

CHAPTER 8

ISLAMIC INVESTMENT INDEX WITH BIO-INSPIRED ARTIFICIAL INTELLIGENCE

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ABSTRACT

Investment activity is the procedure of allocating funds in financial instruments to gain high return with manageable risks. However, the investment activity always difficult to gain higher return because the monitoring and selection of shares is tedious and need technical financial knowledge. Therefore, this study developed Islamic Investment Index to helps investors in searching for share prices of companies that can contributes higher returns, and in the same time reduced risks at manageable level. The selection of the share prices for shariah compliance company need to involved with analysis procedure of business plan, business product, reliability of management level, and share price stability. The selection of company should be selected from shariah compliance companies that listed in Malaysia Stock Exchange. This study employs method of Markowitz theory for portfolio investment. Then, the findings of optimal portfolio investment were confirmed by application of bio-inspired artificial intelligence namely genetic algorithm. These procedures give outcomes of selection of share prices that can achieved high return of investment with lower risk. This study provides novel contribution for helping investors to have better knowledge about the performance of each share price including financial analysis for company listed on Malaysia Stock Exchange. Therefore, the index that developed in this study provides graphical interpretation including technical analysis that helps investors to develop reliable investment portfolio. The developed index in this study also, can prevent any scam activities that involved in share price investment activities. This index will help government in develop better policy of Islamic investment for Malaysia environment.

Key Words: Investment, Artificial Intelligence, Portfolio Theory, Islamic Investment.

1. INTRODUCTION

Financial technology (Fintech) have changed daily life of human drastically over the past decades. The development of Fintech was arising from advances in finance and banking practices. Therefore, this development was attracting more researchers to investigate the opportunities and challenges in adapting Fintech platform. The increasing demand of Fintech platform was due to the quickly spread of Covid-19 virus (Abu Bakar and Rosbi, 2020; Abu Bakar and Rosbi, 2021). Therefore, all the banking sectors must provide a good Fintech platform for customer to do financial transaction. This is because, most of the countries worldwide was implemented Movement Control Order (MCO). According to Muryanto, et al., (2021) Covid-19 pandemic was recorded several important changes in the economy that is the acceleration of digital transformation. Covid-19 has brought positive impacts to the acceleration of Fintech adoption in digital banking services, application-based financial services and e-commerce transactions.

The development of Fintech was introduced many methods in the big data analysis such as bio-inspired artificial intelligence, neural network and others method. Study that focus on the bio-inspired artificial intelligence found that the adaption of bio-inspired artificial intelligence method can calculate an appropriate risk and return in portfolio investment (Abu Bakar and Rosbi, 2019). Therefore, this study was developed Islamic Investment Index to helps investors in searching share prices of companies that can contributes higher returns, and in the same time reduced risks at manageable level. This study used the Modern Portfolio Theory and Genetic Algorithm Method that are found as a good method in measuring the level of risk for portfolio investment. This study only focuses on the Islamic investment.

2. LITERATURE REVIEW

Fintech has rapidly disrupted and innovated the global financial system by creating new business models, revenue streams and investment opportunities (Arslan, et al., 2021). Various Fintech categories such as digital currency (Abu Bakar et al., 2017), blockchain (Abu Bakar and Rosbi, 2018) and artificial intelligence platforms shows the increasing demand from customer to use it. Study by Abu Bakar and Rosbi (2018) regarding the blockchain system indicated that this system is reliable in storing the transaction data including the security level of the system. While, Abu Bakar and Rosbi (2019) concluded that artificial intelligence is a good method in measuring the risk and return in investment.

The development of Fintech in Malaysia was started in year 1950 by introducing the credit card with the purpose to help Malaysians peoples to minimize the burden in carrying cash all the time. However, the aim of Fintech in year 1990 was to encourage bank customers to use online banking system instead of only automated teller machine (Abdul Rahim, et al., 2021). Thus, several studies were examining the acceptance of customers to use Fintech platform. Study by Suzianti, et al., (2021) shows that the trust, economic benefit and convenience are significantly influence users to adopt Fintech services. In addition, Ali, et al., (2021) revealed that the perceived benefit and perceived risk were

significant and positively influenced customers to adopt Fintech platform. Previous study indicated that Fintech are very important platform in achieving economic of scale in Malaysia market.

3. RESEARCH METHODOLOGY

This study analysed each of stock prices to make sure the selected financial instrument is valid and reliable for portfolio investment. The selection process should undergo as Figure 1 that indicates the flow of selection in developing high return of investment with manageable risk.

