International Journal of Engineering & Technology, 8 (1.7) (2019) 297-302

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Causal Loop Diagram of Microtakaful Framework Model with the Integration of Zakat and Waqf

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Abstract

One of the mechanism to provide financial assistant and reduce poverty of the poor is microinsurance or microtakaful. As Islamic institutions, Zakat and Waqf can play an important role providing this microtakaful benefit to the poor as well as reducing the risk of uncertainty in contribution. Even though there are differences in concepts and structure in zakat and waqf, the integration of both institutions will help local zakat authorities and waqf institutions to provide microtakaful benefits as a financial protection to the poor. The aim of this paper is to develop a causal loop diagram (CLD) of the integration of zakat and waqf in providing microtakaful benefit. CLD is one of the important tool in system dynamics approach that helps in visualizing the major variables and the cause and effect relationship between zakat and waqf in a holistic microtakaful model. CLD can be used as a support to the framework in order to ensure the continuity and sustainability of the microtakaful model. This approach will help in visualizing the integration of changes between both zakat and waqf components and the impact of those changes through positive (+) and negative (-) symbol, and balancing and reinforcing of relationships that may result in insolvency of the microtakaful system. The proposed framework model can be used in the long term without having to penalize the parties involved, either the operator, or the participants in order to provide financial protection to the poor. The framework can be useful to the local Zakat authorities and Islamic council on the idea of mutual assistance funds planning to help in uplifting the life of poor and this is one of the urgent agenda for our country.

Keywords: *microtakaful, integration zakat and waqf, causal loop diagram, system dynamics.*

1. Introduction

Many families were unable to cope with their lives after the loss of the head of the family, which usually the breadwinner of the family [1]. The struggling spouse, usually the mother, have to struggle to raise up their children on her own with the little help from any welfare organizations. This situation shows there is a gap in the society where there is a need of social protection in terms of financial assistance to this specific group of people in our country. One of the mechanism to provide financial assistance to the low income group of people is microinsurance or microtakaful.

Group with the low income were defined as a group of people who are ineligibility to participate in receiving normal insurance or takaful protection. This is due to reasons relating to medical history, hazardous occupation, irregular income, insurable interest, and various other considerations that fall within the purview of prudential regulation of exclusive finance [2]. This group are the one who is at the edge of deep poverty, one event of crisis will make them unable to cope with life. Furthermore, they also has limited mechanism to help them to manage their risks, which mainly be the principle reason of the importance of microinsurance or microtakaful [1],[3].

Microinsurance or microtakaful has been introduced as a measures to reduce poverty and promote social mobility, and to break the cycle of poverty [2],[4]. Since many of Malaysians are ill-prepared to cope with unexpected expenses and loss of income, Bank Negara Malaysia (BNM) has already started the discussion paper on microinsurance and microtakaful to ensure balanced and sustainable economic growth, where the product pursue by the insurance industry in Malaysia should be cost-effective and easy-to-understand manner [4]. The emerging interest in microinsurance also reflects the desire of multinational insurance corporations to access markets among low-income communities. In this view, microinsurance is defined as a down-scaled form of insurance tailor made for low-income communities by adjusting the size of premium and the value of the benefits and delivery mechanisms [5].

The complexity of these types of financial protection arises when it implies paying a regular premium in return for an uncertain payout. In addition, it is mostly conceived as a set of individual, rather than group based, contracts where some subscribers benefit from a compensation while others do not. Furthermore, microinsurance is far from being homogeneous as it concerns on a wide variety of risks and takes a lot of different forms [6]. These complexity has become the main constraints in the implementation of microinsurance in Malay-

