Sukuk Vs Conventional Bonds

A study into the performance of Islamic Bonds

Name: Michael Koch
Student Number: 602523
Supervisor: Gareth Roberts
Abstract
Islamic finance is becoming more mainstream as an alternative investment for people that may not even follow Shari’a law. The paper aims to compare Islamic Bonds correctly referred to Sukuk against conventional bonds. Sukuk are relatively new assets in the Islamic finance space and are gaining continuing momentum especially with people who follow Shari’a law, as they want an asset that can be compared to bonds. The paper uses non-parametric statistics to do the analysis as this deals with the correlation in return data. The results tell us that Sukuk outperform bonds but cannot gauge by how much. The results are important in the financial asset space as it tells us about how Sukuk perform against a conventional financial asset and sets a precedent on how to do this going forward.
Acknowledgments
My supervisor Mr Gareth Roberts thank you for all the hours spent in your office talking through the various aspects of my research, and for all the valuable input you have given me.

Fatima Vawda and her team at 27 Four Investment Managers. Thank you for guiding me towards the interesting space of Islamic Finance and for all the support and input on putting together this research.
# Table of Contents

Introduction .................................................................................................................. 5  
Structure of Sukuk ........................................................................................................ 5  
Differences and Similarities to Conventional Bonds ....................................................... 6  
Risks of Sukuk ............................................................................................................... 7  
Criticism of Sukuk ........................................................................................................ 8  
Some theory on returns and conventional bonds .............................................................. 8  
Methodology and Data Selection ....................................................................................... 9  
Results .......................................................................................................................... 10  
Discussion ..................................................................................................................... 12  
Conclusion ..................................................................................................................... 13  
Bibliography .................................................................................................................. 14  
Appendix ......................................................................................................................... 16
Introduction
Islamic finance has seen extraordinary growth over the past few years. The CFA Institute Research Foundation find a number of reports indicating global Islamic financial assets at about US$1.5 trillion as of 2013. In comparison, the largest conventional banks have assets in excess of US$2 trillion each. The latest EY World Islamic Banking Competitiveness Report found that the average growth of Islamic banks from 2009-2013 has been 17% per year. This expansion has been, in part, fuelled by the issuance of Sukuk, which are often referred to as Islamic Bonds. Sukuk are more correctly Islamic investment certificates which are similar to conventional bonds as they allow for funds to be raised in capital markets. They conform to the principles of Shari’a, an Islamic legal code. The Sukuk market has dramatically increased in size with new issuance of US$1.5 billion in 2000 to US$294 billion in 2014 according to a report by Franklin Templeton Investments. The first Sukuk was issued by Shell MDS in Malaysia in 1990 while the first sovereign Sukuk was issued in 2001 by the Central Bank of Bahrain. Countries such as South Africa, Hong Kong and the United Kingdom have issued sovereign Sukuk not to raise capital, but rather to position themselves in the Islamic financial market.

This study aims to explore if any differences exist between Sukuk and conventional bonds in terms of performance and risk. First the different structures of Sukuk will be discussed, then the similarities and differences between Sukuk and conventional bonds as well as the risks that Sukuk face. Finally, the performance of Sukuk will be measured against that of conventional bonds.

Capital Structure
A company has many methods at its disposal to finance its assets this can be done through the use of debt, equity or some hybrid security. The two important methods that will be discussed in this paper is the issuing of debt in the form of bonds and Sukuk that are commonly referred to as Islamic bonds. The assets are comparable as both of them are issuing debt, however, the way the debt is issued in each asset differs. The way Sukuk are structured make it comparable to conventional bonds, but there exist many differences. The differences exist due to Sukuk not being typical debt instruments and having the asset directly attached to them. These differences may make the assets not 100 percent comparable however the analysis that will be performed will still provide useful results.

Structure of Sukuk
Sukuk (plural for Sakk) are Islamic investment certificates, which can be closely compared to conventional bonds. Sukuk are structured in a such a way that they adhere to Islamic laws. In particular, they conform to the principles of Shari’a. The Shari’a principles of riba and excessive gharar are especially important in the case of bonds. Riba does not allow for any interest to be earned or paid in cash or any kind while trading under uncertainty (gharar) is forbidden.

