



***MODELLING PROFIT-LOSS-SHARING CONTRACTS IN
INVESTMENT FINANCING***

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By

MOHD AISHA NUDDIN BIN ABDUL JALIL

**Thesis Submitted to the School of Graduate Studies, Universiti
Putra Malaysia in Fulfilment of the Requirements for the Degree of
Doctors of Philosophy**

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy.

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Excessive debt poses many serious problems to individuals, firms and countries. We have seen many world economic crises, many of which are the results of debt. Countries which have high amount of sovereign debt are in danger of being declared bankrupt nations. These countries have to borrow more to cover their present debts. Islam as a way of life prescribes a solution to this problem by advocating equity based financing. Islam does not ban debt but the religion offers another alternative to debt financing that is the equity based financing.

Instruments of Islamic commercial financing are based on two principles which are: the profit-loss-sharing (PLS) principle which is equity based financing and the mark-up principle (use of debt like instruments). Unfortunately, in today's practice, there is an imbalance between profit-loss-sharing modes of financing and mark-up based financing. Mark-up based financing dominates the Islamic financial markets while equity based financing is almost negligible. Analysis of these two modes of financing is needed in understanding and hopefully correcting the situation. This study analyses four main issues related to profit-loss-sharing (PLS) and non-PLS modes of financing. The first is related to the optimality in the usage of PLS compared to non-PLS. PLS is said to be less desirable by banks due to moral hazard issues. Using two periods of simple debt-plus-equity financing model with probability of defaulting in both periods, the necessary and sufficient conditions for the optimality of PLS (*Mudharabah* and *Musyarakah*) and non-PLS contracts (*Murabahah*) are constructed and analysed. The result shows that without collateral, PLS contract satisfy all the incentive compatibility and limited liability conditions. The moral hazard risk faced by the bank in maximizing the bank profit for PLS contract is also not much different from the non-PLS contracts. Thus, PLS contract is the optimal contract for banks with respect to any level of moral hazard of the contract environment. This result contradicts the result obtained by Aggarwal and

Yousef (2000) in which the authors found that the mark-up based financing is optimal in high moral hazard environment even if it is not secured by collateral. The second issue discussed in this study relates to the effect of collateral and monitoring on the PLS and non-PLS contracts. In addition, the effect of collateral on the entrepreneur, the bank and also the society are investigated. It is found that collateral aids in making the non-PLS contract as the optimal contract for the banks but not for the entrepreneur. It is also found that the Pareto optimal contract which benefits both the bank and entrepreneur is the PLS contract without collateral in which the monitoring cost should be borne by the business cash flow.

The third issue relates to the measurement of moral hazard in PLS and non-PLS contracts. A new moral hazard index based on the entrepreneur's utility function is designed which quantifies the moral hazard faced by a bank in a given set of loan contract. This index is capable of complementing the current techniques in estimating the credit risk of a one-period loan contract. Using the threshold of the index together with the firm gearing ratio, this study also shows that the PLS contract aids in reducing the financial risk of firms.

A systematic method is needed in measuring and understanding the progress in the development of Islamic financial instruments. The fourth issue discussed relates to this purpose, it addresses the issue of the competitiveness of Islamic financial instruments relative to the conventional instruments in a country. The widely employed descriptive Constant Market Share (CMS) analysis tools normally used in analysing competitiveness of exports of a country with respect to other countries in a region or the world are based on general mathematical identities. As the identities are originated from the product rule for the differentiation of product of two functions and relate to changes in shares of entities out of the total share in discrete case, thus it can be explored to be used for other fields other than the change in exports. This study demonstrated how the analysis can be used in analysing the competitiveness of different modes of investment instruments in a country. In this study the Constant Market Share (CMS) tool is described within a new geometric setting. This new approach allows researchers to overcome the traditional unsolvable index number inconsistency problem. Subsequently, CMS competitiveness index constructed from the geometric framework is able to measure the competitive performance of PLS instruments. The solution proposed using the traditional CMS tool is easy to be understood and interpreted while it illustrates changing patterns of PLS competitiveness aggregated across countries or regions.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
Sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PEMODELAN KONTRAK PERKONGSIAN UNTUNG RUGI DALAM PELABURAN PEMBIAYAAN

Oleh

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Hutang yang banyak, mendatangkan masalah yang serius kepada individu, syarikat dan negara. Kita telah melihat banyak krisis ekonomi dunia, yang disebabkan oleh hutang. Negara-negara yang menanggung beban hutang yang tinggi berada dalam keadaan bahaya diistiharkan sebagai negara muflis. Negara-negara ini terpaksa berhutang lagi untuk menyelesaikan hutang terkini. Islam sebagai satu cara hidup memberikan penyelesaian kepada masalah ini dengan mengetengahkan kaedah pembiayaan secara perkongsian untung rugi (*Profit-Loss-Sharing* (PLS)). Islam tidak mengharamkan hutang tetapi menggalakkan kaedah alternative kepada kaedah pembiayaan secara hutang iaitu kaedah pembiayaan berasaskan perkongsian untung rugi.

