

The Theory of Islamic Banking : Look Back to Original Idea

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Abstract

The early discussion on the banking theory limits the view only on mudarabah and musharakah as the foundation of the Islamic banking system. Nevertheless, the stylized fact presented here seems to indicate that they are utilized far less than other forms of Islamic financing. Some possible explanations as to why these instruments are not utilized to a greater extent are due to principal-agent problem. The problems still exist, if Islamic banks operate in the presence of many agents and principals. Therefore, in this paper, we suggest the optimal contract for profit-sharing in Islamic bank in two different characteristics, i.e., contracting for effort and contracting for outcomes.

1. Introduction

Since, the financial services provided by Islamic banks are free from interest. Thus, the financial contracts created between clients and Islamic bank should be free from interest. Or specifically, the financial contracts should be designed accordance with shari'ah principles. By abiding the Islamic principles, then Islamic banks could naturally be declared as shariah-compliant banks.

However, authors like Arif (1988), Chapra (1982) and Ismail (2010a,b), claim that other features are also matters. Matters like the contribution of Islamic banking towards a more equitable distribution of income and wealth, and increased equity participation in the economy, are equally essential. Therefore, the establishment of Islamic banking is not only an effort to comply the shari'ah, but also to achieve the maqasid al shariah.

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The early discussion on the banking theory highlights (or known as original idea) that both *mudarabah* and *musharakah contracts* constitute the foundation of the Islamic banking system. In addition, both contracts are potentially be able to distribute the wealth fairly. Nevertheless, the stylized facts, as reported in Tohirin and Ismail (2009), seem to indicate that they are utilized far less than other forms of Islamic financing, such as *murabahah*. Some possible explanations as to why these instruments are not utilized to a greater extent are due to principal-agent problem.

Furthermore, principal-agent problem is further discussed in the context of many agents and principals. However, this multiple relationship might still create the principal-agent problem or agency dilemma. Therefore, in this paper, we suggest the optimal contract for profit-sharing in Islamic bank in two different characteristics, i.e., contracting for effort and contracting for outcomes.

2. Islamic Banking Theory

The early contributions on the theory of Islamic banking were only discussed as part of the subject in Islamic economic system. For example, the book by Qureshi on *Islam and the Theory of Interest* (Qureshi (1946)) which looked upon banking as a social service that should be sponsored by the government like other public institutions such as public health and education.² His view was based on the point that the bank could neither pay any interest to account holders nor charge any interest on loans advanced. He also suggests the possibility for both Islamic banks and entrepreneur to create a partnership. No mention was made of profit-sharing.

Then, Ahmad (1952), in Chapter VII of his book *Economics of Islam*, proposes the establishment of Islamic banks on the basis of a joint stock company with limited liability. In his proposition, in addition to current accounts, on which no dividend or interest should be paid, there was an account in which people could deposit their capital on the basis of partnership, with shareholders receiving higher dividends than the account holders from the profits made. Like Qureshi (1946), Ahmad (1952) also suggests of possible partnership arrangements with the entrepreneur who seek capital from the Islamic banks. However, the partnership principle was left undefined, nor was it clear who would bear the loss if any. It was also suggested that Islamic banks should cash bills of trade without charging interest, using the current account funds. From here, Islam banks only charge fee to entrepreneur.

² Although earlier than Qureshi (1946), there are other publications in Arabic and Urdu which have made significant contributions to the theoretical discussion. A brief description of these in English can be found in the appendix to Siddiqi's book on *Banking without Interest* (Siddiqi 1983a).

Later, the principle of *mudarabah* was appealed systematically by Uzair (1955). His main contribution lay in suggesting *mudarabah* as the main premise for 'interestless banking'. However, his argument that the Islamic bank should not make any capital investment with its own deposits rendered his analysis somewhat impractical.

Al-Arabi (1966) also suggested a banking system with *mudarabah* as the main pivot. However, he advanced further the idea of a two-tier *mudarabah* which would enable the Islamic bank to mobilize savings on a *mudarabah* basis, allocating the funds also on a *mudarabah* basis. In other words the Islamic bank would act as a *mudarib* in so far as the depositors were concerned, while the 'borrowers' would act as *mudaribs* in so far as the Islamic bank was concerned. In his suggestion, the Islamic bank could provide not only the capital procured through deposits but also the capital of its own shareholders. He also took note that his view with regard to the distribution of profits and the responsibility for losses was strictly in accordance with the *Shariah*.