Sukuk are structured in the following way. The originator sells an asset to the special purpose vehicle (SPV) who then leases this asset back to the originator. The originator pays rental for these assets. This rental can be either fixed or floating depending on the originator. The investors then buy Sukuk certificates and any profit made from the rental of the asset is transferred from the SPV to the Sukuk holder. At maturity, the SPV will sell the asset back to the originator and reimburse the Sukuk holders with this sale.
**Differences and Similarities to Conventional Bonds**

Sukuk can be asset-based or asset-backed. Asset-backed Sukuk are such where a true sale has taken place and the SPV controls the underlying asset. Whereas an asset-based Sukuk is a securitization of the assets which is closer in form to a conventional bond. Conventional bonds do not have any underlying assets and are rather debt instruments whereby investors will get a coupon (interest) payment and at maturity the face value. This can be compared to the rental and proceeds received from the sale of the underlying asset in a Sukuk. The rental that a Sukuk holder receives is based on the profit or loss that the obligator makes from the use of the asset. This is different from bonds where the return or interest is predetermined.

As explained by Tahmoures (2013), in the event the issuer of a conventional bond defaults on a payment the bondholders can bring a lawsuit against it and collect as much as possible. This differs in the case of a Sukuk where the underlying asset can be sold and the proceeds from the sale will be distributed amongst the certificate holders. Bonds and Sukuk are different in structure. Conventional bonds have money as the underlying asset and in the case of Sukuk a tangible asset. This difference is for religious purpose but makes virtually no financial difference. (Tahmoures, 2013) However even though bonds have cash as the underlying asset, the payments can be made from any source of income and if the bond defaults bond holders are able to seize any assets of the company while with Sukuk the only asset the Sukuk holder has rights to is the underlying asset.

Cakir and Raei (2007) find that including Sukuk in a portfolio significantly reduces value at risk (VaR) of the portfolio. They found that including Sukuk reduces VaR by 11%, 15%, 18% and 32% in portfolios of bonds in Malaysian, Pakistan, Qatar and Bahrain respectively. Cakir and Raei warn that the gains of diversification by including Sukuk in the bond need to be evaluated against the lower return and liquidity risk of Sukuk. The secondary market for Sukuk is found to have a lack of activity and this can show that Sukuk are illiquid. The illiquidity can pose a risk on the portfolio at times of volatility, as investors may not be able to buy or sell any Sukuk in the secondary market. This low volatility may be a false sense as Sukuk are only priced in a similar fashion to property, where pricing only happens once a year, but the price could have changed many times within the period. Hence a potentially false sense of low volatility could be observed.

Sukuk and conventional bonds, although the same financially, have different effects on stock markets. Godlewski, Turk-Ariss and Weill (2010) found that in the Malaysian stock market a Sukuk announcement leads to a negative market reaction that adversely affects the firm’s value. Alam, Hassan and Haque (2013) find similar results in a smaller sample consisting of a bigger region namely Malaysia, Indonesia, Singapore, Pakistan, UAE, Bahrain and Qatar. Using a similar methodology to Godlewski, Turk-Ariss and Weill evidence that supports the same conclusion was found. Both Godlewski, Turk-Ariss and Weill and Alam, Hassan and Haque go on to discuss reasons for this negative reaction. It is found that mainly financially unhealthy companies issue Sukuk as opposed to conventional bonds. This can be attributed to profit sharing being more beneficial to a low profit while set interest payments are more beneficial to high profits. “If issuers expect a low profit, they will prefer profit-and-loss sharing financing schemes to minimize their loss in the result of failure. If issuers expect a high return, they will prefer interest-based financing to maximise their gain in the event of success.” (Alam, Hassan and Haque, 2013:26)

Since the market can differentiate between Sukuk and conventional bonds, and Sukuk has negative shock there is a limit on the incentives for companies to issue Sukuk as opposed to conventional bonds. Further Sukuk issuance can become an indicator of bad performance of a corporate, thus fur-
ther affecting the negative performance shock in the stock market. Market mechanism may limit the expansion of Sukuk, which will be counterbalanced by religious motivation.

**Risks of Sukuk**

Market risk comprises both of systematic risk, which rises due to governmental and policy shifts, and idiosyncratic risk, which is different on a firm-to-firm bases and is also uncorrelated between firms. Sukuk faces many of the same risks as conventional bonds – the market risks faced by Sukuk are often similar to that of conventional bonds especially in the case of the interest rate risk.

Interest rate risk would be known as the rate of return risk on Sukuk. This risk arises when the market rate increases and the fixed return on the Sukuk is not allowed to rise then the holder would be earning less on the Sukuk than they would in the market. As Tariq (2004) explains Sukuk are exposed to rate of return risk through the benchmarking with LIBOR in their financing operations. Interest rate risk is not specifically unique to Sukuk and can be similarly found in conventional bonds.

