Mortgage contracts in Islamic home finance: Musharakah Mutanaqisah program vs. Zubair diminishing balance model

Zubair Hasan

INCEIF the Global University in Islamic Finance, Malaysia

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Prof. Dr. Zubair Hasan
INCEIF: The Global University of Islamic Finance

Abstract

The present paper attempts two demonstrations. First, it shows that the Excel formula Islamic banks invariably use to determine the fixed installment payments in home financing amortization has explicit compounding of return. Once the installment is based on that formula, the subsequent claims that in implementation the charge becomes free of interest hardly remain tenable. Second, the paper proposes an alternative home finance model where the mortgage contract has several merits over the structure in common use i.e. the musharakah mutanaqisa program or the MMP. The proposed model is cheaper for the buyer while the margin of return for the banker is not reduced; thus, painting a win-win situation for both. It attracts no juristic doubts. Some bankers of international repute have already hailed the model as an innovative useful breakthrough in the area of Islamic finance. Finally, the model aligns better than others with the maqasid or the objectives of the Islamic law.

Key words: *Home finance; conventional model; mortgages; MMP; ZDBM; Social view*

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1. Introduction

Shelter falls among the essentials for civil living. Islam placed it in the basic needs basket which the state was under eventual obligation to provide for every person living in its territory. The rising awareness of the need across the world today is hardly surprising. The issue has assumed alarming proportions across countries, especially in the developing nations. In India alone the shortage of dwelling units is currently estimated at 27 million requiring billions in dollars to cover up the gap. In Muslim countries also the problem is no less acute. For banks, home financing offers huge potential for profitable investment. After experimenting with a few models, Islamic banks have seemingly settled down en mass with the musharikah mutanaqisa participatory program or the MMP across the globe and the popularity of the model is on the rise.

We had argued earlier that the MMP is not so innocuous a program as many believe it is (Hasan 2011). It is infested with the prohibited compounding process and is no better than the conventional finance in consequences for the customer. We had provided an alternative in the

[1] This paper is the culmination of a few earlier writings and conference presentations on the subject. Still, it is new and so far unpublished. In the process of developing the argument three of the PhD students at INCEIF – Ashraf, Roslan and Nur – have all along helped me in various ways. I am extremely grateful to them but the usual disclaimer applies. "The views expressed in this article are those of the author and do not necessarily represent the views of, and should not be attributed to, INCEIF (The Global University of Islamic Finance)"

shape of diminishing balance model named as the ZDBM. The argument was presented later at several seminars and a detailed paper circulates at the internet providing explanations for amelioration (Hasan 2011a 2011b and 2010). However, mental conditioning and narrower interests have presumably been hurdles to see reason prevail. This paper attempts at providing more and clearer evidence that the way Islamic banks are currently using the MMP is no better than interest financing. We reiterate that the diminishing balance model is devoid of all blemishes that the conventional and MMP models together suffer from.

We have divided the paper into six sections to achieve our ends. In the following section 2 we explain and illustrate how compounding of return process has infiltrated into the current deployment of the MMP in Islamic home finance. Section 3 explains the operation of the ZDBM and provides a Shari'ah framework for putting the model into operation. In section 4 we compare the consequences of the MMP and the ZDBM for the consumer and the society at large, arguing that the latter has equity and efficiency apart from being free of the return compounding process of conventional financing. Section 5 shows that the ZDBM proves cheaper for the customer without in any way reducing the profit margin for the financier. Finally, Section 6 contains some concluding observations pleading for its adoption by the industry for its obvious merits for the individual customers, the bankers and the society.

2. Compounding infiltration via Excel

The following formulas which are stock in trade of conventional interest financing are all based on the compounding principle (Microsoft 2012). Islamic banks claiming to be the La-riba institutions invariably use (1) to determine the installment payment (A), given the chargeable rate of return (r) the time units (n), and the initial bank investment (P_O). The end period amount (P_n) can then easily be ascertained as equal to A times n. Once A is determined

