



Reducing Fragility? Risk Shifting and Islamic Banking

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Abstract

In the last five decades, advances in information technology and in financial innovations have made possible the emergence of an immense capacity for banks to switch regimes from risk transfer to risk shifting. The devastating power of this capacity was amply pronounced in the financial crisis of 2007/2008. The fallout of which has intensified calls for a re-examination of current banking model and its underlying incentives' structure. Risk shifting is, axiomatically, absent in an ideal Islamic financial system. The Islamic banking model, thus, provides unique paradigm with risk sharing at its core. However, the present formation of Islamic banking has grown out of conventional banking and uses many of its techniques and instruments. The main objective of this paper is to empirically investigate the risk shifting behaviour in Islamic banks in dual banking systems of OIC member states. The two-step dynamic difference GMM is applied to cater for the nature of Islamic banking data, which is characterized by a larger dynamic panel and a smaller timeframe. Findings tend to indicate that Islamic banking has a limiting effect on risk shifting. The effect however is not sufficient to fully nullify the overall risk-shifting incentives. The evidence supports strengthening risk sharing and reforming Islamic banking configuration as the way forward for sustainable finance.

Keywords: Risk Shifting, Risk Sharing, Islamic Banks, Sustainable Alternative Banking Model, Two-Step Difference GMM

1. Introduction

The original intent of conventional banking was to serve as pure intermediary between surplus fund holders and deficit units in the economy. In this role banks transferred risk from depositors to borrowers. An edifice of deposit insurance system and supervisory/regulatory structure was erected to protect the creditor at the expense of the debtor. In the last five decades, however, advances in information technology and in financial innovations have made possible the emergence of an immense capacity for rapid regime switching from risk transfer to risk shifting. Keynes (1931, 1936) had long argued that risk transfer, through the predetermined fixed interest mechanism, was inherently unstable. Risk shifting further exacerbated the devastating power of risk transfer. This was amply pronounced in the financial crisis of 2007/2008. Banks' tendency to shift the risk of losses to external parties, while internalizing gains through debt-based contracts (Sheng, 2009), creates a minority class (equity holders and financiers) that benefits from economic and financial growth and excludes a majority (depositors and tax payers) from sharing in the prosperity. Worse still, it "sows" systemic fragility in the form of recurrent risk-shifting-induced crises (Minsky, 1977, 1982). The fallout from the recent crisis has intensified calls for a re-examination of current banking model and its incentives' structure (Čihák et al., 2013).

Risk sharing, on the other hand, is argued to reduce the probability of an adverse outcome, in the presence of moral hazard. It increases access of lower-income groups to finance and promotes shared prosperity in the short to

medium term (Dabla-Norris et al., 2015; Hellwig, 1998). In the long term, it maintains financial stability.

Based on 2:275 of the holy Qur'an and the legal maxims "al-Ghunmu bi al-Ghurmi" and "Al-Kharaj bi adh-Dhaman", risk sharing is advocated as the principal modality of Islamic finance and risk shifting is, axiomatically, absent in an ideal Islamic financial system (The Kuala Lumpur Declaration, 2012). In such a system, equity holders are expected to share assets' upside and downside potential with investment account holders (depositors). Furthermore, "threat of loss" is expected strengthens investment account holders' monitoring incentives (Distinguin, Kouassi and Tarazi, 2013; Calomiris, 1999). This can potentially foster financial inclusion and reduce the incidence of bank failures and the size of losses incurred by depositors and tax payers (Esty, 1998). Having said that, the present formation of Islamic finance has grown out of conventional finance and it uses many of its techniques and instruments. An empirical assessment is, therefore, imperative.

To this end, this paper analyses evidence of risk-shifting behaviour in Islamic banks operating in member states of the Organization of Islamic countries (OIC). Because Islamic banking data is characterized by a larger dynamic panel and a smaller timeframe, which may render, this is done through two-step dynamic difference GMM. Policy recommendations complete the presentation.

2. Significance of the Study

The study contributes to a largely under-researched discipline of Islamic banking and towards understanding risk shifting behaviour in an alternative banking model, where a peculiar class of depositors acts as residual claimants. Studies

conducted, thus far, are based on conventional models of banking, where depositors are fixed claimants. The study also offers first time coverage of OIC member states in the empirical risk shifting literature, where almost 98% of the global Islamic financial assets reside with Islamic banking having the lion's share (SESRIC, 2012). Findings are expected to have significant implications for reforming Islamic banking configuration and the general framework of regulations and supervision, where urgent questions regarding shareholders' incentives and methods of aligning these incentives take central stage.

