SCHEME DIFFERENTIATION FOR A COMPREHENSIVE AND EQUITABLE TAKAFUL BUSINESS

(With Reference To Takaful Business In Malaysia)

By

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ABSTRACT

The prevalent form of Takaful Business in Malaysia is Islamically acceptable since it does not involve prohibited elements such as 'riba', gambling, uncertainty and exploitation. However, in its pricing strategy, Takaful company like conventional insurance copanies, only considers risk factor which normally refers to the probability of loss or the probability of death. Consequently, the premium rate does not reflect the required values of equity and benevolence from Islamic perspective. Here, the poor and the rich are equally charged while the poor is supposed to bear less burden than the rich. Fairness in this case should be looked within the context of overall ethos of Islamic teachings and should be based on its commitment to human brotherhood. Therefore, a model of Takaful Business which could reflect the required noble values of equity and benevolence from Islamic perspective is needed.

In this connection, a Takaful model which directly incorporates income factor along with risk factor is proposed, from which a new premium rate is then suggested. The model shows that the above question could be resolved such that the proposed premium rate reflects the required values of equity, benevolence and brotherhood in Islam. Empirical study further proved that the proposed Takaful model and premium rate are not merely theoretical but also practical and financially feasible.

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CHAPTER 1

INTRODUCTION

1.0 The Objective of the Study

Islamic Economy rests on the principles of justice and benevolence. These principles permeate in all constituent parts of its system. As a result of their operation this system makes important contribution towards the establishment of an integrated and balanced society.

The output and financial sectors are integrated in Islamic economy. Outcome of one sector depends on the performance of the other. For instance, rate of return on capital is determined in the real sector. Better performance of real sector provides higher return to the financial capital. Similarly, efficient functioning of the financial sector induces optimal production of output in the real sector. These linkages are affected formally by the operation of the principles of justice and benevolence. Consequently, efficient growth of Islamic economy takes place over time in a way that the equity is also promoted.

In the contemporary modern economy, the insurance system plays a significant role in determining the effectiveness of its financial system. Apart from providing security to the economic agents, it mobilizes substantial funds for the socio-economic development of the economy.

The efficiency of an insurance market depends on competitive market conditions where perfect information is equally shared by both the clients and the companies. Accordingly, the fair premium rates are determined by the zero profit condition based only on the probability of loss. The premium rate so determined will be fair and efficient. Efficiency is one thing but equity is another. The latter consideration is, however, missing while determining the premium rate. In the Islamic economy, equity is a significantly important aspect which should not be omitted.

Identifying this missing element, this study aims at filling this gap by suggesting a Takaful model which incorporates equity aspect in the determination of premium rates. After deriving the equity-based premium rate, this study theoretically evaluates the viability and practicability of that rate. Furthermore, the study also empirically examines their feasibility in the light of data accumulated from the experience of the Malaysian Takaful Business.

1.1 The Motivating Factor of the Study

The Takaful Company of Malaysia has been doing its business on the basis of Mudarabah for some time. The Mudarabah contract has been beneficial for the participants and the company, which is obviously an improvement over

contemporary insurance system. However, no clear differences have been noticed regarding the premium rate. Takaful company still uses a similar procedure for determining premium rate which is based only on risk factor, thus omitting other factors important to an Islamic economy. Among the omitted factors, the income factor is important as it has vital bearing for realizing justice and benevolence in the economy. Omission of this factor means that insurance system is unjust to low income individuals.

Therefore, two important points need our immediate attention here. Firstly, low income individuals need better treatment and secondly, the integrated principles of justice and benevolence need to be restored into the Takaful system so that the system may reflect the real spirit of the Islamic teachings.

Therefore, there is a need to derive a takaful model which could reflect the above two points. For an Islamic system, resolving these points means success in realizing the Islamic values and failure in resolving it could mean a failure for the system. Motivated by these considerations, we derive a Takaful model which can help restore the integrated values of equity and benevolence in an Islamic perspective by giving a better treatment to the low income groups. The Takaful business organized on the lines suggested in this study will be closer to the norm of an Islamic System of Insurance.

1.2 The Setting of the Study

This study focuses only on the Family Takaful Business practiced by the Takaful Company of Malaysia. General Takaful Business is excluded from the study mainly because within similar risk-types, individuals in General Takaful are already classified in accordance with income levels. Therefore, the question of unfair treatment between the low and high income groups does not exist.

Within the category of Family Takaful Business, Group Takaful as well as Life Insurance under the conventional insurance system, are also available in the market. Therefore, comparative analysis of the suggested system will be made between these systems, namely Family Takaful, Group Takaful, Conventional Insurance and the suggested scheme.

With respect to empirical data for the calculation of the value of time preference, secondary data for GNP for the period of 26 years (1965 - 1990) will be used. For examining the survivability and financial feasibility of the proposed system compared with the existing system, four different cases consisting of 3549 clients will be referred.

In examining the viability of the suggested model, the study uses the secondary data on Malaysian economy mentioned above. A comparative approach is adopted in empirical analysis, focuses on two different aspects, namely comparison between different systems and different organizations.

CHAPTER 2

REVIEW OF THE CONTEMPORARY INSURANCE

2.0 Introduction

This chapter basically reviews those aspects of insurance business which have direct bearing on this study. For the purpose of organized discussion, it is divided into four main sections, beginning with section 2.0 as the introduction, followed by section 2.1 which reviews the subject related to contemporary insurance. Types of insurance is discussed in section 2.2, while the general model of insurance is shown in section 2.3.

Section 2.4 discusses the Islamic views on insurance and the issue of permissibility and non-permisibility of insurance business. The suggested insurance schemes which is conformable to the Islamic law is discussed in section 2.4.3.

2.1 Contemporary Insurance

This section presents mainstream ideas about the nature, definition and function of insurance. It sets the stage for discussing general model of insurance.

There are five ways to deal with risk namely, avoid, retain, transfer, share and reduce. Insurance as a risk device consists of the elements of transferring, sharing and reducing risk through a complicated mechanism. Because of this complexity, it is difficult to exactly define insurance. In its simplest form, it has two fundamental characteristics:[1]

1. Transferring or shifting risk from one individual to a group.
2. Sharing losses on some equitable basis by all members of the group.

Based on the above characteristics, it is clear that insurance does not prevent losses, nor does it reduce their cost. Similarly it does not decrease the uncertainty, nor does it alter the probability of occurance of loss, but it does reduce the financial losses. This is because the event may still occur despite being insured and the probability of occurance of loss is unaltered together with the cost of loss. Through insurance, only the cost of losses has been

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1.Robert I. Mehr, Fundamentals of Insurance, Richard D. Irwin, Inc., (1983), pp. 32.

transferred from one individual to a group.

In this connection, there is question of whether it is the loss or the chance of loss i.e the risk, that is actually covered by insurance. There has been a lot of confusion about this point which has generated two different view points. Those who describe insurance as "pooling of risk" are of the opinion that insurance is a device against loss and, therefore, the loss is actually covered by the insurance.[2] The others however maintain that insurance is an arrangement against risk, therefore the risk is actually covered by insurance. In this case, they describe insurance as "a device for reducing risk"[3] or "removal of risks"[4] or "distributing risk."[5]

Insurance may be defined differently from the standpoint of individual and society.[6]

From the standpoint of individual, insurance is an economic device whereby the individual substitutes a small certain cost (the premium) for a large uncertain financial

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2.M Muslehuddin, Insurance and Islamic Law, 4th Edition, Adam Publisher, New Delhi, (1982), Ch. 1.

3.Robert I. Mehr, Fundamentals of Insurance, op cit, pp. 32.

4.M.N Siddiqi, Insurance in an Islamic Economy, The Islamic Foundation, London (1985), pp. 23.

5. Fahim Khan, Lecture on Insurance, I.I.U, Islamabad, Pakistan, (Unpublished).

6. E.J. Vaughan, Fundamentals of Risk and Insurance , 4th. Edition, John Wiley & Sons, (1986), Ch. 11.

loss (the contigency insured), that would exist if it was not insured. Therefore, for the individual, the purchase of an adequate amount of insurance eliminates the uncertainty regarding a financial loss. With insurance the loss is now distributed and spread to all members of the group to the extent that the loss is eliminated through transfer. If the insuree is a company then the loss is now transferred to the company. Thus, insurance minimises the risk and loss to individuals through transfer mechanism.

From the standpoint of society, insurance is an economic device for reducing or minimizing risk through the process of combining a sufficient number of homogeneous exposures into a group, in order to make the losses predictable for the group as a whole. This can be proved by defining the risk in terms of standard deviation of probability distribution[7]. It is basically because the larger the sample upon which the estimate of the probability is based, the more closely the estimate should approximate the true probability (the law of large numbers).

The functions of insurance, in general, can be classified into three categories; primary, secondary and indirect function[8].

7.Fahim Khan, Lecture (unpublished).

8. Afzal-ur-Rahman, Economic Doctrines of Islam, Banking and Insurance , Vol 4, (The Muslim School Trust London 1979), pp. 131.

The primary function of insurance is to provide security for the individual against uncertain danger of loss which may ruin him financially. Through insurance the individual transfers the burden of financial loss to the insuree by paying a required amount of premium to the insuree. The insuree will then be responsible for the cover of any loss to the insurer.

The secondary function of insurance is resource mobilization and hence to promote commercial and industrial development. Insurance company with its large fund, collected from the premium paid by the paticipants, can enable commercial, industrial and a vast number of business organizations to operate on a large scale through investment and loan.

Thirdly, insurance funds are partly being invested in the government securities. Therefore, insurance also provides financial assistance to the government and local autorities.

2.2 Types of Insurance by Form of Ownership

In general, insurance may be grouped into government and non-government (private) insurers. Government insurer, it may also be called social insurance. Non-government insurers are classified into five groups according to their

form of ownership as listed below:[9]

1. Capital stock insurance companies.
2. Mutual insurance companies.
3. Reciprocals or inter-insurance exchanges.
4. Lioyd's associations.
5. Health expense associations.

Out of the five groups, mutual insurance is closer to the basic principle of Islamic insurance system[10] and is practically applicable. It embodies the spirit of protection, cooperation and mutual responsibility as required by the philosophical foundation of Islamic insurance system. Generally it is similar to the idea of social insurance.

There are three types of mutuals; namely, pure assessment mutuals, advance premium mutuals - assessable policies and advance premium mutuals - non-assessable policies.[11]

In pure assessment mutuals, members of the group share the losses. No premium is payable in advance but each member would be assessed for his portion of losses that occur. If there is no loss, no payment is demanded. In advance premium mutuals - assessable policies, premium is

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9. Robert I. Mehr, Fundamentals of Insurance, op cit, Ch 19.

10. Ikram Azam, Pakistan and Islamic Economics, Lahore (1978), pp. 88-91.

11. Robert I Mehr, Fundamentals of Insurance, op cit, pp. 410-413.

charged at the beginning of the policy period. If the original premiums are sufficient to pay all operating expenses and losses, the surplus will be returned to the policy holders in the form of a dividend. On the other hand, if the original assessment is not enough to meet all contingencies, additional assessment may be levied against the members. Under this plan each member of the organization becomes both an insured and an insurer.[12]

Under the plan of advance premium non-assessable mutuals, premium is charged in the beginning of the policy period and is intended to be sufficient to cover all contingencies. If it is not, additional cost would not be levied against the members but is paid out of the accumulated surplus. However, if there is surplus income over costs, it may be returned to the policy holders as dividend. When a mutual insurance operates on the basis of capital (paid-in-capital) or indivisible reserves and also on the principle of fixed premiums and fixed policies, even if it is a non-profit making, it becomes a cooperative insurance.[13]

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12. Robert I. Mehr, Fundamentals of Insurance, op cit, pp. 410.

13. Ikram Azam, Pakistan and Islamic Economics, op cit, Ch. 6, pp. 81-94.

The form of contemporary insurance i.e private or social insurance are basically the same.[14] They carry the principle of " transfer of risk," in which an individual is liable to pay a sum of premium in return for which he will be paid a compensation upon the occurance of loss. The rate of premium is basically determined based on the risk types, actuarially calculated from the probability of death or probability of loss. The final premium that the insured pays is called the 'gross premium' or 'gross rate.' In calculating gross rate, the company has to first calculate the pure premium i.e the expected loss ratio. In general, pure premium is stated as:

Pure Premium = Losses / Exposure Units

For converting the pure premium into a gross rate requires addition of the loading, which is intended to cover the expenses of operation. These expenses normally include commissions, premium taxes and general administrative expenses. The final gross rate is then derived by dividing the pure premium by a 'permissible loss ratio,' defined as the percentage of the premium that will be available to pay losses after provision of expenses. It is equal to (1 - Expence ratio). Thus gross rate is defined as,

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14. Social insurance (private insurance) is a device for the pooling of risks by their transfer to an organization - usually governmental (company), that is required by law to provide pecuniary or service benefits to or on behalf of covered persons upon the occurance of certain loss.

Gross Rate = Pure Premium / (1 - Expense ratio)[15]

The gross rate is therefore composed of two parts, one designed to provide for the payment of losses, i.e to cover losses and a second, called a 'loading,' to cover the expenses of operation. The unit of protection to which a rate applies differs for the various types of insurance. In life insurance, rates are computed for each $1000 in protection, while in general insurance, rates are normally applied to each $100 of coverage.

Since insurance is dealing with risks and transfer of risks systematically, its operational structure can be explained with the help of a general model of insurance, as discussed below.

2.3 The General Model of Insurance

The operation of insurance in general can be represented by a simple insurance model. The different interpretations of this model by Rothschild M & Stiglitz J

15.E F Brigham, Financial Management (Theory and Practice), 4th Edition, Dryden Press Chicago (1985), pp. 53.

(1976), Wilson (1977), Pauly (1970) and Rees (1988)[16] are essentially the same. The stated model contains the following features:

i. Two possible states, loss and no loss

ii. The probability of loss is p

iii. The amount of loss is L

iv. The amount of premium is r

v. The amount of compensation is C

Therefore the general model of insurance may be stated as follows:

There are assumed to be two possible states of the world, state 1 and state 2. In state 1, an individual suffers no loss and his initial level of income is W. In state 2, he suffers loss equal to L and the probability of loss is p. The individual can be insured against the loss by paying a premium r to an insurance company , in return for which the company will pay him a compensation equal to C if an accident or loss occurs.

16.M Rothschild and J Stiglitz, "Equilibrium in competitive insurance markets: An essay on the economics of imperfect information", Quarterly Journal of Economics, 90 (1976), pp. 629-649; Wilson C, "A model of insurance markets with incomplete information", Journal of Economic Theory, 16 (1977), pp. 167-207; M.V Pauly, "Over-insurance and public provision of insurance : The role of moral hazard and adverse selection", Quarterly Journal of Economics, 66 (1970), pp. 44-62; R Rees, "Uncertainty, Information and Insurance", University of Guelph, Ontario, Canada, Discussion paper no.8. (1988).

The above statements indicate that without insurance an individual income in the two states 'no loss' and 'loss' was (W, W-L); while with insurance it has now become (W-r, W-r-L+C). This is equal to (W-r, W-L+d) where d is equal to (C-r). So the vector a = (r, d) can be described as the insurance contract.

The effect of insurance on individual utility level can be examined based on the expected utility theorem. The theorem states that under uncertainty an individual maximizes expected utility function of the form:

$$U(p,W1,W2) = (1-p)U(W1) + pU(W2).$$

where:

p - Probability of loss

W1 - Income in state 1

W2 - Income in state 2

Based on the above function, an individual utility level with or without insurance can be derived. An individual without insurance will maximize his expected utility function of the form:

$$U(p,0) = U(p,W,W-L).$$
$$= (1-p)U(W) + pU(W-L).$$

While an individual with an insurance contract such as a=(r, d), will maximize his utility function of the form:

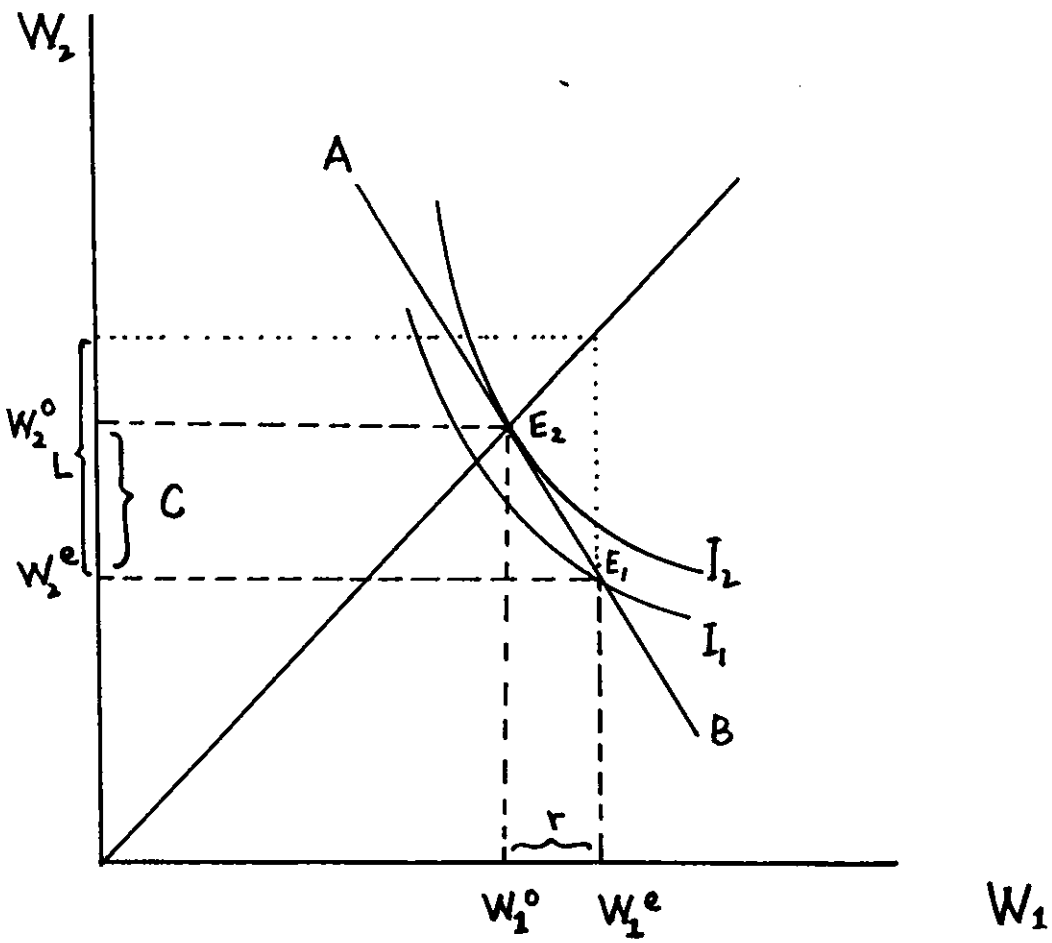
$$U(p,a) = U(p,W-r, W-L+d).$$
$$= (1-p)U(W-r) + pU(W-L+d).$$

The contract such as a=(r, d) will be purchased by an individual only if it satisfies the condition of $U(p,a) \geq U(p,0)$, that is the level of utility with insurance is higher than the level of utility without insurance, meaning that by purchasing the contract his expected utility either increases or is maintained.

Diagramtically it is shown in figure 1 where the horizontal and vertical axes represent income in the state 'no loss' and 'loss' respectively. The 45' line represents income which is equal in both states of nature and the fair odd line, while line AB represents the price of insurance. Point E1 is the individual's initial position. Here, individual's income in state 1 is W1e and due to loss equal to L, his income in state 2 is W2e = W1e-L. Individual's utility level at this point is represented by indifference curve I1 with total utility of U(p,0). When an insurance contract is purchased, by paying the premium r, an individual will get a compensation of C, to cover the loss L if it occurs. Now, his new combination of income is W1o and W2o, i.e moving from point E1 to E2. Consequently, his utility level increases from I1 to I2.

Therefore, through insurance individual will be able to increase his utility level although he has to initially sacrifices as much as 'r' for the payment of premium. The premium 'r' is said to be fair if r=pC and the coverage 'C' is said to be full coverage if C=L.

Figure 1 : Insurance in General



There are conditions required by the individual for purchasing an insurance contract and by the company for offering an insurance contract.

a) Condition for purchasing insurance

An individual will purchase insurance if income in state 1 can be exchanged for income in state 2 at the fixed rate say Θ, meaning that;

$$- dW1 / dW2 = \Theta$$

Therefore, Θ is simply the price of insurance. The amount of insurance purchased in state 2 can be defined as the difference between the actual and endowed incomes in state 2, that is;

$$S = W2o - W2e.$$

Thus the expenditure of insurance in terms of state 1's income is;

$$I = S\ \Theta = W1e - W2o$$

So the opportunity boundary is defined as;

$$W1e - W1o = \Theta\ (W2o - W2e)$$

represented by the line AB in figure 1. Θ can also be defined as the slope of budget line. The actuarially fair price of insurance is $(1-p)/p$, therefore, the real price of insurance can be defined as,

$$\Theta^* = \{\ (1-p)/p\ \}\ \Theta$$

An individual is ready to purchase insurance if he is able to trade off some income in state 1 for income in state 2.[17] This will be done only if the price for doing so is not too expensive. This implies that $-dW1/dW2$ should be less than or equal to Θ^*.

This means that the necessary condition for the purchasing of insurance is that the slope of indifference curve must be less than the price of insurance at the endowment point.

b) Condition for offering an insurance contract

For the insurance company, when an insurance contract such as $r = (r,d)$, where $d = C-r$ is offered at the price Θ, its worth is:[18]

$$\Theta(p,a) = (1-p)r - pd$$
$$= r - p(r+d)$$
$$= r - p\,C$$

Any contract which is expected to be profitable could be supplied by a company. For this purpose, it chooses a contract which maximizes its expected profit $\Theta(p,a)$.

In practical life, generally insurance companies

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17. E Isaac and S.B Gary, "Market insurance, Self-Insurance and Self-Protection", Journal of Political Economy, Vol 80 (July/Aug 1972), pp. 623 - 648.

18. M Rothschild and J Stiglitz, "Equilibrium in Competitive Insurance Markets. An Essay on the Economics of Imperfect Information", Quarterly Journal of Economics, 90 (1976), pp. 629-649.

offer two types of insurance namely, life insurance and general insurance. Although they are reffering to two different things, that is wealth and individual life, but they are basically working on the same principle of transfer of risks and, therefore, using the same procedure for determining the premium.

Basically, there are two categories of premium rates. Firstly, pooled premium rate and secondly, separating premium rate. Pooled premium rate means that the company charges average rate to every individual, which means that the low and high risk types individuals are equally charged. This pricing system is said to be unfair to the low risk types individuals since low risk types individuals are supposed to pay less. Therefore for achieving fair premium rates, separating premium rates were suggested[19]. In this system of pricing, individuals are differently charged in accordance with their risk types. When the problem of moral hazard was noticed, where some dishonest high risk individuals pretended to be of the low risk, and consequently the company may suffer loss, another improvement to the existing separating premium rates were suggested[20]. The suggested rates are known as the separating price under moral hazard. The rates are

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19. Michael Hoy, "Categorizing Risks in The Insurance Industry", Quarterly Journal of Economics, (May 1982), pp. 321-336.

20.R Rees, "Uncertainty, Information and Insurance", University of Guelph, Ontario Canada, Discussion paper no.8, (1988).

considerably fair from the company point of view because it can ensure the zero profit condition, that is no loss. For the participants however, it is fair only from the risk types point of view because the low and high risk types individuals are differently charged in accordance with their risk level. However, it is likely that it may not be fair from income point of view since the rich and the poor are equally charged. This issue will be dealt with more closely in the next chapter when we incorporate the Islamic principle of equity.

The foregoing discussion summerizes main features of contemporary insurance system. In this background, the Muslim scholars have extensively studied the currently practiced insurance system from Islamic point of view. The following section examines typical version of these views.

2.4 Islamic Views on Insurance

Insurance is an instrument of security and protection. It is not an art to deny divine blessings. Although Allah is providing us with the means of livelihood and determining all kinds of unforeseen risks, but this does not mean that Allah will shower our food and clothing from heaven for us if we sit idle. Effort must be made to avoid emergencies and crises and reduce the burden of hard times. Seen from this context, insurance is not an effort to go

against the will of Allah. It is just an effort to seek security and ease the financial burden through cooperative and mutual efforts so that when an individual is liable to pay an indemnity beyond his capacity, the burden is to be shared by the group. This spirit is clearly not against the Islamic teachings.

In the light of Islamic jurisprudence, Insurance may be equated with an agreement between two parties in which one gives a guarantee to the other about his property possesion against its destruction or deterioration from its normal course. Some aspects of this guarantee can be covered under the system of "Aqilah" or "Qasamah" or akad of "Muwalah", "Doman" and "Kaflah."[21]

The system of "Aqilah" has been in practice since the early days of Islam. "Aqilah" mean that liability of an individual to pay the blood money was regarded as the liability of the tribe (Ma'aqil) as a whole.[22]

So, if an individual of the tribe commits an unintentional killing for example, and he need to pay an indemnity (blood money) which is beyond his personal capacity, the tribe would pay the indemnity on his behalf. Therefore, it is reasonable to adopt the same principle in

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21.S.M Yusuf, Economic Justice in Islam, (Lahore 1971), pp. 90-93; and Sobri Salamon, Ekonomi Islam, (Al-Rahmaniah, 1989), pp 213-250.

22. S.M Yusuf, Economics Justice in Islam, op cit, pp. 92.

case of road accident because the errant driver is liable to pay an indemnity, which like blood money, is always beyond his personal capacity. Thus it may justifiably be shifted to the entire group of the drivers.

Insurance may also be classified under "Doman." In this case the guarantor take upon himself a liability which may possibly fall on a person. The only diference is that under the "Doman" principle, the guarantor is prohibited from charging any fee or taking any money in return for the guarantee. Similarly under the system of 'Kaflah', an individual is allowed to assume a liability of the others, in which he will be responsible to cover the liability of that person in case he fails to fulfil his liability.

In some cases financial loss causes destitution to individual or to families. In these cases the need to help the affected people is obvious because the loss may adversely affect the efficiency and productivity of these people which may also simultaneously affect the progress and prosperity of the whole society. Protectiong efficiency and productivity of individuals and families is imperative for the economic growth and prosperity of the whole society. Since Islam favours economic growth, therefore insurance as an instrument of security and protection is acceptable in Islam.

However, there is a question of whether the currently practiced conventional insurance business is

acceptable and conform to the tenets of Islam. In this regards, Muslim scholars and economists have expressed divergent opinions about the permissibility and acceptability of the currently practiced insurance business.

The writers opinions generally can be classified into three different views. Firstly, it is acceptable to Islam because its operation does conform to the rules and requirements of Shariah. Secondly, it is not acceptable to Islam because its operation does not conform to the rules and requirements of Shariah. Thirdly, it is acceptable for the case of general insurance but not for the case of life insurance. The following subsections examine these points.

