إدارة مخاطر عدم الامتثال للشريعة: بناء محفظة متوافقة مع الشريعة منخفضة المخاطر باستخدام نموذج بلاك–ليترمان لتحسين الأرباح

MANAGING SHARIAH NON-COMPLIANCE RISK: CONSTRUCTION OF A LOW-RISK SHARIAH-COMPLIANT PORTFOLIO USING THE BLACK-LITTERMAN PORTFOLIO OPTIMIZATION MODEL[1]

كامولا بيرام

جامعة كنتو كاراتاي، تركيا

Kamola Bayram

KTO Karatay University, TÜRKİYE

شاهيداواتي بنت شاهوان

جامعة العلوم الاسلامية الماليزية

Syahidawati Binti Shahwan

University Sains Islam Malaysia, MALAYSIA

حسين إرغون

جامعة كنتو كاراتاي، تركيا

Huseyin Ergun

KTO Karatay University, TÜRKİYE

الملخص

تستكشف هذه الدراسة التحديات المرتبطة بإدارة المحافظ المتوافقة مع الشريعة وأهمية التعامل مع مخاطر عدم الامتثال للشريعة (SNC)، خاصة في سياق وسائل التواصل الاجتماعي ومخاطر السمعة. وتقترح الدراسة استخدام نموذج بلاك–ليترمان لتحسين الأرباح ودمج وجهات نظر علماء الشريعة لبناء محفظة متوافقة مع الشريعة تحقق عوائد أفضل من المحفظة المرجعية مع التعامل مع مخاطر (SNC)، بالإضافة إلى ذلك، تناقش الدراسة فوائد إضافة الذهب إلى محفظة من الأسهم والسندات وتقدم رؤى حول إعادة توزيع وزن الذهب بناءً على تفضيلات المستثمر من العائد والمخاطر. كما تقدم الدراسة مراجعة شاملة للأدبيات حول نماذج اختيار المحفظة، مخاطر (SNC)، تقييم مخاطر (SNC)، وتنويع المحفظة من خلال الاستثمارات الذهبية المتوافقة مع الشريعة. كما تُشرَح منهجية الدراسة ومصادر البيانات، وتُقدّم النتائج مع تحليلها. وتختَتم الدراسة بتلخيص النتائج الرئيسة ومناقشة تأثيراتها على المستثمرين، وصانعي السياسات، ومديري الأصول في عالم التمويل الإسلامي.

Abstract

This study explores the challenges of managing Shariah Compliant Portfolios and the importance of addressing Shariah non-compliance (SNC) risk, particularly in the context of social media and reputation risk. The paper proposes using the Black-Litterman portfolio optimization model and incorporating the views of Shariah scholars to construct a Shariah-compliant portfolio that generates better returns than the benchmark portfolio while addressing SNC risk. Additionally, the paper discusses the benefits of adding gold to a portfolio of stocks and bonds and provides insights on reallocating gold's weight based on the investor's risk-return preferences. The paper provides a comprehensive review of the literature on portfolio selection models, SNC risk, SNC risk assessment, and portfolio diversification through Shariah-compliant gold investments. The study's methodology and data sources are explained, and the results are presented and analyzed. The paper concludes by summarizing the main findings and discussing

their implications for investors, policymakers, and asset managers in the realm of Islamic finance.

الكلمات الدالة: إدارة المحفظة، الاستثمار المتوافق مع الشريعة، مخاطر عدم الامتثال للشريعة (SNC)، نموذج بلاك–ليترمان لتحسين الأرباح، الاستثمار في الذهب.

Keywords: Portfolio Management, Shariah-Compliant Investment, Shariah Non-Compliance (SNC) Risk, Black-Litterman Portfolio Optimization Model, Gold Investment.

1.0 Introduction

Portfolio management is a critical aspect of investment strategy, and it is essential to consider various risks that may impact investment outcomes. For investors seeking Shariah-compliant investment options, adherence to Islamic principles is a must. Shariah non-compliance (SNC) risk is a significant consideration in managing Shariah Compliant Portfolio, as non-compliance can result in financial losses and harm the reputation of financial institutions (Omar & Rusni, 2019; Rusni, 2016; Lahsasna, 2014).

The advent of social media has made reputation risk an increasingly critical factor, especially for fund managers claiming to offer Shariah-compliant funds. Recent cases, such as the charges levelled against Wahed Invest by the Securities and Exchange Commission, demonstrate the importance of observing SNC risk in portfolio management of Shariah-compliant funds (Butt et al., 2022; Nawal & Rosnadzirah, 2018). However, modelling and analysing SNC risk is challenging, making it challenging to quantify and manage.

This study addresses this gap by leveraging the Black-Litterman portfolio optimization model and incorporating the views of Shariah scholars on the expected behaviour of assets in the benchmark portfolio in terms of SNC risk. The study aims to construct a Shariah-compliant portfolio that generates better returns than the benchmark portfolio while addressing SNC risk.

Gold investment is considered a safe haven asset that can help reduce portfolio risk and is particularly useful during times of economic uncertainty and market volatility. Shariah-compliant gold investment offers an additional option for investors who wish to diversify their portfolios while adhering to Islamic principles. Adding gold to a portfolio of stocks and bonds can improve risk-adjusted returns and serve as an effective hedge against stock market volatility during financial crisis periods. However, investors should conduct proper due diligence to ensure that the investment is truly Shariah-compliant and meets the necessary criteria (Ghazali et al., 2015; Maghyereh et al., 2019; Al-Khazali & Zoubi, 2020; Raza et al., 2016; Naeem et al., 2021; Chkili, 2017). However, gold is underrepresented in our benchmark portfolio. Therefore, our results suggest reallocating gold's weight based on the investor's risk-return preferences.

2.0 Literature Review

This section presents a thorough literature review relevant to the present research. The review provides background information for a better comprehension of the study's main body.

2.1 Shariah Non-compliance Risk in Shariah Compliant Portfolio

Shariah non-compliance risk refers to the risk that a financial institution or any other entity engaged in Islamic finance may violate Shariah principles in its operations or transactions. Shariah non-compliance risk can arise from a failure to comply with the Shariah rules and principles that govern Islamic finance activities, and it can have significant consequences for the financial institution or entity involved.

Shariah non-compliance risk can take many forms, including investing in prohibited activities or industries, charging interest, engaging in speculative or unethical behaviour, or failing to meet the requirements of Shariah law in any other way. Such activities can result in financial losses, reputational damage, legal penalties, and even the loss of license to operate.

