



Liability Driven Investment Analysis for Hajj Financial Management Optimization using Analytic Network Process Approach

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Abstract: In this research, a liability-driven investment strategy is determined which aims to optimize hajj financial management using the Analytic Network Process approach. Based on the results of Benefit, Opportunity, Cost and Risk (BOCR) approach, it shows that in a liability-driven investment strategy, the benefit (excess) and risk components are the most important factors that investors pay attention to. In determining alternative liability-based investment strategies, there are 2 (two) approaches, either by carrying out portfolio immunization (duration matching) or cash flow matching (cash-flow matching). From these two strategies, it was found that the portfolio immunization strategy was the most suitable strategy to be implemented at BPKH in terms of the return and risk dimensions. Then the strategy is implemented through a portfolio-mix combinations between hedging portfolios and growth portfolios (return generating portfolios), and the most appropriate composition based on the dimensions of returns and risks is the hedging portfolio whose magnitude is above the growth portfolio. It can be said that BPKH can carry out a liability-driven investment strategy through a portfolio immunization strategy that contains a hedging portfolio (such as SBSN and corporate sukuk) that is larger than the growth portfolio (such as KIK EBAS, EBAS-SP, KIK DINFRA, KIK DIRE, Limited Investment Mutual Funds, and Direct Investment and Others).

Originality/Value: The novelty of this study is analysing the hajj fund by BPKH in a deeper and specific extent by displaying future liability data.

Introduction

Performing hajj is one of pillars of islam that is mandatory to be performed by a muslim for those who are eligible. In Indonesia itself, there are 238 million muslim in 2022 according to a report from The Royal Islamic Strategic Studies Centre (RISSC). It is equivalent to 87% of the total population in

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Indonesia. Converting those number into the global perspective, Indonesian muslims are about 12% of the total population. As a consequence of being the biggest muslim countries in the world, the hajj quota for Indonesia is also the largest among other countries. In 2023, there are 221000 people performing hajj and it is recorded as highest number in terms of hajj quota outside Saudi Arabia (Keputusan Menteri Agama Nomor 189 Tahun 2023 tentang Kuota Haji). The number will increase in the future due to the high demand and cause longer waiting period for the hajj performer candidate. The increased number of pilgrims also cause large amount of hajj pilgrims fund accumulated that need to be optimized to cover the gap between the cost paid by the pilgrims (Bipih) and the real cost (BPIH).

The real cost of hajj (BPIH) will increase in the future due to several reason such as inflation, geopolitical situation, and exchange rate. However, the additional hajj cost will not be borne by the pilgrims. In optimizing the benefits value of Hajj pilgrims' funds, an accountable and efficient financial management is needed. Hajj fund management act is created as a legal basis to regulate the management of Hajj pilgrims' BPIH deposits, DAU and other sources. Charging BPIH to the value of benefit risks the sustainability of hajj fund due to the fact that the value of benefit is not the right of pilgrims that performs hajj in this period, but also the pilgrims in the future that are still waiting for their turn.

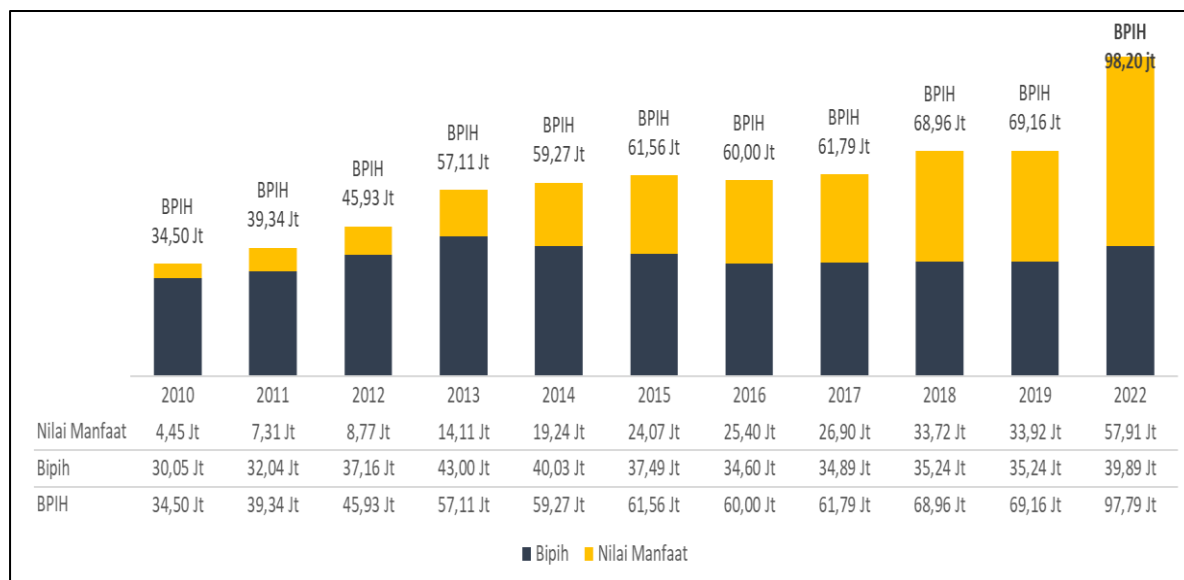


Figure 1. The Comparison between BPIH vs Bipih in 2010-2022
Source: (BPKH, 2022)

