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An Understanding the Determination of Life Insurance Premium: Shariah Compliant in the Islamic Insurance Concept and Practice

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Abstract

The main objective of the insurance is to uphold a sense of solidarities among the parties involved, shared responsibility on the basis of mutual cooperation in protecting the individual against unexpected risk. Insurance is one of tools to minimize or transfer risk which has existed for individuals to the insurance company against future loss faced by the policyholder or insured. The Islamic insurance based on the concept of Ta'awun that means mutual assistance to eliminate forbidden elements accordance with the teachings of Islam such as riba, gharar and maysir. The determination of life insurance premium, such as stated by (Bacinello, et al., 2009) that risk is extremely important and crucial role in life insurance policy. This paper aims to investigate the distinction of setting rates taking into account risk which applied by conventional and Islamic insurance (Takaful). This paper employs using the net single and Annual Level premium formula, the data analysis using numerical example. We found that between conventional and Takaful insurance systems utilize similar methods in the calculation of insurance premium whereas they consider the pure risks faced by participant or insured. It means that conventional and Islamic insurance utilizing historical data, such as mortality rate, expected return rate, expected costs and expected amount of claims. Even though both systems look like apply a similar approach, but the conventional insurance, it is calculated to mitigate or minimize risk of the insurance company against an amount of claim faced in the future as long as insurance enforced until the contract ends. In simple terms it can be called to avoid insolvency of the insurance company. Conversely, Takaful insurance intended to share fair value among participant in determining benevolence through tabarru fund. This means that every participant must pay a premium tabarru to support one another which contributed sufficient amount to cover unexpected claims among them and to uphold mutual fund as evidence the sense of mutual cooperation and brotherhood among participants

Keywords: Conventional and Takaful insurance, premium, ratemaking, risk and tabarru fund

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1. Introduction

The major objective of life insurance contract is to provide the benefits, which depends on risk with regard to survival or premature death of individuals. Risk is a condition under uncertainty, it sometimes unpredictable that can be caused affliction to the people exposed. The providing of risk protection against a pure risk, such as the premature death is extremely important and plays a crucial role in life insurance policy (Bacinello et al., 2009). In a natural phenomenon, most of peoples or everybody will be exposed all sorts of risks in their daily life. It is may can be expected and some of them unforeseen (Khorsid, 2004). These risks may happen in one's life, properties or business ventures. In the fact, these risks influence the lives many of the individuals in a society that sometimes would be giving effect so devastating and shattering. As a result, it can be, leaving unfortunate peoples in the vulnerable and helpless conditions (Mohd Shril Matsawali et al., 2012).

The people will purchase an insurance policy to transfer or to minimize her/his risks to the insurance company when known that they would be facing uncertainty of loss in the future, and they agree to pay compensation to the insurance company as a protection agreement are we known as an insurance premium. In the agreement, insurer will be paid a sum of money if insured faced losses such as accident, injury or premature death and it is would be paid as long as insurance the insurance policy is in-force position (Zhou and Wu, 2007).

The development of insurance practice in the current era originated from two civilizations namely the Babylonians civilization around 4000 – 3000 B.C. and ancient Arab tribes about 570 A.C. The insurance practice of both civilizations at the present time have been distinguished become two systems which known as the conventional and Islamic insurance systems. Despite, the main purpose of both the insurance systems is to create and uphold the value of solidarity and responsibility among the parties involved on the basis of the mutual cooperation while one of them experiencing an unfortunate event that caused suffering (Qureshi, 2011). However, there is a great difference in the practice of the conventional insurance system in the views of Islamic teachings, because of the practice of conventional insurance is present the elements which prohibited by sharia namely riba, gharar and maysir (Pillsbury, 1998).

Currently, Islamic insurance presented as an alternative to conventional insurance, this is the form of resistance by Muslim Ummah. Because for the Muslims, Islam is a complete ways of life that endeavours to build the wholly the structure of human life and culture, because the Muslims hold on that the Islam is a religion based on peaceful coexistence with fellow man through maintenance of stable and conservative societies. In other word, Islam is a society that cares for the most of unfortunate members then the outcome is a Muslim community can thrive, free from crime, bitterness and sadness (Khorsid, 2004).

The Islamic insurance practice is extremely different with the conventional insurance, this is because in the policy of Islamic insurance is based on the concept of Al-Mudharabah, it is a mutual financial transaction between two parties with a profit and loss sharing and must be free from the elements which are prohibited and unlawful in the eyes of the sharia. The model of Islamic insurance policy based on the divine principles of solidarity and mutual co-operation, such as which has enshrined by Allah (s.w.t) in the Holy Qur'an (Surah Al-Maidah verse 5:2); *"... and help you one another in righteousness and piety"*.

