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Allocation of Tabarru's Funds in Endowment Premium

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ABSTRACT

Generally, the premiums paid by participants in Islamic insurance are allocated into three components with specific proportions: administrative costs, participants' savings, and Tabarru's funds (mutual aid funds). Participants' savings and Tabarru's funds are invested according to Sharia principles, and the returns are shared (Mudharabah) between the participants and the company. This study uses the Endowment method to analyze the allocation of Tabarru's funds and participant savings relative to the size of premiums. Additionally, the investment results from Tabarru's funds and participant savings and their distribution to participants and the insurance company will be simulated. Premium calculations utilize the Indonesian Mortality Table (TMI) for the year 2011. The simulation results indicate that administrative costs and investment returns from premiums managed for male participants are more extensive than those for female participants. Therefore, the claim amount for male participants is likely higher than for female participants.

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1. INTRODUCTION

Sharia life insurance aims to provide mutual assistance to policyholders. Premiums paid are used to face future risks based on Islamic Sharia principles and application. A portion of the Sharia insurance funds belongs to the company, and the rest to the policyholders. The portion designated for mutual assistance, called Tabarru', becomes part of the premium, along with administrative costs and participant savings. If a participant experiences a misfortune, other participants can collectively help using Tabarru's funds. Therefore, insurance participants must know the premium allocation when signing the insurance policy [1].

In recent years, Sharia insurance has innovated by incorporating financial technology (Fintech) to enhance marketing [2]. However, the efficiency levels of Sharia insurance have yet to reach 100% when considering total assets, general and administrative expenses, claims payments, investment income, and Tabarru's funds [3]-[5]. In addition to Fintech, unit-linked life insurance in Sharia has also seen significant development. Unit-linked life insurance is an investment-oriented product involving gains and losses. The premium payments for unit-linked insurance differ from those of regular life insurance. Mathematical model for sharia unit link insurance single rates, which are typically more expansive than whole life insurance [6]. Unit-linked life insurance should be based on the insured's needs and economic circumstances. Moreover, the insured should be educated about the agreed-upon contract to ensure protection in case of disputes arising from differences in the interpretation of the contract [7].

Several methods have been developed to calculate premiums/contributions in Sharia life insurance, namely the modified Mudharabah scheme [8], a system without savings elements, and Al-Mudharabah with

a profit-sharing arrangement if the participant does not claim the end of the agreement [9], and the insurance cost and Gompertz Law method [10]. Sensitivity analysis of the sharia insurance contributions shows that the higher the ROI (return on investment) of the company, the lower the contribution value that insurance participants must pay, and the higher the investment returns that the participants in the insurance receive.

In Sharia insurance, the role of the Tabarru's fund is crucial as it is used for mutual assistance. There are several methods for calculating Tabarru', including using the Makeham mortality law and the Gompertz mortality law with the insurance cost method [12] – [14]. To ensure that Tabarru's fund is sufficient to pay claims, the proportion of Tabarru's fund also needs to be considered. The more participants file claims within a specific period, the larger the claims and the larger the Tabarru's fund the company must pay [15]. Therefore, the proportion of Tabarru's fund needs to be optimized [16] – [19]. According to Siswono et al. [20], the proportion of Tabarru's fund in premiums increases with the policyholder's age and the duration of the insurance. Premium contributions positively influence Tabarru's fund's reserve but are unaffected by investment returns [21].

This research will discuss the portion of Tabarru's funds from the endowment premium based on participants' gender, age, and insurance period. We also discuss the claim amount and the profit sharing between the participant and the company. The simulation will be conducted for male and female participants using the 2011 Indonesian Mortality Table (TMI).