3. Issues Motivating the Research

The axiomatic characteristics of Islamic finance and the current state of affairs motivate this study. It is timely given the global financial crisis and the interest it has revived in the sustainability of banking business models and participants' incentives' structure. It is also essential in light of the increasing importance of Islamic finance and the newly-acquired "commercial significance" of its banking operations.

Risk shifting has often been associated with system-wide crises in banking and finance (Kroszner and Strahan 1996, Hovakimian and Kane 2000). During periods of stability, banks' high-leverage risk shifting strategies contribute to a build-up of debt and a weakening of the link between the financial and real sectors of the economy. This further distorts market anomalies and inflates bubbles (Rajan, 2006) that aggravate the depth and breadth of the crisis once it hits.

Matters do not rest here. Risk-shifting banks are characterized by "gambling for resurrection" when close to or in bankruptcy (Brunnermeier and Oehmke, 2012). If

successful, struggling banks remain solvent. Otherwise, losses are shouldered by tax payers, the deposit insurer and/or the lender of last resort, under the veil of limited liability (Boyd and Hakenes, 2012; Mason and Swanson, 1998). Alas, the failure of a handful of institutions spreads to the whole economy, because of the trust-intensive nature of the industry (Duran and Lozano-Vivas, 2014; Elahi et al., 2012; Acharya et al. 2009).

While strong regulations are required to deter such a pervasive conflict of interests (Mirakhor, 2011), they ought to be beyond conventional measures (Elahi et al., 2012). As per Laeven, Ratnovski and Tong (2014, 6), “a large share of inefficiencies in financial markets, and a significant part of the excess cyclicity of credit, can be controlled through affecting incentives of banks”.

To this end, Islamic banks’ risk shifting incentives must be surveyed and maintained under surveillance.

4. Review of Relevant Literature

4.1 Theoretical literature

The discussion of risk shifting is rooted in agency theory (Jensen and Meckling, 1976). Risk shifting occurs as a standard moral hazard problem in an environment of information asymmetry. Informationally-advantaged equity holders are incentivised to pursue their self-interests under concealed conflict of interests (Karl and McCullough, 2012; Hovakimian et al., 2003).

The use of leverage further exacerbates equity holders’ risk-shifting incentives (Hellwig, 1998; Esty, 1997). Debt holders’ often fixed and predetermined rate of interest reinforces equity’s convex payoff structure and its similarity to call

options (Jensen and Meckling, 1976; Black and Scholes, 1973). More specifically, equity holders stand to benefit from projects' excess upside potential, by the virtue of their state-contingent risk-sharing-based contracts, while debt holders' benefits are predetermined contractually. Downside exposure, on the other hand, is limited by limited liability clauses and is largely borne by debt holders (Danielova et al., 2013; Wilson and Wu, 2010; MacMinn, 1987; Jensen and Meckling, 1976). The resulting distributional asymmetry in investment's payoffs can potentially encourage excessive risk taking on the part of equity holders. At the extreme, even negative NPV investments may be pursued (Hernández, Povel and Sertsios, 2014; Hellwig, 1998). Consequently, more safe assets are substituted with risky assets, giving rise to the notion of "asset substitution" (Harris and Raviv, 1991). The conflict ultimately leads to a transfer of wealth from debt holders to equity holders (Van Wijnbergen et al., 2013; Bushman et al. 2012; Esty, 1997 a & b).

Indeed, Galai and Masulis (1976) show that a risky undertaking increases debt holders' systematic risk while reducing it simultaneously for equity holders, when it is not backed by a proportionate increase in bank capital. The authors also demonstrate that the value of equity (E) increases with assets' volatility (σ); $\frac{\partial E}{\partial \sigma} > 0$. The larger the resultant increase in equity value, the greater the equity holder's incentive to shift risk (Galai and Masulis, 1976).

Risk shifting may occur in different informationally-inefficient contexts, beyond the classical debt-equity

relationship¹. This study, however, focuses on risk shifting in dual banking systems where Islamic and conventional banking coexists. In conventional banking depositors represent one class of debt holders and there exists a risk shifting moral hazard between them and the banks' equity holders.