Kaedah pembiayaan secara Islam adalah berdasarkan kepada dua prinsip: Prinsip perkongsian untung rugi (*Profit-Loss-Sharing* (PLS)) dan prinsip *mark-up* (penggunaan kaedah hutang). Malangnya, sekarang terdapat ketidak seimbangan dalam penggunaan kedua-dua kaedah ini. Kaedah *mark-up* telah memonopoli pasaran kewangan Islam manakala kaedah PLS hampir tiada langsung. Analisa untuk mengkaji kedua-dua kaedah ini adalah diperlukan untuk memahami dan menyelesaikan masalah ketidak seimbangan ini. Kajian ini menganalisa empat isu utama berkaitan kaedah PLS dan bukan-PLS. Pertama, isu berkaitan keoptimuman PLS berbanding bukan-PLS. PLS dikatakan tidak disukai oleh bank-bank kerana isu bahaya moral (bahaya berkaitan isu kejujuran pengusaha dalam memenuhi tanggung jawab kontrak). Menggunakan model kontrak hutang dua tempoh beserta ekuiti dengan keberangkalan pengabaian kontrak pada kedua-dua tempoh, syarat yang perlu dan mencukupi untuk keoptimuman bagi kontrak PLS (*mudarabah* dan *musyarakah*) dan bukan-PLS (*murabahah*) dianalisa. Hasilnya menunjukkan kontrak PLS adalah optimal berbanding bukan-PLS dalam apa jua tahap bahaya moral setempat. Hasil ini berbeza dengan yang didapati oleh Aggarwal dan Yousef (2000) yang mendapati kaedah *mark-up* adalah optimal dalam suasana bahaya moral yang tinggi walaupun pembiayaan itu tidak disertakan

dengan cagaran. Isu kedua yang dibincangkan adalah berkaitan kesan cagaran dan pengawasan ke atas kontrak PLS dan bukan-PLS. Kesan cagaran kepada pengusaha, bank dan juga masyarakat turut diselidiki. Kajian mendapati cagaran membantu kontrak bukan-PLS untuk menjadi kontrak yang optimal kepada bank tetapi tidak kepada pengusaha. Kajian juga mendapati kontrak optimal *Pareto* yang memberi manfaat kepada kedua-dua pihak, bank dan pengusaha adalah PLS kontrak tanpa cagaran manakala kos pengawasan sepatutnya ditanggung oleh aliran tunai perniagaan.

Isu ketiga adalah berkaitan pengukuran tahap bahaya moral yang dihadapi oleh kontrak PLS dan bukan-PLS. Satu indeks baru berdasarkan fungsi utiliti pengusaha untuk mungkir diperkenalkan yang mengkuantitikan bahaya moral yang dihadapi oleh bank bagi satu set kontrak pembiayaan. Indeks ini dapat membantu kaedah yang terdapat sekarang dalam menganggarkan risiko moral bagi sesuatu kontrak pembiayaan bagi satu tempoh waktu. Menggunakan tahap ambang (*threshold*) indeks bersama nisbah pengedaran (*gearing ratio*) syarikat, kajian ini juga menunjukkan bahawa kaedah PLS membantu mengurangi risiko kewangan syarikat.

Kaedah yang sistematik diperlukan untuk mengukur dan memahami tahap pencapaian setiap kaedah pembiayaan secara Islam. Isu yang keempat adalah mengenai perkara tersebut, ia membincangkan mengenai persaingan antara kaedah pembiayaan secara Islam berbanding dengan kaedah konvensional dalam sesebuah negara. Kaedah penganalisan *Constant Market Share* yang banyak digunakan untuk menganalisa persaingan eksport bagi sesuatu negara berbanding dengan negara-negara lain di dalam suatu rantau atau dunia adalah diasaskan daripada identiti-identiti matematik umum. Oleh kerana identiti-identiti tersebut adalah terhasil daripada petua hasil darab bagi pembezaan hasil darab dua fungsi dan berkaitan dengan perubahan bahagian sesuatu entiti daripada keseluruhan bahagian dalam bentuk diskrit maka ianya boleh diselidiki untuk kegunaan bidang lain selain perubahan dalam eksport. Kajian ini menunjukkan bagaimana kaedah penganalisan ini boleh digunakan untuk menganalisa persaingan antara kaedah-kaedah pembiayaan yang berbeza di dalam sesebuah negara. Dalam kajian ini *Constant Market Share* telah dibentangkan dalam bentuk geometri. Kaedah baru ini telah dapat menyelesaikan permasalahan indek yang tidak seragam yang tidak dapat diselesaikan sebelum ini. Satu "indek persaingan" telah dibentuk dalam kerangka kaedah geometri tersebut dan ianya boleh digunakan mengukur tahap persaingan kaedah pembiayaan secara PLS dalam sesebuah negara. Penyelesaian yang dicadangkan menggunakan kaedah tradisi *Constant Market Share* adalah sangat mudah untuk difahami dan dihuraikan disamping ia juga dapat menggambarkan corak perubahanan persaingan PLS merentas sector, negara dan rantau.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
LIST OF ABBREVIATIONS	xvi

