# Investor Sentiment Under the Maqasid Al-Shari'ah Compliance Asset Pricing Model: A Behavioral Finance Approach to Islamic Finance

**Igo Febrianto[1], Norhayati Mohamed[2*] and Imbarine Bujang[3]**
*[1]Faculty of Economics and Business, Universitas Lampung, Indonesia*
*[2]Accounting Research Institute (HICoE), Universiti Teknologi MARA, Shah Alam Selangor, Malaysia*
*[3]Faculty of Business and Management, Universiti Teknologi MARA (UiTM) Sabah Branch Kota Kinabalu Campus, Sabah, Malaysia*

## ABSTRACT

This study provides perspectives and insights into the importance of *Maqasid al-Shari'ah* in the discourse of *Shari'ah*-Compliant Asset Pricing Model (SCAPM) development by considering inflation and zakat as the minimum level of expected return. The study also integrated market risk and investor sentiment as systematic risks faced by Muslim investors in stock investments. Using a non-linear panel ARDL approach with monthly panel data from 109 *Shari'ah*-compliant listed companies on the Indonesian Stock Exchange between October 2007 and June 2021 (164 months), the study found that the Islamic market risk premium and investor sentiment had a positive long-term impact on *Shari'ah*-compliant stock returns. Surprisingly, market risk premium had a reverse effect in the short term, while investor sentiment remained positive. These findings contribute to understanding Islamic finance and have practical implications for investors, financial institutions, and policymakers.

**Keywords:** Maqasid al-Shari'ah, Shariah-compliant asset pricing model, investor sentiment

# INTRODUCTION

The application of the conventional Capital Asset Pricing Model (CAPM) in the Islamic finance industry has become a topic of discussion and debate among Muslim scholars. The validity of pricing financial securities stands out among several discussion topics (Ahmed et al., 2014). The main debate topic is using the CAPM's risk-free rate component. Investors use a risk-free rate to describe the minimum rate of expected return on investment with zero risks by the investor over a certain period. Some Muslim scholars view that the component of the risk-free rate, generally measured by the interest rate on government securities, is a predetermined return that is very close to the concept of usury, and usury is one of the main prohibitions in Islamic law. Therefore, a securities model with a risk-free rate component is considered *Shari'ah* non-compliant (Sadaf & Andleeb, 2014). In the context of the development of the Shari'ah Compliance Asset Pricing Model (SCAPM), the incorporation of the principles of Maqasid al-Shari'ah Theory not only addresses the concern regarding the risk-free rate but also provides a framework that aligns with the ethical foundations of Islamic finance, offering a viable solution to the ongoing debate in the field.

Several Muslim academics have attempted to build a *Shari'ah*-Compliant Asset Pricing Model (SCAPM) based on the neo-classical finance paradigm. Ashker (1987) proposed the theoretical application of the traditional CAPM to the SCAPM by replacing the risk-free rate with a zakat rate of 2.5%. Shaikh (2009) recommended replacing the risk-free rate with the nominal Gross Domestic Product (NGDP) growth rate. Hanif (2011) substituted inflation for the risk-free rate, and Hazny et al. (2020) suggested the sukuk rate with zakat purification. However, the majority of the development of the SCAPM consisted of attempting to replace the risk-free rate component of the asset pricing model with various Shari'ah-compliant variables without tracing the origins of Islamic principles and concepts as a starting point. By tracing the origins of Islamic *Shari'ah*, the SCAPM can provide a more solid foundation for asset pricing in Islamic finance. This approach ensures that the model is not solely a modification of conventional finance models but rather a framework rooted in Islamic finance principles, thereby enhancing its credibility and acceptance among practitioners and scholars in the field.

