Asset Securitizations and Bank Stability:

Evidence from Different Banking Systems

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Abstract

The issuance of asset securitization has been subject to a substantial debate by financial regulators and practitioners post the financial crisis of 2008. This study examines the impact of asset securitizations on the performance and financial stability of banks in a dual banking system (Islamic and conventional). Using a unique sample of international banks located in 21 countries, our results provide strong evidence that banks involved in asset securitization are generally riskier and less financially stable. When we comparatively assess the different structures of securitization conditioned on the bank type (i.e. Islamic versus conventional securitization), these two models of asset securitizations show differential effects on bank stability. Unlike conventional securitization, which is marked by significantly low bank stability, an issuance of Islamic securitization leads to lower bank risk. This evidence is prevalent among the two bank types during the financial crisis of 2008-2009 and within non-crisis years. We attribute these findings to the distinctive monitoring and the constraints included in the Islamic model of securitization. The study provides new insights into alternative structures of bank securitization, offering policy implications for regulators governing countries with dual-banking systems.

Keywords: Asset Securitization, Bank Risk, Financial Stability, Bank Type.
JEL Classification: C23, G01, G21, G28, L50, M4

1. Introduction

Asset securitization refers to a mechanism for packaging self-similar loan books as investment vehicles with securities tradable in capital markets. The popularity of this mechanism diminished during the financial crisis of 2008 as it was considered an aggravating factor during the 2008-9 banking crises

period (Ivanov and Jiang, 2020). Consequently, various capital market authorities issued new regulations in an attempt to heighten the monitoring of conventional securitization contracts. The Dodd-Frank Act 2010 of the US Securities and Exchange Commission adopted a number of new rules regarding securitized assets[1]. In part, the issuer is required to produce (i) timely reviews of how funds are divided and paid to security holders within the pool and (ii) 'loan-level information' tabulated in a standardized manner for comparison. A number of empirical studies tested the effectiveness of the post-2008 crisis rules covering mostly single-country settings like the US (e.g. see Barth et al., 2012; Casu, et al., 2011; 2013). Our study complements these studies by providing unique evidence through using a highly monitored type of securitization, based on Islamic[2] contracts for securitization, in comparison to conventional banking securitization. Earlier studies related to conventional securitization show that it is more likely for securitized loans to be foreclosed when delinquent than when the loan is retained within the bank's own loan-book (Piskorski et al., 2009; Sannikov, 2008). This action may not be in the best interest of investors who hold claims on the securitized asset, as the holders of the securitized asset are subject to several types of bank risk that might be difficult to assess. The originating entity may not properly engage in monitoring or in providing investors with the facility to monitor through the pooling and servicing agreements that originated from the securitized asset. Accordingly, it is very difficult to identify this principal-agent effect using asset securitization for a global cross-section without studying different structures of the individual loan contracts (i.e. Islamic versus conventional).

This study aims to differentiate between the contractual properties of the securitization mechanisms applied by Islamic and conventional banks. In particular, we investigate the Islamic and conventional securitization contracts and comparatively assess their possible impact on the issuing banks' stability (i.e. bank financial performance and risk). A comparative examination of assets securitization across Islamic and conventional banks is indispensable to the ongoing debate related to the stability of the two banking sectors (see Beck et al., 2013; Chaffai, 2019; Trinh et al., 2020; Paltrinieria et al., 2020). Given their rapid growth, the impact of Islamic banks on the global economy is increasing. The financial crisis in 2008 has further raised interest in exploring the stability of the Islamic securitization model as a viable and resilient alternative to conventional securitization (Kuran, 2018).

Several structural differences exist between Islamic and conventional investments (*see* Jobst 2007, 2009). First, the latter's claim on the underlying asset in equity is perpetual, whereas in some Islamic securities it has a fixed maturity. Second, all participatory investments undertaken by Islamic banks are subject to certain financing constraints as interest-based debt is prohibited in compliance with the underlying principles of the Islamic banking sector, which stems from religious norms. Therefore, the primary activity in providing financial services (e.g. asset securitization) must be traded through

[1] Specifically, Section 945 of the Act covers the screening and monitoring of assets within the securitized pool.

[2] Islamic banks are those that use sale, leasing and equity-based contracts instead of interest-based loans in compliance with a constrained securitization model. At an institutional level, we denote Islamic banks as those banks that mainly issue Islamic-based securities. This is in contrast to conventional banks, which operate on an interest basis as well as issue securities of all types, but most commonly debt-based securities.

'permissible' financial instruments. Third, the Islamic finance model of securitization requires the capital provider to contractually participate in the risk of the underlying economic activity of a securitized asset. Hence, the Islamic securitization model is based on risk-sharing through a special purpose vehicle (SPV) rather than risk-shifting, which is common under the conventional securitization model. Fourth, as the risks of securitized assets in conventional banks are transferred to the new investors, there will be incentives to decrease the levels of monitoring to reduce costs. For Islamic securitizations, however, the level of monitoring is expected to remain high after the issuance of securities. Finally, the degree of compliance of a given Islamic-based security with the underpinning principles of the religious doctrine is usually governed by 'appropriately' qualified religious scholars (i.e. Shari'ah supervisory scholars) who act as an extended monitoring mechanism to ensure that the usury restrictions are not violated (Elamer et al., 2019); this is in addition to the conventional board of directors.

We utilize these differences between the two types of securitization models to develop sub-sample analyses for several countries which operate with a dual banking system. Our predictions for differences in bank stability across the two securitization models are based on the extent of monitoring and the sensitivity to bank default by Islamic and conventional banks. The strict monitoring imposed on an Islamic securitization systematically calls for originators to operate in a manner that is morally acceptable. Such underlying principles of the Islamic securitization model could mitigate some of the agency costs of debt that are inherent within a conventional model. Therefore, we expect Islamic securitization to promote higher bank stability relative to conventional securitization. However, the increased monitoring comes at a cost and this might not be financially optimal for Islamic securitization; therefore, the financial performance of the Islamic banks might be adversely affected. In this study, bank stability indicators are represented by (a) capitalization, (b) asset quality, (c) management capability[3], (d) earnings ability (e) liquidity management and (f) insolvency risk. In particular, we employ performance measures (i.e., profitability ratio and cost to income ratio) and different risk indicators (i.e., insolvency, credit, liquidity risks). In line with the prior literature (see Fang et al., 2014; Ashraf et al., 2016), bank financial stability could be distorted by risk-taking decisions. However, the impact of different monitoring and risk-sharing mechanisms[4] might become better observed during times of distress (Pagès, 2013). As such, we additionally utilize the event of the financial crisis of 2008-2009 to examine the resilience of the different securitization models during this exogenous shock. We use an international sample of 672 banks (i.e. 4,885 bank-year observations) reflecting listed and unlisted banks in 21 countries operating on dual banking systems for the years 2003-2012. This sample period is marked by unique geo-economic events, including the financial crisis, central banks' interventions and quantitative easing on deflationary and financially distressed economies (Hasan et al., 2013; Mahajan, 2015), which had a substantial impact on securitization activities and the financial sector's sensitivity to systematic

[3]Our study utilizes measures of operational efficiency only for banks. Hence, we define management capability in terms of their ability to manage costs and overheads relative to income.

[4] i.e. important facets that distinguish Islamic versus conventional securitization

distress (Ivanov and Jiang, 2020). The constraints imposed on Islamic finance product structures, as well as the financial crisis, provide a unique setting for investigating the stability of both types of banks.

Our results show that banks which are involved in securitizations (irrespective of bank type) are less financially stable due to a higher insolvency risk when compared to banks that are not involved in securitization. This result is consistent with predictions and confirms earlier findings, such as those of Taylor (2009), Parashar and Venkatesh (2010) and Alasrag (2010). When comparing between banks issuing versus not issuing securitizations within each category of banks, we find that within the Islamic banks sub-sample, banks that issued securitized assets had a significantly better credit profile. This is represented by their low insolvency risk during the non-crisis period and higher asset quality as well as lower credit risk during the crisis period. For the conventional banks sub-sample, our findings show that banks which issued securitized assets exhibited poorer asset quality during the non-crisis years but higher cost efficiency and low capital adequacy as well as high insolvency risk during the crisis period when compared to conventional banks not issuing securitization. The comparative empirical analyses between Islamic and conventional banks issuing asset securitization show that Islamic securitization is associated with significantly high asset quality on average. During the crisis period, Islamic securitizations report low insolvency risk but low cost efficiency when compared to conventional securitization. We additionally examine bank securitization activity, defined as the total securitization value to the total bank assets (see Casu et al., 2011; 2013; Barth et al., 2012). Within the different bank types sub-samples, we find that Islamic securitization activity is marked with significantly high capital adequacy during the non-crisis years. Even within the crisis period, Islamic securitization exhibit consistently high asset quality. In contrast, we find that within the non-crisis period, conventional securitization activity is associated with significantly poor asset quality, which is also prevalent during the crisis, in addition to high insolvency risk. The overall findings support our study hypotheses and provide strong evidence that the highly monitored Islamic securitization model is associated with higher bank stability as compared to the conventional securitization model.

This is the first study to examine the effects of different asset securitization models on bank financial stability within dual banking systems. While there is an increasing volume of literature investigating the impact of securitization on banks' performance and risk, the majority of the studies have focused on US banks without distinguishing these from a distinct and a highly monitored model of asset securitization like the Islamic model. Our findings contribute to the broad strands of literature that consider the relative financial performance and bank risk of both types of banks. We identify and utilize a comprehensive international sample of banks and our findings extend previous research on securitization (i.e. Barth et al., 2012; Campbell et al., 2011; Casu et al., 2011; 2013; Arif, 2020). Our study recognizes the nature as well as the influence of alternative securitization structures while additionally testing for the effect of macroeconomic shocks like the financial crisis of 2008. This study, hence, adds to the sizeable literature on Islamic and conventional banking (e.g., Abedifar et al., 2013; Beck et al., 2013; Paltrinieria et al., 2020; Trinh et al., 2020). We also highlight the effect of the additional monitoring under the Islamic asset

securitization model, which extends the corporate governance literature on the two bank types (e.g., Abdelsalam et al., 2016; Mollah and Zaman, 2015; Elnahass et al., 2019).

The next section describes the background of the study. Section 3 presents the hypothesis development. Section 4 introduces the sample and data. Section 5 outlines the methodology and measures. Sections 6 and 7 report the results and additional tests. Section 8 concludes the study.

2. Institutional background

Asset securitization is a globally popular trading mechanism for a variety of reasons. First, it allows financial institutions to have a direct and quick alternative access to capital markets without diluting existing equity holders (Leyshon and Thrift, 2007). Second, securitization provides more diversified product portfolios for large institutional investors (Campbell et al., 2011). Finally, securitization enables banks to better satisfy Basel III capital adequacy requirements through a transfer of liabilities to become an off-balance sheet item. Hence, banks can circumvent the Basel III adequacy capital ratio, which limits the size of outstanding loans vis-a-vis equity capital (see Aalbers et al., 2011). It also generates a facility to transform collections of loans into different types of assets. For instance, one facility can create higher yield and higher risk assets by pooling defaults within the 'tranche' structure of the security and subsequently protect higher quality tranches to create better investment-grade instruments.

Over the past decade and in response to the sudden reduction in the liquidity and solvency of many conventional securitization vehicles, the volume of Islamic securitization has increased substantially. Securitization within Islamic banks has shown many positive developments owing to enabling competitions with conventional banks and meeting bank capital regulations (see Abdel Karim, 2001; Kothari, 2008; Elnahass et al., 2018) as well as allowing financial innovation in dual banking countries. Islamic banks have also entered into securitization activities to overcome their several liquidity challenges.[5] According to Khoutem (2014), Islamic securitization appears to have enhanced the Islamic banks' position as financial intermediaries and reinforces their role in ongoing financial development.