$$A = P_0 \cdot \frac{r(1+r)^n}{(1+r)^n - 1} \tag{1}$$

$$P_n = A \cdot n \tag{2}$$

$$P_0 . = A . \frac{1-\left(\frac{1}{1+r}\right)^n}{r} \tag{3}$$

Putting the value of A from (2) in (3) and solving we get

$$P_n = P_0 \cdot \frac{n.r}{1-\left(\frac{1}{1+r}\right)^n} \tag{4}$$

using the compounding principle, it is immaterial from the juristic viewpoint as to how its division is subsequently made between amortization of capital and the return on it. In the expression $(1+r)^n$, 1 denotes capital, r the chargeable rate of interest and n the number of time units involved. Thus, the expression tells us how much would capital (=1) become in n time units. To illustrate, let the rate of interest 'r' be 10% or 0.1 per unit. In the first year (n=1) capital i.e. 1 becomes (1 + 0.1 = 1.1). The bank treats it as the capital for the next (n=2) period and multiply it by (1+0.1) to get 1.21. Now, if the loan amount were 100 it would become 100*1.1 = 110 in the first year and 110*1.1 = 121 in the second. If the rate of interest were a simple non-compounding charge 100 in two years would grow to 100 + 10 + 10= 120. Thus, compounding in the first case adds 1 to the total because it converts the first year interest =10 into capital for the second year interest on it being 10*0.1=1: it comes about that

Compounding capitalizes interest (income)
Interest is a curse; compounding even worse

Compounding of interest in the past had converted the poor into paupers. Today it has in addition humbled the rich, downed the mighty banks and bankrupted even nations. Seemingly low rates have snowballed apparently manageable debts grow into un-climbable mountains: In many cases countries find their GDP insufficient to service the debt, let alone the payment of the principal! England has to pay currently no less than $42 billion a year just to service the debt (BBC News – Business), May 2012). And to all this Excel designs may well have contributed.

Various Excel formulas are parts of a well-knit compounding system[2], one perforce leading to others. Formula (3) compounds the principal forward to the P_n while formula (4) discounts back the amount and takes us from a given P_n back to its initial value P_0. The beauty of the web is that once we decide the initial amount of loan (P_0), the chargeable rate of return (r) and the number of periodic installments (n), the kit would readily help us find what would have to be added to the charge for arriving at the fixed amount needed to clear the loan plus interest by the last installment payment. This addition can be converted into the rate of what we call the capital redemption factor. The additive rate for a case can be found from the readymade compounding Tables.

[2] Referring to the key formula (1) in the above set, the Microsoft article (2012) at one stage says: "When the number of compounding periods matches the number of payment periods, the rate per period (*r*) is easy to calculate. Like the above example, it is just the nominal annual rate divided by the periods per year."

Formula (1) of the set automatically incorporates it to arrive at the installment amount. As a matter of fact we can schematically separate the return of capital (R of C) and the return on capital (R on C), the two component of the installment (A) as under.

$$(R\ of\ C) = [(a + Rc)\ (1 + r)^{n} - [R\ (1 - c)] \qquad (5)$$

$$A - (R\ on\ C)$$

A = Installment amount
a = capital redemption factor

R = the periodic interest/rent amount

c = customer's equity ratio

r = Periodic rate of return per unit

(1 + r) = compounding multiplier

n = 0 1 2 3 4 ……..up to the last time unit.

Note that the (R of C) leaves (R on C) as a residual in A which compounds forward[3]. An easy way for the customer to ascertain the redemption factor 'a' in the MMP is to deduct the periodic interest/rent amount from the installment payment. These points would become clearer as we proceed with the illustration we present below. The case chosen is the same as was used in Hasan

CASE FACTS

Cost of the house $ 100000
Customer pays = $ 20000 as his part of the initial cost.
Loan amount ($P_{0)}$) $ 80000
Annual payment A = 11773
Annual interest / rental rate = 8%

SUMMARY
The values have been derived using the Excel compounding formulas given above.

Six monthly payment	A = $ 5886.54
Six-monthly rent	R = $ 4000
Redemption factor (5886.54 – 4000)	a = 1886.54
# of payments	n = 20
Total payment (P_n) = A * n	P_n = $ 117730.8

Verification of equation (5) stated above when n = 1 in the MMP model right hand

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[3] Equation (5) shows an alternative way to find the installment amount. It sets up $A = P_0 \cdot \frac{r(1+r)^n}{(1+r)^n - 1} = (a + Rc)(1+r)^n$

The alternative A = (a + Rc) $(1 + r)^{n}$ vividly brings out the role compounding plays in the determination of A.

$$
\begin{aligned}
A &= [1886.54 + 4000 * 0.2]\ (1 + 0.04)] + [R(1 - 0.2) \\
&= [1886.54 + 800](1.04) + [4000 * 0.8] \\
&= 2686.54 + 3200 = 5886.54
\end{aligned}
$$

(2011). Compounding as explained above infiltrates the MMP financing as Islamic banks invariably se formula (1) to determine the installment amount A. In the illustrative case below we keep the details or the two models identical for purposes of comparison. the MMP is different from the conventional