Figure 1 illustrate the comparison of the cost paid by the pilgrims (Bipih) and the real cost (BPIH) in 2010- 2022. Overall, it can be seen that the real cost constantly increased throughout the period while the cost paid by pilgrims remains relative constant. This caused the benefit value or gap between the cost paid by the pilgrims (Bipih) and the real cost (BPIH) increased. The real cost of hajj started just over Rp. 34 million in 2010. The real cost then increased until 2015 before slightly decreased in 2016 then rose until the end of the period reaching just below Rp. 98 million in 2022. The cost paid by the pilgrims started over Rp. 30 million in 2010. It rose until 2010 reaching its peak with Rp.43 million. Different with the real cost, the cost paid by pilgrims constantly decrease after reaching its peak until the end of period with just below Rp. 40 million in 2022. The gap between the cost paid by the pilgrims (Bipih) and the real cost (BPIH) started just below Rp. 5 million in 2010 and constantly increased until the end of period reaching more than Rp. 57 million in 2022.

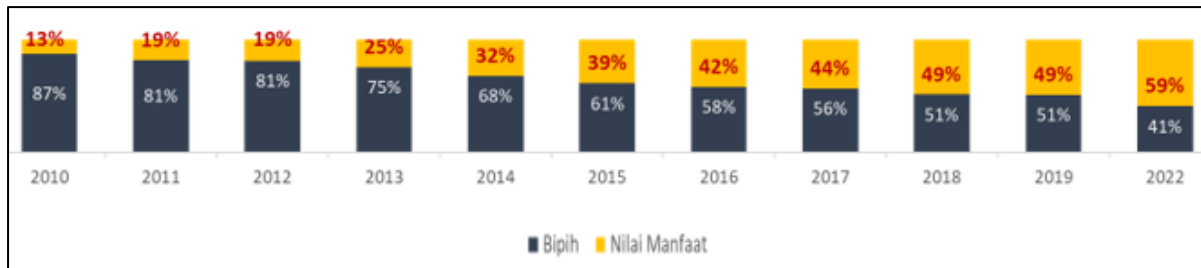


Figure 2. The Composition of The Real Cost (BPIH) 2010-2022
Source: (BPKH, 2022)

Overall, it can be seen that the composition of BPIH changes over the period, which can be seen on Figure 2. In the beginning of the period, the real cost is dominated by the cost paid by pilgrims. The domination of Bipih decreased throughout the period and it becomes balance in 2019 where the real cost consists of 51% of Bipih and 49% of benefit value. At the end of the period, benefit value overcome Bipih in terms of the real cost composition. In 2022, the composition of real cost consists of 59% and 41% for benefit value and Bipih respectively.

Hajj fund investment which is regulated by UU No 34/2014 dan PP No 5/2018 is the backbone of benefit value achievement that covers the gap between the cost paid by pilgrims and the real cost. The investment is dominated by securities investment which is the biggest contributor of BPKH's benefit value with 76% in 2021, 81% in 2022, 83% in 2023, and 64% in 2024. The type of instrument selection and investment tenor selection is determined by the profile and growth in BPIH payment obligations which is the core strategy liability driven investment or using Analytic Network Process approach which is a qualitative methodology. The aim of this study is to analyze the advantages and weakness of liability driven investment. The analysis discovers the potential and risk of liability driven investment in case it is applied in BPKH through priority analysis of the importance of each criterion.

There are several studies about Liability-Driven Investment. [Singhal \(2014\)](#) highlights the importance of asset and liability management strategies on in designing insurance investment policy. Asset and liability management in an insurance company is crucial to achieve a sound financial management and to meet cash flow needs and capital requirements. In Indonesia, [Hulwati et al. \(2022\)](#) studies the hajj fund management. It is stated that investment is the correct way to provide benefit for the welfare and benefit of pilgrims. The return of the investment becomes government subsidy for the pilgrims to cover the gap between the cost that is paid by pilgrims to government and the real cost of hajj. The novelty of this study is analyzing the hajj fund by BPKH in a deeper and specific extent by displaying future liability data. The contribution of this study to the literature is done through several ways. For the academic environment, this study adds the knowledge about strategies on liability-based investment portfolio management. For the stakeholders, this study provides valuable input on the conditions of Hajj financial obligations and optimization of securities investment instruments, as reflected in the liability-based investment strategy and portfolio mix. For the regulators, this study is useful for Islamic capital market development in terms of liquidity and product development for the sake of a sustainable and fair hajj fund management.

Literature Review

Literature review is divided into two; literature review on liability driven investment and literature review on hajj fund management. Literatures on liability driven investment are done by [Shang \(2021\)](#), [Ang et al. \(2013\)](#), and [Wall \(2020\)](#). Literatures on hajj fund management is done by [Hulwati et al. \(2022\)](#), and [Witjaksono and Bustomi \(2021\)](#). [Shang \(2021\)](#) evaluate the effectiveness of RL compared to traditional strategic asset allocation methods, a sample DB plan was modeled with economic scenario generation, dynamic liability projection, asset allocation and surplus projection. The results showed that RL is able to generate reasonable investment strategies with the potential for generating better risk-return tradeoffs than optimal static strategies that have a target time horizon. [Ang et al. \(2013\)](#) develop a liability driven investment framework that incorporates downside risk penalties for not meeting liabilities. The results showed that the shortfall between assets and liabilities can be valued as an option.