The ideal Islamic banking system is unique in its proposition to separate commercial and investment banking activities, in conformity with the Islamic law of contract. As such, Amanah-based short-term demand deposits are supported with 100% reserves² and are exclusively maintained for safe keeping purposes. Investment banks, on the other hand, pursue their traditional intermediary role. They accept surplus funds on a profit-and-loss sharing basis (Mudharabah), and channel them to the real economy through projects that match depositors' risk and return profiles. Since the principal in profit-and-loss sharing contracts are not protected; no reserve is required for this segment of banking. The risk of bank runs is, thus, inherently muted and there is no role for deposit insurance (Mirakhor et al., 2012; Askari et al., 2012). As a result, the moral hazard problem, associated with the latter, is likely to be eliminated. At the same time, the risk of capital loss and the contingency of profits make investment account

¹ Risk shifting has also been analysed in the following contexts: money management (Basak, Pavlova and Shapiro, 2007), mutual funds industry (Huang, Sialm and Zhang, 2011), pension plans (Rauh, 2009), insurance (Karl and McCullough, 2012), and non-financial firms (Gilje, 2013; Eisdorfer, 2008).

² This is also the essence of the Chicago Plan, proposed in the aftermath of the great depression by leading American economists. The proposal advocates a 100% reserve against demand deposits and no deposit insurance for investment deposits (see Mirakhor et al., 2012; Askari et al., 2012; Benes and Kumhof, 2012, among others).

holders residual claimants of the Islamic banks¹ (Abedifar et al., 2013). This, in effect, reinforces their monitoring incentives and expose the banks to greater disciplinary withdrawal risk² (Beck, Demirgüç-Kunt and Merrouche, 2013; Van Wijnbergen et al., 2013; Abedifar et al., 2013). The possibility of adverse wealth transfer is also overcome by the dominance of residual claims, making risk shifting less potent³ (Esty, 1997). Given the above characteristics plus the Shari'ah requirement of real sector anchor and restrictions on the sale of debt and short selling, leverage is capped in Islamic banks (Van Wijnbergen et al., 2013). Altogether, these characteristics weaken Islamic banks' risk shifting incentives.

Even when Islamic banks adopt smoothing strategies to mitigate withdrawal risk, such as maintaining profit equalization reserves and investment risk reserves (Van Wijnbergen et al., 2013; IFSB, 2010), benefits from risk shifting are, still, lower. This is the case because the upside from high-risk projects is no longer monopolized by equity holders but is shared, in accordance to profit-and-loss sharing contract with the investment account holders.

4.2 Empirical literature

A growing body of empirical literature investigates risk shifting in the banking industry. It is, however, dominated by OECD countries related studies, pooled regression analyses and conventional models of banking. An important subset

¹ Please refer to the appendix for a graphical illustration of the resulting differences in deposits' payoffs.

² Also known as displaced commercial risk.

³ Ozerturk (2002) shows that no combination of debt and equity claims can induce the entrepreneur to choose a low risk strategy, except for pure equity.

does so with reference to option-based estimates of the fair value of deposit insurance¹ (See for example, Guizani and Watanabe, 2010; Bushman et al. 2012; Hovakimian, Kane, and Laeven 2003; Hovakimian and Kane, 2000; Duan, Moreau and Sealey, 1992; Pennacchi, 1987; Ronn and Verma, 1986; Marcus and Shaked, 1984). These works and others are founded on the conception that modern financial safety nets² initiate a lethal combination of reduced monitoring on the part of insured depositors, and increased protection of equity holders against downside risk. Both of which strengthen incentives to shift risk to depositors, deposit insurers and tax payers, in aggregate (Hovakimian et al., 2003).

Robert Merton is credited for developing the empirical foundation for this stream of risk shifting analysis. In his seminal 1977 paper, he describes deposit insurance as a put option issued by the deposit insurer to the banks' equity holders. The option value is shown to increase with asset risk and leverage (Duran and Lozano-Vivas, 2014). The introduction of quasi-flat deposit insurance is, therefore, argued to encourage risk shifting by failing to fully adjust the price for risk shifted (Bhattacharya and Thakor, 1993).