To mitigate Shariah non-compliance risk, financial institutions and entities in Islamic finance must ensure that their operations and transactions comply with Shariah law and principles. This can involve engaging with Shariah scholars or committees to provide guidance and oversight, conducting regular Shariah audits, and maintaining transparency and accountability in all financial activities.

Therefore, managing a Shariah-compliant portfolio requires strict adherence towards all aspects of Shariah. It is a fact that committing Shariah non-compliance may cause Shariah non-compliant income of the financial institution hence affecting the return to be shared and delivered to the shareholders and investors. Thus, observing Shariah non-compliance risk is a must in portfolio management. As a major reference in determining Shariah non-compliance risk of a portfolio, classically, in all sources of rulings for Islamic finance have agreed that major and basic non-compliance causes are the availability of riba (interest-based activities like in conventional banks), *gharar* (uncertainty like in conventional insurance), *maysir* (gambling) and production and selling of non-halal food and services (Lahsasna, 2014; Abdullaah J. et. al., 2018a). Many others have added some more extended and derivatives from those revealed prohibited items. It includes among others, *taghrir* (fraud or cheating) (Omar & Rusni, 2019; Rusni, 2016; Lahsasna, 2014), ghubn (Omar & Rusni, 2019; Rusni, 2016; Lahsasna, 2014), *ikrah* (Omar & Rusni, 2019; Rusni, 2016; IFSB, 2016), *ghalat* or mistake (Omar & Rusni, 2019; Rusni, 2016; Lahsasna, 2014), *jahalah* or ambiguousness on the subject matter (Omar & Rusni, 2019; Rusni, 2016), and the status of contracting parties or *jahliyyah* (Omar & Rusni, 2019; Rusni, 2016; IFSB, 2016), production and selling of dangerous and intoxicant items to human, animal, and environment such as tobacco and nuclear (Abdullaah J. et. al., 2018b) which normally coined as defeating the objectives of Shariah. All these aspects are normally observed in the underlying contracts involved in the portfolio and its management.

In Malaysia, there is a specific guideline following the Shariah decisions in considering the Shariah-compliant status of any firm. The Security Commission of Malaysia (SC) adopts a two-tier quantitative approach, which applies the business activity benchmarks

and the financial ratio benchmarks, in determining the Shariah status of the listed securities. In this instance, the securities will be classified as Shariah-compliant if their business activities are non-other than the above-prohibited list with financial ratios within these benchmarks. Some portfolios might require specific rulings considering the nature of the portfolio.   For example, special criteria have been implemented besides the above considerations in fulfilling the Shariah compliance of Sukuk issuance. It includes ownership of tangible assets or services, payments to the investors derived from the after-tax profit and the value paid at maturity representing the market price of the underlying asset (Godlewski et. al, 2013).

On the other hand, gold is another instance of the sought-after stable portfolio, that requires basic consideration due to its nature as currency, in terms of prompt delivery and equality of value which is subject to the types of exchange commodity (Abdullaah J. et. al., 2018). Also, Islamic stocks and shares require the Shariah principle which would differentiate them from a conventional stock market. It includes among other criteria related to the company which includes nature of the business, the asset, and its ratio of debt to equity; criteria related to the investor including their nature of ownership and intention; and finally, criteria related to the transaction involved including the nature of the transaction, zakat transaction provision (Alam, et. al, 2017). All the activities which failed to observe and comply with the above-listed general and specific requirements would expose the portfolio to the Shariah non-compliant risk.

2.2 The Impact of SNC Risk on Investments

Committing non-compliance to Shariah requirements in financial investment can have significant impacts on financial institutions and their clients. This is because Shariah compliance is a fundamental principle of Islamic finance and a necessary condition for the legitimacy of any financial transaction. Non-compliance with Shariah requirements can have the impacts such as legal penalties, reputational damage, ethical concerns, and financial losses.

According to Nor et al. (2019), Kassim et al. (2017) and Yazi, et al. (2015), Shariah non-compliant financial investment of companies has affected their stock price. It is evidently shown in the

case of the withdrawal of the Shariah-compliant status of the investment company from Shariah listed to non-Shariah listed in Malaysia. Interestingly, in addition to the same finding, Nor et al. (2019) found that the announcement from Shariah listed to non-listed has no significant impact on the overall return of the FBM Emas Shariah index.

Non-compliance to Shariah would also have a chained impact on the institution's reputation as reported by Butt et al. (2022) and Nawal & Rosnadzirah (2018). The authors investigated the impact on Islamic banks and found that reputational risk that has a strong link to the Shariah compliance image of a financial institution would bring a positive impact on the bank's performance, hence could be associated with other financial risks like credit risk and liquidity risk.

Furthermore, the advent of social media has made reputation risk a critical concern for fund managers claiming to offer Sharia-compliant funds. This is because social media has amplified the voice of customers and stakeholders, and their opinions can quickly go viral and have a significant impact on a company's reputation. For fund managers offering Shariah-compliant funds, reputation risk arises when they fail to meet the expectations of their customers and stakeholders regarding the compliance of their funds with Shariah law and principles. Any non-compliance or unethical behaviour can be quickly shared on social media, leading to negative publicity and damaging the reputation of the fund manager.

The case of Wahed Invest, the first robo-advisory Shariah compliance platform, is an example of the importance of transparency and honesty in the financial industry, particularly in Shariah-compliant investments.

In 2022, the Securities and Exchange Commission (SEC) charged Wahed Invest with making misleading statements in relation to its Shariah compliance business activities. According to the SEC, Wahed Invest falsely claimed that its robo-advisory platform used a proprietary algorithm to ensure that its investment recommendations were compliant with Shariah law and principles. However, the SEC found that the company had failed to implement adequate controls and procedures to ensure the accuracy of its Shariah compliance representations.

The announcement has received mass responses among its current investors and potential investors. The social media world has made the news and its reputation easily disseminated. In one of the reputable professional social media groups, among others, an investor responded that the decision has made their trust in Wahed Invest tarnished. Indeed, the Shariah non-compliance risk would affect the reputation of the fund provider and manager thus reflecting the perception of market participants.

According to Nawal and Rosnadzirah (2018), another outcome of Shariah non-compliance risk is fund withdrawal that would be resulting from reputation and stock price issues. Following withdrawal, investors also are subject to cleansing and purification of the income should they encounter Shariah compliance has not been observed throughout their investment tenure. Following the recommendation from Hashim et al. (2017), Salleh and Zakaria (2015), investment in companies which have direct or indirect involvement in impermissible business requires income purification out of the profit gained. However, it is nonetheless resolved by the Shariah authorities of Malaysia via Shariah Advisory Council and global Islamic finance reference; Accounting and Auditing Organization for Islamic Financial Organizations (AAOIFI) that participation in those companies is allowed with some tolerable limit (Hashim et al., 2017).