WORKSHEET

	A	B	C	D	E	F	G	H
n	Balance outstanding		Return of capital		Compound	Return on capital		Installment
	CON	MMP	CON	MMP	Rate	CON	MMP	CON / MMP
1	80000	80000	2687	2687	1.04	3200	3200	5887
2.	77313	77313	2794	2794	1.04	3093	3093	5887
3.	74519	74519	2906	2906	1.04	2981	2981	5887
4.	71612	71612	3023	3023	1.04	2864	2864	5887
5.	68590	68590	3143	3143	1.04	2744	2744	5887
6.	65446	65446	3269	3269	1.04	2618	2618	5887
7.	62177	62177	3400	3400	1.04	2487	2487	5887
8.	58777	58777	3536	3536	1.04	2351	2351	5887
9.	55241	55241	3677	3677	1.04	2210	2210	5887
10.	51564	51564	3824	3824	1.04	2063	2063	5887
11.	47740	47740	3977	3977	1.04	1910	1910	5887
12.	43762	43762	4137	4137	1.04	1750	1750	5887
13.	39626	39626	4302	4302	1.04	1585	1585	5887
14.	35324	35324	4474	4474	1.04	1413	1413	5887
15.	30850	30850	4653	4653	1.04	1234	1234	5887
16.	26197	26197	4839	4839	1.04	1048	1048	5887
17.	21357	21357	5033	5033	1.04	854	854	5887
18.	16325	16325	5234	5234	1.04	653	653	5887
19.	11091	11091	5443	5443	1.04	444	444	5887
20.	5647	5647	5661	5661	1.04	226	226	5887
	944756	**944756**				**37726**	**37726**	**117740**

The following Table clarifies the treatment of the rental in the MMP model

Table WS: Rental components in the MMP

n	Return of capital R of C under the MMP $			Return on Capital (Rent for Bank) H	Total Rent K + M
	Capital Redemption Factor	Rent due to Client	Total E		
	J	K	L	M	N
1	1887	800	2687	3200	4000
2	1887	987	2794	3093	4000
3	1887	1019	2906	2981	4000
--	--	--	--	--	--
18	1887	3146	5033	653	4000
19	1887	3347	5234	444	4000
20	1887	3556	5443	226	4000
Total	**37740**	**42260**	**80000**	**37726**	**80000**

A further proof of interest entering the MMP from the back door is provided by a little manipulation of equation (5) to ascertain the return on capital due at any (t) installment.

$$R \ on \ C = P_{\mathbf{0}} \cdot \frac{r(\mathbf{1}+r)^n}{(\mathbf{1}+r)^n-\mathbf{1}} - (a+Rc)(\mathbf{1}+r)^{t-\mathbf{1}} \qquad (6)$$

P_0 = Loan amount
R = Periodic rent
a = A – R where A is the installment amount given by the first term of the equation
c = Customer contribution ratio to cost of the house
n = Number of time points
t = Time point n for which R on C is required

Verification: R on C when n = 6

$$R \ on \ C = 80000 \ \frac{0.04\,(1+0.04)^{20}}{(1+0.04)^{20}-1} - (1887 + 4000{*}0.2)(1+0.04)^{6-1}$$

= 5887 – 3269 = 2618, same as in column G of the worksheet.

Thus, in both cases – CON and the MMP - the return of capital grows on a compounding principle, the rate (r) remaining uniform at 4%.[4] This causes its difference - the R on C - from the instalment amount discount back at non-uniform rates. However, it may be of interest to note that the MMP deals with the Return of Capital in two parts– there is a fixed component – a, the capital redemption factor, and a share in the rental. As such, the compounding process for the latter part is found to be quite firm approximately (1 + r) = 1.1!

Finally, there has been much discussion in the mainstream literature on the point of determinants of a mortgage outcome in home financing and the relative merits and demerits of different financing alternatives for the buyer (Chambers et al 2007). Some have even taken the position that the Excel formulas have no compounding, even as Microsoft (2012) implicitly admits it. But this much even they concede that the first installment payment will contain compounding and compounding will certainly surface if installment payments were carried over unpaidWe have stayed clear of these intricacies as our focus is limited to the current use of these formulas in the MMP.

[4] The standard compounding formula is $P_N = P_0 (1 + r)^n$. But this formula takes P_0 as remaining constant over the time span which is not the case here. P_0 decreases as installments are being paid per unit of time. So, to find out the compounding rate for use in this formula, we have to find out the value of r by inserting the given values of P_n, P_0 and n into this formula. In our case we find r = 0.01951. Thus, $P_n = 80000\ (1 + 0.01951)^{20} = 117738$. This is yet another evidence of compounding infesting the MMP model as currently used in Islamic home financing.

