

New Mathematical Model for Islamic Unit Trust

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Abstract: *The demand for Islamic unit trust which is the alternative to the interest-based market become increasing day by day. This encourages the Malaysian government to take the various intervention and measures, so that interest free market which is Shariah Compliant can be introduced. The aim of this research is to construct a new formulation of Islamic unit trust for better incomes of Muslim customers'. The method of this researches to derivate a new model by using the new concept of dividend. In findings, the new model of formulation can be contrasted in Islamic unit trust. This new model is a suggestion for unit trust management to be applied in the future time.*

Index Terms: *Islamic Unit Trust, Interest-based market, Mathematical Model*

I. INTRODUCTION

In Malaysia, the Islamic finance and banking has been established since 1960s. However, the system is not yet integrated with Halal industry. Until today, many experts and political leaders gave their opinions in order to integrate Halal products and Islamic financial system [12]. As Muslim community is the majority population in Malaysia, it is important to make sure that unit trust system in Malaysia follows the guideline of Shariah laws [7]. Besides, Islamic unit trust not only popular among Islamic investors as people start to be concern about Halal and Haram investment, but also among non-Muslim investors as it is less risky than conventional unit trust [2]. Islamic unit trust funds are defined by their compliance with rules and regulations derived from Islamic law [13]. In order to consider the unit trust is compliance with the Shariah laws, they apply screening process to sort out securities that do not meet Shariah criteria. There are three phases of the Shari'ah filtering process which

are qualitative screening, quantitative accounting screening and purification process [3]. For the qualitative screening, securities which are producing and dealing with Haram products or activities will be sort out. For the second screening, the unit trust fund must be free from the investment which dealing with interest (Riba). The last stage is purification process which is important in Islam which is by zakat and sadaqah [5]. Zakat is compulsory for every Muslim who possesses the nasab while sadaqah is optional for them. In industrial practices, there are two major approaches in the process of purification of Islamic unit trust funds which are the investor himself and the second one is the manager of the management company. However, in some countries including Malaysia, they use the first approach where the unit trust management company does not pay the zakat on behalf of Muslim investors. The Muslim investors need to pay the zakat by themselves after receive the income distribution if the income distribution is meeting the conditions of nisab and haul [5]. It will be very helpful, convincing and ease if the purification process takes part in the formulation of income distribution. This also can be a unique characteristic of formulation for Islamic unit trust which can differentiate it from conventional unit trust. Therefore, this paper aims to construct new mathematical formulation for Islamic unit trust that involves dividend calculation based on range which includes the payment for zakat. This can give more benefit to unit holders.

II. LITERATURE REVIEW

According to [13], the demand for Islamic unit trust which is the alternative to the interest-based market become increasing day by day. This encourages the Malaysian government to take the various intervention and measures, so that interest free market which is Shariah Compliant can be introduced. This will attract the investors who are concern with Shariah compliant issues. There are two conditions that must be fulfill in order to make sure the investment follow the Shariah laws which are the profit from the investment cannot be generated from prohibited activities and there must be a rewards and risk sharing between investor and user of capital. In other words, there must be a win-win situation from the investment. However, there still some challenges that must be faced in the future due to the different views between conventional and Islamic practitioners. For example, some companies neglect to include the payment of zakat especially in the case of unit trust. Besides, there is complaining about the calculation of profits between the Islamic products and conventional ones which there are seen similar to each other.

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According to [11], integrated model can be used to derived a new formulation of home financing and mortgage takaful model which suitable for low to medium income earners. The derivation for new formula of Islamic home financing consider the profit by calculating based on one-third of the total amount of financing, while for the new model of mortgage takaful will compensate those who are losing effort to work.

This study discovered two types of financial product which are home financing and takaful. The new formula for home financing named Barakah model home financing used profit ratio of one-is-to-four. This new formula puts a cap on the ratio of profit to principal financial amount. The new mathematical formulation for home financing in Equation 1 as shown below:

Barakah model home financing amount = Principal + profit (one-fourth of the principal)

$$\begin{aligned} & \left[P + \frac{1}{4} P (1+rn) \right] \\ &= \frac{n}{P + \frac{P}{4} + \frac{Prn}{4}} \end{aligned}$$

$$\begin{aligned} & \frac{P \left(1 + \frac{1}{4} + \frac{rn}{4} \right)}{n} \\ &= \frac{P \left(\frac{5+rn}{4} \right)}{n} \end{aligned} \quad \text{----- (1)}$$

The researcher concludes that Barakah model was the cheapest alternative of home financing compared to BaiBithamanAjil (BBA), MusyarakahMutanaqisah (MM) and tawarruq. According to Ghazaliet. al. (2015), the concept of integration model also can be applied for new family Takaful which give more benefit for their clients. This new construction model follows the basic models in family takaful which are Mudharabah and Wakala. The new model of Mudharabah integration model and Wakala integration model offers complete riders for two people in one product plan which are participants and a child. The researcher comes out with new general formula of static premium and static benefit of Mudharabah integration model and Wakala integration model. The general formula of static premium and static benefit of Mudharabah integration shown as in Table 1 while general formula of static premium and static benefit of Wakala integration shown as in Table 2.