2. RESEARCH METHOD

The first step that needs to be taken is calculating the premium. Premium is the insurance cost for participants to compensate for a loss due to a specific event [22]. $P\left(\bar{A}_{x:\overline{n}|}\right)$ represents the Actuarial Present Value (APV) of the n-year semi-continuous endowment insurance premiums and discrete annuities for n years, formulated as [23]:

$$\boldsymbol{P\left(\bar{A}_{x:\overline{n}|}\right) = \frac{\bar{A}_{x:\overline{n}|}}{\ddot{a}_{x:\overline{n}|}}} \tag{1}$$

where $\bar{A}_{x:\overline{n}|} = \frac{\mu}{\delta+\mu}\left(1 - e^{-(\delta+\mu)n}\right) + e^{-\delta n}.e^{-\mu n}$; $\delta = \ln(1+i)$; $\mu = -\ln\left({}_tp_x\right)$; $\ddot{a}_{x:\overline{n}|} = \sum_{k=0}^{n-1} v^k \ {}_kp_x$; $v = \frac{1}{1+i}$ with μ is force of moratlity, ${}_tp_x$ is the probability that a person aged exactly x dies before exact age (x+t), i is profit sharing.

After obtaining the premium value using equation (1), the premium is allocated into several components. Generally, in Sharia life insurance in Indonesia, the premium is allocated for administrative costs, participant savings, and Tabarru's fund. Here are the percentages of these three components of the total premium:

1. The administrative costs amount to $\alpha\%$,
2. The participant savings fund amounts to $\beta\%$,
3. Tabarru's fund amounts to $(100 - \alpha - \beta)\%$.

Next is to calculate the proportion of investment profit. Investment profit is obtained from the returns on the investment of participant savings and Tabarru's funds following Sharia principles. Suppose I is the invested fund, then

$$I = \ participant\ saving\ funds + Tabarru'fund.$$

Let R is the investment return, and γ is the investment yield rate, then

$$R = \gamma I.$$

The above investment returns will become profits for the insurance company and participants in a particular proportion based on the agreed Mudharabah contract [18].

Let the profit percentage for participants be $c\%$ of the total investment profit, and then the profit percentage for the insurance company is $(100 - c)\%$. Therefore, the amount of cash value for insurance participants is as much as

$$the\ cash\ value\ = P\beta\% + Rc\%,$$

where P is the premium amount, and R is the investment returns from participant savings and Tabarru's funds. Therefore, the amount of claim that each insurance participant will receive when the participant passes away during the insurance period or survives until the end of the insurance period is

$$Claim\ amount = benefit + cash\ value.$$

3. RESULT AND ANALYSIS

This paper uses the simulation data of four male participants aged 20 and 30 with insurance periods of 10 and 20 years. The characteristics of female participants are similar to those of male participants (see Table 1). Although simulation data is used, the analysis of simulation data is expected to assist in analyzing

the composition of Tabarru's funds and investment returns in line with the objectives of this research.

Table 1. The Data of Male and Female Participants

Male Participants ID	ID Female Participants	Age	Insurance Period
L1	P1	20	10
L2	P2	30	10
L3	P3	20	20
L4	P4	30	20

The parameters used in the simulation are as follows: $i = 6\%, \alpha = 20\%, \beta = 65\%, \gamma = 12\%, c = 65\%$. Using equation (1) and the TMI 2011, the amount of the first-year premium for male and female participants is listed in the following figure.