2.4.1 Permissibility of The Currently Practiced Conventional Insurance Business

The Muslim writers favouring currently practiced conventional insurance business maintained that there is no element against the Islamic law in the present insurance business. They maintained that insurance is neither gambling nor speculative transaction because it is based on the principles of mutuality, reciprocity and cooperation. Similarly, the degree of uncertainty and risk involved in insurance is so low which does not turn the contract invalid.[23] In the context of life insurance, some writers have

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23. Afzalur Rahman, Economic Doctrines of Islam, Banking and Insurance, op cit, pp 113.

opined that life insurance is not a defiance of Divine Will because it does not intend to prevent the death. It only tend to minimise the tragic consequences for the family. As regard the riba, the decision and choice lies with the individual whether to accept the axcess payment (interest) or only the sum he has paid.

In the same context, some writers have contended that insurance is not a transactional contract. It is actually a Takaful business and the premium paid is just a form of 'hiba' or gift. Therefore the reason for unknown in price, time and object, for the rejection of conventional insurance business does not hold. Thus the currently practiced conventional insurance business can be implemented as it is.

2.4.2 Non-Permissibility of The Currently Practiced Insurance Business

Those writers opposing currently practiced insurance system focus their arguments on the existence of prohibited elements such as 'riba', gambling, 'shubaha', exploitation, betting, hazardous and transaction not fulfilling the requirement of aqad in Islam. The presence of these elements turn the conventional insurance system un-

Islamic.[24] The impact of these elements from the Islamic point of view is briefly examined in the following.

Muslim scholars are of the view that premium contribution in the fund is invested in interest-based business. Since interest rate is prohibited, therefore such a business is also prohibited. Similarly, some writers pointed out that uncertainty present in insurance contract regarding exact amount of compensation and occurance of loss, etc, render it unacceptable to Islam. Likewise the exact amount of contribution in case of Life Insurance before the occurance of death is also uncertain. Thus the contract is invalid. Moreover, the elements of gambling, exploitation, betting and hazardous in Insurance Business are responsible for its prohibition in Islam.

Keeping in view the above maintained objection, many institutions have opposed the currently practiced insurance business. In this case, the resolution of Islamic Research Congress held in Cairo (1965), Islamic Conference held in Kuala Lumpur (1969) and Islamic Conference on Islamic Economics held in Makka (1976) are pertinent.[25] The Islamic

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24.Available in Sobri Solomon, Ekonomi Islam, op cit, chapter 9; Afzal-ur-Rahman, Economic Doctrines of Islam, Banking and Insurance, op cit, pp. 113 ; Hussein Hamid Hassan: Fiqh al-Muamalat al-Maliyya for Economists, Islamabad (Sept 1987); Muhammad Muslehuddin, Insurance and Islamic Law, (Islamic Publication Ltd. 1982), Ch. 1 and Ch. 2.

25. Resolution of Islamic Research Congress (Cairo 1965); Islamic Conference (Kuala Lumpur 1969) and First International Conference on Islamic Economics (Makka 1976).

Bank of Sudan and the Council of Islamic Ideology of Pakistan[26] also have same opinions. The Council as reported by the Muslim (Tuesday, January 19, 1993) stated that the currently practiced insurance system is not inaccordance with the Islamic law because there exist prohibited elements such as 'riba', gambling, 'shubaha', exploitation, betting, hazardous, and transaction not fulfilling the requirement of aqad in Islam[27].

The Muslim jurists and economists working with different Islamic organizations had proposed an alternative system of insurance which is conformable to the Islamic tenets both in case of life and general insurance. For acceptability, the system should promote social justice through the principles of mutual protection, cooperation, and joint responsibility. In addition, it should also be free from the prohibited elements such as 'riba', gambling, exploitation, 'shubąha', betting and conditions not satisfying the requirement of 'aqad' in Islam.[28].

For acheiving the proposed system, the required main feature of the system is such that the system should be

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26. Council of Islamic Ideology, Government of Pakistan, on Consolidated Recommendations on the Islamic Economic System, (1983 and 1992).

27.The Muslim, (Tuesday, Januaary 19, 1993).

28.Mufti Muhammad Shafiq, Life Insurance (in Urdu), (Dar-ul-Saat 1972), pp. 59-72; Council of Islamic Ideology, Government of Pakistan (1992), op cit, pp 41-55.

based on the principle of mutual responsibility or joint guarantee and the risk of unexpected loss should not be transferred from one party to another. It is rather being spread equitably among the members of the group.

Operationally it means that member should pay an advanced premium to the fund for the cover of any losses. If the loss exceeds the sum of premium already collected, then every member is liable to pay an additional amount to the fund. On the other hand, if there is surplus it should be equally divided between the members. Similarly, the profit generated from the fund, should also be equally divided between the members. In view of their significance, we will discuss the suggested alternatives in detail in the following section as below.

2.4.3 Alternatives Insurance Schemes

Basically two types of schemes have been suggested, one relating to general insurance and other relating to life insurance.

In case of general insurance, it has been suggested that the payment of contributions bee pooled into a general insurance fund.[29] These contributions are considered as

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29. Council of Islamic Ideology, Government of Pakistan (1992), op cit, pp. 41-55.

tabarru' (gift) from the participants to the fund. The company operating the fund invest the money and profit so generated is pooled back into the fund. From this fund, the benefits, compensations, and operational costs are paid. After these payments, if the company is left with surplus then it is shared between the company and the participants in the light of Mudarabah contract.

In the case of life insurance, the participants should first fixed the required amount which is to be paid to the company in instalment over a given maturity period.[30] The company operates the collected fund as follows,

1. The instalment payment should be used in Mudarabah business and the profit so generated is divided on profit/loss basis.

2. The contract between the company and the participants must clearly mentioned the portion of the payment that will be kept in reserve for the purpose of insurance cover (known as personal special account (PSA)). The rest is being credited into participants account (PA), which is used for the purpose of investment.

3. The types of occurance of death must be clearly specified.

30.Mufti Muhammad Shafiq, Life Insurance, op cit, pp. 39-72; Report by Task Force on The Study of The Establishment of Islamic Insurance in Malaysia, (1984).

4. The payment to the participants or their heirs depend upon the occurance of any of the following three events. In case of maturity of the plan, the participants are be paid the amount of instalments credited under PA plus the share fo profit from investment plus the net surplus of PSA. In case of death of the participants before the maturity period, their heirs are be paid the amount of instalments that have been paid by the deceases plus the outstanding instalments plus the share of profit. In case the participants are compelled to discontinue their plan before the maturity period, they are entitled to receive only the portion of their instalments which have been credited into their PA plus the share of profits. The amount that have been credited into PSA shall not be refunded.

The suggested alternative was basically consists of two important concepts. Firstly, 'Al-Takaful' which means joint guarantee, and secondly, 'Al-Mudarabah' which convey the meaning of sharing in profit and loss. In practice it is known as Takaful business. The following chapter discusses theory and practice of this business.

CHAPTER 3

THEORY AND PRACTICE OF TAKAFUL BUSINESS

3.0 Introduction

The main objective of this chapter is to discuss the theory and practice of Takaful business. It is divided into four main sections, beginning with section 3.0 as the introduction section. Section 3.1 discusses motives, mechanism and forms of Takaful, followed by section 3.2 which explains the feasibility of Takaful Business. In this section, the role of Waqf and voluntary institutions in realizing the Takaful business will also be discussed. Section 3.3 discusses the practical case of Takaful Company of Malaysia. Finally section 3.4 identifies some of the weaknesses of the existing Takaful business.

3.1 Motives, Mechànism and Forms of Takaful Business

Conceptually speaking, Takaful is a form of informal guarantee to the members of a group at any level of society. Therefore it embodies the principle of cooperation, mutual help, and sharing of responsibility. For performing this function, no financial obligations are involved. In the contemporary time, the system of informal practice has been institutionalised within the society. Therefore Takaful institution provides joint guarantee to the members of a group against loss. The members agree to jointly guarantee

themselves by paying a certain amount of contribution to the common fund so that if any one of them suffers a loss in catastrophe or disaster, he may balance it with a certain amount of money received from the fund.[31] The mutual responsibility imlies that the risk of unexpected losses is not transferred from one party to another. It is actually shared collectively by all members. The Takaful company operating the fund on behalf of its members, acts just like an organizer. In the event of unexpected losses, the company does not bear the incidence of risk but it still lies on the shoulder of the subscribers.

According to the principle of mutual responsibility, every members of a Takaful company pays not only an agreed amount as an advanced contribution, but also be liable to pay an additional amount to the company if the sum of losses exceeds the collected fund. On the other hand, if there is surplus, it will be shared between the company and the participants on certain predetermined rate in the light of Mudarabah contract.

Originally the motive of Takaful is merely to provide help to the needy individual even without prior arrangement or initial payment. When the need come, help will be provided. Help may come from members of the family or the society. However this assurance is suppose to be available

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31.Mohd Fadzli Yusof,"Takaful - Islamic Alternative to Insurance", Journal of Islamic Banking and Finance, (1990), pp. 39-54.

under the supervision of the state in conjunction with the social welfare system and help should be given to every members of the society without prior payment of premium. The required fund may be collected from donations, zakah or other wealth managed by Bait-ul-mal in Islam. However, if this activity is run by voluntary and private institutions, their motives should remain the same, but prior arrangement and premium payment may be needed. This payment is undoubtedly needed for creating a pooled fund.

The service provided by the Takaful company is limited only to the amount of contribution of the members. However it can extend its service with same amount of premium collections provided it receives donations. To make itself a viable concern, the Takaful Company invests its fund through any Islamically acceptable mode of financing.

It is more likely that Takaful company may adopt Mudarabah instrument for investing its fund. Usually, the company adopts two-tier Mudarabah, one between company and its subscribers and second between company and entrepreneurs.

In any case, the Mudarabah means profit and loss sharing business, in which the owner of the capital and the entrepreneur share the profits and loss. If there is loss the owner lose the capital and the entrepreneur lose the effort. In case of profit, it is shared according to agreed propotion. Similar arrangement is made between company and its policy holders, in which the profit is divided between

the company and the policy holders. Since Islamic law requires that the profit sharing ratio must be clearly specified in advanced, therefore the Takaful contract could be suitably operated on the basis of Mudarabah.

As a matter of fact, Takaful business run on the basis of Mudarabah is like a business venture which embodies the virtues of cooperation, mutual help, and shared responsibility among the participants. The contract therefore should embody the following important elements:[32]

i) There should exist aqad (contract) between the policy holders and the company whereby the company is entrusted to manage the premium collected in investment project in line with the Shariah.

ii) There should exist a contract between the policy holders and the company which states clearly profit and loss ratio.

iii) The contract stipulate that before profits are shared, the payment of compensation to members is made first.

iv) The contract lays down the terms and conditions of the Takaful cover including the benefit which the participants are entitled to.

v) In general the contract stipulates the rights and bligations of both the parties.

32.Report by Task Force Committee, op cit.

In sum, the concept of Takaful business may be stated as a scheme of joint guarantee among members of a group satisfies requirements of Shariah. This guarantee is articulated by contributing money to the Takaful fund, so that whenever any member of the group suffers a loss, he receives money from the fund as compensation. This helps him to compensate the loss. In this way, Takaful arrangement acts as cushion against possible financial loss. Moreover, this cushion is provided at the minimum cost because Takaful company operates on the basis of break-even principle. Hence, it efficiently serves an important social goal. If takaful business is managed by private sector, it is called cooperative Takaful, and on the other hand if it is managed by public sector, it is called social security Takaful.

One may ask whether this arrangement is economically feasible especially in the competitive insurance market. For this, let us now examine the feasibility of Takaful business in the following section.

3.2 Feasibility of Takaful Business

As has been mentionad earlier, Takaful arrangement may be managed by public or private sector. This means that both the sectors could play their due roles in promoting the success of Takaful business. In clarifying this point, the role of state and private sector will be dealt with separately in the following sections.

a) The Role of State

In fact, Takaful arrangement is supposed to be provided by the state (public sector) and if possible the cover should be provided without premium. This arrangement becomes a kind of social security system. However, due to financial problem, free cover is not likely to be given. The state somehow can still play a role in realizing the business by supervising its operation, resulting to a Takaful business under the supervision of the state.

State supervision does not necessarily means that the government should provide the Takaful cover without premium. Contributions from the members may still be required for creating a Takaful fund but possibly at a very minimum level, much less than the ordinary premium rate under the secular insurance system. The state has the capability for implementing this subject for two reasons, firstly the state could acquire the fund from other sources such as donations and employers contributions, and secondly, the state could easily minimise the operating cost of Takaful arrangement by utilizing the existing department. With these two advantages, the state could easily manage the Takaful arrangement.

b) The Role of Non-Profit Motive Private Institutions

Since Takaful business is not a profit motive business, profit motive private company is unlikely willing

to undertake this business because no financial benefit will motivate the company. In such a case, only non-profit motive private company is likely to participate. There are many non-profit motive private organizations such as workers' ossociation, consumers' association, traders' association, and teachers' association. These associations could be asked to provide Takaful cover in addition to its normal functions. For providing this additional function, Takaful contributions could be asked from those members willing to get the service. Since profit is not a prime matter and additional administrative cost is minimum, the required contribution is expected to be less than the premium asked by the existing profit motive insurance company.

Moreover, Takaful service could also be provided by profit motive private institutions as a social service in addition to its normal business. Profit should not be expected from this service and thus the company should understand that Takaful aims at providing service and not a profit generated business. Income and profits should come from its normal business. This method has been implemented successfully by Islamic Bank of Malaysia in which in addition to its normal business, Islamic Bank of Malaysia offers Takaful service managed by Takaful Company of Malaysia. Operationally it is separated but administratively it is under the supervision of Islamic Bank of Malaysia.

c) The Role of Waqf and Voluntary Institutions

Historical record shows that Waqf and voluntary institutions have been playing important role in the Muslim countries. The role of these institutions have been prominent in the social sector like health, religious education, orphanage care centres and travelling facilities.[33] In particular Malaysian economy context where bulk of financial, commercial, and other economic resources are controlled by the non-Muslim population, the efforts to establish the business of Takaful company can be reinforced with the contribution of Waqf institution. Moreover, in view of growing interest in Islamization process in Malaysia, it is easy to channelise the role of Waqf institution for the assistance of Takaful business which is in fact a vital social need. It is thus important to examine the existance and magnitude of Waqf institution in Malaysian economy. Before attempting this, it is appropriate to define nature and motivation behind waqf institution.

Waqf may conveniently be defined as taking corpus of any property from personal ownership and transferring it permanently to the ownership of Allah and dedicating its use to purpose recognized by Shariah. Permanence and irrevocability are two important features of the Waqf.

33.A.A Islahi, Provision of Public Goods: Role of Voluntary (Waqf) Sector in Islamic History. Paper presented at the International Seminar on Islamic Economic, Kuala Lumpur, (1992).

Waqf institution can be categorized into family and public Waqf. Family Waqf aims at supporting the family members while public Waqf is devoted for promoting general welfare particulary of the poor people. It is public Waqf which is expected to assist the establishment of Takaful business.

In Malaysian economy context, the success of voluntary sector in helping the poor has been experienced by Amanah Ikhtiar Malaysia (AIM). AIM is a voluntary institution aims at helping the poor in increasing their income through loan system, known as 'Qard-ul-Hassan'. The poor will be given 'Qard-ul-Hassan' loan for a specific approaved project and they have to return only the principle of the loan.[34] The main financial resource of this institution is donation, both from individual and institutions. Experience has shown that this institution could maintain its financial resource and is capable of providing loan to the poor on sustainable basis. In 1989, about 430,000 poor were given loan by AIM which increased to 2,308,055 poor in 1993. The rate of loan repayment was high, that is about 99.89% in 1993.[35]

34.Amanah Ikhtiar Malaysia, Suratcara Perjanjian AIM, (Sept 17, 1987).

35.Annual Report AIM (1991); Awang Azeir Mohamad, The Role of AIM and YBK in Eradicating Poverty in Malaysia: A Comparative Study. Dissertation submitted to the Faculty of Economic, National University of Malaysia, (1993/94), (Unpublished).

Similarly, Eradicating Poverty Foundation (YBK) has been helping the poor by providing loans for business activities and education to their children. Moreover it has been financing programme for the basic needs of the poor such as improving their houses, providing water supply and electricity.[36]

The above discussion point out the fact that Waqf institution can be helpful in establishing Takaful company. It can either sponsor new Takaful company or grant assistance to the existing Takaful companies. What is actually needed now is to boost the confidence of well-to-do people and convince them about the benefits of Takaful for the poor who cannot afford to be members of this company because of high premium rates. When they become convinced, then they can set up more Waqf institutions which in turn finance Takaful business. Without their cooperation, it is difficult to expect that Takaful company could face the tough competition posed by the established secular insurance industry in Malaysia.

In Malaysia, Takaful business has been in practice since 1985. It is organized by a company known as Takaful Company of Malaysia. This company is in fact under the supervision of Malaysian Islamic Bank. It is interesting to

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36.Annual Report YBK, (1992); Awang Azeir Mohamad, The Role of AIM and YBK in Eradicating Poverty in Malaysia: A Comparative Study, op cit, pp. 66-85.

note that, although Islamic Bank is a profit-motivated private institution, its involvement in Takaful business shows that, such institution can also cater non-profit service like Takaful business. The operation of this business as practiced by Takaful Company of Malaysia is explained as under.

3.3 Takaful Company of Malaysia - A Practical Example of Takaful Business

The framework of the proposed Takaful Business has been discussed conceptually in the previous chapter. The present discussion provides some discription of its operational procedure. It is likely that different models of Takaful Business can be designed in lines with this operational procedure. Different models may be available but Malaysian model of Takaful Business is known to be successful in practice.

3.3.1 Operational Aspect

The currently practiced Takaful Business in Malaysia is managed by the private commercial sector which operates within the premise of private commercial sector. As a commercial sector, the operator (Takaful company) requires paid-in capital and also operates for profit.. The participants are required to pay to the fund a predetermined amount of premium in accordance with the amount of wealth

insured. Since the fund will be invested, the contract of Takaful between the company and the participants is based on the principle of 'al-Mudarabah', i.e sharing of profit/loss in business. Therefore, the company and the participants are inter-related and bounded under the contract of of 'al-Mudarabah', in which the company acts as the entreprenour (al-mudharib) while the participants act as the owner of the capital (sahib-ul-mal). Under the contract it is stated that if there is a surplus, it will be divided between the company and the participants, but if there is a deficit it will not be recovered from the participants.

Since the currently practiced Takaful Business is managed by the private commercial sector which operates for profits, being established on the basis of a paid-in capital and operating its business on the principle of fixed premium and fixed policies, therefore, it is likely that the company possesses the following features; (1) Mutual insurance characteristics and (2) Advance premium non-assessable mutuals. In this respect, Takaful on the basis of mudarabah practiced in Malaysia is most likey to be classified under the category of cooperative insurance organized by private commercial sector.

Practically there are two types of Takaful Business (schemes) namely, Family Takaful Business (Islamic Life Insurance) and General Takaful Business (Islamic General Insurance). Operationally these schemes are similar, in

which both the company and the participants are bounded under the contract of 'al-Mudarabah'. In both the cases, the company acts as the entrepreneur while the participants act as the owner of the fund.

However, the plans in Family Takaful are essentially an investment programme which provides investment return to the participants as well as providing mutual financial aid to any of the participants who suffers loss. Therefore, the instalments paid by the participants will be credited into two separate accounts namely (1) Participant's Account (PA) and (2) Participant's Special Account (PSA).

The portion of payments credited into the PA is solely for the purpose of savings and investments while the portion of payments credited into the PSA is considered as tabarru' (contribution) for the operator to pay the Takaful benefits. Operational flow and how the share of profits from PA as well as the Takaful benefits from PSA are distributed are shown in chart 1 of appendix 3.1.

Unlike the Family Takaful, General Takaful scheme does not provide the objective of investment and mutual financial aid at the same time. It provides only the cover against loss upon properties or assets. Therefore, the amount of Takaful premium paid by the participants will be considered merely as tabarru' (contribution) to the Takaful fund. These tabarru' will also be invested but the profits generated will be pooled back into the fund. If there is a surplus after

deducting all the operating costs, the surplus will be shared between the company and the participants as has been agreed under the contract of 'al-mudarabah.' Operationally it is shown in chart 2 of Appendix 3.2.

The rate of tabarru' in the Family Takaful scheme was fixed in accordance with the maturity periods as follow:

Table 1.1: Tabarru' Rate (%) in Different Maturity Period

Age Group (Years)	Maturity Period (Years)		
	10	15	20
18 - 30	2.0	3.5	5.0
31 - 35	2.5	4.5	6.5
36 - 40	3.5	6.0	9.0
41 - 45	5.0	8.5	-
46 - 50	7.0	-	-

Surce : Mohd Fadzli Yusof (1990), op cit, pp. 45.

Different pricing strategies were actually used by Takaful Company of Malaysia, meaning that it used different strategies for different schemes. Let us now examine objectively the company's pricing strategies.

3.3.2 Pricing Strategy

In the previous section, the operation of Takaful Business has been explained. The way of how the rate of tabarru' is determined has also been shown. It will be been shown that Takaful contract b(p,do) is equal to a(p,d) when g=1 and a = 0, implies that Takaful and conventional insurance are theoretically similar. One of the important features of the conventional insurance is that its premium is charged in accordance with individual risk-types; the higher the risk types, the higher he has to pay the premium. This means that risk-types is being used as a signal to classify different individuals. In this connection, a fair insurance contract is defined as one in which r=pC, which means that the premium is simply the expected value of the compensation to be paid. It is said to be fair because;

i. It is fair between the company and the participants because theoretically neither the company nor the participants shall get any gain or suffer any loss from the contract. On average they are all break even.

ii. It is likely to be fair between the participants in terms of risk-types because every individual is charged in accordance with his risk-types, those having higher probability of loss have to pay higher premium.

This policy has been implemented in both Takaful Businesses, i.e General Takaful and Family Takaful Business. In General Takaful Business for example, the

company classified individual risk on the basis of types of wealth or assets. Within the scheme of motor vehicles for example, it has been classified into different types of vehicles such as motor cycle, car, van, bus etc. The reason for this classification is that the probability of accident that may be inflicted upon the driver is greatly related to the type of vehicles. The probability of accident for a van for example, is likely to be greater than the probability of accident for a car, even if it is driven by a same driver. Therefore, the premium demanded for covering of a van is higher than the premium demanded for covering of a car.

In the case of Family Takaful, individuals are classified on the basis of their age. The higher the age the higher the probability of death, and therefore the higher the premium demanded. In general the strategy adopted by the company was either a separating price or a pooled price, depending upon the types of the schemes.

Separating price is a situation where individuals are differently charged in accordance with their risk-types. The higher the risk-types, the higher the premium charged and vice versa. This may be implemented when full information is available for the company. The separating price under the situation of full information is likely to be fit for the case of Family Takaful because in Family Takaful individuals are offered the contract appropriate only to their risk-types. The older the age the higher the premium demanded.

Figure 2 : Separating Price

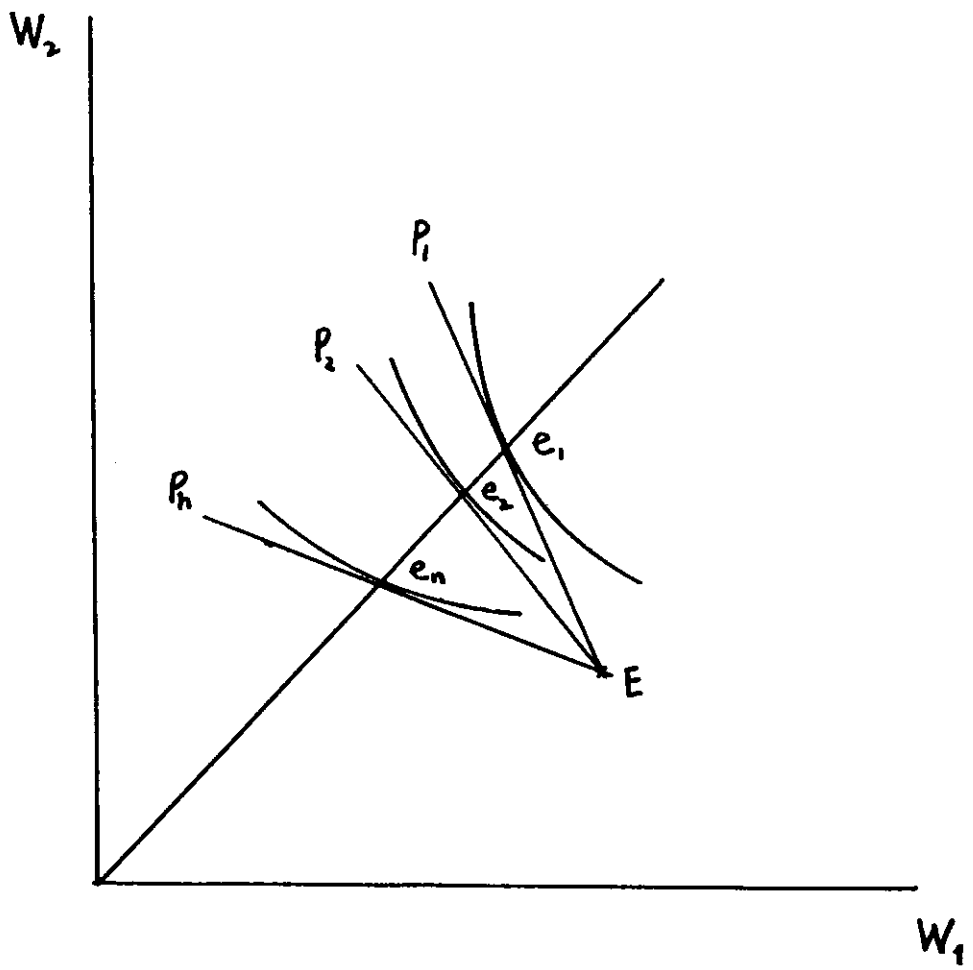


Figure 2 shows that with the initial position E, individuals are appropriately charged only to their types. Individuals of low risk types with probability p1 are charged with the price having the slope of Ep1; and individuals with the probability p2 are charged with the price having the slope of Ep2, and so on. Since p1 < p2 < p3 <.....< pn, then by defining 'ri' as the premium rates for risk-types i=1,2,....n, r1 < r2 <.....< rn. Equilibrium points e1, e2, ...,en can be called as separating equilibrium.

Pooled price on the other hand is a situation where individuals are equally charged regardless of their risk-types. The premium charged is used to be the average premium of high and low risk-types.

In the case of General Takaful, risk classification was made only on the basis of types of assets and the resulted price is likely to be a separating price. But when human factor is included, separating price classification is no longer suitable. Consider the case of car insurance, some drivers are 'good drivers' and some others are 'bad drivers.' They are clearly having different probability of accident even if they are driving the same car. Thus a unique price of premium for the cover of car insurance is not likely a separating one rather a pooled price between good and bad drivers because cars driven by good and bad drivers are equally charged.