In managing assets and the expected return, an investor must also carefully assess the associated risk factors linked to the investment asset. The next consideration is identifying systematic risk sources in developing the SCAPM. In conventional finance, the market risk premium is an essential variable in the traditional CAPM. From the early development of the CAPM model by Treynor (1962), Sharpe (1964), Lintner (1965), and Mossin (1966) to the latest conventional developments such as the Sustainable CAPM by Zerdib (2022), market risk premium remains an important variable in the CAPM model. However, market risk premium faces many empirical challenges in subsequent developments. Evidence show that CAPM and its beta coefficient as a measurement of a security's sensitivity to movement in the overall market, or a coefficient of market risk premium, is not the only risk factor. Several firm characteristics also have a significant explanatory power towards average returns. Traditional CAPM has difficulty explaining why asset prices deviate from fundamental values, market bubbles, stock crashes, financial crises, basic facts about the aggregate stock market, the cross-section of average returns, and individual investor trading behaviour (Barberis & Thaler, 2003).

Shaikh et al. (2019) found mixed results when testing market risk premium on *Shari'ah*-compliant stock using the Lintner (1965) approach. The beta coefficient was marginally positive in linear CAPM (OLS), negative in GMM, and insignificant in both. The introduction of non-linearity made beta significant but negative in OLS and positive in GMM, with a positive and significant non-linear coefficient. Including non-linearity and residual variance made beta significant but negative in both OLS and GMM. CAPM posits a positive relation between beta and returns. However, recent studies show a lack of supporting evidence for traditional CAPM, which motivates the study to examine alternative multi-factor models to capture the stock returns.

In response to the difficulties and limitations faced by the neo-classical paradigm CAPM explaining anomalies and economic phenomena has led to the development of the financial behaviour asset pricing model approach. The model was developed based on the Noise Trader approach (Black, 1986) and Prospect Theory (Kahneman, 1979). It argued that investor decisions are affected by human psychology and that economic agents are not always rational (DeLong et al., 1990; Barberis & Thaler, 2003; Ritter,

2003; Chauhan et al., 2020). Their demand for risky assets is affected by their beliefs or sentiments not fully justified by fundamental values. Recently in behavioural finance development, investor sentiment has become the focus of behavioural finance literature on asset pricing models. Investor sentiment is a belief about future cash flows and investment risks that are not predictable based on the facts (Baker & Wurgler, 2007). Empirical studies suggest that rational and irrational investors are subject to sentiment and that investor sentiment is systematic and has explanatory power on stock returns (Daniel et al., 1998; Zhu et al., 2020; Paudel et al., 2022).

Previous studies on the Islamic capital market also have shown that investor sentiment can affect stock returns. Białkowski et al. (2012) investigated the influence of the holy month of Ramadhan on investors' psychology. The results supported that the month of Ramadhan positively impacts the investor's mood and sentiment, thus influencing their investment decision. Narayan and Bannigidadmath (2017) used sentiment-induced keywords to examine the effect of financial news on *Shari'ah*-compliant stock returns. They exhibited a higher predictability for sentiment-induced keywords in *Shari'ah*-compliant stocks than in non-*Shari'ah*-compliant stocks.

Similarly, Trichilli et al. (2018) examined Financial and Economic Attitudes Revealed by Search (FEARS) investor sentiment predictability for Islamic stock returns in the Middle East and North Africa (MENA) stock markets. They concluded that investor sentiment has higher predictability in Islamic stock markets. Applying behavioural finance principles in developing asset pricing models in the Islamic finance industry is still in its early stages. The unique ethical principles of Islamic finance, which promote responsible and ethical investing, make it particularly relevant to the development of SCAPM. Incorporating investor sentiment in the SCAPM will provide a more comprehensive understanding of the relationship between risk and return on investment.

Therefore, based on the discussion and issues above, we aimed to dive deeper into the SCAPM by constructing a model that emphasizes the connection between return and risk utilizing the *Maqasid al-Shari'ah* theory in Islamic finance. We proposed the fulfilment of basic necessities (*dharuriyyat*) and zakat rate as a proxy for investors' required rate of return

as a substitute for the conventional risk-free rate in asset pricing models. This action would ensure that the model is based on a thorough understanding of Islamic finance and investment, resulting in a more robust and accurate model. Additionally, this would lend authenticity to the model, elevating its acceptance and credibility among the Muslim community. Secondly, as the Islamic financial market is an open market, investor behaviour within it is highly diversified. Consequently, investor behaviour may constitute an inherent risk in investing in stocks. Despite the limitations imposed by Sharia principles on financial products and transaction processes, the natural human drive to earn profits can fuel investor behaviour, rendering it a source of investment risk that all capital market investors must contend with. To address this issue, we suggest that investor sentiment be included as a systematic risk factor in the development of SCAPM.