Irshad (1964) also spoke of *mudarabah* as the basis of Islamic banking, but his concept of *mudarabah* was quite different from the traditional one in that he thought of capital and labour (including entrepreneurship) as having equal shares in output, thus sharing the losses and profits equally. This actually means that the owner of capital and the entrepreneur have a fifty-fifty share in the profit or loss as the case may be, which runs against the *Shariah* rulings. Irshad (1964) further suggested two kinds of deposit accounts. The first sounded like current deposits in the sense that it would be payable on demand, but the money kept in this deposit would be used for social welfare projects, as the depositors would get zero return. The second one amounted to term deposits which would entitle the depositors to a share in the profits at the end of the year proportionately to the size and duration of the deposits. He recommended the setting up of a Reserve Fund which would absorb all losses so that no depositor would have to bear any loss. According to Irshad (1964), all losses would be either recovered from the Reserve Fund or borne by the shareholders of the bank.

A pioneering attempt at providing a fairly detailed outline of Islamic banking was made in Urdu by Siddiqi in 1968. (The English version was not published until 1983.) His Islamic banking model was based on *mudarabah* and *shirkah* (partnership or *musharakah* as it is now usually called). His model was essentially one based on a two-tier *mudarabah* financier-entrepreneur relationship, but he took lengthy explanation to describe the mechanics of such transactions in considerable detail with numerous hypothetical and arithmetic examples. He classified the operations of an Islamic bank into three categories: services based on fees, commissions or other fixed charges; financing on the basis of *mudarabah* and partnership; and services provided free of charge. His thesis was that such interest-free banks could be a viable alternative to interest-based conventional banks.

The issue of loans for consumption clearly presents a problem, as there is no profit to be shared. Siddiqi addressed this problem, but he managed only to scratch the surface. While recognizing the need for such interest-free loans (*qard hasan*), especially for meeting basic needs, he seemed to think it was the duty of the community and the State (through its *baitul mal* or treasury) to cater to those needs; the Islamic bank's primary objective, like that of any other business unit, is to earn profit. He therefore tended to downplay the role of Islamic banks in providing consumption loans, but he suggested limited overdraft facilities without interest. He even considered a portion of the fund being set aside for consumption loans, repayment being guaranteed by the State. He also suggested that consumers buying durables on credit would issue 'certificates of sale' which could be ended by the seller at the bank for a fee. It was then the seller not the buyer who would be liable as far as the bank was concerned. However, the principles of *murabaha* and *bai' muajjal* were not invoked. It seems that his suggestion is far from reality.

Strangely, Siddiqi favoured keeping the number of shareholders to the minimum, without advancing any strong reasons. This is contrary to the general consensus which now seems to have emerged with reference to Islamic banks operating on a joint stock company basis, a consensus which incidentally is also in line with the Islamic value attached to a broad equity base as against heavy concentration of equity and wealth. Ironically, Siddiqi (1983b) thought that interest-free banking could operate successfully 'only in a country where interest is legally prohibited and any transaction based upon interest is declared a punishable offence'. He also thought it important to have Islamic laws enforced before interest-free banking could operate well. This view has not gained acceptance, as demonstrated by the many Islamic banks which operate profitably in 'hostile' environments, as noted earlier.

Chapra's model of Islamic banking (Chapra 1982), like Siddiqi's, was based on the *mudarabah* principle. His main concern, however, centred on the role of artificial purchasing power through credit creation. He even suggested that 'seigniorage' resulting from it should be transferred to the public exchequer, for the sake of equity and justice. Al-Jarhi (1983) went so far as to favour the imposition of a 100 per cent reserve requirement on commercial banks. Chapra was also much concerned about the concentration of economic power private banks might enjoy in a system based on equity financing. He therefore preferred medium sized banks which are neither so large as to wield excessive power nor so small as to be uneconomical. Chapra's scheme also contained proposals for loss-compensating reserves and loss-absorbing insurance facilities. He also spoke of non-bank financial institutions, which specialize in bringing financiers and entrepreneurs together and act as investment trusts.

Mohsin (1982) has presented a detailed and elaborate framework of Islamic banking in a modern setting. His model incorporates the characteristics of commercial, merchant, and development banks, blending them in novel fashion. It adds various

non-banking services such as trust business, factoring, real estate, and consultancy, as though interest-free banks could not survive by banking business alone. Many of the activities listed certainly go beyond the realm of commercial banking and are of so sophisticated and specialized a nature that they may be thought irrelevant to most Muslim countries at their present stage of development. Mohsin's model clearly was designed to fit into a capitalist environment; indeed he explicitly stated that *riba*-free banks could coexist with interest-based banks.