Islamic security is defined as investment certificates representing shares and rights in tangible assets, usufructs and services, or equity of a given project or equity of a special investment activity (AAOIFI, 2015). Investors of Islamic securities hold ownership (actual or beneficial) claims in the underlying assets (Box and Asaria 2005). The contractual features of Islamic securities and rights of investors in terms of returns and associated risks for different types of securities are largely determined by Shari'ah guidelines. For example, whereas Islamic securities representing ownership of real assets or projects are tradable at negotiable market prices, securities that are debt-based cannot be traded and can only be exchanged at par value (Abdel-Khaleq and Richardson, 2007). In contrast, conventional securitization involves the pooling

[5] Islamic banking markets have been characterized as being relatively young and illiquid. Islamic banks and regulators have therefore actively been looking for mechanisms to build more active trading and integrated markets. Similar to conventional banking markets, disintermediation through securitization offers Islamic banks cheaper finance and longer maturity terms than loans contracts. The demand for Islamic securitization has been growing tremendously for several reasons (Bassens et al., 2013), including the pressing need for investment products that improve liquidity management.

of financial assets, mainly in the form of debt and receivables, and creating securities that represent the pool of debt obligations (FRB, 1990). The unique nature of Islamic asset securitization contracts is that all underlying financial activities must be either trade-based or asset-linked, a constraint that is claimed to encourage greater scrutiny and stricter oversight and, hence, there is a systematic resilience of the originator. Furthermore, takaful (Islamic insurance) should be used to protect real assets underlying the securities. In the case of asset-backed securitization, Shari'ah requires that the transfer of assets represents a true sale which entitles the investors to earn their returns. Certain Islamic securitized assets have variations in total liability, such that the capital provider has seniority in the event of liquidation. The degree of control is far from debt-based contracts used for conventional securitization. The recipient of capital usually has the autonomy to make decisions on the operational aspects of the economic activities involved. For Islamic-based assets, the risk-sharing in the benefits and costs of the underlying economic activity naturally requires enhanced screening and monitoring. For conventional securitized assets, the credit risk stems from the action of breaking the contractual covenant and defaulting.

Securitization can take the form of asset-backed securities or asset-backed bonds, with the former having a pass-through structure and the latter being a pay-through instrument (Obaidullah, 2007). Because Islamic securities are not homogenous, and for data collection purposes, it is useful to distinguish between those contracts with substantive Islamic banks' involvement in the risk exposures of the capital holder and those that are more-or-less debt-like in purpose. The AAOIFI Shari'ah Standards identify 14 types of Islamic securities that can be classified broadly as debt, assets, and equity types (Safari et al., 2014).[6] *Debt-based Islamic securities* arise from sale transactions that create debt (Tariq and Dar, 2007). An example of an Islamic debt-based security is one that is based on a credit sale that earns a fixed return. Funds raised by issuing this kind of securities are used to purchase goods or assets that are sold to the obligor at a mark-up payable at a future date or in instalments. The credit exposure of debt-based securities lies with the obligor/issuer of the securities, resembling the pay-through feature of conventional asset-backed bonds. However, Islamic debt-based security is qualitatively different from an interest-based security since in the former new debt is created through a sale and in the latter existing debt is packaged and sold. Furthermore, the returns in Islamic debt security represent profit from the sale and the instrument is not tradable. *Asset-backed Islamic securities* are certificates issued against a tangible asset, leased asset, and/or promise of a lease in the future. Islamic securities of usufructs are also considered asset-backed securities issued by the owners of the usufruct of existing or future assets. An asset-backed Islamic security has a sale and lease-back arrangement whereby investors become owners of assets or usufructs for the tenure of the security (Rainey and Salah 2011). Being asset-backed, these Islamic securities are tradable and the rent earned on the assets can be fixed or variable and linked to a benchmark rate. While Islamic asset-based securities have a pass-through structure similar to

[6] AAOIFI standards also identify investment agency-based contracts. While the relationship between the investors and issuer takes the form of an agency contract, the former earns a return based on an underlying activity that can take the form of debt, asset or equity structures. See AAOIFI (2015) for details.

conventional asset-backed securities, the difference lies in the underlying assets, which are real assets in the former and debt in the latter. *Equity-based Islamic securities* are used to raise funds by using partnership contracts, giving the investors undivided and proportionate ownership of the project (Rainey and Salah, 2011). As the holders of equity-based securities participate on a profit-loss sharing basis, they are exposed to the risks of the project and have pass-through features similar to asset-backed securities, with the underlying assets representing those owned by the project. Being backed by assets in a project, equity-based securities are tradable at market prices. The Islamic securities considered in this paper include asset-based and equity-based securities only. The features and properties of various types of Islamic securities are illustrated in Table 1.

[INSERT TABLE 1 HERE]

3. Hypotheses Development

3.1 Asset securitization and bank stability:

Following the financial crisis in 2008, asset-backed securities have been subjected to substantial scrutiny; a primary driver of this scrutiny has been the issue of the monitoring and contractual oversight of the underlying assets. Taylor (2009) provides a preliminary empirical analysis of the sub-prime component of a number of interconnected crises and demonstrates *prima facia* evidence that incentive incompatibility in securitized asset pools is a possible channel for hidden credit risks. In this context, substantial solvency versus liquidity issues emerge as primary drivers of volatility.

Dissipating liquidity within securitized assets has been discussed by Kiff and Kisser (2010). The suggested causation mechanism for this loss of liquidity is the consecutive contamination of the different classes of financing products in the credit market, alongside the freezing of non-government credit markets, such as commercial papers and bonds. The inflated capital costs led to the occurrence of the credit crisis and to the failure of financial institutions with poor credit profiles and a weak liquidity position. Both the large injection of money from banks into the mortgage bond market as well as the high volume of lending practices by mortgage brokers, banks and others accelerated the subprime crisis, recalling that mortgage pools are common underlying assets in securitized investment vehicles. Shin (2009), Parashar and Venkatesh (2010) and Alasrag (2010) suggest that these features of a substantial fraction of traded securities have exposed the global banking system to high vulnerability, including both insolvency and liquidity risks. Liquidity risk in a securitized asset has both an ‘inside’ and ‘outside’ components (Holmstrom and Tirole, 2011). Inside liquidity risks are in the form of the cash-flow generation of the individual underlying assets against the value of any collateral. Outside liquidity risks are driven by factors affecting the ability to liquidate the assets in the market.

Previous studies on the impact of securitization on banks’ stability before the financial crisis find a positive link between securitization and bank risk. Despite enabling banks to convert illiquid assets into liquid funds, it has been argued that securitization is likely to increase the expansion of credit and cause

banks to hold riskier assets. The existing conventional banking literature shows that securitization impairs a bank's financial condition and increases bank risk (Calomiris and Mason, 2004; Cebenoyan and Strahan, 2004; Loutskina and Strahan, 2006; Casu et al., 2011). Dionne and Harchaoui (2008) find a positive association between securitization and bank credit risk, while Franke and Krahnen (2005) and Haensel and Krahnen (2007) report that collateralized debt obligations increase the systematic risk to the issuing bank. A further argument is that securitization has also been used as a device for risk-shifting assets. Cantor and Rouyer (2000) provide empirical evidence that credit risk for the issuer improves if the riskiness of the securities sold to investors is higher than that of the issuer prior to securitization; as such, the degree of risk within the assets was out of line with the banks' average asset risk.

Prior studies find that banks securitize their riskier loans while retaining safer ones on their balance sheets. However, it might be the case that the transaction intensifies the issuer's net exposure to the default risk of its assets. Dell'Ariccia et al. (2009), Mian and Sufi (2009), and Keys et al. (2010) suggest that banks securitize their worst mortgage loans to pass on their credit risks to new investors. Affinito and Tagliaferri (2010) find that securitization allows the bank to decrease the weight of bad loans to operate with lower capital or to invest the capital into new businesses. Additionally, Cebenoyan and Strahan (2004) find evidence to suggest that securitization reduces bank risk but that banks use the achieved risk reduction to undertake new risks. In terms of profitability and returns, as securitization provides banks with an additional source of loan financing and liquidity, banks are likely to be motivated to shift their portfolios toward higher risk to obtain a higher return on assets (Bakoush et al., 2019). However, issuing banks will still retain the first loss of contractual interests in order to provide implicit recourse in securitizations. This result indicates that the risks inherent in the securitized assets have not been fully transferred to investors and are, in effect, still held by the issuing bank, but off the balance sheet as the risk remains with the banks through contractual arrangements (Niu and Richardson, 2006; Chen et al., 2008; Vermilyea et al., 2008). Therefore, previous evidence suggests a positive association between securitization and risk, with a negative association between securitization and financial stability.

In line with the above, we conjecture that banks involved in assets securitization, irrespective of whether their contractual variations are Islamic or conventional, are expected to be riskier. This leads to the first hypothesis, stated in the alternative form:

H_1*: Banks involved in asset securitization are less financially stable relative to banks not issuing asset securitization.*

3.2 Conventional versus Islamic bank asset securitization:

Securitization in Islamic banks has risk-sharing elements, as with Islamic securities the banks and investors share the risks and returns of the underlying assets. In contrast, conventional bank securitization is used as a risk-shifting device, whereby credit and interest rate risks are transferred to the new investors. The presence of structural differences between the two securitization models, as discussed in Section 2,

are likely to have substantial implications on the stability of Islamic versus conventional banks. There is a general divergence in the findings in the finance literature with respect to the financial health and stability of Islamic banks and conventional banks. Srairi (2009) finds that conventional banks tend to be more efficient than Islamic banks, whilst Johnes et al. (2014) report that Islamic banks are typically on a par with conventional banks in terms of gross efficiency[7]. Similarly, Abedifar et al. (2013) find no significant difference between the two banking sectors with respect to the insolvency risk. Their finding on credit risk is mixed and varies according to which proxy for credit risk is used. Beck et al. (2013) show insignificant differences between Islamic banks and conventional banks in their business orientation. However, they find that Islamic banks are less cost-effective but have a higher intermediation ratio, higher asset quality and are generally better capitalized. With the enhanced complexities of Islamic financial products as well as higher overhead and monitoring costs, lower cost efficiency is to be expected (see Beck et al., 2013)[8]. Pellegrina (2012) used samples of European conventional banks and Islamic banks to show that the ratio of equity to deposits is negatively associated with efficiency in both categories of banks. However, this effect is lower in Islamic banks than in conventional banks. With higher screening and product processing costs, Islamic banks are expected to exhibit lower cost efficiency and profitability as compared to their conventional counterparts. Recently, Arif (2020) used a sample of European conventional banks to investigate the relationship of securitization and covered bonds with bank stability and highlighted that this relationship varies with the level of a bank's involvement in a specific instrument. Finally, Trinh et al. (2020) compared between Islamic and conventional bank stability with respect to the effect of the board of directors' busyness (i.e. serving on multiple directorships). They found that Islamic bank stability is lower than conventional banks when they appoint busy boards of directors and busy Shari'ah scholars.

In line with the above discussions, the differences in the features of securitizations between Islamic and conventional securitizations have implications for moral hazard problems in terms of monitoring the underlying assets. Based on the Islamic securitization model, the degree of extended monitoring and mitigation for credit risk alongside the explicit risk-sharing is expected to lead to lower bank risk when compared to their conventional counterparts. Islamic banks issuing securitization are likely to be more risk-averse and, hence, adopt a prudent attitude towards engagements in securitization activity. For instance, most of the securities issued by Islamic banks are to raise funds to procure new assets, and the quality of existing assets will not directly impact the quality of assets underlying the Islamic securities issuance. Instead, it is expected that Islamic banks will raise funds to invest in assets/projects of better credit quality to lower the cost of funds. Incentives to monitor will be higher in Islamic securities because Islamic banks share the risks of underlying assets with the new investors. As securities are issued for a limited period of time and the assets revert back to the Islamic banks at maturity, these will be closely monitored to ensure that their qualities do not deteriorate. Accordingly, we conjecture that Islamic banks

[7] Johnes et al. (2014) decompose bank gross efficiency, defined as the efficiency of each bank relative to the whole banking sector, into (i) net efficiency (the efficiency of banks measured relative to their own bank type frontier) and (ii) type efficiency (the efficiency which relates to method of operation or "modus operandi").