This research was conducted in Indonesia, one of the countries with a strong presence in the Islamic finance industry. In 2020, Indonesia's total Islamic financial assets were estimated to have reached USD 119 billion, an increase of 20.2% compared to the previous year. Therefore, this study provided perspectives and insights into the importance of the element of *Maqasid al-Shari'ah* in discussing the development of SCAPM by considering the minimum level of expected return and zakat as a wealth purification. This study also integrated the risk factors that arise from the market and investor sentiment as a systematic risk that investors must face.

The research objectives of this study were twofold. Firstly, the study intended to incorporate the principles of *Maqasid al-Shari'ah* theory into the SCAPM, specifically by considering the fulfillment of basic necessities (*dharuriyyat*) and zakat rate as proxies for investors' required rate of return. Secondly, the study aimed to examine the effect of market risk premium and investor sentiment on stock return within the framework of the SCAPM. By investigating the relationship between these variables, the research soughtto enhance our understanding of the factors influencing stock returns in Islamic finance. This approach ensured the model's adherence to Islamic ethical principles and strengthens its credibility among the Muslim community. Additionally, the study aimed to recognize investor sentiment as a systematic risk factor in the development of SCAPM, recognizing the diversified investor behaviour within the Islamic financial market.

The subsequent section presents a comprehensive literature review, followed by hypothesis development and research methodology, including the data collection process. Next, the study's empirical test results, findings, and implications are presented. Finally, the last section provides the study's conclusions and limitations.

# LITERATURE REVIEW

## *Maqasid al-Shari'ah* in Asset Pricing

*Maqasid al-Shari'ah* is a term that refers to a purpose, objective, principle, intent, goal, end (Ibn Ashur, 2006). It is the pillar and foundation of the Islamic financial system, improving justice and well-being for all macro and micro-level stakeholders (Soualhi, 2015). Developed by Abu al-Ma'ali al-Juwayni (d. 478 AH/1085 CE), the *Maqasid al-Shari'ah* rationale was continued by Abu Hamid al-Ghazali (d. 505 AH/1111 CE) and Abu Ishaq al-Shatibi (d. 790 AH/1388 CE). *Maqasid al-Shari'ah* can be divided into three categories: necessities (*dharuriyyat*), needs (*hajiyyat*), and luxury/complementary (*tahsiniyyat*). Under the category of necessities (*dharuriyyat*), al-Ghazali ordered the five primary things suggested by al-Juwayni, as follows; (1) preservation of faith/religion, (2) preservation of soul/life, (3) preservation of mind, (4) preservation of offspring/lineage and (5) preservation of wealth. These five primary things are safeguarding cases that must exist to establish the benefit of religion and the world. This minimum level of fulfilling *dharuriyya*t can be employed as the minimum expected rate of return in the SCAPM. Hence, this minimum level of *dharuriyyat* can act as a benchmark that replaces the risk-free rate in the CAPM since it shares similar significance and provides an alternative approach to asset valuation, which is grounded in Islamic principles and does not involve any form of riba. An alternate measure of the fulfillment of necessities (*dharuriyyat*) is the inflation rate. In this context, the inflation rate serves as a crucial proxy in evaluating the rate of such fulfilment by considering the impact of inflation on the purchasing power of individuals. Inflation is an increase in the general price level of commodities, products and services over a specified period.

In addition to meet the necessities (*dharurriyat*), we also offer the zakat rate as part of the minimum expected rate of return for Muslim investors in investments, as zakat is an inseparable part of wealth. The fulfilment of zakat obligations, one of the five pillars of Islam that defines a Muslim's faith, serves as a means of purifying wealth. Zakat also has a strategic position in Islamic education and economic progress, and by paying zakat, a Muslim fulfils both personal and social obligations. As a measure of the expected minimum rate of expected return in our *Maqasid al-Shari'ah* Compliance Asset Pricing Model, this study proposed the fulfillment of basic necessities (dharuriyyat), measured by inflation, and zakat rate as a proxy for investors' required rate of return.

