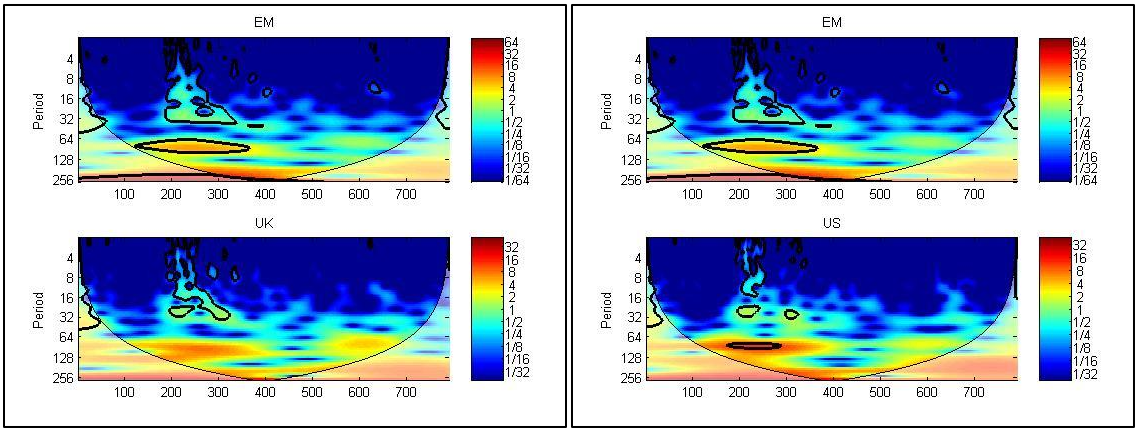
According to Madaleno and Pinho (2012) the black countour in regions with energy indices designates the 5% significance level (95% confidence level) estimated from Monte Carlo simulations using phase randomized surrogate series, assuming the botton red noise defined by the variance and the number of points of the original time series. Interestingly, the results from different four markets initiated some facts which quite puzzle with no high power variance in the high or lower frequency at the time scales decomposition.



Graph 1 : Comparative analysis between Japan and UK, Japan and US



Graph 2 : Comparative analysis between Japan and EM, UK and US



Graph 3: Comparative analysis between Japan and UK, Japan and US

Continuous Cross Wavelet Analysis

In the cross wavelet coherence, we try to understand the existence of covariance between two continuous wavelets. The analysis however found no significant covariance between the two markets which infer some understanding that the four markets hold its own uniqueness of each market. On average, more than half of the time scales of the four markets shown any sign of warm concentration. Economically, we may also infer that the ideas that the market relatively owns it specific super power and it does not influence one to another if there are any economic catastrophe exists within this period. However, we have to bear in mind that this is relatively involve only Islamic equities and most potentially the internationally players would prefer due to its stability since it not involve participations in gambling and liquor for entertainment which would be . If we observe the diagram carefully, we may see there is one island existing in the graph where the color was not really obvious warm at 64 to 128 days band for every pair of cross wavelet due to series of economic events such as Lehman Brothers failure, Fannie and Freddie takeover, TARP fails to pass congress, no TARP asset purchases and bank stress test which cause more pressure on the market confidence towards more announcement from the financial institutions and also Federal Reserve.