3. ZDBM – an alternative

The inspiration rather urge to develop this model came from two sources: First the proliferating econometric studies on Islamic finance have often claimed that Islamic banks are more efficient on cost-profit criteria than their conventional counterparts. Second, there is a judicial opinion on record in Malaysia that Islamic banks fleece their clients at times even more than the interest charging institutions. The two views are contradictory and prompt investigation. Hence, the introduction of a new approach which we think is tenable in the first instance on the principle of what we cannot prove as un-Islamic is Islamic, though we shall indicate the juridical basis for the model.

Let us continue with our example to explain the new model. The bank proposes to the client as follows. "You have already paid $20000 to the seller as earnest money. The remaining $80000 the bank shall pay for acquiring a *proprietary share* in the house, you acting as our agent. For getting back the amount $80,000 in six-monthly installments over a period of ten year, we shall put a yearly mark-up of 8% for our ownership share in the house. However, the mark-up amount will be reduced proportionate to the return of our money. That would help reduce your liability to the bank. The registration of the house in the court will be in your name but you will have to sign simultaneously a mortgage deed pledging the property with the bank as security until installments as per Table 1 have all been cleared in full. The Table provides the calculation for your six-monthly installments". The Table is based common sense. It is easy to explain and understand its logic.

Table 1: Working of the Diminishing Balance Model

Installment # n A	Return of Capital B	Outstanding Balance C	Return on Capital 4% D	Installment payment E = B + D
0		80000	---	---
1	$4000	$76000	$3200	$7200
2	$4000	$72000	$3040	$7040
3	$4000	$66800	$2880	$6880
---	---	---	---	---
19	$4000	$4000	$320	$4320
20	$4000	$0	$160	$4160
Total	**$80000**	**$8400000**	**$33600**	**$113600**

ZDBM and the Shari'ah

What could possibly be the initial Shari'ah jacket for the ZDBM? We preface our answer with the statement that we juxtapose the model in the general four cornered box with the others. At the corners are the regulators, lawmakers, banks and the customers. Product designing, documentation, and observation of laws are to be taken care of essentially by the bank, the

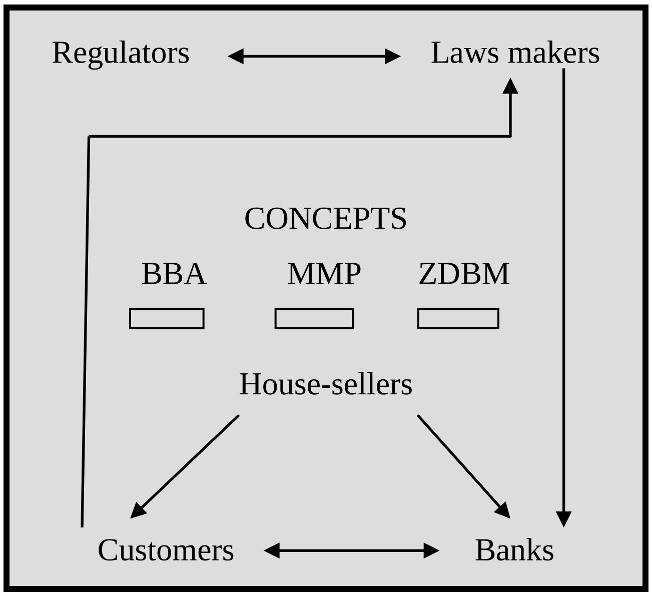

Figure 1: Alternative home financing modes

regulators and the lawmakers. The three operate or must operate in a cohesive coordinated manner. The Figure 1 depicts the relative positions of the parties involved in the box, the