CHAPTER

1	INTRODUCTION	1
	1.1 Introduction	1
	1.2 Islamic Financial Instruments	1
	1.2.1 Profit-Loss-Sharing Instruments	3
	1.2.2 Non-Profit-Loss-Sharing Instruments	4
	1.2.3 Issues Related to Profit-Loss-Sharing Mode of Transactions	5
	1.3 Problem Statement	6
	1.4 Research Hypothesis	8
	1.5 Thesis Objectives	8
	1.6 Scope and Limitation of Thesis	9
	1.7 Significance of the Study	9
	1.8 Thesis Organization	10
2	LITERATURE REVIEW	12
	2.1 Overview of Research Background	12
	2.2 Profit-Loss-Sharing and Performance of Islamic Financial Institutions	12
	2.2.1 Implementation Problems	12
	2.2.2 Reasons for Low Implementation of Profit-Loss-Sharing Financing	14
	2.2.3 Moral Hazard	15
	2.3 Collateral	15
	2.4 Credit Risk Issues	16
	2.4.1 Credit Risk Analysis	17
	2.4.2 Financial Ratios	18
	2.4.3 Gearing Ratio	20
	2.5 Determination of Profit-Sharing Ratio	21
	2.6 Constant Market Share and Competitiveness Issues	21
	2.6.1 Constant Market Share Analysis	22
	2.6.2 Critiques of Constant Market Share Analysis	22
	2.6.3 Analysing Competitiveness of Different Mode of Investment	

	Instruments in A Country Using Constant Market Share Analysis Method	23
3	PROFIT-LOSS-SHARING CONTRACTS IN INVESTMENT FINANCING	24
3.1	Introduction	24
3.2	A Review of Aggarwal and Yousef Model	25
3.2.1	Summary of Aggarwal and Yousef Analysis	29
3.2.2	Reflections and Some Clarifications on the Aggarwal and Yousef Model	30
3.3	Model	32
3.4	Types of Contracts	35
3.4.1	The Optimal Contract	35
3.4.2	Cut-off Level of Moral Hazard	37
3.4.3	Cut-off Level of Moral Hazard for the First Period	37
3.4.4	Model with Default Probability	38
3.4.5	Summary of the Analysis of Each Type of the Contract	42
3.5	The Effect Of Collateral and Monitoring Cost on Debt and Equity Financings	43
3.5.1	Financing with Collateral	44
3.5.2	Effect of Collateral on the Bank	44
3.5.3	Model with Collateral	45
3.5.4	Effects of Collateral on the Borrower	46
3.5.5	Effects of Collateral on Society	49
3.5.6	Effects of Monitoring Cost on Debt and Equity Contracts	49
3.5.7	Model of Debt and Equity Contract with Monitoring Cost	50
3.5.8	Pareto Optimal Contract	50
3.6	Summary and Conclusions	51
4	MORAL HAZARD INDEX IN ISLAMIC INVESTMENT FINANCING	53
4.1	Introduction	53
4.2	Moral Hazard Index	53
4.2.1	Entrepreneur's Utility Function	54
4.2.2	Moral Hazard Index	54
4.2.3	Examples of Moral Hazard Index Calculations	61
4.2.4	Properties of Moral Hazard Index	61
4.3	Threshold of Moral Hazard Index	63
4.3.1	Gearing Index	64
4.3.2	Threshold of Moral Hazard Index with Respect to a Debt Contract	64
4.3.3	Threshold of Moral Hazard Index	64

	with Respec to an Equity Contract	66
4.3.4	Examples of Bank's Assessment of Firms and Projects	67
4.4	Conclusion	69
5	THE ANALYSIS OF COMPETITIVENESS OF PROFIT- LOST-SHARING INSTRUMENTS	70
5.1	Introduction	70
5.2	The Basic CMS Model and Area Representation of the CMS Identities	70
5.3	A Geometric Framework for CMS Analysis	77
5.4	Constant Market Share Competitiveness Index: The Net Share Approach	81
5.4.1	Numerical examples	88
5.4.2	Analysis of the Performance of PLS mode of Transactions in Malaysia in 2015	96
5.5	Conclusions	98
6	SUMMARY, GENERAL CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH	100
6.1	Summary and General Conclusion	100
6.2	Recommendations for Future Research	102
	BIBLIOGRAPHY	103
	APPENDICES	110
	BIODATA OF STUDENT	121
	LIST OF PUBLICATIONS	122

LIST OF TABLES

Table		Page
4.1	Symmetrical characteristic property of $T(x, y)$	54
4.2	Examples of Moral Hazard Index calculations	57
4.3	The Effect of Change in $E(x)$ to Moral Hazard Index	58
4.4	Table of Gearing Ratio Index for firms A, B and C	63
4.5	Table of Moral Hazard Index for projects P, Q and R	63
4.6	The sum of Gearing Ratio Index and Moral Hazard Index of the combination of firms A, B, C and projects P, Q and R	63
5.1	Constant Market Share Competitive Index, Milana's Identity and other traditional CMS Identities for five countries over the first time interval	84
5.2	Constant Market Share Competitive Index, Milana's Identity and other traditional CMS Identities for five countries over the second time interval	86
5.3	Changes along the diagonals of Δp isoclines	88
5.4	Analysis of the performance of Profit-Loss-Sharing (<i>Mudharabah and Musyarakah</i>) modes of transactions in Malaysia in 2015	91