Table 1: General Formula of Static Premium and Static Benefit of Mudharabah Integration

Symbols of elements	Q3	Q4	Q5	Q6 to Q8	Q9	Q10	Q11	Q12	Q13
Formula of elements	600n	0.4(600n)	0.6(600n)	$P_n(1 + 0.05) + \left(\frac{P_i}{100}\right) + \left(\frac{66 + T_{n-1}}{12}\right)$ Where P is the personal account and n=1,2,3,...	2x	10x	10x	5x	0.3x

Table 2: General Formula of Static Premium and Static Benefit of Wakala Integration

Symbols of elements	Q3	Q4	Q5	Q6	Q7 to Q9	Q10	Q11	Q12	Q13	Q14
Formula of elements	600n	0.4n(600n)	0.1n(600n)	0.5n(600n)	$P_n(1 + 0.05) + \left(\frac{P_i}{100}\right) + \left(\frac{66 + T_{n-1}}{12}\right)$ Where P is the personal account and n=1,2,3,...	2x	10x	10x	5x	0.3x

The monthly premium is affordable to all categories income earners and customer can choose the suitable plan for them either Mudharah or Wakala model. This new formulation is usable for all categories of income earners but only applicable for Family Takaful.

According [11], a new mathematical model of family takaful is set up which focus on education plan takaful. This new model gives many benefits for customers which are more versatile compared to present family takaful. Besides, this new model targeted customers who are from lower to higher income group as it has low premium. Loss

an effort to work and hospital bills are added in this new method. Therefore, the riders cover the death coverage, 40 critical illnesses or loss of effort to work, khairat, hospitality bills and payment benefit. The new construct client proposal shown as in the Table 3.

Table 3: Client proposal of education plan takaful

No.	Element	Value
1	Monthly payment	RM Y
2	Female non-smoker	K year-old
3	Period Term	N years
4	Rate of Interest	R per annum
5	Monthly saving	RM p
6	Tabarru Account	RM j
7	Surrender Values	RM t
8	Death Coverage	RM 10x
9	Khairat	RM x

10	Loss of effort to work / 40 critical illnesses	RM 10x
11	Hospitality Bills	RM 5x

III. METHODOLOGY

Amanah Saham Bumiputera (ASB) which is the mainstream government unit trust in Malaysia currently used the Average Lowest Balance (ALB) concept to calculate the dividend. The existing calculation of dividend based on ALB concept can only be done yearly [14]. Currently, the dividend is calculated by adding up the lowest balance of each month in a year to obtain the average balance for the year. Then, by using simple interest, the average balance will be used to find the dividend earned. The calculation for the dividend in Equation 2 had shown as below:

Dividend earned for the i^{th} year, $D_i = P_i r_i t_i$,

where:

P_i is the average lowest balance of each month in i^{th} year,

r_i is the dividend rate for the i^{th} year,

t_i is the term (in year)

The calculation to find P_i as follows:

$$P_i = \frac{\sum_{n=1}^{12} P_n}{12} \tag{2}$$

Where P_n is the lowest balance in a year

For example, on 1st January Syakir’s account balance in ASB is RM 13,000.00. Every month, he deposit RM 300.00 into her account and sometimes, he withdraw her money from the ASB account. The transaction of her ASB account in the Table 4 as follows:

Table 4: The transaction of her ASB account

Month	Balance (RM)	Deposit (RM)	Withdraw (RM)	Last Balance (RM)	Monthly Lowest Balance (RM) P_n
January	13,000.00	300.00	0.00	13,300.00	13,000.00
February	13,300.00	300.00	500.00	13,100.00	13,100.00
March	13,100.00	300.00	0.00	13,400.00	13,100.00
April	13,400.00	300.00	0.00	13,700.00	13,400.00
May	13,700.00	300.00	200.00	13,800.00	13,700.00
June	13,800.00	300.00	0.00	14,100.00	13,800.00
July	14,100.00	300.00	400.00	14,000.00	14,000.00
August	14,000.00	300.00	0.00	14,300.00	14,000.00
September	14,300.00	300.00	0.00	14,600.00	14,300.00
October	14,600.00	300.00	0.00	14,900.00	14,600.00
November	14,900.00	300.00	300.00	14,900.00	14,900.00
December	14,900.00	300.00	0.00	15,200.00	14,900.00
Total Monthly Lowest Balance (RM)					166,800.00
The Average Lowest Balance, P_i (RM)					13,900.00

Let the dividend for that year, is 7.00%.