This paper focused on the aspect of rate setting in life insurance premium, such as stated by Bacinello, 2009 that risk is extremely important and plays a crucial role in life insurance policy. It is meant that if the insurance company cannot predict the total of risk that would be protected precisely and accurately, then the insurance company automatically would be facing a larger problem such as lowering of demand for insurance that affected by premium insurance which giving influence to achieve target premium income and cause insolvency of the insurance company. The objective of this paper is to clarify and investigate the distinction calculation on setting rate of life insurance premium between conventional and Takaful (Islamic insurance) taking into account the pure risks.

2. Literature Review

This section would be reviewing some previous study related to the development of conventional and Islamic Insurance (Takaful) and also determination of life insurance premium and then would be concluded as conceptual framework. .

2.1 The Origin of Conventional and Islamic Insurance

The primary idea regarding of insurance comes from the Babylonians and their civilizations around of 4000 - 3000 B.C. Since the beginning of this idea about insurance through the contract of *Bottomry* which illustrates that, the world witnessed a gradual development of this idea through their basic principles of insurance among countries them such as Babylon, Greek, Rome, Italy and India. The practices of insurance have been obtained appreciation of the many societies in the world throughout the history which role as a significant financing technique (Cohen, 1995).

The nature of *Bottomry* contract, it was introduced by the merchants of Babylon whereby they have applied the money or goods were advanced to the merchants for the aims of trade. A pure loan is one of which became consideration of interest in which the lender had the right to claim in a fixed rate of interest from merchant more than or above the loan, or between such as a loan for interest and capital for a share of profits from the trade. The transaction who conducted between the lender and the borrower based on a mutual understanding with consideration of payment of the interest and the lender should be protecting the borrower from liability against unforeseen and accidental happenings in the trade. The interest payments in *Bottomry* contract have similarities with insurance premiums today, whereby the merchant (borrower) such as insured and the lender played the role as insurer (Billah, 2003). Therefore, it is can be concluded that the practice of conventional insurance today originated from the practice of an ancient Babylonian era through the *Bottomry* contract (Outreville, 1998).

Today's, the practice of insurance through "*Bottomry Contract*" obtained a substantial recognition in the common law, as recent years have witnessed that a rapid development in this area. Such a rapid development might have resulted from the rapid growth of the lawful system in the field of commerce and trade. Conversely, in the Islamic law, the main idea of insurance originated from the practice of ancient Arab tribal custom before 570 A.C through the doctrine of *al 'Aqilah*. It was common practice by ancient Arab tribes that, if any the tribe member killed by another tribe member then heir of the victim would be received payment an amount of blood money as a compensation by the close relatives of the killer. It consequently obtained recognition under Islamic law based on the agreement of the Holy Prophet Muhammad (s.a.w) within one of his verdicts against a woman from the tribe namely *Huzail*. Therefore, the main idea of *'Aqilah* was that, the tribes of ancient Arab had to be prepared to make a financial contribution on behalf of the killer to compensate the heir of the victim such readiness to make financial contribution which has resemblance with the premiums in the practice of insurance. While the payment of compensation to the heir of victim under the system of *al* '*Aqilah* could be similar to the indemnity in the insurance practice now, it is a form of monetary protection for the beneficiaries against inevitable affliction such as premature death of the victim (Klingmuller, 1969).

Accordance with previous descriptions above, it was confirmed that conventional insurance extremely different with Takaful insurance. The discussion about permissible and prohibited around an insurance issue which until today becoming an important issue in the field of financial system at risk and insurance. The application of both insurance has similarities and differences. The similarities of both applications of insurance can be seen from two civilizations of insurance namely indemnity, whereas differences between both systems of insurance is the bottomry contract, transaction who made by the lender and the borrower following the concept of the mutual understanding, whereas the borrower should be paying the interest and the lender should be protecting the borrower from liability against unexpected loss and accident in the trade. Besides that, for Takaful insurance is originated from the tribes of ancient Arab known as the contract of *'Aqilah* where the killer to compensate the heir of the victim such readiness making a financial contribution. It has a resemblance with the premiums in the practice of insurance today.

Following the issue related premium insurance between the conventional and Takaful insurance obviously that the practice of conventional insurance presence forbidden element in views of Islam, so starting from this discussion about the validity of insurance still become an important issue among researchers.

