SME's Lending and Islamic finance. Is it a "win-win" situation?

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Outline

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Motivation

- Small and Medium enterprises (SMEs) are key drivers in economic development, representing more tha 90% of businesses in many economies.
- Access to finance by SMEs is vital for SMEs to eliminate hurdles to growth (Beck and Demirguc-Kunt 2006).
- The strand of literature comparing between Islamic and conventional banks in terms of SMEs lending is scarce in general.
- Signifcant increase in Lending to SMEs by Islamic Banks.
- There are structural and operational differences between Islamic and Conventional Banks. This is basically due the significant differences in lending products.
- Conventional banks adopt *hard* information to lend to corporates (*Transactional lending*) whereas *soft* information is used to lend to SMEs (*Relationship lending*).
- Islamic banks use *Murabaha* contracts to lend to borrowers- corporates or SMEs.
- The *Murabaha* contract (Sale + mark-up) creates a *collateral by contract* to the client against the loan (Shaban et al. 2014).

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Objectives

- We investigate whether there is "win-win" situation in Islamic banks' lending to SMEs.
- We examine prices, outputs and profits of two types of banks (Islamic vs conventional) competing in a Bertrand framework, assuming product differentiation and cost asymmetry.
- This allows us to capture the effect of differences in lending techniques on prices and market share.

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The role of collateral in lending

- The collateral can be considered as a substitute for the actual risk evaluation of a borrower. Thus, banks may perform less screening for the projects they finance [*the lazy bank hypothesis*] (Manove et al. 2001).
- The collateral may complement screening and monitoring activities. In the presence of other claimants, the lender's incentive to monitor the borrower is reduced due to *the informational free-rider problem* (Longhofer and Santos 2000, Rajan and Winton 1995).
- If the value of the collateral is too high relative to the lender's claim, the lender has no incentive to monitor regardless of the borrower's business conditions (Rajan and Winton 1995).
- The collateral requirements are negatively correlated with the duration of bank-borrower relationship (Boot and Thakor 1994).

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Murabaha vs Relationship lending

- The unique structure of a *Murabaha* contract provide incentive to Islamic banks to exprience short-term set up for relationship banking.
- The process of lending to SMEs through a *Murabaha* lending is likely shorter and comprises lesser cost to the Islamic bank compared to relationship lending by conventional bank. This in turn will have cost efficiency implication on the Islamic banks.
- The *Murabaha* lending product can be clearly recognised by borrowers (SMEs) as a differentiated product, creating a *"collateral by contract"* to the borrower.

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The Model

- We consider the model by Singh and Vives (1984) and Zanchettin (2006).
- A representative SME has a strcitly concave quadratic utility function U of the two lending products l_1 (loan from an Islamic bank) and l_2 (loan from a conventional bank) and a linear function of a numeraire good, m

$$U = \alpha_1 l_1 + \alpha_2 l_2 - \frac{1}{2}\left(l_1^2 + l_2^2 + 2\gamma l_1 l_2\right) - (1 + r_1)l_1 - (1 + r_2)l_2, \qquad (1)$$

  where r_1 denotes the effective interest rate charged by the Islamic bank and r_2 * denotes the interest rate charged by the non-Islamic bank.
- The parameter $0 \leq \gamma \leq 1$ in (1) represents the degree of product differentiation.
- If $\gamma = 0$ both banks operate as monopolists in independent markets (Zanchettin 2006).
- If $\gamma = 1$ both lending products are identical. In the sequel we focus upon the case $0 < \gamma < 1$.
- The parameters α_1 and α_2 denote the extent to which the loans lead to meaningful economic activity.

*Religious considerations in Islamic banking forbid the charging of interest. However, a pre-determined effective interest rate can be charged that is still Shariah compliant (Chong and Liu 2009)

The Model (cont'd)

- The utility function in (1) generates the following system of linear demand functions:

$$l_i = \frac{1}{1-\gamma^2}\left[\alpha_i - 1 - r_i - \gamma(\alpha_j - 1 - r_j)\right] \quad [i,j = 1,2;\ i \neq j]. \tag{2}$$

- In the case where $\gamma < 1$ this can be inverted to give

$$r_i = \alpha_i - l_i - \gamma l_j - 1. \tag{3}$$

- In terms of the supply side of the market the Islamic and non-Islamic banks offer loan products l_1 and l_2 respectively.Both banks face a linear cost function with marginal costs $c_1 < \alpha_1$ and $c_2 < \alpha_2$.
- Thus the cost of the loans is assumed to be less than the value of the economic activity that the lending supports.