LIST OF FIGURES

Figure		Page
4.1	Moral Hazard Box	52
4.2	Disproportionate scaling and not symmetric	53
4.3	Proportionate scaling and symmetric	54
4.4	Graph $GRI(Q_f, D_f)$ versus $MHI(\beta_1, F_1)$ for debt contract	61
4.5	Graph $GRI(Q_f, D_f)$ versus $MHI(\beta_1, F_1)$ for equity contract	62
5.1	Area representation of identity 5.3 $\Delta Q > 0$ and $\Delta s > 0$	67
5.2	Area representation of identity 5.4 $\Delta Q > 0$ and $\Delta s > 0$	68
5.3	Area representation of identity 5.5 $\Delta Q > 0$ and $\Delta s > 0$	68
5.4	Area representation of identity 5.6 $\Delta Q > 0$ and $\Delta s > 0, \theta = 0.5$	69
5.5	Area representation of identity 5.6 $\Delta Q < 0$ and $\Delta s < 0, \theta = 0.5$	69
5.6	Area representation of identity 5.6 $\Delta Q < 0$ and $\Delta s > 0, \theta = 0.5$	70
5.7	Area representation of identity 5.6 $\Delta Q > 0$ and $\Delta s < 0, \theta = 0.5$	71
5.8	Constant Market Share Space	73
5.9	Isoclines of Equi- Δp	75
5.10	Isoclines of Equi-Constant Market Share Competitive Index in s^1 versus s^0 graph	77
5.11	Two different periods Constant Market Share Competitive Indices with two different	

	max (s_t^1, s_t^0) in s^1 versus s^0 graph	78
5.12	Isoclines of Equi- Constant Market Share Competitive Indices in Constant Market Share Space	80
5.13	Constant Market Share Space's partitions with respect	81
5.14	Constant Market Share Space of data from Table 5.1	85
5.15	Constant Market Share Space of data from Table 5.1 and Table 5.2	87
5.16	Constant Market Share Space of data from Table 5.3	89
5.17	Constant Market Share Space for The analysis of the performance of Profit-Loss-Sharing modes of transactions in Malaysia in 2015	92

LIST OF ABBREVIATIONS

CE	Competitive Effect
CMS	Constant Market Share
CMSCI	Constant Market Share Competitiveness Index
CMSS	Constant Market Share Space
CONV	Conventional
GE	Growth Effect
IFI	Islamic Financial Institutions
INPLS	Islamic Non-PLS
MHI	Moral Hazard Index
PLS	Profit-Loss-Sharing

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter presents an overview of the thesis subject matter. We present a brief introduction on the growth of Islamic finance institutions (IFI). Consequently, the types of Islamic financial instruments are elaborated together with critics of their implementations, followed by the problem statement and research objectives. At the end of the chapter, the scope and organization of the thesis are outlined.

1.2 Islamic Financial Instruments

Islam is one of the world's major religions in which its teaching covers every aspect of human life. According to Islam all activities should be done in conformance to Allah's guidance, be it individual, social, economic, political or even spiritual. All activities are considered by Islam as acts of worship, if done in conformance to Allah's guidance. The banking system being an economic activity should also comply with certain rules if it is to be termed as Islamic. Nasser Social Bank, the first Islamic bank established in Egypt in 1971, is the first interest-free institution established by the government in a Muslim country (Abedifar et al., 2015). Since then, many countries have opened their own Islamic banks which offer many Islamic financial instruments in their transactions. These instruments have shown an increase in demand in recent years with many financial institutions all over the world offering these types of services. More than sixty countries around the world have established Islamic banks. In a number of countries, Islamic financial contracts are also being offered by conventional commercial banks (Khan, 2010).

The major difference between Islamic financial instruments and the conventional instruments is that the former are not supposed to involve any *riba* (usury), which is prohibited by Islam. Thus Islamic banks are usually referred to as "interest-free" banks (Khan, 2010). In general term, Islamic financial instruments are financial instruments that adhere to the Islamic legal principles which are basically derived from the Holy Quran (2:275-280, 3:130, 4:161, 30:39) and also from the traditions (*sunnah*) of Prophet Muhammad (peace be upon him) (Khan, 2010).

Examples of the translation to the nearest meaning of the verses of the Holy Quran that refer to the prohibition of interest are given as follows:

"O you who believe! Be afraid of Allah and give up what remains (due to you) from riba (usury) (from now onward), if you are (really) believers. And if you do not do it, then take notice of war from Allah and His Messenger but if you repent, you shall have your capital sums. Deal not unjustly (by asking more

than your capital sums), and you shall not be dealt with unjustly (by receiving less than your capital sums)” (Al-Baqarah, 2:278-279).

“Allah will destroy riba (usury) and will give increase for sadaqaat (deeds of charity, alms, etc) and Allah likes not the disbelievers, sinners” (Al-Baqarah, 2: 276).