2.3 Shariah Non-Compliance Risk Assessment

Shariah non-compliance risk refers to the risk that an Islamic financial institution (IFI) may violate the principles of Islamic law (Shariah) in its operations, products, or services, which could potentially harm the institution's reputation, financial stability, or legal compliance. Assessing and measuring this risk is crucial for IFIs to ensure that their activities are Shariah-compliant and to maintain the trust of their stakeholders.

Most studies on Shariah non-compliance risk assessment and measurement are qualitative in nature since Shariah compliance is primarily a subjective concept that requires expert judgment and interpretation. Islamic law is based on principles rather than specific rules, and there can be different interpretations and opinions among

Shariah scholars on the permissibility of certain practices or transactions.

Therefore, a qualitative approach that involves analysing and interpreting the opinions and views of Shariah scholars and experts is often used to assess and measure Shariah non-compliance risk. For example, Ahmad and Lateh (2020) developed a Shariah Risk Management Model (SRM-i) using conceptual and textual analysis. The SRM-i model consists of five stages: identification, assessment, monitoring, mitigation, and reporting. The model emphasizes the importance of involving Shariah experts in the risk management process and suggests ways to incorporate their views into risk assessment and mitigation. The article discusses the importance of risk management in Islamic finance and the need for a comprehensive Shariah risk management framework. The authors reviewed the literature on Shariah risk management and identified the main types of Shariah risks faced by Islamic financial institutions. They also analysed the Shariah principles and guidelines related to risk management and developed a conceptual model for Shariah risk management. Moreover, the authors discuss the role of technology in Shariah risk management and suggest the use of artificial intelligence and blockchain technology to enhance the efficiency and effectiveness of the risk management process.

Some studies also conducted the Shariah non-compliance risk assessment post issuance of the Shariah non-compliance issue as analysed by Rosly et al. (2017) and Omar and Rusni (2019). Rosly et al. (2017) for instance, measure the Shariah Non-Compliance Risk based on constructed or hypothetical cases of available Malaysian legal cases after the court decision has been made.

A closer to the empirical study was conducted by Mohd Noor et al. (2018), where the authors proposed the use of probability of default of contracts' essentials and conditions to model Shariah risk measurement. Hence, Shariah risk is to be modelled using the binomial estimation for predicting the probability of default of each element considering that it is independent default. They made an assumption that failure to meet the Shariah contract's essential elements and conditions is considered as committing Shariah default. Using the assumption, a binomial model is used to represent the discrete

processes of Shariah risk circumstances with the assumption that only two possible outcomes at a time which is default or non-default. Seven (7) models were introduced based on the joint probability of Shariah default in contracts' essential elements. The study however limit only those Shariah risk with the same type of contract.

2.4 Portfolio Diversification through Shariah-Compliant Gold Investment

Razak et al. (2017) discuss the potential benefits and challenges of introducing gold investment as a new asset class for the Malaysian Employees Provident Fund (EPF), a government-managed retirement savings fund for Malaysian workers. The article examines the potential benefits of introducing gold investment to the EPF, such as diversification benefits, inflation hedging, and lower correlation with other asset classes. However, the authors also highlight some challenges and risks associated with gold investment, such as volatility, liquidity, and storage costs. The authors then discuss the potential implementation of gold investment for the EPF, including the necessary regulatory changes and the establishment of an appropriate investment framework. The authors conclude by arguing that gold investment could be a valuable addition to the EPF's investment portfolio, but that careful consideration must be given to the potential risks and challenges.

Shariah compliance aspect of gold is also addressed in Adzimatinur et al. (2021). The authors discuss the potential of gold-backed-cryptocurrency as a Shariah-compliant investment analyses the volatility and risk associated with this asset class. The authors argue that gold-backed-cryptocurrency has the potential to provide a more secure and stable investment option for Muslim investors, as it combines the stability of gold with the convenience and accessibility of a cryptocurrency. The authors provide a brief overview of Shariah compliance principles related to cryptocurrency and gold investments and argue that gold-backed-cryptocurrency can be considered a Shariah-compliant investment, provided that certain conditions are met. These conditions include the physical ownership of gold, the avoidance of interest-based transactions, and compliance with other Shariah principles. The authors then analyse the volatility and risk

associated with gold-backed cryptocurrency and compare it to other asset classes, such as gold and Bitcoin. They conclude that while gold-backed-cryptocurrency may be less volatile than Bitcoin, it is still subject to certain risks, such as regulatory uncertainty and technological risk.

On the other hand, Ghazali et al. (2015) examine whether Sharia-compliant gold investment in Malaysia serves as a hedge or a safe haven. The authors use daily data from January 2000 to December 2012 to analyse the relationship between gold and stock market returns, as well as the effectiveness of gold as a portfolio diversifier. Their findings suggest that gold investment is a safe haven asset during times of financial crisis, as evidenced by the negative relationship between gold and stock market returns during these periods. However, during normal market conditions, gold does not serve as an effective hedge against stock market volatility. In terms of portfolio diversification, the study finds that adding gold to a portfolio of stocks and bonds improves risk-adjusted returns, especially during financial crisis periods. The study suggests that Sharia-compliant gold investment in Malaysia can serve as a safe haven asset during financial crisis periods and can improve portfolio diversification when added to a portfolio of stocks and bonds.

Maghyereh et al. (2019) examine the connectedness and hedging between gold and Islamic securities in the time-frequency domain using wavelet coherence and wavelet-based hedging techniques. The study uses daily data from January 2000 to December 2017 and focuses on the time periods before and after the global financial crisis. The study finds that gold and Islamic securities are significantly connected in the long run, particularly during the post-crisis period. The wavelet coherence analysis shows that the connection between gold and Islamic securities is stronger at lower frequencies, indicating a stronger long-term relationship. In terms of hedging, the study finds that Islamic securities are effective in hedging against gold risk, particularly during the post-crisis period. The wavelet-based hedging analysis shows that Islamic securities can provide a better hedge against gold risk at lower frequencies, indicating a stronger long-term relationship between the two assets. The authors also investigate the impact of oil prices on the relationship

between gold and Islamic securities and find that oil prices have a significant influence on this relationship, particularly during the pre-crisis period.