The option pays the difference between liability and asset value at maturity, if the liabilities are greater than the assets, and zero otherwise. [Wall \(2020\)](#) establish a general and flexible terminal surplus optimization framework in continuous time, which allows for dynamic investment strategies and stochastic liabilities. The study finds that the constraints have a considerable impact on the investment strategy in the base scenario for the investor with power utility whereas the investor with HARA utility reduces the risk even without constraints as there lative surplus (RS) decreases.

[Darwis \(2019\)](#) focus on asset and liability management in banking industry. Asset and Liability Management in banking industry consists of managing assets and liabilities in a disciplined manner, in line with changes in banking regulations in implementing prudential banking principles. [Jang et al. \(2021\)](#) suggest an optimal liability-driven investment (LDI) strategy for a closed defined-benefit pension fund including real assets. Our results show that an optimal LDI portfolio with the key-rate duration matching bond strategy is superior to both a duration-convexity matching bond strategy and an aggregate bond index-tracker strategy. [Tammam-Hastings \(2021\)](#) examines optimal investments from the perspective of investors with sustainability-related obligations. Relevant optimization issues can rarely be tracked analytically, but liability-driven investments can significantly outperform common strategies that don't account for liabilities. Both focus on the profile and size of liability in determining investment strategy. Add longevity risk management factor to determining the level of liability related to future mortality. [Singhal \(2014\)](#) highlights the importance of asset liability management in designing insurance investment policies and the various strategies included in the asset liability management framework. The result of the study reveals that ALM is relevant to, essential for, the sound financial management of insurance companies that invest to meet future cash flow needs and capital requirements. Fulfillment and analysis of future obligations is absolutely necessary to avoid bankruptcy where the asset value is unable to cover obligations. The focus is on the insurance sector

For the literatures on hajj fund management, [Hulwati et al. \(2022\)](#) aims to analyze the Management of Hajj Fund in Indonesia. The result stated that the Hajj funds managed by BPKH have been placed on deposit and investment in securities. The placement of hajj funds in this investment means that the previous Ministry of Religion and the current BPKH have tried to develop and make the existing funds productive to have a positive impact and benefit and provide benefits for prospective pilgrims in the future. [Witjaksono and Bustomi \(2021\)](#) focus on measuring BPKH risk profiles related to investment and the risks and returns of various financial instruments available for investment. The results showed that the analysis result to risk-return profile from various investment assets is known to deposit sharia banking and gold as a riskless asset. [Ghofar, Firdaus, and Rulindo \(2019\)](#) analyze the criteria for investing in Hajj funds and alternative investments that provide benefits to Muslims so that they have an impact on economic growth. The results showed that investment in infrastructure and the real sector provides benefits to Muslims economically, so as to improve the welfare of Muslims which in turn can encourage economic growth.

Methods

This study employs qualitative approach gaining the data through indepth interview and inputting questionnaires from several respondents. The respondents in this study are expert from BPKH itself that are the decision maker, expert from DSN-MUI representing the shariah perspective, academician, stakeholder from the ministry of religion that are related to hajj, stakeholder from ministry of finance that are generating sukuk as the biggest contributor of BPKH's investment portfolio, stakeholder from OJK and Bank Indonesia representing the regulatory and supervisory authority in Islamic capital market, and practitioner in the Islamic capital market that initiated the liability driven investment model in their portfolio. The data are analyzed using Analytical Network Process (ANP) method with a Benefit, Opportunity, Cost and Risk (BOCR) network structure approach to identify, classify, and arrange all the factors and interest that are affecting the result. Beside that, ANP enables feedback and interdependence between criteria in the BOCR network structure which ease the decision making. Beside using primary data from high-level respondents, this study also input secondary data from monthly investment reports, financial reports, data from KPKH and BPKH. In the ANP analysis, the number of respondents is not used as a validity benchmark. The condition for valid respondents in ANP is the expertise in their fields.

There are 10 respondents from eight institution; three of them are from BPKH who is the head that are doing the hajj fund management and seven are from academicians, regulators, experts in sharia field, government and practitioner from the capital market. The details of the respondent can be seen on [Table 1](#).

Table 1. List of Respondent in the Study

No	Name	Institution	Position
1	Fadlul Imansyah, SE, MM CiFP, AAK	BPKH	Head of Executive Board
2	Dr. H. Indra Gunawan, SE., SIp., MSc., CSA, CPM, CIB, ACI Arb, CIMBA	BPKH	Member of the Executive Board for Securities and Gold Investment
3	Dr (Cand). Eko Surya Lesmana, CTP, CRP, CIB, CPM, LCCC	BPKH	Deputy for Risk Management
4	H. Ramadhan Harisman, ST, MBA	Ministry of Religion	Head of the Planning Bureau of the Secretary General of the Ministry of Religion
5	Dr H. Rahmat Hidayat, SE, M.T.	DSN - MUI	Member of the DSN-MUI Management Board
6	Arif Machfoed	Otoritas Jasa Keuangan	Deputy Director of Islamic Capital Markets
7	Rifki Ismal, Ph.D.	Bank Indonesia	Deputy Director of the Department of Sharia Economics and Finance, as well as senior researcher
8	Agus Prasetya Laksono, S.E., M.Si.	Ministry of Finance	Head of Sub-Directorate of Project Management and State Sharia Securities Assets, Directorate of Sharia Financing, Directorate General of Financing and Risk Management.
9	Dr Beny Witjaksono, S.P., M.M.	Esa Unggul University	Lecturer of Islamic Economics and Finance at Esa Unggul University
10	Astri Octora, CFA	Manulife Asset Management Indonesia	Head of Product and Advisory PT Manulife Asset Management Indonesia