[8] Consistently, Iqbal (2001) shows that IBs are not efficient in their operations. This might be associated with several challenges facing IBs: (a) the need to preserve high competitive returns to investors, similar to their conventional counterparts; (b) the desire to avoid inconvenience to the shareholders resulting from lack of due diligence; (c) difficulties in quick access to liquidity; and (d) the need to control for high withdrawal risk resulting from potential liquidity problems.

issuing securitization have lower risk and are generally more stable than their conventional counterparts. This leads to the second hypothesis, developed in the alternative form as follows:

H_2: Islamic banks involved in asset securitizations are more financially stable than their conventional counterparts.

4. Sample and data

The primary variable of interest for empirical analyses is whether the bank has issued securitized assets during the reporting year. We then decompose this dummy variable into conventional securitizations or Islamic securitizations, after excluding non-Islamic securities such as debt-based securities (the cost plus instrument). A substantial component of our data on securitization for a large sample of international banks are hand-collected. The data collection process involved reading all or part of a bank's prospectus in order to classify the Islamic securities. Our objective is to use the specific features of certain Islamic securities to identify the impact on the issuing banks' financial stability.

Annual asset securitization data were hand-collected from the annual reports and notes of banks. These reports were collected using such data sources as Thomson One, Bankscope and the websites of the banks in question. The global list of Islamic securities issuances was initially identified using the Thomson-Reuters Zawya & IFIS databases.

In a typical Islamic security, an originator will transfer an asset to a special purpose vehicle (SPV). The SPV then presents potential investors with a claim in those assets, and/or the right to its future cash flows, for the tenure of the Islamic securities. If the bank does not report any information about Islamic securities issuances, we checked publicly available bank prospectuses. The objective of our study is to conduct a statistical experiment to categorize banks into groups that issue none, one, or more of the types of securitized asset and to see if these sub-sets have statistically significantly different impacts on issuing banks' financial stability. Apart from compliance with religiosity precepts, our defining criteria for Islamic securities issuances relate to the treatment of assets' de-recognition within an Islamic bank's annual reports and how the bank reports the sale of the assets. We utilized the documented distinctions in the contract design of Islamic securities described in *Table 1* to distinguish clearly between specifically Islamic securities and those that more closely mimic conventional debt securities. We then used this distinction to identify populations of banks and, hence, identify differences between Islamic and conventional banks. Thus, we gained some insight into the impact of contract variations on the issuing banks' financial stability. The debt-based Islamic securities were excluded from our empirical analysis.

The data for the bank stability indicators were collected using Orbis and the Financial Times Banker databases. Given the degree of overlap between our sources, we conducted a large-scale verification procedure to check the data consistency. Any further gaps (mostly in relation to MENA banks) were filled with data collected from Thomson-Reuters' Zawya.

The study's sample represents an unbalanced panel data of listed and unlisted banks operating in 21 countries[9] for the years 2003-2012. This sample period is characterised by unique geo-economic events, such the financial crisis, central banks' interventions, and quantitative easing on deflationary and financially distressed economies (Hasan et al., 2013; Mahajan, 2015), which substantially impacted securitization activities and the financial sector's sensitivity to systematic distress (Ivanov and Jiang, 2020). The summer 2007 to early 2013 period witnessed a series of interconnected financial crises. The NBER denotes the peak to trough recession period as occurring from December 2007 to June 2009 for the United States. However, from December 2012 several countries experienced a sovereign crisis. We also emphasize that Islamic banks have been subject to several regulatory changes before 2003, including the mandatory adoption of Basel II capital adequacy requirements (see Elnahass et al., 2018). Therefore, our study's sample period offers simultaneous and comparative examinations across both Islamic and conventional banks while recognizing the effect during the financial crisis of 2008-09. We filtered the sample following similar criteria applied in other banking studies (see Beck et al., 2013; Mollah and Zaman, 2015; Elnahass et al., 2019; Trinh et al., 2020). These include (a) countries which operate with dual banking systems and have at least four banks; (b) banks which have full annual reports available from official websites, published as of 31 December of the financial year; (c) only commercial full-fledged banks were kept; and Islamic windows are excluded;[10] and (d) banks having full data availability of at least three consecutive years. The final sample reflects 4,885 bank-year observations (672 banks) for both bank types. There are 136 Islamic banks (861 year-observations) and 536 conventional banks (4024 year-observations).

5. Model and measures

To examine the impact of asset securitization on bank stability under the two distinct securitization structures used by Islamic banks (IBs) and conventional banks (CBs), six models are specified and separately estimated as indicators of the CAMEL framework. These financial stability indicators are likely to depict the general financial health and various financial risks in banks (Keffala, 2020). Our first model is the capital adequacy, representing the regulatory capital ratio a bank must hold. Consistent with Demirgüç-Kunt and Huizinga (2010) and Beck et al. (2013), we use the *CAR* ratio, which is calculated as (Tier 1 + Tier 2) deflated by the bank's total risk-weighted assets. This measure reflects the legal regulatory requirements for capitalization (Fonseca and González, 2010; Buch and Prieto, 2014). The higher the *CAR* ratio, the higher the bank capital adequacy.

The non-performing loans[11] to gross loans (*NPLtoGR*) ratio is used to measure asset quality (credit risk), see Abedifar et al. (2013) and Trinh et al. (2020); the higher the ratio, the higher the credit risk for a bank and the lower the asset quality.

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[9]Based on this sample identification process, our final sample includes banks operating within 21 countries, including Algeria, Bangladesh, Brunei, Mauritania, Iraq, Jordon, Kuwait, Bahrain, Egypt, Lebanon, Malaysia, Mauritania, Pakistan, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, Turkey, United Kingdom and Yemen.

[10] Conventional banks with Islamic windows refer to banks with an independent department providing Islamic products with an SSB. Consistent with Johnes et al. (2014) and Elnahass et al. (2018), the reason for excluding these banks is that supervisory issues and accountancy requirements are expected to be different to those of full-fledged Islamic banks.

[11] Non-performing loans are defined as loans in the bank's portfolio that are overdue for more than 90 days on interest or principal payments. They are disclosed as supplemental financial statement information (Wahlen, 1994).

The costs to income (*CStoIN*) ratio is used as a measure of efficiency (Johnes et al., 2014). This measure is expected to capture the dynamics of operational efficiency. A higher *CStoIN* ratio suggests lower levels of a bank operating efficiency (Beck et al., 2013).

Bank profitability is also used to indicate a bank's earning capability through the *ROAE* (Čihák and Hesse, 2010). This serves as a robust measure of bank financial performance by gauging the extent of operational efficiency and capturing the nuances of banks' diversifying earnings through non-interest income activities and the management of their costs (see Mollah and Zaman, 2015; Trinh et al., 2020). The higher the *ROAE* ratio, the better earnings capability of the bank.

We use the net loans to total assets (*NLtoTA*) ratio to measure bank liquidity management; a higher *NLtoTA* ratio suggests lower liquidity management, in line with Beck et al. (2013).

The insolvency risk is measured by *Z-score*, i.e. the standard measure of distance from insolvency distress probabilities derived from hazard models (Ashraf, 2016; Ashraf, 2017; Trinh et al., 2020). The *Z-score* is calculated as the sum of return on assets and capital assets ratio, scaled by the standard deviation of return on assets. A high *Z-score* implies a good solvency position, hence, leading to a high stability for the bank. We use the natural logarithm of the *Z-score* to control for outliers[12]. We follow Trinh et al. (2020) to calculate the standard deviation of return on assets over the entire sample period.[13]

Following the prior literature on asset securitization in general (see Casu et al., 2011; Campbell et al., 2011), we restrict the definition of bank securitization to represent banks involved only in new issuance, either through SPV or the bank itself. Islamic securities issuance is referred to as Islamic asset securitization. We identify specific criteria to determine the value of the total securitization from each financial report and securitization prospectus (if one exists). Due to the fact that not all securities are Islamic-based, we categorize Islamic asset securitization into (a) equity-based Islamic securities (profit-loss sharing arrangements) such as credit sale and partnerships or (b) asset-based, reflecting Islamic securities backed by lease and Sukuk issuances that are approximately conventional[14]. We drop the latter from our analyses since these do not represent explicit Shari'ah compliant Islamic securities.

Our baseline model is specified as:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 GSEC_{i,t} + \beta_3 BK_i + \beta_4\, SIZE_{i,t} + \beta_5 NON\_INT_{it} + \beta_6\, AGE_{it} + \beta_7\, LIST_{it} + \beta_8\, CRISIS_t + \beta_9\, MACRO_{i,j,t} + \varepsilon_{i,t} \quad (1)$$

Where:

$FS_{i,t}$ is a set of financial stability indicators for bank *i* at time *t*; $FS_{i,t-1}$ is the first lag of the dependent variable to capture partial adjustments in bank financial stability.

[12] As the distribution of *Z-score* is positively skewed, we use the Ln (1+Z-score).

[13] For robustness checks, we use a 3-year and 5-year rolling average of standard deviation and re-calculate our *Z-score* (Beck et al. 2013; Trinh et al., 2020). However, our results are not sensitive to this change.

[14] We reviewed the prospectuses for the presence of contractual cash-flows that can be viewed as debt-like (i.e. with either a fixed or variable coupon payment pegged to a fixed spread above an indexed rate, such as the LIBOR or the OIS rate).

$SEC_{i,t}$ is our explanatory variable of interest, and for our various sub-analyses it takes one of the following forms (i.e. the different measures of asset securitizations):

(i) *GSEC*: General SEC dummy equals 1 (0) if the bank is (is not) involved in asset securitization.

(ii) *SEC_IB*: a dummy variable for Islamic banks and is equal to 1 (0) if the Islamic bank issued (did not issue) asset securitization.

(iii) *SEC_CB*: a dummy variable for conventional banks and is equal to 1 (0) if the bank is (is not) involved in asset securitization.

(iv) *ISEC*: is a dummy variable equal to 1 if the bank is Islamic and is involved in asset securitization and 0 if the bank is conventional and is involved in asset securitization. ISEC is a subsample of the GSEC group of banks when SEC=1 and encompasses any bank that issues a new securitized asset; however, the dummy variable is only equal to unity for Islamic banks.

(v) *ASEC*: A continuous variable (activity for asset securitization) defined as the total amount of asset securitization for both Islamic banks and conventional banks deflated by the contemporaneous total assets of the bank.

BK_i is the dummy variable that identifies Islamic banks as 1 and conventional banks as 0.

$SIZE_{i,t}$ is the natural logarithm of assets for bank *i* at time *t.*

$NON\_INT_{i,t}$ is the total non-interest operating income for bank *i* at time *t.*

$AGE_{i,t}$ is the age of bank *i* at *t* years since the year of its establishment.

$LIST_{i,t}$ is a dummy variable, taking a value of 1 for listed banks and 0 for unlisted banks.

$CRISIS_t$ is a dummy time variable equal to 1 for the 2008-2009 period and 0 otherwise.

$MACRO_{i,j,t}$ is a set of country-level macroeconomic indicators (indexed by country) at time *t*.

ε_{it} = the error term.

Table 2 presents the variable definitions and notations in our models.