Al-Khazali and Zoubi (2020) investigate the role of gold as a portfolio diversifier for Dow Jones Islamic indices using stochastic dominance analysis. The study covers the period from January 2000 to December 2017. The results show that adding gold to the Islamic portfolio can improve risk-return trade-offs and provide superior investment opportunities compared to the Islamic portfolio without gold. The authors find that gold dominates the Islamic portfolio in the second-order stochastic dominance (SSD) sense, which means that adding gold can improve the portfolio's downside risk while maintaining or improving its upside potential. The study also finds that the optimal allocation to gold in the Islamic portfolio is between 5% and 14%. The authors suggest that this range may vary depending on the investor's risk tolerance and investment objectives.

Raza et al. (2016), compare the role of gold and Islamic stocks as a hedge and safe haven in the time-frequency domain for the BRICS markets. The study covers the period from January 2003 to December 2014. The results suggest that gold can be an effective hedge against stock market risk in the BRICS markets, while Islamic stocks may not provide significant hedging benefits. The study finds that gold and Islamic stocks have a weak positive relationship in the short-run, but no significant long-run relationship. In terms of safe haven properties, the study finds that gold is a reliable safe haven asset during periods of the financial crisis in the BRICS markets, while Islamic stocks do not exhibit consistent safe haven characteristics. The authors suggest that gold can be a suitable safe haven investment for investors seeking to protect their portfolios during times of market turbulence.

Naeem et al. (2021), examine the asymmetric relationship between gold and Islamic stocks in bearish, normal, and bullish market conditions. The study covers the period from January 2001 to September 2018 and focuses on the Islamic stock markets of Malaysia, Pakistan, Turkey, and the Gulf Cooperation Council (GCC) countries. The results show that the relationship between gold and Islamic stocks is asymmetric in different market conditions. The study finds evidence of a strong negative relationship between gold and Islamic stocks

during bearish market conditions, which suggests that gold can act as a safe haven asset during times of market turmoil. However, the study also finds that the relationship between gold and Islamic stocks is weaker and less significant during normal and bullish market conditions. This suggests that gold may not provide significant diversification benefits during normal or bullish market conditions.

Chkili (2017), examines whether gold serves as a hedge or a safe haven for Islamic stock market movements using a Markov switching approach. The study covers the period from January 2005 to December 2015 and focuses on the Islamic stock markets of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The results indicate that the relationship between gold and Islamic stocks varies across different market regimes. The study finds that gold acts as a hedge during bearish market conditions but does not provide significant diversification benefits during normal or bullish market conditions. Furthermore, the study finds that the relationship between gold and Islamic stocks is stronger during periods of the financial crisis, suggesting that gold can serve as a safe haven asset during times of market turbulence.

Overall, portfolio diversification through Shariah-compliant gold investment can be a viable strategy for investors who seek to manage their portfolio risk while adhering to Islamic principles. However, the purchase and sale of gold must be done in a transparent and fair manner, with all parties having access to the necessary information and documentation.

3.0 Methodology

The main idea underlying the Black-Litterman model is to emerge equilibrium with the specific views of an investment manager, since in most cases, if not always, an investment manager has unique views or intuition related to the expected return of some of the assets in a portfolio, which *may* be different from the Implied Equilibrium return. These views may be expressed in either absolute or relative terms. Note that in practice absolute views are very rare, much more common are relative views. An absolute view is a view where an investment manager has an intuition regarding one asset.

For example, *"I expect that asset A will have an absolute return of 5%"*. Whereas, in a relative view, an investor compares the performance of two or more assets to each other. For example, *"I believe that asset B will outperform asset C by 4%"* or *"I expect that assets N, M, and L will outperform assets X and Z by 2%"*. Each view, either absolute or relative, should be accompanied by a level of confidence (LC). The level of confidence is interpreted as a standard deviation around the expected return of the view. The more confident an investor is about his view the smaller is the standard deviation and vice versa. Moreover, there is a positive relationship between the level of confidence and its impact on the portfolio. Such a low level of confidence attached to the view has a lesser effect. Views give insight into an investor's intention.

3.1 Risk Aversion Coefficient

The risk aversion coefficient (λ) characterizes the expected return-risk profile and shows the size of the expected return the investor is willing to forgo to derive a less volatile portfolio. The risk aversion coefficient acts as a benchmark to predict return with inverse optimization (Idzorek, 2007). The expected return increases as the risk aversion coefficient increases i.e., higher λ implies a higher risk appetite of the investor. Table 1 summarizes the values of the risk aversion coefficient corresponding to the benchmark portfolios. Hence, a higher λ associated with a higher risk and vice versa.

Table 1: Risk Aversion Coefficient and Type of the
Corresponding Portfolio

Value of risk aversion coefficient (λ)	Type of Portfolio
1	very conservative
2	moderately conservative
3	moderate
4	moderately aggressive
5	aggressive
6	very aggressive

In our analysis, we consider $\lambda = 1$ since the objective of this study is to derive a *very* conservative portfolio.

The Black-Litterman formula calculates the new expected returns of the assets in the portfolio based on the investor's views and the market equilibrium. The formula balances the investor's views with the market equilibrium, considering the level of uncertainty in the investor's views and the risk aversion of the investor. The resulting portfolio is efficient and well-diversified, and it reflects both the investor's views and the market equilibrium.

4.0 Data

In this study we consider Shariah Compliant portfolio structured by Wahed Invest (financial technology and services company which launched the world's first automated Islamic investment platform or robo-advisor in 2017) as our benchmark portfolio.

Our benchmark portfolio comprises the following assets: Global Stocks, Emerging Market Stocks, Sukuk, Real Estate and Gold. These assets are used to construct six various types of portfolios namely: i) very aggressive portfolio, ii) aggressive portfolio, iii) moderately aggressive portfolio, iv) moderate portfolio, v) moderately conservative portfolio and finally, vi) very conservative portfolio. Table 2 and Figure 1 depict the composition of each type of portfolio and the weight of each asset in the corresponding portfolio. awareness and education programs at the global level, favourable laws, supportive institutions, and the full support of the governments at the country level.