Incorporating Maqasid al-Shari'ah principles, such as fulfilling basic necessities (dharuriyyat) and observing zakat, into the Asset Pricing Model represented a significant advancement in Islamic finance. By aligning the investment framework with the objectives of justice, societal well-being, and the purification of wealth, the model ensured a more ethical and socially responsible approach to asset pricing. This perspective considers the financial aspects and the broader impact on individuals and society, emphasizing the holistic nature of Islamic finance.

## Behavioural Finance in SCAPM

Hirshleifer (2001) expressed that the literature on behavioural finance is under development, particularly in behavioural asset pricing. This approach attempts to explain the variation of stock returns based on psychology-based factors rather than rational decision-making. The premise of behavioural asset pricing is based on the counterargument that investors are not always rational and make decisions subject to psychological biases and heuristics. Daniel et al. (1998) and Barberis et al. (1998) have developed theoretical models in behavioural asset pricing to explain stock prices through specific biases of investor psychology. Empirical investigations by researchers such as De Bondt and Thaler (1985; 1987), Fisher & Statman (2002), Brown and Cliff (2004), and Baker and Wurgler (2006) attempted to capture the aggregate effect of investor psychology on stock returns.

In an Islamic financial system, individual and institutional behaviours are subject to Islamic norms, which arise from different assumptions than

Western markets. Islamic *Shari'ah* restricts speculative actions and considers them undesirable. Although stock market trading is allowed, speculation is either unacceptable or strictly controlled as it involves high uncertainty and is similar to gambling, which the Quran strictly forbids. Islam introduces the concept of a comprehensive spiritual dimension, which includes the Islamic view of psychology. Razak (2011) explains that the concept of human nature in Islam includes physical, social, psychological, and spiritual dimensions. Ideally, in making decisions, including financial decisions, only *qalb* and *aql* should be involved, with *qalb* serving to determine the filter of good and bad investments based on values, morals, and ethics. In contrast, *aql* carries out fundamental rational analysis of investment decisions. However, including *nafs* can lead to actions that deviate from the ideal values and principles of Islamic finance. Therefore, Al-Abbadi and Abdullah (2017) suggest that using instruments in behavioural finance, such as behavioural biases, can also be applied to the Islamic approach and related phenomena.

Behavioural finance, particularly in behavioural asset pricing, challenges the assumption of rational decision-making by highlighting the impact of psychological biases and heuristics on stock returns. In an Islamic financial system, distinct norms and assumptions guide individual and institutional behaviours, with speculative actions discouraged due to the prohibition of gambling. Islamic views on human nature encompass physical, social, psychological, and spiritual dimensions. While ideal decision-making involves the qalb and aql, the inclusion of nafs can lead to ethical deviations. Exploring the application of behavioural finance instruments, including biases, in the Islamic approach can offer valuable insights and enhance understanding in this field.

## Investor Sentiment in SCAPM

*Shari'ah* allows only common stocks to be traded. There seems to be a consensus among contemporary jurists on the permissibility of exchanging common stocks through buying and selling transactions (Ahmad et al., 2014). Selling a common share is like selling a portion of the company's share, and it is considered as an individual's property, where the owner has the right to sell or lend as long as it does not cause harm to other shareholders (Osmani & Abdullah, 2009). Islamic Fiqh Academy declared that investing in common stock is permissible if the main business of the

company complies with the *Shari'ah* ruling (Ahmad et al., 2014). In stock markets, speculation exists by nature, and one might argue that speculation resembles gambling and, therefore, investment in shares is not permissible by *Shari'ah*. The argument here is that in the stock market, the buying or selling is done to make a profit anticipating that price will change and gain will come from natural or artificial price differences. Speculators are therefore believed to behave with unusual patterns of the markets within the random walks of stock price movements through the adoption of different 'gambling' positions (El-Din & Hassan, 2007).