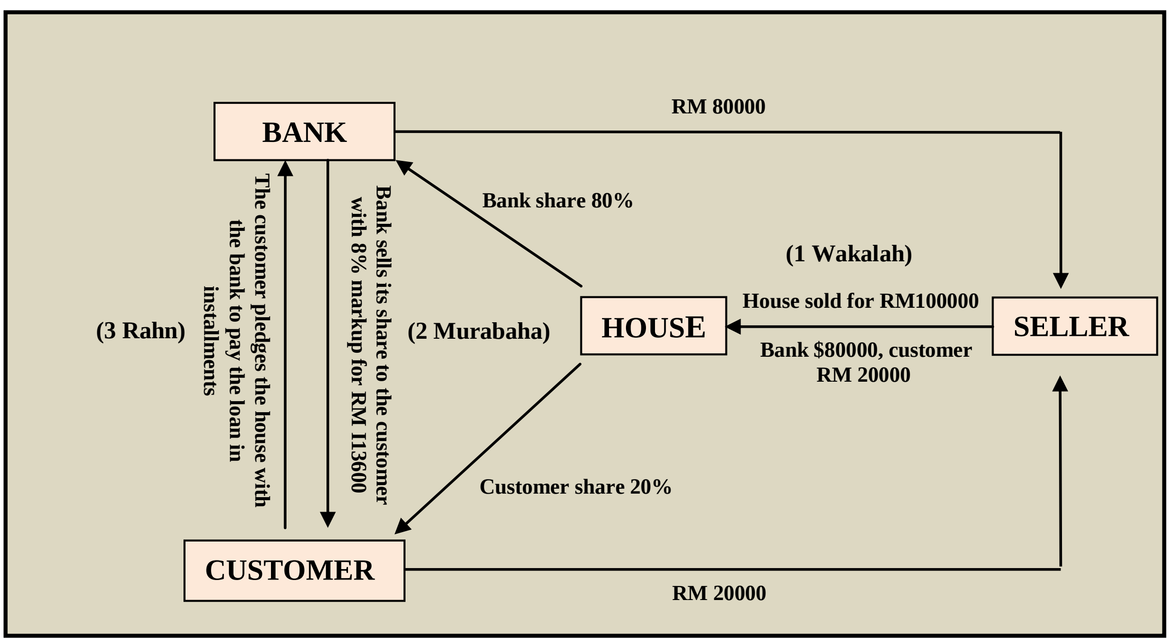

Figure 2: Diminishing Balance Model in operation: Three independent contracts

arrows showing the nature of their mutual relationships. Being technical matters we desist in taking positions on these matters.

Leaving out the finer legal, structural, and regulatory positions of this general frame, we can spell out the working aspects of the ZDBM. It can possibly be based on three mutually exclusive and independent Islamic contracts to be consecutively executed.

1. A sale contract among the customer, bank and the seller giving co-ownership of the house to the first two in a 20:80 division. The customer will work as the agent of the *bank under an appropriate letter of authority.*
2. A second contract whereby the bank sells his share to the customer with an agreed 8% mark-up over cost – RM 80000.
3. A third contract whereby the customer mortgages the house with the bank until the installments have all been paid in full.

4. ZDBM VERSUS MMP

It is the contract of mortgage that survives between the customer and the bank until all effects are cleared in any mode of home financing conventional or Islamic. Mortgage under the ZDBM clear advantages over the conventional/MMP mortgage. We shall see that the MMP

Table 2: ZDBM VS. MMP: Comparative data

n	**Outstanding balance**		**Return of Capital (R of C)**		**Return on Capital (R on C)**	
	ZDBM	MMP	ZDBM	MMP	ZDBM	MMP
	A	**B**	**C**	**D**	**E**	**F**
1	80000	80000	4000	2687	3200	3200
2	76000	*77313*	4000	2794	3040	3093
3	72000	74519	4000	2908	2880	2981
4	68000	71612	4000	3023	2720	2864
5	64000	68590	4000	3144	2560	2743
6	60000	65446	4000	3270	2400	2617
7	56000	62177	4000	3401	2240	2486
8	52000	58777	4000	3537	2080	2350
9	48000	55241	4000	3678	1920	2209
10	44000	51564	4000	3825	1780	2062
11	40000	47740	4000	3978	1600	1909
12	36000	43762	4000	4138	1440	1749
13	32000	39626	4000	4303	1280	1584
14	28000	35324	4000	4475	1120	1412
15	24000	30850	4000	4654	960	1233
16	20000	26197	4000	4840	800	1047
17	16000	21357	4000	5034	640	853
18	12000	16325	4000	5235	480	652
19	8000	11091	4000	5445	320	442
20	4000	5647	4000	5663	160	224
Total	**840000**	**944756**	**80000**	**80032**	**33600**	**37708**

has not only got compounding, it attracts some juristic frowns as well (Hasan 2011).

The main ones are as follows.

1. ZDBM turns out to be cheaper for the customer due to a faster repayment of capital plan. For example, in our illustration the customer gains $4108 - the difference between the return on capital columns in the Table.
2. Significantly, the customer does not gain at the cost of the banker. Notice that the sum of outstanding balance, which we take as proxy for funding deposits, reduces in the ZDBM proportionate to the reduction in the return volume. Please see the following equation. Figures are from the total row of Table 2.

$$\begin{array}{ccccccc} \textit{Models} & & \textit{Funding Deposis} & & \text{Re}\textit{turn on Capital} & & \\ \dfrac{ZDBM}{MMP} & = & \dfrac{840000}{947756} & = & \dfrac{33600}{37708} & = & 0.888 \end{array}$$

   For this reason the margin on funding deposits remains the same in both cases i.e. 4%. ZDBM is a win-win model for both the parties: The cost of the house is reduced for the client. Islamic banks get an edge over their conventional rivals while their profit margin remains unchanged. We return to this point in some detail later in the discussion.
3. ZDBM is more efficient; it absorbs fewer resources – funding deposits are smaller. It follows that the model must also increase the liquidity levels in the system.
4. The ownership of property passes faster to the customer. Researches show that constant amortization program as in the ZDBM are more equitable than any other scheme in operation (Chambers, M. S. et al 2007) In our illustration, half way down the time scale 50% ownership passes to the customer as compared to 40% under the MMP. (See Figure 3 below) Thus, for the customer and society the fixity of amortization - not the fixity of installment payments – is thus more important.