Table 2: Components of the Shari'ah Compliant Benchmark
Portfolios

Asset Types / Portfolio Types	Global Stocks (%)	Emerging Market Stocks (%)	Sukuk (%)	Real Estate (%)	Gold (%)	Cash (%)	Total Weight (%)
Very Aggressive	75.00	10.00	0.00	10.00	3.75	1.25	100.00
Aggressive	50.25	10.00	16.00	10.00	12.50	1.25	100.00
Moderately Aggressive	35.00	10.00	33.75	7.50	12.50	1.25	100.00
Moderate	21.25	7.50	55.00	5.00	10.00	1.25	100.00
Moderately Conservative	12.75	3.50	75.00	0.00	7.50	1.25	100.00
Very Conservative	0.00	0.00	92.50	0.00	5.00	2.50	100.00

Source: Wahed Invest (https://wahedinvest.com/portfolio/)

Source: Wahed Invest (https://wahedinvest.com/portfolio/)
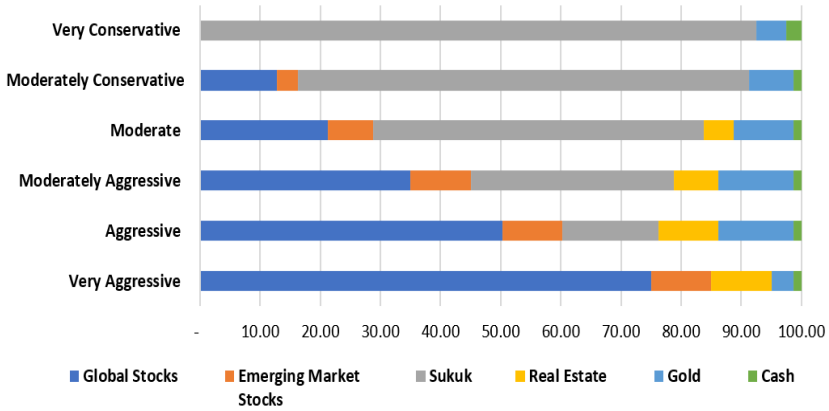
Figure 1: Weight of Each Asset Type in the corresponding portfolio

Based on the benchmark portfolio, the assets selected for this analysis comprise of global stocks, emerging market stocks, sukuk, real estate and gold. Monthly total return indices are used over the sample period from March 2017 to March 2022. As a proxy for sukuk, global stocks, emerging market stocks, real estate, and gold; subsequently, historical data on Tadawul Sukuk & Bonds Index (TSBI), Dow Jones Islamic Market World (DJIMI), Dow Jones Islamic Market World Emerging Markets (DJIEMG), Dow Jones Real Estate (DJUSRE) and Gold Spot US Dollar (XAU/USD) are used in this study. Table 3 reports the descriptive statistics for all assets used in this study.

Table 3: Descriptive Statistics

Name	Type	Mean	Standard Deviation	Period
Tadawul Sukuk & Bonds Index (TSBI)	Sukuk	0.01 %	0.33%	March 2017 to March 2022
Dow Jones Islamic Market World (DJIMI)	Global Stocks	1.06%	4.40 %	
Dow Jones Islamic Market World Emerging Markets (DJIEMG)	Emerging Market Stocks	0.65%	4.67%	
Dow Jones Real Estate (DJUSRE)	Real Estate	0.62 %	4.90 %	
Gold Spot US Dollar (XAU/USD)	Commodity	0.82 %	3.68%	

Source: Investing.com

Among all asset classes, sukuk have the lowest mean return with the lowest standard deviation attached. This justifies its role in the benchmark portfolio as an asset with low risk and low return. Therefore, it constitutes 92.50 % of the very conservative portfolio (see Table 2). The highest mean return belongs to global stocks with a standard deviation of 4.40% which is slightly less compared to the volatility of emerging stocks. Gold has a higher mean with a lower standard deviation return compared to emerging market stocks and real estate. When we look at the portfolio diversification characteristics, we see that assets such as stocks and bonds are positively correlated, meanwhile gold moves in the opposite direction especially in times of financial turmoil. This feature of gold was studied by Baur and Lucey

(2009) who presented the evidence of the potential for gold to act as a safe-haven asset. According to their findings, gold tends to hold its value when stock markets experience extremely negative returns. Besides, the authors determine between the safe-haven and hedge assets where hedge assets were defined as assets uncorrelated or negatively correlated with other assets or portfolios on average (e.g. sovereign bonds) during normal times, while safe-haven assets are defined as assets uncorrelated or negatively correlated with other asset or portfolios during the times of market stress or turmoil only.

After explaining the safe-haven feature of gold we need also to explain the volatile nature of gold. One can observe from Table 3 that the volatility of gold (3.68%) is considerably higher compared to the volatility of Sukuk (0.33%) which at first sight may be seen as a contradiction to its safe-haven asset characteristics. This phenomenon was explained in Baur (2012) who studied the volatility of gold and demonstrated that there is an inverted asymmetric reaction to positive and negative shocks, such as positive shocks increase the volatility more than negative shocks. The author suggested that this effect is due to the safe-haven property of gold since investors interpret positive gold price changes as an indicator of future adverse conditions and uncertainty in other markets. According to his results, inverted volatility feature of gold can lower the aggregate risk of a portfolio for specific correlation levels.

Regardless of its attractive features in portfolio diversification and its attractiveness for investors with low-risk appetite (Bayram et. al., 2018) gold is underrepresented in our benchmark portfolios (see Table 2). Its weight is 3.75%, 12.50%, 12.50%, 10.00%, 7.50% and 5.00% in the very aggressive, aggressive, moderately aggressive, moderate, moderately conservative, and very conservative portfolios respectively. Interestingly, there is a very slight difference (1.25 %)

between the weights of gold in the very aggressive (3.75 %) and very conservative portfolios (5.00 %) (paradoxically). Meanwhile, the highest weight (12.50%) appears in aggressive and moderately aggressive portfolios. Gold is a safe-haven asset therefore it is traditionally seen as an asset/commodity which preserves the value of the portfolio during extreme times of the market therefore was always a preference of investors with low-risk appetite and objective to preserve the value of the portfolio. This was also studied by Bayram et al. (2018) who implemented the Black–Litterman model to construct a strategic portfolio (portfolio which preserves its value during times of financial turmoil) for central banks with optimal allocation to gold and suggested that benchmark portfolios should increase gold holdings to preserve the value of the reserves during volatile times. It is obvious that the weight of gold in the very conservative benchmark portfolio needs to be increased and the question is what is the optimal weight? Black Litterman model is used to derive the optimal level of gold for the very conservative posterior portfolio. The Shariah views on gold are discussed in the next section.

4.1 Views of Shariah Experts

In total five (5) Shariah experts have been interviewed for this study. The interviews were conducted via online media and experts were given introductory notes on the objective of the study and disclaimers for the status of the expert's opinions for ethical consideration. They were also introduced to Black-Litterman Portfolio Optimization Model and how it affects the decision made by the portfolio manager. The experts also explained the method to provide opinions where two types of views they could provide, i.e., absolute and relative views with examples of responses for each of them. Consecutively, after explaining the overall process of the interview,

they were given questions based on the process in Black-Litterman Portfolio Optimization Model. They were asked two questions. The first question was on the risk exposure of the given list of portfolios based on the Shari'ah Compliant Benchmark Portfolios and the second question was the level of their confidence.