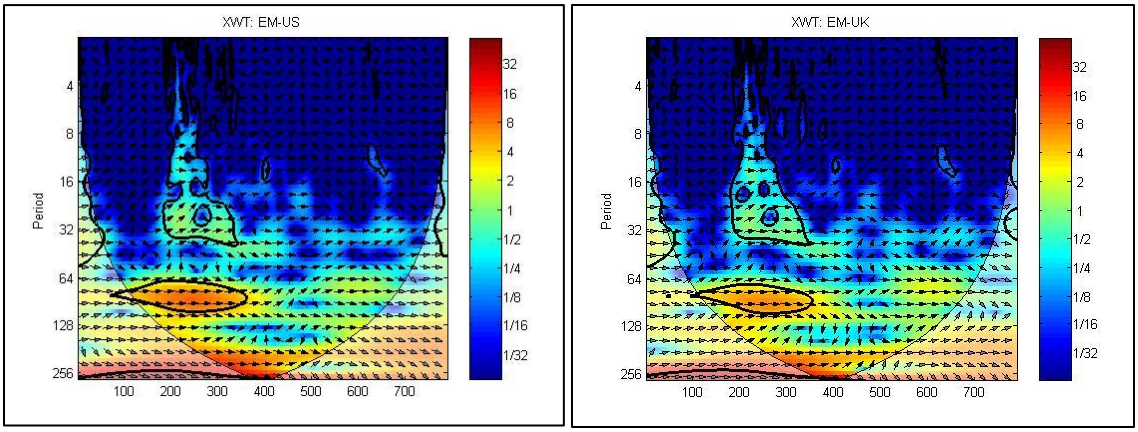


Figure 1 : The crosswavelet analysis between EM-US , EM –UK

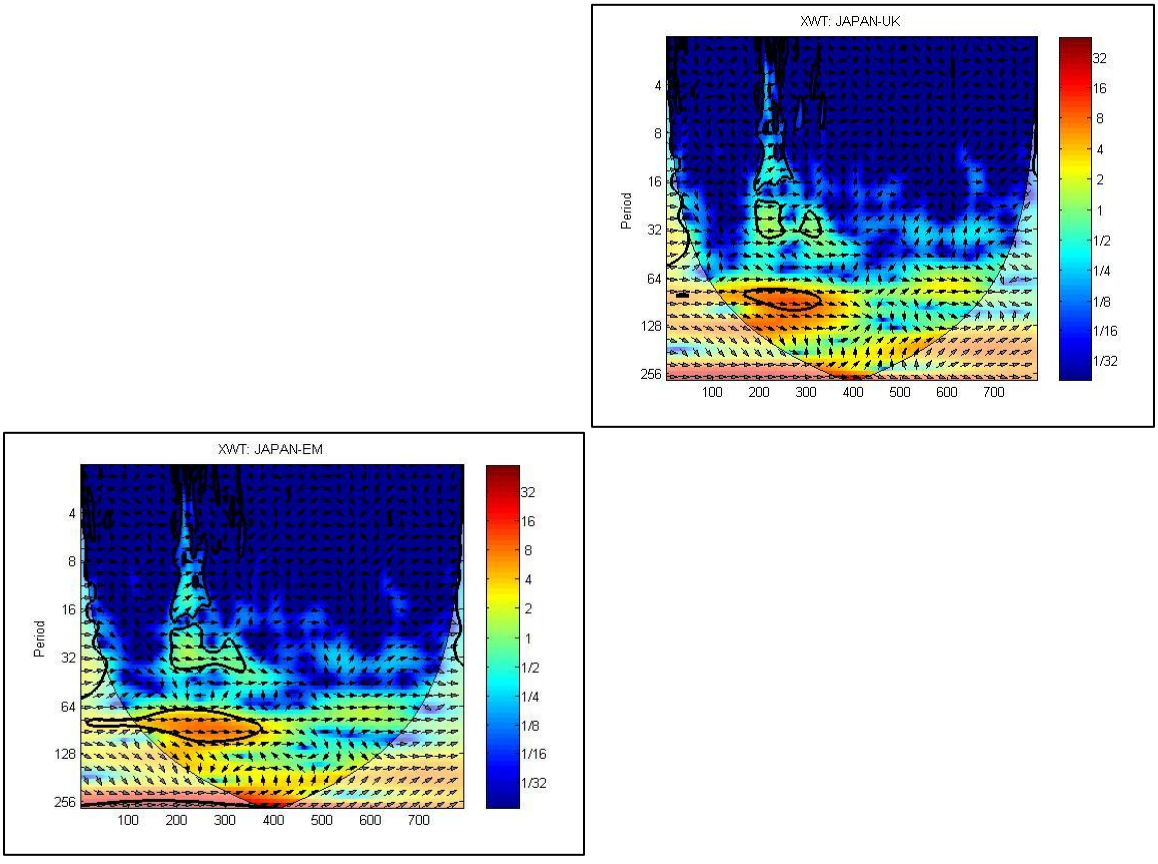


Figure 2 : The continuous crosswavelet analysis between Japan – EM, and Japan UK

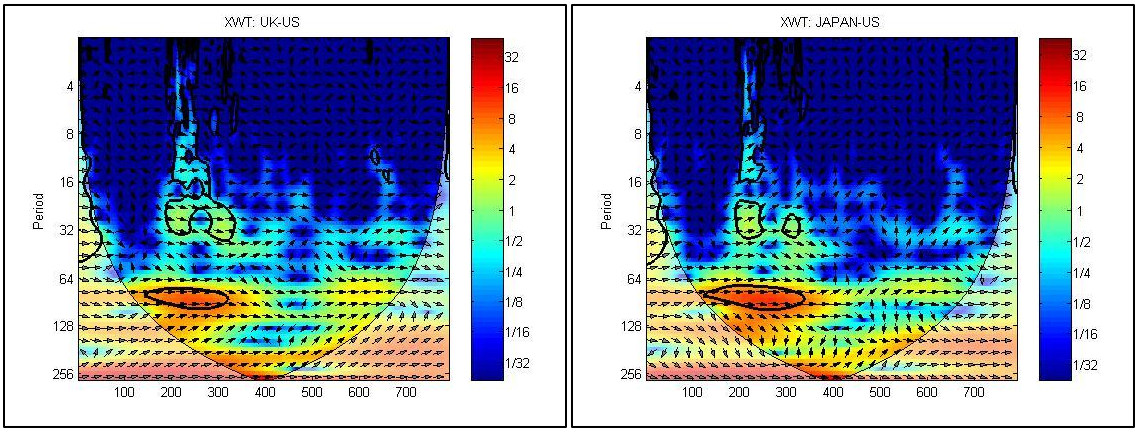


Figure 3 : The continouous crosswavelet analysis between UK-US, Japa and US

Wavelet Coherence

The WTC finds regions in time frequency space where the two time series co-vary (but does not necessarily have high power).Figure 4 estimates the wavelet coherency and phase difference between the four indices. The analysis basically obtained through monte carlo simulation techniques. Madaleno and Pinho (2012) mentioned wavelet cross coherency shows low-medium statistically significant coherence, but also able to see some medium islands. The results however interesting and quite contradict with the initial results gathered from the continuous cross wavelet.

