

A Model of Demand for Islamic Banks' Debt-based Financing Instruments

(Model Permintaan untuk Instrumen Pembiayaan Berasas Hutang Perbankan Islam)

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ABSTRACT

This paper presents a theoretical analysis of the demand for debt-based financing instruments of the Islamic banks. Debt-based financing, such as through *bai bithaman ajil* and *al-murabahah*, is by far the most prominent of the Islamic bank financing system and yet it has been largely ignored in Islamic economics literature. Most studies instead have been focusing on equity-based financing of *al-mudharabah* and *al-musyarakah*. Islamic banks offer debt-based financing through various instruments derived under the principle of exchange or more specifically, the deferred contract of exchange. In this paper we set an analytical framework that is based on an infinitely lived representative agent model to analyze the demand for goods to be purchased by deferred payments. The resulting demand will then be used to derive the demand for Islamic debt. We also investigate theoretically, factors that may have an impact on the demand for Islamic debt.

Keywords: Debt-based financing; Islamic debt; deferred contract of exchange; inter-temporal utility maximizing model; Islamic banking

ABSTRAK

Makalah ini secara teori menganalisis permintaan untuk instrumen pembiayaan berasas hutang yang ditawarkan oleh perbankan Islam. Pembiayaan berasaskan hutang misalnya, *bai bithaman ajil* dan *al-murabahah* adalah komponen terpenting pembiayaan perbankan Islam, namun sering diabaikan dalam pustaka ekonomi Islam. Sebaliknya, kebanyakan kajian bidang ini lebih tertumpu kepada pembiayaan berasaskan ekuiti menerusi *al-mudharabah* dan *al-musharakah*. Perbankan Islam menawarkan pembiayaan berasas hutang melalui pelbagai instrumen yang dicipta menggunakan prinsip kontrak pertukaran, atau lebih khusus, kontrak jualbeli tangguh. Dalam makalah ini dipaparkan satu kerangka analisis berasaskan model agen perwakilan berkehidupan infinit untuk menganalisis permintaan untuk pembelian barang secara tangguh. Seterusnya, permintaan yang terhasil digunakan untuk menerbitkan permintaan untuk hutang perbankan Islam. Kajian ini juga secara teori menyelidik faktor-faktor yang boleh memberi kesan terhadap permintaan hutang perbankan Islam.

Kata kunci: Pembiayaan berasas hutang; hutang perbankan Islam; kontrak jualbeli tangguh; model agen perwakilan berkehidupan infiniti; perbankan Islam

INTRODUCTION

A major source of contradiction in Islamic finance theory is the treatment of debt financing. The vast majority of studies in this area have been ignoring debt-based finance and practically all analytical-models of Islamic banking are derived under the principle of profit and loss sharing. This is in sharp contrast to the practical world of Islamic banking in which debt-based finance dominates equity-based finance by a large margin.

Islamic banking refers to a system of banking that complies with Islamic law, the *Shari'ah*. The most important *Shari'ah* principle that governs Islamic banking is the prohibition of *riba*. Interest is a form of *riba* and thus, Islamic banks are not allowed to utilize interest-based contracts in order to affect debt financing. Prohibition of interest however, does not mean that the *Shari'ah* also prohibits debt financing. On the contrary, Islamic banking is allowed to utilize debt as well as being allowed to use equity as a mode of finance. However, unlike conventional

banking which uses loan-based contracts, Islamic banking utilizes the deferred contract of exchange for affecting debt financing. This contract of exchange is legitimate in the view of practically all the major schools of jurisprudence or *mazhabs* (Abdul Halim 2005; Joni Tamkin 2005) and is today the most widely used mechanism for financing in Islamic banking. According to Al Qaradawi (1960) it is permissible to sell an article for deferred payments. He relates his opinion to *al Hadith* narrated by Al Bukhary that "The Prophet (pbuh) bought some grain from a Jew, to be paid for at a specific time, pledging his coat of mail as security." Al Qaradawi (1960) additionally points out that the majority of scholars, and those from the Shafi'i and Hanafi schools, are of the opinion that it is legitimate for the seller to ask for a higher price if the buyer asks for deferred payments.