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A "win-win" situation?

- *A win-win situation?* Suppose that the SME has to wait time T_1 from the Islamic bank and time T_2 from the non-Islamic bank before accessing fund. The structure of the *Murabaha* contract is such that it is assumed that $T_1 < T_2$.
- Suppose that g represents the growth rate associated with a project funded by the loan and T denotes the completion time of the project. This delay in accessing funds gives rise to the following SME opportunity cost (O-C):

$$\text{O-C}_1 = e^{gT} - e^{g(T-T_1)},\ \text{O-C}_2 = e^{gT} - e^{g(T-T_2)} \text{ and } \text{O-C}_1 < \text{O-C}_2. \quad (4)$$

- The potential win-win situation is illustrated by looking at the cost from the bank's perspective. Suppose that the bank's monitoring cost function is given by

$$c_i = \text{Fixed Cost}\left[e^{-\lambda \text{Collateral}}\right]. \quad (5)$$

The banks' cost function

- The cost function in equation (5) abstracts important real-world cost implications of collateral-based lending (Rajan and Winton 1995). Further, from equation (5) and the discussion of collateral-based lending it follows that we must have

$$c_1 < c_2. \tag{6}$$

- Suppose further that the monitoring structure and the potential benefits associated with the *Murabaha* contract, collateral, managerial control and lack of information asymmetry, may also lead to a higher growth rate, $g_1 > g_2$ say.
- However, it is assumed that the additional growth benefits are relatively modest $g_1 < g_2 T_2/T_1$ say. In this case the associated opportunity cost satisfies a modified version of equation (4) with

$$\text{O-C}_1 = e^{g_1 T} - e^{g_1(T-T_1)},\ \text{O-C}_2 = e^{g_2 T} - e^{g_2(T-T_2)} \text{ and } \text{O-C}_1 < \text{O-C}_2. \tag{7}$$

Differentiated lending products

- Further, the economic value of the associated loans satisfies

$$\alpha_1 = e^{g_1(T-T_1)} > \alpha_2 = e^{g_2(T-T_2)}. \tag{8}$$

- Equation (8) also means that we may assume that $\alpha_i > 1$ so that borrowing at a zero rate of interest would generate positive economic activity.
- In the sequel equations (6) and (8) motivate two natural considerations of interest:
  1. Pure cost advantage $\alpha_1 = \alpha_2 = \alpha$, $c_1 < c_2$.
  2. Additional quality advantage $\alpha_1 > \alpha_2 = \alpha$, $c_1 < c_2$.

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First-stage competition over price

- The price competition between Islamic and non-Islamic banks in a Bertrand competition framework

Proposition 1

In the Bertrand equilibrium the market share of the Islamic bank is given by

$$\frac{l_1}{l_1 + l_2} = \frac{2\alpha_1 - \alpha_2\gamma + \gamma c_2 + (\gamma^2 - 2)c_1 - \alpha_1\gamma^2}{[2 - \gamma - \gamma^2][\alpha_1 + \alpha_2 - c_1 - c_2]}. \tag{9}$$

- The following propositions establish a theoretical basis by which Islamic banks can gain a foothold in the lending market to SMEs.

Proposition 2

If they enjoy a pure cost advantage then the equilibrium market share of the Islamic bank is strictly positive.

First-stage competition over price (cont'd)

Proposition 3

As the quality advantage increases the market share of the Islamic bank increases.

- Propositions 2-3 above outline a clear theoretical basis for Islamic banks to enjoy substantial market share in the lending market to SMEs.
- Proposition 4 gives a stronger result and outlines conditions under which, in principle, the Islamic bank can dominate the entire market.
- This result also motivates the question of a second-stage competition.