[TABLE 2 HERE]

Considering the challenge around identifying a truly exogenous instrument, we apply the generalized method of moments (GMM) estimator proposed by Arellano and Bond (1991). With this estimator, we can control for the endogeneity problems that may appear in our models. In the GMM model, we use a lagged instruments approach to deal with the problem of endogeneity within and between the equations forming our statistical model (Ashraf, 2017). Specifically, in our chosen model of the GMM framework the lagged differences of the dependent variable are imposed to generate the instruments[15]. The GMM controls for (1) time-invariant fixed effects, which we eliminate by taking the first differences of all variables; (2) the autoregressive process in the data for each financial performance indicator (we include a lagged dependent variables model to capture the dynamic nature of these variables); and (3) the

[15] An additional advantage in employing GMM for our dataset is that the estimator requires fewer assumptions on the statistical properties of the dependent variable, and the system GMM approach provides the opportunity to evaluate the statistical fit of the eleven equations in the model in a consistent manner. The advantage of the two-stage error components model of Blundell and Bond (1998) is that when potentially highly persistent first-order autoregressive terms are included in the model specification, the two-stage system GMM model often outperforms the first-differenced Arellano and Bond (1990) approach.

potential presence of endogeneity of the explanatory variables, using instrumental variables based on three-period lagged values of the explanatory variables (Blundell and Bond, 1998). Our basic specification is essentially the Arellano and Bover (1995) approach[16]. We estimate our models using both the standard and robust covariance estimators and we control for country fixed effects.

To test the model specification validity, we first calculate the p-values of the Hansen test of the over-identification of restrictions, which confirms the validity of the choice of instrumental variables. Second, the AR(1) and AR(2) statistics, which measure first and second-degree serial correlations, respectively, show that the AR(1) is insignificant when we use one-period lags for all the dependent financial stability variables on the right-hand side of Eq. (1) and as the instrument (see Kruiniger, 2008; Ashraf et al., 2018). An exception is the two dependent variables, *NPLtoGR* and *Z-score*, which show significant results for AR(1), suggesting that the results of these two models might be doubtful. However, we further test for AR(2) and it reports consistently insignificant finding across all the models. Therefore, we use lags t-1 to t-2 as instruments in our GMM estimations. We also treat macroeconomic variables like MDS, GDPGR and INF as endogenous and use their one-period lag values as instruments.

6. Results

6.1 Descriptive statistics

In *Table 3*, we report the sample composition by country and bank type. For our sampled banks with asset securitization, these represent 14% of the total sample. For Islamic banks, the highest concentration of SEC banks is located in Malaysia, UAE, and Bahrain, while the highest representation of conventional banks involved in SEC is in the UK, Turkey and Egypt. The proportion of banks issuing new securitization is relatively low, with 90 of 497 banks reporting at least one new issuance. In terms of bank-years, new issuances represent around 10% of the total sample.

Table 4 presents the descriptive statistics for the full sample. Our sample banks report high capital adequacy (*CAR*) with a mean of 22%, but the mean for the asset quality indicator (*NPLtoGR*) is positive 9.08%, suggesting high bank risk on average. Moreover, the sample banks show an average cost efficiency ratio of 62.39% (i.e. *CStoIN*) with a positive mean for the ROAE ratio of 9.45% and an average (positive) *Z-score* of 2.95. The mean value for the liquidity management indicator (*NLtoTA*) is 45.35%.

Table 5 presents the statistics for banks involved in asset securitization (i.e. SEC banks) versus banks not engaging with asset securitizations (i.e. NON SEC banks) in Panel A. We also compare between IBs and CBs in Panel B. In Panel A, when comparing between SEC and NON SEC banks, our results show that SEC banks hold lower *CAR* on average at 17.08% relative to NON SEC banks, which report a mean of 21.96%, confirmed by the paired mean comparisons t-test, which is significant. SEC banks report a

[16] An alternative approach is that of a three-stage OLS (3SLS) estimator. In applying this approach to our dataset, the results are not materially dissimilar to those reported herein. Indeed, since the detected significance of the coefficients for both our dummy variables and securitization activity for the 3SLS are somewhat higher, we deem the two-step GMM to be the more 'conservative' set of results. Although 3SLS estimators are more efficient than GMM, they are not consistent and thus they generate biased results since they do not eliminate unobservable heterogeneity. These differences between individuals (banks in this case) are potentially correlated with the explanatory variables (also called individual-specific effects), are invariant over time, and they thus directly influence corporate decisions (e.g. entrepreneurial capacity and corporate culture).

significantly lower mean of credit risk, *NPLtoGR* (i.e. higher asset quality) of 5.81%, than NON SEC banks. SEC banks also report better cost efficiency (*CStoIN*) on average but they have significantly poorer profitability (*ROAE*) and lower liquidity management (*NLtoTA*) than NON SEC banks, on average. SEC banks report a lower mean for the insolvency risk (*Z-score*) than NON SEC banks. SEC banks are larger in size and older in age when compared to the mean values of NON SEC banks. In Panel B, comparing between the two bank types (i.e. IBs and CBs), we find that IBs report higher average capital adequacy than CBs and a lower mean credit risk. Moreover, in Panel B, IBs have significantly lower means for *CAR* and the *NPLtoGR* ratio (i.e. lower credit risk and higher asset quality) when compared to CBs. IBs also hold a higher average *CStoIN* ratio (lower cost efficiency) and lower means for *ROAE* compared to their conventional counterparts. These findings support prior evidence which states that IBs are challenged by liquidity management issues and have restrictions on their business model to manage high profit margins when compared to CBs (Čihák and Hesse 2010; Beck et al. 2013). However, IBs show a lower risk profile than CBs, with a significantly lower mean *Z-score* (lower insolvency risk) and lower mean *NLtoTA* (higher liquidity management). Our results are in line with Trinh et al. (2020) and Elnahass et al. (2019).

[Insert Tables 3, 4 & 5]

6.2 Empirical results

We report our regression results for the main specifications in Tables 6 to 10 for the pooled asset securitization (*GSEC) model*, issuance versus non-issuance of Islamic securities (*SEC_IB)*, issuance versus non-issuance of conventional asset securitization (*SEC_CB)* and comparing between Islamic and conventional banks involved in asset securitization *(ISEC)*.

Table 6 reports the results for SEC banks which have issued asset securitization during the reporting period (i.e. the full sample). We find that on average and outside the financial crisis period of 2008-2009, these banks have riskier profiles, represented by a statistically significant and negative coefficient of 0.087 on *GSEC* under the Z-*score* model, indicating an overall increase in the insolvency risk of sampled banks. There is insignificant evidence for asset quality or earnings. During the crisis period, the results show insignificant evidence across different stability indicators, which suggests that the sampled securitization banks are generally unaffected by this episode of financial distress. Our results are in line with the expectations and confirm Cebenoyan and Strahan's (2004) and Bakoush et al.'s (2019) arguments that banks use the proceeds from securitizations to issue new loans with higher-than-average default risk. In addition, banks tend to use asset securitizations to shift credit risk by securitizing those loans with a substantially poor quality loan book (Casu et al. 2013). Keys et al. (2010) and Dell'Ariccia et al. (2009) find that U.S. banks securitized their worst mortgage loans over the last decade. Krainer and Laderman (2011) also show that the loans chosen by lenders for securitizations tend to be riskier than the loans retained in their own portfolios. Therefore, this is likely to expose the bank to a higher insolvency

risk in the long-term due to a higher probability of default[17]. These results are consistent with H_1 and confirm our predictions for high bank risk (i.e. low financial stability) for banks generally involved in asset securitizations.

With respect to the control variables, they are also in line with expectations. For example, large banks have lower bank capital adequacy, higher asset quality, and better management capability and higher earnings. The bank listing status (i.e. *LIST*) is only significant under *Z-score*, suggesting that listed banks are characterised by high insolvency risk. The macro-economic factors, GDP growth rate and inflation (*INF*) play an important role in determining the financial stability measures. Banks in high per capita growth countries tend to have lower non-performing loans (i.e. better asset quality), lower *CStoIN* (i.e. better cost efficiency), and higher earnings.

[Insert Table 6]

To obtain further insights into the effect of securitization among dual banking systems, Tables 7 and 8 present the separate analyses across the IBs and CBs sub-samples that particularly engage/do not engage with asset securitizations, both during and outside the financial crisis period. In Table 7, our results show that the coefficient on SEC_IBs under the *Z-score* model is significant and positive with 0.145. This result indicates that, unlike Islamic banks not issuing securitization, Islamic banks involved in securitizations (SEC_IB) have significantly low insolvency risk during the non-crisis period. During the crisis period, Islamic banks, which issued securitization, report significantly higher asset quality when compared to Islamic banks not engaging in securitization, with a significantly negative coefficient on *SEC_IB_CRISIS* of 8.422 for the *NPLtoGR* model. These findings imply that even during financially distressed periods, the highly monitored Islamic securitization model improved the credit profile for these set of banks. The results also indicate an insignificant impact on bank capital adequacy whether the bank issues new securitized assets or not. Therefore, IBs do not appear to adjust their capital position on the liabilities side of the balance sheet when issuing Islamic securities, suggesting that the effect is on the asset side of the balance sheet and on the return to equity holders, rather than on the proportion of equity held by the bank. Overheads for the financial crisis years are not significantly different; this is to be expected, as all Islamic banks involved in securitization tend to increase oversight and monitoring costs during this period.

In Table 8, we find precisely the opposite result for conventional banks issuing securitization when compared to conventional banks not involved in securitization (i.e. SEC_CB). The former banks report a significant and positive coefficient of 1.925 on SEC_CB under *NPLtoGR*. This result indicates poor asset

[17] With unreported results, when we restrict attention regarding the identification of these banks via the dummy to only during the crisis of 2008/2009, we find that there is no discernible difference in the capital adequacy of the banks issuing securitization than that of the overall population of banks. Indeed, if this effect is reversed and the dummy is suppressed during 2008/2009, then the out-of-crisis effect has a measurably greater order of significance. However, we do not find any of the other variables to be significant, so these banks do not exhibit any major differences in the financial stability measures relative to their peers other than a high insolvency risk.

quality during the non-crisis year for conventional banks engaging in securitization, relative to their conventional counterparts not engaging in securitization. Moreover, during the crisis period, these banks report significantly low capital adequacy (i.e. low *CAR; -1.589*) and high insolvency risk (low *Z-score; -6.406*); however, they have high cost efficiency (low *CStoIN*). These results indicate that securitization allows conventional banks to switch to more marketable assets, thereby enlarging the volume of their business (see Alkhan, 2006); however, this has negatively affected their *CAR* ratio, suggesting an adverse impact on meeting regulatory capital requirements. The results also support the argument by Pagès (2013) and Pagès and Possamai (2014) and follow prior studies (e.g. Loutskina and Strahan, 2006; Casu et al., 2011) offering evidence of the occurrence of increasing credit risk due to the issuance of asset securitizations.

The overall findings indicate that the statistical differences between banks issuing/not issuing securitizations in terms of loan book quality, cost efficiency and solvency almost exclusively arose during the 2008 to 2009 crisis period. The highly monitored and constrained Islamic securitization improved the credit profile of Islamic banks issuing securitization. These findings primarily support our second hypothesis, H_2, and are consistent with predictions.

[Insert Tables 7 & 8]

To further test our second hypothesis, we compare between Islamic and conventional securitization through *ISEC*. This indicator represents a securitization dummy which takes the value of 1 if the bank is Islamic and involved in new asset securitization and 0 if the bank is conventional and involved in asset securitization. Our results in Table 9 provide strong evidence that during the non-crisis years, Islamic banks issuing assets securitizations report significantly higher asset quality (i.e. a negative coefficient of -0.850 on *ISEC* under the *NPLtoGR* model) relative to their conventional counterparts. As the two bank types enter the financial crisis period (i.e. *ISEC_CRISIS*), Islamic banks demonstrate significantly low cost efficiency (i.e. *positive coefficient 9.598*), but they have a marginally low insolvency risk (i.e. *negative coefficient of 0.023*). These results are in line with Chaffai (2019), who found that IBs are less vulnerable than their counterparts when they are exposed to shocks on their lending activities. Although Islamic asset securitization is marked with a lower bank risk, this seems to come at a cost. The results also support the findings of Bitar et al. (2019), who found that the constraints imposed by Shari'ah monitoring over the Islamic banking business model widen the efficiency gap between IBs and CBs, at the expense of IBs, leading to lower cost efficiency. This finding is consistent with our expectations that banks issuing Islamic securities pay a significant cost to monitor these Islamic securitization assets. They are rewarded by a substantially superior loan book that does not require holding high loss reserves during the crisis. In fact, the Islamic banks pay for the crisis beforehand in terms of higher overheads relative to their conventional counterparts.