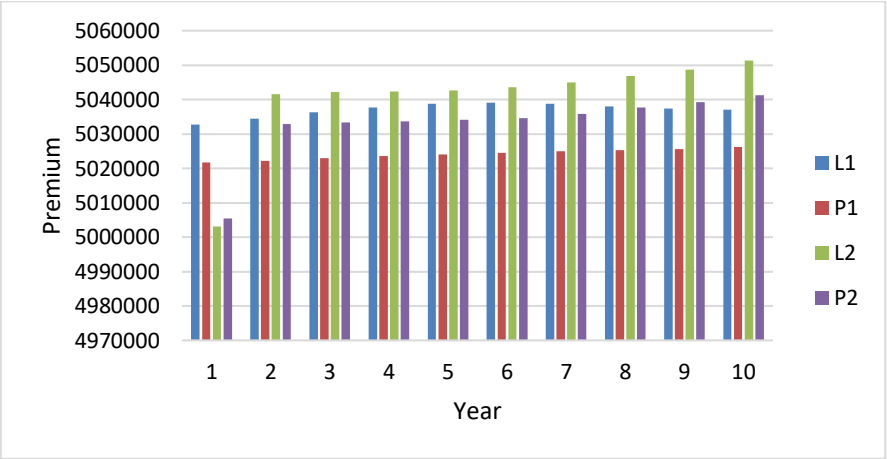


Figure 1. Insurance Participants Premium for Insurance Period 20 Year

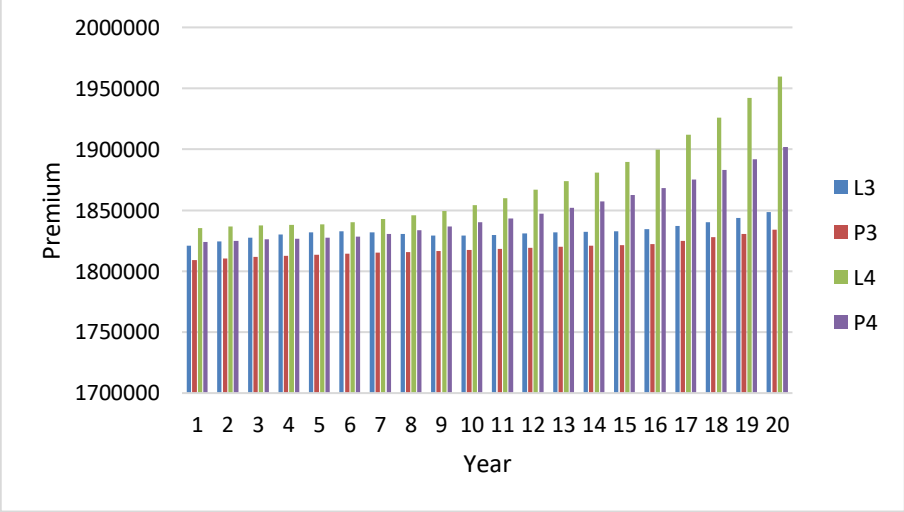


Figure 2. Insurance Participants Premium for Insurance Period 20 Year

In Figures 1 and 2, both figures indicate that the premium payments become more prominent as the participants' ages increase. In both Figure 1 and Figure 2, it is also known that the premiums paid by male participants tend to be larger than those paid by female participants. This is evident from the blue and gray colored indexes, which are higher compared to the red and yellow colored indexes. Furthermore, based on the two figures above, it is observed that with the assumption of the same insurance/coverage period, as the age of the insurance participant increases, the premium to be paid also increases compared to the premium for younger participants.

Next, the previously known premium will be calculated to obtain each value of the premium allocation

components. The calculation results for the first-year premium are attached in the following table.

Table 2. Allocation of Endowment Premium (in Rupiah) for Male Participants with a Benefit of Rp 70,000,000

Male Participants ID	Premium	Premium Allocations			Investment Fund
		Administration Costs	Participant Savings	Tabarru's Fund	
L1	5,032,646	1,006,529	3,271,220	754,897	4,026,117
L2	5,003,070	1,000,614	3,251,995	750,460	4,002,456
L3	1,821,050	364,210	1,183,683	273,158	1,456,840
L4	1,835,428	367,086	1,193,028	275,314	1,468,342

Table 3. Allocation of Endowment Premium (in Rupiah) for Female Participants with a Benefit of Rp 70,000,000

Female Participants ID	Premium	Premium Allocations			Investment Fund
		Administration Costs	Participant Savings	Tabarru's Fund	
P1	5,021,678	1,004,336	3,264,090	753,252	4,017,342
P2	5,005,377	1,001,075	3,253,495	750,806	4,004,301
P3	1,809,289	361,858	1,176,038	271,393	1,447,431
P4	1,824,054	364,811	1,185,635	273,608	1,459,243

The results for the investment fund in Table 2 and Table 3 are allocated for participant gains and company gains, as stated in Table 4 and Table 5. Tables 4 and 5 show that the claims for males are higher than for females.