Result

The descriptive analysis is done through questionnaire filling to several experts and practitioner, regulator and academicians, which is described on Figure 3. Respondents that filled out the questionnaire consisted of 5 (five) experts, 4 (four) regulators and 1 (one) academicians. Expert/practitioner respondents are industry players with practical experience as managers or are involved in managing Hajj funds. Regulatory respondents are experts from the government or institutions that are related to the Hajj funds management. While academic respondents are those who are involved in the education sector, especially universities with knowledge in the Hajj funds management.

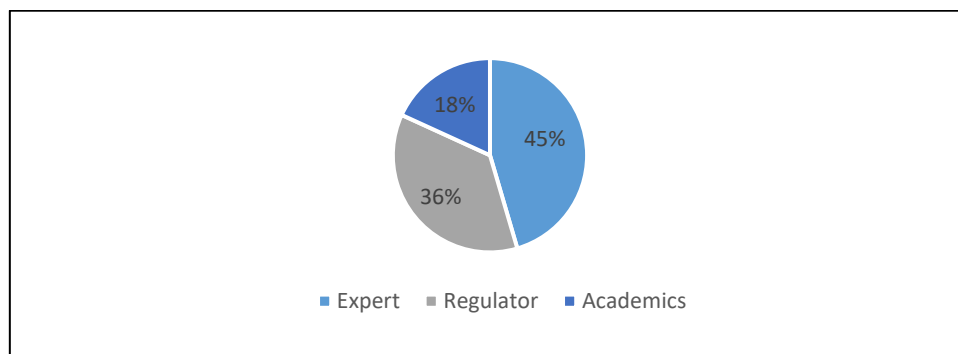


Figure 3. The Composition of Respondents Based on the Background

Liability Based Investment Strategy Analysis

Analytic Network Process

The hierarchical structure of the Analytical Network Process (ANP) in this study has levels of goals, criteria, sub criteria, and alternatives. At the goal level, the aim is to know the liability-based investment strategy. At the criteria level, Benefit Opportunity Cost Risk (BOCR) is used. Meanwhile, the sub-criteria in the ANP hierarchical structure are criteria for each aspect as follows:

- a) The benefit feature aspect with several criterias such as matching assets with liabilities, accurate investment tenors, minimizing market risk and reinvestment risk, optimal returns, and safe due to the principal value protection
- b) The opportunity method aspect with several criterias such as active management through portfolio rebalancing, asset allocation through hedging portfolios and return generating portfolios, diversification, sustainability in dealing with fluctuating liability conditions, and appropriate for the application
- c) Cost aspects including uncommon in Indonesia, volatile liability growth, a lot of macroeconomic factors that influence liability growth, limitations of sharia instruments that are in in line with liability cash flows, and assets and liabilities matching condition
- d) The risk aspect with several criterias such as scarcity of new instrument when it comes to rebalancing in accordance with the cash flow of liabilities, deep monitoring, low rate of return due to secure cash flow obligations through fixed income instruments, failure in projections of future obligations, and suboptimal Regulatory arrangements.

Those criterias and aspects are scored by rating and numeric scale, as explained on [Table 2](#) below.

Table 2. Comparison of Verbal Rating Scale and Numeric Scale

Verbal Rating Scale	Numeric Scale
Very much higher level of importance	9
	8
Much higher level of importance	7
	6
Higher level of importance	5
	4
Slightly higher level of importance	3
	2
Same level of importance	1

There are two choices of model in the alternative level; portfolio immunization which refers to duration matching and cash flow matching. Out of these two choices, there are three possibilities that can be done through portfolio mix that generate optimum return and measurable risk. When the hedging portfolio is bigger than return generating portfolio, it can be called as low risk condition. When the hedging portfolio is as big as the return generating portfolio, it can be called as moderate risk condition. When the hedging portfolio is smaller than return generating portfolio, it can be called as high-risk condition. The questions in the ANP questionnaire are in a table form. In the data input process, questionnaire table is converted into pairwise comparison by comparing which elements have the greatest influence in terms of importance level and how big the influence is.

[Figure 4](#) displays ANP framework where the data collection is utilizing Super Decision Software 3.2. version. After that, the data will be analyzed with the method developed by [Saaty and Vargas \(2013\)](#). The result of ANP analysis showed that the combined assessment of criteria, sub-criteria and alternatives regarding the structure are consistent. Furthermore, the analysis asses and create an overview of each element of the priorities.