Exchange rate fluctuations can be unfavorable and this can lead to risk on the returns of Sukuk. “In the event of a divergence between the unit of currency in which the assets in the Sukuk pool are denominated, and the currency of denomination in which Sukuk fund are accumulated, the Sukuk investors are rendered to an exchange rate risk.”(Tariq, 2004:451) Most Sukuk are issued outside of the United States of America but still issued in US dollars. This means that if the country of issue’s currency strengthens against the dollar the real return received will be less. Exchange rate fluctuation is a risk in all international investing. This risk is not a unique risk to Sukuk, but it is one that is important to consider.

Another risk that faces both Sukuk and conventional bonds is that of credit risk. Credit risk is the probability that settlements will be delayed or defaulted on. The Shari’a principles limit the credit risk management instruments available to investors. As Tariq (2004) describes Sukuk are in large part issued in emerging markets where counterparties possess less sophisticated risk management mechanism and consequently these counterparties may be more inclined to default on their commitments.

A risk that is only faced by Sukuk is that of Shari’a compliance. If the underlying structure of a Sukuk asset is changed, then this could cause the Sukuk to no longer be Shari’a compliant and, therefore, the certificate will be rendered null and void. This risk can be diminished by closely working with Shari’a advisors to ensure that any underlying changes to the Sukuk are in compliance with the principles of Shari’a.

An important risk that is unique to Sukuk is legal risk. Sukuk are such a new asset in the financial space that legal uncertainty exists. The legal uncertainty creates a problem as Sukuk holders will not know how the case will play out as no legal precedence exists.

Accounting and tax implications exist as a risk similarly to the way that the legal risk works. Sukuk are special purpose vehicle and the way this needs to be treated in accounting terms can complicate the investment. While with tax the argument, Sukuk can be seen as a rental and not as financing and this is treated differently in accounting terms and this can directly affect the bottom line of the company.

A Sukuk has to be linked to underlying asset and this brings with extra risks as now we face risks related to the asset. As Tariq (2004) says the primary risk is the loss of this underlying asset. If the underlying asset is made up of equipment or large-scale construction then this risk can easily become significant. Islamic finance has made provisions for insurance in the form of Takaful and this can be
used to alleviate the risk of asset loss. The underlying asset will also have to be maintained to ensure that returns will continue to be made by the investor. This is the responsibility of the SPV in most cases. Without proper maintenance, the value of the asset could significantly drop and this could hinder the pay out an investor will receive at maturity of the contract.

**Criticism of Sukuk**

In 2007, Muhammed Taqi Usmani heavily criticised the structure of Sukuk saying that approximately 85% of issued Sukuk structures contravened the principles of Shari‘a. The issues that Usmani found centred on incentives for managers, stipulating loans when profits fall below prescribed percentages and the guarantee of capital at the maturity date of the Sukuk.

Usmani goes on to say that “of the expected rate of return from the enterprise is 15%, the interest at the same may be no more than 5%. If, owing to poor management the actual rate of return from the enterprise falls to 10%, then how may what is in excess of 5% be given to the manager as a reward for “good management”? How can this be, even when poor management resulted in profits dipping from [an expected] 15% to 10%? It should, therefore, be clear that what is being called an “incentive” in these Sukuk is not truly an incentive but rather a method for marketing these Sukuk on the basis of interest rates”. These incentives defeat the purpose of the Islamic economic system in which wealth is to be equitably distributed among investors.

In Sukuk contracts, a certain percentage rental that is comparative to a coupon payment on a conventional bond is stipulated. The current form says that if the profits realised are below this percentage then managers are to give Sukuk holders an interest-free loan that will be paid back by higher profits than stipulated rental in future periods or from lowering the cost of repurchasing the asset at the redemption time of the Sukuk. Usmani says that there is nothing in the Shari‘a that can justify such a loan.

The issue surrounding the guarantee of the principle amount to Sukuk holders at maturity is also not Shari‘a compliant according to Usmani. The Shari‘a legal presumption with regards to an underlying Sukuk asset is that Sukuk holders are entitled to the true market value of the asset whether that is below or above the face value. Usmani discusses the different types of managers that conform to Shari‘a principles and he finds that in none of these management commitments is it lawful to guarantee the principle amount back to investors.

These issues that Usmani has highlighted can all be attributed to the idea that Sukuk need to conform to conventional bonds. This goes against the noble objectives of Islamic economics, which is to ensure equitable distribution among partners from enterprises that they enter. In closing, Usmani recommends that Shari‘a supervisory boards need to abide by the standards issued by the Shari‘a committee.