2.2 Ratemaking on Life Insurance Premium in Conventional and Takaful Insurance

In an insurance company, the rate of premium insurance plays an important role, whereas it is based on the concept of pooling or loss sharing. Black and Skipper (2000) stated that the loss sharing in turn involves the accumulation of a fund from amounts paid by insured to provide benefits for the unfortunate few who suffer loss, where to establish the amount to be charged by the insurer to the insured must start with some idea as to likelihood of loss for the group. The likelihood of losses in life insurance is shown by specially constructed namely mortality table. Mortality table represented a record of mortality observed in the past and is arranged so as to show the probabilities of death and survival at each age separately. It shows a hypothetical group individuals beginning with a certain age and traces the history of the entire group year by year until all have died.

Harrington and Niehaus, (2004) states that a fundamental principle of insurance pricing is if insurers are to sell coverage willingly, they must receive premiums that, first premium is sufficient to fund their expected claim costs and administrative costs. Second, premiums are providing an expected profit to compensate for the cost of obtaining the capital necessary to support the sale of coverage. In addition, the premium level that is just sufficient to fund the insurer's expected costs and provide insurance company owners with a fair return on their invested capital is known as the fair premiums.

Ciurel, (2000) confirms that insurance premiums must be adequate, which means that for a group of contracts, the money collected from policyholders, plus the interest earned from the investment of these amounts, shall be sufficient to pay all promised amounts and cover the insurance company expenses; insurance premiums must be equitable, that risk must consider each person insured; insurance premiums should not be excessive compared to the sums insured.

Rejda, (2008) stated that rate of premium for life insurance policy is based on two underlying concepts namely mortality and interest. However, there are third variable is the expense factor which is the amount the company adds to the cost of the policy to cover operating costs of selling insurance, investing the premiums, and paying claims. Mortality in life insurance is based on the sharing of the risk of death by a large group of people. The amount at risk must be known to predict the cost to each member of the group. Mortality tables are used to give the company a basic estimate of how much money it will need to pay for death claims each year. By using a mortality table, the insurer can be to determine the average life expectancy for each age group. Later, rate of interest that is second factor used in calculating premium that is interest rate earnings. Companies invest your premiums in bonds, stocks, mortgages, real estate, etc., and assume they will earn a certain rate of interest on these invested funds.

In addition, third consideration is the expenses of operating the company. The company estimates such expenses as salaries, agents' compensation, rent, legal fees, postage, etc. The amount charged to cover each policy's share of the expenses of operation is called the expense loading. This is a cost area that can vary from company to company based on its operations and efficiency.

Cox and Lin, (2004) have employed their study related natural hedging of life and annuity mortality risks. The values of life insurance and annuity liabilities move in opposite directions in response to a change in the underlying mortality. Natural hedging utilizes this to stabilize aggregate liability cash flows. They have shown empirical evidence that the insurer who utilize natural hedging also charge lower premiums than otherwise similar insurers. This indicates that insurers who are able to utilize natural hedging have a competitive advantage. In addition, they show how a mortality swap might be used to provide the benefits of natural hedging to a firm business.

Klingmuller, (1969) stated that the practice of Islamic insurance, insurance premium originated from the idea of *‘Aqilah* whereas the tribes of ancient Arab had to be prepared to make a financial contribution on behalf of the killer to compensate the heir of the victim such readiness to make financial contributions. While the payment of compensation to the heir of victim under the system of al ‘*Aqilah* could be similar to the indemnity in the insurance practice now, it is a form of monetary protection for the beneficiaries against inevitable affliction such as premature death of the victim.

According to previous studies, we found that the setting rate of insurance premium greatly affected by risk. It is necessary to convert a random value between gain and loss in financial terms specifically in insurance premium or price of insurance. It is an interesting finding for further discussion because the standard approach used in the calculation to setting rate of the life insurance premium almost similar. Where, for the conventional and Takaful insurance still uses the same concept namely indemnity. Hence, in this study, we would be investigate relating the determination of premium insurance, specifically for Takaful insurance as evidence that there are the differences between the two systems of insurance, not only differ on sides of name or terms, for example, in conventional insurance premium to cover risk called risk premium, and Takaful insurance named tabarru fund (compensation).