sia. Other nations such as Indonesia, Afghanistan, Bangladesh, Cambodia, Pakistan and even China already begun in implementing protection for the low income communities through microinsurance.
As an Islamic nation, Malaysia also should implement microinsurance or microtakaful. The purpose of the Shari'ah at the highest level is to preserve and protect the five (5) central necessities as stated by famous Persian scholar Al-Ghazali (1413 AH): "The objective of Shariah is to promote the welfare of the people, which lies in safeguarding their faith (din), their life (nafs), their intellect ('aql), their posterity (nasl) and their wealth (mal). Whatever ensures the safeguarding of these five serves public interest and is desirable." The objectives of Shariah emphasizes man must fulfil his needs and necessities and the rest will follow suit [3].
In providing financial aids to the poor, it is a must for a Muslim to avoid those prohibited elements in Shariah. Takaful, as the known as the Islamic insurance, is free from gharar (uncertainty), maisir (gambling) and riba (interest), which is not allowed in Islam [7]. Therefore, microtakaful is a type of microinsurance that is compliance with shariah principles [8]. This takaful protection is known to be important even to the poor. This group also agreed to have this protection even though they are not willing to pay for the product [3]. Using zakat contribution as the main contributors, and waqf as the operators of those contributions, there are potentials of integrating both zakah and waqf institutions. The effective integration of both concepts in microtakaful insurance will have positive impacts to the poor and needy for attaining their social welfare and to support their financial.
Therefore, the aim of this paper is to develop a causal loop diagram (CLD) of the integration of zakat and waqf in providing microtakaful benefit. This CLD is important as a decision tool in to integrate between zakat and waqf towards producing a microtakaful model [9]. This integration of zakat and waqf is necessary to eliminate the limitations of both institutions in providing such benefits. This CLD can help in visualizing and determining the factors that may influence the components in the model. The CLD also contributes in helping the related institutions and parties to understand the real world of microtakaful structures and the dynamic and complexity of the integration structure [10].
Similar studies have been using CLD as a part of the system thinking approach was found that focus on managing risk that may emerge and the performance in the implementation of model developed [11]–[14]. This approach has been adopted in this study targeted to understand the dynamicity of a pension system and the benefits and uncertainty of cash flows [11]. Besides, CLD also has been used in a study to increase the efficient use of risk management resources and improve effectiveness of management in a new developed risk-based model framework [12] and theoretical management service model [13]. Moreover, this approach is also been adopted to model a complex system relationship of a banking system including economic subsystem that may affect banking system stability with the objective of planning for emergency liquidity assistance [14].
The next section discusses the concept, the approach and the fundementals of microtakaful, zakat and waqf. This section also discusses the previous studies which enhance the importance of incorporating zakat and waqf in providing microtakaful benefits.

2. Literature Review

2.1 Concept and Issues Related to Microtakaful, Zakat and Waqf

In Islamic economics and social welfare, zakat and waqf are the main instruments to distribute the economic wealth from those who are capable to contribute to the poor and needy. However, there are differences in the concepts and operational of these two. Zakat is a compulsory payment made by the wealthy to the specific group which are economically under-privileged. However, the contribution of zakat cannot be considered as charity where there are specific amount have to be contribute and specific group of people to be addressed (also known as the asnaf) [15]. One of the issues in zakat fund is the delay in distributing the fund to the zakat recipients or the asnaf. Another important issues is the denial in the rights of zakat recipients. Having this issues, it is important that the authority in the management of zakat to have a responsible in distributing the fund to ensure that the zakat recipients are receiving those funds [16].
Meanwhile, waqf is defined as perpetual dedication of any property which can be used as charitable purposes. It can be addressed or channel to general population or specific group of people [17], [18]. The wider scope of responsibilities but no specific time constraints in distributing the benefits will make waqf as an important institutions that will manage the funds required in the microtakaful model. The waqf institutions can help in managing the investment and also managing the claims when it is due.
Microtakaful is a financial product that protect the participants against the financial risk, which are specially developed for the poor or the low income group. The concept of microtakaful varies from the takaful from the perspective of target group, claim operations and also the amount of contributions. The target group which are the low income group has a low awareness in the financial protection product such as insurance and takaful. This group usually involved in a hazardous work and also uncertain in payout. Therefore, to make the microtakaful products effectively function, the products has to be designed so that the contributions is affordable, with a simple claim procedures [8]. Microtakaful product developed from the integration of both of waqf and zakat concepts will definitely benefit to the poor and the needy in providing support towards their financial risks [16]. Since microtakaful product should be specifically design for low-income group in terms of benefits, contributions, delivery channels, terms and coverage [1], therefore, there is a need as an initial point, to offer an easy-to-understand insurance product that can be easily implement from both of consumer and operators perspectives[3].

2.2 Studies on the Integration of Zakat, Waqf and Microtakaful Modeling

There are two types of Islamic insurance (takaful) models which are takaful tijari that is more on business oriented, while takaful ta'awuni is based on mutual cooperation [19]. With the main objective of helping the poor (the asnaf) to have financial protection, the profit or surplus from the contribution should not be the prime consideration. This surplus should back up the reserved fund as a preparation for future claims.
There are several studies were discussed on the integrating of zakat and waqf in providing microtakaful benefits to the poor [8], [19], [20]. These studies are being used in this study as a based in understanding the concept of microtakaful from shariah perspective [20] as well as useful in developing the microtakaful framework model that integrates the zakat and waqf [8], [19].
Previously, cooperative microtakaful model has been proposed based on the cooperation from zakat funds, donor institutions, non-government organizations, takaful operators and also the government [19]. This model still imposed the needs to pay the contribution from the participants with the help from subsidies to reduce the amount to be paid to poor. However, the target group (poor) does not consider the benefits from the transaction but they are more consent on whether they can meet the payment obligations [21]. Thus, im-