The point that there is more to Islamic banking than mere abolition of interest was driven home strongly by Chapra (1985). He envisaged Islamic banks whose nature, outlook and operations could be distinctly different from those of conventional banks. Besides the outlawing of *riba*, he considered it essential that Islamic banks should, since they handle public funds, serve the public interest rather than individual or group interests. In other words, they should play a social-welfare-oriented rather than a profit-maximizing role. He conceived of Islamic banks as a crossbreed of commercial and merchant banks, investment trusts and investment-management institutions that would offer a wide spectrum of services to their customers. Unlike conventional banks which depend heavily on the 'crutches of collateral and of non-participation in risk' (p. 155), Islamic banks would have to rely heavily on project evaluation, especially for equity-oriented financing. Thanks to the profit-and-loss sharing nature of the operations, bank-customer relations would be much closer and more cordial than is possible under conventional banking. Finally, the problems of liquidity shortage or surplus would have to be handled differently in Islamic banking, since the ban on interest rules out resort to the money market and the central bank. Chapra suggested alternatives such as reciprocal accommodation among banks without interest payments and creation of a common fund at the central bank into which surpluses would flow and from which shortages could be met without any interest charges.

From the above discussion, Islamic banking has three distinguishing features: (a) it is interest-free, (b) it is multi-purpose and not purely commercial, and (c) it is strongly equity-oriented. The literature contains hardly any serious criticism of the interest-free character of the operation, since this is taken for granted, although concerns have been expressed about the lack of adequate interest-free instruments. There is a near-consensus that Islamic banks can function well without interest. A study by Iqbal and Mirakhor (1987) has found Islamic banking to be a viable proposition that can result in efficient resource allocation. The study suggests that banks in an Islamic system face fewer solvency and liquidity risks than their conventional counterparts.

The multi-purpose and extra-commercial nature of the Islamic banking operation does not seem to pose intractable problems. The abolition of interest makes it

imperative for Islamic banks to look for other instruments, which renders operations outside the periphery of commercial banking unavoidable. Such operations may yield economies of scope. But it is undeniable that the multipurpose character of Islamic banking poses serious practical problems, especially in relation to the skills needed to handle such diverse and complex transactions (Iqbal and Mirakhor 1987).

The stress on equity-oriented transactions in Islamic banking, especially the *mudaraba* mode, has been criticized. It has been argued that the replacement of predetermined interest by uncertain profits is not enough to render a transaction Islamic, since profit can be just as exploitative as interest is, if it is 'excessive' (Naqvi 1981). Naqvi has also pointed out that there is nothing sacrosanct about the institution of *mudaraba* in Islam. Naqvi maintains that *mudaraba* is not based on the Qur'an or the Hadith but was a custom of the pre-Islamic Arabs. Historically, *mudaraba*, he contends, enabled the aged, women, and children with capital to engage in trade through merchants for a share in the profit, all losses being borne by the owners of capital, and therefore it cannot claim any sanctity. The fact remains that the Prophet raised no objection to *mudaraba*, so that it was at least not considered un-Islamic.

The distribution of profit in *mudaraba* transactions presents practical difficulties, especially where there are multiple providers of capital, but these difficulties are not regarded as insurmountable. The Report of Pakistan's Council of Islamic Ideology (CII 1983) has suggested that the respective capital contributions of parties can be converted to a common denominator by multiplying the amounts provided with the number of days during which each component, such as the firm's own equity capital, its current cash surplus and suppliers' credit was actually deployed in the business, i.e., on a daily product basis. As for deposits, profits (net of administrative expenses, taxes, and appropriation for reserves) would be divided between the shareholders of the bank and the holders of deposits, again on a daily product basis.

However, lately, several authors among others Abdus Samad et. al (2005) raised the agency problem in *mudarabah* and *musharakah* contracts. When a business is run by professional managers, as opposed to the owner or supplier of capital (shareholder), a conflict of interest may arise. A manager is the business owner's agent. As the utility increases, managers will seek to maximize their own utility instead of maximizing the wealth or utility of the shareholders or the business owners. They have an incentive to increase their own salaries, fringe benefits, and other perks, all of which represent a conflict of interest that may lead them to place personal interest ahead of such corporate goals as maximizing the shareholders' profit margin. This conflict is the most common problem in all businesses or corporations managed by agents rather than the shareholders or debtholders.