Given the list of portfolios (as in Table 2) the experts are of the opinion that gold has minimum exposure to SNC risk provided that it is traded physically on the spot. The nature of gold as a ribawi item requires a straight observation of its portfolio management. The experts also are in consensus that having allocated gold in a portfolio with the given mechanisms will meet lower SNC. However, being a ribawi asset, gold has strict Shariah requirements, and the traded mechanisms should be observed as stringent. Some experts added that to ensure its stringent mechanisms are observed, supervisory and regulatory structures should be established to monitor the trading process. For instance, in some countries, Islamic banking institutions with gold accounts and their transactions are supervised and regulated by banking governance and the home country's legal reference.

The level of confidence admitted by the experts for gold is on average 98% of all the experts interviewed. The experts are of the view that Sukuk has less SNC risk exposure compared to the other assets including global stocks, emerging market stocks and real estate. The arguments by experts are based on the current governance of Sukuk issuance which is a highly regulated instrument. Sukuk, when it is innovated, the observance towards Shariah aspects begins from the very beginning of the proposal and prospectus submitted. The endorsement by the Shariah board has made initial mitigation and commitment towards the Shariah compliance issues that might be arising. The experts also confirmed that once Sukuk is endorsed as Shariah-compliant, sukuk proceeds could only be used for Shariah-

compliant purposes, which is the role to ensure that the rest of its Shariah compliance observance is with the trustee. The Shariah committee will be notified of any changes of mandates previously approved. In addition, an expert also opined that compared to SNC risk, Sukuk has higher exposure to credit risk.

The level of confidence viewed by the experts for Sukuk is on average 90.75% of all the experts interviewed. Table 4 summarizes the views used for this study and the level of confidence or LC attached to each view.

Table 4. Views and LC attached to the views

	Views	Level of Confidence (LC)
1	Gold has no SNC risk given it is an allocated gold	98 %
2	SNC risk attached to sukuk is lower compared to the stock market.	90.75%

Source: Author's own.

In the Black-Litterman model there are a few assumptions related to the expert views: first, the number of outperforming assets need not match the number of assets underperforming, and second, the model does not require that investors specify views on all assets (Idzorek, 2007).

5.0 Methodology

We start our analysis by deriving the variance–covariance matrix of excess returns (Σ) which is presented in Table 5.

Table 5: Variance-Covariance Matrix of Excess Returns (Σ)

	TSBI	DJIMI	DJIEMG	DJUSRE	XAU/US
TSBI	0.001%	0.000%	0.000%	0.000%	0.005%
DJIMI	0.000%	0.188%	0.155%	-0.021%	0.027%
DJIEMG	0.000%	0.155%	0.211%	0.004%	0.044%
DJUSRE	0.000%	-0.021%	0.004%	0.225%	-0.018%
XAU/US	0.005%	0.027%	0.044%	-0.018%	0.131%

Source: Author's calculations

Variance-covariance matrix displays the extent to which corresponding elements from two sets of ordered data move in the same direction which is known as a linear relationship between two variables. The positive coefficient corresponds to the co-movement of variables in the same direction, whereas the negative coefficients are interpreted as a movement of the variables in different directions. On the diagonal (highlighted) of the variance-covariance matrix we have the variance of the variables and on the off-diagonal we have the covariances between the variables which are symmetric.

The main point distinguishing the Black-Litterman model from the Mean-Variance optimization is that it makes possible the inclusion of specific expectations of a portfolio manager on the future performance of the assets, whereas Mean-Variance optimization considers only the historical performance of the asset.

Since this study aims to build a portfolio which addresses the SNC risk meanwhile generates attractive returns for the risk-averse investor the views of Shariah experts (see Table 4) are incorporated into the model. Table 6 presents the results of the Black-Litterman model for the very conservative portfolio.

Table 6: Return Vectors and Resulting Portfolio Weights for Very Conservative Portfolio

Asset Class	New Combined Return Vector E[R]$_{BCH\_VC}$	Implied Equilibrium Return Vector Π_{BCH_VC}	Difference E[R] - Π	W$_{BCH\_VC}$	W$_{BL\_VC}$
TSBI	0.0011	0.0013	-0.0002	93.00%	61.00%
DJIMI	-0.0149	0.0049	-0.0198	0.00%	0.00%
DJIEMG	-0.0127	0.0066	-0.0193	0.00%	0.00%
DJUSRE	-0.0030	0.0006	-0.0036	0.00%	0.00%
XAU/US	0.0251	0.0128	0.0123	7.00%	39.00%
			Total	100%	100%

Source: Author's calculations

Our benchmark portfolio comprises three assets namely sukuk, gold and cash with weights of 92.5%, 5% and 2.5% respectively (see Table 2). This study excludes cash from the analysis and adds its weight to gold since gold is the closest among the assets in terms of liquidity. Therefore, the weight of gold in Table 6. is 7% instead of 5% in the corresponding benchmark portfolio. Recall that the Black-Litterman model considers the historical performance of the asset as well as the subjective views of the portfolio manager on the future performance of the assets under consideration. In our model, the views are related to the SNC risk rather than expected returns only.

The new or posterior very conservative portfolio derived from the Black-Litterman model is composed as follows: 61% is allocated to sukuk and 39% is allocated to gold. The composition of these assets in our benchmark portfolio was 93% and 7% for sukuk and gold respectively. Our model has no allocation to Global Stocks, Emerging

Market Stocks and Real Estate this result is in line with the benchmark portfolio. Note that this study derives an optimal allocation of assets for the very conservative portfolio which targets the group of investors with a very low-risk appetite ($\lambda = 1$).
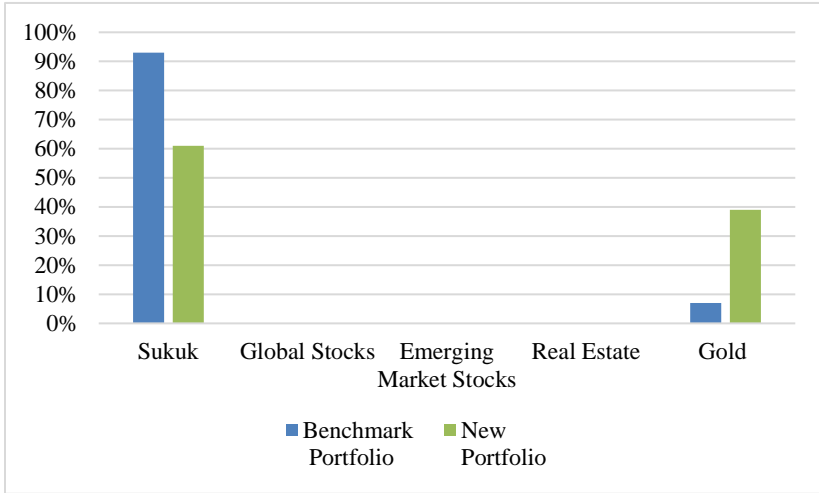
Source: Wahed Invest, Authors' own calculations

