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

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Abstract

Information asymmetry is a common feature that hinders lending to small and medium enterprises (SMEs). In the last decade, the growth in Islamic banks lending to SMEs was overwhelming to the extent that it prompted practitioners to regard this as a" win-win" situation. Unlike a conventional bank that mainly resorts to relationship banking to SMEs, an Islamic bank uses a *Murabaha* contract that creates a "*collateral-by-contract*" to the borrower. Such distinct lending approaches by the two types of banks have an implication on banks' cost curves that arise from differences in monitoring cost. In this article, we develop a two-stage competition model to investigate the growth in SMEs lending by Islamic banks. In our theoretical model, Islamic and conventional banks compete with prices at the first stage (Bertrand framework) and with loan output at the second stage (Cournot framework). Our result reveal that in price competition an Islamic bank will gain market share initially due to its differentiated product. However, in the second stage, the amount of lending to SMEs by Islamic banks decreases due to market share competition.

1 Introduction

There is substantial evidence in the literature that access to finance by small and medium enterprise (SMEs) is vital for SMEs to eliminate hurdles to growth (Beck and Demirguc-Kunt, 2006). A number of factors including information asymmetry, lack of collateral and inexperienced management are significant challenges to SMEs access to external funds (among others Shaban et al, 2014; Owualah, 1990; Petersen and Rajan, 1994). Banks as financial intermediaries are expected to be one of the main providers of funds to SMEs, in the similar way that they provide lending to households, government entities and large corporations. To supply lending to various customer categories, banks incur costs in establishing lending systems and processes in place. For example, it is commonly known that banks adopt hard information (financial statement analysis) to lend to corporates. On the other hand, they use soft information (relationship banking) lending to SMEs. Serving these two types of customer categories simultaneously have significant implications on bank costs and organisational structure. The elevation in banks costs due to the adoption or expansion in relationship banking is one of the key factors that hinder banks' willingness to lend to SMEs (Berger and Udell, 2002).

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The strand of literature comparing between Islamic and conventional banks in terms of SMEs lending is scarce in general. More importantly, the literature on Islamic banking tends to focus upon discussing the *Shariah* differences between conventional and Islamic banking activities. In so doing the literature overlooks an important key difference between the two banking paradigms. Namely, an Islamic bank does not need to go through the same structural and operational complexities that a conventional bank does when lending to SMEs. This is indeed due to the unique structure of its lending contract (i.e. *Murabaha*) and organisational structure. Unlike conventional bank loans, the Islamic bank's *Murabaha* contract (cost plus mark-up)* does not require an Islamic bank to set up a relationship banking system nor employ specialist personnel to deal with SMEs. In fact, there is no juristic *Shariah* reason that requires discrimination between the lending processes to large or small firms. Controversially, doing so may be considered as a violation to the *Shariah* law that refrains discrimination.

The *Murabaha* contract resembles an Asset Based Lending (ABL) contract, however, in a reverse mode. The collateral asset† is created by signing a lending agreement between the borrower and the Islamic bank. In other words, it creates a *collateral-by-contract* to the borrower (Shaban et al, 2014). This allows Islamic bank to avoid the high due diligence cost and evaluation errors of the asset since the contract is based on an indisputable market value of a new asset. Islamic bank can undertake the process of contacting the vendor directly to receive the purchasing quota (price=market value) or delegate the process to the buyer (borrower). This feature, in particular, has a diminishing implication on Islamic bank's cost compared to the conventional counterpart. It is common knowledge both in the literature and in the banking industry that the cost (monitoring and due diligence) associated with the ABL ‡ is higher than the relationship lending in a conventional banking context. Unlike *Murabaha* contracts lending, ABLs are mainly used by a borrower to finance working capital rather than new capital investment.

The literature on lending elaborates that the presence of collateral in a lending agreement has an implication on banks' cost, the period after which the bank grants the loan and the risk perception of the bank. The collateral is perceived as a substitute of the actual risk of the borrower. This may incite banks to perform less screening for the projects they finance (Manove, Padilla and Pagano, 2001). According to Rajan and Winton (1995) and Longhofer and Santos (2000) collateral is regarded as a complement to the screening and monitoring activities by the bank. Further, Rajan and Winton (1995) argue that the bank may have less incentive to monitor the borrower regardless of his business condition, if the value of the collateral is too high relative to the bank's claim. The collateral requirements are negatively related to the duration of bank-borrower relationship (Boot and Thakor, 1994).