Despite its legitimacy, the majority of academic researchers always view Islamic debt financing in a negative light. Many have criticized this type of financing on the ground that it does not strictly conform to Islamic

teaching (Chapra 1986; Metwally 1997; Siddiqi 1998), being less Islamic and thus, there should be minimal use of this type of financing (Zakaria 1987) as it is just a disguise to legalize riba (Chapra 1986; Metwally 1994). Khan (1986) condemned Islamic debt financing on the ground that it carries a fixed or predetermined return for the use of money, whilst others (Chapra 1986; Siddiqi 1985) believe that it helps in promoting social justice, economic efficiency and stability. For many researchers in Islamic economics, the equity-based finance is the preferred mode of financing of the Islamic banking system and that the principle of profit and loss sharing (PLS) should form a basis for modeling Islamic banking and finance. Consequently, many analytical studies on Islamic banking and finance have utilized the PLS principle of *mudharabah*, either as the reference point or as a basis for their theoretical framework (Chong & Liu 2009; Cihak & Hesse 2008; Metwally 1997). Moreover, theoretical-models of Islamic banking and the Islamic economy that have been developed (Choudhury 2000; Hassan & Choudhury 2002; Hasan 2002; Khan 1986) are all derived from utilizing the PLS principal.

It is no doubt that PLS-based models help facilitate understanding of the workings of Islamic banking and contribute significantly to Islamic finance. However, the facts that *al-mudharabah* and *al-musharakah* financing through the PLS principle are the most sparingly used tools of financing in Islamic banking and are on a declining trend (Hasan 2002; Mansor et al. 2010) provide an indication that PLS-based models are not the true reflection of the actual Islamic banking and finance

system. Indeed, a model of debt financing should be a better representative.

This study is an attempt to set up an analytical framework that is consistent with debt financing of the Islamic banking system. A modest aim of this paper is to present a theoretical analysis of the demand for debt financing instruments of the Islamic banking system. For this purpose, a standard infinitely lived representative agent model (ILRA model) is modified to cater for the existence of goods transacted under the deferred contract of exchange. Finally, the paper analyzes the determinants of the demand for Islamic debt.

DEBT FINANCING OF ISLAMIC BANKING

There are two main types of contracts that define financing operations of the Islamic banking system: the contract of PLS (*ukud al-isytirak*) and the contract of exchange (*ukud al-mu'awadhat*). Under the PLS contract banks provide *al-mudharabah* financing to its client for a share of profits (or losses), or *al-musyarakah* financing when the bank also becomes a partner in any venture or project. The contract of exchange requires a bank to use its funds to facilitate economic transactions, usually involving a purchase of goods or assets from a third party and resells them to its client on a deferred basis. The deferred contract of exchange enables Islamic banks to create various financing instruments that can be classify as debt-based. A breakdown of various types financing instruments of the Islamic banking system in Malaysia is shown in Table 1.

TABLE 1. Islamic banking: Financing by concepts (RM million)

Type of financing	June 2009	Dec 2009	June 2012
Al-musyarakah	1558.3 (1.4)	2349.4 (1.8)	9699.8 (4.5)
Al-mudharabah	442.9 (0.4)	375.7 (0.3)	250.3 (0.1)
Bai bithaman ajil	36866.5 (32.4)	42913.6 (32.1)	69593.1 (32.4)
Ijarah	3184.2 (2.8)	4033.0 (3.0)	3711.8 (1.7)
Ijarah thumma al-bai	35398.9 (31.2)	38953.3 (25.2)	52003.6 (24.2)
Al-murabahah	18857.0 (16.6)	23020.2 (17.2)	35379.4 (16.5)
Istisna	1468.0 (1.3)	1486.5 (1.1)	1265.2 (0.6)
Others	15831.8 (15.9)	20350.7 (15.2)	43081.7 (20.0)
Total	113607.6 (100.0)	133482.3 (100.0)	214984.9 (100.0)

Notes: End of period

Number in brackets are percentage of total

Islamic banking = Islamic banks + Islamic banking Scheme

Exclude financing sold to Cagamas

It can be seen from Table 1 that the proportion of equity financing of *al-mudarahah* and *al-musharakah* is quite small, less than 5 percent, and it does not show any sign of increasing. On the other hand, *bai bithaman ajil* (BBA), *ijarah thumma al-bai* (ITB) and *al-murabahah* are by far the more important financing instruments of the Islamic banking system in Malaysia, collectively contributing more than 75 percent of the total financing. It should be noted that in practice, all these types of financing are done utilizing the principle of *al-murabahah* (mark-up or cost-plus). As such in many Middle Eastern countries, these financing products are all classified under the *al-murabahah* financing system (Norazlina 2005). Thus, it is quite clear that, at least in Malaysia, debt financing, in particular the various types of *al-murabahah* financing was affected through the deferred contract of exchange are the more important features of the Islamic banking system. PLS financing is quantitatively too small and thus it cannot adequately represent the reality of Islamic banking.