Riba is defined as any increment incurred upon specific (usurious) items and upon debt, due to the deferred payment term (Abdul Rahman, 2010).

Usmani (2001) stated that: “The directions of the Holy Qur'an and the Sunnah are quite explicit on the point that any amount, however little, stipulated in addition to the principal in a transaction of loan is *riba*, hence prohibited.”

Besides forbidding the taking of interest, there are also other requirements for a transaction to be considered Islamic. According to the majority of Islamic scholars there are three pillars of a contract. The first is the parties involved in a transaction, the second is the subject of the transaction and the third is the process of offering and accepting. In Islamic finance these three pillars should satisfy certain criteria in order to be considered valid. Two of the basic criteria are the prohibition of dealing with *gharar* (extreme uncertainty) and *maysir* (gambling) (Abdul Rahman, 2010; Hayat, 2006). However, we will not elaborate these criteria as they are not directly related to the objectives of this study.

It is found that the presence of Islamic banking in a country has positive impacts on the economic growth of the country (Imam and Kpodar, 2015). Conventional financial instruments are largely debt-based and allow for risk transfer, while Islamic financial instruments in contrast are asset-based, and centre on risk sharing. These features in Islamic finances make Islamic bank activities to be closely related to real economy and reduce their tendency to excesses and bubbles. Hasan and Dridi (2011) analysis suggests that Islamic banks have been affected differently from conventional banks by the global economic crisis. Factor related to the Islamic bank business model helped limit the adverse impact on the profitability of Islamic bank in year 2008. Islamic banks' credit and asset growth performed better than did that of conventional banks during the period from the year 2008 to 2009, contributing to financial and economic stability.

People might ask, “How can a financial system operate without imposing interest?” The answer to this question as given by Warde (2000) is that it can operate through an agreement on a profit and loss sharing principle, or acting as buying agents and imposing a service charge or mark-up price on clients. Basically the instruments of commercial financing offered by Islamic banks are of two types; the first is based on an investment concept which is called Profit-Loss-Sharing (PLS) instrument, while the second type of Islamic financial

instruments is mark-up (debt-based) financing which is based on a buying and selling concept also known as contract of exchange. The instruments can be divided further into five main contracts: *mudharabah*, *musyarakah*, *murabahah*, *ijarah* and *salam*. The first two contracts are of profit-loss-sharing (PLS) based financing, while the other three are mark-up based financing (Smaoui and Salah, 2012; Aggarwal and Yousef, 2000; Usmani, 2002).

1.2.1 Profit-Lost-Sharing Instruments

In this type of financing, bank financed projects are based on profit-loss-sharing (PLS) agreement. Basically, in PLS financing, banks finance the business ventured by customers and profit will be shared between banks and customers based on a pre-agreed ratio. Customers will pay the bank the principal plus the bank's equity share. Bank returns are not fixed since the amount depends on the profit from the projects. Two examples of Islamic banks PLS financing are the *musyarakah* and *mudharabah* financing. *Mudharabah* financing involves a contract between a bank and an entrepreneur where the bank provides the capital and the entrepreneur mobilises it for specific business activities. The profit gained from the activities is shared by both parties according to an earlier agreed ratio. Similarly, in the case of a loss, the bank will bear the losses in term of money and the entrepreneur loses in terms of effort (Khan and Mirakhor, 1989).

Musyarakah financing is a contract in which several parties participate in a joint venture business project where the profits or losses are shared between them according to an agreed ratio. The providers of capital are given an option whether or not to participate in the management or not (Febianto and Kasri, 2007).

There are fundamental differences between *mudharabah* and *musyarakah* financing. Firstly, in *mudharabah* financing, investors are the main provider of fund for a project. Second in *mudharabah* financing investors are not allowed to be involved in the management of the project whereas in *musyarakah* financing, all participants have the right to take part in the management of the project. Thirdly, in *musyarakah* financing, liabilities of all participants are not limited, but in *mudharabah* financing the liabilities of the investors are limited to the amount invested in the project. Furthermore, in *musyarakah* financing all assets are jointly owned by the participants and they are entitled to any appreciation of the assets. In contrast, in *mudharabah* the entrepreneur is entitled only to the profit obtained from the project according to the agreed ratio but is not entitled to any appreciation of the asset (Usmani, 2002).

There also exists a new and different type of *musyarakah* financing known as diminishing *musyarakah* in which the share of the financier in a project is divided into several units. These shares are purchased by the client over a contracted time period until all the units are owned by the client (Usmani, 2002).

PLS mode of transaction is regarded as the cornerstone of the Islamic financial system since it advocates risk-sharing and equitable distribution of risk which is considered non-exploitative and socially productive (Warde, 2000).

1.2.2 Non-Profit-Loss-Sharing Instruments

The second type of Islamic financial instruments is the debt-based financing which is based on a buying and selling concept, also known as a contract of exchange. Examples of debt-based financing offered by Islamic financial institutions (IFI) are *murabahah*, *ijarah*, *istisna* and *salam*. The most widely used are the *murabahah* and *ijarah* financing (Siddiqi, 2006).