The dividend, $D_i = 13,900.00 \times 7.00\% \times 12/12$
=RM 973.00

IV. RESULT AND DISCUSSION

The aim of the study is to construct the new mathematical formulation of Islamic unit trust which covers the new calculation of dividend by modification of integration model and the process of purification by deduction the payment of zakat.

A. Contraction of New Dividend of Islamic Unit Trust

This paper introduces a new model for Islamic unit trust that calculates the dividend based on integration model by [8], [9], [10], & [12]. In this new calculation, the integration model has been modified. We consider monthly and annually transaction. Therefore, there are two concept used in order to find the new principle. For monthly, we used range concept while for annually, we used average concept. Then, the both principle will be used to find the dividend earned by using the simple interest formula. The ALB concept will be replaced by range concept and average concept which gives more benefit and win-win situation for investors and unit trust

management.

Dividend earned for the i^{th} year as in Equation 3 as follows:

$$D_i = \left[(P_H - P_L) \times r_i \times t_i \right] + \left[\left(\frac{P_H + P_L}{2} \right) \times i_0 \right] - \left[\left(\frac{P_H + P_L}{2} \times r_z \right) \right] \tag{3}$$

where:

P_H is the highest principal in the current year,

P_L is the lowest principal in the current year,

r_i is the monthly dividend rate, where $i = 1,2,3,\dots,11$

i_0 is the dividend rate for the current year,

t_i is the summation of each month from January until November in current year

Notes: $t_i = \sum_{i=1}^{11} \frac{t_i}{12}$
= $\frac{t_1}{12} +$



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$$\begin{aligned} \frac{t_2}{12} + \frac{t_3}{12} + \frac{t_4}{12} + \dots + \frac{t_{11}}{12} \\ = \frac{1}{12} + \frac{2}{12} + \frac{3}{12} + \frac{4}{12} + \dots + \frac{11}{12} \\ = \frac{66}{12} \end{aligned}$$

r_z is the percentage of zakat payment which is 2.5 %

This study considers the example of transaction of Syakir's ASB account. The transaction of her ASB account in the Table 5.0 as follows:

Table 5.0: Example of transaction of Syakir's ASB account

Month	Balance (RM)	Deposit (RM)	Withdraw (RM)	Last Balance (RM)
January	13,000.00	300.00	0.00	13,300.00
February	13,300.00	300.00	500.00	13,100.00
March	13,100.00	300.00	0.00	13,400.00
April	13,400.00	300.00	0.00	13,700.00
May	13,700.00	300.00	200.00	13,800.00
June	13,800.00	300.00	0.00	14,100.00
July	14,100.00	300.00	400.00	14,000.00
August	14,000.00	300.00	0.00	14,300.00
September	14,300.00	300.00	0.00	14,600.00
October	14,600.00	300.00	0.00	14,900.00
November	14,900.00	300.00	300.00	14,900.00
December	14,900.00	300.00	0.00	15,200.00

Dividend earned for the i^{th} year, D_i =

$$\left[(P_H - P_L) \times r_i \times t_i \right] + \left[\left(\frac{P_H + P_L}{2} \right) \times i_0 \right] - \left[\left(\frac{P_H + P_L}{2} \times r_z \right) \right]$$

$$= \left[(14,900.00 - 13,000.00) \times 7\% \times \frac{66}{12} \right] + \left[\left(\frac{14,900.00 + 13,000.00}{2} \right) \times 7\% \right] - \left[\left(\frac{14,900.00 + 13,000.00}{2} \right) \times 2.5\% \right]$$

$$= 731.50 + 976.50 - 348.75 = 1,359.25$$

We had computed the amount of dividend for Islamic unit trust using current practice of mainstream unit trust in Malaysia which is ASB and new mathematical formulation of dividend for Islamic unit trust using suitable data and example. We found that new mathematical formulation is more interesting which give higher dividend than current practice formulation. Besides, the new mathematical formulation which includes the payment of zakat or tax can give extra advantage to investors. This can attract more people and investors to invest in Islamic unit trust and choose this Islamic unit trust than others. Investors who satisfied with this amount of dividend will invest more money. This situation can give a win-win situation to investors and unit trust management. The new mathematical formulation of Islamic unit trust can give more profit to investors while the unit trust management will get more investors. This can give advantages for both parties.

V. CONCLUSION

The new mathematical formulation of Islamic unit trust is constructed in order to set up an Islamic unit trust which

follow the Shariah laws and give more benefit to investors and unit trust management. As Malaysia's current system for profit distribution of unit trust is not include the payment of zakat, thus this new model is a suggestion for unit trust management to be applied in the future time.

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