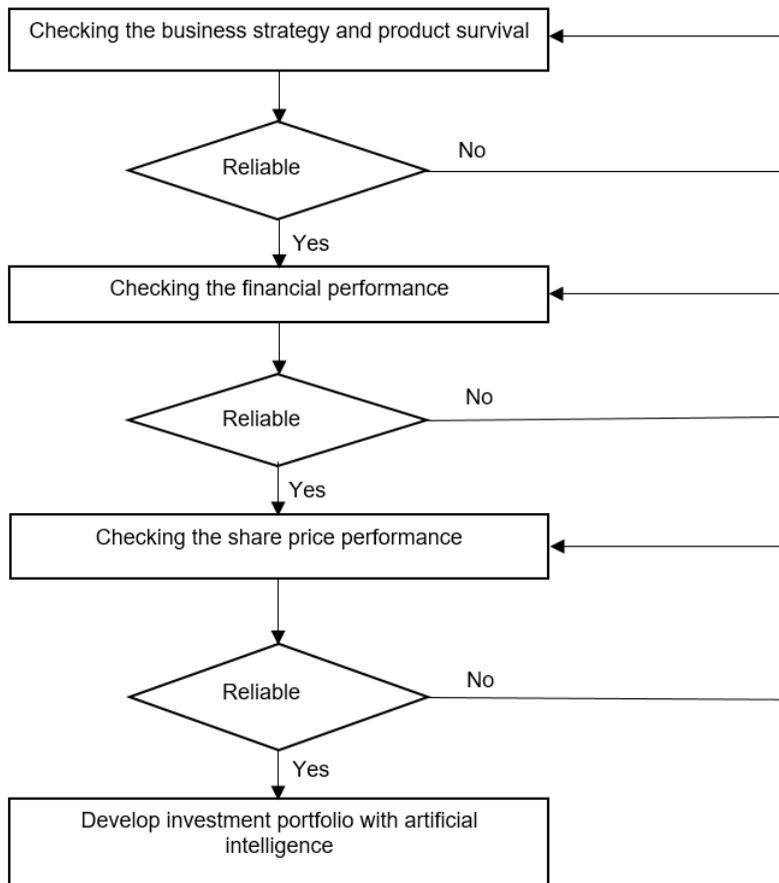


Figure 1: Procedure in developing Islamic Investment Index with Bio-inspired artificial intelligence

3.1. Financial performance checking using ROE and ROA

In developing an investment portfolio, stock prices that exhibit higher value of investment return need to be selected. The financial performance indicators that implemented in this study are using Return on Equity (ROE) and Return on Asset (ROA). ROE is considered a gauge of a corporation's profitability and how efficient it is in generating profits. Meanwhile, ROA shows the percentage of how profitable a company's assets are in generating revenue.

The calculation of ROE is using Equation (1).

$$ROE = \frac{\text{Net Income}}{\text{Shareholder's Equity}} \dots\dots\dots (1)$$

In Equation (1), the Net Income (NI) is gross profit minus all other expenses and costs. Next, Shareholder's Equity (SE) is the owner's claim after subtracting total liabilities from total assets.

Next, the calculation of ROA is shown in Equation (2).

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}} \dots\dots\dots (2)$$

In Equation (2), the Total Assets (TA) is accumulation of liabilities and equity. The equation for TA must balance because everything the firm owns must be purchased from debt (liabilities) and capital (Owner's or Stockholder's Equity).

3.2. Portfolio analysis using Markowitz theory

Markowitz theory explains that it is possible for investors to select and design an optimal portfolio to maximize returns by taking on a quantifiable amount of risk. This study chooses selected stock prices that exhibit good performance in three elements namely business plan, financial performance and share price movement. The stock prices that meet with all three requirements will be selected to analyse using Markowitz in developing optimal portfolio investment.

The expected return for two types of assets is shown in Equation (3).

$$E_p = w_A R_A + w_B R_B \dots\dots\dots (3)$$

E_p : Expected return for portfolio of combination share price A and share price B

R_A : Rate of return for share price A

R_B : Rate of return for share price A

w_A : weightage of component for share price A

w_B : weightage of component for share price B

5. CONCLUSION AND RECOMMENDATION

This study developed four processes to achieve optimal portfolio investment using Islamic investment index. The index developed with analysing three main factors namely business strategy, financial performance and share price movement. From this process, the optimal investment portfolio achieved when investor gain expected return at manageable risk. This study indicates 50% for Axiata and 50% for Maybank, gives 30.85% return with 19.83% risk.

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