Muslim investors may use both qualitative and quantitative *Shari'ah screening* processes to limit arbitrage and short-selling impediments. Investor sentiment can be identified as investors' expectations and feelings about market conditions. Investors use their moods, attitudes, psychological and cognitive factor to establish their expectations and beliefs to predict asset prices in the future. A Muslim investor will decide by considering his belief in *Shari'ah*'s provisions. Both qualitative and quantitative *Shari'ah*-screening processes may lead stocks to short-selling impediments and limit arbitrage (Khan et al., 2010), which then hints that *Shari'ah*-compliant stocks are influenced more by noise traders than conventional stock in the long-run. Ftiti et al. (2019) found that using lagged economic policy uncertainty, oil prices, and investor sentiment may improve the predictability of Islamic stock returns. Shah and Albaity (2022) found in the Middle East and North Africa region (MENA) region revealed that market sentiment, uncertainty, and trust positively affected bank stock returns, while individual sentiment negatively influenced bank stock returns.

The researchers then developed several indirect investor sentiment measurement indicators based on economic and company financial data, providing reliable data availability with higher duration and frequency than direct measurements. This approach was supported by financial theories and based on stock market activities. Empirical literature used indirect measures of investor sentiment such as share turnover (Baker & Wurgler, 2007) trading volume (Chuang et al., 2010) and P/E ratio (Naik & Padhi, 2016). The investor sentiment under Maqasid al-Shari'ah Compliance Asset Pricing Model represented a step forward in understanding and incorporating the unique characteristics of Islamic finance. The consideration of investor sentiment within this framework acknowledged the importance of qualitative

and quantitative Shari'ah screening processes in shaping investment decisions.

## HYPOTHESES

Incorporating the principles of Maqasid al-*Shari'ah* Theory into the SCAPM and utilizing the fulfillment of basic necessities (*dharuriyyat*) and zakat rate as proxies for investors' required rate of return will establish a more credible and robust framework for pricing financial securities in Islamic finance. Acknowledging investor sentiment as a systematic risk factor in the SCAPM will enhance our understanding of the relationship between risk and return in the Islamic financial market. We expected that investor sentiment will have a significant impact on stock returns, indicating that investor behaviour plays a crucial role in shaping investment outcomes. By integrating investor sentiment within the framework of the SCAPM, we anticipated that the model will better capture the complexities and dynamics of the Islamic financial market, leading to more comprehensive and reliable asset pricing predictions.

These hypotheses aimed to investigate the effectiveness of the SCAPM in incorporating Maqasid al-*Shari'ah* principles and investor sentiment into the asset pricing framework in Islamic finance. By addressing the shortcomings of the conventional CAPM and incorporating unique factors specific to Islamic finance, the SCAPM has the potential to provide a more accurate and comprehensive understanding of asset pricing in the Islamic financial market.

## RESEARCH METHODOLOGY

This study used secondary monthly panel data. The sample of this study was 109 *Shari'ah*-compliant listed companies that remained on the list of *Shari'ah* shares issued by the regulator between October 2007 and June 2021, or 164 months, in the Indonesian Stock Exchange. The authority launched its first *Shari'ah* securities list on September 12, 2007. Data were collected from the Thomson Reuters database, the official website of the Indonesia Stock Exchange (IDX.com), the official website of the Financial

Services Authority (ojk.go.id), the official website of the Central Bank of Indonesia (bi.go.id) and the website of listed companies covered seven years from November 2007 until June 2021. This study used data on *Shari'ah*-compliant stocks listed on the Indonesian capital market.

The literature suggests a long-run equilibrium relationship between investor sentiment and stock returns (Pandey & Sehgal, 2019). This article uses various econometrics methods to investigate the relationship between investor sentiment, direct and indirect measurement and stock return under Maqasid al-Shari'ah Compliant Asset Pricing Model. We applied the Panel Autoregressive Distributed Lag Model (P-ARDL) technique analysis by Pesaran and Smith (1995) using STATA software. The P-ARDL can simultaneously estimate the long-term and short-term cointegration correlations in a case of mixed order of integration and different lags on different variables (Shin et al., 2014). This ability is particularly relevant when examining the relationship between MRP, investor sentiment, and stock returns, as these factors can exhibit both short-term fluctuations and long-term equilibrium effects, which is crucial when dealing with complex financial relationships with varying time dynamics. P-ARDL also complies with small and large sample sizes (Kutu & Ngalawa, 2016; Rafindadi & Yosuf, 2013). By employing the P-ARDL model within the SCAPM framework, this study provides robust and comprehensive insights into the influence of MRP and investor sentiment on stock returns, contributing to a deeper understanding of asset pricing dynamics in the Shari'ah-compliant market.