MODEL

In this model, we modified a Classical-model to be consistent with the principles of Islam that prohibit interest rates. In terms of analysis, this study uses a micro foundation for macroeconomic analysis that links various sectors of an economy together. The agents in the economy consist of households, firms and the government. In order to be consistent with the principles of interest-free financing, a few equations such as labor and good market equilibrium conditions, production function, utility function and capital accumulation equation from the standard classical-model will be modified.

Under the classical economy, wages and rental rate of capital are predetermined for firms. This implies that the claim on capital and labor must be satisfied before knowing the actual profits of the firms. In contrast, under the Islamic economy, only wage for labor is predetermined while the capital is only rewarded if firms yield an economic profit. Both the entrepreneur and external financier will decide their agreed profit sharing ratios before starting the business under the PLS system. This implies that when a firm tries to maximize its own profit share, it ends up maximizing the profit share of the financier as well. It is important to note that here, under an Islamic economy, the employment consists of labor hired by entrepreneurs in the market and labor hired from entrepreneurs' personal labor force. Thus, we denote 'household' as the financier and 'firm' as the entrepreneur throughout the model. In addition, we also introduce an Islamic debt-based financing instrument in which banks buy the commodity on behalf of the household and sell it to the household at an agreed margin of profit added to the cost. The payment is generally being deferred and paid together with the markup.

Consider an economy that is populated by a large number of identical and infinitely lived-in households.

The number of households is and for simplicity we assume that the population is constant or the growth rate is zero ($L_{t+1} = L_t$). They all have the same preferences and choose the allocation portfolio between cash goods, *mudarahah* goods (goods purchased using PLS financing) and equity goods. It is assumed that both *mudarahah* and equities are perfect substitutes, as the household will refuse to hold a less attractive asset. Consequently, households are assumed to allocate their wealth between the three groups of financial assets, which are cash goods for transaction (c_t^s), *mudarahah* goods (c_t^m) for investment and *murabahah* goods (goods purchased using various types of *al-murabahah* financing) (c_t^d) for consumption. The preference is given by:

$$E_0 \sum_{t=0}^{\infty} \beta^t U [c_t^s, c_t^m, c_t^d] \quad (1)$$

Since the rate of return on cash goods is zero, the real rate of return is negative by the rate of inflation. For *mudarahah* goods, the household as a financier of *mudarahah* will receive a markup denoted as $\mu\%$ of the normal profit rate in the economy, θ . Thus, the total-markup is equal to $\rho = \mu\theta$. We assume that both the household and the firm know this profit rate and they negotiate the profit-sharing ratios, $(1 - \rho) : \rho$ respectively. Under the *mudarahah* system, capital is rewarded only if the firm produces wealth. Denoting θ as the Islamic profits in the economy, following Muhammad Anwar (1987), we assume that 'Islamic profits' here are equal to the total revenue minus the total cost. In contrast with the classical-model, here the total costs do not include returns to capital and entrepreneurial labor, which is given by:

$$\theta = \frac{(p_t Y_t - w_t L_t)}{pK} \quad (2)$$

Assume that the firm (entrepreneur) of goods i for instance, produces goods i using a constant returns to scale Cobb-Douglass production function denoted by:

$$Y(i)_t = K(i)_t^\alpha L(i)_t^{1-\alpha} \quad (3)$$

where L_{it} and K_{it} are labour and capital in a competitive market, respectively. Each household is endowed with one unit of labor, which is supplied exogenously and earning a wage rate, w_t in period t . Households also holding capital and receive a rental rate of capital equal to p_t^k , which is also known as the user cost of capital. In the classical-model, the real capital rate consists of a depreciation rate (δ), change in capital due to change in inflation (π) and the finance cost determined by a fixed interest rate (r). However, in the Islamic economy, an interest rate is prohibited. Thus, in order to determine the user cost of capital, we follow Anwar (1987) who views expected profit share of the financier, $\rho = \mu\theta$ as the capital cost. Therefore, instead of following $p_t^k = r + \delta - \pi$, where δ is the depreciation rate, now we assume that $p_t^k = \rho + \delta - \pi$ since r is prohibited in the Islamic economy.