Recent empirical literature has, in general, confirmed the presence of moral hazard in the form of risk shifting by

¹ Deposit insurance contract creates multilateral principal-agent conflicts (Kane, 1995; Calomiris, 1999). Risk is shifted when banks succeed in increasing the risk-adjusted value of their deposit insurance, without being charged for the increase (Bushman et al. 2012) (see the third equation in the model section).

² Modern financial safety nets include implicit and explicit deposit insurance, solvency standards, public capital infusion, central bank's lender-of-last-resort facilities and emergency assistance from multinational institutions, such as the IMF.

deposit-taking banks (Bushman et al. 2012; Guizani and Watanabe, 2010; Hovakimian, Kane, and Laeven 2003; Hovakimian and Kane, 2000; Duan, Moreau and Sealey, 1992; Pennacchi, 1987). Cross-country variations in the intensity of risk shifting have been mainly ascribed to different institutional environments, different deposit insurance design features¹ and different regulatory and supervisory frameworks².

Other proxies have also been used to test for risk shifting, based on the assumption that a banks' balance sheet reflects its risk preferences, inter alia (Mitchener and Richardson, 2013). These include key balance-sheet ratios, such as the ratio of non-performing loans to assets, the ratio of risk-weighted assets to total assets and the Z-score³ (see, for example, Duran and Lozano-Vivas, 2014; Angkinand and Wihlborg, 2010; Aggarwal and Jacques, 2001). The first proxy is a common measure of credit risk. The latter two are broader in scope and

¹ Loss-control features such as risk-sensitive premiums, coverage limits, and coinsurance provisions are found to deter risk shifting incentives under deposit insurance (Hovakimian et al., 2003). The argument of some critics with regards to risk-sensitive premiums is worth-noting, however, as they argue that that the spread in premiums between the safest and riskiest banks has been insufficient to seriously dissuade risk shifting (Kaufman, 1994). Risk-sensitive premiums can only be effective "if a substantial premium loading is present" (Dong et al, 2013).

² Significant risk shifting is observed in countries with poor contract enforcement; property rights rules and governance systems that impede efficient public and private monitoring of financial institutions (Demirgüç-Kunt and Detragiache, 2002; Demirgüç-Kunt and Kane, 2002).

³ The Z-score is an inverse measure of overall risk that quantifies the distance to default based on book values. It is measured as $Z = \frac{E+ROA}{\sigma}$, where E is the equity-to-assets ratio, ROA is the return on total assets and σ is the standard deviation of the rate of return on assets (Duran and Lozano-Vivas, 2014).

serve as measures of overall risk. Landier et al. (2012) and Hooks and Robinson (2002), on the other hand, are amongst few researchers who directly analysed insured banks' asset compositions to detect risk shifting.

All in all, the incentive to shift risk is less pronounced for banks whose charter values are prohibitively high¹ (Gropp and Vesala, 2004; Keeley, 1990), whose shareholders have relatively high "skin in the game" (Talib, 2013) and whose depositors are actively monitoring (Diamond and Rajan, 2001). Attempts to align incentives include capital controls. However, stricter disclosure rules and increased capital requirements in regimes that weaken private monitoring and shift the burden of risk management to deposit insurers and other regulatory bodies have not been sufficient. Policy makers are urged to refocus on measures that alter banks' risks attitudes and increase depositors' disciplinary incentives² (Mitchener and Richardson, 2013; Rajan, 2006).

The efficacy of the above private and public controls, however, depends on informational, ethical³, and economic considerations (see for example Hovakimian et al., 2003; Hovakimian and Kane, 2000). A society's internal culture and ethical traditions are more important than external laws and regulations in shaping risk shifting incentives (Bernstein,

¹ Bank's charter value is an estimate of its growth opportunities. A high charter value dissuades excessive risk-taking by "increasing the cost of financial distress" (Demsetz et al., 1997). The estimate is positively related to anti-competitive regulations and is commonly proxied by the average market-to-book assets ratio (Galloway, Lee and Roden, 1997; Marcus and Shaked, 1984).

² Depositors may discipline banks by requiring higher rates of return and/or withdrawing their deposits (Demirguc-Kunt et al., 2009).

³ Risk shifting incentives may, therefore, vary with social capital, solidarity and ethicality of a given society.

2000). This notion further supports the hypothesised potential of Islamic banks in restraining undesirable risk shifting.