3. Methodology

This paper investigates the most important topics related to the calculation of (risk) premiums for realistic insurance and annuity contracts. It was applied qualitative and quantitative analysis to achieve the objective of the study. First, qualitative analysis used to elaborate whole of the rate making system by insurance company on the setting rate for premium insurance. Second, quantitative analysis employed to determine the dissimilarity method used in the two types of insurance namely conventional and Islamic insurance. Almost all life insurance products are actuarially created by calculating the relationships of mortality, interest, and expense and the financial values resulting from each based on time. This study would be considered at length net single premium formulas for insurance and annuities due, under the standard assumptions of the survival function between integer ages, when there is a periodical premium per year. The calculation would be highlight related with the death benefit payable and benefits payable if insured still alive until the insurance contract ends.

Basic models for setting of premium insurance are statistical and financial approach is applying through random variable (Dione and Harrington, 1991). It analyses the total monetary amount of claims arising from an insurance pool during a specified reporting period (e.g., one year). The total amount of claims is the sum of the expenses for claims of the individual exposure units comprising the pool. First, we calculate the present value of the future death benefit or called net single premium (*NSP*). The model used to setup rate of net premium insurance standardly applied in insurance such as below:

$$NSP = \omega \left(\frac{Lx_{t=0} - Lx_{t-1}}{Lx_{t=0}} \right) (\upsilon^n) = \omega \left(\frac{{}_n d_x}{Lx_{t=0}} \right) \left(\upsilon^n \right) \tag{1}$$

Whereas, ω denotes as sum of insurance coverage planned by the insured or insurer must be protected if insured facing of loss or premature death. Lx_{t-1} is the number of the policyholder live before the time period of the contract instalment and $Lx_{t=0}$ denoted as the number of the policyholder live while the instalment of insurance. It is can be called probability death of the policyholder or denoted by ${}_n d_x$, then υ^n known as discount factor.

The rate setting of net single premium payment is based on three main assumptions, namely premiums are paid at the beginning of the policy year, second death claims are paid at the end of the policy year and the death rate is uniform throughout the year.

Further, after we have obtained the value of net single premium having that determine net annual level premium payment, the formula can be written such as below:

$$NALP = \frac{\omega\left(\frac{{}_{n}d_{x}}{Lx_{t=0}}\right)(\upsilon^{n})}{PVLAD-(t-T)} = \frac{NSP}{PVLAD-n} \tag{2}$$

The description of the above formula is if the premiums are paid for life, the premium is called a whole life annuity due and if premiums are paid for only a temporary period, the premium is called a temporary life annuity due. This paper would highlight through following above formula and derivation of the formula related. Where the basic principle the rate setting of insurance premium is a statistical and financial technique, it is based on present and future value formula. Following the equation (1) and (2) we desired to investigate the differences of ratemaking applied in conventional and Takaful insurance. This study use numerical data, sum of insurance coverage ω = \$1000, indonesia life table ${}_{n}d_{x}$ and ${}_{n}P_{x}$, r =5%, time of contract is 10 years and age of participant is 30 years old.

4. Discussion

The rate setting of life insurance premium used by conventional insurance firsts considers the amount of insurance coverage and it is multiplied with the number of insured alive at the ends of period and second expected value of interest rate to obtain all cost must be paid by the insured as agreed to pool risk in a large group of peoples. It is usually known as discount factor which functioned as to obtain the present value of future cash flow. The premium applied by conventional insurance here called net single premium, this is the primary technique to determine how insured must be paid insurance coverage in the amount of coverage such expected by the insured. In this case we are using 1 unit exposure bought by the insured/ sum of insurance coverage is \$1000, time of insurance contract that is 10 years, and we are assuming the value of guarantee rate is 5 percent, and then the age of the insured is 30 years old. Using the equation (1 and 2) we are obtained as below:

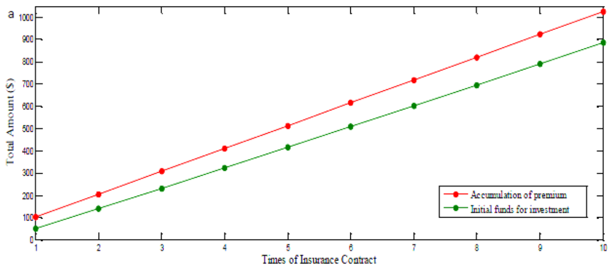

Figure 1(a)