Denote w_t and $(\rho + \delta - \pi)$ as the wage and the rental rate of capital respectively, then the profit maximization of the firm is given by:

$$\max_{\{K_t, L_t\}} p_t K_t^\alpha L_t^{1-\alpha} - w_t L_t - (\rho + \delta - \pi) K_t \quad (4)$$

The first order condition with respect to K_t, L_t give the following marginal productivity of capital and labor or so-called factor payments (in aggregate terms):

$$\frac{w_t}{p_t} = (1 - \alpha) \left(\frac{K_t}{L_t} \right)^\alpha \quad (5)$$

and

$$\frac{\rho + \delta - \pi}{p_t} = \alpha \left(\frac{L_t}{K_t} \right)^{1-\alpha} \quad (6)$$

Due to symmetry, the cost minimization in the input market implies the optimal combination of labor and capital when the labor supply is exogenous which are given by:

$$\frac{K_t(i)}{L_t(i)} = \frac{\alpha}{1 - \alpha} \frac{w_t}{\rho + \delta - \pi} \quad (7)$$

We assume that households consume not only normal goods (c_t) but also consume murabahah goods (c_t^d) by asking the bank to purchase an asset. This loan will be paid with a markup equal to κ . It is assumed that the markup is a predetermined variable resulting from the decisions undertaken in period $t - 1$. By decomposing consumption into normal and *murabahah* goods, we obtain:

$$C_t = c_t + c_{t+1}^d p_t - (1 - \delta) c_t^d p_t - \varphi(1 + \kappa) p_t c_t^d \quad (8)$$

where φ is the percentage of the sequence of payments made by households to the bank at regular time intervals.

Furthermore, consider the case of endogenous capital accumulation, where both the supply and demand for capital are determined endogenously. Denote that I_t is the household's investment during period t and capital is depreciated at rate δ ; the capital accumulation is therefore:

$$K_{t+1} = I_t + (1 - \delta) K_t \quad (9)$$

The market clearing condition is given by:

$$Y_t \equiv C_t + I_t + G \quad (10)$$

Denote Y_t as the household's demand for goods in period t , while w_t, p_t^k, Π_t and T_t are real wage, real capital rate, and profit flow from firms and taxes, respectively. Thus, the flow of budget constraints that incorporate the holding of cash, mudarabah-equity goods explicitly take the form:

$$c_t^s p_{t-1} + \rho c_t^m p_{t-1} + \frac{w_t}{p_t} L_t + \left(\frac{\rho + \delta - \pi}{p_t} \right) K_t - Y_t + \Pi_t - \tau_t = c_{t+1}^s p_{t+1} + c_{t+1}^d p_{t+1} \quad (11)$$

By combining equations (9) and (10) and substituting these into (11), we now have the flow of budget constraints with endogenous capital accumulation as following:

$$c_t^s p_{t-1} + \rho c_t^m p_{t-1} + \frac{w_t}{p_t} L_t + \left(\frac{\rho + \delta - \pi}{p_t} \right) K_t - c_t - c_{t+1}^d p_t + (1 - \delta) c_t^d p_t + \varphi(1 + \kappa) p_t c_t^d - K_{t+1} + (1 - \delta) K_t - G_t + \Pi_t - T_t = c_{t+1}^s p_t + c_{t+1}^m p_t \quad (12)$$

In order to derive the demand model, let us assume that the specific utility function is given by:

$$\max_{\{c_t^s, c_t^m, c_t^d, K_{t+1}\}} U(c_t^s, c_t^m, c_t^d) = \frac{[c_t^{\gamma}, c_t^{m\phi}, c_t^{d\alpha}]^{1-\sigma}}{1-\sigma} \quad (13)$$

where $\sigma = \frac{1}{\theta}$ is the elasticity of substitution between the consumed quantities of the cash goods and debt θ goods. It measures the strength of the substitution effect that a change in relative prices induces. By using L'Hospital's rule, this utility function converges to a logarithmic as $\sigma \rightarrow 1$. According to this rule, differentiate both the numerator and denominator with respect to σ and then take the limit of the derivatives' ratio as $\sigma \rightarrow 1$, which will converge the utility function to $\gamma \ln c_t^s + \phi \ln c_t^m + \alpha \ln c_t^d + \lambda_t$.

The problem of a representative household is therefore to maximize (13) subject to (12) with respect T to c_t^s, c_t^m, c_t^d and K_{t+1} . The Lagrangian is given by:

$$\mathcal{L} = \gamma \ln c_t^s + \phi \ln c_t^m + \alpha \ln c_t^d + \lambda_t \left[c_{t+1}^s p_t + c_{t+1}^m p_t - c_t^s p_{t-1} - \rho c_t^m p_{t-1} - \frac{w_t}{p_t} L_t - \left(\frac{\rho + \delta - \pi}{p_t} \right) K_t + c_t + c_{t+1}^d p_t - (1 - \delta) c_t^d p_t - \varphi(1 + \kappa) p_t c_t^d + K_{t+1} - (1 - \delta) K_t + G_t - \Pi_t + T_t \right] \quad (14)$$