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First-stage competition over price (cont'd)

Proposition 4

If $c_2 > c_{Thresh}$ *where*

$$C_{Thresh} = \alpha_2 - \frac{\alpha(\alpha_1 - c_1)}{2 - \gamma^2} \tag{10}$$

then in Bertrand equilibrium the market share of the non-Islamic bank is zero. With a pure cost advantage

$$C_{Thresh} = \frac{\alpha[2 - \gamma^2 - c_1 - \alpha]}{2 - \gamma^2} \tag{11}$$

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First-stage competition over price (cont'd)

- Suppose that that we have the constraint $r_1 \leq r_{max}$ [†].
- The implications this has for long-run market share under price competition are described below.

Proposition 5

In the long-run the market share of the Islamic bank satisfies
(i) [Best case scenario]

$$\frac{l_1}{l_1 + l_2} \leq \frac{\alpha_1 - \alpha_2\gamma + \gamma(1 + r_2) - 1}{(1 - \gamma)[\alpha_1 + \alpha_2 - 2 - r_2]}$$

(ii) [Worst case scenario]

$$\frac{l_1}{l_1 + l_2} \geq \frac{\alpha_1 - \alpha_2\gamma + \gamma(1 + r_2) - (1 + r_{max})}{(1 - \gamma)[\alpha_1 + \alpha_2 - 2 - r_{max} - r_2]}.$$

[†]Religious considerations in Islamic banking forbid the charging of interest. However, a pre-determined effective interest rate can be charged that is still Shariah compliant (ChongChong and Liu (2009). Net interest (returns) charged by Islamic banks are discussed in Ahmed et al. (2002) with the maximum interest rate being 21.4%.

Second-stage competition over market share

- We analyse market share in a Cournot equilibrium whereby both Islamic and non-Islamic banks compete over market share.
- In our model this represents an important second stage of competition whereby non-Islamic banks may respond to losing substantial market share as seems possible given both the recent growth in Islamic finance and the theoretical results laid out earlier.

Proposition 6

In Cournot equilibrium we have that

$$l_1 = \frac{2\alpha_1 - \gamma\alpha_2 + \gamma c_2 - 2c_1}{4 - \gamma^2}; \; l_2 = \frac{2\alpha_2 - \gamma\alpha_1 + \gamma c_1 - 2c_2}{4 - \gamma^2}.$$

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Second-stage competition over market share (cont'd)

- In the sequel we examine welfare considerations and ask if a second-stage competition over market share may lead to the reduced availability for alternative Islamic banking products for SMEs.
- From an economic perspective this reduces to a comparison of the properties of Bertrand and Cournot equilibria (Singh and Vives 1984, Zanchettin 2006).
- From the model laid out earlier it follows that the total Islamic banking loans is given by $l_1 + \gamma l_2$.
- In the sequel we concentrate on the case $\alpha_1 = \alpha_2$.
- The following proposition suggests that if Islamic and non-Islamic banks compete under market share, then the amount of alternative Islamic finance available as loans to SMEs may be reduced.

Proposition 7

Under Cournot equilibrium the total amount of Islamic finance loans available to SMEs is reduced.

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Conclusion

- Bank lending to SMEs seems to be tailor made for Islamic banking practises based around relationship lending as opposed to other more conventional forms of debt financing.
- A key competitive benefit of this approach is a pure cost advantage brought about by reduced monitoring costs.
- However, the nature of the contract may also provide opportunities for enhanced growth and an additional quality advantage based around the holding of collateral, greater managerial experience and reduced information asymmetries.

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Conclusion (cont'd)

- A pure cost advantage should provide Islamic banks with a foothold in the market for lending to SMEs.
- An additional quality advantage means that this advantage can be more intense in the sense that the market share of Islamic banks could increase dramatically in principle capturing the whole of the market.
- However, our model predicts that in a second-stage Islamic and non-Islamic banks will compete over market share.
- This has important implications for policy and for development finance as it is predicted that in competing for market share the amount of Islamic finance lending available to SMEs will decrease.