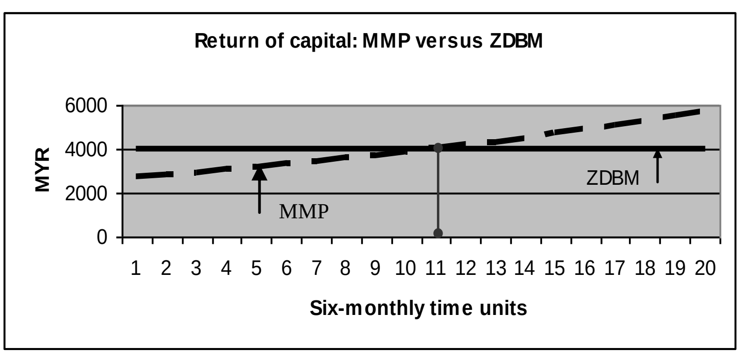

Figure 3: Return of capital is faster under ZDBM than under the MMP

5. In the case of default, ZDBM is more equitable to the parties. Suppose in our Table 2, default takes place half-way i.e. after 10 instalments have been paid in each case (See row 11). Under the ZDBM the buyer's liability reduces proportionately to 50% while under the MMP he will still have to pay almost 60% of the debt -$ 7713 more to be exact!
6. In the MMP there can and have arisen disputes on the revision of rental, the value of the property and the amount of liability remaining unpaid once default takes place. In the ZDBM matters are much clearer. The return on capital – the operation of the mark-up stops at once in case of default. The house will remain under charge for any outstanding balance on capital account alone.
7. The MMP also requires the creation of three transactions: (i) creation of a joint ownership in property. (ii) the financier leases his share in the house to the customer on rent and (iii) the customer undertakes to purchase different units of the financier's share until the ownership is completely transferred to the former. Taken singly, the jurists regard the three transactions valid if certain conditions are fulfilled. However, it is strongly doubted if their combination in a single contract can be allowed. (Hasan, 2011, p. 15).
8. Scholars are divided on the issue if the undertaking of the customer to buy-back the financier's share in the property would be enforceable in a court of law because of absence of consideration, if not for the lack of free will.
9. The shares are not divided in uniform units and the mechanism of determining the fair value of each is never in place. What is done is to treat the rent portion accruing to the client as both the price and the market value of the share – the client never sees a penny of the rent he earns. The customer has no option but to agree to this dubious arrangement under the gaze of Shari'ah advisors to the bank.
10. In the case of default, the condition of the customer under the MMP may not be comfortable. Some banks have insisted that not only the balance of capital remaining outstanding but also the return on it for the remaining period must be treated as unpaid liability of the client to meet their commitment to the depositors.
11. ZDBM is free of all the disabilities that in our view afflict the MMP. Once a default takes place, the operation of mark-up in the ZDBM comes to an end; balance outstanding on capital account alone is to be cleared. The ownership of the house is not in dispute, the property is released once the outstanding amount is paid.

5. CAPITAL COST RISK COVERAGE AND RELATED ISSUES

Critics argue that the ZDBM is cheaper because it ignores capital costs and risk premium which elements are taken care of in the MMP model by adding a redemption factor to the base rental. This brings us back to the point we briefly discuss above. We demonstrate below that the ZDBM works without in any way reducing the margin of profit for the bank. ***It is cheaper because it reduces the funding deposits of the bank proportionate to the reduction in profit, thus leaving the margin unchanged.***

The following formula is commonly employed for fixing the price of financial products.

Price = cost of funds + risk factor + hurdle costs + overhead costs (7)

Cost of funds includes deposit cost, statuary reserve ratio (SRR) and liquidity requirement (LAR) cost. Risk factor includes cost of capital charge to absorb market, credit and operational risk. Hurdle rate is the return the bank expects to earn.