**Some theory on returns and conventional bonds**

Conventional bonds are debt instruments for both companies and governments, where an investor loans money to either the company or the bond for a defined period of time, at a variable or fixed interest rate. The entity that borrowed the money from the investor has the obligation to pay the investor back at the agreed upon terms.
Economic theory tells us that rational investors are risk adverse and want to be compensated for the risks they take. If an investor can make the same return on two assets that have different risk they will invest in the asset that has a lower risk if they are acting rationally. The models built in literature, take this into account and try to establish ways to quantify each risk and see how the different risks contribute to the risk-premium (the return on the asset above the risk-free return) of a financial asset.

Kiem and Stambaugh (1986) try to predict expected risk premiums and how they change with a change in certain observable variables. Kiem and Stambaugh (1986:358) say “A simple valuation model suggests that levels of asset prices might be inversely related to expected future returns.” they aim to find variables that can be proxies for the levels of asset prices and also to see if seasonality is important in estimation of expected returns. The analysis performed is done on common stocks but more importantly on long-term bonds. The study finds that the levels of asset prices explain some of the movement in the expected risk premium. It similarly finds that’s seasonality is important in estimating changing returns and significantly affects the expectations. The results of the paper are important as it emphasises the importance of risk on explaining returns on assets and how the higher the risk the higher the returns should be.

Warga (1992) studies the effects of the liquidity differences in bonds and how this affects the return premium that is generated. The paper finds that the more liquid bonds are subject to significantly lower returns. Tax effects are a reason that this could occur and the results are tested to see if tax plays a role in explaining the result and it is found that tax does not affect the results and it is just the liquidity differences that explain the difference in returns. This result is important in the structure of both conventional bonds and Sukuk as they both face liquidity risk. The liquidity risk in the Sukuk market is of a different structure due to the limited nature of Sukuk assets and the appetite for the asset. Liquidity exists in such a way that that selling the asset before maturity will not be a problem but buying into further assets could be problematic. This liquidity situation makes it hard to measure the liquidity risk on Sukuk.

**Methodology and Data Selection**

The Dow Jones Global Sukuk index was used as a proxy for Sukuk performance and the JP Morgan Global Emerging Market Bond index was chosen as a proxy for bond performance. Data ranges from 30 September 2005 to 26 June 2015 and is in a 5-day format. The JP Morgan Index is comparable to the Sukuk index as Sukuk issuance occurs mainly in emerging markets. Conditions in developed countries would not be comparable and may skew results; therefore an index that allows for bonds in developed countries would not be desirable. As the Sukuk index was from inception no reindexing was required. The JP Morgan bond index was reindexed to take 30 September 2005 as the base to make it comparable with the Sukuk index.

A range of non-parametric tests were applied to determine whether Sukuk performance are greater than bond performance and to see they have equal variance as this will tell if the risk structure is different. Non-parametric tests were chosen due to the simplicity they provide when comparing two datasets. Using non-parametric statistics, no assumptions have to be made about the underlying distribution of the data and powerful results and inference can be drawn. The reason parametric paired t-test could not be used is that one of the assumptions is that pair differences (Sukuk-Bond,) be independent across i, however with the data being returns, this assumption will be violated as returns today are usually highly correlated with yesterday’s returns and tomorrow’s returns will be correlated with to-
day’s. This means the pair differences will not be independent across i. Another assumption of using the paired t-test requires the data to come from a normal distribution, in the case of the sample being large it would not have been a problem as the central limit theorem would have come into play and the data the assumption of normality would have held.

The Wilcoxon signed rank test and the Kolmogorov-Smirnov test were all used to test if Sukuk outperformed bonds. A variance test was used to check if the variance of these two assets had a similar risk attached to them. These non-parametric tests do not rely on the assumption of normality and will tell if the two assets are statistically different with good power and no violation of any assumptions.

Further checks were done to see how much correlation lies between bonds and Sukuk. Time Series plots were used to provide a visual description of the performance between Sukuk and bonds.

The following two regressions were run and compared to test if the trend of the two assets in the time series is the same.

\[
\text{Sukuk} = a + b \times \text{date}
\]

\[
\text{Bond} = p + q \times \text{date}
\]

A test was done to check the equality of p and b. This indicates whether the trend of the two assets is equal or if one asset is moving significantly faster than the other.

**Results**

The tests suggest that Sukuk over the 10 year period significantly outperform conventional bonds. This can be seen quite clearly in the time series plot of the two assets as seen in (figure 1).