Similarly, for the case of Group Family Takaful, individuals are equally charged regardless of their risk-types. Thus, pooled price can in general be considered as the average price of low and high risk individuals. Mathematically it may be stated as:

$$Po = kp1 + (1-k)p2$$

where;

Po - Pooled insurance price (average price)

k - The rate of individuals in low risk category

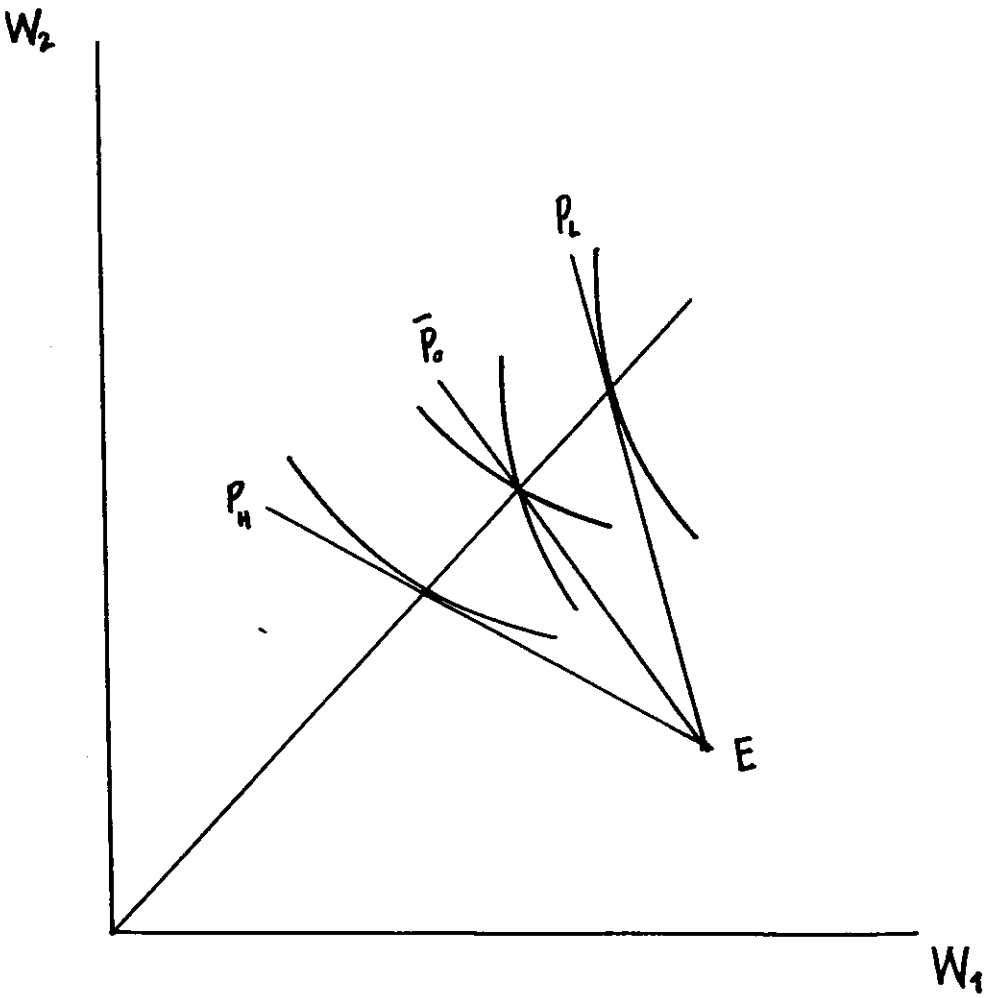
p1 - Probability of loss for low risk category

p2 - Probability of loss for high risk category

Diagramatically it is shown in figure 3. Based on the initial endowment point E, line EpL represents the slope of price line that should be offered to individuals of probability pL (low risk) and Eph represents the solpe of price line that should be offered to individuals of probability ph (high risk). The company however, charged Po, i.e a unique price to both categories of individuals. Line EPo which may be considered as the averege price of low and high risk-types is the pooled price line. In this case, individuals are all pay equal premium rate 'ro.'

This strategy is adopted normaly by a company under the situation of imperfect information, that is a situation where the company does not posses the information about the individuals' risk types.

Figure 3 : Pooled Price.



The pricing strategy in General Takaful implemented by Takaful Company of Malaysia is referred to every category of commodity, which mean that every category of asset is individually offered a different pooled price. Therefore, the whole pricing system may be stated as pooled price of different asset groups. This may be stated as :

$$Poi = k\ p1i + (1-k)\ p2i$$

where;

Poi - Pooled price for group i

k - The rate of individuals in low risk category for asset group i

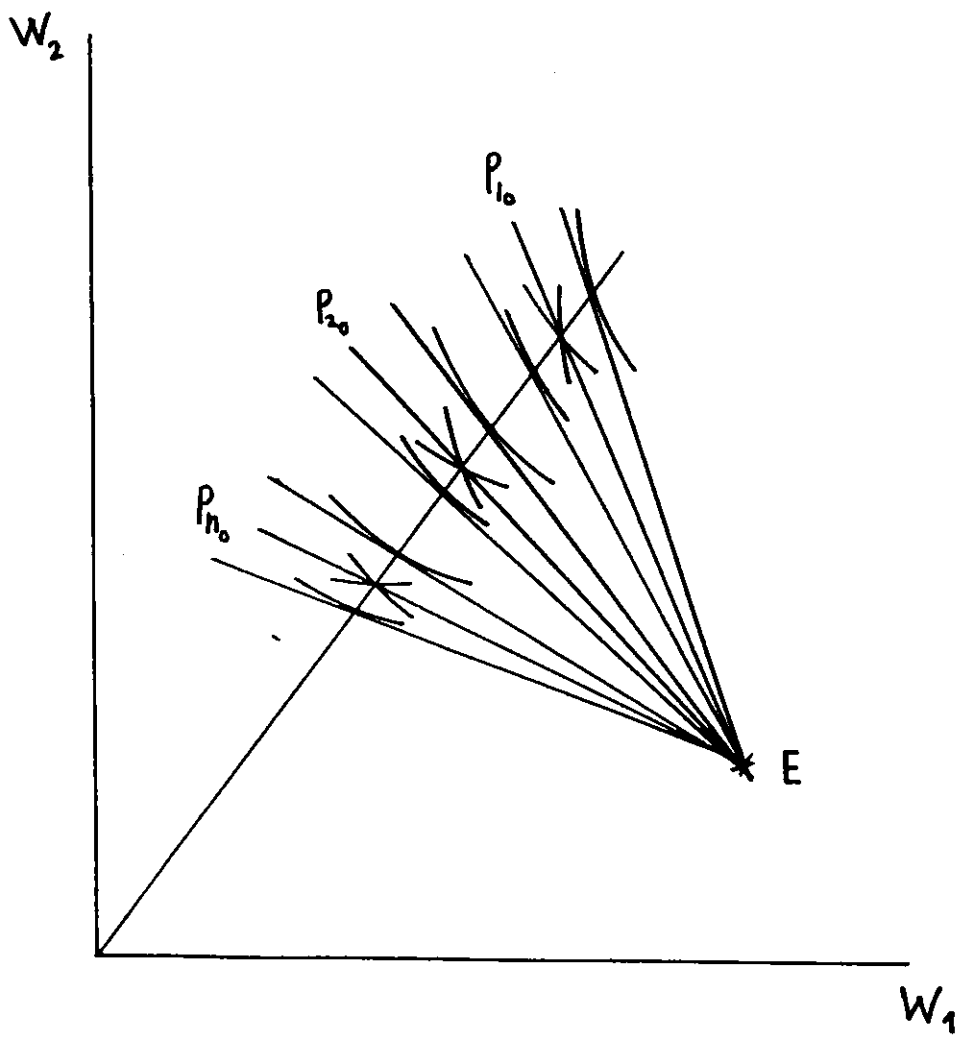
p1i - Probability of loss for low risk individuals in asset group i

p2i - Probability of loss for high risk individuals in asset group i

i - Group of assets

The above situation is shown in figure 4. Assuming that the probability of loss for asset category 1 is less than that of category 2 and so on, i.e p1<p2<...<pn then P1o, P2o,..... Pno are the pooled prices for asset groups 1, 2, ..., n respectively with P1o < P2o <....<Pn. Consequently the line EP1o, EP2o,....., EPno are the pooled price lines for asset groups 1, 2, ..., n respectively.

Figure 4 : Pooled Price in group i.

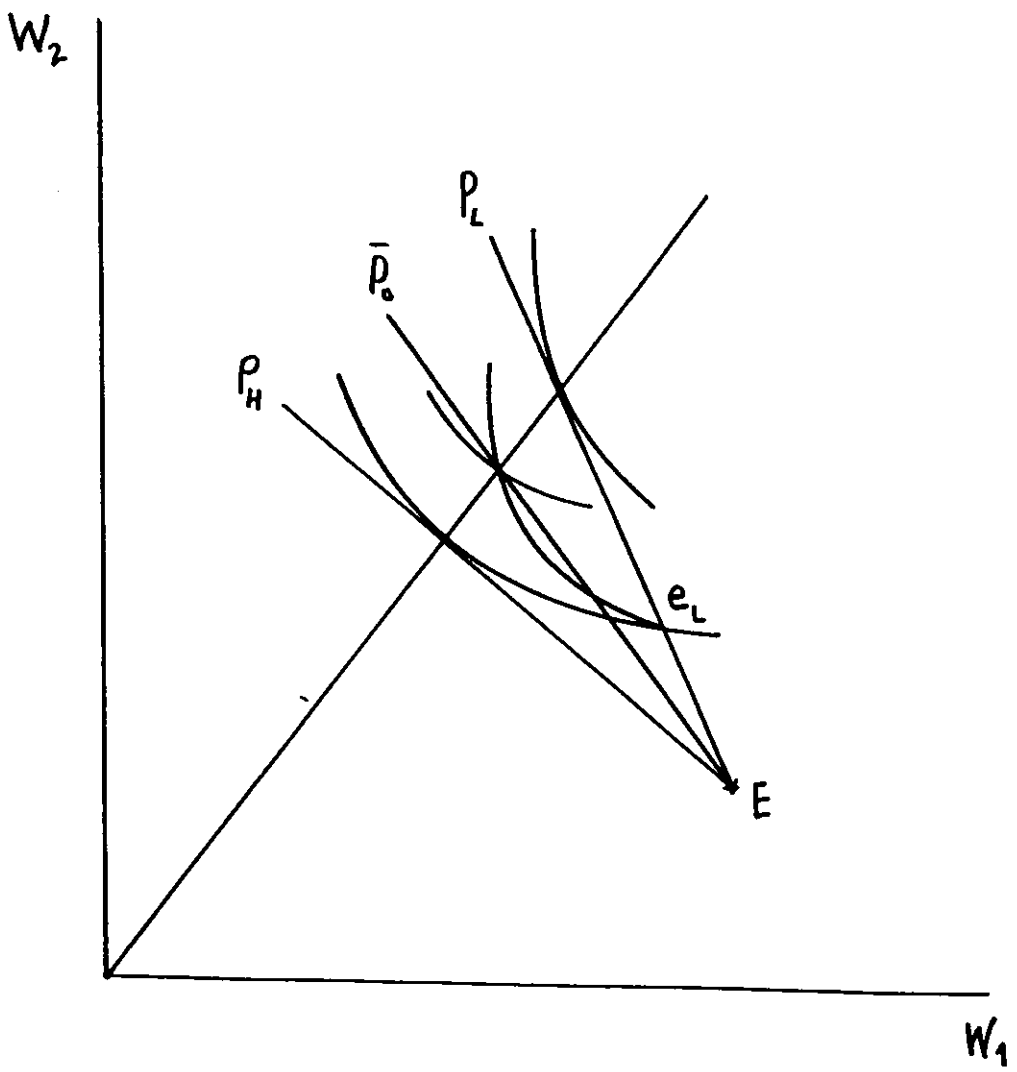


The existence of third party insurance contract in the case of motor-vehicles insurance leads to a different type of pricing strategy. In third party contract, the company only pays the compensation to the third party in the event of accident. The insurer himself get no compensation due to the accident. The third party in this case is defined as the party to whom the insurer involve in the occurance of the accident.

In this contract, low risk-types individuals are offered a very low premium with a very little guarantee of compensation. Only low-risk types individuals are ready to participate in this contract because despite the low rate of premium they are forced to be under insured. This type of contract is not attractive to the high-risk types individuals.

In practice however, for each category of asset (vehicles), there is a pooled price offered. But at the same time third party contract is also offered. Therefore, within a category of asset, pooled and separate prices simultaneously exist. This feature is shown in figure 5. For asset category i; Eph and Epl are the price lines that should be offered to high and low risk types respectively, i.e high price for high risk types and low price for low risk types. However, price line EPo is offered, implies that individuals in asset category i are equally charged (pooled price).

Figure 5 : Separating Price With Third Party.



With respect to the third party insurance contract, it is denoted by point eL. The premium paid in this contract is too low for the very little compensation, so that it is not attractive to individuals in higher risk-types.

Thus we may say that in General Takaful, the company is adopting the separating price strategy in general, but for a particular asset the company is considering separate as well as pooled price strategy together.

3.4 A General Appraisal

As explained earlier that pooled price is the most likely pricing strategy in General takaful. In the case of Family Takaful however, it is likely to be the separating price. Based on this information, it is now possible to examine the system practiced by the Takaful Company of Malaysia. This evaluation is expected to clarify some of the weaknesses of the existing Takaful business.

In a perfect competition insurance market, may or may not be in equilibrium. If it is not in equilibrium, it is just an alternation between pooled and separating price. On the other hand, if it is in equilibrium, it will either, in the form of separating equilibrium or a pooled one. This means that the market price will be either in a separating or pooled price point. These points have been stated in many

studies. Rothschild and Stiglitz (1976)[37] concluded that the market may be in equilibrium, and it will be either in the form of (1) no subsidy separating price equilibrium or (2) a pooled price equilibrium.

Miyazaki (1977)[38] and Spence (1978)[39] also concluded that market equilibrium may be acheived, and it will take the form of either (1) no subsidy separating price equilibrium or (2) subsidy equilibrium price (pooled price). Similarly Rees (1988)[40] has noted that the market may or may not be in equilibrium. In case that it is not in equilibrium, it means that the market prices are interchanging between pooled price and separating price. If it is in equilibrium, it will be in the form of no subsidy separating price.

An important conclusion can be drawn here, that is, whether the market is in equilibrium or not in equilibrium, insurance price in the market will be either in the form of pooled price or separating price. In this connection it may

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37. M Rothschild and J Stiglitz, "Equilibrium in Competitive Insurance Markets: An essay on the Economics of Imperfect Information", Quarterly Journal of Economics, (Nov. 1976), pp. 629-649.

38.H Miyazaki, "The Rat Race and International Labor Market", Bell Journal of Economics, VIII (Aug.1977), pp. 394-418.

39.M Spence, "Product Differentiation and Performance in Insurance Markets", Journal of Public Economics, 10 (1978); pp. 427-447.

40.R Rees, "Uncertainty, Information and Insurance", University of Guelph, Ontario Canada, Discussion Paper No. 8 (1988).

likely to lead to two possibilities, namely unfair to the low risk types and unfair to the less-wealthy groups. These possibilities are examined as under.

i) Unfair to the Low-Risk Types

As has been mentioned earlier , pooled price implies subsidy price in which low-risk types are subsidizing the high-risk types,[41] and separating price on the other hand implies under insured for low-risk types.[42] Market price, whether it is in equilibrium or not, will take the form of either pooled price or separating price. In the first case, high-risk types are paying less than what they are suppose to pay while low-risk types are paying more than what they are suppose to pay. In the second case, the contract offered used to be under insured the low-risk types. This means that there are only two possible events for the low-risk types, that is:

1) Low-risk types are offered not a full insurance contract at their actuarially fair price, or;

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41. In case of pooled price, low-risk types and high-risk types are equally charged on the average price. This means that high-risk types are paying less than what they are supposed to pay while low-risk types are paying more than what they are supposed to pay.

42. Separating price could exist and could be profitable if there is no problem of moral hazard in which high-risk types purchased the contract of low-risk types. To solve this problem, low-risk types are offered the contract which is not attractive to high-risk types. such a contract used to be under insured the low-risk types.

2) Low-risk types are subsidizing high-risk types.

The reverse is true for the high-risk types namely:

1) They are being subsidized by low-risk types, or;

2) They receive full insurance contract at their actuarially fair price.

Such a treatment is clearly unfair to the low-risk types. However, this problem can slightly be improved by categorizing the risks by which the company could offer a selection of policies with different prices and coverage levels. The main gainers are the low-risk individuals belonging to the low-risk category.[43]

ii) Unfair to the Less-Wealthy

Since premium rate is based only on risk types, the lower (higher) the risk level, the lower (higher) will an individual be grouped and the lower (higher) the premium rate has to be paid. Thus low income and high income individuals have to pay equal premium rate as long as they are in the same risk types. This is likely to be unfair for the low income groups for the following reasons:

Firstly, less wealthy individual is likely to behave like a low risk types individual. With little current income, he will be willing to sacrifice less than $1 of current money

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43.Michael Hoy, "Categorizing Risks In The Insurance Industry", Quarterly Journal of Economics, (May 1982), pp. 321 - 336.

to obtain $1 of future money, while the high income individual is likely to be willing to sacrifice more than $1 of current money to obtain $1 of future money. This implies that the slope of indifference curve for the low income individual is likely to be steeper than that of the rich, meaning that the less wealthy individual is also the lower risk types. This may leads to (1) The less wealthy individuals subsidize the more wealthy individuals or (2) The less wealthy individuals are not receiving full insurance contract. Clearly the less wealthy individuals are being victimized.

Secondly, the relative ability of the higher income groups to shift their income or to bear the burden may be greater than the low income groups.[44] Thus charging equal premium rate may not be fair because this means that the low income groups individuals are relatively bearing more burden than the high income groups individuals.

Thirdly, For the purpose of income redistribution, progressive taxes are used instead of lump-sum or proportionate taxes[45] because it could produce better results. Meaning that the high income groups should

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44.J.F Due and A.F Friedlaender, Government Finance, Economic of the Public, (Richard D.Irwin Inc., 6th Edition, 1977), Ch. 9.

45. R.W Boadway and D.E Wildasin, Public Sector Economics, (Little Brown and Company, Boston, Toronto, 2nd Edition, 1984); J R Davis & Charles W Meyer, Principles of Public Finance, Prince Hall Inc. Englewood Cliffs, (1983), pp. 119-136.

contribute relatively higher by paying higher rate of taxes. Thus charging equal premium rate may not produce a better distribution effect and may not be fair for the low income groups.

Fourthly, individual may help or give due to three basic motivations namely altruism, reciprocity and direct benefit.[46] In this respect, some high income groups' individuals may like to help or give more due to their behaviour of unselfishness, sympathetic feeling for others, social norms or individual feelings of commitment. This may benefit the low income groups. However, in the present premium rate determination, such provision was not available. Therefore, the low income groups are not getting what they are supposed to get from the rich, implying that they are not receiving their due right.

This fact can be examined more objectively by considering different income groups in insurance market. Suppose that the company offers an actuarially fair insurance price given by the line -(1-p)/p, both the low and high income groups individuals have to pay premium r for the compensation of C. This may lead to the following possibilities:

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46. C.T Clotfelter, Federal Tax Policy and Charitable Giving, (The University of Chicago Press, 1985); M Feldstein,"Income Tax Charitable Contributions", Part I, National Tax Journal, (March 1975).

i. Assuming that the high and low income individuals are all maximizing their utility at the actuarially fair price, means that they are assumed to be having a similar slope of indifference curve; which is unlikely to be true.

ii. If the high and low are assumed to be having different slopes of indifference curve, then charging a similar price to all may not be fair. Some individuals may be treated better than the others.

This situation is shown in figure 6. Within the axes of W1 and W2, certainty or odd line is given by 45' line and suppose that Wo is the boundry to differentiate between the high and low income group. Suppose that the price offered is shown by the line -(1-p)/p , both the high and low income have to pay r for the compensation C. This implies that the high and low income groups are assumed to be having a similar slope of indifference curve, Ir and Ip respectively; which is unlikely to be true. The effect will be either firstly, if the price offered is in accordance with the indifference curve of the high income group Ir, the low income group will be under-insured, shown by Ipi; or secondly if the price offered is in accordance with the indifference curve of the low income group then the high income group will be over-insured, shown by Iri.

Figure 6 : Equal treatment for the rich and the poor.

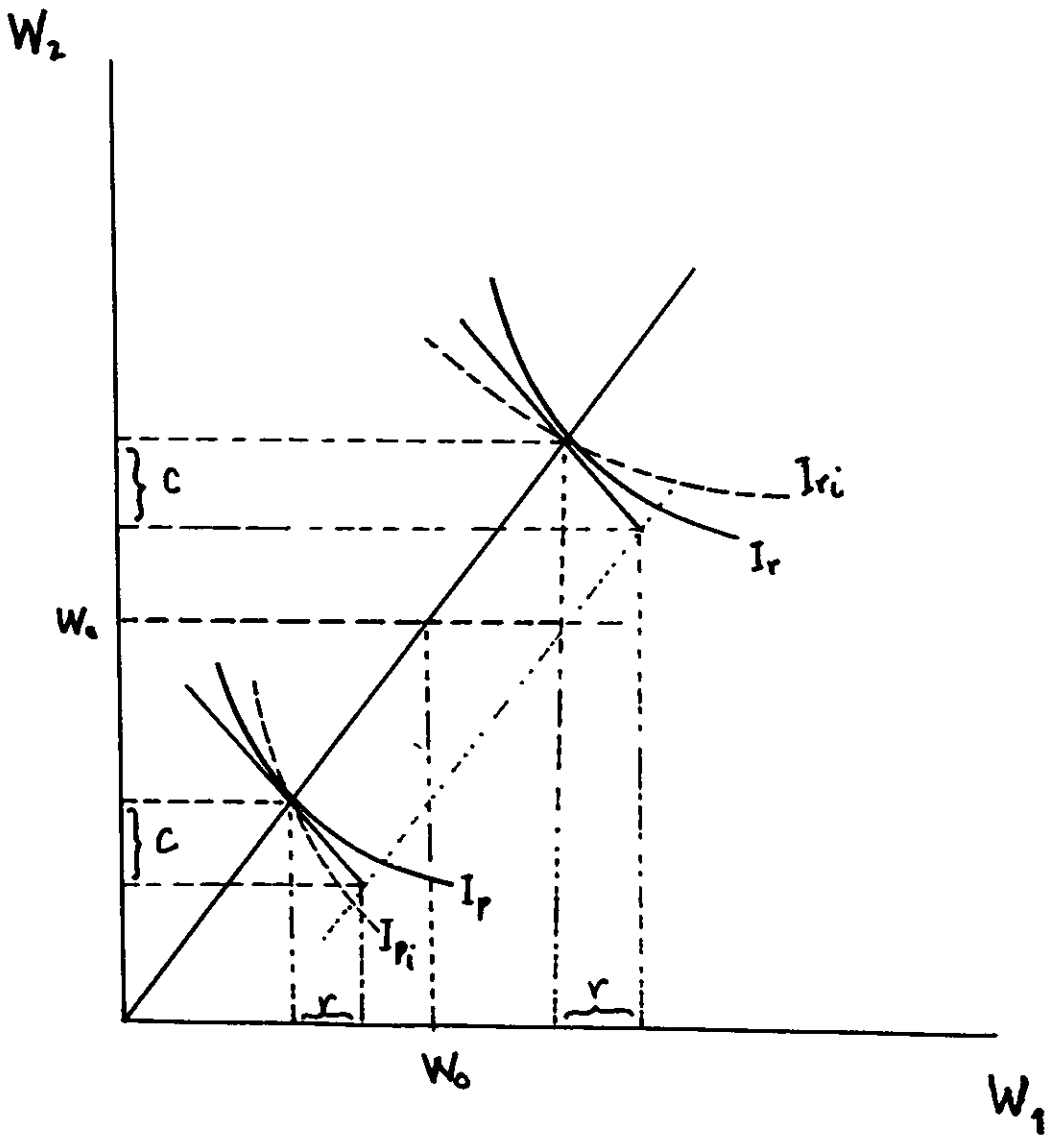
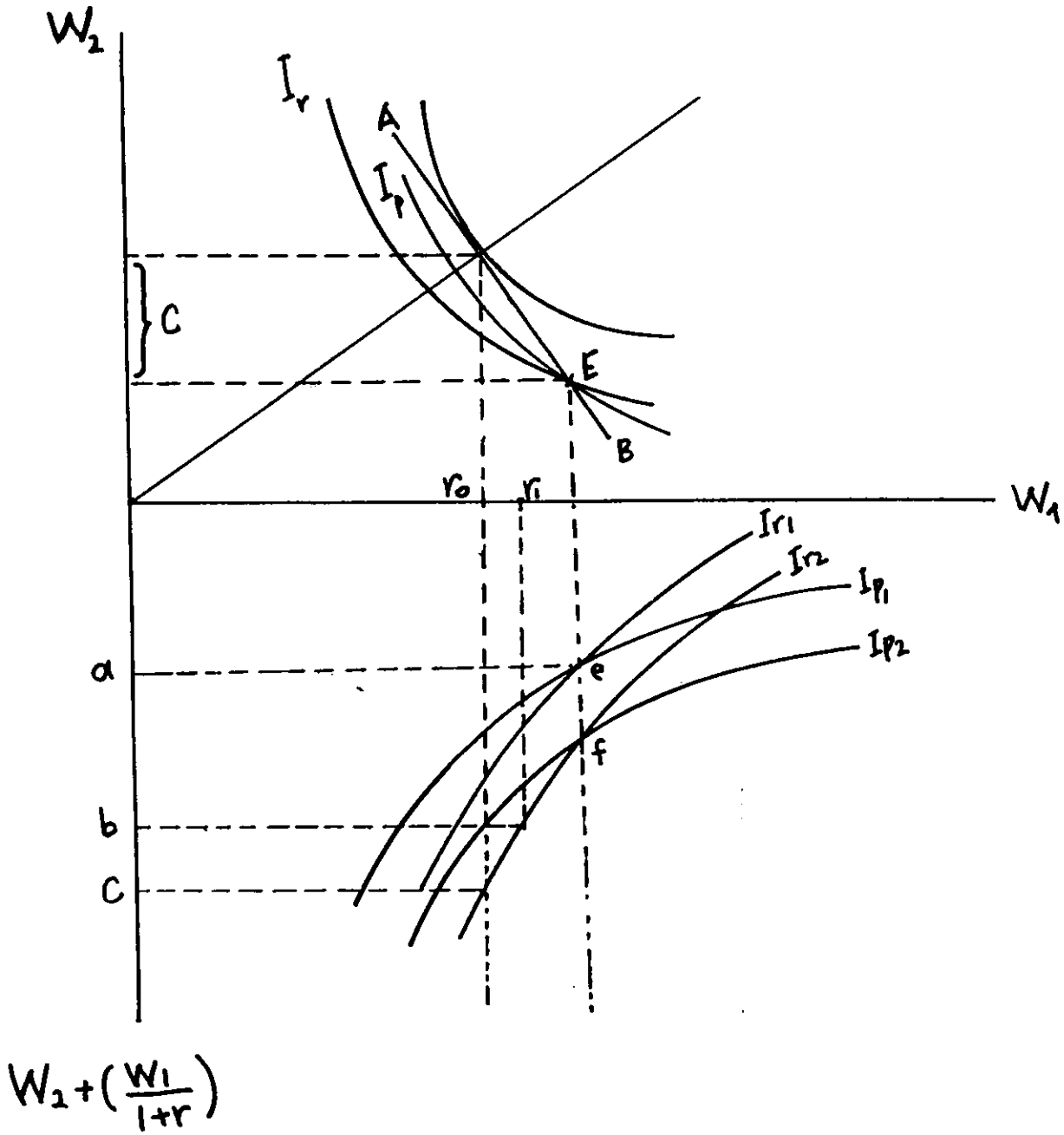


Figure 7 : Fair Treatment for The Poor



In respect to insurance, this fact indicates that the low income group individuals like to or supposed to pay less for the same compensation if both are to be fairly treated.

