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Is optimal Islamic financial contract stabilizing? The perspective of a New Keynesian model with the financial accelerator

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ABSTRACT

This paper aims to inspect the stabilization aspects of Islamic financial contracts by drawing on a New Keynesian macroeconomic model with the financial accelerator. The model allows for shared responsibilities on both the assets and liabilities sides of the Islamic banks that resemble, in principle, the two-tiered *Mudarabah* financing on the asset side and profit-sharing investment accounts on the liability side. The implied optimal Islamic financial contract argues that payoff distribution between entrepreneur and bank is contingent on the macroeconomic environment via the entrepreneur's leverage, whereas that between bank and investors is endogenous to bank's capital and leverage. Compared to the conventional debt contract with a predetermined return, we find that an Islamic financial contract amplifies shocks as much as conventional financial contracts do, if not to a greater extent. The impacts on entrepreneurs' and banks' leverage, however, depend largely on the source of the shock and are opposite to those observed under conventional debt contract. Whereas favorable aggregate supply and monetary shocks increase the overall leverage, shocks favorably hitting preference and marginal efficiency of investment reduce the leverage. The underlying mechanism is the shock-shifting *ex post* payoff distribution between creditors and debtors that shapes the cost of the external finance and, thus, leverage.

1. Introduction

The world's appetite for Islamic finance has grown rapidly in recent years, not only due to religious commitment to Shari'ah-compliant financial products in the Muslim world but also as a catalyst for more inclusive financial development in countries with Muslim populations of non-negligible sizes. The onset of the global financial crisis of 2007–2008 further led to the increased interest in Islamic finance, even outside the Muslim world, as people seek an alternative, resilient banking system. While Islamic banking is important on its own as institutional support for sustainable growth in developing Southeast Asian, South Asian, and Middle Eastern and North African countries (see, for instance, Imam and Kpodar, 2016; Gheeraert, 2014), it is exactly the stabilization aspect of Islamic banking that resembles the characteristics of “partnership”, “equity financing”, “profit-and-loss sharing”, or “shared responsibilities”, regardless of what it is called, that is appealing to the non-Muslim world.

In fact, empirical evidence in support of this stabilization aspect has begun to accumulate. Ibrahim (2016), for instance, found that Islamic financing decisions are a-cyclical at worst and counter-cyclical at best, leaving banks' lending fairly stable even during bad times. This is certainly in contrast to the “when-it-rains-it-pours” nature of

conventional bank lending. Kabir, Worthington, and Gupta (2015), who compared the credit risk of Islamic banks to that of conventional banks, found that the former has considerably lower credit risk. Beck, Demirguc-Kunt, and Merrouche (2013) also found that Islamic banks are better capitalized and are less likely to dis-intermediate during crises. Thus, as a result, the stock prices of listed Islamic banks have performed better during the recent crisis (see, also, Azmat et al., 2017). Narayan and Phan (2017) have neatly taken stock of the recent literature developments.

The picture, however, is not unanimously rosy. Doumpos, Hasan, and Pasiouras (2017), for instance, provided a more cautious assessment, as they found that the difference of the overall financial strength between Islamic and conventional banks is not statistically significant. By finding that Islamic instruments were preferred over conventional debt by less profitable firms, Minhat and Dzolkarnaini (2017) suggested that Islamic financiers' likely underestimation of the agency cost of financing can be damaging in the absence of proper risk management. Islamic banking development, as Gheeraert and Weill (2015) argued, does not always favor macroeconomic efficiency.

Against these contradictory empirical findings, we need an economic explanation that can coherently rationalize the (lack of) macro-stabilizing

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effect of Islamic banks. The problem is “how ‘Islamic’ is Islamic banking?” has long been perturbing the profession. The oft-cited Chong and Liu (2009) found that only 0.5% of all Islamic loan advances in Malaysia are based on the profit-and-loss paradigm of *Mudarabah* and *Musharaka*, despite a predominant *Mudarabah* deposit. As Islamic banks use a conventional banking model that relies on profit-and-efficiency-maximizing maturity transformation business, Islamic banks’ business model is not dissimilar to those of conventional banks (Azmat et al., 2015; El-Gamal, 2002; Khan, 2010; Beck et al., 2013). Furthermore, in a market intensely competing for funding, the Islamic investment rate has to pivot to the conventional bank deposit rate, making Islamic bank financing functionally indistinguishable from conventional banking.

It is then natural to ask how “partial” Islamic bank model can exhibit a stabilizing role that is supposed to occur only in a strictly followed profit-and-loss paradigm. To what extent the business cycle properties and resilience of Islamic banks can be attributed to its Islamic principles if it is functionally indistinguishable from conventional banking? Probing deeper into the question, it is even more interesting to know whether and in what way the risk-sharing nature of “full” Islamic bank financing can dampen the credit cycle by dis-incentivizing debt leverage. To address these questions, we need a modern macroeconomic model of Islamic bank financing.

This paper takes up the challenge by embedding Islamic financial contracts in a New Keynesian dynamic stochastic general equilibrium model with the financial accelerator of Bernanke et al. (1999), henceforth BGG,¹ along the spirit of Carlstrom, Fuerst, Ortiz, and Paustian’s (2014) and Carlstrom, Fuerst, and Paustian’s (2016) theory of privately optimal contract. In contrast to BGG-type financing, in which a lump-sum return on lending and deposit is predetermined, a risk-sharing characteristic appears on both the assets and liabilities sides of the Islamic banks. We model two-tiered *Mudarabah* financing in terms of banks’ lending to entrepreneurs and provision of profit-sharing investment accounts (PSIA) to investors. While the repayment rate is predetermined based on the expected profitability of real undertakings, the distribution of the expected payoff to entrepreneurs and lenders is determined *ex post* and is conditional on the macroeconomic environment. Meanwhile, PSIA investors receive a return that is also determined *ex post* by the profitability of the bank. For that, we derive an optimal Islamic loan contract with indexation to the entrepreneur’s leverage and the optimal deposit contract indexed to the bank’s capital and leverage.