The decomposition plot (figure 2) describes the bond time series clearly showing the effects of trend, seasonal effects and the randomness in the time series which can be closely compared a similar plot (figure 3) using the Sukuk time series.

As the plot depicts a deep drop can be seen in Sukuk performance over the period corresponding with the financial crisis of 2008/2009 while bonds remained relatively stable during that period.

The non-parametric tests all show that Sukuk is greater than bonds which indicate that they performed better. The Wilcoxon signed ranked test showed a z-score of 20.152 which has a negligible probability attached to it, which means Sukuk is greater than bonds at 0.1% significance level. The Kolmogorov-Smirnov test shows a d-score of 0.014455 corresponding to a probability of 4.199e-15 again showing with high confidence that Sukuk are greater than conventional bonds.

Testing the equality of the variances shows an f-score of 1.8823 with 2522, 2522 degrees of freedom which leads to a rejection of the null hypothesis in favour if the alternate hypothesis that Sukuk has greater variation than conventional bonds.

The correlation between Sukuk and conventional bonds was found to be 0.9082, which is positive and high meaning that they move in roughly the same direction.

The results of the regression say b = 0.016627 and q = 0.0128522. The chi-squared result of testing b=q has one degree of freedom has a score of 703.71 corresponding to a probability of 2.33629*10^{-155} which is approximately 0. This shows that b and q are not equal and the trend of the Sukuk is higher than that the conventional bond.

A Summary of all the results is tabulated below.
<table>
<thead>
<tr>
<th></th>
<th>Conventional Bonds</th>
<th>Sukuk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>122.6048</td>
<td>124.2707</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>13.28613</td>
<td>18.22837</td>
</tr>
<tr>
<td>Min</td>
<td>99.33839</td>
<td>86.74</td>
</tr>
<tr>
<td>Max</td>
<td>145.1575</td>
<td>155.92</td>
</tr>
<tr>
<td>Correlation: Bond</td>
<td>1</td>
<td>0.9082</td>
</tr>
<tr>
<td>Correlation: Sukuk</td>
<td>0.9082</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>Null Hypothesis</th>
<th>Alternate Hypothesis</th>
<th>Test Score</th>
<th>P-Value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilcoxon Signed Rank Test</td>
<td>Sukuk = Conventional Bond</td>
<td>Sukuk &gt; Conventional Bond</td>
<td>z-score = 20.152</td>
<td>≈0</td>
<td>Reject the null hypothesis in favour of the alternate hypothesis</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov Test</td>
<td>Sukuk = Conventional Bond</td>
<td>Sukuk &gt; Conventional Bond</td>
<td>d-score = 0.11455</td>
<td>≈0</td>
<td>Reject the null hypothesis in favour of the alternate hypothesis</td>
</tr>
<tr>
<td>Variance Test</td>
<td>Sukuk Variance = Conventional Bond Variance</td>
<td>Sukuk Variance &gt; Conventional Bond Variance</td>
<td>f-score = 1.8823 df(2522,2522)</td>
<td>≈0</td>
<td>Reject the null hypothesis in favour of the alternate hypothesis</td>
</tr>
<tr>
<td>Test Equality of Trend</td>
<td>Sukuk Trend= Conventional Bond Trend</td>
<td>Sukuk Trend &gt; Conventional Bond Trend</td>
<td>Chi-squared score = 703.71 df(1)</td>
<td>≈0</td>
<td>Reject the null hypothesis in favour of the alternate hypothesis</td>
</tr>
</tbody>
</table>

**Discussion**

The results are strongly in favour of Sukuk outperforming conventional bonds. In the time series plot of the two assets it can be seen that Sukuk grows to a much higher point than conventional bonds. The Sukuk can be seen to fall quite drastically in the region of 2008/2009, which corresponds to the period of the financial crisis. The crisis centered around a crash in the housing and real estate market. As the structure of a Sukuk is mainly backed by real estate it is expected to have a severe drop when the value of the underlying assets dropped drastically causing the crash. While the emerging market bonds were not affected as drastically during the crisis due to markets not bursting the way they did in the developed countries. The decomposed plot of the conventional bond time series shows, in the random effects area, a drop in bond value was observed but was not enough to cause a disruption in the trend. Moreover, the effects in the bond market happen slightly earlier than the Sukuk market. Considering that Sukuk are a fairly new financial asset, it can be expected that they will suffer more than conventional bonds which are usually considered some of the safest type of investments. During later years and the recovery of the market, it can be seen the Sukuk are relatively more stable than conventional bonds. This is shown in the random section of the decomposition of both assets after 2010 – the Sukuk random plot is relatively more stable than that of the bonds.