We first conduct panel unit root tests before performing the main estimations. The tests were necessary to check whether the variables are non-stationary. Several tests were conducted: Im et al. (2003) test (IPS), Levin et al. (2002) test (LLC) and Harris and Tzavalis (1999) test (HT). All of these tests used the null hypothesis of non-stationarity. The selection of lag length was chosen using the Bayesian-Schwarz criteria. Following the extensive literature on dynamic panel data, we implemented several estimators to assess the relationship between investor sentiment and stock return by using the Mean Group (MG) and Pooled Mean Group (PMG) by Pesaran and Smith (1995), Pesaran et al. (1999).

# MEASUREMENT OF VARIABLES

## Measurement of Dependent Variables

The dependent variable of this study was the expected return $E(R_{it})$ of *Shari'ah*-compliant stock listed in the Indonesia Stock Exchange and Malaysia Stock Exchange calculated by the formula:

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}$$

Rit        = return from asset i in period t
Pt         = price of asset i in period t
Pt-1       = price of asset i in period t-1

## Measurement of Independent Variables

The independent variables of this study were indirect investor sentiment measurement, as follows:

**Table 1: Indirect Measurement of Investor Sentiment**

| No | Measurement of investor sentiment | Studies | Data level of measurement | Source of Data |
|----|-----------------------------------|---------|---------------------------|----------------|
| 1  | Trading Volume | Chuang et al. (2010) | firm level | Datastream |
| 2  | Share Turnover | Baker and Wurgler (2007) | firm level | Datastream |
| 3  | P/E Ratio | Naik and Padhi (2016) | firm level | Datastream |

Thus, to test our hypothesis regarding the effect of investor sentiment under the *Maqasid al-Shari'ah* Compliant Asset Pricing Model, this article uses the following specification of a general model of ARDL as follows:

$$\Delta ERINFZ_{i,t} = (\theta_0 ERINFZ_{i,t-1} + \theta_0 MRP_{i,t} + \theta_2 SENT_{i,t}) + \sum_{}^{j=1}{}_{p-1}$$
$$\lambda_{ij}\Delta ERINFZ_{i,t-j} + \sum_{j=1}^{q-1} \delta 1_{ij} \Delta MRP_{i,t-j} + \sum_{j=1}^{q-1} \delta_{2ij} \Delta SENT_{i,t-j} + \varphi_i + e_{i,t}$$

$ERINFZ_{it}$   = (Return of asset $_i$ at time $_t$ - INFZt)
$INFZ_t$         = (Inflation + Zakat rate at time $_t$)
$MRP_t$          = Market Risk Premium at time $_t$
$SENT$           = investor sentiment proxies by Trading Volume, Share Turnover and Price Earning Ratio

Where $ERINFZ_{it}$ was the dependent variable; $MRP_{it}$ and $SENT_{it}$ were k x1 vectors that were allowed to be purely I(0) or I (1) or cointegrated; $\delta_{ij}$ was the coefficient of the lagged dependent variable called scalars; $\beta_{ij}$ were k x1 coefficient vectors; $\varphi_i$ was the unit-specific fixed effect; $i = 1,\ldots, N$; $t = 1,2,\ldots, T$; $p,q$ were optimal lag orders; $e_{it}$ was the error term.

## EMPIRICAL RESULT

The first step to analyse the data was to run descriptive statistics for all variables based on data from 109 *Shari'ah*-compliant stocks in Indonesia Stock Exchange from October 2007-June 2021, as presented in Table 2. Data characteristics were analysed by mean value, standard deviation, minimum and maximum value. The normality of data was verified by the value of skewness and kurtosis.