The analysis answers the first problem which are the advantages, weaknesses, potential and risks of implementing a liability-based investment strategy through analyzing the priority importance of each

criterion. The result of ANP indicate that the benefit opportunity cost risk aspect is crucial to determine the liability driven investment strategy in the hajj financial management.

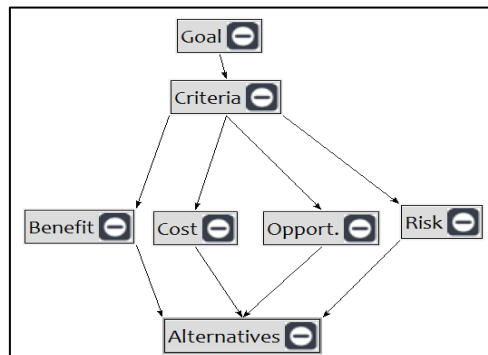


Figure 4. ANP Structure in Super Decision Software 3.2 Version

Table 3. Output Analytic Network Process Data Analysis

Criteria	Weight	Rank	W
1. Benefit	0.33	1	0.000
2. Opportunity	0.21	3	
3. Cost	0.15	4	
4. Risk	0.31	2	
Benefit			
1.1. Matching Aset with Liability	0.31	1	0.059
1.2. More accurate investment tenor	0.21	2	
1.3. Market risk minimalization and reinvestment risk	0.20	3	
1.4. More optimal return	0.13	5	
1.5. Safer due to principal value protection	0.16	4	
Opportunity			
2.1. Able to use active manage scheme through portfolio rebalancing	0.22	3	0.060
2.2. Asset allocation through portfolio hedging and portfolio generating return	0.15	4	
2.3. Diversification	0.26	1	
2.4. Resilience in conditions where the liability fluctuate	0.22	2	
2.5. Suitable to be implemented in fix benefit scheme like BPKH	0.14	5	
Cost			
3.1. Rarely applied in Indonesia	0.13	5	0.059
3.2. Volatile liability growth which is hard to be projected	0.17	4	
3.3. Several macroeconomic factors affect the liability growth	0.20	3	
3.4. Scarcity of Islamic instrument that suit the liability and cash flow	0.27	1	
3.5. Difficulty in realizing asset and liability matching	0.22	2	
Risk			
4.1. Difficulty in rebalancing	0.28	1	0.060
4.2. Deeper monitoring is needed	0.19	3	
4.3. Low return	0.23	2	
4.4. Failure in projecting process	0.17	4	
4.5. Lack Of Regulation	0.12	5	
Alternative Strategy			
5.1. Portfolio Immunization			1,00
5.1.1. Risk	0,47	2	
5.1.2. Return	0,53	1	1,00
5.2. Kas Cash Flow Matching			
5.2.1. Risk	0,55	1	
5.2.2. Return	0,45	2	
Alternative Portfolio Mix			
6.1. Hedging Portfolio > Growth Portfolio	0.39	1	0.148
6.2. Hedging Portfolio = Growth Portfolio	0.31	2	
6.3. Hedging Portfolio < Growth Portfolio	0.30	3	

Source: Processed by The Author.

After we processed the ANP framework on this research, by analysing BOCR approaches, we could define and list down the output as shown below on [Table 3](#).

Discussion

The results of the ANP analysis show that the combined assessment of criteria, sub-criteria and alternatives made by respondents regarding the structure has a good level of consistency. Furthermore, an assessment of each element, as well as creating an overview of the priorities for each element is produced. In order to achieve the aim of this research, to determine the Liability Based Investment Strategy in the context of Optimizing Hajj Financial Management, it is necessary to pay attention to the Benefit Opportunity Cost Risk aspect. Based on the results of data processing, the priority order of aspects that contribute to the Obligation-Based Investment Strategy is obtained.

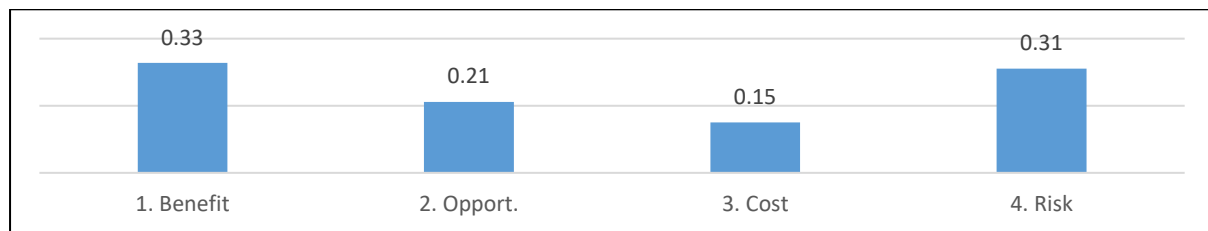


Figure 5. Benefit Opportunity Cost Risk Criteria

[Figure 5](#) shows the aspects that contribute to the liability-based investment strategy. The first priority for developing liability-based investment strategy is benefit with a value of 0.33. The risk aspect contributes as the second priority with a value of 0.31. Opportunity occupies the third priority with a value of 0.21. The last priority is Cost with a value of 0.15.