From figure 7 it can be seen that if E and e are the initial points before insurance, Ip1 and Ir1 are the indifference curves for the low and the high income groups respectively; and AB is the offered insurance price. By paying ro the rich utility level will increase to Ir2 if he is compensated as much as ab, an increment of ef in utility. For the low income group however, for the same amount of utility increment ef, i.e for the movement from Ip1 to Ip2 and be compensated as much as ab, he is willing to pay or suppose to pay only r1. If he pays ro, he must be compensated as much as ac instead of ab.

iii) Inefficient

Takaful fund is considered as a collective fund under the principle of mutual help and mutual responsibility for the benefit of all members. Any amount classified under the participant special account will be used only to provide covers against loss and the amount paid by the members will be considered merely as tabarru' (contribution). As a collective fund, the amount demanded from the members should be fairly equal in the sense that the burden should be at the same level for every member.

Charging equal amount of contribution from every person is not acceptable because the said amount may be burdensome for the low income groups but light for the high income groups. Based on the plausible assumption of diminishing marginal utility of money income, the value of $1 is not equal in the eye of the low and high income groups. Similarly, charging equal percentage of premium rate may not be equally burdensome because their marginal value of money are also different. Therefore, charging equal premium rate to all, the low and high income groups, may not be optimum because it may be burdensome to the lower income groups but may not be for the higher income groups.

Based on the criterion of utilitarianism, the optimum level will be attained only when the marginal utility of income is the same for all.[47] The equality of marginal utility of money requires the progressive rate instead of lump-sum or proportionate rate. It is because the marginal utility of money for the higher income groups may be smaller and, therefore, the relative ability of the higher income groups to bear the burden may be greater. Therefore, in order to redistribute the burden of contributing to the fund fairly

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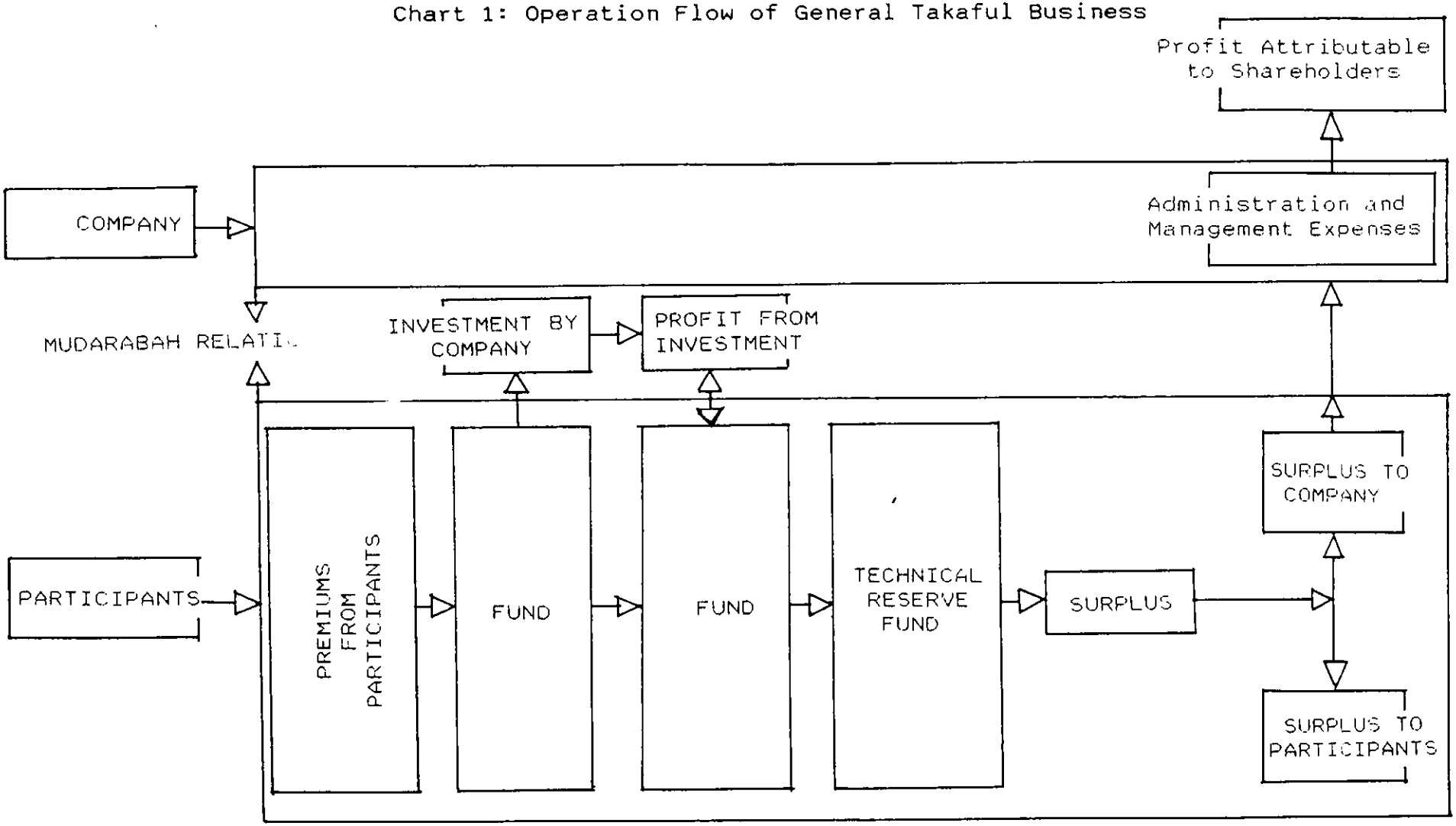
47.Earl R. Rolf & George F Break, Public Finance, The Ronald Press Company, New York, (1961), pp. 95;
Richard M Musgrave, The Theory of Public Finance, McGraw Hill Book Company, New York (1959),pp. 102.

equal and at the optimum level, progressive premium rate with respect to income groups may be used.

Previous discussion bring our attention to realize the questions created by the currently used premium rate, which is likely to victimize the less wealthy individuals. This also indicates the deficiency of the system. Since Islam is committed to secure the fate of these groups, it is of our interest now to resolve the problem. These matters, i.e improving the system as well as the fate of the less wealthy individuals, will be dealt with in the next chapter.

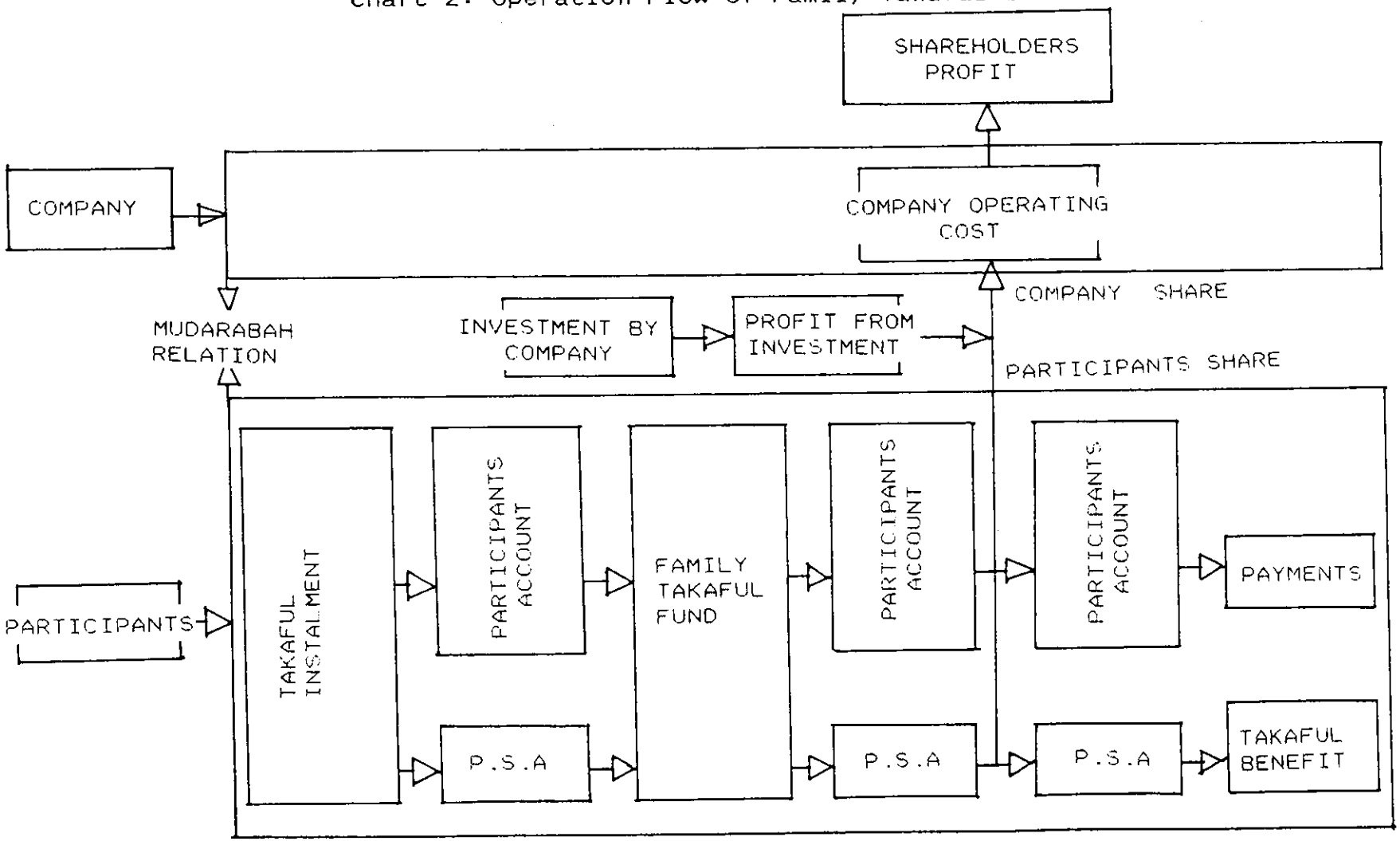
Appendix 3.1 :

Chart 1: Operation Flow of General Takaful Business



Appendix 3.2 :

Chart 2: Operation Flow of Family Takaful Business



CHAPTER 4

TAKAFUL MODEL INCORPORATING INCOME GROUPS

4.0 Introduction

The goal of this chapter is to model a Takaful Business which incorporates income groups for the purpose of designing a premium rate which embodies income level along with risk-types. It also discusses practical aspects of this model particulary the issue relating to its financial feasibility. This chapter contains seven main sections. Section 4.1 models Takaful Business followed by section 4.2 which deals with model of Takaful Business which incorporates different income levels. Section 4.3 shows the process of weight determination and also explains the newly generated premium rate. Section 4.4 examines the issue of survivability of the proposed scheme, while section 4.5 and section 4.6 discuss the economic effects and policy implication of the proposed premium rate, respectively. Section 4.7 discusses the limitation of the model.

4.1 Modelling the Takaful Business

Before a model of Takaful Business which incorporate different income levels could be built, let us first model the Takaful Business.

Based on the Takaful features explained above, it is possible for us to put it into a proper model. For the purpose of simplicity and similarity, the model of Takaful that will be built here will be adopted from the existing general model of insurance given in section 2.1.3. This would be done by inserting the additional features derived from Takaful Business into the general model of insurance. For this purpose, we will first identify the additional features of Takaful which are likely to be included into the model. The model of Takaful is then derived by inserting these features into the general model of insurance.

For the purpose of modelling Takaful Business on the basis of general model of insurance, it is necessary to first identify the feature of Takaful Business, because the operation of Takaful Business on the basis of 'Mudarabah' is slightly different from the opreration of conventional insurance. The difference which can be visualized and may be included into the general model of insurance is related to the returned premium (Takaful contributions) in the form of dividend derived from the surplus. The returned premium, (Takaful contributions) derived from the surplus, clearly reduces the actual premium paid by the participants.

Suppose 'ro' is the amount of contributions paid by the participants and 'a' is the amount of surplus paid back to the participants as a dividend at the end of the year, then (ro - a) is the actual amount of Takaful contributions paid by the participants.

The same principle also applies to the fund of Takaful but here it reduces the actual amount of contributions received by the fund paid by the participants. Here, 'ro' is the amount of Takaful contributions received by the fund (paid by the participants) and 'a' is the amount of surplus paid to the participants, then (ro - a) is the actual amount of Takaful contributions received by the fund.

Thus, a new feature that can be derived from the above discussion is the actual amount of contributions paid and received by the participants and the fund respectively. This feature may possibly be derived as:

$$ra = (ro - a)$$

where :

ra - The actual amount of Takaful contributions paid by the participants and received by the company (fund).

ro - The amount of Takaful contributions paid by the participants and received by the company (fund).

a - The amount of surplus paid to the participants by the company (fund).

Since, as is normally being practiced, additional costs will not be levied on the participants in the case of negative surplus, then a will be greater than or equal to 0, i.e $a \geq 0$. Consequently then $ra \geq ro$.

Similarly, as is normally being practiced, the surplus 'a' will be paid only to those who have made no claim but not to the participants who suffer losses and already received the claims. Consequently, participants will receive only either the surplus 'a' or the compensation 'C'.

4.1.1 The Model of Takaful Business

Keeping in view that Takaful Business is based on the contract of 'Mudarabah' and therefore the surplus (profits) will be divided between the participants and the company, the additional feature mentioned in the previous section should directly be considered into the model. In this connection, the term $ra = (ro - a)$ would now be included into the general model of insurance and with this addition, the extended model may now be considered as the model of Takaful Business.

The following features may, therefore, be available in the Takaful Business:

i. Two possible states, loss and no loss

ii. The probability of loss is p

iii. The amount of loss is L

iv. The amount of premium is r

v. The amount of compensation is C

vi. The surplus will be divided

Thus the model of Takaful may be stated as follows :

There are assumed to be two possible states of the world, state 1 and state 2. In state 1, an individual suffers no loss but in state 2 he suffers loss equal to L. Individual's initial income is W and the probability of loss is p. An idividual can get himself insured against the loss by paying some amount of contribution ro to a mutually pooled fund among the participants (which is managed by a company), in return for which he will be paid either a compensation C (if any loss occurs) or a dividend a (if there is surplus).

This situation implies that without Takaful contract, an individual income in the two states of 'no loss' and 'loss' was (W,W-L); while with Takaful it becomes (W-ro + a , W-ro -L+C) which is equal to (W-ra ,W-L+d) where ra = (ro - a) and d = (C-ro). Thus a vector such as b = (ra, d) is the Takaful contract. In this case a participant is ready to pay the Takaful contributions as much as ro which will give him the maximum level of utility. At this point, with a fair premium he will get a compensation guarantee of C.

As has been shown earlier, the effect of Takaful contract on the utility level can be examined on the basis of expected utility theorem. So without Takaful an individual will maximize his expected utility level described by a function of the form :

$$U(p,0) = U(p,W,W-L).$$

$$= (1-p)U(W) + pU(W-L).$$

When a Takaful contract such as b = (ro , d) is purchased, his expected utility maximization function becomes:

$$U(p,b) = U(p,W-ro + a , W-ro -L+C).$$

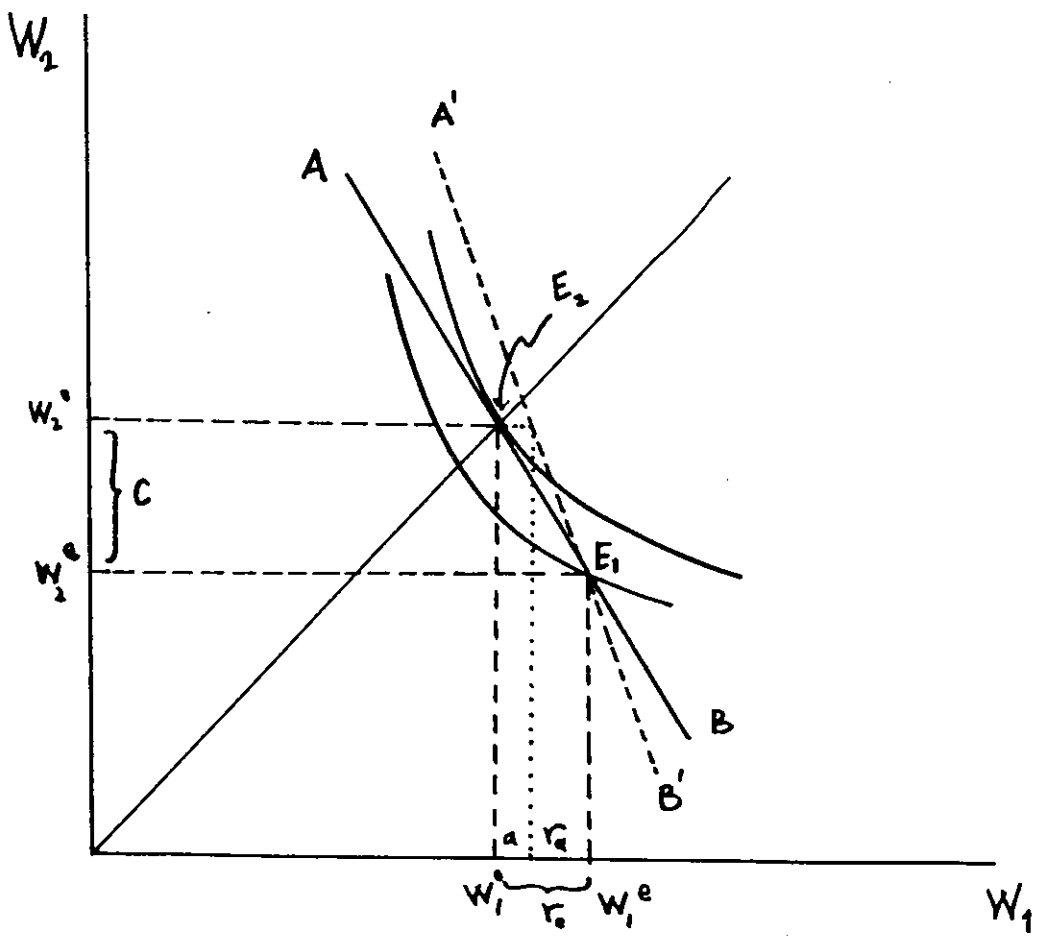
$$= U(p,W-ra , W-L+d).$$

$$= (1-p)U(W-ra) + pU(W-L+d).$$

Theoretically, it is also true that the Takaful contract b = (ro ,d) will be purchased if $U(p,b) \geq U(p,0)$. This could be achieved if the slope of indifference curve is flatter than the price line $-(1-p)/p$. Diagramatically, it is shown in figure 8.

Figure 8 is similar to figure 1 except the fact that the premium (contribution r) paid is different, i.e 'ro' instead of 'r', and at the end of the year the actual premium paid is ra = ro - a. Since additional premium will not be levied at any case (as is normally being practiced and agreed), then by assuming $a \geq 0$, the actual

Figure 8 : Takaful Business



premium 'ra' will be less than or equal to 'ro', i.e what the participant has initially paid. If 'a' > 0, then 'ra' < 'ro' as shown by the line A'B', in the figure 8.

For the Takaful company, when a Takaful contract such as b = (ro , d) is offered and purchased by the participants, by assuming that the cost is zero and no retained (undistributed) profit, it is worth of :

$$\Theta (p,b) = (1-p)ro - pd .$$
$$= ro - p(ro + d)$$
$$= ro - p(ro + C - ro)$$
$$= ro - p(C)$$
$$= \text{Surplus}.$$

In conventional insurance , it belongs to the company and, therefore, it is the worth of the contract for the company. In Takaful Business however, since the surplus will be divided between the company and the participants, the worth of the contract for the fund is zero, except if there is undistributed profits.

For the company or the organizer of the fund, the worth of the contract depends upon the ratio of profit agreed under the contract of Mudarabah. If suppose that 'g' is the profit ratio alloted to the company, then it is worth of,

$$\Theta (p,b) = g \{ (1-p)ro - pd \}$$
$$= g \{ ro - pC \}$$
$$= g \{ \text{Surplus} \}$$

where $\Theta(p,b)$ is profit share alloted to the company. Since 'a' is the portion to be returned from surplus to the participants then:

$$g\{\text{Surplus}\} = \{(\text{Surplus}) - (a)\}$$

Thus ,

$$\Theta(p,b) = \{(\text{Surplus}) - (a)\}$$
$$= g\{\text{Surplus}\}$$

Since 'ro' is expected to be enough for the payment of claim pC, then Surplus is likely to be greater than 0, so the value of $\Theta(p,b)$ is likely to be greater than or equal to 0, i.e $\Theta(p,b) \geq 0$.

Therefore, it follows that the participants would get their surplus share worth of:

$$\Theta'(p,b) = (1-g)\{\text{Surplus}\}$$
$$= a$$
$$\geq 0 .$$

4.1.2 Takaful, Conventional Insurance and Profit Sharing

The Takaful model clearly considers the aspects of insurance and Mudarabah simultaneously. Since, there already exists the business of insurance (conventional insurance) and mudarabah (profit sharing) in the economy, let us now take a glance of the theoretical difference, if any, between the two.

i) Takaful and Conventional Insurance

It is easy to notice the similarity between the general model of insurance and the model of Takaful. If g = 1 and a = 0, both the models are equal. This can be shown as follows:

Given that b(p,do) and a(p,d) are the contract of Takaful and conventional insurance respectively, where do = C -ro and d = C-r, with ro = ra + a. The surplus for the company and the participant are respectively;

i. (r-pC) and 0 in conventional insurance and

ii. g(ro -pC) and (1-g)(ro -pC) in Takaful Business.

When g=1 and a = 0, we may have;

i. ro = r.

ii. do = C-ro = C-r = d.

Thus,

iii. b(p,do) = a(p,d).

iv. g(ro - pC) = (r - pC).

v. (1-g)(ro - pC) = 0.

Comparing iv and v gives,

vi. r - pC = ro - pC.

Implying that conventional insurance and Takaful company are equally performed. This result is consistant with the initial condition of g=1 and a=0.

But if g < 1 and a > 0, both g and a reduce the surplus to be received by the company, therefore, the question of survivability and comparative advantage of the

company especially in the competitive insurance market may arise.

Suppose that the contract b = (p,do) is compared with the contact a = (p,d), it seems to be attractive only to the participants but not to the company, because the company now has to share the surplus with the participants. This means that the company receives less surplus while the participants get back their premium, and therefore the company is unlikely to offer the contract such as b=(p,do).

Only if g=1, the contracts b=(p,do) and a=(p,d) are equally good and therefore b=(p,do) could likely be offered.

This notion is however, not likely true even if the company aims at maintaining the expected profits at the same level (as it was in the conventional system). In Takaful Business, 'g' must be less than 1 and it can be shown that with 'g' less than 1, the contract such as b=(p,do) can still be offered and giving a result or surplus as good as the contract of a=(p,d), implying that takaful company can offer the contract b=(p,do) to compete with the contract of a=(p,d). This can be done by offering a slightly higher premium, i.e $ro^{1} > r$.

---

1. If in the contract b=(p,do), ro = r + a, the surplus share for the company is equal to (g){ r+a - p (C) }. It could be equal to { r - p(C) } even if with g < 1.

From the participants' point of view, offering higher rate of premium will not necessarily disgrace or demoralize the Takaful company. Takaful Business can still be attractive for two reasons; firstly, for the payment of dividend at the end of the year and secondly, for the payment of profit from the mudarabha contract.

For example, by offering $ro = r + a$, the company would receive the surplus of $g(ro - pC)$ which is possible to be as good as under the contract of $a=(r,d)$, i.e the surplus of $(r-pC)$, and although the premium ro is higher than r, participants are likely to be still willing to participate and purchase the contract because they know that some portion of the surplus will be returned to them as a dividend. If they expect that dividend to be paid is 'a', then the premium paid is actually $ra = r$[1], which implies that both the contracts, Takaful and conventional insurance, would be indifferent for them and, therefore, having an equal chance of survival in the competitive insurance market.

Similarly, people believe that there will be profit generated from the Mudarabah contract and their share will be paid at the end of the year. Therefore, charging a slightly higher premium will not affect individual decision because it will be neutralized by the existence of dividend and profit sharing.

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1. Initially $ro = ra + a$, but when dividen 'a' is paid, the actual premium paid is $ra = ro - a$. Thus $ra = r$.

ii) Takaful and Profit Sharing Business

Profit sharing business has been analysed theoretically by Khan (1985)[48] and Choudhury (1986)[49]. These studies indicated that profit-sharing is a form of business whereby partners in a joint investment venture advance capital, labour or enterprise on the contractual agreement to share the profits of the venture by pre-assigned percentages.

Khan (1985) terms it as Variable Return Scheme (VRS) because the amount of profits to be obtained is not known although the rate of profit share is already fixed. So it is simply to share the profits of the business because the capital collected is mainly for the purpose of business venture. If there is a loss, the partners may jointly bear the loss.

Mudarabah is a profit and loss sharing in which one party provide capital (sahib-ul-mal) and the other party manages the enterprise (entrepreneour). Therefore in a Mudarabah contract, "sahib-ul-mal" may provide only capital and the entrepreneour provides only entrepreneourship. If there is a profit, it will be shared based on the agreed proportions, but if there is a loss the entrepreneour loses

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48. Waqar Masood Khan, Towards an Interest-Free Islamic Economic System, (The Islamic Foundation, U.K and the International Association for Islamic Economics, Islamabad, 1985).

49. Masudul Alam Choudhury, Contributions to Islamic Economic Theory, (University College of Cape Breton, Canada, 1986), pp. 72 - 86.

his effort while the "sahib-ul-mal' loses his capital. In this system, capital is purely for the purpose of business venture.

In Takaful Business however, payment is separated into two account, Personal Account (PA) and Personal Special Account (PSA). The premium which is located under the PSA, is not for the purpose of business venture but mainly for the purpose of insurance cover. Takaful operator manages the fund under the PSA and since the premium paid is expected to be enough only for the payment of compensation, the operator and the participants agree to share the surplus, i.e after deducting the fund from the compensation payment. Takaful operator gets the share from the surplus because any profits generated from the PSA managed by the operator are being credited into the fund. Profit is not distributed as it is. Thus sharing of profits in Takaful is actually sharing of surplus. This applies especially in General Takaful Business.

However, profit sharing for the Participants' Account (PA) in Family Takaful is similar to the Mudarabah business mentioned earlier since PA is mainly for business venture. Its profit is to be shared between the company and 'sahib-ul-mal' based on the agreed predetermined ratio.

4.2 Modelling Takaful Business Incorporating Income Groups

Realizing the effects created by the currently used premium rate as discussed in the previous chapter, which basically victimizes the low income groups, the solution for it may be derived from different aspects but is likely to give a similar answer.

Firstly, if we are more concerned about equity and Islamic ethics that should be embodied into the Takaful system, we also reach to the solution that income level is the factor that should be considered directly into the Takaful system because the present system omits equity aspect.