Given its prevalence, it is important to see how it applies to *mudarabah* and *musharakah*. In *musharakah* mode of financing, a joint venture profit-sharing business of two or more parties in which the Islamic bank is an important partner or shareholder. Under *musharakah*, the bank relies on the other partner(s) to manage the business and make the day-to-day decisions. Even though the bank could monitor the management of the business by hiring external auditors and consultants, such measures would incur additional costs. Therefore, the bank must rely on professional managers or other partners to manage the businesses, even though these managers may have an incentive to maximize their own utility at the business owner's expense.

Under *mudarabah/musharakah* financing, the Islamic bank does not participate directly in management decisions. Rather, it relies completely on the business venture's trustee or entrepreneur. This trustee is clearly an agent of the Islamic bank and, therefore, is inherently subject to the agency conflict of interest. Thus, under both *musharakah* and *mudarabah*, the Islamic bank experiences the agency problem with its associated costs.

The agency problem becomes more acute when banks have little access to dependable accounting information, due to a lack of standardized financial reporting requirements and procedures. The difficulties presented by this agency problem, together with the lack of verifiable financial data, complicate the profit-sharing characteristics of these forms of Islamic financing and actually encourage debt financing (e.g., *murabahah* and *ijarah*) over equity financing (e.g., *musharakah* and *mudarabah*).

To some extent, the agency problem in *musharakah* and *mudarabah* can be reduced by carefully specifying the sharing of profit and performance bonuses between the entrepreneur and the bank. Also, in the case of *musharakah*, the bank participates in the election of the company's board and officers, a factor that should further reduce the agency problem.

3. The Islamic Banking Model of Multiple Agent-Principal

The above discussion shows that Islamic banks are based on the abolition of interest which requires a complete restructuring and innovations in the financial services. To replace interest-based modes of financial services, experts in Islamic banking devise financial contracts. In Islamic banking operation, deposits are treated as capital, or borrowed funds. If depositors create a *wadiah* contract, then Islamic bank acts as custodian, and if depositors save money based on *wakalah* contract, depositors appoint Islamic bank as *wakeel*, or depositors lend money to Islamic banks used the

Qard contract. For *mudharabah* deposit contract, Islamic bank is treated as entrepreneur.

While, on the asset side, Islamic bank creates several contract with customers. In *musharakah mutanaqisah* home financing, Islamic bank becomes the partner of houseowner. For sukuk *ijarah*, Islam bank as sukukholder receives profit (if any) from trust agreement. LaPorta et al. (1996) and Ismail and Tohirin (2009) considered these contracts are influenced from law origin.

It shows that the operation of Islamic bank creates a multiple relationship between agent and principal. By having, funds and skill, Islamic bank can act as agent and principal at the same time. Although in conventional bank, the relationship might go beyond the creditor-debtor relationship, for example as agent/wakeel, custodian, bailee and bailer, but most of the studies on bank-customer relationship assume the presence of creditor-debtor, see for example C.F.H (1935), Datar (2002), Tirole (2002) and Krimminger (2004).

However, this multiple relationship might also create the principal–agent problem or agency dilemma. This problem arises under conditions of incomplete and asymmetric information when, for example, a principal hires an agent, the problem may arise that the two may not have the same interests, while the principal is, presumably, hiring the agent to pursue the interests of the former.

Other acts that can be considered as ‘the principal–agent problem’ are the problem of motivating a party to act on behalf of another. The principal-agent problem arises when a principal compensates an agent for performing certain acts that are useful to the principal and costly to the agent, and where there are elements of the performance that are costly to observe.³ This is the case to some extent for all contracts that are written in a world of information asymmetry, uncertainty and risk. We will discuss both as follows.

The key features of principal-agent problems are that: the principal knows less than the agent about something important, and their interests conflict in some way. Hence, there seem to be two types of problems: problems where agents can do some costly action to improve outcomes for the principal but the principal cannot observe the action. These are known, among others Jensen and Meckling (1976), Fama (1980), Eisenhardt (1985, 1989), Finkelstein and Daveni (1994) as effort aversion/moral hazard problems. Problems where there are different types of agents and principals cannot tell the difference among them. These are known as adverse selection when the types are fixed and the question is which agents will participate.