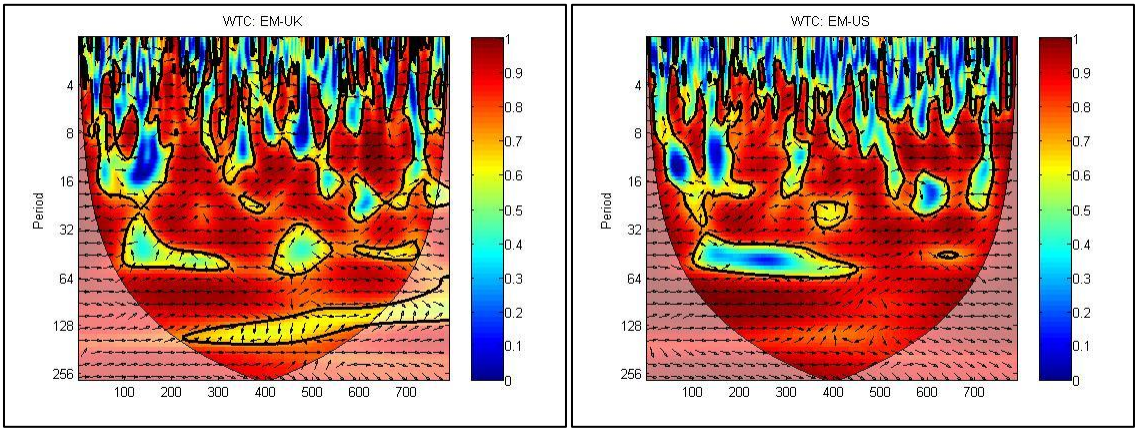


Figure 4: The cross wavelet coherence result between Islamic Emerging Market and Islamic UK

shown that from period 4 to 16 days, Islamic UK was leading the market while between 16 to 32 days

band, the Islamic Emerging Market was leading with exception case between 64 to 128 day bands. Most of the time towards high scales it is seems not leading each other. For Emerging Market and US, it shown that Islamic US leading the Islamic Emerging Market but overall there is no evidence of who lead each other. Interestingly, both graphical presentation between Islamic Emerging market-Islamic UK and Islamic Emerging Market – US shown there are correlated to each other.