Secondly, if we are concerned more about income redistribution, progressive premium rate is the possible solution. This means that premium rate should increase in accordance with income level. Clearly we have to incorporate income level into the system.

Essentially, income level have now come into focus. Since the above points are directly or indirectly related to equity, the subject matter of this study, it is of our interest now to operationalize this matter. For this purpose, a Takaful model which directly incorporate income level is proposed as below.

4.2.1 Classification of Income Groups

a) Income Categories

Let us define the following categories of income:

1. W1 Individual income in state 1 (no loss)
2. W2 Individual income in state 2 (loss)
3. Wo Minimum level of income required for basic need fulfilment

b) Income Groups

For the purpose of simplicity in analysis, let us consider three different groups namely, the low income group (the poor), the middle income group and the high income group (the rich). These groups will be carefully diferentiated and separately defined as follows:

Definition 1:

Low income group (poor) If $W1 < Wo$ and $W2 < Wo$.

Definition 2:

Middle income group If $W1 > Wo$ and $W2 < Wo$.

Definition 3:

High income group (rich) If $W1 > Wo$ and $W2 > Wo$.

Definitions 1 to 3 show the way of grouping the level of income into three different groups. The boundary used in the categorization was the minimum level of income needed for the fulfilment of basic needs, denoted as Wo.

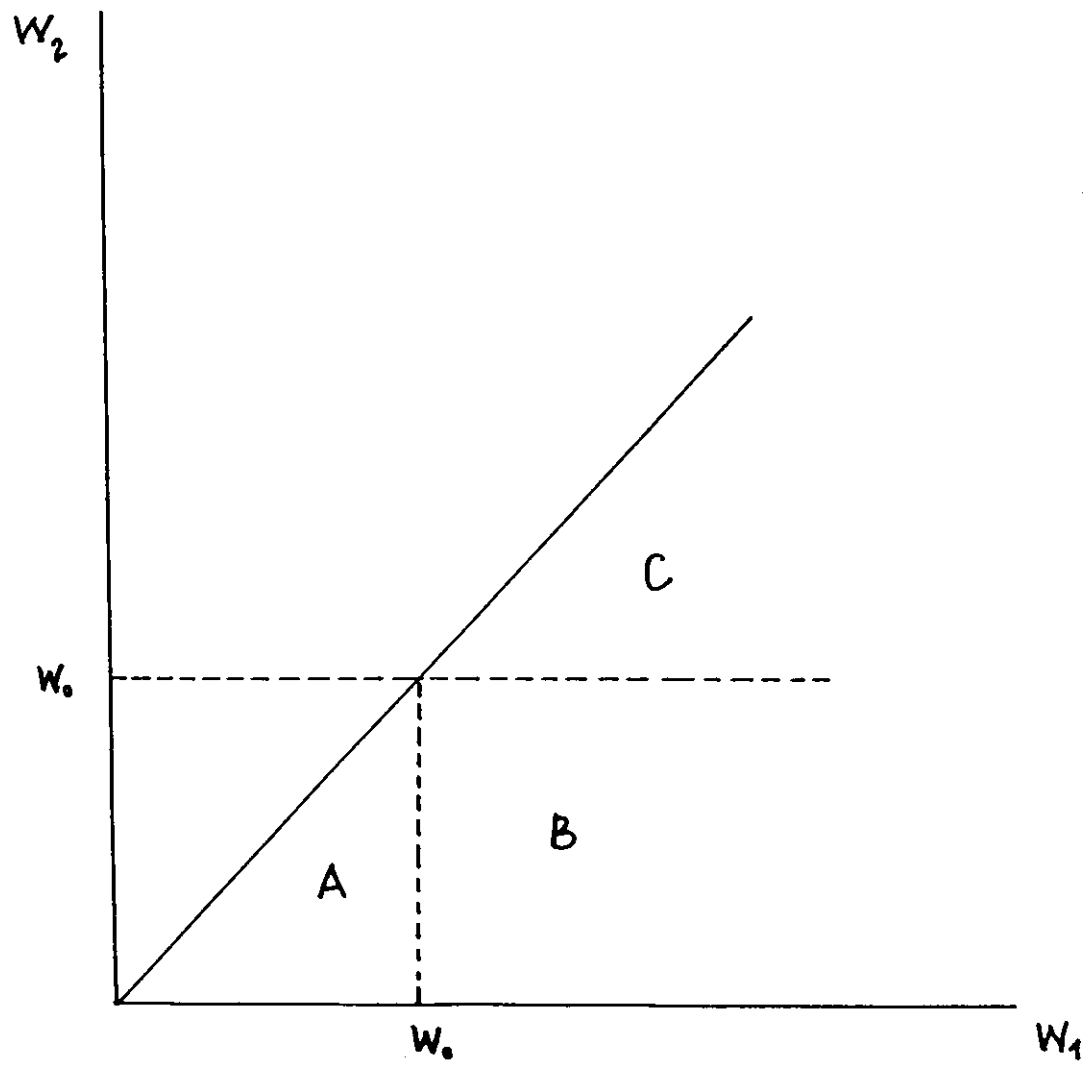
Definition 1 states that if individual income is strictly less than Wo in both states, loss and no loss; he is categorized as poor. This is rationally true because in this situation he always has insufficient income even for the fulfilment of his basic needs.

Definition 2 indicates that if an individual's income is more than Wo in state 1 (no loss) but less than Wo in state 2 (loss), he is categorized under middle income group. This classification is logically true because in such a situation, he has enough income for the fulfilment of his basic needs only if no loss occurs. His income will be insufficient when there occurs a loss.

Definition 3 states that an individual is categorized as rich if his income is strictly greater than Wo in both the states of loss and no loss. This classification is undoubtedly true because his income in this case is always more than enough for the fulfilment of his basic needs.

Figure 9 shows the location of these groups. Point A represents the poor, point B represents the middle income group and point C represents the rich. The minimum level of income required for the basic need fulfilment is Wo. In region A individual income is less than Wo in both the states, loss and no loss. In region B individual income is greater than Wo in state no loss but less than Wo in state loss. And in region C individual income is greater than Wo in both the state, loss and no loss.

Figure 9 : Group classification.



4.2.2 The Model

The model of Takaful defined in section 4.1 is referred and this model will be extended by incorporating different income groups defined above. Through this extension we identify the following features for the model:

i. Two possible states, loss and no loss
ii. The probability of loss is p
iii. The amount of loss is L
iv. The amount of premium is r
v. The amount of compensation is C
vi. The surplus will be divided
vii. Minimum income for basic need fulfilment is Wo

The model may be stated as follows:

There are assumed to be two possible states, state 1 and state 2. In state 1, an individual suffers no loss while in state 2 he suffers a loss equal to L. The probability of loss is p and his income in state 1 and state 2 are W1 and W2 = W1-L, respectively. The minimum level of income needed for the fulfilment of basic needs is Wo, implying that income less than Wo will not be sacrificed for the payment of premium. An individual can be himself insured against the loss by paying some amount of contribution ro to a mutually pooled fund (which is managed by a company) in

return for which he will be paid a compensation C if a loss occurs or a dividend 'a' if there is surplus and no loss occurs.

From the above information, without Takaful contract, individual income in state 1 and state 2 are (W1 , W2). In accordance with individual groups it may be classified as follows :

Income group	State 1	State 2
The poor	W1 < Wo	W2 < Wo
The middle income	W1 > Wo	W2 < Wo
The rich	W1 > Wo	W2 > Wo

When Takaful contract such as c=(ro , C-ro) is offered and purchased by the individuals of group i , their income in state 1 and state 2 becomes:

Income group	State 1	State 2
The poor	W1-ro < Wo	W2-ro + C < Wo
The middle income	W1-ro $\geq$ Wo	W2-ro + C $\geq$ Wo
The rich	W1-ro > Wo	W2-ro + C > Wo

Generally the above income level may be stated as {(W1-ro), (W2-ro + C)} or {(W1-ro), (W1-ro-L+C)} for individual in group i.

Under the expected utility theorem with uncertainty, an individual preferences for income in two states of nature, state 1 and state 2 is described as:[50]

$$U(p,W1,W2) = (1-p)\ U(W1) + p\ U(W2).$$

By putting the value of Wo into the function, it can be written as:

$$U(p,W1,W2,Wo) = U(Wo) + (1-p)U(W1-Wo) + pU(W2-Wo).$$

This function indicates that individual utility is now calculated based on the minimum required level of utility U(Wo). Individual should first maximize his utility to the level of fulfilling his basic needs U(Wo), that is the minimum level of utility an individual should enjoy. Whether or not this level could be acheived would depend on the level of income in state 1 and state 2, i.e by the terms (1-p)U(W1-Wo)+ pU(W2-Wo). U(p,W1,W2,Wo) is greater than, equal to or less than U(Wo) if the terms (1-p)U(W1-Wo)+pU(W2-Wo) is greater than, equal to or less than zero, respectively.

Based on the above function, an individual's expected utility maximization function without insurance can be written as :

50.M Friedman and L.J Savage, The Utility Analysis of Choices Involving Risk, Journal of Political Economy, No 4, Vol.IVI (Aug. 1948), pp. 279-304.

$$U(p,0) = U(Wo) + (1-p)U(W1-Wo) + pU(W2-Wo).$$

Therefore, for individuals in different income groups, we may have the following facts in the case of 'without insurance contract', (without Takaful):

1. The poor; $U(p,0) < U(Wo)$.
2. The middlle income; $U(p,0) <=> U(Wo)$.
3. The rich; $U(p,0) > U(Wo)$.

When insurance contract (Takaful contract), such as $c = (ro , C-ro)$ is purchased, the expected utility function becomes:

$$U(p,c) = U(Wo)+(1-p)U(W1-Wo-ro)+ pU(W2-Wo-ro +C).$$

From the above facts, it follows that in the case of 'with insurance', the level of expected utility are as follows:

1. The poor, $U(p,c) > U(p,0) < U(Wo)$.
2. The middle income, $U(p,c) > U(p,0) <=> U(Wo)$.
3. The rich, $U(p,c) > U(p,0) > U(Wo)$.

The contract of insurance will be purchased if by purchasing the contract 'c', $U(p,c) \geq U(p,0)$.[51] This can possibly be fulfilled if the price of insurance represented

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51.R Rees, "Uncertainty, Information and Insurance", University of Guelph, Ontario, Canada. Discussion paper No. 8, (1988).

by the slope of -(1-p)/p is steeper than the slope of indifference curve.[52]

The model may be represented by figure 10. W1 and W2 represent wealth in state 'no loss' and 'loss' respectively, and Wo is the minimum level of income required for basic need fulfilment. Consider any price line {-(1-p)/p}j for all j , with endowment E1, E2 and E3 for the poor, middle income group and the rich, respectively, an insurance contract can be defined in each group. The price lines will be P1o, P2o and P3o, respectively.

However, it is easily noticed that total utility of the poor is always less than U(Wo), at the situation of with or without insurance. This implies that the poor will not purchase insurance.

Therefore, it must be noted here that, the model has identified one more additional condition required by individual for purchasing an insurance contract , that is $U(p,c) \geq U(p,0) \geq U(Wo)$. Therefore, we may deduce the following possibilities from our model:

a) Poor individual may not purchase insurance

b) Middle income group may or may not purchase insurance

c) Rich individual may purchase isurance

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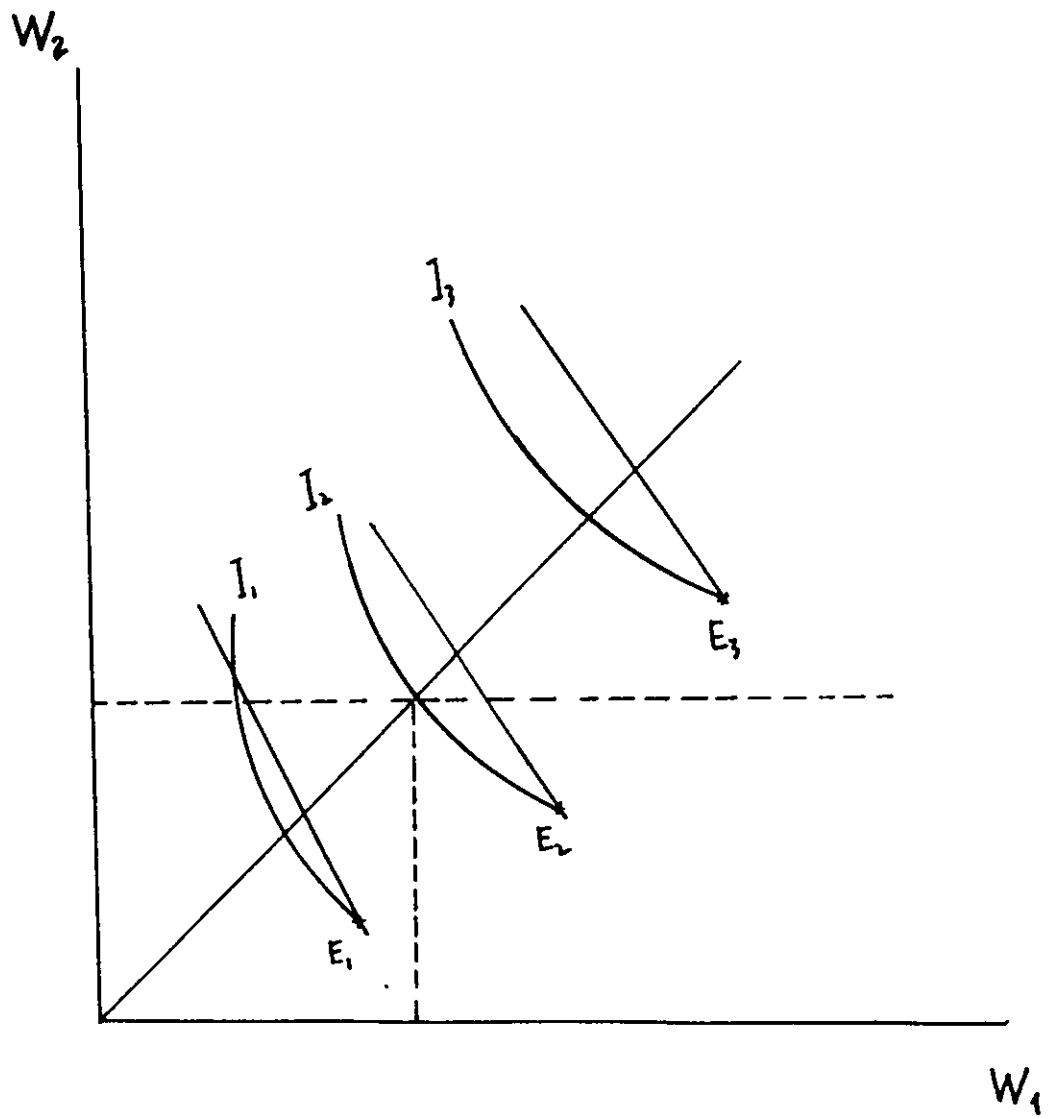
52. I Ehrlich and G.S Becker, "Market Insurance, Self-Insurance and Self-Protection", Journal of Political Economy, Vol 80 (July/Aug 1972), pp. 623-648.

Figure 10 : Takaful with income group.



4.2.3 Crucial Assumption

The following assumption is crucial for the model.

" Individuals in different income groups having different slope of indifference curve."

The following Lemma and corollary may be used for substantiating the above assumption:

Lemma 1:

Defining C1 and C2 as consumption in period 1 and 2; W1 and W2 as wealth in state 1 and 2, and Ct(W1,W2) for t=1,2;

" For U(C1,C2) where Ct(W1,W2) for t=1,2; U1'/U2' = (1+r) decreases as W1 increases."

Lemma 2:

"There exist point Wo by which when W1 and W2 changes such that W1 or W2 or both are greater than or les than Wo, individual behaviour changes."

Corollary 1:

The slope of indifference curve will be different for different income groups.

We prove the lemma and corollary in appendix 4.1 of this chapter.

4.2.4 Implication of the Model

The model yields important results. They are: (1) poor individuals need different insurance arrangement, (2) low income groups should pay low premium rate, and (3) the premium rate should be progressive with respect to income.

(1) Different Arrangement for the Poor

Three different groups have been identified and it is expected that certain group may not participate in any insurance contract. This could happen because although insurance is needed by every individual, not every individual can afford it due to his financial constraint. Previously it has been stated that most likely poor individual may not participate in any insurance contract because his utility was always less than U(Wo) even if he purchases insurance.

Theoretically, this possibility could happen only if the slope of indifference curve is steeper than the price line. This means that the poor's indifference curve in this case is steeper than the price line. Within the contex of this model, by referring to the previous Lemmas, we may expect that when income level decreases continuously it will reach to a point where the slope of indifference curve is steeper than the price line. In such a case, individuals will not purchase insurance.

From the previous Lemma, the following Lemma and corollary may be derived and can be used to substantiate the above point:

Lemma 3:

"There exist a point W* such that at the endowment point W1 = W*, U1/U2 = -(1-p)/p."

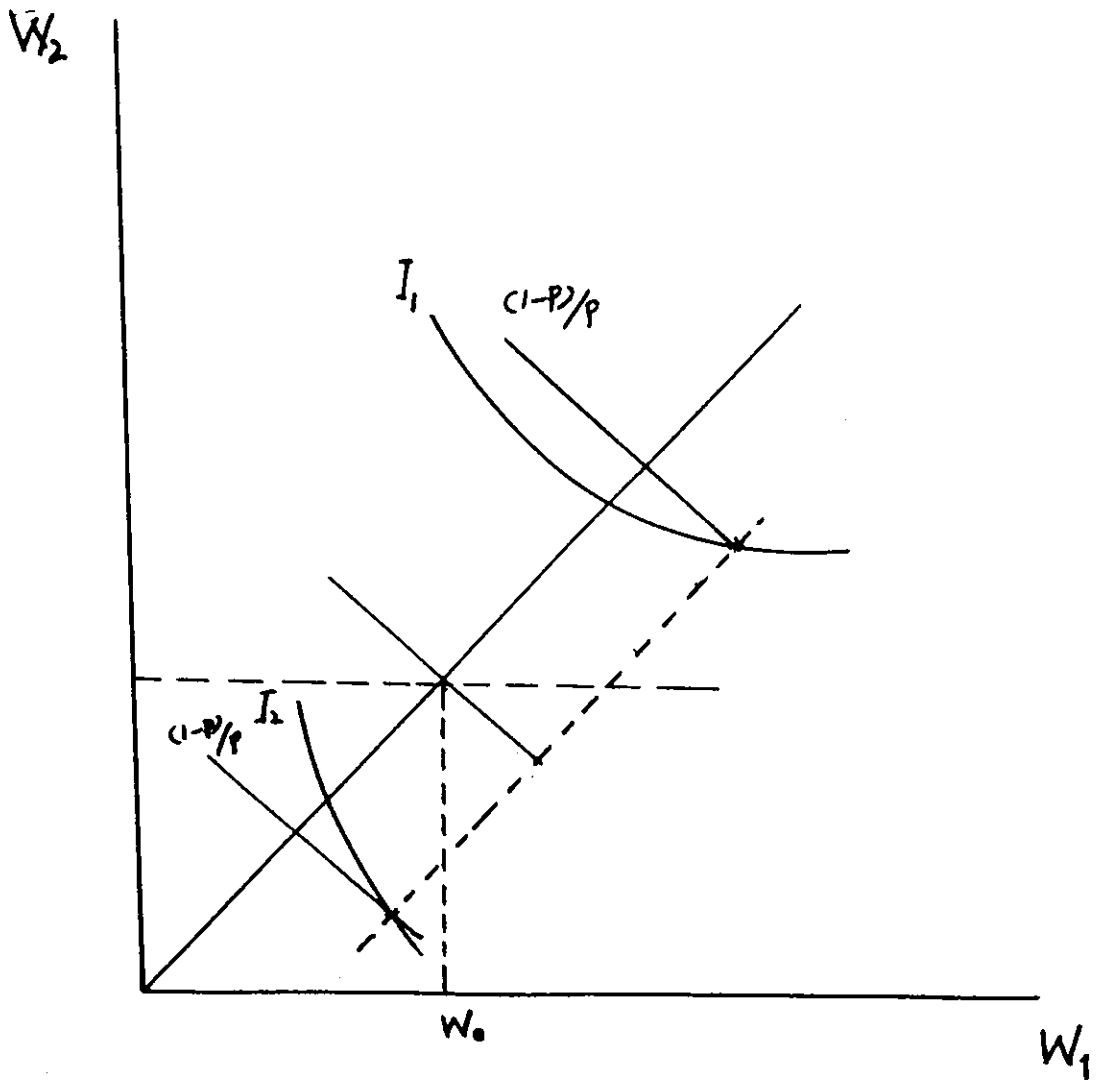
Corollary 2:

Individuals with income W1 < W* may not purchase insurance contract.

We prove the lemma and corollary in appendix 4.2 of this chapter. Assuming that point W* is equal to Wo, the above Lemma and corollary leads to the conclusion that poor individuals defined in the model are likely not to participate in any insurance contract if the offered price is similar to that being offered to the rich. They feel that the offered price is too expensive for them to purchase the contract. Figure 11 explains this fact clearly.

In figure 11, suppose that at income level greater than Wo, the slope of -(1-p)/p is steeper than the slope of indifference curve, I1. In this case insurance will be purchased. When income level decreases, the slope of indifference curve may increase, and when it reaches Wo the slope of indifference curve equals the slope of -(1-p)/p.

Figure 11 : Group Without Insurance



Thus Io intercept the slope of -(1-p)/p at the odd line. But when income level is less than Wo, the slope of indifference curve becomes steeper than the slope of -(1-p)/p. I2 cross the slope of -(1-p)/p from above. In this case insurance price is too expensive and will not be purchased because purchasing insurance means decreasing the utility.

This means that the present schemes do not serve the interest of the poor and therefore need a new arrangement.

(2) Lower Premium Rate for the Lower Income Groups

Accepting the fact from the above Lemma and corollary, we have the following propositions;

Proposition 1:

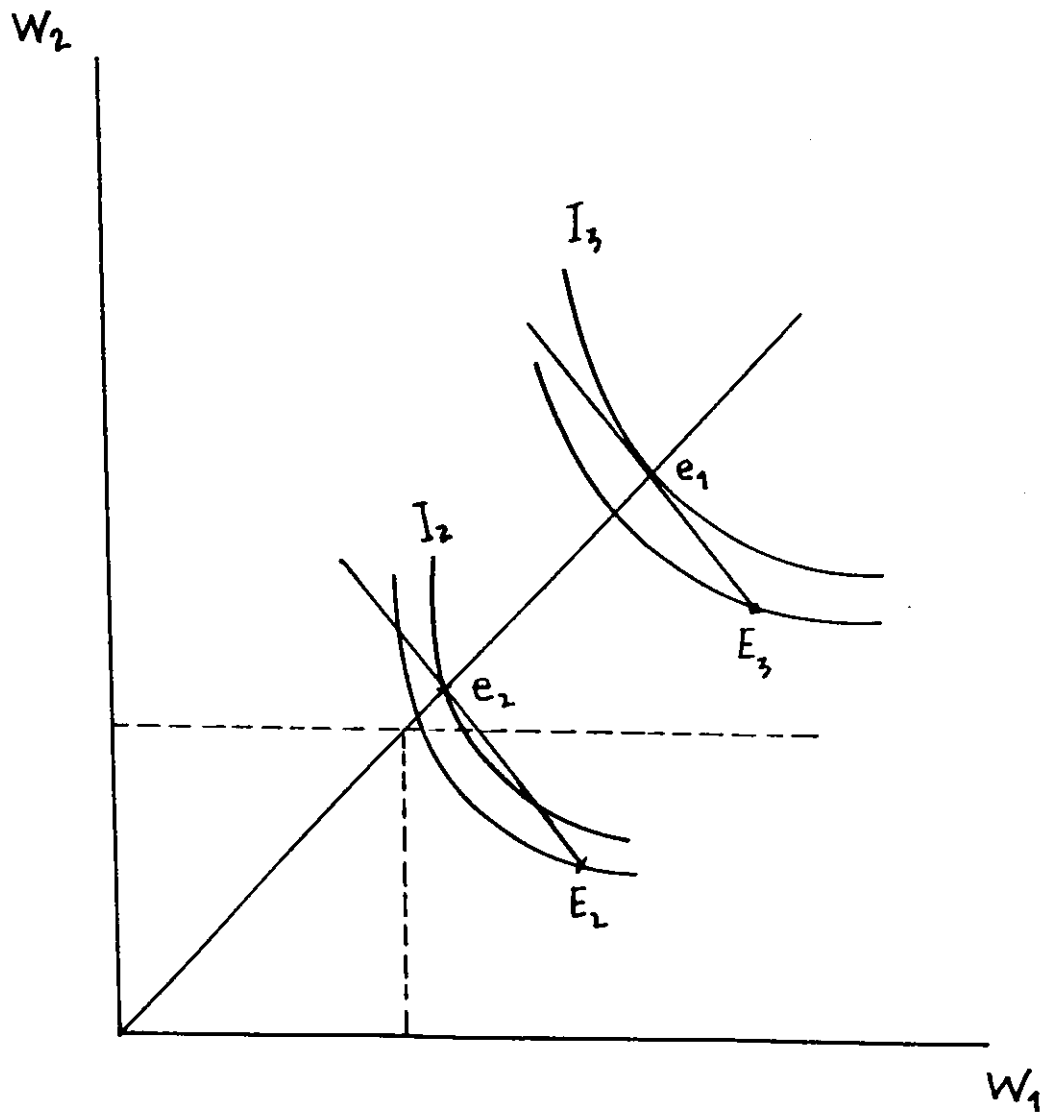
Offering a similar premium rate to individuals in different income groups mean over-paid (under-paid) to the higher income groups (lower income groups).

Proposition 2:

Low income groups are likely to gain less welfare improvement from a similar Takaful contract.

We prove these propositions in appendix 4.3 of this chapter. These propositions are represented in figure 12. If the offered premium rate is full coverage at the actuarially fair premium rate to the richer individuals, the less wealthy individuals will be under-insured, and vice-versa. Suppose that r1 is the fair premium rate for the wealthy individuals,

Figure 12 : Under-Insured For The Less Wealthy



Ir touches the price line at the equilibrium point e1. But for the less wealthy individuals with steeper indifference curve, their indifference curve crosses the price line from above at point e2, which is clearly under-insured. The reverse is true.

This situation implies that within the frame work of our model, less wealthy individuals should pay less premium rate compared to the more wealthy individuals. This point is proved in appendix 4.4.

(3) Progressive Premium Rate

The slope of indifference curve becomes flatter as the level of income increases and vice-versa, which means that price should increase as income level increases, and vice-versa. The higher the income groups the higher should be the premium rate demanded, and vice-versa. This implies that premium rate is progressive with respect to income level.

Since the currently offered premium rate is progressive with respect to risk types, then by incorporating the factor of income level, we may have a premium rate which is progressive with respect to both the factors, risk types as well as income level.

Flatter indifference curve for the richer individuals also means that their compensation rate should be lower than the existing rate. It is because they are now receiving more than what they are suppose to receive. If the rich are

receiving exactly what they are suppose to receive, equal compensation rate means that the poor receive less than what they are suppose to receive, implies that they are suppose to be given higher compensation rate than the existing rate.

This means that compensation rate should also be adjusted such that the higher the income groups the lower will be the compensation rate.