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Appendix I

Proof of Propostion 1

Each firm chooses r_i to maximise

$$\begin{aligned}
\text{Profit} &= [\text{Price} - \text{Cost}] \times \text{Quantity of loans} \\
&= [1 + r_i - c_i] l_i \\
&= [1 + r_i - c_i] \frac{1}{1-\gamma^2} [\alpha_i - 1 - r_i - \gamma(\alpha_j - 1 - r_j)] \\
&\propto \frac{r_i}{1-\gamma^2} [\alpha_i - 1 - \gamma(\alpha_j - 1 - r_J) - 1 + c_i] - \frac{r_i^2}{1-\gamma^2}
\end{aligned}$$

Differentiating and equating to zero gives

$$r_i = \frac{\alpha_i - 1 - \gamma(\alpha_j - 1 - r_j) + c_i - 1}{2}. \tag{A.1}$$

Appendix II

So

$$
\begin{aligned}
[4-\gamma^2]r_1 &= 2\alpha_1 - 2 - 2\alpha_2\gamma + 2\gamma + \alpha_2\gamma - \gamma - \alpha_1\gamma^2 + \gamma^2 + \gamma c_2 - \gamma + 2c_1 - 2 \\
&= 2\alpha_1 - \alpha_2\gamma - \alpha_1\gamma^2 + \gamma^2 - 4 + \gamma c_2 + 2c_1 \\
r_1 &= \frac{2\alpha_1 - \alpha_2\gamma - \alpha_1\gamma^2 + \gamma^2 - 4 + \gamma c_2 + 2c_1}{4-\gamma^2} \\
r_1 &= \frac{2\alpha_1 + \gamma c_2 + 2c_1 - \alpha_2\gamma - \alpha_1\gamma^2}{4-\gamma^2} - 1 \qquad \text{(A.2)}
\end{aligned}
$$

By symmetry

$$
r_2 = \frac{2\alpha_2 + \gamma c_1 + 2c_2 - \alpha_1\gamma - \alpha_2\gamma^2}{4-\gamma^2} - 1. \qquad \text{(A.3)}
$$

Differentiating (1) and equating to zero it follows that

$$
\begin{aligned}
l_1 &= \alpha_1 - \gamma l_2 - (1 + r_1) \qquad \text{(A.4)} \\
l_2 &= \alpha_2 - \gamma l_1 - (1 + r_2). \qquad \text{(A.5)}
\end{aligned}
$$

Appendix III

Combining equations (A.2-A.5) it follows that

$$l_1 = \frac{2\alpha_1 - \alpha_2\gamma + \gamma c_2 + (\gamma^2 - 2)c_1 - \alpha_1\gamma^2}{(4 - \gamma^2)(1 - \gamma^2)}. \tag{A.6}$$

By symmetry

$$l_2 = \frac{2\alpha_2 - \alpha_1\gamma + \gamma c_1 + (\gamma^2 - 2)c_2 - \alpha_2\gamma^2}{(4 - \gamma^2)(1 - \gamma^2)}. \tag{A.7}$$

The stated result follows noting that when forming the fractions $l_1/(l_1 + l_2)$ the denominators will cancel. □

Appendix IV

Proof of Proposition 2

In this case the market share of the Islamic bank given by equation (9) becomes

$$\begin{aligned}
\frac{l_1}{l_1+l_2} &= \frac{\alpha(2-\gamma)+\gamma c_2+(\gamma^2-2)c_1}{2\alpha-c_1-c_2} \\
&> \frac{\alpha(2-\gamma)+\gamma c_1+(\gamma^2-2)c_1}{2\alpha-c_1-c_2} \\
&= \frac{-(\gamma^2+\gamma-2)(\alpha-c_1)}{2\alpha-c_1-c_2} \geq 0.
\end{aligned}$$

□

Appendix V

Proof of Proposition 3

Let $\alpha_2 = \alpha$ and assume that $\alpha_1 > \alpha$. The market share of the Islamic bank given by equation (9) becomes

$$\frac{I_1}{I_1 + I_2} = \frac{2\alpha_1 - \alpha\gamma + \gamma c_2 + (\gamma^2 - 2)c_1 - \alpha_1\gamma^2}{[2 - \gamma - \gamma^2][\alpha_1 + \alpha - c_1 - c_2]}. \tag{A.8}$$