[Insert Table 9]

The above results imply differential impacts of asset securitizations on bank stability depending on the bank type and the nature of the securitization model applied. The main findings confirm our second hypothesis that Islamic banks issuing asset securitizations are more stable than their conventional counterparts. Moreover, conventional banks that commonly issue securitized debt may do so either because they are closer to critical solvency levels or because the issuance allows them to operate at generally lower solvency levels. Our results provide *prima facie* evidence that, unlike Islamic banking, although conventional securitization provides little benefit to shareholders in conventional banking related to cost efficiency, it does reduce the overall solvency and regulatory capital profile of the issuing bank. This finding supports the notion that the stated benefits of asset securitization are more evidential for Islamic banks operating under the constrained model of issuance of securitizations. These benefits are observed even during periods of exogenous financial shocks, like the financial crisis of 2008.

7. Additional analyses: The asset securitization activity

Based on our expectations and the main findings, the intrinsic nature of the contract design for Islamic securities means that the monitoring of both securitized and internal loan book assets will be both closer and more costly. However, the upside to these costs is a better asset quality and low insolvency risk both in the long run and during crisis events. Evidence from the dummy specification strongly supports this conjecture, and these results are applicable to a number of alternative explanations. However, the SEC dummy variables may simply reflect the signalling implicit in the choice of the value of securitization.

The main results imply that Islamic banks guided, by their religious doctrine, have an obligation to ensure that the owners of capital participate in the economic risks associated with their investments. This risk-sharing might lead to better performing loan books than the wider populations, and this is counter-balanced by an increase in costs. However, we identify the population of banks by the types of securities they issue (Islamic or conventional securitizations) and how they self-declare their cultural typology (i.e. Islamic versus conventional). An additional explanation is that the level of securitization activity (irrespective of issuance type) might be a major driver and have implications for bank stability. If not properly managed, large securitizations can have substantial risk factors attached to them for the institution.

Accordingly, in this section we extend our analyses to assess the annual securitization activity within different bank types. We aim to examine whether Islamic banks that issue Islamic securities differ from conventional banks that issue conventional securities. We restrict the whole sample to only those bank-years that issued any type of new security. A clearer extraction of the signal is provided in terms of the difference between the population of IBs issuing Islamic securitizations and those issuing conventional securitizations during an exogenous shock, such as the financial crisis. The variable *ASEC* (securitization activity) is continuous, effectively replicating Barth et al.'s (2012) methodology, albeit over the six financial stability dependent variables. We cluster our full sample into Islamic bank (in Table 10) and conventional bank (in Table 11) sub-samples to run separate estimations. We also add the ASEC_CRISIS dummy to control for banks involved in securitizations during the crisis and to illustrate that the detected effects in the absence of the activity of securitization are preserved.

Table 10 shows that IBs issuing securitization are characterised by significantly high capital adequacy, with a positive and significant coefficient of 0.377 on ASEC for the CAR model, during the non-crisis

years. However, IBs show poor cost efficiency due to a significantly positive coefficient on *ASEC* under the *CStoIN* model of 1.636 (i.e. low management capability). During the crisis period (*ASEC_CRISIS*), IBs exhibit significantly high asset quality, with a negative coefficient of -4.034. When we compare these findings to conventional banks issuing new securitization, in *Table 11*, we find that for the non-crisis years, CBs are associated with significantly poor asset quality, having a positive and significant coefficient on *ASEC*. During the financial period, these banks report significantly low asset quality and high insolvency risk.

Together, our results support Barth et al. (2012) and are in line with Dionne and Harchaoui (2008), suggesting that an increase in the activity of securitization of conventional banks (Table 11) leads to a significant decrease in asset quality. These findings further confirm our second hypothesis and our main findings (in Tables 6-9), showing the distinct implications of the Islamic securitization model when compared to the conventional model during and outside the financial crisis period. The general findings indicate that the issuance of Islamic securitized assets implies a more costly asset management base than that for conventional securitization. This in line with Chen et al. (2019), who showed that the management of securitized assets is costly and significantly affected by the expertise of the management team.

[Insert Tables 10 & 11]

8. Conclusion

This is the first study to compare the impact of different securitization structural typologies on the relative financial stability of banks using several financial indicators and an international sample of countries operating on a dual banking system. The explicit contractual variations between an Islamic and a conventional securitized asset are the objects of interest in this study and are essential in explaining the relative differences in a variety of bank risk and performance indicators. In contrast to prior studies (e.g. Barth et al., 2012) that concentrated on the degree of retained interest from US banks' new issuances, we utilize an alternative mechanism for high monitoring over asset securitization, namely Islamic securitization, to examine whether asset securitization differentially affects bank stability. Our main measures of bank stability are represented by the CAMEL measures: capital, asset quality, management capability, earnings ability, liquidity and insolvency risk. Several complementary analyses have been conducted: (i) the average effect of asset securitization on bank stability (irrespective of the bank type) for the full sample; (ii) subsample analyses for the issuance/non-issuance of asset securitizations to assess the different impacts within the same bank type; and (iii) comparative assessments for restricted samples of Islamic versus conventional issuing banks. In an additional analysis, we used the value of securitization to run two parallel analyses for each bank type. Our prediction is that the restrictions placed on the contractual design of certain Islamic securities require the banks to maintain costly monitoring procedures and to invest heavily in up-front screening; however, this should lead to high bank stability relative to their conventional counterparts. In addition, we examine the theoretical assumption that if conventional securitizations are under-investing in screening and monitoring, there will be a significant difference in the asset quality and solvency between these alternative securitizations models.

Our evidence is consistent across all models estimated. Banks that are involved in securitizations (irrespective of bank type or securitization model) were, throughout the whole period (2003-2012), riskier (less stable). Comparisons between banks issuing and not issuing asset securitizations show that Islamic banks with securitizations exhibit lower insolvency risk on average, and during the crisis, they report low credit risk (i.e. high asset quality) compared to Islamic banks not issuing securitizations. Comparisons between conventional banks issuing/not issuing asset securitizations indicate that the former is associated with significantly high credit risk on average. Moreover, during the crisis period, conventional banks issuing securitizations report significantly low regulatory capital and have high insolvency risk. However, these banks show high cost efficiency relative to conventional banks not engaging in securitization. Our results indicate strong evidence for the differential impacts on banking stability subject to the structure securitization model implemented by banks (i.e. Islamic versus conventional securitization). We find that during the non-crisis years, Islamic banks issuing asset securitizations report significantly high asset quality (i.e. lower credit risk) relative to their conventional counterparts. During the financial crisis, Islamic banks demonstrate significantly lower cost efficiency, but they also have a lower insolvency risk than conventional banks. Additional analyses identifying the effect of the asset securitization activity indicate that Islamic banks have high capital adequacy but poor cost efficiency. We also find that during the financial crisis of 2008, Islamic banks continue to show high asset quality in contrast to their conventional counterparts, which show low asset quality and high insolvency risk.

The evidence presented in this study provides extended guidance to researchers and investors engaging with dual banking systems and offers important implications for policymakers. The overall findings suggest that Islamic banks that issue Islamic securitized assets have significantly different properties than their conventional counterparts. Throughout the sample period, Islamic banks issuing securities exhibit a higher asset quality, which we believe reflects a higher degree of monitoring. These results correspond with our expectations that banks issuing Islamic securities have substantially different economic exposures than conventional bank securitizations. The resilience of the constrained securitization model of securitization is observed during exogenous shocks. The notion that conventional asset securitizations attributed to part of the cause of the 2008/9 financial crisis, in conjunction with underinvestment by banks in screening and monitoring together with policies to risk shift via securitization, is plausible. Although monitoring is costly for Islamic securitization, the increased monitoring of Islamic security issuance increases Islamic banking stability. Accordingly, regulators and market participants in conventional banks can benefit from our empirical evidence regarding the differential impacts of monitored/unmonitored securitization models on bank stability. However, the findings in this study indicate that banks that have a doctrinal mandate to monitor assets had far superior asset quality during the financial crisis, leading to high bank stability. Moreover, we argue that the lower cost efficiency of Islamic banks is indicative of a more costly approach to monitoring and screening new securitizations, which further extend and explain earlier findings by Beck et al. (2013) and Trinh et al. (2020), who found that Islamic banks are generally less cost-efficient. Hence, it seems that a substantially costly loan book brings rewards to Islamic banks during financially stressful periods. These findings confirm those by Stulz and Williamson (2003) and Acemoglu et al. (2005), who note that the impact of culture on economic institutions and policies is of substantive importance to the wider economic system.

The study offers new perspectives to consider in long-term investment decisions for alternative types of asset securitization vehicles. These new insights presented in this study contribute to an ongoing debate about the need to reconsider the role of contractual monitoring and screening in mitigating risky activities and promoting stability for the global banking industry – a call that, obviously, needs to be voiced to regulators in an attempt to prevent a second wave of financial crises and macroeconomic shocks. We conjecture that conventional banks make a conscious risk-return decision to under-invest in monitoring their securitization model, which adversely affects their bank stability. The equity holders in Islamic banks tend to be willing to pay a premium, in terms of reduced cash flow, to facilitate religiously based activities. The overall findings in this study respond to contemporary calls for extending the global understanding of alternative banking business models and risk management theories (see Chen et al., 2019).

The scope of this study can only determine the implications for banks' risk profile and long-term financial stability without explaining motives for banks to be involved in asset securitization. Future studies could, hence, contribute to the continuing debate on the influence of controlling for different contracting structures in the context of securitization activities across international capital markets. We recommend that future studies extend our analyses to examine asset securitization under the global crisis related to the implications of the COVID–19 pandemic on financial institutions.

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Table 1: Islamic asset Securities Types and Features

Islamic-Securities Types	Underlying Contract	Nature of Return	Risk Attribution	Returns (fixed/variable)	Tradability
Asset-backed	Leasing	Rent	Assets	Fixed/variable	Yes
Sale-based	Sale	Profit	Obligor	Fixed	No
Equity	Partnerships	Profit	Project	Variable	Yes

Notes: Table 1 describes the features and properties of various types of Islamic securities. a-The return can be fixed if the underlying assets of the projects such as real estate yields fixed return.