Figure 2: Very Conservative Shariah Compliant Portfolio Benchmark vs Posterior

Figure 2 illustrates the allocation of assets in the current portfolio and the new (posterior) portfolio derived using the Black-Litterman model. As mentioned in earlier sections, allocation to gold is underrepresented in our benchmark very conservative portfolio. Recall that gold is a safe-haven asset which implies that gold outperforms other assets during times of financial distress and turmoil, gold has no counterparty risk. Moreover, according to the Shariah interviewed for this research gold has minimum exposure to SNC risk if it is traded physically on the spot. However, being a ribawi asset, gold has strict Shariah

requirements, and the traded mechanisms should be observed as stringent. Some experts added that to ensure its stringent mechanisms are observed, supervisory and regulatory structures should be established to monitor the trading process. For instance, in some countries, Islamic banking institutions with gold accounts and their transactions are supervised and regulated by banking governance and the home country's legal reference.

Meanwhile, Sukuk is another asset with low SNC risk it has an exposure to the credit risk. These views and the historical performance of gold justify its 32% increased weight in the new very conservative portfolio.

6.0 Conclusion

The study aimed to construct a portfolio that addresses the SNC (Shariah Non-Compliance) risk while generating attractive returns for risk-averse investors. The Black-Litterman model was used, which incorporates both historical performance and the subjective views of the portfolio manager on the future performance of assets, specifically related to SNC risk.

The variance-covariance matrix of excess returns (Table 5) was derived, which represents the linear relationships and co-movements between different assets. Positive coefficients indicate co-movement in the same direction, while negative coefficients indicate movement in different directions. The diagonal elements represent the variances of the assets, and the off-diagonal elements represent the covariances, which are symmetric.

The results of the Black-Litterman model for the very conservative portfolio (Table 6) showed that the new portfolio allocation consisted of 61% allocation to sukuk and 39% allocation to

gold. This allocation was different from the benchmark portfolio, which had 93% allocation to sukuk and 7% allocation to gold. The model considered the historical performance of the assets as well as the subjective views on SNC risk. The allocation to gold was increased due to its status as a safe-haven asset with minimum exposure to SNC risk when physically traded on the spot. Sukuk, another asset with low SNC risk, also received a significant allocation.

The findings of this study align with existing literature that highlight the importance of incorporating subjective views and future expectations into portfolio construction models, such as the Black-Litterman model. The model's ability to incorporate specific expectations of a portfolio manager, in this case, related to SNC risk, sets it apart from traditional mean-variance optimization models that rely solely on historical performance. The study also acknowledges the strict Shariah requirements for gold and the need for a supervisory and regulatory structure to ensure compliance.

In conclusion, the Black-Litterman model, incorporating subjective views on SNC risk, led to a revised portfolio allocation with increased weight to gold and Sukuk. This allocation aimed to address SNC risk while generating attractive returns for risk-averse investors. The findings of this study contribute to the existing literature by showcasing the application of the Black-Litterman model in a Shariah-compliant investment context and emphasizing the importance of considering specific risk factors in portfolio construction.

References

Abdullaah, J., Asyaraf, M.R. Syahidawati, S. (2018a). The Four Introductory Theories of Fiqh Muamalat. Nilai: Wisdom Publication.

Abdullaah, J., Asyaraf, M.R. Syahidawati, S. (2018b). The Four Main Contracts of Fiqh Muamalat. Nilai: Wisdom Publication.

Abdullah, A. and Abu Bakar, M.J. (2015). The Gold Market and the Value of the U.S. Dollar. International Business Research, 8(3), 190-207.

Adzimatinur, F., Manalu, V.G., & Rahimi, F. (2021). The Sharia Compliance of Gold-Backed-Cryptocurrency: Analysis of Volatility and Risk. Proceedings of the 1st Universitas Kuningan International Conference on Social Science, Environment and Technology, UNiSET 2020, 12 December 2020, Kuningan, West Java, Indonesia.

Ahcene Lahsasna. (2014). Shari`ah Non-Compliance Risk Management and Legal Documentation in Islamic Finance. Wiley Online Library.

Ahmad, M. H., & Lateh, N. (2020). The Development of Shariah Risk Management Model (SRM-i) for the Use of Shariah Compliance Organizations. Environment-Behaviour Proceedings Journal, 5(SI1), 79-84.

Alam, M.M., Akbar, C.S., Shahriar, S.M., and Elahi, M.M. (2017). The Islamic Shariah Principles for Investment in Stock Market, Qualitative Research in Financial Markets, 9(2): 132-146.

Al-Khazali, O.M., & Zoubi, T.A. (2020). Gold and portfolio diversification: A stochastic dominance analysis of the Dow Jones Islamic indices. Pacific-basin Finance Journal, 60, 101264.

Baur, D. (2012). Asymmetric Volatility in the Gold Market. Journal of Alternative Investments, 14, pp. 26-38.

Baur, D. and Lucey, B.M. (2009). Flights and contagion – An empirical analysis of stock-bond correlations. Journal of Financial Stability, 5(4), 339-352.

Bayram, K., Abdullah, A. and Meera, A.K. (2018), "Identifying the optimal level of gold as a reserve asset using Black–Litterman model: The case for Malaysia, Turkey, KSA and Pakistan", International Journal of Islamic and Middle Eastern Finance and Management, Vol. 11 No. 3, pp. 334-356. https://doi.org/10.1108/IMEFM-06-2017-0142

Black, F. and Litterman, R. (1991). Global Asset Allocation with Equities, Bonds, and Currencies. Fixed Income Research, Goldman, Sachs & Company, October.

Black, F. and Litterman, R. (1992). Global portfolio optimization. Financial Analysts Journal, 48, September/October, 28-43.