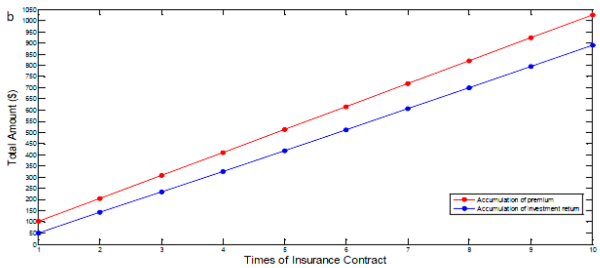

Figure 1(b)

Fig. 1 (a) Value of premium payment and initial investment fund in Conventional Insurance; (b) Value of Accumulation premium and investment return in conventional insurance

The figure 1 (a) exhibits that the premium insurance charge for insured if he or she wants to buy insurance coverage is \$1000 at 10 years, age of the insured is 30 years old and guarantee rate is 5 percent. Then the premium charge or premium should be paid by the insured to the insurer is \$103 per unit exposure. We can observe red line indicates the accumulation of premium paid annually by insured to cover risk would be faced in the future. Further look that the value of the investment fund after deducted expenses such as a risk premium, administrative and operational cost refer green-line it is the accumulation of fund for investment. This illustrates that for 10 year contract until maturity, there are expenses which time to time smaller. The beginning of one year insured must be paid high cost included operational cost almost 50 percent or $53 of the amount of payment until the last year or before insurance the ends that is $8 or 7.8 percent.

Further, following figure 1 (b) demonstrates that investment return time to time increase, the beginning of first year investment fund only $50 until the end of the year is $890 or 87 percent from accumulation of premium received from the insurer. So, because this product has great benefit, whereas if the is insured death before the insurance contract ends or maturity time, his or her beneficiaries would be obtained payment as much as the sum of insured coverage added with the accumulation of investment return. For instead if 5 years later, after insuring the death (premature death) beneficiaries receive 100 percent sum of insurance coverage plus investment return compounding $419 or total amount receive is $1,419. Then, if insured still alive at the ends of insurance contract he or she would receive payment from the insurer as much as investment returns $890. In this case we do not include the assumption for investment, here we only involved rate as big as 5 percent or called guarantee rate. So, if the conditions like this we can be concluded that the total amount which paid by the insured to the insurer is $1.025 for 10 years and insured would receive $890. This means that the insured loss around $135 (this value of risk to cover the risk of insured in times of insurance).

While, in the practice of Takaful insurance on premium rate-making they used similar technique which applied by conventional insurance, nevertheless in the Takaful insurance the relationship between the insurance company and participant or insured is based on a contract namely mudharabah. It means to eliminate the forbidden element prohibited in Islamic views. The mudharabah contract employs as a form of profit and loss sharing, whereas through this contract Takaful insurance has changed the relationship between insurer and insured and also among insured.

The issue permissible and prohibit elements in the application of insurance not only in rate of interest share from insurer to the insured only, but in Takaful also giving a profit through the participant account or an account that has contents investment fund after deducted operation fees and tabarru fund. The tabarru fund is one of the terms used by Takaful insurance, in the conventional insurance tabarru fund called risk premium, it looks like different name, but in the practice it’s really different. Because, in the practice of the Takaful insurance tabbaru fund is compensation should be paid by the insured to uphold the sense of mutual helps, solidarities and brotherhoods. The calculation applied is separated between the amounts of insurance coverage based on the expected claim faced and operating expenses should be spent by insurance company in managing investment fund of insured to obtain a return that would be shared as profit normally each year of insurance contract.

The ease understanding related this implementation of rate-making by Takaful, the below figure used can be described as follows:

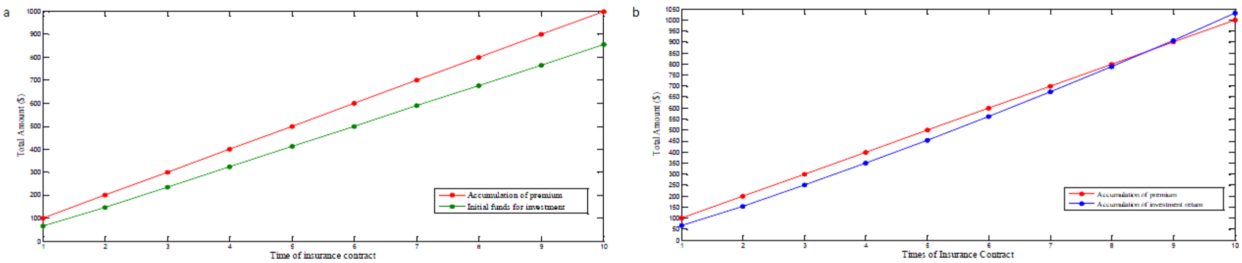

Figure 2 (a) Figure 2 (b)