Differentiating (A.8) we have that

$$\frac{\partial}{\partial \alpha_1}\left(\frac{I_1}{I_1 + I_2}\right) = \frac{[2 + \gamma - \gamma^2](\alpha - c_2)}{[2 - \gamma - \gamma^2]^2[\alpha_1 + \alpha - c_1 - c_2]} > 0. \tag{A.9}$$

□

Appendix VI

Proof of Proposition 4

Suppose that the market share of the non-Islamic bank is 0. It follows from (A.7) that

$$\begin{aligned} 0 &= 2\alpha_2 - \alpha_1\gamma + \gamma c_1 + (\gamma^2 - 2)c_2 - \alpha_2\gamma^2, \\ c_2(\gamma^2 - 2) &= \alpha_2\gamma^2 + \alpha_1\gamma - \gamma c_1 - 2\alpha_2, \\ c_2 &= \alpha_2 - \frac{\gamma(\alpha_1 - c_1)}{2 - \gamma^2}. \end{aligned}$$

Since by equation (A.7) the market share is a decreasing function of c_2 the result follows. □

Appendix VII

Proof of Proposition 5

From equations (A.4-A.5) the market share of the Islamic bank satisfies

$$\frac{l_1}{l_1+l_2}=\frac{\alpha_1-\alpha_2\gamma+\gamma(1+r_2)-(1+r_1)}{(1-\gamma)[\alpha_1+\alpha_2-2-r_1-r_2]}. \tag{A.10}$$

The function given by equation (A.10) is a decreasing function of r_1. Using $r_1 \geq 0$ it follows that

$$\frac{l_1}{l_1+l_2}\leq\frac{\alpha_1-\alpha_2\gamma+\gamma(1+r_2)-1}{(1-\gamma)[\alpha_1+\alpha_2-2-r_2]}$$

Similarly, using $r_1 \leq r_{max}$ it follows that

$$\frac{l_1}{l_1+l_2}\geq\frac{\alpha_1-\alpha_2\gamma+\gamma(1+r_2)-(1+r_{max})}{(1-\gamma)[\alpha_1+\alpha_2-2-r_{max}-r_2]}.$$

□

Appendix VIII

Proof of Proposition 6

Under Cournot each bank chooses l_i to maximise

$$[\text{Price-Cost}] \times \text{Quantity} = [\alpha_i - l_i - \gamma l_j - c_i] l_i$$

Differentiating and equating to zero gives

$$l_1 = \frac{\alpha_1 - \gamma l_2 - c_1}{2}; \; l_2 = \frac{\alpha_2 - \gamma l_1 - c_1}{2}. \tag{A.11}$$

Solve (A.11) to give

$$l_1 = \frac{2\alpha_1 - \gamma\alpha_2 + \gamma c_2 - 2c_1}{4 - \gamma^2}; \; l_2 = \frac{2\alpha_2 - \gamma\alpha_1 + \gamma c_1 - 2c_2}{4 - \gamma^2}. \tag{A.12}$$

□

Appendix IX

Proof of Proposition 7

Under Bertrand equilibrium it follows from equations (A.2) and (A.4-A.5) that the total Islamic finance lending to SMEs is given by

$$B_{loans} = I_1 + \gamma I_2 = \alpha - (1 + r_1) = \frac{2\alpha + \alpha\gamma - 2c_1 - \gamma c_2}{4 - \gamma^2}.$$

Under a Cournot equilibrium it follows from (A.12) that the total Islamic finance lending to SMEs is given by

$$\begin{aligned} C_{loans} &= I_1 + \gamma I_2 = \frac{2\alpha + \alpha\gamma - \gamma c_2 + (\gamma^2 - 2)c_1 - \alpha\gamma^2}{4 - \gamma^2} \\ &= B_{loans} + \frac{\gamma^2 c_1 - \alpha\gamma^2}{4 - \gamma^2} \\ &< B_{loans} \text{ since } \alpha > c_1. \end{aligned}$$