**Table 2: Descriptive Statistic**

| Variable | Average | Std. Dev. | Minimum | Maximum | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| ERINFZ | -0.0458 | 0.1232 | -0.5129 | 0.4392 | 0.3056 | 1.8545 |
| MRPJIIIZ | -0.0479 | 0.0701 | -0.3396 | 0.1340 | -0.9286 | 3.0906 |
| VOL | 10,200,112 | 2,460,896 | 10 | 158,466,723 | 3.5013 | 13.5931 |
| SHTO | 0.0021 | 0.0054 | 0.0000 | 0.1600 | 6.6098 | 77.6587 |
| PER | 2.6693 | 18.6584 | -265.5669 | 368.4850 | 7.6749 | 125.0322 |

The study provides descriptive statistics for several variables related to the Islamic stock market. The average *Shari'ah*-compliant stock return (ERINFZ) had a negative average return of -0.0458 with a standard deviation of 0.1232. This value suggested that the returns were generally less spread out and closer to the average return, indicating a relatively lower level of volatility or risk associated with the stock. The distribution of ERINFZ was slightly skewed to the right with skewness of 0.3056 and thin-tailed with few outliers, as indicated by its kurtosis of 1.8545. The average market risk premium (MRPJIIIZ) was also negative at -0.0479, with a lower standard deviation of 0.0701. The distribution of MRPJIIIZ was slightly skewed to the left with a skewness of -0.9286 and leptokurtic with a kurtosis of 3.0906.

Moreover, the descriptive statistics showed that the variables VOL, SHTO, and PER had highly skewed and leptokurtic distributions, which indicated that the data was not normally distributed. The skewness of VOL,

SHTO, and PER was 3.5013, 6.6098, and 7.6749, while the kurtosis was 13.5931, 77.6587, and 125.0322. Hair et al. (2010) and Bryne (2010) argued that data is normal if skewness is between -2 to +2 and kurtosis is between -7 to +7. To deal with the non-normality of the data, the natural logarithm (Ln) transformation was used to create a more symmetric distribution. This approach is commonly used in finance research to address the non-normality of financial data.

To test for stationarity, we conducted a variety of unit root tests. The results of the Im et al. (2003) test (IPS), Levin et al. (2002) test (LLC) and Harris and Tzavalis (1999) test (HT) are reported in Table 3. All of these tests used the null hypothesis of non-stationarity. As can be seen from Table 3, all of the variables were integrated at level I(0). This finding indicated the appropriateness of the Panel ARDL approach.

**Table 3: Unit Root Test Result**

| Variables | LLC | | HT | | IPS | |
|---|---|---|---|---|---|---|
| ERINFZ | -71.1738 | *** | 0.1268 | *** | -87.4127 | *** |
| p-value | (0.0000) | | (0.0000) | | (0.0000) | |
| MRPJIIIZ | -47.9709 | *** | 0.3759 | *** | -70.8346 | *** |
| p-value | (0.0000) | | (0.0000) | | (0.0000) | |
| LNVOL | -41.9565 | *** | 0.4478 | *** | -66.6272 | *** |
| p-value | (0.0000) | | (0.0000) | | (0.0000) | |
| LNSHTO | -41.2553 | *** | 0.4482 | *** | -66.2098 | *** |
| p-value | (0.0000) | | (0.0000) | | (0.0000) | |
| LNPER | -3.9583 | *** | 0.7752 | *** | -15.6245 | *** |
| p-value | (0.0000) | | (0.0000) | | (0.0000) | |

Levin, Lin & Chun (LLC) assumes a common unit root process; Im, Pesaran and Shin (IPS) assume an individual unit root process; Harris–Tzavalis (HT) assumes that the number of panels tends to infinity while the number of periods is fixed. ***, ** represent 1% and 5% level of significance, respectively.