Table 2 Definition and Descriptions for the Test Variables

Variables	Definitions
$\mathbf{FS_{i,t}}$	A set of financial performance indicators for bank *i* in time *t*.
Capitalization:	
CAR_{it} (%)	Capital Adequacy Ratio
Asset Quality:	
$NPLtoGR_{it}$ (%)	Non-Performing Loans to Gross Loans
Management	
$CStoIN_{it}$ (%)	Cost to Income
Earnings Ability	
$ROAE_{it}$ (%)	Return on Average Equity.
Liquidity Management	
$NLtoTA_{it}(\%)$	Net loans to Total Assets
Insolvency Risk:	
Z-score	Logarithm of the Z-score and its components.
Independent Variables	
SEC_{it}	The explanatory variable of interest and corresponds to: *(i)* ***GSEC:*** General SEC dummy equal 1 if the bank is involved in asset securitization and 0 if not involved in asset securitization. This variable is interacted with the financial crisis dummy CRISIS (2008-2009 is unity, otherwise zero). *(ii)* ***SEC_IB [_CRISIS]***: a dummy variable for Islamic banks and is equal to 1 (0) if the Islamic bank issued (not issued) asset securitization. This variable is interacted with the financial crisis dummy CRISIS (2008-2009 is unity, otherwise zero). *(iii)* ***SEC_CB [_CRISIS]***: a dummy variable for conventional banks and is equal to 1 (0) if the bank is (is not) involved in asset securitization. This variable is interacted with the financial crisis dummy CRISIS (2008-2009 is unity, otherwise zero). *(iv)* ***ISEC***: is a dummy variable equals 1 if the bank is Islamic and involved in asset securitization and 0 if the bank is conventional and involved in asset securitization. ISEC is a subsample of the GSEC group of banks when SEC=1 and encompasses any bank that issues a new securitized asset; however, the dummy variable is only equal to unity for Islamic banks. This variable is interacted with the financial crisis dummy CRISIS (2008-2009 is unity, otherwise zero). *(v)* ***ASEC***: A continuous variable (*a*ctivity for asset *sec*uritization) defined as the total amount of asset securitization for both IB and CBs deflated by the contemporaneous total assets of the bank. This variable is interacted with the financial crisis dummy CRISIS (2008-2009 is unity, otherwise zero).
BK_i	Dummy variable equal 1 for Islamic banks and 0 for conventional banks.
$SIZE_i$	Natural logarithm of the total bank assets for bank *i* at time *t*.
$AGE_{,t}$	Age of bank *i* at time *t* since the year of its establishment
$LIST_{it}$	An indicator variable, taking a value of 1 for listed banks and 0 for unlisted banks.
$NON\_INT_{i,t}$	Total Non-Interest Operating Income scaled by Total Assets for bank *i* at time *t*.
$CRISIS_t$	Time Dummy equal 1 for the financial periods of 2008-2009 and 0 otherwise

2 - **Macro**	A set of country level macroeconomic variables for bank *i* in country *j* at time *t*.
MSD_{it}	Bank *i* deposits at time *t* over total banking sector deposits at time *t*.
ROI_{it}	The quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood
$RQ_{i,t}$	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development
$GDPGR_{it}$	Growth in GDP per capita in country *j* at time *t*.
INF_{it}	Country-prevailing inflation rate for bank *i* in time *t*.

Notes: Table 2 provides definitions and notations for test variables in the empirical models examined in this study.

Table 3 Sample Composition of Bank Type and Country Levels

Country Name	GSEC Obs.	ASEC Obs.	Islamic banks Obs.	Conventional Banks Obs.	No. of Islamic Banks	No. of Conventional Banks
ALGERIA	132	39	15	117	2	13
BAHRAIN	261	238	157	104	22	13
BANGLADESH	231	177	24	207	5	32
BRUNEI DARUSSALAM	23	13	13	10	3	1
EGYPT	248	196	29	219	3	24
INDONESIA	578	396	46	532	10	70
IRAQ	89	68	29	60	7	16
JORDAN	169	154	26	143	3	15
KUWAIT	129	119	79	50	11	5
LEBANON	290	187	12	278	3	39
MALAYSIA	254	211	82	172	18	30
MAURITANIA	104	57	24	80	4	12
PAKISTAN	265	219	53	212	8	27
QATAR	83	80	28	55	4	6
SAUDI ARABIA	123	119	53	70	6	7
SYRIAN ARAB REPUBLIC	79	71	12	67	3	11
TUNISIA	189	129	13	176	2	19
TURKEY	274	219	26	248	4	29
UNITED ARAB EMIRATES	249	226	76	173	10	20
UNITED KINGDOM	1,051	622	32	1,019	5	141
YEMEN	64	52	32	32	4	6
Total	**4,885**	**3,59**	**861**	**4,024**	**136**	**536**

Notes: Table 3 Reports the total sample and subsamples by country and bank type. The sample period covers year-end reporting for 2003 through 2012 for 21 countries (first column). The second and third columns denote the total sample size (bank-years) used to identify our securitization dummy (GSEC) and the level of securitization activity (ASEC) respectively. The fourth and fifth columns report the surveyed bank-year observations for IBs and CBs respectively. The sixth and seventh columns report the number of Islamic and conventional banks respectively for each country and in total in the sample. Obs. refers to bank-years observations over the sample period.

Table 4: Whole Sample Descriptive Statistics for the Dependent and Control Variables

Variables	Mean	Median	St.Dev
CAR (%)	22.16	16.95	19.56
NPLtoGR (%)	8.09	3.89	12.51
CStoIN (%)	62.39	52.23	61.43
ROAE (%)	9.45	9.84	27.16
NLtoTA (%)	45.35	47.16	22.03
z_score	2.95	3.00	0.95
SIZE	7.48	7.40	2.05
NON_INT	2.96	1.19	45.21
AGE	36.82	27.00	43.06
LIST	0.41	0.00	0.49
MSD	0.05	0.01	0.09
ROL	55.19	57.90	26.25
RQ	57.92	56.80	26.25
GDPGR	8.32	7.85	11.03
INF	5.53	4.48	4.82

Notes: Table 4 presents the descriptive statistics for the test variables for the period of 2003-2012. The study's pooled sample reflects banks operating in 21 cross countries with 4,885 bank-year observations (672 banks).

Table 5 Descriptive Statistics for SEC versus NON SEC Banks, and IBs versus CBs 2003-2012

PANEL A	SEC Banks			NON SEC Banks			
Variables	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Two-Sample t-Test (two-tailed)
CAR (%)	17.08	14.84	8.15	21.96	16.98	19.07	-3.56***
NPLtoGR (%)	5.81	2.52	12.02	7.32	3.77	9.97	-1.99**
CStoIN (%)	59.55	55.44	29.19	62.77	50.81	65.03	-0.80*
ROAE (%)	6.90	8.39	22.26	9.33	10.11	26.82	1.46**
NLtoTA (%)	51.31	54.62	21.53	46.45	49.25	21.46	-3.61***
z_score	2.29	2.17	1.10	2.94	2.97	0.94	-5.27***
SIZE(Natural Log)	9.92	9.53	2.49	7.47	7.47	1.85	20.83***
NON_INT (mil USD)	0.04	0.01	0.15	0.03	0.01	0.45	0.44**
AGE (in years)	68.02	36.00	79.21	31.69	26.00	28.20	15.63**
LIST(0,1)	0.21	0.00	0.40	0.42	0.00	0.49	6.99***
MSD (%)	0.05	0.02	0.07	0.05	0.01	0.09	0.08**
ROL (units)	76.10	92.49	20.04	52.80	57.82	24.31	
RQ (units)	79.26	94.74	19.74	55.56	55.88	23.86	
GDPGR (%)	5.31	6.38	11.76	7.94	7.84	11.20	
INF (%)	4.63	3.29	3.89	5.79	4.77	4.83	
PANEL B	**Islamic Banks**			**Conventional Banks**			
CAR (%)	26.82	18.59	26.02	21.20	16.80	17.79	6.18***
NPLtoGR (%)	7.02	3.80	11.29	8.26	3.92	12.69	1.84*
CStoIN (%)	73.89	51.43	95.43	59.91	52.48	50.91	-5.57***
ROAE (%)	7.24	8.25	18.91	9.95	10.10	28.65	-2.50***
NLtoTA (%)	44.36	48.61	25.53	45.54	46.89	21.24	1.32**
z_score	3.75	2.78	1.01	3.00	3.05	0.93	6.43***
SIZE (Natural Log)	7.01	7.22	1.76	7.58	7.45	2.10	-7.45**
NON_INT (mil USD)	0.02	0.01	0.10	0.03	0.01	0.50	0.01
AGE (in years)	16.40	14.00	11.37	40.77	30.00	45.72	13.88***
LIST(0,1)	0.46	0	0.50	0.40	0.00	0.49	-2.911
MSD (%)	0.04	0.01	0.08	0.05	0.01	0.09	
ROL (units)	53.29	62.44	21.56	55.59	57.28	27.12	
RQ (units)	55.88	60.78	20.94	58.36	55.39	27.22	
GDPGR (%)	7.96	8.33	12.26	8.40	7.84	10.75	
INF (%)	5.25	3.91	5.23	5.59	4.48	4.72	

Notes: Table 5 presents the descriptive statistics for the test variables for the period of 2003-2012 comparing in banks involved in securitization (SEC) with those not involved in securitization (NON SEC) in panel A, and Islamic banks (IBs) with conventional banks (CBs) in panel B. We also report on the paired sample mean test (T-test). The ***, **, * represents p-values of 0.01, 0.05, and 0.10.

Table 6 Banks Issuing Assets Securitization, Full Sample during 2003 - 2012

	(1) Bank Capital	(2) Asset Quality	(3) Management Capability	(4) Earnings Ability	(5) Liquidity Management	(6) Insolvency Risk
VARIABLES	**CAR**	**NPLtoGR**	**CStoIN**	**ROAE**	**NLtoTA**	**z_score**
GSEC	0.551	0.667	-3.777	-2.034	0.545	-0.087**
	(0.514)	(0.274)	(0.252)	(0.398)	(0.657)	(0.022)
GSEC*CRISIS	-1.328	-1.280	-4.674	2.941	-1.224	0.090
	(0.177)	(0.246)	(0.247)	(0.473)	(0.452)	(0.860)
BK	-1.895	9.717**	3.324	-3.366	3.642	-1.679***
	(0.901)	(0.011)	(0.143)	(0.480)	(0.664)	(0.007)
SIZE	-4.567***	-2.588*	-19.613***	13.510*	-0.614	0.010
	(0.002)	(0.074)	(0.001)	(0.076)	(0.643)	(0.791)
NON_INT	80.403**	-4.603	-59.678***	48.198***	4.859	2.814***
	(0.012)	(0.903)	(0.000)	(0.006)	(0.900)	(0.000)
AGE	0.033	0.219	-0.029	-2.849	0.101	0.008
	(0.797)	(0.142)	(0.975)	(0.128)	(0.531)	(0.193)
LIST	1.073	-1.109	-47.242	-13.790	10.367	-0.866*
	(0.847)	(0.899)	(0.351)	(0.915)	(0.378)	(0.086)
CRISIS	-0.049	0.072	-4.544	-7.718	-0.315	-0.025
	(0.910)	(0.904)	(0.118)	(0.106)	(0.570)	(0.114)
MSD	-16.430	-17.641*	-19.400*	-5.981	-26.409	0.356
	(0.256)	(0.082)	(0.083)	(0.974)	(0.148)	(0.556)
ROL	0.083	0.134	0.154	-0.246	0.020	-0.011***
	(0.325)	(0.223)	(0.816)	(0.487)	(0.823)	(0.005)
RQ	-0.117	-0.099	0.020	-0.216	0.116	-0.001
	(0.115)	(0.146)	(0.943)	(0.672)	(0.131)	(0.639)
GDPGR	-0.006	-0.035*	-0.205*	0.147**	0.018	0.003***
	(0.664)	(0.059)	(0.068)	(0.040)	(0.378)	(0.000)
INF	-0.192***	0.096	0.303**	0.076	0.134	-0.006***
	(0.000)	(0.270)	(0.042)	(0.577)	(0.111)	(0.002)
EtoTA		-0.044	-0.639	0.959	-0.175*	0.031***
		(0.799)	(0.143)	(0.219)	(0.079)	(0.000)
Constant	51.337***	16.865*	27.001***	18.629	9.027	2.145***
	(0.000)	(0.076)	(0.000)	(0.902)	(0.420)	(0.000)
Observations	1,393	1,236	1,798	1,834	1,831	1,851
Country Fixed-Effects	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
No. of instruments	84	90	90	90	90	90
Wald Chi^2	262***	373***	102***	424***	158***	784***
AR(1) p-value	0.093	0.096	0.078	0.125	0.681	0.152
AR(2) p-value	0.480	0.072	0.517	0.764	0.733	0.003
Hansen-J-P-value	0.458	0.512	0.425	0.420	0.201	0.677