In *murabahah* financing, the bank first buys an asset, then sells it back to the customer at a marked-up price. The customers then owe the bank the price of the asset plus the marked-up price which may be paid on an instalment basis. In this type of financing, banks receive a fixed return. This type of financing is not similar to the conventional system which is based on usury even though it is debt based as the amount the customer has to pay to the bank is fixed at the beginning of the contract and does not increase even due to late payment.

As for *ijarah* financing the bank purchases an asset and rents it to an entrepreneur for a fixed charge. The ownership of the asset either remains with the bank or is gradually transferred to the entrepreneur. In this type of financing banks also receive a fixed return (Febianto and Kasri, 2007).

Istisna is a kind of sale where a buyer places an order on a commodity with an agreed price from the manufacturer before the commodity is manufactured and delivered. It can be considered as project financing or purchase order (Abdullah et al., 2011).

Salam is a sale whereby a buyer puts an order to a seller on some specific goods by paying cash in advance before the goods are delivered at a future date and can be considered as forward financing or advanced purchase (Usmani, 2002).

There is also a type of loan provided by Islamic banks which is called *al-qard al-hasan*. It is a gratuitous loan given to needy people for a specified period. The face value of the loan is to be paid off without any mark-up (Zaher and Kabir Hassan, 2001). As far as this thesis is concerned the focus is on the PLS mode and the non-PLS mode of transactions practiced in IFI.

1.2.3 Issues Related to Profit-Loss-Sharing Mode of Transactions.

The rising of Islamic financial system faces many critics as a number of quarters are questioning the practicality of these systems that do not comply with the objectives of their establishment. Some researchers argue that IFI are not actually offering PLS services but rather conventional services with PLS brand. The superiority of Islamic financial instruments as argued by its proponents is in PLS based financing. However, in practice, PLS is neglected by Islamic banks which offer debt-based financing (Aggarwal and Yousef, 2000; El Gamal, 2006; Farooq, 2007; Chong and Liu, 2009; Khan 2010). Yousef (2004) defined the problem as “*murabahah syndrome*”, which refers to the dominance of *murabahah* mode over the *mudharabah* mode of transactions.

Febianto and Kasri (2007) provided some reasons for the low implementation of PLS transactions by banks. Among the reasons are that banks are not willing to take business risks and cover the high cost of monitoring PLS contracts. In addition, there are very few credible institutional infrastructures to conduct common monitoring and to share information of credit rating on borrowers & entrepreneurs. Meanwhile, Aggarwal and Yousef (2000) utilised a specific set of assumptions to construct a model of Islamic banking demonstrating the rationality of the extensive use of debt-like instruments by IFI. Based on the agency models introduced in Bolton and Scharfstein (1990) and Hart and Moore (1999), Aggarwal and Yousef (2000) weakened some of the assumptions on the entrepreneur’s utility function and demonstrated that the dominant form of financing is the equity-plus-debt financing with increasing risk. This study analyses and comments on the methodology used by Aggarwal and Yousef (2000) in obtaining the result and proposes an alternative view on the issue. This is the first issue analysed in this study.

The role of collateral in equity and mark-up base contract is the second issue analysed. Its effect on banks, entrepreneurs and society are also analysed. Besides that the relationship between collaterals and its effect on the optimality of debt and equity contracts with respect to the moral hazard of the environment is also investigated. Sufficient conditions under which collateral helps in dealing with moral hazard are also elaborated.

The third issue discussed is regarding the measurement of moral hazard risk of a contract between the bank and the entrepreneur. This study proposes a new simple practical index in measuring and analysing the moral hazard related to a business project based on the entrepreneur utility function. Knowing the moral hazard level associated to a given business project helps in pairing the project with a suitable firm base on the firm’s financial standing. Banks can use the index for filtering risky contracts involving firms and business ventures. The index together with the gearing ratio can be utilised in analysing the effect of moral hazard on PLS and non-PLS contracts. The threshold of the moral hazard index demonstrated that the index together with the gearing ratio of firm can be utilized to determine feasible projects for firms. The index can

complement the already existing indices in finalising a contract between the bank and the entrepreneur.

Competitiveness is the fourth issue discussed in this study. The concept of competitiveness have been used both at the micro-economic and macro-economic levels. The notion of competitiveness is not clearly defined at the macro-economic level where there is no commonly accepted definition of competitiveness. Some economists associate it with productivity while others associate it with different aspects of economy (Siudek and Zawojka, 2014). As for the micro-economic level, the notion of competitiveness can be associated with the ability of a firm to compete in gaining market shares in a business competition with several other firms. An increase in a firm's market share means a decline in another firm's market share (Tyszynski, 1951).

As far as this thesis is concerned, it deals with the issue of competitiveness between several competing entities in a clearly defined market. It proposes an index together with the geometrical tool to measure the competitiveness and visualize the effect of the competitiveness within the Constant Market Share (CMS) analysis framework. Even though CMS analysis is normally used in analysing competitiveness of exports of a country with respect other countries in a region or the world but in actuality it is just a mathematical descriptive tool in analysing the competitiveness of a business entity in relative to other rivalry entities with regard to goods and services trading in a country or regions. Thus it is possible to use this tool in analysing competitiveness between different modes of transactions in a country or region. In this study the proposed index together with the geometrical tool is then utilized in analysing the performance of *mudharabah* and *musyarakah* trades which are PLS trades with respect to *murabahah* and also conventional trades which are non-PLS trades in a country.