³. Here, Diamond and Dyvzib (1983) use the term of costly monitoring.

Various mechanisms may be used to try to align the interests of the agent in solidarity with those of the principal, such as commissions (incentives) and profit sharing. Others studies such as Stiglitz (1987) and Rees (1985a and 1985b) look at the efficiency wages, performance measurement (such as sales, sales growth, production and financial statements), the agent posting a bond, or fear of firing (i.e. treat of termination, see Blair and Roe (1999)).

Normally, the principal gets value created by agent's action minus payment to agent. The agent looks at his/her payment less the cost of his/her effort. Hence, a conflict arises if there is no mechanism to align the interests of the two parties. In this section, the explanation is given to align the employee's interest with that of the employer through two mechanisms: profit-sharing and incentives.⁴ In profit-sharing, the outcome and effort level are stochastically related.⁵ The risk aversion of the players therefore is a factor. The contract will feature payoffs as a function of stochastic outcomes, and the agent will only sign a contract that provides him enough expected utility to overcome his reservation utility. The agent's expected utility will depend on the probabilities of various outcomes, the payoff that he receives for those outcomes, and the utility that he receives as a function of those payoffs. With fixed probabilities and payoffs, the agent's expected utility will be a decreasing function of his risk aversion. To convince the agent to sign a contract, therefore, the principal must offer payoffs that are either more generous or more equal as the agent becomes more risk averse.

Incentives – by specifying different payments for different outcomes, the contract sets up incentives for the agent as he chooses an effort level. If under a given contract payments are larger for higher outcomes, and higher effort is more likely to produce higher outcomes (as is usually the case in these models), then the agent may be motivated to exert higher effort. If his expected utility from signing the contract and exerting some level of effort is larger than his reservation utility, he will sign the contract (this is the risk issue); if his expected utility from exerting high effort is higher than his expected utility from exerting any other level of effort then he will exert high effort (this is the incentive issue).

4. What Next?- Profit-Sharing as Optimal Contract

In this section, we will discuss an optimal contract for profit-sharing in Islamic bank in two different contracts, i.e., contracting for effort and contracting for outcomes.

⁴ Although, we also recognize other mechanisms such as Bonuses, stock options, future promotion and threat of firing

⁵ If there was a deterministic relationship, it would not matter that the effort was not observed. Further explanation will be given in section 4.

(a) Contracting for effort: first best

In profit sharing contract, if effort is observable, we can write contracts that specify a level of effort and are thereafter enforced in contracts. The task facing the principal is thus twofold:

- For a given level of effort specified in a contract c^* , the agent must choose the payoff vector $a = (a_1, a_2, \dots, a_N)$ (a share (in profit) for each of N outcomes) that satisfies her own effort while convincing the principal to participate (providing the agent with an expected payoff greater than or equal to his reservation payoff), and
- Choose a level of effort that satisfies her expected payoff.

The optimal contract at a given level of effort will provide the agent exactly his reservation payoff (in expectation). Since the outcomes are distributed accordingly, there are a lot of ways to do this: at one extreme, the contract could be set up: where a huge profit payment is given for an extremely rare outcome and no payment is given otherwise; at the other extreme, the contract could give the agent the same wage regardless of the outcome. Which contract the principal chooses will depend on the risk aversions of the principal and agent.

Here, the risk sharing problem with observable effort (the “first-best optimal risk sharing problem”) arises. If the agent is risk averse and the principal is risk neutral, the best contract for the principal for a given level of effort provides the same profit (at least) regardless of the outcome (i.e. the agent is fully insured). If the agent is risk neutral and the principal is risk averse, the situation is reversed, and the optimal contract gives the principal the same net payoff ($p_n - a_n$) regardless of the outcome, which means that the principal is fully insured. In other words $p_i - a_i = p_j - a_j = F$ for i, j , which means that the agent pays the principal the fixed amount F for the business, and receives a net payoff of $p_n - F$ for every n . If both are risk averse to some extent, the optimal contract will share the risk. The principal will still be choosing the payoffs p that are most beneficial to her while (barely) convincing the agent to sign the contract.

If we have a different plot of p_n vs a_n for a given level of satisfaction. In the case where both the principal and the agent are risk averse, this will start at the origin, sloping upwards, and approach a vertical asymptote where $p_n = a_n$ - can be thought of as the ratio in this plot, which dictates an optimal profit a^* such that we talk about so often in this kind of situation (known as “mutual benefits”) – the marginal benefit to the principal per marginal benefit to the agent. Return devoted to different payoffs a_n should have the same “mutual benefits,” and this value should be such that principal just barely convince the agent to participate.