Butt, M.A., Ayub, H., Latif, B., Asif, F., Shabbir, M.S. and Raja, A.A. (2022), "Financial risks and performance of conventional and Islamic banks: do reputational risk matters?", Journal of Islamic Accounting and Business Research, 13 (4), 581-595.

Chkili, W. (2017). Is gold a hedge or safe haven for Islamic stock market movements? A Markov switching approach. Journal of Multinational Financial Management, 152-163.

Ghazali, M.F., Lean, H.H., & Bahari, Z.B. (2015). Sharia-compliant gold investment in Malaysia: Hedge or safe haven?☆. Pacific-basin Finance Journal, 34, 192-204.

Godlewski, Christophe & Ariss, Rima & Weill, Laurent. (2014). Do the Type of Sukuk and Choice of Shariia Scholar Matter?. SSRN Electronic Journal. 10.2139/ssrn.2537420.

Hashim, A. M., Habib, F., Isaacs, Z., & Gadhoum, M. A. (2017). ISRA-Bloomberg Sharīʿah Stock Screening And Income Cleansing Methodologies: A Conceptual Paper. ISRA International Journal of Islamic Finance. 9(1), 27-42

He, G. and Litterman, R. (1999). The Intuition Behind Black-Litterman Model Portfolios. Investment Management Research, Goldman Sachs Quantitative Resources Group.

Idzorek, T. M. (2007). A Step-by-Step Guide to the Black-Litterman Model: Incorporating User-Specified Confidence Levels. S. Stephen, Forecasting Expected Returns in the Financial Markets. Oxford: Academic Press.

IFSB (2016). Sharī'ah Non-Compliance Risk in The Banking Sector: Impact On Capital Adequacy Framework Of Islamic Banks. Islamic Financial Services Board, Working Paper Series, March 2016, WP-05/03/2016.

Kassim, N. S., Ramlee, R., & Kassim, S. (2017). Impact of inclusion into and exclusion from the Shariah index on a stock price and trading volume: An event study approach. International Journal of Economics and Financial Issues, 7(2), 40-51.

Lahsasna, Ahcene. (2014). Shariah Issues and Resolutions in Contemporary Islamic Banking and Finance, (2014) IBFIM Publication, Malaysia.. Fernandes et. al., 2007;

Lee, W. and Lin, H. (2010). The dynamic relationship between gold and silver futures markets based on Copula-AR-GJR-GARCH Model. Middle Eastern Finance and Economics, 7, 119-129.

M. H. Abdullah and O. I. Bacha. (2001) Halal stock designation and impact on price and trading volume. The Journal of Accounting, Commerce & Finance - Islamic Perspective, 66-97.

Maghyereh, A.I., Abdoh, H., & Awartani, B. (2019). Connectedness and hedging between gold and Islamic securities: A new evidence from time-frequency domain approaches. Pacific-Basin Finance Journal.

McGowan Jr, C. B., & Muhammad, J. (2010). The theoretical impact of the listing of Syariah-approved stocks on stock price and trading volume. International Business & Economics Research Journal (IBER), 9(3), 11-20

Mohd Noor, N. S., Ismail, A. G., & Mohd. Shafiai, M. H. (2018). Shariah risk: its origin, definition, and application in Islamic finance. SAGE Open, 8(2), 2158244018770237.

Mylchreest, P. (2007). Gold war. Redburn Research (November 12). Retrieved from http://www.gata.org/files/RedburnPartnersGoldReport_11-12-2007.pdf

Mylchreest, P. (2016). Death of the Gold Market: Reforming the LBMA and the true price of physical gold. Equity & Cross Asset Strategy (4 May 2016). Retrieved from http://www.gata.org/files/MylchreestReport-05-2016.pdf

Naeem, M.A., Qureshi, F., Arif, M., & Balli, F. (2021). Asymmetric relationship between gold and Islamic stocks in bearish, normal and bullish market conditions. Resources Policy.

Nasreen, S., Naqvi, S. A. A., Tiwari, A. K., Hammoudeh, S., & Shah, S. A. R. (2020). A wavelet-based analysis of the co-movement between Sukuk bonds and Shariah stock indices in the GCC region: Implications for risk diversification. Journal of Risk and Financial Management, 13(4), 63.

Nawal, K., & Rosnadzirah, I. (2018). Monitoring non-compliance risks in Islamic venture capital. The International Revue of Entrepreneurial Finance, 1(1), 33-46

Nor, F. M., Shaharuddin, A., Marzuki, A., & Ramli, N. A. (2019). Revised Malaysian Shariah screening: Its impact on Islamic capital market. Open Access. 10(1). 17-30.

Omar, H. & Rusni, H. (2019). Shariah Non-Compliance Treatment in Malaysian Islamic Banks. International Journal of Management and Applied Research. 6. 220-233. 10.18646/2056.64.19-016.

Raza, N., Ibrahimy, A.I., Ali, A., & Ali, S. (2016). Gold and Islamic stocks: A hedge and safe haven comparison in time-frequency domain for BRICS markets. The Journal of Developing Areas, 50, 305 - 318.

Razak, N.A., Abdul-Rahman, A., & Yaacob, S.E. (2017). Implementing gold investment for Malaysian Employees Provident Fund (EPF). Geografia: Malaysian journal of society and space, 12.

Rosly, S. A., Naim, M. A., & Lahsasna, A. (2017). Measuring Shariah non-compliance risk (SNCR): Claw-out effect of al-bai-bithaman ajil in default. Journal of Islamic Accounting and Business Research, 8(3), 272-283

Rusni, H. (2016). Shariah non-compliance risk and its effects on islamic financial institutions. Al-Shajarah: Journal of the International Institute of Islamic Thought and Civilization (ISTAC), 21(3), 21-31

Salleh, A. Z., & Zakaria, M. Z. (2015). Purification of Islamic Unit Trust Funds: A Shariah Analysis on Malaysian Approach. Al-Qanatir: International Journal of Islamic Studies, 2(1), 13-22.

Satchell, S. and Scowcroft, A. (2000). A Demystification of the B-L model: Managing Quantitative and Traditional Portfolio Construction. Journal of Asset Management, 1(2), 138-150.

Seiler, M. J. (2004). Performing Financial Studies: A Methodological Cookbook. Prentice Hall.

US Securities and Exchange Commission. (February 10, 2022). SEC Charges Robo-Adviser with Misleading Clients. Retrieved from https://www.sec.gov/news/press-release/2022-24

Yazi, E., Morni, F., & Imm, S. S. (2015). The effects of Shariah compliance announcement towards stock price changes in Malaysia. Journal of Economics, Business and Management, 3(11), 1019-1023.