1.3 Problem Statement

One of the major challenges faced by the IFI today are associated with their transactions which are lacking in the fundamental pillars of Islamic finance known as the PLS entity. PLS is a major attribute of Islamic financial instruments which makes it superior over non-Islamic modes of transactions (Iqbal et al., 1998). Studies related to the optimality of this mode of transaction are becoming very important. Reasons behind the low implementation of the PLS mode of transactions by Islamic banks are debatable in which one of the factors that is blamed for its low implementation is the moral hazard factor. Aggarwal and Yousef (2000) utilized a specific set of assumptions to construct a model of Islamic banking in order to demonstrate the rationality of the extensive use of debt-like instruments by IFI. The authors arrived at the conclusion by showing that the cut-off level of moral hazard for a pure-equity contract is lower than that of a debt-plus-equity contract. A higher cut-off level of moral hazard implies that the contract is suitable for a higher moral hazard environment. The conclusion is derived under the assumption that all the bargaining power is with the banks and the banks set the entrepreneur's equity

share equal to the entrepreneur's level of moral hazard. As the level of moral hazard is not observable, setting the entrepreneur's equity share equal to the level of moral hazard is not practical. However, the problem that exists until today is that there is no thorough analysis done in determining the feasibility of their assumption and their working. A thorough research is needed in analysing the validity of their findings.

Another important element in a loan contract is the collateral. Most research finding regarding collateral deal with conventional banking which involves interest. More studies need to be done with regard to the effects of collateral in Islamic financing. Who obtains the benefit in a loan secured by collateral? What is the association between collateral and the optimality of an Islamic finance contract? In order to answer all these questions, studies focusing on collateral in Islamic finance with models without the element of interest need to be conducted.

Credit risk ranking of the entrepreneur is another important aspect of a financial contract between banks and entrepreneurs. Many techniques are being utilized in the evaluation of the credit risk of an entrepreneur. A wide range of factors are considered in the computation of credit risk such as the entrepreneur's performance record, capital leverage, assets as well as management quality. However, none of the techniques take into consideration the entrepreneur's utility in defaulting. Using the entrepreneur's utility in defaulting to estimate the default probability might complement the existing techniques in estimating an entrepreneur's credit risk ranking. The default probability will help firms in estimating their financial standing with respect to any given contract. Understanding the relation between probability of default of firm and the level of risk of a business contract is another important aspect of Islamic finance that needs to be addressed since this will aid banks and firms venturing into profitable business projects.

The method for analysing the competitiveness of the PLS mode of transactions in a country's financial dealing is another aspect that needs to be standardised. Generally, percentage change in total PLS trades is used as a measure in analysing the performance. A more comprehensive measure such as an index which can reflect the competitiveness of the PLS trade of a country over a certain period is needed to serve this purpose. As the concept of competitiveness is still not thoroughly defined in economics, this study is confined to the commonly acceptable definition of competitiveness between two business entities. CMS analysis which is mainly used to measure competitiveness for international trades can be investigated to be used for this purpose. As the identities used in the analysis are general mathematical identities which relates to changes of entities in discrete cases, it should be explored to be used for other fields.

Analysing all the above issues relating to the PLS and the non-PLS modes of financing helps in understanding and hopefully solving the problem of imbalance in practice between these two modes of financing by Islamic banks.

1.4 Research Hypothesis

The research work presented in this thesis is carried out by hypothesizing the following;

1. Different assumptions on the objective function of bankers and borrowers with respect to profit and utility maximization will generate different cut-off levels of moral hazard.
2. The choice of investment mode by IFI is not due to the higher moral hazard risk in the PLS mode of transaction, but rather to other possible reasons such as banks not willing to take business risks or PLS transaction is less profitable. This stand is in agreement with the research done by Alam and Parinduri (2014) which proved empirically that Islamic banks do not practise PLS financing even when their contracting environment gets better. Equity financing is also almost negligible in current practices even in low moral hazard environment as shown shown in the literatures (Aggarwal and Yousef, 2000; El Gamal, 2006; Farooq, 2007; Chong and Liu, 2009; Khan 2010). The reasons behind why IFI resort to mark-up based contracts or debt financing might be due to the high business risk associated to PLS contract, since in a mark-up contract the bank's income is independent of the outcome of the business.
3. The level of moral hazard in PLS contract with respect to the entrepreneur's utility function is generally lower than in conventional contracts.

1.5 Thesis Objectives

There are five objectives of this thesis which relate to Profit-Loss-Sharing (PLS) mode of transactions in Islamic Financial Institutions. Elaborations of the objectives are given as follows:

1. To analyse the optimality of financial contracts between pure-equity contract, pure-debt contract and also debt-plus-equity contract with respect to the utility function of the entrepreneur in defaulting on a contract.
2. To determine the effect of collateral and monitoring costs on the optimality of debt and equity contracts.
3. To develop an index for measuring the moral hazard faced by a bank in a financial contract between the bank and an entrepreneur based on the entrepreneur's utility in defaulting.