The first order necessary conditions for this Lagrangian with respect to c_t^s, c_t^m, c_t^d and K_{t+1} are:

$$\lambda_t = \frac{\gamma}{c_t^s p_{t-1}} \quad (15)$$

$$\lambda_t = \frac{\phi}{c_t^m \rho p_{t-1}} \quad (16)$$

$$\lambda_t = \frac{\alpha}{c_t^d p_t [(1 - \delta) + \varphi(1 + \kappa)]} \quad (17)$$

$$\frac{\rho + \delta - \pi}{p_t} + (1 - \delta) = \frac{\lambda_t}{\beta \lambda_{t+1}} \quad (18)$$

Using (15) and (16), the demand for *mudarabah* goods is given as:

$$\frac{c_t^m}{c_t^s} = \frac{\phi}{\gamma \rho} \quad (19)$$

Notice that, the demand for *mudarahah* goods here is negatively related with ρ , instantaneous profit sharing associated with the household (financier). The higher the ratio of profit sharing, ρ , the lower the amount of *mudarahah* demanded by the firm (entrepreneur). In addition, the demand for *mudarahah*-equity goods is also subject to the elasticity of substitution between cash and *mudarahah* goods, which are ϕ and γ .

Next, by combining (15) and (17), we obtain the demand for *murabahah* that is specified as the following form:

$$\frac{c_t^d}{c_t^s} = \frac{\alpha}{\gamma[(1-\delta)+\varphi(1+\kappa)](1+\pi)} \quad (20)$$

From (13), it can be noted that the demand for Islamic debt-based financing negatively depends on the markup, κ . The reason is because the markup also reflects the cost of borrowing and thus, if the markup is higher, the amount of debt-based loans will be lower. The demand for *murabahah* is also determined by φ which is the rate of periodic payments made by the household to the bank at regular time intervals. Apart from that, the demand for *murabahah* is negatively related to inflation. The negative impact of inflation on debt implies that Islamic debt financing serves as an automatic stabilizer on credit and money supplies.

Using (15) and (18), the asset accumulation margin for cash goods is given by:

$$\frac{c_{t+1}^s}{c_t^s} \frac{P_{t\beta}}{P_{t-1}} = \frac{\rho + \delta - \pi}{P_t} + (1 - \delta) \quad (21)$$

Next, using (16) and (18), the following asset accumulation margin is obtained for *murabahah* goods:

$$\frac{c_{t+1}^d}{c_t^d} \frac{P_{t+1\beta}}{P_t} = \frac{\rho + \delta - \pi}{P_t} + (1 - \delta) \quad (22)$$

Finally, using (15) and (18), the asset accumulation margin for *mudarahah* goods is given by:

$$\frac{c_{t+1}^m}{c_t^m} \frac{P_{t\beta}}{P_{t-1}} = \frac{\rho + \delta - \pi}{P_t} + (1 - \delta) \quad (23)$$

Finally, by combining (14) and (15), the non-arbitrage condition is obtained which is:

$$\frac{c_{t+1}^s}{c_t^s} = \frac{c_{t+1}^m}{c_t^m} = \frac{c_{t+1}^d}{c_t^d} = \frac{\beta}{1+\pi} \left[\frac{\rho + \delta - \pi}{P_t} + (1 - \delta) \right] \quad (24)$$

This condition suggests that the expected return on *mudarahah*, *murabahah* and cash goods are equal to the expected real rate of return on capital.

CONCLUSION

Islamic financing techniques may have different effects on the decision-making of economic agents as well as on

the macroeconomic framework of the economy. Although there have been a substantial amount of research studying Islamic financing, most of the existing literatures only focus on a profit loss sharing system which is based on *mudarahah* and *musyarakah* systems. The practice in reality however, is overwhelmingly dependent on the use of Islamic debt-based financing instruments while profit loss sharing is the least demanded mode of financing in most of the Islamic banks in the world. Unfortunately, no study so far has been made in the context of a theoretical-macroeconomic framework to investigate the behavior of agents in economics towards Islamic debt-based financing or *murabahah*. Hence, this paper addresses the gap in the literature by analyzing the model for both *mudarahah* and *murabahah*. In this paper, we have analyzed the behavior of agents in economics through their consumption, production and investment. By means of an infinitely lived representative agent model, we have analyzed the demand for goods to be purchased by deferred payment. We found that the demand for *murabahah* is negatively related to the markup, inflation rate and the rate of periodic payments as well as the elasticity of substitution between goods. The negative impact of inflation on debt implies that Islamic debt financing serves as an automatic stabilizer on credit and money supplies.

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