But how to incorporate income level into the existing premium rate and compensation rate for obtaining the said premium rate and compensation rate ? One possibility is through adjustment process, that is adjusting the existing premium rate with a factor or weight which may represent income level. In this regard we have to identify the said weight.

4.3 The weight

The required weight to be identified is of the form:

$$W_j^* \quad \text{for } j=1,2 \text{ and } 3.$$

where,

W_j^* - The weight

j - Income groups j

In the previous chapter individuals have been clearly classified and differentiated in accordance with the level of income. Lemma and corollary have been used for

differentiating the slope of indifference curve. Generally it has been shown that the higher the income the flatter will be the slope of indifference curve and consequently, the higher will be the premium required. Therefore, income level is positively correlated to the premium rate and thus, the weight should have the following property:

Property 1:

If Wj* is the weight for income group j and pi/(1-pi) is the offered Takaful price to individual in risk type i; within the risk type i, Wj* is positively related to income in group j.

We prove this property in appendix 4.5 of this chapter.

4.3.1 Determination of The Weight

As has been stated earlier that individuals have to be differentiated on the basis of income level so that the premium charged would be fair not only in terms of risk-types but also in terms of income level. In this connection, individuals have been classified into three different income groups, namely the poor, the middle income and the rich. However income level is not suitable to be directly used as a weight to differentiate them because the poor and the rich are different not only in terms of income level but more important is in terms of time preference, i.e future value and marginal value of money which directly relates to the slope of indifference curve.

The value of time preference is closely related to income level; by which the higher the income the lower will be the value of time preference. However, using only the value of time preference directly as a weight to differentiate the rate of premium charged is not suitable. It is because it could not be directly classified in accordance with income levels (groups) as needed and, therefore, it does not represent income levels. Thus, the value of time preference and income groups should be considered simultaneously.

For this reason, the value of time preference shall be used as a weight only after it has been classified in accordance with income level. One of the possible method which can be used for relating the value of time preference to income level is through regression function. By this method, the value of time preference for a particular income group could be estimated. It could then be used to calculate the weight. The steps involved may be summerized as follows:

1. Estimate the value of time preference or marginal value of income.

2. Regress the value of time preference on income (GNP).

3. Calculate the value of time preference with respect to particular income group.

4. Calculate Wj*.

In a slightly detailed discussion, the above steps are explained as below:

1. The value of time preference or the marginal value of income, can be calculated by using the standard formula given in the analysis of linar expenditure system.

2. Since the value of time preference is related to income level, it could be written as a linear function of income as follows:

$$TP = f(Income).$$

where

TP - The value of time preference.

For the purpose of calculating the value of time preference in relation to a particular income group, a simple regression function could be used. The linear function could be written as:

$$TPi = a + \beta Yi + Ui$$

where,

TP - The value of time preference.

Y - Income level.

a and β - Parameters to be estimated

U - Random error.

3. After estimating the function, the value of time preference for a particular income group j could be written as follow :

$$TPj = a + B \{(Y1j+Y2j)/2\}$$

where,

Y1j - Lower limit of income for group j.

Y2j - Upper limit of income for group j.

a and B - The stimated parameters.

4. TPj would be used for calculating a weight for income group j. Since TPj is negatively related to income level, but the adjusted premium is positively related to income level, the weight Wj for income group j would be equal to :

$$Wj = 1/TPj .$$

If we assume that the currently charged premium is fairly good for a particular group, it could be considered as the deflator group. Suppose that the deflator group is denoted by d, the weight is now equal to :

$$Wj^* = 1/(TPj/TPd)$$
$$= TPd/TPj$$

where,

Wj* - The deflated weight.

TPj - Time preference for group j.

TPd - Time preference for deflator group.

An important characteristic of the weight is that it increases in accordance with income groups. This means that

for all j and n,

$$Wj^* < Wj+n^* \quad \text{for} \quad n \geq 1$$

For j = 1, 2, 3 we may have,

$$W1^* < W2^* < W3^*$$

It must also be noted here that if income levels are not correctly available due to the problem of morel hazard, we may instead use the amount of policy taken by the individuals, and therefore the classification may be based on the amount of policy.

4.3.2 The Proposed Premium Rates

The required premium rate can be derived by adjusting the existing premium rate using the weight mentioned above. Suppose ri is the premium rate offered to individuals in risk-types i and Wj* is the weight for individuals in income group j , the adjusted premium for individuals in risk-types i of income group j could be generally written as:

$$rij = Wj^* \; ri$$
$$= (TPd/TPj) \; ri$$

where,

rij - The proposed premium rate for risk type i in income group j.

Wj* - The weight for income group j.

ri - The existing premium rate for risk type i.

Here, rij is the premium rate which embodies both the factors, namely risk types and income level. It represents the premium rate for risk type i in income group j. A group which is thought to be suitably fit with the currently charged premium rate is choosed as the deflator group, so for j=d, its adjusted premium is:

$$rid = Wd^* ri$$

$$= (TPd/TPd)\ ri = ri\ .$$

Suppose the offered premium rate to individuals in risk-types i is ri, for i = 1,..,n, we have the following premium rate as shown in Table A.

Table A : Premium Rate wrt Risk Types

Risk-types i	Premium ri
1	r1
2	r2
.	.
.	.
n	rn

After the adjustment we may have rij for i=1,....,n and j=1,2,3, where rij represents the premium rate for risk type i and income group j. This is shown in Table B below:

Table B : Premium Rate wrt Risk Types and Income Groups

		Income group j		
		1	2	3
R	1	r11	r12	r13
i	2	r21	r22	r23
s	3	.....		
k	.	.....		
	.	.....		
	n	rn1	rn2	rn3

From the above table rij represents the premium rate for individual in risk-type i and income group j. For example, r11 is the premium rate for individual in risk type 1 and income group 1.

In this case, r11 < r12 < r13. This also true for all rij for i = 1,....,n and j = 1, 2, 3 because W1* < W2* < W3*. Therefore, we may have the following property for the proposed premium rate:

Property 2:

The premium rate rij = Wj* {pi/(1-pi)} is positively related to income group j within the risk type i.

We prove this property in appendix 4.6 of this chapter. As has been mentioned earlier, the newly derived premium rate rij is positively correlated with income groups (level) such that the higher the level of income the higher will be the premium. Therefore, supposing j=1 is the lowerst income group, the premium can in general be written as:

$$r_{i,j} < r_{i,j+1} \quad \text{for all } i \text{ and } j.$$

Thus for risk-type i and j = 1,...,k; we have:

$$r_{i1} < r_{i2} < r_{i3} < \ldots\ldots < r_{ik}$$

Similarly, for income group j, for all i=1,....,n; it is true that,

$$r_{1j} < r_{2j} < \ldots\ldots\ldots\ldots < r_{nj}$$

Suppose that the dth group is taken as the deflator group which implies that:

$$W_1^* < W_2^* < \ldots < 1 < \ldots < W_k^*$$

Therefore, the premium rate may be stated as follow:

$$r_{i1} < r_{i2} < \ldots < r_i < \ldots < r_{ik}$$

where,

rij - the newly derived premium rate for j=1,...,k.

ri - the existing premium.

Therefore, the main characteristics of the premium rate are:

1. $r_{i,j} < r_{i+m,j}$ for all $m = 1, 2, \ldots, n$

This means that the premium rate is progressive with respect to risk types.

2. $r_{i,j} < r_{i,j+g}$ for all $j = 1, 2, \ldots, k$

This means that the premium rate is progressive with respect to income groups. These characteristics imply that the higher the level of income within a similar risk type the higher will be the rate of premium; and similarly the higher the risk type within a similar income group the higher will be the premium rate. This is the premium rate which we are looking for.

4.4 Survivability Of The Proposed Scheme

Survivability / break even for the company mean that the collected premium should be at least sufficient for the payment of claims, meaning that the worth of the contract should not be negative. So considering the case of our initial premium rate which considered only risk-types, for the premium collected r, compensation payment C and probability of loss p, the necessary condition for the survivality is:

$$(1-p)\ r\ -\ p\ C\ =\ 0$$

This means that the average collected premium (1-p)r should be at least sufficient for the average payment of claim pC. In practice however, as a profit maximizer the company would like to maximize the above condition.

Suppose that the company now uses the newly proposed premium rate rij = Wj* ri, meaning that j's different income groups are now being separately considered. So within the risk-type i, there are now j's different premiums, by which every individual in each group is paying W*r, that is W1*r for group 1, W2*r for group 2 and so on. This means that for maintaining the break even condition after the adjustment so that it would be as good as it was before the adjustment, it must satisfy the following condition:

$$(1-p)\ Wj*r - p\ C = 0$$

By defining Øj as the percentage of individual in income group j, the above condition will be satisfied if and only if:

$$E\ Øj\ Wj*\ r\ =\ r\ .$$

where E Øj = 1.

Implies that:

$$(1-p)\ E\ Øj\ Wj*\ r\ -\ pC = 0$$

This condition requires that total premium collected after the adjustment should be equal to the total premium collected before the adjustment. Therefore, for k different income groups, the following condition should be fulfilled:

$$Ø1W1*r + Ø2W2*r + \ldots + ØkWk*r = r \ .$$

The above condition can also be referred to a particular risk type i, i.e whether total collection of premium from each risk type is maintained as it was before. The condition may be written as:

$$Ø1iW1*ri + Ø2iW2*ri + \ldots\ldots + ØkiWk*ri = ri$$

The value of Wj*r is known because the value of Wj* and r are both known. Therefore, the value of Øj for all j's need to be solved for fulfilling the above condition. It is likely that the solution for Øj are not unique because there are many possible combinations which could satisfy the above condition. If so, then one may ask the question of how the company could ensure the fulfilment of the break even condition before the implementation of the system so that its financial performance is maintained as it was before the implementation of the system, or otherwise the success of the system is not guaranteed.

It is possible to solve the necessary condition for the fulfilment of the break even condition. For this purpose and for the purpose of simplicity, let us first consider three different income groups, j.

Consider j for j=1,2,3 as income groups; and let us define Øj for j=1,2,3 as the percentage of individual in income group j. In this case, it follows from the previous

section that, the condition to be satisfied is:

$$\emptyset 1W1^*r + \emptyset 2W2^*r + \emptyset 3W3^*r = r$$

Suppose that the second group is considered as the deflator group, then $W2^* = 1$. Thus the above equation reduces to:

$$\emptyset 1W1^*r + \emptyset 2r + \emptyset 3W3^*r = r .$$

Rearrange the above equation we have:

$$\emptyset 1W1^*r + \emptyset 3W3^*r = r - \emptyset 2r$$

$$= (1-\emptyset 2)r$$

Since $\emptyset 1 + \emptyset 2 + \emptyset 3 = 1$; $\emptyset 2$ can be written as :

$$\emptyset 2 = 1- \emptyset 1 - \emptyset 3.$$

By substituting this value into the above condition, we may have :

$$\emptyset 1W1^*r + \emptyset 3W3^* r = (\emptyset 1 + \emptyset 3) r$$

Dividing both sides by r give us:

$$\emptyset 1 W1^* + \emptyset 3W3^* = \emptyset 1 + \emptyset 3$$

Rearrange it for $\emptyset 1$ and $\emptyset 3$ gives;

$$\emptyset 3 (W3^* -1) = \emptyset 1 (1 - W1^*)$$

Simplifying it give us:

$$(\emptyset 3/\emptyset 1) = (1-W1^*)/(W3^* -1)$$

The terms above may be defined as follows:

(Ø3/Ø1) - The ratio of proportion of individual in the higher income group, who pay higher premium with respect to the proportion of individual in lower income group who pay less premium.

(1-W1*) - The rate of reduction in premium paid by low income group.

(W3* - 1) - The rate of increment in premium paid by higher income group.

It was stated that for break even we need:

$$Ø1W1*r + Ø2W2*r + Ø3W3*r = r$$

But to be as good as it was before, new collection should at least equal or be greater than it was before. Thus the new collection should satisfies the following condition;

$$Ø1W1*r + Ø2W2*r + Ø3W3*r \geq r$$

Therefore, the required condition becomes:

$$(Ø3/ Ø1) \geq (1-W1*)/(W3*-1)$$

The terms Ø1 is simply the proportion of individual who pay less premium after the adjustment while Ø3 is the proportion of individual who pay higher premium after the

adjustment. Thus, for the given value of W1* and W3*, as long as the ratio of individuals in high income group who pay higher premium with respect to individuals in low income group who pay less premium is greater than or equal to the ratio of reduction in the premium paid by low income group with respect to increment in the premium paid by high income group, the company is likely to survive in the sense that the premium collected will be sufficient for the payment of compensations. This means that the increment in premium paid by individuals in high income group is sufficient to cover the deficit due to the reduction in premium paid by individuals in low income group.

The solution is clearly not unique, however, it is adjustable and could be controlled. By knowing the value of W1* and W3*, the ratio Ø3/Ø1 can be fixed accordingly. This means that the value of Ø1 and Ø3 can be used as a policy variable in determining the percentage of individuals who should pay more and less. Basically as long as Ø3/Ø1 is greater than (1-W1*)/(W3* -1) the survivability of the company is guaranteed.

Thus, for the survivability it is necessary to satisfy the following condition:

$$Ø3/Ø1 \geq (1-W1^*)/(W3^* -1).$$

This condition may be explained as the number of higher income group individuals should not be less than

(Ø3/Ø1) percent compared with the number of lower income group individuals. If this comparison is based on the amount of premium collected then the above condition may be stated as the amount of premium paid by the higher income individuals which should not be less than (Ø3/Ø1) percent compared with the amount of premium paid by the lower income individuals.

An important point to be noted here is that for fulfilling the above condition, the value of (Ø3/Ø1) should not be predetermined. It should be determined only after knowing the value of W1* and W3*. Ø1 and Ø3 may carry any value as long as they satisfy the required condition. Therefore, the values of Ø1 and Ø3 are clearly variable and not fixed. If this condition is referred to a particular risk type i, the condition required is:

$$(Øi3 / Øi1) \geq (1-W1^*)/(W3^*-1)$$

This condition means that total collection from each risk type should be at least maintained.

In addition, it also requires that high income group individuals may not renounce their contract due to the increment in the premium rate. If there is renouncement, it is assumed that it should not significantly affect the company performance. Therefore, in addition to the above condition, it is also required that the rich are price inelastic in insuramce demand.

Another possible way to determine the value of Ø's is to consider risk-types and income groups simultaneously. Let us consider ØijWij*r for all i and j, we may have the following equations:

$$\begin{aligned}
&Ø11\ W1*r1 + Ø12\ W2*r1 + \ldots.+ Ø1k\ Wk\ r1 = r1\\
&Ø2i\ W1*r2 + Ø22\ W2*r2 + \ldots.+ Ø2k\ Wk\ r2 = r2\\
&Ø31\ W1*r3 + Ø32\ W2*r3 + \ldots.+ Ø3k\ Wk\ r3 = r3\\
&\ldots\ldots \quad \ldots\ldots \quad \ldots\ldots \quad \ldots. \quad \ldots\\
&Øn1\ W1*rn + Øn2\ W2*rn + \ldots.+ Ønk\ Wk\ rn = rn
\end{aligned}$$

where $r1+r2+r3+\ldots\ldots\ldots+rn = r$

The above simultaneous equation is not determined because there are (nk) parameters with only k equations. Therefore, restrictions should be imposed if the above simultaneous equation is to be solved. In this connection, the following two restrictions will be imposed:

i. It is assumed that the percentage of individual in each income group is equal. This restriction implies that considering income group as a policy variable, equal percentage will be given to individual in his respective group regardless of his risk-types. This restriction may be stated as :

$$Ø11 = Ø21 = Ø31 = \ldots\ldots = Øn1 = Ø1$$

$$Ø12 = Ø22 = Ø32 = \ldots\ldots = Øn2 = Ø2$$

$$\emptyset 13 = \emptyset 23 = \emptyset 33 = \ldots\ldots = \emptyset n3 = \emptyset 3$$

$$\ldots\ldots \quad \ldots\ldots \quad \ldots\ldots$$

$$\emptyset 1k = \emptyset 2k = \emptyset 3k = \ldots\ldots = \emptyset nk = \emptyset k$$

ii. The number of income groups is equal to the number of risk-types; that is i=j for all i and j.

Substituting restrictions (i) into the above simultaneous equations, we may have the following equations for all i and j:

$$\emptyset 1W1*r1 + \emptyset 2W2*r1 + \emptyset 3W3*r1 + \ldots\ldots + \emptyset kWk*r1 = r1$$

$$\emptyset 1W1*r2 + \emptyset 2W2*r2 + \emptyset 3W3*r2 + \ldots\ldots + \emptyset kWk*r2 = r2$$

$$\emptyset 1W1*r3 + \emptyset 2W2*r3 + \emptyset 3W3*r3 + \ldots\ldots + \emptyset kWk*r3 = r3$$

$$\ldots\ldots \quad \ldots\ldots \quad \ldots\ldots \quad \ldots \quad \ldots\ldots \quad \ldots$$

$$\ldots\ldots \quad \ldots\ldots \quad \ldots\ldots \quad \ldots \quad \ldots\ldots \quad \ldots$$

$$\emptyset 1W1*rn + \emptyset 2W2*rn + \emptyset 3W3*rn + \ldots\ldots + \emptyset kWk*rn = rn$$

Generally it may be written as;

$$A\ [\emptyset] = [r]$$

where,

A is a (n x n) matrix of Wi*rj for all i and j.

[Ø] is a (n x 1) matrix of Øj for all j.

[r] is a (n x 1) matrix of rj for all j.

There are k parameters with n equations in the system, implying that the above simultaneous equations system are still not determined. By imposing restriction (ii), n and k are now equal, therefore we have n equations and n parameters to be estimated. Thus the solution for Ø's may or may not be unique.

Actually the equations may be reduced to a simple general equation for the solution of Ø's. It is of the form:

$$Ø1W1^*r + Ø2W2^*r + Ø3W3^*r + \ldots\ldots + ØkWk^*r = r.$$

Dividing by r, it may be further simplified as :

$$Ø1W1^* + Ø2W2^* + Ø3W3^* + \ldots\ldots + ØkWk^* = 1.$$

By considering any income group, suppose group (m+1) as the deflator group and using the procedure explained earlier, the equation may be reduced to :

$$Ø1(1-W1^*) + Ø2(1-W2^*) + \ldots + Øm(1-Wm^*) = Ø\,m+2(Wm+2^*-1) + Ø\,m+3(Wm+3^*-1) + \ldots + Øk(Wk^*-1).$$

where :

$W1^*, W2^*, \ldots\ldots, Wm^* < Wm+1^*$ and

$Wm+2^*, Wm+3^*, \ldots\ldots, Wk^* > Wm+1^*$

The solution for Ø's are clearly not unique and they may carry any value as long as they satisfy the required condition. Therefore, the value of Ø's can be determined accordingly, in accordance with the intended policy.

Based on the value of Ø1, Ø2, ...,Øk ; we can determine the percentage of individual who should pay less (reduction in premium) or pay more (increment in premium) in the adjustment process. These parameters can be considered as policy parameters.

4.4.1 Challenges for Survivability

The fulfilment of the survivability condition mentioned earlier is not guaranteed. Some of the issues causing difficulties in the fulfilment of the necessary condition can be dealt with as below.

i) Rich are Price Inelastic

When the rate of premium for the higher income groups increased, it is likely that some of the affected participants will withdraw their policies. If this thing happens, the number of participant decreases. In order to maintain the business, the company should ensure that reduction in total premium collection due to withdrawal should not greater than increment in income due to premium rate increment. For fulfilling this condition, it should be assumed that the rich are price inelastic in insurance demand. Under this assumption, the rich will not

significantly renounce their insurance contract due to the increament in the premium rate. Therefore when Takaful is operated by private institutions as an alternative to the conventional insurance, and most likely charges takaful contributions, people would certaintly compared it with the conventional insurance premium rate. Since the payment for the rich is increased, price inelastic in insurance demand is required. Although this assumption has not yet been proved, it could be possibly true under the following situations,

a) If there exist a committed group of individuals towards Islam in the society. These people will certainty pefer Takaful business as an alternative to the conventional insurance regardless of the premium rate. Therefore, even if Takaful business offers higher premium rate, they will still purchase Takaful contract.

b) According to Helping Theory, individual may like to help due to fulfilling social responsibility[53]. This feeling is supposed to exist among the rich, paticulary in Muslim society. Therefore, if they feel that their participation in the Takaful contract is due to their commitment to help the less wealthy, and they know that Takaful business is not a profit motive business, a slightly high premium rate will not deter their wish.

53.C.T Clotfelter, Federal Tax Policy and Charitable Giving, (The University of Chicago Press, 1985); M Feldstein, "Income Tax Charitable Contributions", Part I, National Tax Journal, (March 1975).

ii) Adverse Selection and Moral Hazard

Adverse selection problem is a situation where the company does not possess sufficient information about the person to be insured and therefore try to avoid insuring too many below average risks or too many poor risks individuals. Individuals who realize that they are worse than average may have a tendency to get more coverage. As an attempt to secure more than the coverage to which they are entitled, they may intentionally defraud the company. Thus, moral hazard is a problem created by the dishonest person who like to defraud the company. Consequently, the company may suffer a loss.

Within the framework of our model the above problems may be irrelevant. It is because firstly, our model is applied only in Family Takaful Business in which individuals can be clearly classified or grouped in accordance with their risk types. Thus, we are possessing full information about individual's risks. Secondly, with respect to risk classification, the model adopts a similar procedure as normally used by the insurance companies. Thus, separating price strategy is the likely solution.

In connection with adverse selection and moral hazard problems, our real problem is actually related to income groups. The problems which may arise are firstly, how the company would manage if too many low income group individuals join the contract and secondly, how to avoid individuals from pretending to belong to low income groups

for the purpose of getting lower premium rate. These problems may also cause a loss to the company.

The first problem may be solved by the following two possibilities:

i. Accordingly adjust the value of Ø's, i.e the parameters which represent the number or percentage of individuals in a particular income group. The adjustment should be in harmony with the value of weight, W*.

ii. Accordingly adjust income groups classification. This adjustment should be based on the value of Ø's and must be properly assessed.

The second problem may be solved by finding an alternative to income level for classifying individuals. Since we expect that individuals are dishonest in declaring their income level, their insurance coverage can be used as an alternative. This means that higher their insurance coverage the higher they will be grouped.

4.5 Economic Effects

We will now examine the likely effects of implementing the proposed scheme. Two important aspects to be discussed are related to firstly welfare of the society and secondly equity between the high and low income groups.

a) Welfare Improvement

It has been shown that offering a similar premium to every individual in a risk type i would mean that not every individual is fully insured. Individuals could be under-insured, over-insured or fully insured (Figure 12). Therefore, individual should also be differentiated not only in accordance with his risk-type, but also in accordance with his income level, so that individual could be differently charged in terms of risk-type and income level. Thus when rij is charged to individual in risk-type i and income group j, every individual is likely to be equally treated and fully insured because through the adjustment the more (less) wealthy individuals who are over-insured (under-insured) have now to pay more (less).

Suppose that the offered premium ri represented by price line (1-p)/p is fit to individual in income group j, then individuals in income group j-1 (j+1) would be under-insured (over-insured). This is shown in figure 13, where the indifference curve of individual in income group j touches the price line on the certainty line, but the indifference

curve of more (less) wealthy individuals crosses the price line from below (above). The intersections points are e1, e2 and e3, respectively. After the adjustment, the more wealthy individals have to pay more, represented by the price line {(1-p)/p}2, in which point e2o is full-fair insurance for them. On the other hand, the less wealthy individuals will pay less, represented by the price line {(1-p)/p}3, in which point e3o is full-fair insurance for them. Thus the premiums charged are equally fair to every indivdual.

From the figure, it is clearly seen that the welfare of the poor increases while the welfare of the rich decreases, meaning that welfare improvement is not of the Pareto improvement. The poor are better off but the rich may be worse off. This result is, therefore, in line or similar to the conclusion given by Hoy (1982), because the initial position was not at the separating equilibrium. But, if the initial position was separating or if at the initial position the rich was fully insured (not over-insured), the resulted improvement may likely be of the Pareto type.

The welfare of the society is likely to increase for three reasons. Firstly is, high income group individuals are unlikely to withdraw their Takaful contract due to the implementation of the new scheme because they are loyal and committed. They are still indifferent between the old and new contract, and sincerely ready to accept the fact. But new comers from the low income groups individuals are

expected. Thus, on average the society's welfare increases.

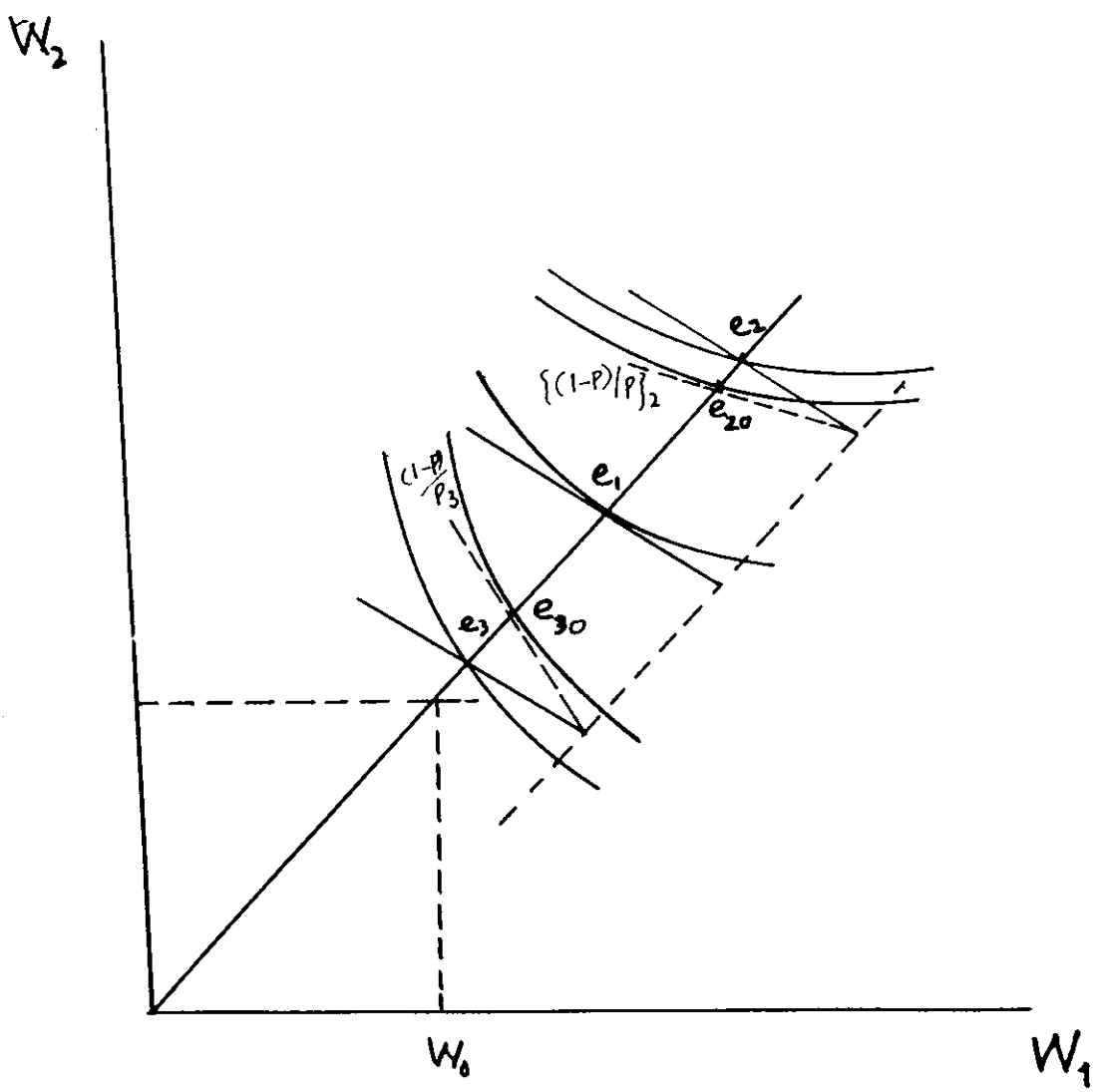
Secondly, if we expect that there will be a withdrawal from the rich, it is likely that, it may not decrease total welfare of the society because rich are rlatively demand-inelastic than poor. Therefore, withdrawal of the richer, will be compensated by the new entry of the poorer. Thus, in total, the society may gain welfare improvement.