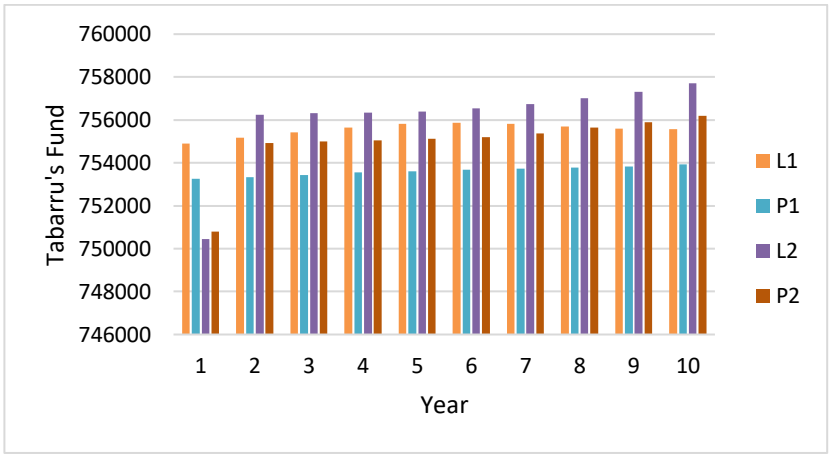
Table 4. Allocation of Investment Returns and Claim Amounts (in Rupiah) for Male Participants

Male Participants ID	Investment Returns	Investment Returns Allocations		Cash Value	Claim Amounts
		Participant Profits	Company Profits		
L1	483,134	314,037	169,097	3,585,257	73,585,257
L2	480,295	312,192	168,103	3,564,187	73,564,187
L3	174,821	113,634	61,187	1,297,316	71,297,316
L4	176,201	114,531	61,670	1,307,559	71,307,559

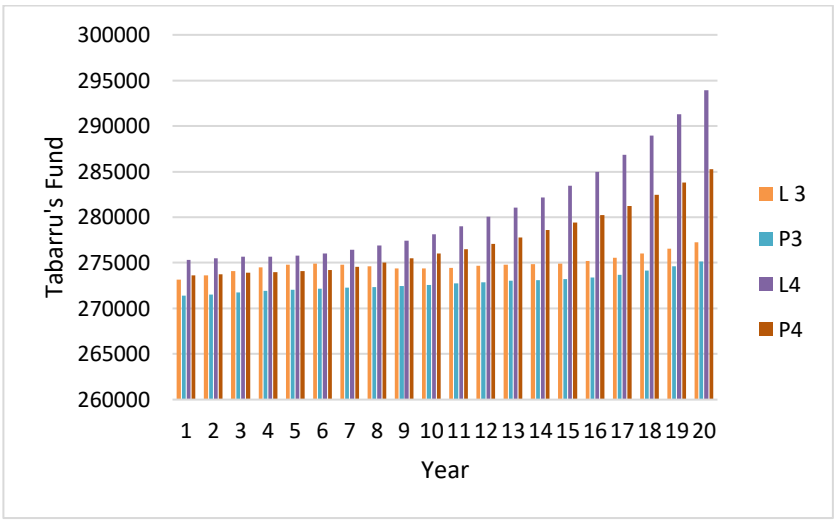
Table 5. Allocation of Investment Returns and Claim Amounts (in Rupiah) for Female Participants

Female Participants ID	Investment Returns	Investment Returns Allocations		Cash Value	Claim Amounts
		Participant Profits	Company Profits		
P1	482,081	313,353	168,728	3,577,443	73,577,443
P2	480,516	312,336	168,181	3,565,830	73,565,830
P3	173,692	112,900	60,792	1,288,937	71,288,937
P4	175,109	113,821	61,288	1,299,456	71,299,456

In this simulation, we performed the premiums and their allocations, investment results and their allocations, and the number of claims, as shown in Tables 1 – 5 for insurance periods of 10 years and 20 years. The amount of Tabarru's fund for each individual is listed in the Figure 3.



(a)



(b)

Figure 3. Tabarru's funds for participants with (a) 10 years and (b) 20 years insurance period

From Figure 3, it can be observed that Tabarru's fund for male participants tends to be higher compared to Tabarru's fund for female participants. It is also known that Tabarru's fund for older participants will likely be more significant than for younger participants. The simulation results will differ for different parameter values.

4. CONCLUSION

This article has discussed the allocation of Tabarru's funds for endowment insurance premiums. The simulation results indicate that the Tabarru's fund and the claim amount for male participants are higher compared to the Tabarru's fund and claim amount for female participants. Additionally, with the parameter values we set, Tabarru's fund tends to increase as the age of the participants increases.

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