The above discussion infers that the process of lending to SMEs through a *Murabaha* lending contract is likely to be both shorter and comprises lesser cost to the Islamic bank compared to relationship lending in a conventional bank. This, in turn, will have a cost-efficiency implication for Islamic banks. Moreover, the *Murabaha* lending product can clearly be recognised by SMEs

*The *Murabaha* contract is a sale where both the cost of the asset and the profit margin are disclosed to the buyer. According to the *Murabaha* contract, the client knows exactly the cost of the asset and the selling price that the banks will charge – hence the notion of "cost plus mark-up". For example, Islamic bank will buy the asset that the client wishes to acquire for say $10,000 and sell it to the client for a different amount, say $15,000.

†Note that the asset is bought from the vendor by the Islamic bank and then sold to the customer with mark-up

‡During the last 10 years ABLs gained the reputation from many in the industry as "gutter banking" and as a lending vehicle best avoided. This stigma extended to companies that used it as well. The companies that were looking for ABLs were perceived as companies with bad credit, strapped for cash and incapable of gaining funding from traditional sources.

borrowers as a differentiated product. The fact that lack of collateral (Voordeckers and Steijvers, 2006), managerial experience (Martin and Staines, 1994) and information asymmetry (Binks et al., 1992) are factors that, individually or collectively, may hinder SMEs lending in a conventional banking paradigm. The *Murabaha* contract is in effect potentially more convenient and rather appealing to SMEs borrowers.

In this paper we analyse the lending to SMEs by an Islamic bank and a conventional bank using a model for a differentiated duopoly developed by Singh and Vives (1984) and Zanchettin (2006). Section 2 outlines the model and its parameterisation in a banking context. Section 3 discusses a Bertrand equilibrium setting whereby Islamic and non-Islamic banks compete over the effective rate of interest charged. Results in this section establish a theoretical basis for the recently observed dramatic growth in Islamic banking and financial products. Section 4 discusses a Cournot equilibrium context whereby in a second stage of competition Islamic and non-Islamic banks compete over market share. We show that competition over market share reduces the total funding available via Islamic financial products to SMEs. Section 5 concludes.

2 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 (represents a loan from an Islamic bank) and l_2 (represents a loan from a conventional lending bank) and a linear function of a numeraire good, m

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

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. 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 parameter $0 \leq \gamma \leq 1$ in (1) represents the degree of product differentiation or alternatively the extent to which the Islamic and the non-Islamic bank exert an influence over each other. If $\gamma = 0$ both banks operate as monopolists in independent markets (Zanchettin, 2006). If $\gamma = 1$ both lending products are identical. Despite some notable similarities between Islamic and non-Islamic banking practices (Chong and Liu, 2009) the case $\gamma = 1$ does not appear to be economically or financially meaningful. 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.

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.

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 $T_1 < T_2$ (see Section 1). 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):

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

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

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

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 in Section 1 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

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

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 $\alpha_1 > \alpha_2 = \alpha$, $c_1 < c_2$.

3 First-stage competition over price

In this section we analyse lending behaviour by the Islamic and non-Islamic banks in a Bertrand competition framework when the two banks compete over price. We have the following preliminary proposition.

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.*

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 motivates the question of a second-stage competition over market share discussed in Section 4.

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

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

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

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

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 in Section 3.

Proposition 6 *In Cournot equilibrium we have that*

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

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 in Section 2 it follows that the total Islamic banking loans is given by $l_1 + \gamma l_2$. In the sequel we concentrate on the case $\alpha_1 = \alpha_2$. Considering both the wider context and notable similarities between Islamic and non-Islamic bank lending (Chong and Liu 2009) this seems to be the most financially and economically realistic.

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.*

5 Conclusions

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.

Islamic banking and the use of Islamic financial products has increased significantly in recent years. By using a model for a differentiated duopoly, Sections 2-3 lay out a theoretical foundation for this observed phenomenon. A pure cost advantage should provide Islamic banks 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.