Thirdly is, we accept the fact that welfare of the rich decreases and welfare of the poor increases, but it is likely that the decrease in welfare of the rich is less than the incease in welfare of the poor. From figure 13 we may say that the magnitude of e2e2o < e3e3o. It is because marginal utulity of money per dollar is greater for the poor. Thus increament in utility for the poor as a result of reducing per dollar in premium rate is greater than reduction in utility for the rich as a result of increasing per dollar in premium rate.

b) Equity on Cost Side

For the issue of relative burden it is likely now that the low and high income groups are at the similar marginal value of income because the premium rate was being adjusted in accordance with their preferences. The richer have to pay slightly higher premium rate because their

Figure 13 : Welfare Improvement



relative ability tend to be higher. In this way, the fairness on cost side is ensured.

Initially when the rich and the poor pay equal premium rate, the charged rate is said to be unfair because in this situation marginal utility of money per dollar is not equal for the rich and the poor. The poor suffers more because he pays more in terms of utility. This is based on the notion of decreasing marginal utility. Formally we may write,

$$\{r\}p > \{r\}R$$

where

$\{r\}$ - Premium rate

$\{r\}p$ - per dollar incidence of premium for the poor

$\{r\}R$ - per dollar incidence of premium for the rich

Since $r = a/c$, where 'a' is the amount of premium paid and 'c' is the amount of compensation received, then it is true to write it as,

$$\{a/c\}p > \{a/c\}R$$

This means that paing of a given premiumfor the same compensation c is more burdensome for the poor. For achieving equity we need to either reducing the premium 'a' to 'a"' for the poor or raising it to 'a*' for the rich. By doing so, we would be reducing the burden for the poor and increasing it for the rich. Thus we may have,

$$\{a"/c\}p = \{a*/c\}R$$

where $a'' < a^*$.

This means that equity is achieved even if compensation is maintained at c. However, equity can be achieved even faster if compensation c is raised to c^* for the poor and reduced to c" for the rich. Thus, using the same notation as before, we may have,

$$\{a''/c^*\}p = \{a^*/c''\}R$$

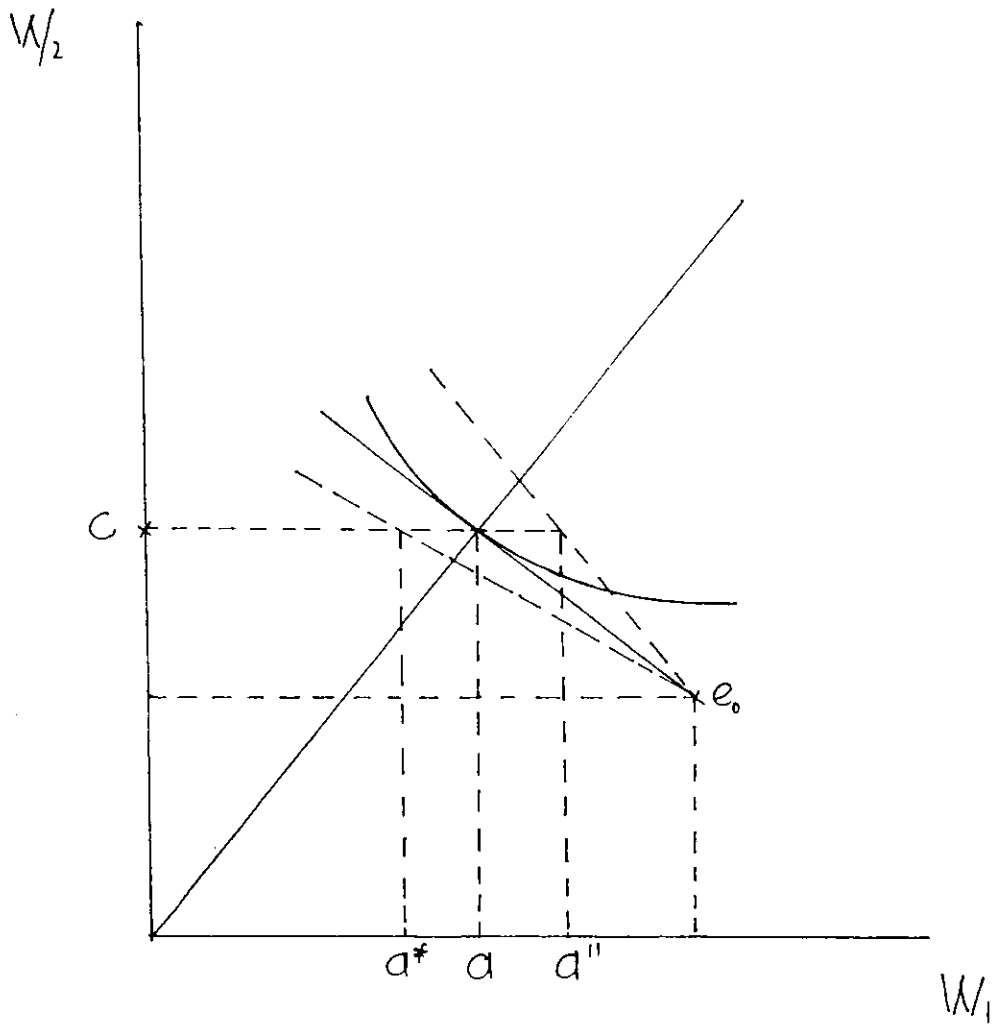
where $c^* > c''$.

Equalizing of both terms means that marginal utility of money per dollar burden are equal fo both the rich and the poor. This implies that equity can be achieved whether compensation for the rich is maintained or decreased. In our model however, compensation for the rich is likely to be maintained.

For the purpose of illustration, suppose that 'a' and 'c' are respectively the initial premium rate and the amount of compensation paid, as shown in figure 14. When the rich is charged more, suppose a*, his compensatin is maintained at c. Similarly, when the poor is charged less, such as a", his compensation is also maintained at c.

It is important to point out that the equity is nt served symmetrically on the benefit side. While the rich pay relatively higher premium, they relatively received less compensation in terms of utility due to the principle of decreasing marginal utility. This may induce the rich to make

Figure 14 : Changes in Premium Rate



less use of the services of the Takaful company.

The problem of symmetrical treatment of the benefits of Takaful company can be tackled at least through two ways. One is the influence of moral values which may motivate a rich person to stay with the Takaful company even though he is not receiving same amount of utility as a poor client is getting on the benefit side. He may be willing to sacrifice some part of psychological satisfaction for the Islamic cause ie. establishment and success of Takaful company. Second is that, Takaful company may be able to pay more to the rich out of its funds built out of its profits or some endowments.

4.6 Policy Implications

In this section we shall consider some policies which can be derived from the results and informations produced by the model. The policies are are directly or indirectly related to aspect. Within this limit, we may list some policy implications of the model, by no means exhaustive, as follow:

i) Direct role of insurance company

As explained earlier, the model may improve the fairness of the premium by incorporating equity aspect, in which individuals now pay in accordance with their relative abilities. This leads to income redistribution in favour of

less-wealthy individuals. This fact indicates that Takaful Business could play a role not only in providing insurance cover but redistributing income in favour of the less-wealthy indivduals. Takaful Business under the proposed scheme may even produce a better result because its policy was to promote the spirit of mutual support, sacrifice, cooperation and equity as opposed to individualism, self-seeking, competition and exploitation, as experienced in the contemporary insurance business.

Therefore, the state and the company should realize and make use of these possibilities and opportunities. Takaful company should now be directly used for promoting equity and income redistribution, not only through creating job or providing in-job training for low income groups as normally being proposed, but in addition, it should be introduced directly into its marketing strategies and pricing policies. An interesting point to be noted here is that, by doing so, Takaful company would directly plays a role in promoting equity and income redistribution even if it does not creat any new job or does not provide in-job training for the low income groups.

ii) The state and social security for the poor

As noted in the model, the poor would not participate in any Takaful contract due to his financial constraint, which means that the poor has no means to cover his loss.

Since the ultimate responsibility of need fulfilment rests with the state, the ultimate responsibility of providing social security also rest with the state. Thus the state is obliged to look after the interests of the poor. In this connection, the state should provide social security or social grants to support the poor.

Initially, the state could arrange programmes to enable poor individuals to acquire the means necessary to fulfil their needs on their own, but at the same time State should run social security programmes especially for the poor. These programmes may carry two objectives: firstly to meet need-fulfilment and secondly to provide social insurance for the poor.

Since poor individuals are not earning or earn very low income, they are not in a position to make any contribution. Thus, its financial resources should be obtained both from different the voluntary contributions of rich people and the zakah. It is also possible to collect revenue for this purpose through taxes.

iii. State intervention in the markets

Since poor individuals do not purchase any Takaful contract, this means that they have no access to the Takaful market. For ensuring poor people's access to the Takaful market, the state should arrange a social security programme especially for the poor as explained in part (ii) above.

In addition, intervention in the commodity and factor markets by the state is also possible and even needed. It is because the poor was not only deprived from access to the Takaful market but also to the commodity and factor markets. So, without state intervention the unbalanced and unjust distribution of income may get worse and consequently the gap between the rich and the poor widens. Therefore, direct state intervention such as in the labour market regarding a minimum wage legislation or providing credit/grant and marketing facilities for the poor is also required.

4.7 Limitation of the Model

The model seems to be confined in the following two cases firstly, it can only be applied on a particular scheme if participants in that scheme can be classified or suitably classified in accordance with their income groups, and secondly, the results are unlikely to be stable, in the sense that any change in the data or group classifications may greatly affect the results.

4.8 Appendices

Appendix 4.1

a) Proof for Lemma 1:

Let U(C1,C2) where C1(W1,W2) and C2(W1,W2).

It is also true that U(W1,W2).

Let W1 may be traded off for W2. For maintaining the utility level W1 may be traded for (1+r) W2. Thus,

$$U1(W1,W2) = U2(W1,W2)\ (1+r)$$

Rearranging it gives;

$$U1/U2 = (1+r)$$

where (1+r) is simply the value of time preference.

As W1 increases consumption in state 1, (C1) and wealth in state 1, (W1) become relatively less important and vice-versa. Therefore, consumer ready to sacrifice more C1 and W1 for C2 and W2. Meaning that for W1* > W1,

$$(U1^*/U2^*) > (U1/U2)$$

This implies that the slope of indifference becomes flatter as W1 increases.

b) Proof for Lemma 2:

From Lemma 1 we have (U1/U2) = (1+r)

Suppose that W1 and W2 change by sW1 and sW2, we may have;

$$U1(W1+sW1,W2+sW2) = U2(W1+sW1,W2+sW2)\ (1+r)o$$

So that,

$$U1(W1+sW1,W2+sW2)/U2(W1+sW1,W2+sW2) = (1+r)o$$

If the changes leads to a new income braket, their relative value to trade off W1 with W2 also change.It may leads to;

$$(1+r) \neq (1+r)o$$

Implies a change in individual behaviour.

Therefore, there must be (exist) a point Wo such that when sW1 and sW2 or both change to the extent that W1+sW1 or W2+sW2 or both are greater or less than Wo, individual behavior changes.

c) Proof for corollary 1:

Let (W1r,W2r) and (W1p,W2p) be the endowment for the higher and lower income groups individuals respectively.

From Lemma 1 we may have,

$$U1r/U2r = (1+r)\ \Theta r \quad \text{and}$$

$$U1p/U2p = (1+r)\ \Theta p$$

where $\Theta r < \Theta p$

Implies that the higher the income level the flatter the slope of indifference curve.

Appendix 4.2

a) Proof for Lemma 3:

Let there be an endowment point (W1,W2) and assume that at this point individual willing to purchase insurance contract. This means that at this point;

$$U2/U1 < -(1-p)/p$$

Suppose that wealth decreases to the extent that individual's income bracket changes, therefore;

By Lemma 1 we have,

$$U2/U1 \quad \text{increases}$$

but the price line $-(1-p)/p$ constant.

Therefore, there must be a point W* by which when wealth continue decreasing and U2/U1 continue increasing, $U2/U1 = -(1-p)/p$.

b) Proof for Corollary 2:

From Lemma 3 we have $U2/U1 = -(1-p)/p$ at point W*.

As income level further decreases, U2/U1 becomes steeper such that when wealth less than W*, $U2/U1 > -(1-p)/p$.

This implies that insurance will not be purchased.

Note: W* is some how equal to Wo, minimum level of income required for basic need fulfillment.

Appendix 4.3

a) Proof for proposition 1:

Suppose that $-(1-p)/p$ is the price line offered to both the high and low income groups; and $U1r/U2r$ and $U1p/U2p$ are the slope of indifference curve for the high and low income groups respectively, we may be able to conclude that :

If the offered price is in accordance with the low income group then in equilibrium we have ,

$$U1p/U2p = -(1-p)/p$$

From corollary 1 we may have $U1r/U2r < U1p/U2p$.

Thus,

$$U1r/U2r < -(1-p)/p$$

Implies over-paid for the high income group.

On the other hand if the offered price is in accordance with the high income, the low income group will be under-paid.

b) Proof for proposition 2:

Let's define;

$Ur(p,0)$ and $Up(p,0)$ as total utility before insurance for the high and low income groups, respectively.

And $Ur(p,c)$ and $Up(p,c)$ as total utility after purchasing insurance contract c for the high and low income groups respectively.

Increment in utility due to insurance for the high and low income group individuals are respectively;

$$A = Ur(p,c) - Ur(p,0) \quad \text{and}$$

$$B = Up(p,c) - Up(p,0)$$

From proposition 1 we may have :

$$A > B$$

Appendix 4.4

Within the framework of the model, individual will maximize his utility by the function of:

$$U(p,o) = U(Wo) + (1-p)U(W1-Wo) + pU(W2-Wo)$$

When insurance contract such as a=(r,d) is purchased, his utility function becomes;

$$U(p,a) = U(Wo) + (1-p)U(W1-Wo-r) + pU(W2-Wo+d)$$

Let's define c and S as the price and quantity of insurance respectively, then:

$$c = r/S$$

$$= r/d \ .$$

Substituting r=cS into the function give;

$$U(p,a) = U(Wo) + (1-p)U(W1-Wo-cS) + pU(W2-Wo+S)$$

Maximizing the function subject to the constraint given by the opportunity boundary gives us:

$$dU/dS = (1-p)U1'(-c) + pU2' = 0$$

Solving for c give,

$$c = \{ p/(1-p)\} U2'/U1'$$

or

$$co = c\{(1-p)/p\} = U2'/U1'$$

Insurance will be demanded if the slope of indifference curve exceeds the price of insurance at the endowment point , that is the slope of price line is steeper than the slope of indifference curve, that is;

$$co > U2'/U1'$$

Then,

$$c\{(1-p)/p\} > U2'/U1'$$

And therefore,

$$c > \{ U2'/U1'\} \{p/(1-p)\}$$

At actuarially fair price c = p/(1-p), thus;

$$(p/1-p) > \{p/(1-p)\} U2'/U1'$$

or,

$$1 > U2'/U1'$$

which is true only if $U2'/U1' < 1$. For the poor however, $U2'/U1'$ is unlikely to be less than 1.

Appendix 4.5

a) Proof of property 1:

Let Wij be the weight for income group j and ci = pi/(1-pi) is the price offered to indviduals in risk-types i, therefore we have:

$$U2ij \,/\, U1ij = - Wj \{(1-pi) \,/\, pi\}$$

For higher and lower income groups respectively, we have;

$$U2ih \,/\, U1ih = - Wh\ (1-pi)/pi$$

$$U2iL \,/\, U1iL = - WL\ (1-pi) \,/\, pi$$

Rearranging it we have;

$$U1ih/U2ih = - \{1/Wh\}\ pi/(1-pi)$$

$$= - Wh^*\ pi/(1-pi)$$

$$U1iL/U2iL = - \{1/WL\}\ pi/(1-pi)$$

$$= - WL^*\ pi/(1-pi)$$

From corollary 1 we may have;

$$\{U2ih/U1ih\} < \{U2iL/U1iL\},$$

Therefore:

$$U1ih/U2ih > U1iL/U2iL$$

Thus,

$$\{Wh^*\}\ pi/(1-pi) > \{WL^*\}\ pi/(1-pi)$$

$$i.e \quad Wh^* > WL^*$$

Appendix 4.6

a) Proof for property 1:

Let ri = pi/(1-pi) is the price offered.

From property 1 we have;

$$rih = Wh^* \, pi/(1-pi) \quad \text{and}$$

$$riL = WL^* \, pi/(1-pi)$$

Since $Wh^* > WL^*$ implies that $rih > riL$.

CHAPTER 5

EMPIRICAL TESTING OF THE TAKAFUL MODEL INCORPORATING INCOME GROUPS

5.0 Introduction

The objective of this chapter is twofold. Firstly, it testifies the theoretical model derived in the preceding with a view to see its operational aspects and secondly, to examine its performance compared with other schemes especially Family Takaful. Section 5.1 explains the premise of the solution, followed by section 5.2 which demonstrates the calculated results and break even condition. The issue of survivability is discussed in section 5.3, supported by section 5.3.2 which examines a case study based on four Malaysian organizations consisting of 3549 clients.

5.1 The Premise for the Solution

As discussed in the previous chapter, the model theoretically contains the following four important equations/identities.

i. Time preference equations

$$TP = a + B\ Y + U \quad \text{and}$$

$$TPj = a + B\ \{(Y1j+Y2j)/2\}$$

ii. Weight identity

$$Wj^* = [TPd/TPj]$$

iii. The proposed premium rate

$$rij = Wj^*\ ri$$

iv. The survivability condition

$$\emptyset 3/\emptyset 1 \geq (1-W1^*)/(W3^*-1)$$

Using the same definition provided in the previous chapter, the above equations/identities can be considered as the essence of the model. It is likely that different case and condition may give different solution, thus the calculated solution in this chapter will be based on the following premises:

i) The Scheme

The selected scheme is the scheme of 10 years maturity period in Family Takaful Business. Its rate of tabarru' in accordance with the age level are given as follows:

Table 1: Premium Rate in Family Takaful (10 years maturity)

Age	Rate of Tabarru'
18 - 30	2.0 %
31 - 35	2.5 %
36 - 40	3.5 %
41 - 45	5.0 %
46 - 50	7.0 %

Source: Mohd Fadzli Yusof (1990), op cit.

ii) Income Groups

Individuals are classified into three different income groups; the low income, the middle income and the rich, under the following categories;

Low	Income less than RM 500.00
Middle income	RM500.00 - RM1000.00
Rich	Income more than RM1000.00

iii) The Deflator Group

Three weights are calculated by considering middle income group as the deflator group. This is based on the assumption that the existing premium rate fit suitably fit to the middle income group.

iv) Insurance covers are classified into three groups as follows:

Low income	Less than	RM5000.00
Middle income	RM5000.00 -	RM10,000.00
High income	More than	RM10,000.00

5.2 The Result

a) Time Preference Equation

Based on the Malaysian GNP from 1965 - 1990,[1] the value of time preference/marginal value of income (Lambda) was calculated.[2] These variables give us the following regression equation:[3]

$$TPi = 0.8849 - 0.000016\ Yi.$$

$$(15.226) \quad (-8.346)$$

$$N = 26 \quad R' = 0.7518$$

where,

TP - Time preference

Y - Income level (GNP)

b) The Weight

Based on the level of income as classified earlier and considering the middle income group as the deflator

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1.Data is given in Appendix 4.1, Table 4.1.

2.The value of lambda is given in Appendix 4.1, Table 4.2.

3.Detail output is given in Appendix 4.1, Table 4.3.

group, by using the result given in (a) above, the calculated weight, i.e W1*, W2* and W3* for all the groups, low, middle and rich espectively, are as follows:

Table 2: The Weight for Three Income Groups

Weight	Value
W1*	0.9909
W2*	1.0000
W3*	1.0139

Source: Derived from Appendix Table 5.2.

The weights indicate that the low income group (W1*), pay less while the rich (W3*), pay more. The middle income group which has been taken as the deflator group is however, paying the same rate of tabarru' i.e premium rate as it was before the adjustment.

c) The Proposed Premium Rate

The proposed premium rate rij for all i and j, can be obtained by adjusting the currently used premium rate with the weight just derived. From only 5 premium rates, now we may have (3X5), i.e 15 premium rate with respect to risk types and income levels.

The proposed premium rate (tabarru' rates) are, therefore:

Table 3: Premium Rates for Three Income Groups

Age (Year)	Income group low	Middle	Rich
18 - 30	1.9818	2.0	2.0278
31 - 35	2.4772	2.5	2.5347
36 - 40	3.4681	3.5	3.5486
41 - 45	4.9545	5.0	5.0695
46 - 50	6.9363	7.0	7.0973

Source: Calculated from Table 1 and Table 2.

Under the proposed scheme, the company charges different rates to individuals in a similar risk type in accordance with their income group. In risk type 18-30 for example, the company now charges 1.9818 %, 2.0 % and 2.0278 % premium rates to low, middle and high income groups respectively, instead of only 2.0 % to every individual previously.

d) Break Even Condition

From the above information we have,

$$(1-W1^*)/(W3^* -1) = (1-0.9909)/(1.0139-1.0)$$

$$= (0.0091 / 0.0139)$$

$$= 0.6546.$$

Therefore, it is necessary that $\emptyset 3/\emptyset 1$ should be greater than or equal to 0.6546 if the break even condition is to be maintained, meaning that the company would financially be as good as it was before, i.e under the Family Takaful scheme.

The condition means that the percentage of the higher income group individuals who pay more should not be less than 65.46 % compared with the percantage of low income group indviduals who pay less. This implies that 0.6546 percent of individuals who pay more will be able to compensate 1.0 percent of individual who pay less. Thus as long as the actual percentage of low income individuals is not more than 1.5276 times greater than the percantage of richer individuals, the break even condition will be fulfilled and, therefore, the company performance will be maintained.

e) Larger Groups

The solution can be extended into larger income groups. Supposedly, classify the society into five income groups[1]. Based on the same regression function and considering group 4 as the deflator group, we may have the following weights:

Table 4: The Weights for Five Income Groups

Weight	Value
W1*	0.9746
W2*	0.9790
W3*	0.9862
W4*	1.0000
W5*	1.0093

Source: Calculation given in Appendix 5.5.

In this case we will be having (5X5) different premium rates (tabarru' rates), each of them is in relation with risk types and income groups.

1.Classification available in Appendix 4.3.

Thus, the proposed premium rates (tabarru' rates) are as under (Table 5):

Table 5: Premium Rate for Five Income Groups

Age (Year)	Income groups 1	2	3	4	5
18 - 30	1.9492	1.9580	1.9724	2.00	2.0186
31 - 35	2.4365	2.4475	2.4655	2.50	2.5232
36 - 40	3.4111	3.4265	3.4517	3.50	3.5325
41 - 45	4.873	4.895	4.931	5.00	5.0465
46 - 50	6.8222	6.853	6.9034	7.00	7.0651

Source: Calculated from Table 1 and Table 4.

The solution for Ø's for the fulfilment of break even condition is not unique. Its final equation for the solution of Ø's is:

$$Ø1(1-W1^*) + Ø2(1-W2^*) + Ø3(W3^*-1) = Ø5(W5^*-1)$$

Substituting the value of Ø's into it we have :

$$Ø1(0.0254) + Ø2(0.0210) + Ø3(0.0138) = Ø5(0.0093)$$

Therefore, the policy parameters Ø's can be assigned any value in accordance with the intended policy as long as they satisfy the above equation. Since the reduction in premium is expected for the less wealthy individuals, the above equation is suitably to be stated as:

$$Ø5(0.0093) - Ø1(0.0254) - Ø2(0.0210) - Ø3(0.0138) = 0.$$

where minus (-) sign indicates reduction.

Dividing by Ø5(.0093), by assuming Ø5 = 0.3, the equation reduces to;

$$1 - 9\,Ø1 - 7.5\,Ø2 - 5\,Ø3 = 0.$$

If for example we wish to include only 30 % of individuals (clients) in group 5 (rich and supposed to pay higher premium rate), we would be able to determine the percentage of individuals in group 1,2 and 3 for maintaining the break even condition. Of course the value of Ø1, Ø2 and Ø3 are not unique; but this is what we call the policy variable. One of the possible solution in this case is Ø1 = 5 %, Ø2 = 3 % and Ø3 = 6.5 %. How these variables could be determined would depend upon the way how we group the people.

5.3 The Survivability Issue

Since the values of Ø's are not unique, the required conditions may or may not be satisfied in practical life; then one may ask the question on what basis the maintainance of break even and the survivability of the company in practical life could be ensured. What if, the introduction of the new schemes leads to a great withdrawal of the high income group clients, thus leading to reduction of the business. In this regards, the following section examines the feasibility of the proposed scheme for the case of Malaysia.

5.3.1 Insurance Demand

From the very beginning we are aware that initially the high and the low income individuals pay the same rate of premium, such that the low income groups are under-insured while the high income groups are over-insured. By introducing the new schemes, the low income groups pay less but the richer pay more. If we accept the fact that through the schemes the rich and the poor are now correctly categorized, and therefore they are all fairly charged exactly in accordance with their respective categories, then the break even is ensured. High income group individuals do not feel being victimized because they know that previously they were specially treated. Therefore, the rich are unlikely to withdraw and consequently the survivability is ensured.

If there is a withdrawal, it is expected that it may not be to the extent which affect the company performance because price elasticity of the rich is normally less elastic than the poor. Therefore, withdrawal of the rich, if any, will be compensated by the entry of the lower groups. Oon Soon Hwa (1984)[1] in her study shows that in general high income group is likely to have smaller income elasticy and price elasticity. Although her study was based on consumption goods and not directly related to insurance, we at least could expect that the rich is also likely to be less price elastic in insurance demand. If it is so then the increment in the rate of premium will not lead to a great withdrawal of the rich clients compared to the entry from the lower group clients.

The likelihood of less price elastic on demand for insurance for the high income groups has been proved by the experience of Takaful Business in Malaysia. The experience of the Takaful Company of Malaysia indicates that clients are loyal, may be due to their commitment to Islam. Although there are companies (conventional insurance) offering lower premiums, clients do not rush toward them, but they remain with the Takaful Company. The number of new participants joining the business is even increasing.