Turning to Islamic banking, risk shifting in Islamic banks remains largely under-researched, as compared to their conventional counterparts. The nascent industry has received increased research attention since the onset of the recent global financial crisis. Empirical literature, however, is focused on such areas as the efficiency and profitability of Islamic banks (see, for example, Abdul Rahman and Rosman, 2013; Hassan, Mohamad and Bader, 2008; Mokhtar, Abdullah and Alhabshi, 2008; Chong and Liu, 2009; Yudistra, 2004; El-Gamal and Inanoglu, 2002; Aggrawal and Yousef, 2000); profit dynamics (Beck, Demirgüç-Kunt and Merrouche, 2013; Chong and Liu, 2009); risk and stability (Bourkhis and Nabi, 2013; Abedifar, Molyneux and Tarazi, 2013; Čihák and Hesse 2010), among others. The overwhelming majority of these studies find no significant differences between Islamic and conventional banks in the researched areas. To the researcher's knowledge, there has been no attempt to assess risk shifting behaviour in Islamic banks. This study, therefore, contributes to a largely under-researched discipline of Islamic banking and offers first time coverage of OIC member states in the empirical risk shifting literature.

5. Research Objectives and Questions

In consideration to the centrality of risk-sharing in Islamic finance and the far-reaching repercussions of moral hazard, we empirically assess risk-shifting behaviour in Islamic banks and derive implications for the future of sustainable finance.

In particular, we test the hypothesis that Islamic banks have less incentive to shift risk, through answering the following questions:

1. Do banks' risk shifting behaviour depend on their underlying banking model; whether conventional or Islamic? and
2. What are the factors that determine the magnitude of risk-shifting?¹

6. The Model

Merton (1977) and Duan et al. (1992) models provide suitable grounds for testing risk shifting. They link the actuarial insurance subsidy received by a bank to its risk shifting behaviour² and infer risk shifting not only to depositors but also to taxpayers and the general public (Duran and Lozano-Vivas, 2014). We further extend the models to estimate the impact of Islamic banking on risk shifting behaviour. Risk-shifting occurs when banks increase the risk-adjusted value of the subsidy (IPP) by increasing the risk (σ_v) and/or the leverage of their assets "without internalizing the full cost of the increased insurance" (Bushman et al., 2012, P.5).

¹ While deterrents, such as monitoring by investment account holders, could reduce leverage or solicit higher capital, in response to increased risk, the change may not be sufficient to fully nullify the bank's risk shifting incentives (Bushman et al., 2012). We are particularly interested in examining Islamic-banking-variables, such as the magnitude and composition of funding (risk-sharing based deposits vs. fixed deposits).

² Other empirical models and common proxies for risk shifting have been disregarded, given concerns about their efficacy, precision and higher probability of measurement error (Hernández, Povel and Sertsios, 2014).

Where risk is measured by the standard deviation of the return on assets, the equation is modified as follows:

$$IPP_{it} = \beta_0 + \beta_1 IPP_{it-1} + \beta_2 \sigma_{vit} + \beta_3 \sigma_{vit} * IB + \beta_4 \sigma_{vit} * X_{it} + \varepsilon_5$$

where,

IPP_{it} is the actuarial value of insurance premium per dollar of insured deposits, $i = \text{bank}$ and $t = \text{time}$,

σ_{vit} is asset risk,

IB is a binary variable that takes the value of 1 if the bank is Islamic and 0 otherwise, and

X_{it} is a vector of bank-specific and country-specific control variables

ε is an error term.

Banks succeed in shifting risk when the net changes in σ_v increases the risk-adjusted value of insurance premium (IPP) (Duan et al., 1992). A positive estimate of the net effect of σ_v is, thus, consistent with observed risk-shifting. An estimate of $\beta_3 < 0$ would indicate that Islamic banking has a limiting effect on risk shifting. If banks find risk-shifting behaviour to be value maximizing, such that the net effect of $\sigma_v > 0$, they would manage their overall risk levels accordingly. On the other hand, if banks do not find risk shifting to be beneficial, they would refrain from taking excessive risk; as consequences will be borne by equity holders (Bushman et al., 2012).