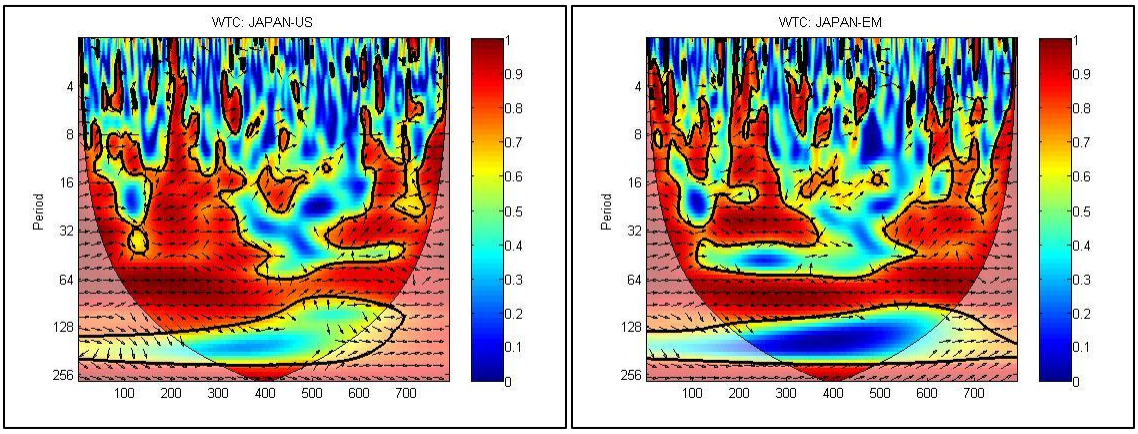
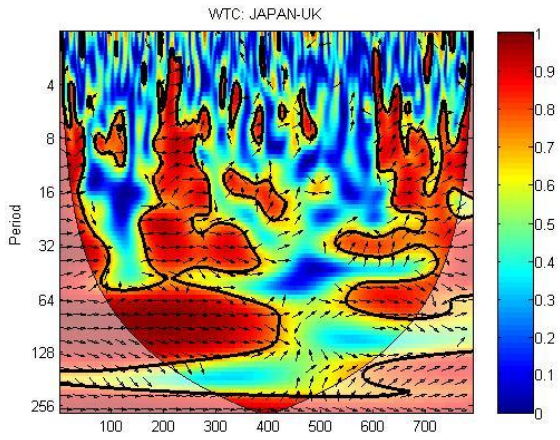
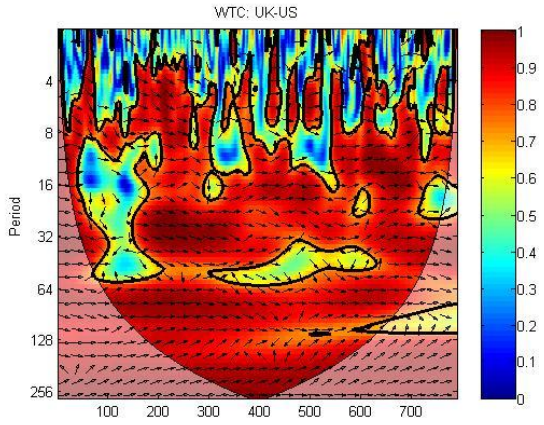


Figure 5: The cross wavelet coherence between Islamic Japan and Islamic US shown that the there are co-vary relationship exist between this two markets. On the daily time scales of 8 to 64 days the co variance between Islamic Japan and shown that Islamic US was leading Japan. However there is also evidence that between 64 to 128 days period Japan was leading towards the end of 2008 to early 2009. In terms of Islamic Japan and Islamic Emerging market, it was evidence that Islamic Emerging market some lead in the movements 16-32 days period band.

Figure 6 shown that the covariance between Islamic Japan and Islamic UK relatively small with Islamic Japan leading between the 64 days to 128 days band. Hence, this result contravene with the idea of Islamic UK was a super power after US. Islamic UK and Islamic US was mainly lead by the Islamic UK at most of the period band except for the period of 128 days to 256 days band which Islamic US was leading the UK.





Conclusion

The analysis found the returns for four Islamic indices relatively stable except for the period of middle 2008 to early 2009 when lots of economic steps were taken by the federal Reserve to safeguard the US economy. The crisis caused the business slowdown largely in US due to credit shortages and the situation when capital plight cause the excessive cash out from the markets. Generally, the returns for the four indices relatively stable onwards. The analysis through discrete wavelet generally found that estimated beta and r-squares for five different dimension of time scales proved that the beta is non monotonic. The volatility however increases over time which further confirmed that shariah indices were still exposed to the economic uncertainty as the time frame increases. Wavelet coherence specifically found the existence of causality elements between the indices interaction as well as high covariance existing among these four indices which is represented by red colors. Although not most of the time Islamic emerging market was leading, but still there are some evidences Islamic Emerging markets had taken its own independency from the western economy especially. This analysis however failed to deny the dominancy of Islamic US indices as the leader for the overall markets.

Hence this analysis hopefully will help the market participants including the government and regulators to augment more efforts to publicize the Islamic equities not only on the shariah compliance per se, but also on its ability to offer stable returns. This research probably can be further extended to

efficient market hypothesis (EMH) for the future researchers to understand the Islamic indices can be classified under weak, semi-strong or strong form. In addition, this research also enriched basic understanding that Islamic Emerging Market also gained level playing fields opportunity with reputable market giants such as UK , US and Japan.

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