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1. Oon Soon Hwa, Household Expenditure Pattern in Malaysia, Thesis submitted to the Faculty of Economics, National University of Malaysia, (1983/84), (Unpublished).

This phenomenon shows that a slightly higher premium does not affect the clients' choice. Therefore, if the clients choose the Takaful Company over others in spite of its higher premium rate, then it is unlikely that the clients would renounce it if due to the introduction of the new schemes the premium rate demanded is slightly higher than it was before. Great withdrawal is unlikely to happen, but if there is withdrawal, it is likely to be insignificant and could easily be compensated by the new entry.

In the case of Malaysia, the clients are seem to be price inelastic in Takaful demand because they are committed to Islam. They choose Takaful Business because of Islam and will not move to Conventional Insurance Business although they offer better prices. Therefore, it seem that the survivability of Takaful Business depend upon a certain committed group of individuals. This implies that Takaful Business will not be able to compete in the open competitive Insurance market. In such a case it is unlikely to survive.

5.3.2 Case study

In order to empirically examine whether this scheme could be implemented sucessfully or whether it would perform as good as the other schemes, let us examine some specific cases for comparison. For this purpose we will compare the amount of premium collected under the present schemes with the possible amount of premium that may be collected under

the new scheme. From this comparison we may deduce that if the amount of premium that may be collected under the proposed scheme is equal or greater than the amount of premium that has been collected under the present schemes, the proposed scheme is justifiable.

The exact comparison is however, with the Family Takaful Business because the proposed premium rate is a modification from it. In this comparison we assume that there is no withdrawal from the rich as well as no new entry from the low income groups. Three aspects will be examined namely, total premium collected, the fulfilment of the survivability condition and performance in a particular risk types.

a) Total Premium Collected

In this case we select four different organizations with 3549 participants, presently participating in the Group Takaful scheme namely, Felda Angkut, Felda Kilang, Persatuan Bekas Perajurit and Perbadanan Angkut. For these organizations we calculate total premium that may be collected under different schemes namely conventional system, Group Takaful, Family takaful and the newly proposed scheme as well as the whole organizations together. The result is given in the table below:

Table 6: Total Premium Collected From Different Schemes

Name of organizations	Premium Collected From Conv	G.T	F.T	(P.S)*
1. Felda Angkut	11708.10	13651.0	11395	11395
2. Felda Kilang	55001.90	63288.00	53270	53270
3. Perbadanan	30509.4	22545.00	28680	29076
4. Persatuan	1826.08	1504.90	916	907
5. (1+2+3+4)	99045.48	100988.90	94261	94648

Source: Calculated from data in Appendices Tables 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, and 5.13.

where,

Conv - Conventional system.

G.T - Group Takaful.

F.T - Family Takaful.

P.S - Proposed scheme.

From the above results (Table 6), we can see that the proposed scheme is able to collect the premium as good as the other schemes. For the first two cases, adjustment was not required because financially participants are at the same level.

Comparison with Family Takaful indicates that in all the cases except Persatuan, the newly proposed scheme earns the collected premium equal or more than that of the Family Takaful scheme. This means that the proposed scheme would perform as good as the Family Takaful. For the whole organization together, total collection from the proposed scheme is also greater than the collection from the Family Takaful scheme. So if the Family Takaful currently practiced could servive with its collection, then the proposed scheme would also survive.

b) Survivability Condition

Observing the survivability condition available in Table 7, we find that in all the cases except Persatuan, the survivability conditions are fulfilled. When all organizations are considered together, the necessary condition for survival is also fulfilled, giving the value of 6.52 greater than 0.65. This means that in general the newly proposed scheme will perform as good as it was before (Family Takaful).

Table 7: Survivability Condition

Organization	(Ø3/Ø1)	(1-W1*)/(W3*-1)	Condition
Felda Angkut	0	0	Fulfil
Felda Kilang	0	0	Fulfil
Perbadanan	ϕ	0.65	Fulfil
Persatuan	0	0.65	Not fulfil
All together	6.52	0.65	Fulfil

Source: Calculated from Appendix Table 5.14.

Thus we may conclude that since the proposed scheme is likely to collect the amount of premium as good as the present schemes can collect and the fulfilment of the break even condition is almost certain, then it is most likely that the proposed scheme will also financially perform, as good as the existing schemes are performing.

c) Performance in a particular risk-types

More detailed comparison can also be done on the basis of each risk-type (age group) category. In this comparison we would be able to know the difference in the premium collected in each risk type (age group) for different schemes. The collected premium with respect to risk type and type of schemes is shown in Table 8 as under:

Table 8: Total Premium Collected From Different Schemes With Respect to Risk Types

Age (Year)	Premium collected from Conv	G.T	F.T	(P.S)*
18 - 30	52926.4	67310.5	45713.5	49810.0
31 - 35	13612.7	15629.9	14538.4	14487.5
36 - 40	8885.1	7949.7	10413.0	10502.5
41 - 45	10941.4	6050.1	11059.0	11675.0
46 - 60	12684.9	4258.9	8853.4	8778.0
	99048	101196	94261	94648

Source: Calculated from data in Appendices Tables 5.6, 5.7, 5.8, 5.8, 5.9, 5.10, 5.11, and 5.12.

From Table 8 we observe that total premium collected indicate that for each risk type, the proposed scheme performs equally good except in the second risk type, i.e age level 31 - 35, and the fifth risk type, i.e age level 46 and above, where the collected amount is slightly less than the collected amount under the Family Takaful. However, total

collection for the whole business is promising and there was no significant difference of collection that has been noticed. This indicates that the proposed premium rate if implemented could lead the company to a similar financial performance, as good as it was under the Family Takaful Business.

The possibility of success is supported by the fulfilment of break even condition even in each risk types. By referring to the break even condition for maintaning the financial performance compared to the Family Takaful, as given in Table 9, we found that in all risk types the values of $(\emptyset 3i/\emptyset 1i)$ are greater than 0.65. These indicate that in accordance with each risk type, the collected premium will not be less than what it was collected before. Therefore, in each risk types, the proposed scheme would also perform as good as it was under the Family Takaful. The values for break even condition in each risk types are given in Table 9 below.

Table 9: Break Even Condition for Each Risk Type

Age	Ø1i	Ø2i	Ø3i	(Ø3i/Ø1i)
18-30	0.0028	0.9122	0.0849	30.33
31-35	0.0019	0.6892	0.3088	164.25
36-40	0.0114	0.5763	0.4122	36.00
41-45	0.0704	0.4647	0.4647	6.60
46-60	0.4640	0.1855	0.3464	0.75

Source: Calculated from data in Appendix Table 5.15.

5.4 Appendices

Appendix Table 5.1

Gross National Product 1965 - 1990

Obs	GNP	Obs	GNP
1	9561	14	28629
2	10088	15	28238
3	11039	16	28669
4	11467	17	30177
5	12237	18	33176
6	13033	19	32088
7	15386	20	29589
8	15864	21	32811
9	15003	22	36766
10	18272	23	40279
11	20067	24	44684
12	22282	25	47861
13	26354	26	51996

Source: Collected from the Malaysian Economic Report, 1965 - 1990.

Appendix Table 5.2 : Time Preference

Obs	GNP	Time Preference
1	9651	.
2	10088	0.91506
3	11039	0.85577
4	11467	0.86158
5	12237	0.81073
6	13033	0.75730
7	15386	0.49870
8	15864	0.46022
9	15003	0.67210
10	18272	0.40754
11	20067	0.42720
12	22282	0.38350
13	26354	0.31225
14	28629	0.32077
15	28238	0.37047
16	28669	0.33907
17	30177	0.29844
18	33176	0.24689
19	32088	0.40040
20	29589	0.50177
21	32811	0.24952
22	36766	0.21834
23	40279	0.21437

24	44684	0.18925
25	47861	0.19122
26	51998	0.16554

Source: Calculated from Table 5.1

Appendix Table 5.3: Regression Analysis

Dependent Variable: LAMDA (Time Preference)

Analysis of Variance

Source	DF	SS	MS	F Value	Prob F
Model	1	0.99311	0.99311	69.66	0.0001
Error	23	0.32790	0.01426		
C Total	24	1.32101			

Root MSE	0.11940	R-square	0.7518
Dep Mean	0.44272	Adj R-sq	0.7410
C.V.	26.96953		

Parameter Estimates

Variable	DF	Parameter	Std Error	T	Prob T
INTERCEP	1	0.88499	0.05812	15.226	0.0001
GNP	1	-0.000016	0.000002	-8.346	0.0001

Source: Calculated from Table 5.2.

Appendix 5.4

Given;

$$TPi = 0.88494 - 0.000016\ Ii.$$

and income groups;

Poor	Less than	RM500.00
Middle	RM500.00 -	RM1000.00
Rich	Greater than	RM1000.00.

The value of TPj for j=1,2 and 3 are;

$$TP1 = 0.8849 - 0.000016(500/2)$$
$$= 0.8809.$$
$$TP2 = 0.8849 - 0.000016\{(500+1000)/2\}$$
$$= 0.8729$$
$$TP3 = 0.8849 - 0.000016\{(10000+2000)/2\}$$
$$= 0.8609$$

Consider group 2 as the deflator group, then :

$$W1^* = 0.8729/0.8809$$
$$= 0.9909.$$
$$W2^* = 0.8729/0.8729$$
$$= 1.00.$$
$$W3^* = 0.8729/0.8609$$
$$= 1.0139.$$

Appendix 5.5

Given,

$$TPi = 0.8849 - 0.000016\ Ii.$$

And suppose income groups are as follows:

Group 1	Less than	RM200.00
Group 2	RM200.00	- RM499.00
Group 3	RM500.00	- RM1000.00
Group 4	RM1000.00	- RM2000.00
Group 5	More than	RM2000.00

The value for TPj for j=1,2,3,4 and 5 are;

TP1 = 0.8833 TP2 = 0.8793 TP3 = 0.8729

TP4 = 0.8609 TP5 = 0.8529

Consider group 3 as the deflator group, we may have;

W1* = 0.9746 W2* = 0.9790 W3* = 0.9862

W4* = 1.00 W5* = 1.0093.

Appendix Table 5.6 : Felda Angkut

AGE	BIL	COVER	QX/1000	EXPT.COVER	QX	ACT.VAL	DEF.VAL
18	4	40	2.12	84.80	2.7	108.00	23.20
19	4	40	2.12	84.80	2.7	108.80	23.20
20	15	150	2.12	318.00	2.7	405.00	87.00
21	27	270	2.12	572.40	2.7	729.00	156.00
22	47	470	2.12	996.40	2.7	1269.00	272.60
23	55	550	2.12	1166.00	2.7	1485.00	319.00
24	56	560	2.12	1187.20	2.7	1512.00	324.00
25	58	580	2.12	1229.60	2.7	1566.00	336.00
26	45	450	2.12	954.00	2.7	1215.00	261.00
27	26	260	2.12	551.20	2.7	702.00	150.80
28	36	360	2.12	763.20	2.7	972.00	208.80
29	22	220	2.14	470.80	2.7	594.00	123.30
30	19	190	2.17	412.30	2.7	513.00	100.70
31	17	170	2.21	375.70	2.7	459.00	83.30
32	11	110	2.28	250.80	2.7	297.00	46.20
33	11	110	2.36	259.60	2.7	297.00	37.40
34	17	170	2.46	418.20	2.7	459.00	40.80
35	1	10	2.57	25.70	2.7	27.00	1.30
36	9	90	2.72	244.80	2.7	243.00	-1.80
37	5	50	2.88	144.00	2.7	135.00	-9.00
38	11	110	3.07	337.70	2.7	297.00	-40.70
39	4	40	3.28	131.20	2.7	108.00	-23.20
40	1	10	3.49	34.90	2.7	27.00	-7.90
41	0	0	3.92	00.00	2.7	00.00	00.00
42	2	20	4.17	83.40	2.7	54.00	-29.40
43	3	30	4.89	146.70	2.7	81.00	-65.70
44	1	10	5.20	52.00	2.7	27.00	25.00
45	4	40	5.80	232.00	2.7	108.00	-124.00
46	0	00	6.47	00.00	2.7	00.00	00.00
47	0	00	7.25	00.00	2.7	00.00	00.00
48	1	10	8.14	81.40	2.7	27.00	-54.40
49	0	00	9.15	00.00	2.7	00.00	00.00
50	1	10	9.93	99.30	2.7	27.00	-72.30
51	0	00	11.22	00.00	2.7	00.00	00.00
52	0	00	12.23	00.00	2.7	00.00	00.00
53	0	00	13.37	00.00	2.7	00.00	00.00
54	0	00	15.18	00.00	2.7	00.00	00.00
55	0	00	17.26	00.00	2.7	00.00	00.00
Jumlah		5130000.00		11708.10		13851.00	2142.90

Appendix Table 5.7 : Felda Kilang

AGE	BIL	COVER	QX/1000	EXP COVER	QX/1000	ACT VAL	DEF VAL
18	3.00	30000.00	2.12	63.60	2.70	81.00	17.40
19	18.00	180000.00	2.12	381.60	2.70	486.00	104.40
20	56.00	560000.00	2.12	1187.20	2.70	1512.00	324.80
21	62.00	620000.00	2.12	1314.40	2.70	1674.00	359.60
22	97.00	970000.00	2.12	2056.40	2.70	2619.00	562.60
23	170.00	1700000.00	2.12	3604.00	2.70	4590.00	986.00
24	257.00	2570000.00	2.12	5448.40	2.70	6939.00	1490.60
25	271.00	2710000.00	2.12	5745.20	2.70	7317.00	1571.80
26	270.00	2700000.00	2.12	5724.00	2.70	7290.00	1566.00
27	184.00	1840000.00	2.12	3900.84	2.70	4968.00	1067.20
28	180.00	1800000.00	2.12	3816.00	2.70	4860.00	1044.00
29	132.00	1320000.00	2.14	2824.80	2.70	3564.00	739.20
30	131.00	1310000.00	2.17	2842.70	2.70	3537.00	694.30
31	101.00	1010000.00	2.21	2232.10	2.70	2727.00	494.90
32	58.00	580000.00	2.28	1322.40	2.70	1566.00	243.60
33	61.00	610000.00	2.36	1439.60	2.70	1647.00	207.40
34	49.00	490000.00	2.46	1205.40	2.70	1323.00	117.60
35	40.00	400000.00	2.57	1028.00	2.70	1080.00	52.00
36	28.00	280000.00	2.72	761.60	2.70	756.00	-5.60
37	30.00	300000.00	2.88	864.00	2.70	810.00	-54.00
38	29.00	290000.00	3.07	890.30	2.70	783.00	-107.30
39	18.00	180000.00	3.28	590.40	2.70	486.00	-104.40
40	16.00	160000.00	3.49	558.40	2.70	432.00	-126.40
41	16.00	160000.00	3.92	627.20	2.70	432.00	-195.20
42	4.00	40000.00	4.17	166.80	2.70	108.00	-58.80
43	17.00	170000.00	4.89	831.30	2.70	459.00	-372.30
44	7.00	70000.00	5.20	364.00	2.70	189.00	-175.00
45	12.00	120000.00	5.80	696.00	2.70	324.00	-372.00
46	7.00	70000.00	6.47	452.90	2.70	189.00	-263.90
47	9.00	90000.00	7.25	652.50	2.70	243.00	-409.50
48	2.00	20000.00	8.14	162.80	2.70	54.00	-108.80
49	0.00	0.00	9.15	0.00	2.70	0.00	0.00
50	2.00	20000.00	9.93	198.60	2.70	54.00	-144.60
51	2.00	20000.00	11.22	224.40	2.70	54.00	-170.40
52	0.00	0.00	12.23	0.00	2.70	0.00	0.00
53	1.00	10000.00	13.37	133.70	2.70	27.00	-106.70
54	0.00	0.00	15.18	0.00	2.70	0.00	0.00
55	4.00	40000.00	17.26	690.40	2.70	108.00	-582.40
	2344.00	23440000.00		55001.90		63288.00	8286.10

Appendix Table 5.8 : Perbadanan Angkut Felda

AGE	BIL	COVER	QX/1000	EXP COV	QX/1000	ACT VAL	DEF VAL
18	0.00	0.00	2.12	0.00	2.70	0.00	0.00
19	0.00	0.00	2.12	0.00	2.70	0.00	0.00
20	0.00	0.00	2.12	0.00	2.70	0.00	0.00
21	1.00	10000.00	2.12	21.20	2.70	27.00	5.84
22	7.00	70000.00	2.12	148.40	2.70	189.00	40.60
23	10.00	105000.00	2.12	222.60	2.70	283.50	60.90
24	16.00	160000.00	2.12	339.20	2.70	432.00	92.80
25	17.00	190000.00	2.12	402.80	2.70	513.00	110.00
26	30.00	330000.00	2.12	699.60	2.70	513.00	191.40
27	33.00	410000.00	2.12	869.20	2.70	1107.00	237.80
28	33.00	420000.00	2.12	890.40	2.70	1134.00	243.60
29	37.00	450000.00	2.14	963.00	2.70	1215.00	252.00
30	25.00	300000.00	2.17	651.00	2.70	810.00	159.00
31	36.00	480000.00	2.21	1060.80	2.70	1296.00	235.20
32	29.00	345000.00	2.28	786.60	2.70	931.50	144.90
33	36.00	480000.00	2.36	1132.80	2.70	1296.00	163.20
34	25.00	315000.00	2.46	774.90	2.70	850.50	75.60
35	38.00	505000.00	2.57	1297.85	2.70	1363.50	65.65
36	26.00	340000.00	2.72	924.80	2.70	918.00	-6.80
37	17.00	190000.00	2.88	547.20	2.70	513.00	-34.20
38	28.00	430000.00	3.07	1320.10	2.70	1161.00	-159.10
39	26.00	320000.00	3.28	1049.60	2.70	864.00	-185.60
40	11.00	135000.00	3.49	471.15	2.70	364.50	-106.65
41	18.00	250000.00	3.92	980.00	2.70	675.00	-305.00
42	15.00	215000.00	4.17	896.55	2.70	580.50	-316.05
43	15.00	215000.00	4.89	1051.35	2.70	580.50	-470.85
44	12.00	185000.00	5.20	962.00	2.70	499.50	-462.50
45	6.00	650000.00	5.80	3770.00	2.70	1755.00	-2015.00
46	9.00	200000.00	6.47	1294.00	2.70	540.00	-754.00
47	7.00	90000.00	7.25	652.50	2.70	243.00	-409.50
48	5.00	70000.00	8.14	569.80	2.70	189.00	-380.80
49	4.00	45000.00	9.15	411.75	2.70	121.50	-290.25
50	6.00	70000.00	9.93	695.10	2.70	189.00	-506.10
51	9.00	205000.00	11.23	2302.15	2.70	553.50	-1748.65
52	5.00	70000.00	12.23	856.10	2.70	189.00	-667.10
53	3.00	30000.00	13.37	401.10	2.70	81.00	-320.10
54	4.00	55000.00	15.18	834.90	2.70	148.50	-686.40
55	1.00	15000.00	17.26	258.90	2.70	40.50	-218.40
	600.00	8350000.00		30509.40		22545.00	-7964.40

Appendix Table 5.9: Persatuan Bekas Perajurit

AGE	BIL	COVER	QX/1000	EXP VAL	ACT VAL	DEF VAL
18	0	0.00	2.12	0.00	0.00	0.00
19	0	0.00	2.12	0.00	0.00	0.00
20	0	0.00	2.12	0.00	0.00	0.00
21	1	2000.00	2.12	4.24	20.90	16.66
22	0	0.00	2.12	0.00	0.00	0.00
23	1	1000.00	2.12	2.12	10.45	8.33
24	1	1000.00	2.12	2.12	10.45	8.33
25	2	2000.00	2.12	4.24	20.90	16.66
26	0	0.00	2.12	0.00	0.00	0.00
27	0	0.00	2.12	0.00	0.00	0.00
28	0	0.00	2.12	0.00	0.00	0.00
29	1	1000.00	2.14	2.14	10.45	8.31
30	1	2000.00	2.17	4.34	20.90	16.56
31	0	0.00	2.21	0.00	0.00	0.00
32	1	1000.00	2.28	2.28	10.45	8.17
33	0	0.00	2.36	0.00	0.00	0.00
34	0	0.00	2.46	0.00	0.00	0.00
35	0	0.00	2.57	0.00	0.00	0.00
36	1	2000.00	2.72	5.44	20.90	15.46
37	0	0.00	2.88	0.00	0.00	0.00
38	0	0.00	3.07	0.00	0.00	0.00
39	1	2000.00	3.28	6.56	20.90	14.34
40	1	1000.00	3.49	3.49	10.45	6.96
41	3	3000.00	3.92	11.76	31.35	19.59
42	1	1000.00	4.17	4.17	10.45	6.28
43	3	6000.00	4.89	29.34	62.70	33.36
44	3	6000.00	5.20	31.20	62.70	31.50
45	0	0.00	5.80	0.00	0.00	0.00
46	3	5000.00	6.47	32.35	52.25	19.90
47	4	6000.00	7.25	43.50	62.70	19.20
48	3	5000.00	8.14	40.70	52.25	11.55
49	7	10000.00	9.15	91.50	104.50	13.00
50	1	2000.00	9.93	19.86	10.45	-9.41
51	4	7000.00	11.22	78.54	73.15	-5.39
52	1	2000.00	12.23	24.46	20.90	-3.56
53	4	7000.00	13.37	93.59	73.25	-20.34
54	9	15000.00	15.18	227.70	156.75	-70.95
55	12	21000.00	17.26	362.46	219.45	-143.01
56	7	12000.00	17.26	207.12	125.40	-81.72
57	6	8000.00	19.73	157.84	83.60	-74.24
58	5	8000.00	21.76	174.08	83.60	-90.48
59	2	3000.00	23.94	71.82	31.35	-40.47
60	1	1000.00	26.31	26.31	10.45	-15.86
61	1	1000.00	28.93	28.93	10.45	-18.48
62	1	1000.00	31.88	31.88	10.45	-21.43
		145000.00		1826.08	1504.90	-321.18

Appendix Table 5.10

Collected Premium From The Proposed Scheme

- Felda Angkut

Age	Low	Middle	High
18 - 30	-	8280	-
31 - 35	-	1425	-
36 - 40	-	1050	-
41 - 45	-	500	-
46 - 50	-	140	-
		11395	

Source: Calculated from Appendix Table 5.6

Appendix Table 5.11

Collected Premium From The Proposed Scheme

- Felda Kilang

Age	Low	Middle	High
18 - 30	-	3662	-
31 - 35	-	7725	-
36 - 40	-	4235	-
41 - 45	-	2800	-
46 - 60	-	1890	-
		53270	

Source: Calculated from Appendix Table 5.7

Appendix Table 5.12

Collected Premium From The Proposed Scheme

- Perbadanan Angkut

Age	Low	Middle	High	
18 - 30	-	1.6	47.95	
31 - 35	-	-	53.86	
36 - 40	-	-	50.21	
41 - 45	-	-	76.81	
46 - 60	-	-	60.32	
	-	1.6	29074.62	29076.22

Source: Calculated from Appendix Table 5.8

Appendix Table 5.13

Collected Premium From The Proposed Scheme

- Bekas Perajurit

Age	Low	Middle	High
18 - 30	17.84	-	-
31 - 35	2.47	-	-
36 - 40	17.74	-	-
41 - 45	79.27	-	-
46 - 60	790.74	-	-
	907.66	-	-

Source: Calculated from Appendix Table 5.9

Appendix Table 5.14

Percentage of Participants With Respect to Income Group

Organization	Income group		
	Ø1	Ø2	Ø3
Felda Angkut	0	1	0
Felda Kilang	0	1	0
Perbadanan	0	0	1
Persatuan	1	0	0
All together	0.0259	0.8050	0.1690

Source: Calculated from Appendices Tables 5.10, 5.11, 5.12, and 5.13.

Appendix Table 5.15

Number of Participants in Four Organizations With Respect to Risk Types and Income Groups

Age	Low	Middle	High	
18-30	7	2245	209	
31-35	1	366	164	
36-40	3	151	108	
41-45	10	66	66	
46 above	71	29	153	
	92	2857	600	3549

Source: Calculated from Appendices Tables 5.6, 5.7, 5.8, and 5.9.

CHAPTER 6

SUMMARY AND CONCLUSION

6.1 Summary

This study has observed some possible defects of the existing premium rate used by the Malaysian Takaful Company in particular and by insurance companies in general. It then proposed an alternative which is expected to be better especially from Islamic point of view. The gist of this study may be summarized as under.

The existing premium rate considers only risk types, and consequently in a competitive insurance market with the problem of moral hazard and adverse selection, the low-risk and high-risk individuals are not fairly charged. The high-risk individuals are likely to be treated better. In terms of risk types the existing pricing system can still be considered as the most feasible, unfortunately however, it is not so when income factor is considered and justice/equity is seen from Islamic perspective. It tends to lead to unjust treatment to the less wealthy individuals.

By incorporating income factor along with risk factor in determining premium rate, the new premium rate which emerges embodies both, risk and income factors. Individual would then simultaneously be classified and charged differently in terms of both factors.

Consequently now, not only low risk types individuals pay less than that of the higher risk types but low income group individuals also pay less than that of the higher income group individuals.

However, the change is applicable only for the case of Family Takaful, therefore, the company can now implement and offer two different pricing systems i.e premium rate which considers only risk-types (as before) and premium rate which consider both aspects, risk-types and income levels simultaneously (the proposed premium).

The first system is exactly similar to the currently practiced system and applicable only to the General Takaful. It is because individuals seem to be equally wealthy and already classified in terms of their wealth. Therefore, the currently practiced system for the case of General Takaful could still be maintained. On the other hand, the second pricing system is applied for the case of Family Takaful. Compared with the first system, it is only an adjustment by which income factor is now considered.

By switching from Family Takaful schemes into the newly proposed schemes, the less wealthy individuals enjoy more benefits and become the principal gainers of the new schemes. Furthermore, in term of burden for contributing to the fund, the proposed premium rate is likely to produce an optimal result because low and high income groups are now

paying in accordance with their relative ability, the rich pay more while the poor pay less. They are paying the amount at which their marginal value of income are likely to be similar. This means that individuals are now fairly charged because they are bearing equal burden in accordance with their ability.

The proposed premium if implemented, would not negatively affect the financial performance of the company. It guarantees the survivability of the company, as good as it was before. Thus our model is able to accomplish twin goals of Islamic economy, firstly, equity and secondly, efficiency. More interesting is that, the model achieves equity in a way that efficiency is not affected.

6.2 Conclusion

The thesis has contributed in the literature on Takaful Business by suggesting a model. This model integrates income and risk factors in its analysis which has not been done before. Accordingly, it provides a way to attain the Islamic goal of justice and benevolence by allowing low income individuals to benefit from Takaful Company by paying less premium rate. The newly proposed premium rate embodies equity aspect by simultaneously incorporating income factor along with risk factor in its determination. Thus, by implementing this premium rate, individuals are likely to be

fairly treated in terms of both aspects, risk factor as well as income factor. The proposed premium rate is also able to ensure the financial viability of the Takaful company. Furthermore, it can be proved to be financially feasible and could perform as good as other schemes such as Family Takaful, Group Takaful and conventional insurance.

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