posing the requirement to pay the contribution, will only reduce the possibility to help the poor to protect themselves against financial risk.
Furthermore, involving many parties in this previous cooperative model such as the government, NGOs, and any other donor organisations, will not help ensuring the continuity and the sustainability of providing microtakaful benefit. It is because that this cooperative model required donations from the said parties and these donations are in voluntarily basis where there will be uncertainty in the commitment and the amount.
The next section discusses the methodology involved in the development of the CLD of microtakaful model.

3. Methodology

3.1 Problem Identification

The exisiting takaful products in the industry have a different target group [20]. Microtakaful is specifically designed to give financial aid to a group with financial incapabilities [3]. In this study, the microtakaful model designed to give financial protection specifically to the group of asnaf. This research proposed the integration model of zakat and waqf tested in the Family Takaful Product. This product provides financial coverage to the beneficiary of the participants (insured) if the participant dies. The insured will be the head of the family who provides the income for the family. This target group, which is the asnaf, is unable to contribute to the premium payment [3]. Therefore, it is necessary to utilize zakat fund to be used as a contribution to the microtakaful model and being managed by waqf institutions. Due to the contributions are entirely provided by the zakat funds collected, the participants can only come from the group of asnaf identified by the zakat authorities.
The key problems identified from the microtakaful insurance are:

i. The microtakaful contributions are provided by the zakat fund, which will help reducing the price risk in the microtakaful model. The participants (asnaf) of the microtakaful benefits will no longer need to pay the contribution.
ii. The main constraint of the zakat fund is the fund collected must be distributed to the asnaf as soon as possible. The integration with the waqf institutions will able to provide investment required and to hold the funds until the claim is due.
iii. In the existing cooperative microtakaful model, there are many parties involved in providing microtakaful benefits. It is a good intention to have more parties involved in order to reduce the contribution amount in the model. However, the donation comes from the other parties will results in uncertainty in the cash flows which will results in unsustainability in providing microtakaful benefits.

3.2 Proposed Framework Model of Zakat and Waqf Integration

The proposed framework of the microtakaful model is based on the key problems mentioned in the earlier section. The main goal of the model is to provide a sustainable microtakaful benefit without considering any profit elements. This proposed model only concentrate on the zakat and waqf institutions. Both institutions are integrated to build a sustainable microtakaful model in the long term. Therefore, the objectives of the microtakaful model are:

i. To provide microtakaful benefits to the asnaf where the contributions will provided by the zakat fund
ii. To use waqf institutions to manage funds which required the investment returns and claim management

To sustain the funds in the long term, Figure 1 below shows the proposed framework of the microtakaful model, with the integration of zakat and waqf institution:

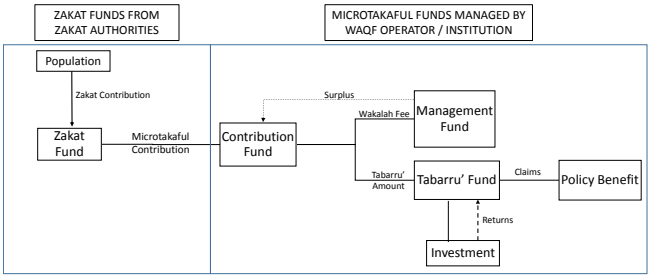


Fig. 1: Proposed Framework of Zakat-Waqf Microtakaful Model

The Zakat Fund, which will be contributed by the population through their zakat contribution which is determined by their income, will be the sole provider of the microtakaful operation. A specific amount of microtakaful contribution for each participants, will be managed by the waqf operator. This microtakaful contribution deducted from the Zakat Fund will be determine based on the consideration of tabarru' (donation) amount and the wakalah fee. From this microtakaful contribution, the waqf operator will manage three separate funds which are the Contribution Fund, the Management Fund and the Tabarru' Fund as proposed in the Figure 1.
The contribution fund will act as the participants' fund for the purpose of managing contributions received from the zakat. This Contribution Fund, will accumulates through the deduction of microtakaful contribution from the Zakat Fund. Next, this Contribution Fund will be separated into two funds which are Management Fund and the Tabarru' Fund.
The objective of Management Fund is to provide any expenses occurred in managing this microtakaful operation. The surplus from effective and efficient management of the Management Fund will be return to the Contribution Fund. The amount contributed into this fund is called Wakalah Fee, where the Waqf operator will act as an agent to the participants. This Wakalah model approach is suitable in reducing financial risk to the operator [22].
The Tabarru' Fund is the main fund that will provide the microtakaful benefits. The fund will received specific tabarru' (donation) amount from the Contribution Fund. The tabarru' amount is calculated with the consideration of the investment returns and the mortality rate of the participants. This fund needs to be properly invest so that the investment return's assumptions will help to reduce the microtakaful contribution. However, the assumptions need to be prudent so that difference between the assumptions of return from the investment and the actual return from the investment will not affect the Tabarru' Fund in providing microtakaful benefit when it is due.