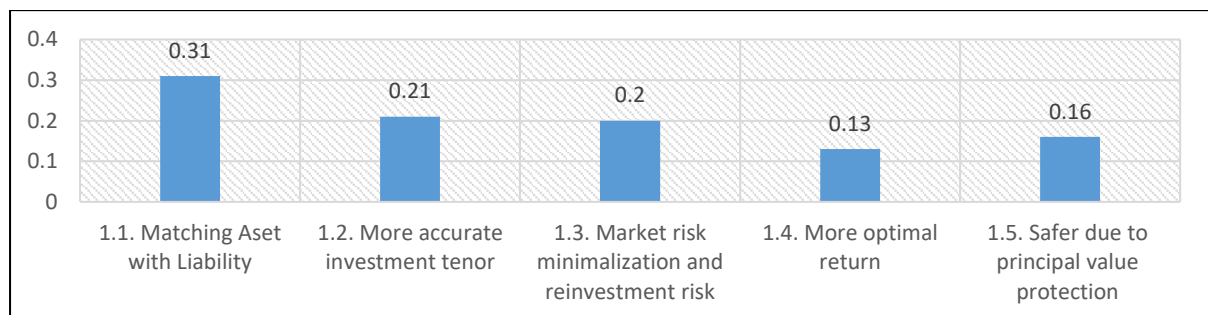


Figure 6. Benefit Criteria

Furthermore, the importance of each element in the advantages, weaknesses, potential and risks of the liability-based investment strategy is explained. [Figure 6](#) shows that matching asset and liability criteria is the first priority with a score of 0.31. Matching asset and liability in the sub-criteria aspect is rated as the highest by experts and practitioners. Implementing appropriate, easy-to-understand matching of assets and liabilities is an important thing to consider in developing a liability-based strategy. Fulfilling this criterion in investment is the most important thing for developing a liability-based investment strategy. The investment tenor criteria as the second priority is more accurate in contributing with a value of 0.21. The criteria for minimizing market risk and reinvestment risk is the third priority with a value of 0.20. Safer due to principal value protection criteria is the fourth priority with a value of 0.16. The implementation of a precise asset-liability matching is important in developing a liability-based strategy.

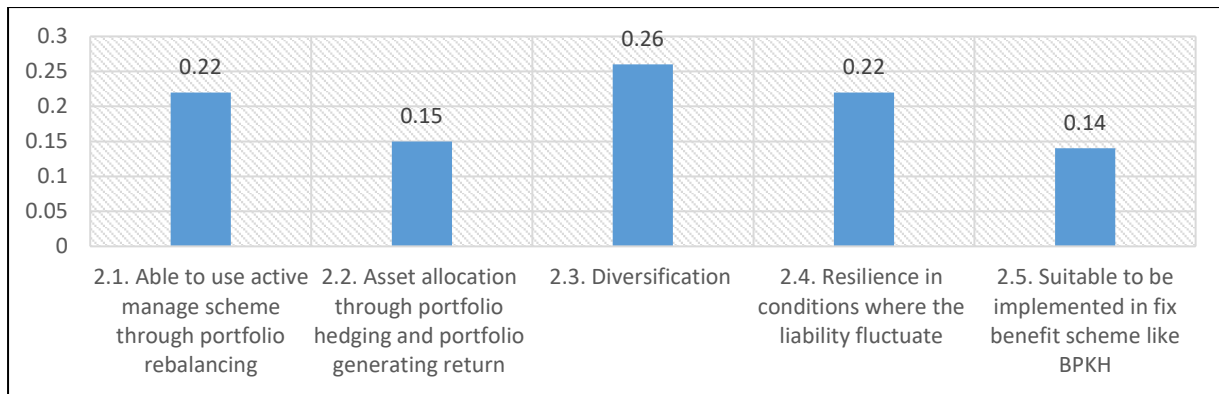


Figure 7. Opportunity Criteria

Figure 7 shows that diversification criteria is the first priority with a score 0.26. Diversification criteria in the sub-criteria aspect is rated as the highest by experts and practitioners. It is needed to attract investor. Able to use active manage scheme through portfolio rebalancing resilience in conditions where the liability fluctuate contribute the same with 0.22. Asset allocation through portfolio hedging and portfolio generating return criteria is the third priority with 0.15. Suitable to be implemented in fix benefit scheme like BPKH is in the fourth priority with 0.14. Several investment products are needed based to attract investor in terms of an optimum hajj fund management based on the result of this sub-criteria.