We are especially interested in addressing two fundamental questions: how are shocks propagated throughout the economy under optimal Islamic financial contract? Additionally, does the optimal Islamic financial contract dampen debt leverage? Previewing our results, we surprisingly find that Islamic financial contracts amplify shocks as much as conventional financial contracts do, if not to a greater extent, in the benchmark model with perfectly substitutable conventional and Islamic deposits and with Islamic loan as the only external finance available. The impact on the entrepreneur’s and bank’s leverage, however, depends largely on the source of shock. Whereas expansionary total factor productivity and monetary shocks increase the overall leverage, the favorable preference and marginal efficiency of investment shocks reduce the leverage.

To the best of our knowledge, this is the first paper to integrate Islamic financial contracts into a full-fledged dynamic stochastic general equilibrium to provide a modern macroeconomic view of Islamic bank financing. By shedding light on the macroeconomic ingredients for and implications of an optimal Islamic financial contract, we find that the payoff distribution

between creditors and debtors determined *ex post* resembles a buffer that absorbs the impact of an adverse shock hitting the economy.

Intuitively, when an unfavorable shock erodes the payoff of an investment project, the threshold below which the entrepreneurs cannot survive climbs. The resultant smaller share of payoff that goes to the borrowing entrepreneurs, as the shared-responsibility characteristic of Islamic financial contract promises, implies a falling promised repayment rate to the bank. Unlike conventional debt contract with a pre-determined loan repayment rate, this allows the entrepreneurs to hold on to more net worth channeled from PSIA investors through the bank to avoid default.

Against this backdrop, our model is effectively consistent with the existing empirical findings, as surveyed by Narayan and Phan (2017), wherein the default rate of Islamic loans is lower (Baele et al., 2014), Islamic banks are more resilient (Pappas et al., 2016; Daher et al., 2015) and have higher intermediation ratio (Beck et al., 2013), Islamic bank lending is not pro-cyclical (Ibrahim, 2016), and Islamic banks are more inclined toward financing small and medium enterprises, which are more likely to fall below the productivity threshold (Aysan et al., 2016).

Another implication of the model that deserves proportional attention is its flexibility to house different modes of Islamic financial contract, i.e., *Musharakah* versus *Mudarabah* contracts, under one roof to inspect the risk-sharing behavior, lending-borrowing dynamics, and business cycle analysis. We believe that this is an important theoretical milestone to accomplish if we intend to establish Islamic financial arrangement as a rigorous alternative to the conventional financial contract. It goes without saying that the model can then be used to design optimal Islamic financial regulatory frameworks for different types of contract. Finally, by painting Islamic bank financing with modern macroeconomic brushstrokes, we hope to bridge the scholar community from both sides for the sake of both Islamic and conventional banking development.

The paper is organized as what follows. Section 2 elaborates the macroeconomic model of two-tier *Mudarabah* financing that emphasizes on shared responsibilities. The model is taken to Malaysia’s data by using Bayesian approach in Section 3. Through the estimated model in Section 4, shock transmission mechanisms and debt leverage implication of Islamic financial contract are studied from comparative point of view. Section 5 concludes with policy remark.

2. A model of shared-responsibility Islamic financial contract

There are four types of differentiated agents in the model economy: a representative household, a unit continuum of differentiated final goods firms and of entrepreneurs producing capital, and a lender. In the first three sub-sections we will lay out the standard New Keynesian model for household and final goods firms before proceeding to the discussion on the Islamic financial contract.

2.1. Household

The representative household works for final goods firms with compensations w_t and consumes a bundle of differentiated final goods $C_t (= (\int_0^1 c_t^{1-1/\varepsilon} dt)^{\varepsilon/(\varepsilon-1)})$. She also accumulates wealth in the form of conventional D_t and Islamic deposits $D_{\mathcal{I},t}$ (which can be viewed as profit-sharing investment account (PSIA) typically offered by Islamic banks), and government bonds B_t . Preferences that takes the form

$$u(C_t, L_t) = \mathbb{E}_0 \left\{ \sum_0^\infty \beta^t e^{\gamma_{\mathcal{I},t}} \left(\frac{C_t^{1-\sigma}}{1-\sigma} - \Theta \frac{L_t^{1+\chi}}{1+\chi} \right) \right\}$$

will be maximized given the following budget constraint

$$C_t + \frac{D_t + D_{\mathcal{I},t} + B_t}{P_t} = w_t L_t + (1 + \gamma_{D,t-1}) \frac{D_{t-1}}{P_t} + (1 + \gamma_{\mathcal{I},t-1}^D) \frac{D_{\mathcal{I},t-1}}{P_t} + (1 + r_{t-1}) \frac{B_{t-1}}{P_t} + \Pi_t$$

¹ A financial accelerator refers to a financial feedback loop, through which a small change in financial markets can produce a disproportionately large change in real economic conditions. The underlying mechanism is the collateralized assets, which usually take the form of assets being acquired or investment project for which the loan is taken up. Collateral is necessitated due to asymmetric information between lenders and borrowers, as lenders are less likely to be certain about the reliability of any given borrower. Suppose a shock hits that reduces the net worth of the investment project. The resulting deterioration in the credit worthiness of the firms undercuts their ability to borrow, which, in turn, undermines the sustainability of the investment project and their net worth.

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