In sustaining those funds, it is required to further investigate the factors that may influence the cash flows of the funds. Due to the existence of relationships between those factors, the CLD was used to visualize the cause and effect of the factors involved that may result in unsustainability of the microtakaful model.

3.3 Development of Causal Loop Diagram of Microtakaful Model

System dynamics is one of discipline in Operational Research, which is a combination of conceptual tool (qualitative approach) and modeling methodology (quantitative approach) that capable in providing a holistic view of the system [13], [23].
Causal loop diagram (CLD) or known as influence diagram is one of the important tool in system dynamics approach that is useful to conceptualize a dynamic model [24]. It is a tool to visualize a cause and effect relationship between components in the system and to understand the structure as well as the relationship or behavior involved that would affect the component in the system. Interestingly, CLD also can provide a clear view of how the change of one factor in the model triggers changes in another factor. These relationships can be non-linear, indirect, and modified by related factors. In addition, these factors are simultaneously controlled by different components with some factors can be controlled by multiple components [13], [25-27].

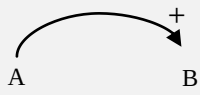
3.4 Steps in the Development of Causal Loop Diagram

The CLD diagram presents a hypothesis of what would happen if a certain change occurs in the systems' components rather than predicting the actual outcome [26]. There are two main phases involved in developing CLD which are the problem articulation and the model conceptualization [13], [24], [26], [28]. The methodology of developing CLD for the microtakaful integration model is based on these steps:

i. Determine the name of each variables.
   In this stage, key variables in the microtakaful model is defined to represent the functions in the system. The key variables name are population, zakat fund, contributions, tabarru' fund, management fund, investments, claims and mortality.
ii. List variables which appears to be a problem.
   The main issue to be solved in the model is when the model become unsustainable in the future where the future claims is more than the future contributions.
iii. Determine the cause of variables which contributes to the problem
   In this stage the variables are linked based on the relationship among those variables. As an example, there is relationship among the mortality rate with the claims, and also the zakat fund with the populations.
iv. Determine the effect of variables which resulted from the problem.
   To ensure the sustainability and solvency of the microtakaful model, the tabarru' fund should have more funds to meet the claims when due. Therefore, any variables that results in insolvency of the model should be properly examine. As an example the increase in mortality rate and the lower growth of tabarru funds from low investment returns.
v. Connect and label the causal relationship either (+) or (-) among variables.
   This step is important to visualize the relationship for all variables in the model.
vi. Determine either there are loop occurs from each causal relationship, such as balancing loop or reinforcement loop.
   This step is to discover the causal behavior over time among the variables. The behavior can caused in growth (decline) over time or steadily being balanced by the opposite changes of the variables involved.

The arrow and the sign on the arrow used in the diagram to indicate the influence factor and the direction of the influence either result in increase or decrease of the components related [13], [26], [27]. The symbols in the CLD can be interpreted as shown in the table below:

Table 1: Symbols and Interpretation in Causal Loop Diagram

Symbol	Interpretation
	When all else are equals, if A increases (decrease), then B increases (decreases).
	When all else are equals, if A increases (decrease), then B decreases (increases).
	Reinforcement loop, where the components in this loop will gradually increases (decreases) exponentially over time
	Balancing loop, where the components in this loop will approaching some target over time

4. Causal Loop Diagram of Zakat-Waqf Integration Model

The CLD of the proposed microtakaful model framework is presented in the Figure 2 below:

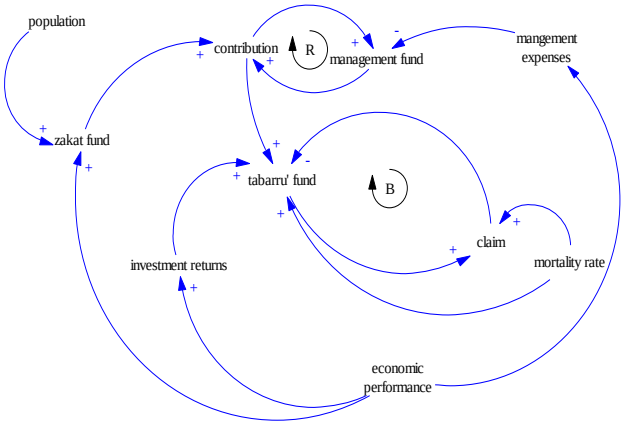


Fig. 2: Causal Loop Diagram for Microtakaful Model

Referring to the figure, the model consists one reinforcing loop and one balancing loop. The reinforcing loop is the management fund loop (R) and the balancing loop is the tabarru' fund loop (B).
This microtakaful model proposed in this paper provides benefits through the consistent contribution from the zakat fund. The zakat fund value, which is mainly based on the income of the population of the state or nation, is proposed to be a sole provider to provide microtakaful benefits to the asnaf. Increase in the number of population, will increase the collection of zakat. There are three funds proposed to be included in the model which are contribution fund, management fund and the tabarru' fund.
This contribution amount from the zakat fund into the contribution fund is based on the waqf management expenses required and also tabarru' deduction to the tabarru' fund. If there are surplus in the management fund which results from the efficient of the waqf management, the surplus will be return back to the contribution fund. This will result in reinforcing loop between contribution fund and management fund. The reinforcing loop in this system is expected to have a growth trend where the contribution fund and management fund continues to grow. The number of partcipants will increase as a result in increasing number of populations and hence will result in increasing in contributions.
The tabarru' fund, which is based on tabarru' deduction, will be used to pay out claims when due. The tabarru' deduction will be based on the mortality assumptions and also the investment assumptions. The formulation to calculate the tabarru' deduction is similar to the calculation of net premium in life insurance policy. The claim and the tabarru' fund will have a balancing loop where the claim made will reduce the accumulated value in the tabarru' fund and the increasing in expected claim will increase the tabarru' deduction, and later will result an increase in tabarru' fund. The balancing feedback loop (B) will help to achieve minimum target requirement of the tabarru' fund in order to meet future claims.
One of the importance variables included in the model is the economic performance. This economic performance will influence the performance of the management of the model through the management expenses and also influence the investment performance of the tabarru' fund.

5. Conclusion

This paper proposed a microtakaful framework model that addressed the problem faced by the asnaf in their commitment to provide microtakaful contribution. The model proposed in this paper only involving zakat and waqf with both functioning to reduce the uncertainty in the cash flows in order to provide a sustainable structure in providing microtakaful benefits. The CLD developed in this study helps in identifying the important factors involved in the integration of these zakat and waqf that may influence the sustainability of the microtakaful system. Besides, the proposed CLD also used to visualize how the change in funds either zakat fund, contribution fund, management fund and tabarru funds in the model triggers changes in the investment strategies and returns from investments.
This proposed microtakaful model framework can be used as a basis in designing the future products of microtakaful and making decisions on mutual assistance funds planning.

6. Recommendation and Future Work

To ensure continuity and sustainability of the fund, it is recommended that this microtakaful model is being tested and validated through a systematic approach to ensure the effectiveness of the microtakaful model before it is being implemented. One of the method which capable of meeting this objective is through system dynamics approach through the development of stock and flow diagram. This stock and flow diagram can be used to simulate the conceptual model developed in CLD, which will be more towards quantitative analysis. This simulation model will assist in determining the outcome based on policies, conditions, and decisions of the amount of contributions needed for each participants in the microtakaful model and also the amount of benefit should be given to the recipients.
By integrating risk management and system dynamics approach, it is possible to identify risk factors involved [11]. These information can be used to suggest recommendation towards the improvement of the model to ensure the continuity and sustainability. Furthermore, this system dynamics approach capable incorporates macroeconomic variables that may influence the contributions and investment returns of the fund [19]. The impact from the changes of the components, either it is big or small, can be visualized and support the operators of microtakaful model to determine the point of risk that may result in insolvency of the fund, and later result in unsustainable of microtakaful system [29]. All of the issues and recommendations mentioned should be addressed in the future work. It should also include the comparison of policies, decisions or strategies by the operators to sustain the microtakaful model through system dynamics model simulation analysis.

Acknowledgement

Appreciation and thanks to Universiti Teknologi MARA on university's grant code: 600-IRMI/DANA 5/3/LESTARI (0106/2016) for the research titled: "Development Of Dynamic Pricing Model For Takaful Insurance Products."

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