To sum up, when effort is contractible the principal-agent problem reduces to one in which the principal chooses a level of agent effort that gives her the highest expected satisfaction. She figures out what the optimal risk-sharing contract is for various levels of effort and then chooses the contract (and therefore level of effort) that is best for her.

(b) Contracting for outcomes: second-best

When effort is not contractible (which is usually the case in these problems) the contract must specify outcomes, not effort levels. This development adds a level of complexity in that now we want to write a contract that leads the agent to choose the right amount of effort. Assume that higher effort makes high outcomes more likely. What kind of contract would: (i) lead the agent to sign, and (ii) lead the agent to choose high effort? Again, extreme solutions can be illuminating:

- The contract could be like a chance in which all depend on the outcome. If you make the return large enough to encourage participation, then the agent will choose high effort. But this contract may not be optimal because the principal might be able to induce high effort at a lower expected payoff by moving some of the return to deposit insurance scheme. A risk-averse agent may will be willing to participate at lower expected profit but still choose high effort.
- The contract could fully insure the agent against risk, i.e. the agent is paid a fixed return regardless of outcome. But in this case the both agent and principal violate the contract.

You can think of this as a trade-off between risks and incentives. The principal wants to impose some risk on the agent in order to motivate him to choose higher effort (and ultimately produce higher outcomes, which is what the principal really cares about). But imposing higher risk means providing a higher expected profit (because the risk-averse agent needs compensation to participate). The only difference between the first-best problem (with effort observed) and the second-best problem (outcomes, not effort, observed) is the addition of the “incentive compatibility constraint”.

Given the probability of outcomes, effort costs, satisfaction functions and reservation functions, the budget constraint depends on the level of the payoffs for contract in (a) (C1), while the contract in (b) (C2) depends on the relative values of the payoffs a_n across outcomes. If C1 did not bind (i.e. the agent is getting a higher expected satisfaction than his reservation), then the principal could benefit herself by revising the payoff vector a such that c^* still provides the same satisfaction to the agent as his next best choice of c^* (i.e., C2 still binds) but the absolute level of satisfaction

provided is lower. In other words, if the principal makes all of the payoffs slightly lower, then the agent will pick the same level of effort but at a lower cost to the principal. If the C2 does not bind (i.e., the agent is picking the right level of effort and the resulting expected satisfaction is strictly greater than that for any other effort level), then the principal could benefit herself by revising the payoff vector a such that the agent is burdened with less risk. If there is less risk on the agent, the expected payoff can be made lower while providing the same expected satisfaction for that level of effort. In other words, the original situation had incentives and, by turning down the volume on those incentives, the principal can pay less in expectation.

For the simplest case, with two outcomes, two effort levels, and a risk-neutral principal, the C1 and C2 together dictate the profits paid for each outcome level in order to induce a particular effort level at lowest cost. Since there are only two effort levels, the C2 must bind with equality; with more effort levels, I think C2 binds with equality for only one pair of effort levels. The approach to solving the problem is thus to find the payoffs that would cause the agent to choose each effort level and then evaluate which effort level is better for the principal. Inducing low effort when the principal is risk-neutral always calls for a constant *profit* that produces the agent's reservation. (Fully insuring the agent is the cheapest way to encourage participation.) The low-effort contract will be better for the principal when the agent is very risk averse; inducing participation and high effort at the same time will require a high expected profit to compensate such an agent for taking on risk.

5. Conclusions

Our main findings from this paper are: first, Islamic banks prefer to offer debt related products; second, the principal-agent problem still exist in the Islamic banking model with many agents and principal; and third, since the second-best problem is the first-best problem with an additional constraint, the first-best solution must weakly pareto-dominate the second-best solution: The principal would do weakly better if she could contract for effort and not output, and the agent does the same either way. That means that the principal may be willing to devote resources to making effort contractible, and the agent would not stop it. In the simplest (two effort levels) case, if the principal chooses to implement high effort in the second-best scenario, then she would choose to do the same in the first best. But there may be cases where she would implement high effort in the first-best but not the second-best scenario – those cases where the compensation she must give the agent to bear the incentive-producing risk is larger than the expected increase in output from the higher level of effort.

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