Since the objective of this brief section is restricted to showing that under the ZDBM deployment, the bank's rate of return on capital investment remains unaffected; we have assumed that deposits match with financing amortization balance. SRR is taken at 4% with zero return and LAR at 2% on 1% minimal return. Capital charge is calculated at 4% equaling half of the 8% mark-up the bank uses. Hurdle rate and overheads are ignored to keep matters simple. For demonstration we construct Tables 3 and 4 using the same illustrative case we used earlier. The indicated rates in column headings of the Tables being annual have been divided by 2 in each case to calculate six-monthly figures. The excerpts from relevant Excel worksheets are produced below for both the ZDBM and MMP cases to show that the de facto

Table 3: ZDBM absorbs fewer funds than the MMP making home purchase cheaper for the customer without reducing the rate of return on funding for the bank.

Months	Exposure structure (Assets side)						Risk coverage (Liabilities side)				Margins		
	Funding deposits	SRR	LAR	Total deposits	Capital	Total D + C	P & L Deposits	LAR	Capital	Total	Gross Margin	**R on I %**	R on D + C %
		4% on 1	2% on 1	1+2+3	8% on 1	4+5	3% 0f 4	1%	4% on 5	7+8+9	5 – 10	**11/4**	11/6
n	1	2	3	4	5	6	7	8	9	10	11	**12**	13
1	80000	1600	800	82400	3200	85600	1230	8	64	1304	1896	**2.3**	2.2
2	76000	1520	760	78280	3040	81320	1174	4	61	1239	1801	**2.3**	2.2
3	72000	1440	720	74160	2880	77040	112	4	58	1174	705	**2.3**	2.2
--	--	--	--	--	--	--	--	--	--	--	--	**--**	--
18	12000	240	120	12360	480	12840	185	4	10	196	284	**2.3**	2.2
19	8000	150	75	8225	300	8525	123	1	6	129	171	**2.3**	2.2
20	4000	80	40	4120	160	4280	42	0	5	65	95	**2.3**	2.2
Total	**840000**												

Table 4: MMP absorbs more funds inflicting higher costs on the consumers and the society

Months	Exposure structure (Assets side)						Risk coverage (Liabilities side)				Margins		
	Funding deposits	SRR	LAR	Total deposits	Capital	Total D + C	P & L Deposits	LAR	Capital	Total	Gross Margin	**R on I %**	R on D + C %
		4% on 1	2% on 1	1+2+3	8% on 1	4+5	3% 0f 4	1%	4% on 5	7+8+9	5 – 10	**11/4**	11/6
n	1	2	3	4	5	6	7	8	9	10	11	**12**	13
1	80000	1600	800	82400	3200	85600	1236	4	44	1304	1896	**2.3**	2.2
2	77313	1540	775	79632	3092	822724	1194	4	62	1260	1832	**2.3**	2.2
3	74519	1490	745	76754	2980	79734	1151	4	60	1215	1765	**2.3**	2.2
--	--	--	--	--	--	--	--	--	--	--	--	**--**	--
18	16413	328	164	16905	657	17561	254	1	13	268	389	**2.3**	2.2
19	11178	224	112	11514	448	11962	1173	1	9	183	265	**2.3**	2.2
20	5733	115	58	5906	230	6136	89	0	5	94	136	**2.3**	2.2
Total	**944756**												

rate of return in the two models are the same. The Tables also narrate the happenings on both the assets and liabilities sides of a bank's balance sheet. Notice also that the return on investment is identical at 4.6% (2.3 x 2) in the two models (Column 12). However, the *funding deposits* are much lower in the ZDBM – about 10 - 12% - than the MMP. Thus, ZDBM is more efficient than the MMP in matters of fund utilization and possibly in granting liquidity as well.

6. CONCLUDING REMARKS

Our focal point in the above discussion has been the demonstration of back door interest-taking that infests the current Islamic home financing and show how it can be eradicated. Shari'ah structures used in home finance was a side issue as they are under intense juridical scrutiny over time and space in the literature (Hussain 2010). The paper reinforces the argument of our earlier writings that the MMP model for Islamic home financing is no better than its conventional counterpart in *riba* usage or its consequences for the participants in the program. The amortization exercise in these contracts uses not only interest but the rates invariably follow a compounding pattern implicit in the Excel formulas explained in Section 2 above and invariably used by the Islamic banks also for determining the periodic installment. Such compounding is much vociferously condemned in the Quran (3: 130-132). The Microsoft acknowledgement its formula for installment determination involves compounding even if late confirms the validity of what I have been arguing since late 2009. This admission is more than sufficient for Islamic jurists and regulators to reconsider rather reverse their position on MMP without delay. Even the argument that MMP uses interest rate just as a bench mark loses its validity In any case, houses are seldom found at the sea level, the bench mark for measuring heights in geography.