4. To analyse the threshold of the index developed in the third objective and utilize it to determine the feasible projects for firms.
5. To develop a new measure for competitiveness between several business entities in business rivalry and applying it in the analysis of the performance of the PLS mode of transactions in a country or region.

1.6 Scope and Limitation of Thesis

This research studies the optimal contracts between pure-equity, pure-debt and also debt-plus-equity contracts with respect to the entrepreneur's utility in diverting cash flow. This is obtained from the incentive compatibility, limited liability condition and the first order condition of the bank's income function. Even though this study analyse the relation between moral hazard level and the optimal contract but the reasons behind the low implementation of PLS by IFI are not covered in this study.

As for the moral hazard index developed in this study, it is an index which measures the level of moral hazard associated to a set of variables in a contract which is independent of the entrepreneur. The index measures the level of moral hazard associated to one period contracts. The value of the index will always be the same for a specific contract regardless of the entrepreneur, thus, it is not sufficient to apply the index alone in finalising a contract on a loan. Finally, as for the competitiveness index of PLS trades, it is a measure for gauging the performance of PLS trades of a country for a period of time without specifying the reason behind the achieved performance.

1.7 Significance of the Study

This research revisits the method introduced by Aggarwal and Yousef (2000) in arriving at the conclusion that the cut-off level of moral hazard of debt-plus-equity contract is higher than that of pure-equity contract in maximizing the bank's income, making it more suitable for a high moral hazard environment. It analyses the assumptions used in arriving at their finding. "Will changing the assumptions changes the result of the analysis?" "Is the PLS contract not practically applicable since many Islamic nations are categorised as having a high moral hazard environment?" Answers to these questions can serve as a guideline in understanding the true reasons behind the low implementation of PLS contract in IFI. The research also discusses the effects of collateral and monitoring costs in relation to the optimal contract. It also analyses the condition for obtaining Pareto optimal contract. The result of this research is significant to those involved in Islamic finance and it is also important for the survival of PLS financing in IFI.

The following part of this study deals with quantifying moral hazard in PLS and non-PLS contracts in Islamic financial instruments. It is important for both the financier and the entrepreneur to know the level of moral hazard associated to a given set of variables within a contract such as the amount of equity share of the entrepreneur, the capital, the expected profit and the debt (if it exists). This quantified value is able to help in obtaining the appropriate variables so as to keep the moral hazard within a reasonable limit. The relation between financial strength of a firm and the moral hazard level of a business project is also analysed which will help in obtaining the threshold level of moral hazard. The threshold level of moral hazard associated to a business project together with the gearing ratio of firm aids bank in assessing credit risk on corporate loans.

The final part of this study deals with the measurement for the competitiveness of the PLS mode of transactions in a country. This study is significant for the government in monitoring the performances of this mode of transaction in a country. In addition, it is also significant to researchers in this area of study. As for financiers and entrepreneurs it is significant to them since they are the parties directly involved in these types of transactions.

1.8 Thesis Organization

Chapter 2 of this thesis presents the review of literatures related to this research. The chapter is divided into six sections. The first section discusses the general issues related to the thesis while the second section discusses the Islamic financial institutions and PLS issues. The third section presents the collateral issues while the fourth section discusses credit risk issues relating to the different mode of financing. The fifth section presents the determination of profit-sharing ratio issues and finally, the sixth section discusses the competitiveness issues.

The detail regarding the first objective of this thesis is demonstrated in Chapter 3. The chapter comprises six sub-topics, the first demonstrates the introduction to the objective while the second reviews and reflects Aggarwal and Yousef (2000) model and analysis. The third section presents a modified model of two period debt and equity contract while the fourth section discusses the optimal contract with respect to moral hazard of the environment for pure-debt contract, debt-plus-equity contract and pure-equity contract. The fifth sub-topic discusses the effect of collateral and monitoring cost to the bank, entrepreneur and society. The chapter ends with a summary and conclusion.

Chapter 4 discusses in detail the second objective of the thesis. This chapter consists of four sections. The first is the introduction to the topic while the second introduces an index to measure the moral hazard related to the financing contract. It also presents a geometrical instrument in understanding the index named as the Moral Hazard Box. Examples of calculation involving moral hazard level using the index and properties of the index are given at the end of the chapter. The third section discusses the threshold of the moral

hazard index with respect to debt and equity contracts. The chapter ends with a summary and conclusion.

Chapter 5 discusses in detail relating to the third objective of the thesis. This chapter comprises five sub-topics where the first section presents an introduction to the topic while the second section discusses procedures relating to Constant Market Share (CMS) analysis. The third section demonstrates the Constants Market Share (CMS) identities using the area approach while the fourth section proposes an index to measure the performance of PLS mode of transactions together with examples of its application. The topic ends with a conclusion.

Chapter 6, which is the last chapter of this thesis, provide a summary and conclusion of the thesis along with a number of recommendations for future research. At the end of the thesis a list of references, publications and appendices are provided.

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