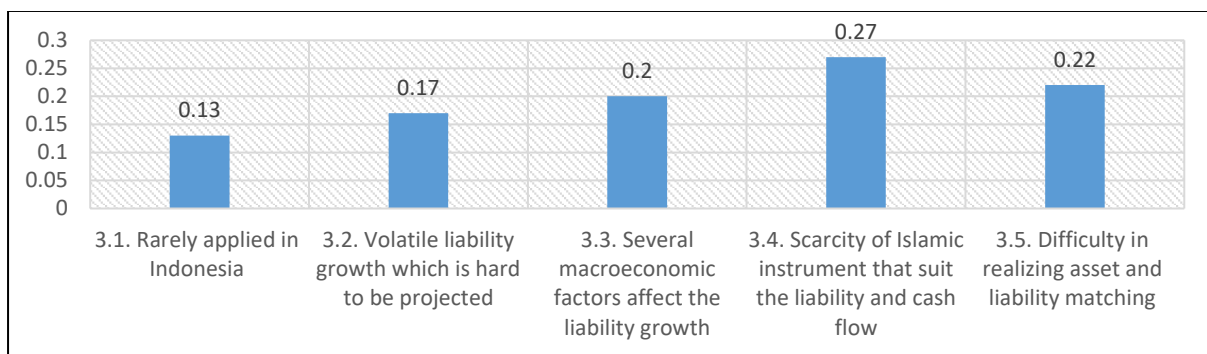


Figure 8. Cost Criteria

Figure 8 shows that scarcity of Islamic instrument that suit the liability and cash flow criteria is rated as the highest by experts and practitioners. It is indicated that diversification of investment products and more intense product marketing are needed to enlighten the investors about sharia-based investment products. Difficulty in realizing asset and liability matching criteria contribute with a score 0.22. Rarely applied in Indonesia is the last criteria with a score 0.13. Liability based investment strategy needs to be improved somehow to increase the awareness of the investor about it.

Figure 9 shows that difficulty in rebalancing is the first priority rated as the highest by experts and practitioners with a score of 0.28. It is indicated that in rebalancing process, there is a difficulty to get instruments that suit the liability profile. In other words, the current rebalancing process is based on the product available in the market, not based on the cash flow of the liabilities profile. Low return criteria due to cash flow of liabilities securitization through fixed income instruments contribute with a score of 0.23. It indicates that the return does not suit the expectation of the investors. Lack of regulation criteria contribute with a score of 0.12. Adequate regulations are needed to regulate liability driven investment better in Indonesia.

There are two alternative liability-based investment strategies can be implemented and developed; portfolio immunization/duration matching and cash flow matching/tenor matching through risk dimension and return. Both alternatives are presented in Figure 10 and Figure 11.

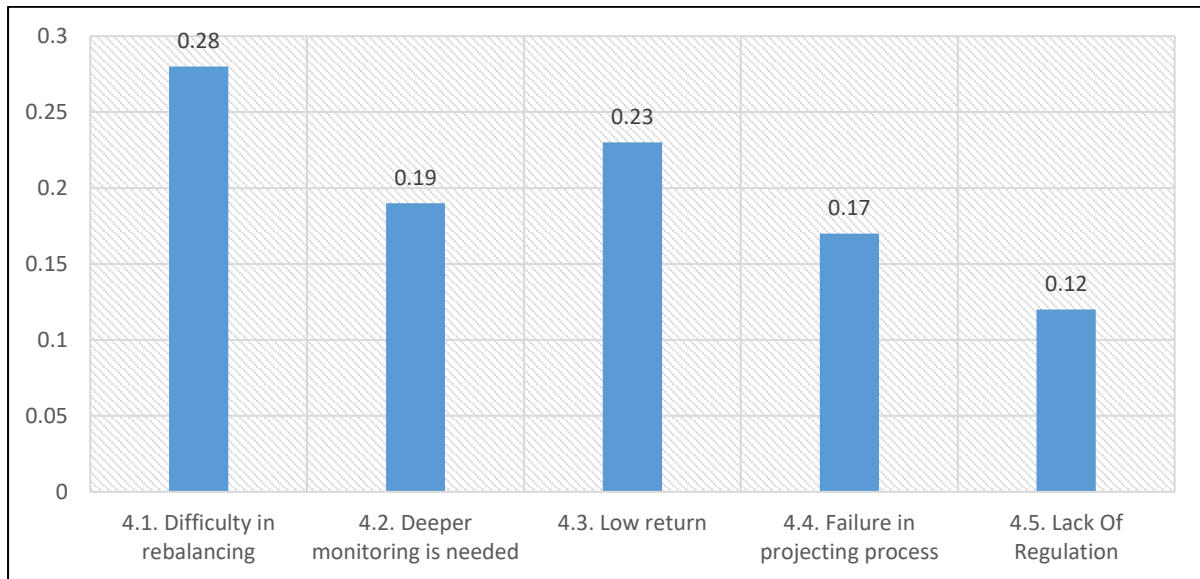


Figure 9. Risk Criteria

Based on the return result, 41.7% of the respondent suppose that portfolio immunization strategy gives a high return with a score of 7 and 33.3% of the respondent suppose that portfolio immunization strategy gives a very high risk. It is assumed that with portfolio immunization, liability-based investment strategies can be applied to generate a very high income. The combination of the risk and return result on portfolio immunization strategy is stated at Figure 10.