In order to identify factors that influence the magnitude of risk shifting, a combination of the following bank and country-specific variables are considered:

1. Bank's capital ratio. On the one hand, an increase in equity can lower moral hazard problems, by exposing more of the banks' "skin in the game". On the other hand, it can increase banks' risk-taking capacity,
2. Bank's size. Large banks can benefit from both scale economies and diversification (Hughes et al., 2001). At the same time, they might be riskier, since they may try and exploit the Too-Big-To-Fail safety net subsidies (Kane, 2010).
3. Return on assets (ROA). To measure the general profitability of the bank.
4. Real GDP per capita's growth rate. Favourable economic conditions are expected to deter risk shifting behaviour (Laeven, 2002).
5. Rule of law. To control for the general institutional environment and the efficiency and the integrity of the country's legal system,
6. Lerner index. To measure the market power in the banking industry and
7. A stock market dummy that takes the value 1 when the country has a stock market and 0 otherwise.

The analysis is performed using two-step dynamic difference GMM to cater for the nature of Islamic banking data and overcome the potential dynamic panel bias resulting from a small timeframe. Orthogonal deviations are used to preserve the sample size in the presence of time gaps. The two step's standard errors are corrected using Windmeijer's (2005) correction procedure.

7. Data

The panel data set comprises more than 340 Islamic (75) and conventional (273) banks in 19 OIC member countries, where both Islamic and conventional banks coexist in dual banking systems. The sample period spans 2002-2013.

Banks must have at least three years of continuous observations to be included into our sample. Banking data is taken from the Bankscope database. Country-level data is derived from key World Bank global databases such as the World Development Indicators, and World Governance Indicators. IPP and σ_v , are unobservable but were estimated using option pricing methods¹ (Bushman et al., 2012).

The sample's descriptive statistics (Table 1) conform to the overwhelming majority of Islamic banking studies suggesting only marginal differences between Islamic and conventional banks. Whereas Islamic banks tend to be less levered and better capitalized, conventional banks are more profitable, less volatile and larger in size.

¹ The use of synthetic data is common in financial literature (Hovakimian et al., 2003).

Table 1: Sample's Descriptive Statistics

Islamic Banks				Quantiles				
Variable	n	Mean	S.D.	Min	.25	Mdn	.75	Max
IPP	571	0.02	0.08	0.00	0.00	0.00	0.00	0.97
D/V	571	60.29	20.41	1.30	51.63	65.23	74.47	111.08
σ_v	571	21.60	33.34	0.36	7.19	13.09	23.73	453.57
Size	571	5.3e+06	9.1e+06	20216.10	6.2e+05	2.2e+06	5.5e+06	7.5e+07
Capital	571	14.06	12.60	-77.21	7.52	11.19	17.53	82.61
RoE	563	10.09	31.63	-573.30	5.26	11.19	17.02	101.22

Conventional Banks				Quantiles				
Variable	n	Mean	S.D.	Min	.25	Mdn	.75	Max
IPP	2779	0.01	0.06	0.00	0.00	0.00	0.00	0.86
D/V	2779	65.28	15.03	1.43	58.21	68.25	74.93	156.53
σ_v	2779	18.26	23.23	0.27	6.95	12.66	20.59	362.40
Size	2779	8.5e+06	1.6e+07	36835.70	7.5e+05	2.3e+06	8.2e+06	1.2e+08
Capital	2779	11.70	7.68	-95.94	7.69	10.44	14.27	78.97
RoE	2731	13.62	34.06	-534.93	7.57	13.74	20.40	850.24

8. Estimation Results

Table 2 tabulates the estimation results. The net positive coefficient of σ_v is evident of risk shifting in the sampled banks and is consistent with the findings of the conventional literature on risk shifting. This suggests that banks' risk-shifting incentives are dominating regulators and depositors' disciplinary pressure. As far as the Islamic banking is concerned, the coefficient on the Islamic Banking interaction term (β_3) is negative. This implies that risk shifting benefits and incentives are lower in the case of Islamic banks. The magnitude, however, is not sufficient to fully nullify the overall risk-shifting incentives. This may, in part, justify the relative resilience of Islamic banks during the recent financial crisis (Hasan and Dridi, 2010) and hint, at the same time, at the weaknesses of the current

configuration of Islamic banking, which fail to fully discipline banks' risk shifting incentives.