Evidence from the testing the equality of the variance, however, suggest that Sukuk are more variable than bonds which suggest that Sukuk contain more risk than that of conventional bonds. This could be due to the age and perceptions of the two assets with Sukuk not being as established as bonds. This could lead to greater risk profile as bonds are seen to be a very safe investment. As Godlewski, Turk-Aris and Weill (2010) as well as Alam, Hassan and Haque (2013) found, Sukuk are perceived differently conventional bonds by the market, this can aid in explaining the different risk profiles. The higher risk profile could link to the reason that we have Sukuk offering greater returns than conventional bonds. This is a fundamental component of investing, a higher risk yields a higher return.

The results of the non-parametric tests performed agree that Sukuk outperform conventional bonds. These tests all have very low probability and can be concluded that there is very little chance that Sukuk and bonds are equal or even that bonds outperform Sukuk in terms of returns. The conclusion from these tests is that Sukuk outperform conventional bonds. The Sukuk market is relatively new and highly attractive. This contributes to the performance of Sukuk as the hype and appetite for Sukuk can help to increase returns.

The test of equality of trend concluded that the trend was greater in Sukuk than conventional bonds which further indicates that Sukuk perform better than conventional bonds. The higher trend means that Sukuk over time reach higher returns quicker than conventional bonds do. This shows a greater performance.
As the literature has stated the market see Sukuk and conventional bonds as different financial instruments. This can also be a reason that Sukuk performs better than bonds. This together with the risk profile shows that the hypothesis is that Sukuk should offer better returns than bonds. As it is known an asset with higher risk is often associated with higher returns to compensate for this risk, the negative impact of Sukuk on the market and the variance test tend to agree with this hypothesis. Further risk can be seen from the criticism of Sukuk as certain Islamic scholars believe that Sukuk are correctly structured tends to increase risk as many follows of Islam may be willing to dump the Sukuk if it were to classified as breaking the religious practices. This increases the risk, which would also need to be compensated for.

Over the next few years with Sukuk gaining momentum and recognition in the market, Sukuk may become more stable. It however it will remain to be seen if this will have an effect on the returns. Nevertheless, the above results strongly indicate that Sukuk outperform conventional bonds.

The results could be skewed, as the indices may not be fairly comparable. The structure of the indices is not fully known and it would be important to see the number of overlapping companies or at least if the indices have companies with the same credit risks. If the indices have major structural differences this would render the results useless. This would be an important analysis to be done to properly validate the results. The results of this paper are strongly indicative of the Sukuk outperforming bonds, but this is just preliminary results and needs to be taken further by deconstructing the indices that are taken as proxies. Further the fact that Sukuk and conventional bonds are not 100 percent comparable could also slightly skew the results.

It would be further useful to test and compare Sukuk and conventional bonds in a portfolio situation where the assets are separately added into a portfolio of assets and see how the addition of these assets each effect returns and risk profiles.

**Conclusion**

Sukuk are explosive and innovative instruments in the field of Islamic finance. To test whether these relatively new assets in the Islamic Finance world perform the same as their conventionally equivalent bonds a range of non-parametric tests were undertaken. Non-parametric tests were chosen due to the underlying nature of the data and returns in general as parametric results would be skewed.

The higher level of risk found in Sukuk has been found by previous research and could be due the underlying structure and the unique market Sukuk are found in. This would be an interesting space to expand research and develop a more robust system of rating Sukuk issuance in the same way that bond issuance has credit ratings by various agencies. This would be difficult for Sukuk as with bond the rating happens at a company level while with Sukuk the ratings will have to be done on asset level which may become very tricky and tiresome.

This research is limited in by the techniques of comparison and can be developed further by tests in portfolio returns. Another place where research could take place is a market by market analysis of Sukuk and conventional bonds to see if the same performance indicators are reliable in the market of each asset.

The results of the tests all agree that Sukuk outperform conventional bonds, while the risk on Sukuk is found to be higher. The higher risk could be a reason for Sukuk having higher return performance. In the financial space, an asset that has a higher risk profile needs to compensate the investor and this
compensation is through higher returns. In the long term, after the excitement of Sukuk wears away we may see the market settle and Sukuk and bonds could become assets that co-exist with the same returns and same risks.

**Bibliography**


Decomposition of additive time series

Figure 3