Notes: Table 6 presents the results for GMM estimations for the GSEC securitization dummy with auxiliary controls, this dummy identifies the population of bank-years where that any type of securitization activity has been undertaken irrespective of bank type or securitization type. The main specification of the regression model is as follows:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 GSEC_{i,t} + \beta_3 BK_i + \beta_4\, SIZE_{i,t} + \beta_5 NON\_INT_{it} + \beta_6\, AGE_{it} + \beta_7\, LIST_{it} + \beta_8\, CRISIS_t + \beta_9\, MACRO_{i,j,t} + \varepsilon_{i,t}$$

Where $GSEC_{i,t}$ is a dummy variable, it is equal to 1 if a bank in a specific year (time t) has originated a new securitized asset and 0 if the bank has not issued a new securitized asset. Variables definitions (see Table 1). The dependent variables listed from (1) to (6) are the financial stability indicators. Results under the GMM technique are reported using robust standard errors. P-values in parentheses, *p < 0.10, **p < 0.05, ***p < 0.001. The Wald test of the joint significance of the reported coefficients, asymptotically distributed as x^2 under the null hypothesis of no relationship, degrees of freedom in parentheses. m_i (m_1, m_2) is a serial correlation test of order I (1 and 2) using residuals in first differences, asymptotically distributed as N(0, 1) under the null hypothesis of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as x^2under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Table 7 Islamic Banks Issuing Islamic Asset Securitization, Sample Restricted to Islamic Banks only

	(1) Bank Capital	(2) Asset Quality	(3) Management Capability	(4) Earnings Ability	(5) Liquidity Management	(6) Insolvency Risk
VARIABLES	(1) Bank Capital CAR	(2) Asset Quality NPLGROSS	(3) Management CREDIT	(4) Earnings ROAE	(5) Liquidity NLIQTA	(6) Insolvency Z_SCORE
SEC_IB	-0.494	1.581	-0.859	-0.490	0.033	0.145***
	(0.603)	(0.241)	(0.845)	(0.815)	(0.982)	(0.000)
SEC_IB_CRISIS	1.363	-8.422***	-7.620	-4.932	-2.917	0.065
	(0.326)	(0.000)	(0.503)	(0.647)	(0.645)	(0.694)
SIZE	-0.720	-3.482**	-19.364**	-3.246	-2.299	-0.048
	(0.690)	(0.012)	(0.021)	(0.449)	(0.387)	(0.492)
NON_INT	88.499**	85.161	-544.113**	273.191***	24.414	3.595***
	(0.045)	(0.130)	(0.017)	(0.000)	(0.494)	(0.000)
AGE	-0.139	0.098	4.278*	0.260	0.202	0.021
	(0.601)	(0.635)	(0.058)	(0.737)	(0.677)	(0.123)
LIST	5.296	7.890	-42.145	-22.552	22.571	-0.610
	(0.240)	(0.240)	(0.630)	(0.560)	(0.141)	(0.249)
CRISIS	-2.104**	-0.958	-8.145	-0.269	1.202	0.056
	(0.025)	(0.438)	(0.353)	(0.867)	(0.413)	(0.382)
MSD	-25.316	-35.309	-133.387	100.323	-32.180	2.587
	(0.144)	(0.160)	(0.308)	(0.128)	(0.566)	(0.117)
ROL	-0.040	0.168	1.824	-1.024*	0.528*	-0.017
	(0.627)	(0.345)	(0.244)	(0.076)	(0.055)	(0.204)
RQ	-0.045	0.049	0.720	0.263	0.019	-0.000
	(0.770)	(0.763)	(0.147)	(0.445)	(0.920)	(0.978)
GDPGR	0.048*	-0.036	-0.667*	0.352***	-0.032	0.005***
	(0.077)	(0.152)	(0.056)	(0.004)	(0.318)	(0.002)
INF	-0.249**	0.241*	1.045*	-0.602***	0.132	-0.013**
	(0.044)	(0.100)	(0.053)	(0.009)	(0.462)	(0.018)
EtoTA		-0.618**	-1.220	-0.023	0.029	0.017***
		(0.015)	(0.107)	(0.907)	(0.883)	(0.000)
Constant	22.718*	20.588	33.709	67.130*	-9.386	2.022***
	(0.100)	(0.105)	(0.811)	(0.090)	(0.672)	(0.000)
Observations	208	178	337	358	352	363
Country Fixed-Effects	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
No. of instruments	84	90	90	90	90	91
Wald Chi 2	4997***	9068***	3973***	34***	53***	101***
AR(1) p-value	0.251	0.133	0.620	0.276	0.103	0.094
AR(2) p-value	0.368	0.394	0.365	0.226	0.144	0.165
Hansen-J-P-value	0.983	0.371	0.710	0.366	0.899	0.999

Notes: Table 7 presents the results for GMM estimations for the SEC_IB_CRISIS securitization dummy with auxiliary controls interacted with a crisis dummy, this dummy identifies the population of Islamic bank-years for the 2008/9 when Islamic securitization activity has been undertaken. The main specification of the regression model is as follows:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 SEC\_IB\_CRISIS_{i,t} + \beta_3\, SIZE_{i,t} + \beta_4 NON\_INT_{it} + \beta_5\, AGE_{it} + \beta_6\, LIST_{it} + \beta_7\, CRISIS_t + \beta_8\, MACRO_{i,j,t} + \varepsilon_{i,t}$$

Where, $SEC\_IB\_CRISIS_{i,t}$ is a dummy variable equal to 1 if for the 2008/9 period a bank in a specific year (time t) has originated a new Islamic securities (identified as Islamic under our criteria in Section 3) securitized asset and 0 if the bank has not issued a new securitized asset. The dependent variables listed from (1) to (6) are the financial stability indicators. Results under the GMM technique are reported using robust standard errors. P-values in parentheses, *p < 0.10, **p < 0.05, ***p < 0.001. The Wald test of the joint significance of the reported coefficients, asymptotically distributed as x^2 under the null hypothesis of no relationship, degrees of freedom in parentheses. m_i (m_1, m_2) is a serial correlation test of order I (1 and 2) using residuals in first differences, asymptotically distributed as N(0, 1) under the null hypothesis of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as x^2under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.

			Capability	Ability	Management	Risk
VARIABLES	**CAR**	**NPLtoGR**	**CStoIN**	**ROAE**	**NLtoTA**	**z_score**
SEC_CB	0.796	1.925**	-6.195	-7.915	0.509	0.039
	(0.613)	(0.006)	(0.170)	(0.124)	(0.790)	(0.376)
SEC_CB_CRISIS	-1.589***	-0.501	-6.406**	-6.271	0.834	-0.090**
	(0.000)	(0.590)	(0.006)	(0.182)	(0.154)	(0.017)
SIZE	0.012	0.069	1.545	0.131	0.042***	0.009
	(0.947)	(0.876)	(0.298)	(0.142)	(0.000)	(0.209)
NON_INT	-4.717***	-4.258**	-23.076***	18.037	0.839	0.073
	(0.004)	(0.017)	(0.003)	(0.178)	(0.576)	(0.172)
AGE	50.198	-53.577	-501.728***	371.764*	-9.289	2.376**
	(0.215)	(0.198)	(0.000)	(0.066)	(0.869)	(0.014)
LIST	-0.030	0.344*	1.187	-3.546	0.049	-0.005
	(0.863)	(0.053)	(0.134)	(0.108)	(0.784)	(0.377)
CRISIS	-3.310	7.913	-24.992	-76.580	11.550	-0.444
	(0.574)	(0.341)	(0.150)	(0.662)	(0.331)	(0.554)
MSD	0.275	0.889	-2.963	-8.983	-1.095**	-0.021
	(0.545)	(0.221)	(0.103)	(0.145)	(0.044)	(0.100)
ROL	-15.866	-24.280**	-79.301	-15.550	-20.613	-0.662
	(0.349)	(0.037)	(0.105)	(0.943)	(0.244)	(0.510)
RQ	0.124	0.197*	0.108	-0.274	-0.066	-0.007
	(0.131)	(0.071)	(0.830)	(0.410)	(0.497)	(0.223)
GDPGR	-0.174**	-0.067	-0.046	-0.126	0.109	0.003
	(0.046)	(0.410)	(0.856)	(0.793)	(0.145)	(0.315)
INF	-0.019	-0.056**	-0.003	0.108	0.011	0.001
	(0.278)	(0.010)	(0.972)	(0.199)	(0.652)	(0.373)
EtoTA	-0.141**	0.114	0.047	0.214	0.150*	-0.004
	(0.016)	(0.258)	(0.707)	(0.300)	(0.091)	(0.113)
Constant	59.320***	14.836	207.794***	43.381	8.719	2.243***
	(0.000)	(0.195)	(0.007)	(0.840)	(0.459)	(0.002)
Observations	1,185	1,058	1,461	1,476	1,479	1,488
Country Fixed-Effects	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
No. of instruments	85	91	90	90	90	91
Wald Chi 2	4997***	9068***	3973***	34***	53***	101***
AR(1) p-value	0.351	0.333	0.720	0.096	0.103	0.094
AR(2) p-value	0.368	0.394	0.365	0.226	0.144	0.165
Hansen-J-P-value	0.983	0.371	0.710	0.366	0.899	0.999

(1)	(2)	(3)	(4)	(5)	(6)
Bank Capital	**Asset Quality**	**Management Capability**	**Earnings Ability**	**Liquidity Management**	**Insolvency Risk**

Table 8 Conventional Banks Issuing New Securitizations, Sample Restricted to Conventional Banks only

Notes: Table 8 presents the results for GMM estimations for the SEC_CB_CRISIS securitization dummy with auxiliary controls interacted with a crisis dummy, this dummy identifies the population of conventional bank-years for 2008/9 when any form of securitization activity has been undertaken. The main specification of the regression model is as follows:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 SEC\_CB\_CRISIS_{i,t} + \beta_3\, SIZE_{i,t} + \beta_4 NON\_INT_{it} + \beta_5\, AGE_{it} + \beta_6\, LIST_{it} + \beta_7\, CRISIS_t + \beta_8\, MACRO_{i,j,t} + \varepsilon_{i,t}$$

Where, $SEC\_CB\_CRISIS_{i,t}$ is a dummy variable equal to 1 if for the 2008/9 period a bank in a specific year (time t) has originated any new securitized asset and 0 if the bank has not issued a new securitized asset. The dependent variables listed from (1) to (6) are the financial stability indicators. Results under the GMM technique are reported using robust standard errors. P-values in parentheses, *p < 0.10, **p < 0.05, ***p < 0.001. The Wald test of the joint significance of the reported coefficients, asymptotically distributed as x^2 under the null hypothesis of no relationship, degrees of freedom in parentheses. m_i (m_1, m_2) is a serial correlation test of order I (1 and 2) using residuals in first differences, asymptotically distributed as N(0, 1) under the null hypothesis of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as x^2under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Table 9 Islamic banks issuing Islamic Security, Sample Restricted to all Banks issuing Securitization