Fig. 2 (a) Value of premium payment and initial investment fund in Takaful Insurance; (b) Value of Accumulation premium and investment return in Takaful insurance

Based on the same case in the previous example, figure 2 (a) shows that the premium insurance charged for insured if he or she want to buy insurance coverage is $1000 at 10 years, age of the insured is 30 years old and guarantee rate is 5 percent. Then the premium charge or premium should be paid by the insured to the insurer is $100 per unit exposure. We can see the red line indicates the accumulation of premium paid annually by insured to cover risk would be faced in the future. Further look that the value of the investment fund after deducted expenses such as a risk premium, administrative and operational cost refer green-line it is the accumulation of fund for investment. But in Takaful insurance premium assumed is compensation to share risk among participant or called tabarru fund, further margin annual premium after deducted tabarru fund would be reduced other cost such as operational and administrative expenses.

Having that the annual premium after deducted expenses, it would be called participant account this is content, the amount for invested by the insurer. Following the description before this is clear that for 10 year contract until maturity, there are expenses which time to time smaller. The beginning of one year insured must be paid high cost included operational cost almost 35 percent or $35 of the amount of payment until the last year or before insurance the ends that is $11 or 1.1 percent compounding. This can be summarized that the annual premium paid by the insured on Takaful insurance more cheap compared with conventional is $3 ($103-$100), although cost at the beginning of the year is able categorized low around 35 percent, but in the 9 to 10 years insured spent $11 or 1.1 and overall expenses have to paid by the insured is $145 this cost greater than cost in conventional insurance is $140 or have a marginal value of $5. It caused by Takaful insurance is created different function in a calculation based on mudharabah concept. Whereas, each of charge portion separated to fulfil Shariah compliant in order to clear in the type of contract. Furthermore, we would show about the accumulation return on investment and accumulation of premium in Takaful insurance practice:

The figure 2 (b) shows that investment return in Takaful insurance is increasing time to time, the beginning of first year investment fund only $67 until the end of the year is $1.032 or 103.2 percent from accumulation of premium received from the insurer. So, because this product has great benefit, whereas if the is insured death before the insurance contract ends or maturity time, his or her beneficiaries would be obtained payment as much as the sum of insured coverage added with the accumulation of investment return. For instead if 5 years later, if insured death (premature death) beneficiaries receive 100 percent sum of insurance coverage plus investment return compounding $455 or total amount receive is $1,455. Then, if insured still alive at the ends of insurance contract he or she would receive payment from the insurer as much as investment returns $1,032. In this case we do not include the assumption for investment, here we only involved rate as big as 5 percent or called guarantee rate. So, if the conditions like this we can be concluded that the total amount which paid by the insured to the insurer is $1.000 for 10 years and insured would receive $1,032. This means the insured earn yield around $32 (this a share of surplus underwriting and sharing profit from investment fund with pre-agreed is 70 percent for insured and 30 percent for insurer).

Based on the determination by same case and numerical analysis, we obtain that although premium insurance paid cheapest for Takaful insurance, but it has a high cost in operational and administrative compared with conventional annual premium payment high. Then the investment fund in Takaful insurance giving good choice in investment, whereas, with guarantee rate 5% return of investment can be received by insured more from annual premium paid compared with conventional insurance. This indicates that the Takaful insurance besides aiming to eliminate forbidden elements which exist in conventional insurance, it’s also giving a better profit compared with the conventional insurance.

5. Conclusion and Findings

Based on the previous discussion, we found that although conventional and Islamic insurance applied similar techniques to calculate risk premium (term in conventional insurance) or tabarru fund (term in Islamic insurance) both determination with considering pure risk through mortality risk. So, after fulfil the calculation we detected different goals between them. For conventional insurance the determination of calculation using pure risk or life function from mortality risk intended to account all risk will be faced by the insurance company in to give protection for insurance participant and financial risk of the insurance company. Meanwhile for Islamic insurance, the life function from mortality risk considered to share fair value in the payment of compensation (tabarru fund) by a participant to the insurance company. Islamic insurance used contract of al-Mudharabah to eliminate forbidden elements which existing in conventional insurance such as riba, gharar and maysir. It is also aims to uphold the sense of mutual-cooperation, solidarities and brotherhood among participant of insurance.

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Al-Qur'an, Surah Al-Maidah verse 5:2

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