With regards to our second research question, the strength of risk shifting incentives are found to be highly state-dependent, as suggested by earlier literature. Other things being equal, banks' size, profitability and market power inversely influence banks' risk shifting. In particular, the negative coefficient of Lerner Index (market power) is consistent with the lower risk-taking incentives of banks with higher charter values. Furthermore, banks in strong legal system with proper enforcement of rules shift less risk. The findings are inconclusive with regards to the influence of macroeconomic variables on banks risk shifting behaviour.

Table 2: Estimation Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IPP _{<i>it</i>}	0.418*** (0.0773)	0.601*** (0.0563)	0.398*** (0.0671)	0.395*** (0.0619)	0.297*** (0.0785)	0.222*** (0.0609)	0.191*** (0.0613)	0.219*** (0.0562)
σ_v	0.00483*** (0.00169)	0.00498*** (0.00255)	0.0899*** (0.0291)	0.102*** (0.0257)	0.0885*** (0.0314)	0.0403*** (0.0192)	0.0594*** (0.0206)	0.113*** (0.0194)
IB* σ_v		-0.000708 (0.00516)	-0.0153*** (0.00300)	-0.0164** (0.00759)	-0.0204** (0.00803)	-0.0120* (0.00671)	-0.0128* (0.00758)	-0.0120* (0.00716)
Size* σ_v			-0.00492** (0.00192)	-0.00539*** (0.00162)	-0.00374** (0.00169)	-0.00364*** (0.00127)	-0.00462*** (0.00141)	-0.00371*** (0.00124)
Capital* σ_v			-0.0000861 (0.00415)	0.000283 (0.00409)	-0.000619 (0.00343)	0.00220 (0.00287)	0.00194 (0.00258)	0.00219 (0.00312)
ROA* σ_v								-0.0160*** (0.00233)
GDP Growth* σ_v				-0.00222** (0.00105)	-0.000460 (0.00107)	-0.000482 (0.000827)	-0.000871 (0.00194)	-0.000634 (0.000985)
Rule of Law* σ_v					-0.0128*** (0.00471)	-0.00126 (0.00530)	0.00344 (0.00528)	-0.000991 (0.00523)
Stock Market* σ_v						0.0297*** (0.00609)	0.0328*** (0.00671)	0.0287*** (0.00602)
Lerner Index* σ_v						-0.00643 (0.00777)	-0.0125* (0.00730)	-0.00784 (0.00561)
F	20.08	44.68	28.98	25.31	23.78	11.41	9.715	13.08
No of observations	1783	1963	2642	2575	2575	1783	1696	1769
No. of banks	287	302	345	331	331	287	287	286
No. of instruments	45	66	180	181	254	189	190	210
AR(1) test	-3.13***	-3.70***	-3.40***	-3.40***	-2.95***	-2.94***	-2.89***	-3.25***
AR(2) test	-0.35	0.04	-0.57	-0.55	-1.14	-0.70	-0.79	-1.62
Hansen test	36.96	62.67	193.84	194.98	260.09	168.84	182.00	194.17

Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

9. Policy Implications

The evidence of risk shifting in Islamic banks calls for immediate remedial actions and regulatory reforms in the Islamic banking industry. The implementation of IFSA 2013 in Malaysia may provide significant impetus in this regard.

The empirical assessment, nonetheless, provides some useful insights regarding the way forward for sustainable finance. Though currently insufficient to fully nullify banks' risk shifting incentives, the deterring impact of Islamic banking is worth strengthening through the expansion of risk sharing and removal of risk transfer incentives in the present regulatory and supervisory framework. This could be achieved through market-oriented approach to incentivising risk sharing.

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11. List of Appendices

Appendix 1. Sample's Summary

	Country	No. of Banks	No. of IBs
1	Malaysia	39	16
2	Pakistan	30	8
3	United Arab Emirates	23	7
4	Bahrain	15	6
5	Bangladesh	35	5
6	Turkey	31	4
8	Yemen	9	4
9	Jordan	12	3
10	Saudi Arabia	12	3
11	Kuwait	9	3
12	Qatar	9	3
13	Iraq	7	3
14	Indonesia	55	2
15	Egypt, Arab Rep.	24	2
17	Syrian Arab Republic	11	2
18	Tunisia	15	1
19	Mauritania	6	1
20	Palestinian Territories	3	1
21	Brunei Darussalam	2	1
	Total	347	75