Appendix: Proofs

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

$$r_i = \frac{\alpha_i - 1 - \gamma(\alpha_j - 1 - r_j) + c_i - 1}{2}. \tag{12}$$

So

$$\begin{aligned}
[4-\gamma^2] r_1 &= 2\alpha_1 - 2 - 2\alpha_2\gamma + 2\gamma + \alpha_2\gamma - \gamma - \alpha_1\gamma^2 + \gamma^2 + \gamma c_2 - \gamma + 2c_1 - 2 \\
&= 2\alpha_1 - \alpha_2\gamma - \alpha_1\gamma^2 + \gamma^2 - 4 + \gamma c_2 + 2c_1 \\
r_1 &= \frac{2\alpha_1 - \alpha_2\gamma - \alpha_1\gamma^2 + \gamma^2 - 4 + \gamma c_2 + 2c_1}{4-\gamma^2} \\
r_1 &= \frac{2\alpha_1 + \gamma c_2 + 2c_1 - \alpha_2\gamma - \alpha_1\gamma^2}{4-\gamma^2} - 1 \qquad (13)
\end{aligned}$$

By symmetry

$$r_2 = \frac{2\alpha_2 + \gamma c_1 + 2c_2 - \alpha_1\gamma - \alpha_2\gamma^2}{4-\gamma^2} - 1. \tag{14}$$

Differentiating (1) and equating to zero it follows that

$$l_1 = \alpha_1 - \gamma l_2 - (1 + r_1) \tag{15}$$
$$l_2 = \alpha_2 - \gamma l_1 - (1 + r_2). \tag{16}$$

Combining equations (13-16) it follows that

$$l_1 = \frac{2\alpha_1 - \alpha_2\gamma + \gamma c_2 + (\gamma^2 - 2)c_1 - \alpha_1\gamma^2}{(4-\gamma^2)(1-\gamma^2)}. \tag{17}$$

By symmetry

$$l_2 = \frac{2\alpha_2 - \alpha_1\gamma + \gamma c_1 + (\gamma^2 - 2)c_2 - \alpha_2\gamma^2}{(4-\gamma^2)(1-\gamma^2)}. \tag{18}$$

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

Proof of Proposition 2

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

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

□

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

$$\frac{l_1}{l_1+l_2}=\frac{2\alpha_1-\alpha\gamma+\gamma c_2+(\gamma^2-2)c_1-\alpha_1\gamma^2}{[2-\gamma-\gamma^2][\alpha_1+\alpha-c_1-c_2]}. \tag{19}$$

Differentiating (19) we have that

$$\frac{\partial}{\partial\alpha_1}\left(\frac{l_1}{l_1+l_2}\right)=\frac{[2+\gamma-\gamma^2](\alpha-c_2)}{[2-\gamma-\gamma^2]^2[\alpha_1+\alpha-c_1-c_2]}>0. \tag{20}$$

□

Proof of Proposition 4

Suppose that the market share of the non-Islamic bank is 0. It follows from (18) 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 (18) the market share is a decreasing function of c_2 the result follows. □

Proof of Proposition 5

From equations (15-16) the market share of the Islamic bank satisfies

$$\frac{l_1}{l_1+l_2}=\frac{\alpha_1-\alpha_2\gamma+\gamma(1+r_2)-(1+r_1)}{(1-\gamma)[\alpha_1+\alpha_2-2-r_1-r_2]}. \tag{21}$$

The function given by equation (21) 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

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

□

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

$$l_1 = \frac{\alpha_1 - \gamma l_2 - c_1}{2};\ l_2 = \frac{\alpha_2 - \gamma l_1 - c_1}{2}. \tag{22}$$

Solve (22) to give

$$l_1 = \frac{2\alpha_1 - \gamma\alpha_2 + \gamma c_2 - 2c_1}{4 - \gamma^2};\ l_2 = \frac{2\alpha_2 - \gamma\alpha_1 + \gamma c_1 - 2c_2}{4 - \gamma^2}. \tag{23}$$

□

Proof of Proposition 7

Under Bertrand equilibrium it follows from equations (13) and (15-16) that the total Islamic finance lending to SMEs is given by

$$B_{loans} = l_1 + \gamma l_2 = \alpha - (1 + r_1) = \frac{2\alpha + \alpha\gamma - 2c_1 - \gamma c_2}{4 - \gamma^2}.$$

Under a Cournot equilibrium it follows from (23) that the total Islamic finance lending to SMEs is given by

$$\begin{aligned} C_{loans} &= l_1 + \gamma l_2 = \frac{2\alpha + \alpha\gamma - \gamma c_2 + (\gamma^2 - 2)c_1 - \alpha\gamma^2}{4 - \gamma^2} \\ &= B_{loans} + \frac{\gamma^2 c_1 - \alpha\gamma^2}{4 - \gamma^2} \\ &< B_{loans} \text{ since } \alpha > c_1. \end{aligned}$$

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