Hopefully, Islamic bankers and regulators would take note of the *Diminishing Balance model* - the ZDBM and its merits. It is Shari'ah compliant and cheaper for the customer without being costlier to the bank. Also, it avoids all the complexities of the rent or property value revision that confront us in the MMP. The relatively larger installments in early stages in the ZDBM may be a boon not a bane for younger people who may not have started the family yet or may be having fewer small kids. The life cycle hypothesis need not detain us here. The presumption that individuals *consciously* tend to smoothen their expenditure with reference to their life time income and wealth was mooted for relating consumption expenditure (and savings) to economic growth. For applying the idea in micro-financing areas, one has to show that human behavior in the matter runs at the individuals' level close to aggregative tendency. Here the question seems to be: what home buyers do or would prefer -- initial lower charge or smaller final cost? It is a difficult question to answer but this much is undisputed that uniform amortization as in ZDBM has the merit of passing ownership to the customer at a faster rate than in the case of uniform installment payment of the MMP. Research holds that a constant amortization regime "seems to increase home-ownership across the entire life cycle" (Chambers et al 2007, p.3).

The ZDBM enunciates a general principle and procedure, home finance taken as an illustration. It can help reform even the current MMP for smooth transition. However, charging on the diminishing balance is a principle with wider applications. Once the principle is granted recognition by the stakeholders, Islamic finance modes are likely to undergo some radical and gainful transformation across the globe, providing a much needed edge to the system vis-à-vis the conventional in every sphere of finance. Malaysia can add another shining feather to her leadership cap in Islamic finance. For, the march of truth cannot be held back for long.

REFERENCES

American Finance House – LARIBA: Financing alternative to the conventional, Riba System, Lariba.com Home Financing – Accessed on 24.10.2011

Chambers, M. S, Garage, C and Sehlagehauf, D (September 2007): *Mortgage contracts and housing tenure decisions*, Working Paper, Federal Reserve Bank of St. Louis (Research Division), pp. 1-40.

Hasan, Zubair (2012): *Islamic home finance*, INCEIF Blog postings, 16 .5.12 and 18.5.12. www.inceif.org/blog.

Hasan Zubair (2011): *Islamic home finance in the social mirror*, ISRA: International Journal of Islamic Finance, Vol. 3, No.1 June.

Hasan, Zubair (2011a): *The Diminishing balance model for home financing*, Journal of Islamic Banking & Finance, Karachi Vol 28 Issue 3 pp. 150-156.

Hasan Zubair (2011b): *Riba in La-riba contracts – Where to turn in Islamic home financing?* MPRA working paper # 35421

Hasan, Zubair (2010): *Islamic house financing: current models and a proposal from social perspective*, Journal of Islamic Banking & Finance, Karachi. Volume 27 Issue 4

Hussain, A (2010): *Islamic Home Financing and Mortgages*, Islamic Mortgages.co.uk. Accessed on 1.1.2012.

ISRA (2011): *Financing based on Musharikah Mutanaqisa contracts*, Downloaded on 12.11. 2011.

LARIBA, Knowledge Center: Frequently asked questions: In answer to the question -- *I heard that in your contract you have a term as interest. What does that mean?* Accessed on 1.1.2012.

Malaysia International Islamic Finance Centre (November 12, 2011): *Shaping Islamic Finance together – Musharikah Mutanaqisah – Last update* Downloaded 12.11.2011.

Maybank2u.com (November 12, 2011: *Musharkah Mutanaqisah Term Financing (MMTF-i) – A shari'ah compliant financing facility for asset acquisitions and refinancing.* Downloaded 12.11.2011.

Meera, A. K. M & Razak, D. A (2009): *Home financing through the Musharakah Mutanaqisah contracts: some practical issues,* JKAU: Islamic Economics, Vol. 22, No.1, pp. 3-25.

Microsoft (2012): *Amortization Calculation Formula – Excel,* http://www.vertex42.com/ExcelArticles/amortization-calculation.html (Cached Page)

Microsoft (2011): *How to calculate compound interest for an intra-year period in Excel* http://support.microsoft.com/kb/213907

Osmania, N.M & Abdullah, M.F (July 2010): *Musharakah Mutanaqisa Home Financing: A Review of Literatures and Practices of Islamic Banks in Malaysia*, International Review of Business Research Papers, Volume 6, and No. 2

Smolo, E. and Hasssn, M.K (2011): *The potentials of musharakah mutanaqisa for Islamic housing finance.* International journal of Middle Eastern Finance and Management, Vol.4; No.3 PP. 237 - 258

Zayan Finance: The declining balance program - integrity in financing; Shari'ah Compliance information.www.zayanfinance.com/ii-shariah-compliance.php - Accessed on 24.10.2011