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## Credit risk in Islamic joint venture bond

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## ABSTRACT

This paper focuses on Islamic joint venture (IJV) bonds and examines whether conventional structural credit risk models capture Islamic bonds' underlying risk. Their various extensions have first been adjusted for the IJV bonds' unique characteristics and then tested through simulations to identify any appraisal issues. The models are then used to assess data from 52 Malaysian Islamic bond issuers. We find that conventional structural models and their Islamic extensions miscalculate IJV bonds and so afford them lower credit ratings.

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## 1. Introduction

The Islamic finance industry has grown rapidly over the last few decades to total some USD \$1.54 trillion in financial assets by the end of 2012 (EY, 2014). Of these, USD \$130 billion were accounted for by sukuk issues – financial instruments often known as Islamic bonds. This growth has been hampered by a shortage of specially trained and experienced practitioners in Islamic finance. So in the short run, the industry has instead hired conventional bankers as well as applied conventional finance techniques across much of their operations. While expedient, this solution has not been without its costs. Some Islamic instruments now look all too similar to conventional ones and likewise some techniques have been applied with only a modest consideration of true risk and reward positions that Islamic finance affords.

This is particularly so for the sukuk where as with other financial instruments, risk and reward are the key determinants in their valuation and hence attractiveness. Some behavioural studies suggest that investors have a much stronger aversion for uncertainty and loss than implied by expected utility theory, hence, a higher weight is assigned to risky outcomes in their utility (Kahneman and Tversky, 1979; Benartzi and Thaler, 1995). Miscalculation of risk, therefore, can result in investors experiencing artificially high or low levels of utility from investing in certain instruments. In conventional finance, such miscalculations have led to mispricing, bubbles and inefficient distribution of financial resources (Brunnermeier, 2009; Bolton et al., 2012; Acharya and Naqvi, 2012). For risk measurements of debt instruments, credit risk models play an important role. Their validity and assumptions have been continuously updated for new and complex financial instruments (Duffie and Singleton, 2003; Lando, 2004). The journey from the initial Merton (1974) credit risk model to the practical

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**Table 1**  
Islamic bond structures.

Islamic instrument	Additional Islamic constraints	Islamic type of contract
IJV bonds	<ul style="list-style-type: none"> <li>• Represent ownership in a particular project rather than the whole venture.</li> <li>• Have a maturity date.</li> </ul>	Musharakah
SARA bonds	<ul style="list-style-type: none"> <li>• Islamic bonds represent ownership of underlying asset. Use the concept of lease financing.</li> </ul>	Ijarah
Debt bonds	<ul style="list-style-type: none"> <li>• They have to be structured based on buying and reselling of the underlying asset so that a debt is created.</li> <li>• The Islamic bank first buys a real asset and then immediately sells it back to the client at a higher price creating a debt which the client periodically repays.</li> </ul>	Murabaha

Source: Adapted from [Usmani \(2002\)](#) and [AAOIFI \(2008\)](#).

[Finger et al. \(2002\)](#) CreditGrades model as well as to the more complex reduced form models ([Duffie and Singleton, 2003](#)) took the conventional finance industry several decades. In comparison, Islamic finance has had no such experience and in most cases still uses conventional credit risk models ([Usmani, 2007](#)<sup>3</sup>; RAM ratings, 2011), perhaps quite inappropriately, to capture the credit risk of Islamic bonds.

Islamic bonds in general and Islamic joint venture (IJV) bonds<sup>4</sup> in particular possess some unique characteristics, e.g. IJV bonds have a more pronounced equity link. Conventional credit risk models, which are designed to capture the risk of debt like structures seem to be incapable of capturing the risk of IJV type structures and might even assign them higher default probabilities (lower survival probabilities) compared to conventional debt bonds. Researchers, however, have seemingly not challenged the validity nor questioned the ability of conventional credit risk models to identify their underlying risk differences. This research gap motivates the following research question: Can conventional credit risk models be used to assess credit risk in IJV bonds?

This paper adjusts, the [Merton \(1974\)](#), first passage and CreditGrades model for the IJV bonds' unique characteristics and tests through simulations to identify if these models have a misvaluation against them. The adjusted models are then used to test data from 52 Malaysian Islamic bond issuers. The results suggest that these models and their Islamic extensions have a bias against equity type IJV bonds resulting in lower credit ratings. This is because current credit risk models focus on the principal's repayment abilities. In contrast, IJV bonds' return can be greater (or lower) than the principal. The results also imply that this bias cannot be removed by merely adjusting conventional models for IJV characteristics. So perhaps credit rating agencies should treat IJV bonds simply as equity and measure their risk using equity risk tools.

This paper contributes to two distinct strands of literature. Firstly, in the credit risk modelling literature ([Duffie and Singleton, 2003](#)) it suggests that conventional models might be misvaluing the risk of IJV bonds. It also traces this misvaluation to a tacit model assumption, a sole focus of safekeeping the principal. The principal's safekeeping and other conventional model assumptions should therefore be closely examined to ensure they reflect the nature of different Islamic instruments for both Islamic capital markets and Islamic banks. Secondly, the paper adds to the debate over whether Islamic instruments little originality different from conventional instruments ([Chong and Liu, 2009](#); [Khan, 2010](#)) by suggesting that the reliance on conventional credit risk models could explain the poor utilisation of IJV bonds.

The remainder of this paper is structured as follows. Section 2 discusses the unique features of IJV bonds. Section 3 provides the literature review. The methodology and data is discussed in Section 4. The results are presented in Section 5 and the paper ends with the summary in Section 6.

## 2. IJV bonds

Islamic capital markets use alternatives to conventional finance that are free from interest (riba), uncertainty (gharar) and gambling (maysir). As detailed in [Table 1](#), the most commonly used structures include IJV (Musharakah/Mudarabah) bonds, secured against real asset (Ijarah) bonds and debt (Murabahah) bonds ([Ayub, 2007](#)). The focus in this paper is on IJV bonds.

IJV bonds (Musharakah/Mudarabah sukuk) are unique instruments with characteristics of both debt and equity. Their holders effectively become part owners of a particular project. If the project is successful, IJV bond holders receive a periodic share of the profits, in an attempt to safeguard the principal, and similar to debt characteristics. IJV bond holders also bear any of its loss according to their investment proportion. Unlike ordinary equity shares, IJV bonds have a maturity date at which time unlike normal debt or preference shares, the issuer can, and usually does, buy them back from the investor at their then market price rather than face value ([Usmani, 2002](#)). Their equity type structure implies that, given no arbitrage, there should be a direct relationship between the market price of a firm's IJV bonds and its ordinary shares. This is because

<sup>3</sup> The prospectus from the sukuk issuance by Sitara Chemical Musharakah Term Finance Certificate Prospectus stated that conventional credit models have been used in their analysis of various sukuk products. As conventional finance professionals simply translate sukuk as Islamic bonds, IJV related sukuk are promoted as simply as a different type of bond even though they have a much stronger equity nature.

<sup>4</sup> IJV bonds are more formally known as Musharakah Sukuk.

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