VARIABLES	CAR	NPLtoGR	CStoIN	ROAE	NLtoTA	z_score
ISEC	1.077	-0.850**	-1.643	-2.403	0.310	0.039
	(0.262)	(0.003)	(0.586)	(0.343)	(0.794)	(0.313)
ISEC_CRISIS	-0.848	-0.915	9.598**	-3.456	-1.062	0.023*
	(0.292)	(0.371)	(0.044)	(0.383)	(0.494)	(0.064)
SIZE	-6.520***	-2.140*	-19.398***	12.514*	0.492	0.019
	(0.005)	(0.089)	(0.001)	(0.071)	(0.649)	(0.638)
NON_INT	33.237	-10.174	-14.038***	22.111***	-12.735	2.284***
	(0.204)	(0.705)	(0.000)	(0.000)	(0.655)	(0.000)
AGE	0.266	0.167	0.829	-2.504	0.006	0.008
	(0.258)	(0.170)	(0.160)	(0.120)	(0.964)	(0.215)
LIST	0.931	-2.804	-59.478	-3.224	7.549	-1.095**
	(0.914)	(0.764)	(0.389)	(0.977)	(0.429)	(0.020)
CRISIS	-0.249	-2.570	-5.257*	-0.280	0.016	0.189
	(0.590)	(0.290)	(0.054)	(0.499)	(0.209)	(0.689)
MSD	-13.857	-16.370	-37.545	-2.598	-7.839	0.210
	(0.371)	(0.280)	(0.253)	(0.956)	(0.145)	(0.460)
ROL	0.080	0.235*	0.109	-0.021	-0.015	-0.011***
	(0.412)	(0.083)	(0.813)	(0.933)	(0.833)	(0.005)
RQ	0.000	-0.106	0.426	-0.247	0.136**	-0.004*
	(0.996)	(0.124)	(0.162)	(0.409)	(0.015)	(0.059)
GDPGR	-0.004	-0.038**	-0.210**	0.135**	-0.008	0.002***
	(0.813)	(0.048)	(0.042)	(0.030)	(0.657)	(0.001)
INF	-0.138**	0.096	0.202	0.210	0.111	-0.003*
	(0.021)	(0.261)	(0.197)	(0.204)	(0.118)	(0.059)
EtoTA		-0.120	-0.572*	0.803	-0.165	0.035***
		(0.395)	(0.098)	(0.246)	(0.138)	(0.000)
Constant	52.003***	10.521	176.179***	7.346	6.324	2.589***
	(0.000)	(0.169)	(0.000)	(0.949)	(0.419)	(0.000)
Observations	1,632	1,508	2,283	2,327	2,325	2,344
Country Fixed-Effects	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
No. of instruments	85	90	90	90	90	91
Wald Chi 2	891***	468***	528***	325***	965***	258***
AR(1) p-value	0.625	0.712	0.241	0.214	0.485	0.124
AR(2) p-value	0.745	0.825	0.472	0.891	0.471	0.145
Hansen-J-P-value	0.781	0.361	0.745	0.147	0.873	0.748

Notes: Table 9 presents the results for GMM estimations for the ISEC securitization dummy. This dummy identifies the population of Islamic bank-years from only the sample of banks that issue securitizations, therefore the sample is (SEC_IB union SEC_CB) and the dummy ISEC represents SEC_IB only from this sample. The ISEC dummy is then interacted with a crisis dummy (2008 and 2009 = 1), zero otherwise. The main specification of this regression model is as follows:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 \text{ISEC\_CRISIS}_{i,t} + \beta_3\, SIZE_{i,t} + \beta_4 NON\_INT_{it} + \beta_5\, AGE_{it} + \beta_6\, LIST_{it} + \beta_7\, CRISIS_t + \beta_8\, MACRO_{i,j,t} + \varepsilon_{i,t}$$

The dependent variables listed from (1) to (6) are the financial stability indicators. Results under the GMM technique are reported using robust standard errors. P-values in parentheses, *p < 0.10, **p < 0.05, ***p < 0.001. The Wald test of the joint significance of the reported coefficients, asymptotically distributed as x^2 under the null hypothesis of no relationship, degrees of freedom in parentheses. m_i (m_1, m_2) is a serial correlation test of order I (1 and 2) using residuals in first differences, asymptotically distributed as N(0, 1) under the null hypothesis of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as x^2under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Table 10 Annual Activity of Securitization within Islamic Banks

	(1) Bank Capital	(2) Asset Quality	(3) Management Capability	(4) Earnings Ability	(5) Liquidity Management	(6) Insolvency Risk

VARIABLES	CAR	NPLtoGR	CStoIN	ROAE	NLtoTA	z_score
ASEC	0.377***	33.474	1.636**	0.102	-0.247	-0.006
	(0.000)	(0.263)	(0.006)	(0.244)	(0.423)	(0.187)
ASEC*CRISIS	0.023	-4.034***	1.857	-0.156	0.195	0.005
	(0.654)	(0.000)	(0.195)	(0.103)	(0.611)	(0.272)
SIZE	0.359	-3.032**	-16.323*	-3.062	-2.324	-0.051
	(0.816)	(0.015)	(0.066)	(0.493)	(0.434)	(0.494)
NON_INT	95.225**	63.285	-525.100**	270.903***	23.149	3.486***
	(0.029)	(0.169)	(0.026)	(0.000)	(0.503)	(0.000)
AGE	-0.301	0.069	3.697	0.233	0.254	0.022
	(0.291)	(0.751)	(0.108)	(0.766)	(0.617)	(0.112)
LIST	5.102	7.643	-42.671	-22.439	19.629	-0.642
	(0.292)	(0.238)	(0.625)	(0.553)	(0.231)	(0.233)
CRISIS	-1.641*	-0.695	-8.663	-0.476	1.122	0.057
	(0.077)	(0.549)	(0.305)	(0.769)	(0.432)	(0.393)
MSD	-43.721*	-27.954	-180.752	98.399	-24.144	2.659
	(0.077)	(0.241)	(0.212)	(0.131)	(0.648)	(0.127)
ROL	-0.116	0.163	1.752	-1.058*	0.521*	-0.016
	(0.208)	(0.332)	(0.248)	(0.071)	(0.086)	(0.206)
RQ	0.060	0.039	0.816*	0.267	0.009	-0.002
	(0.648)	(0.781)	(0.098)	(0.429)	(0.960)	(0.724)
GDPGR	0.019	-0.052	-0.799*	0.353***	-0.010	0.006***
	(0.535)	(0.120)	(0.063)	(0.008)	(0.837)	(0.004)
INF	-0.162	0.326**	1.250	-0.627**	0.036	-0.015**
	(0.142)	(0.012)	(0.145)	(0.020)	(0.855)	(0.033)
EtoTA		-0.417*	-1.268	-0.016	0.027	0.018***
		(0.089)	(0.112)	(0.937)	(0.875)	(0.000)
Constant	16.431	15.449	27.499	68.073	-8.435	2.129***
	(0.159)	(0.225)	(0.849)	(0.102)	(0.714)	(0.002)
Observations	208	178	337	358	352	363
Country Fixed-Effects	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
No. of instruments	85	91	91	91	91	91
Wald Chi 2	854***	152***	762***	843***	462***	258***
AR(1) p-value	0.214	0.947	0.256	0.212	0.251	0.247
AR(2) p-value	0.487	0.561	0.782	0.712	0.472	0.142
Hansen-J-P-value	0.711	0.548	0.713	0.552	0.681	0.413

Notes: Table 10 presents the results for two stage GMM estimations using the Islamic banks sub-sample. The ASEC variable represents the total activity of securitization measured as the total amount of asset securitization deflated by the contemporaneous total assets of the bank. The main specification of the regression model is as follows:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 \text{ASEC}_{i,t} + \beta_3 \text{ASEC} * \text{CRISIS}_{i,t} + \beta_4\, Size_{i,t} + \beta_5 NON\_INT_{it} + \beta_6\, AGE_{it} + \beta_7\, LIST_{it} + \beta_8\, CRISIS_t + \beta_9\, MACRO_{i,j,t} + \varepsilon_{i,t}$$

The dependent variables listed from (1) to (6) are the financial stability indicators. Results under the GMM technique are reported using robust standard errors. P-values in parentheses, *p < 0.10, **p < 0.05, ***p < 0.001. The Wald test of the joint significance of the reported coefficients, asymptotically distributed as x^2 under the null hypothesis of no relationship, degrees of freedom in parentheses. m_i (m_1, m_2) is a serial correlation test of order I (1 and 2) using residuals in first differences, asymptotically distributed as N(0, 1) under the null hypothesis of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as x^2 under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Table 11 Annual Activity of Securitization (ASEC) within Conventional Banks

	(1)	(2) Asset Quality	(3) Management	(4)	(5) Liquidity	(6) Insolvency

	Bank Capital		Capability	Earnings Ability	Management	Risk
VARIABLES	**CAR**	**NPLtoGR**	**CStoIN**	**ROAE**	**NLtoTA**	**z_score**
ASEC	0.167	0.319***	0.374	0.149	0.023	-0.003
	(0.625)	(0.004)	(0.181)	(0.557)	(0.844)	(0.388)
ASEC*CRISIS	-0.900	0.481**	-0.236	-0.251	-0.074	-5.023**
	(0.300)	(0.001)	(0.329)	(0.372)	(0.402)	(0.038)
SIZE	-6.881***	-2.998**	-18.886***	16.232	1.356	0.018
	(0.009)	(0.038)	(0.006)	(0.162)	(0.252)	(0.720)
NON_INT	4.274	-30.365	-309.326***	319.868***	-25.122	1.619***
	(0.873)	(0.271)	(0.001)	(0.003)	(0.467)	(0.002)
AGE	0.321	0.241*	1.574*	-3.342*	0.016	0.001
	(0.267)	(0.070)	(0.086)	(0.097)	(0.908)	(0.813)
LIST	-5.622	1.457	-26.329	-86.872	8.667	-0.142
	(0.570)	(0.903)	(0.512)	(0.628)	(0.424)	(0.802)
CRISIS	0.289	0.006	-1.212	-5.899**	-0.650*	-0.004
	(0.537)	(0.991)	(0.364)	(0.043)	(0.081)	(0.707)
MSD	-6.928	-20.230	-17.450	-17.173	-6.044	-0.203
	(0.739)	(0.214)	(0.450)	(0.768)	(0.197)	(0.448)
ROL	0.120	0.280**	0.057	-0.204	-0.057	-0.010**
	(0.270)	(0.042)	(0.909)	(0.712)	(0.482)	(0.034)
RQ	-0.038	-0.085	0.308	-0.159	0.154***	0.000
	(0.652)	(0.244)	(0.205)	(0.533)	(0.004)	(0.875)
GDPGR	-0.001	-0.047**	-0.033	0.031	-0.024	0.000
	(0.954)	(0.042)	(0.663)	(0.730)	(0.252)	(0.475)
INF	-0.100	0.094	0.158	0.380	0.125*	-0.002
	(0.133)	(0.323)	(0.465)	(0.149)	(0.093)	(0.309)
EtoTA		-0.082	-0.137	1.120	-0.181	0.041***
		(0.583)	(0.708)	(0.275)	(0.149)	(0.000)
Constant	55.631***	7.980	129.285**	62.940	2.966	2.686***
	(0.000)	(0.395)	(0.025)	(0.742)	(0.727)	(0.000)
Observations	1,424	1,330	1,946	1,969	1,973	1,981
Country Fixed-Effects	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
No. of instruments	85	91	91	91	91	91
Wald Chi 2	874***	223***	487***	551***	114***	854***
AR(1) p-value	0.111	0.745	0.312	0.174	0.845	0.511
AR(2) p-value	0.124	0.871	0.424	0.741	0.591	0.121
Hansen-J-P-value	0.717	0.111	0.156	0.153	0.781	0.781

Notes: Table 11 presents the results for two stage GMM estimations using the conventional banks sub-sample. The ASEC variable represents the total activity of securitization measured as the total amount of asset securitization deflated by the contemporaneous total assets of the bank. The main specification of the regression model is as follows:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 \text{ASEC}_{i,t} + \beta_3 \text{ASEC} * \text{CRISIS}_{i,t} + \beta_4\, SIZE_{i,t} + \beta_5 NON\_INT_{it} + \beta_6\, AGE_{it} + \beta_7\, LIST_{it} + \beta_8\, CRISIS_t + \beta_9\, MACRO_{i,j,t} + \varepsilon_{i,t}$$

The dependent variables listed from (1) to (6) are the financial stability indicators. Results under the GMM technique are reported using robust standard errors. P-values in parentheses, *p < 0.10, **p < 0.05, ***p < 0.001. The Wald test of the joint significance of the reported coefficients, asymptotically distributed as x^2 under the null hypothesis of no relationship, degrees of freedom in parentheses. m_i (m_1, m_2) is a serial correlation test of order I (1 and 2) using residuals in first differences, asymptotically distributed as N(0, 1) under the null hypothesis of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as x^2 under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.