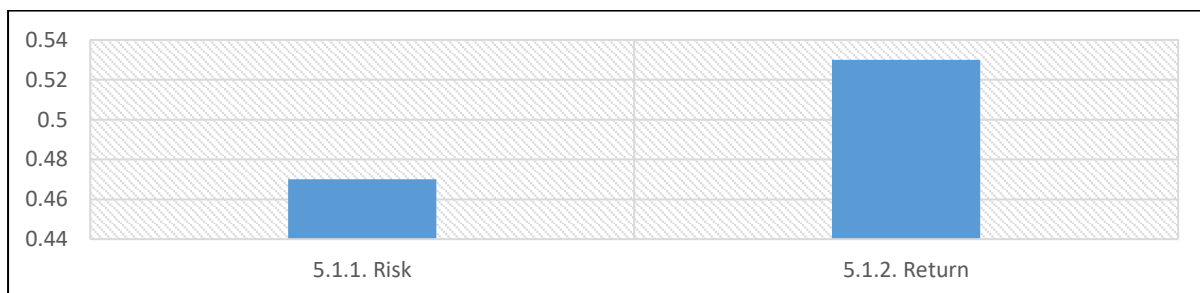


Figure 10. Return and Risk Dimension on Portfolio Immunization

Figure 10 shows that return is still the dominant component in portfolio immunization strategy where it contributes 53% while risk component only contributes 47%. In other word, the return is still bigger than the risk in liability-based investment strategies. Based on the return result, 41.7% of the respondent suppose that cash-flow matching gives a very high return. It is indicated the respondent dominantly think that cash-flow matching in liability-based investment strategies generates a very high return. In the risk aspect, 41.7% of the respondent think that cash-flow matching gives a very high risk. The risk and return dimension combination in cash-flow matching strategy can be seen on Figure 11.



Figure 11. Return and Risk Dimension on Cash-Flow Matching

Figure 11 shows that the risk aspect is more dominant than the return aspect in cash-flow matching strategy with 55% compared to 45% respectively in liability-based investment strategies. In other word, the risk is higher that the return in cash flow matching. From two alternatives in liability-based investment strategies, portfolio immunization is considered more suitable to be implemented due to the result where the return is higher than the risk.

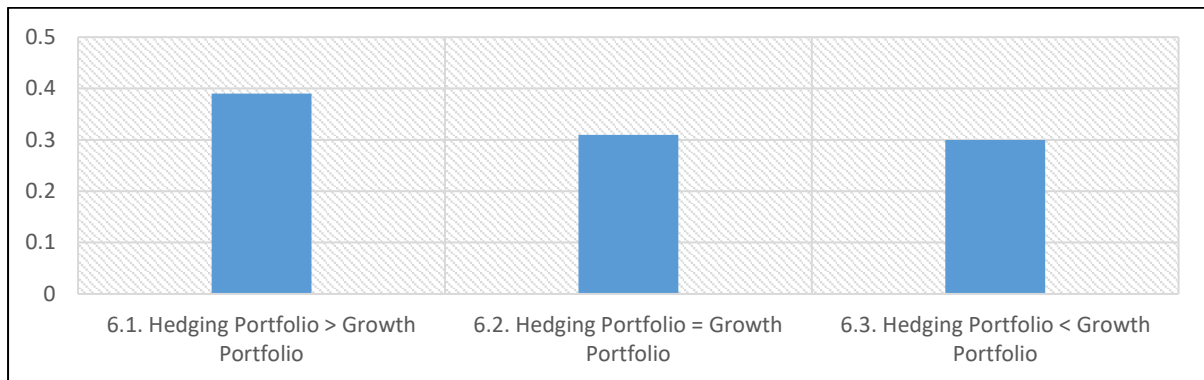


Figure 12. Portfolio Mix Composition Alternatives in Liability-Based Investment Strategies

In operating the portfolio immunization strategy, portfolio mix alternatives are needed to generate an optimum return and measurable risk. The composition can be built through three alternatives, namely hedging portfolio is higher than return generating portfolio, hedging portfolio is the same as return generating portfolio, and hedging portfolio is lower than return generating portfolio. Figure 12 shows that hedging portfolio is higher than return generating portfolio criteria is the first priority with a score of 0.39. The second priority is hedging portfolio is the same as return generating portfolio with a score of 0.31. The last priority is hedging portfolio is lower than return generating portfolio with a score of 0.3. The most suitable portfolio mix composition with the optimum return and measurable risk is the composition where hedging portfolio is higher than return generating portfolio criteria in implementing liability-based investment strategies through portfolio immunization.

Conclusion

In this research, we provide an empirical study of liability driven investment analysis for hajj financial management optimization through Analytic Network Process approach. Using questionnaire filled by respondents from several background such as experts, practitioners, representative from government and academics by exploring the criteria through Benefit Opportunity Cost and Risk (BOCR) analysis, it is concluded that benefit and risk criteria are the most superior criterion in evaluating liability-based investment strategies, with chosen 33% of respondents and 31% of respondents respectively. From the assessment of each criterion and sub-criteria in a liability-based investment strategy, portfolio immunization is the ideal strategy with optimal returns and measurable risk. The portfolio immunization

strategy through portfolio mix consists of hedging portfolio and return generating portfolio. Out of these two strategies, hedge portfolio is preferred than return generating portfolio. With the current conditions at BPKH, the respondents think that hedging portfolio can cover annual Hajj obligations with less risk.

Based on the findings, some implications are stipulated. Through BPKH's internal policies, it can be seen that the Benefit and Risk elements. Elements of Benefit Value are BPKH obligations that must be fulfilled based on the 2021-2025 BPKH Strategic Plan (Renstra) and also the Annual Activity Plan and Budget (RKAT). From the benefit value component, BPKH faces risk problems and BPKH's current risk appetite is low (Low). BPKH must be able to provide high returns by allocating Hajj finances at an investment return rate that is above average but remains low risk which is contrary to the theory high risk high return.

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