The panel ARDL estimation results are reported in Table 4. The results showed the estimates and standard errors for a panel autoregressive distributed lag (ARDL) model using the mean group (MG) and pooled mean group (PMG) estimators. The Hausman test was also performed to determine which estimator is more appropriate for the data. The result represented the short-run dynamics of the relationship as well the long-run effects of each regressor on *Shari'ah*-compliant stock return in the Indonesia stock exchange over the study period. The Hausman test result for investor

sentiment measurement of volume trading and share turnover favoured MG over PMG. While for investor sentiment measurement of price earning ratio, the result favoured PMG over the MG as the estimation approach of choice.

**Table 4: Panel ARDL**

| Estimator | | MG | | PMG | | |
|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | | **Std Error** | **Coefficient** | | **Std Error** |
| **Measurement 1** | | | | | | |
| Long Run | MRPJIIIZ | 0.8393 | *** | 0.0246 | 0.8319 | *** | 0.0133 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | LNVOL | 0.0061 | *** | 0.0007 | 0.0042 | *** | 0.0004 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| Short Run | Ect | -0.9845 | *** | 0.0109 | -0.9578 | *** | 0.0110 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | MRPJIIIZ | -0.1290 | *** | 0.0187 | -0.1075 | *** | 0.0224 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | LNVOL | 0.0017 | ** | 0.0008 | 0.0028 | *** | 0.0008 |
| | ρ-Value | (0.0290) | | | (0.0010) | | |
| | Cons | -0.0906 | *** | 0.0109 | -0.0583 | *** | 0.0013 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| Hausman Test | | 10.1800 | | | | | |
| | ρ-Value | 0.0062 | | | | | |
| **Measurement 2** | | | | | | |
| Long Run | MRPJIIIZ | 0.8430 | *** | 0.0242 | 0.8364 | *** | 0.0133 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | LNSHTO | 0.0066 | *** | 0.0007 | 0.0045 | *** | 0.0004 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| Short Run | Ect | -0.9852 | *** | 0.0108 | -0.9581 | *** | 0.0109 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | MRPJIIIZ | -0.1320 | *** | 0.0184 | -0.1107 | *** | 0.0223 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | LNSHTO | 0.0017 | ** | 0.0007 | 0.0028 | *** | 0.0008 |
| | ρ-Value | (0.0230) | | | (0.0000) | | |
| | Cons | 0.0425 | *** | 0.0051 | 0.0308 | *** | 0.0011 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hausman Test | | 15.4400 | | | | | |
| | ρ-Value | (0.0004) | | | | | |
| Measurement 3 | | | | | | | |
| Long Run | MRPJIIIZ | 0.8086 | *** | 0.0248 | 0.7714 | *** | 0.0125 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | LNPER | -0.0537 | | 0.1938 | 0.0187 | ** | 0.0083 |
| | ρ-Value | (0.7820) | | | (0.0250) | | |
| Short Run | Ect | -0.9821 | *** | 0.0102 | -0.9584 | *** | 0.0103 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | MRPJIIIZ | -0.1315 | *** | 0.0183 | -0.0992 | *** | 0.0220 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | LNPER | 13.6203 | *** | 2.0042 | 13.4782 | *** | 1.9554 |
| | ρ-Value | (0.0000) | | | (0.0000) | | |
| | Cons | 0.1458 | | 0.9727 | -0.0988 | *** | 0.0015 |
| | ρ-Value | (0.8810) | | | (0.0000) | | |
| Hausman Test | | | | | 2.9100 | | |
| | ρ-Value | | | | (0.2333) | | |

**Notes:** ***,** and * denote a significance level at 1%, 5% and 10%, respectively.

## DISCUSSION

From the result in Table 4, all variables performed significantly in terms of sign and magnitude of the estimated coefficient in explaining the *Shari'ah*-compliant stock return. The market risk premium had a positive and significant long-run impact on *Shari'ah*-compliant stock returns, as indicated by the coefficient of 0.8393 for model 1 with LNVOL as the measurement of investor sentiment, 0.8430 for model 2 with LNSHTO as a measurement of investor sentiment and 0.7714 for model 3 with LNPER as measurements of investor sentiment.

However, in the short run, the market risk premium (MRPJIIIZ) coefficients in all models were negative and significant at the 1% level. This finding suggested that an increase in market risk premium can lead to a decrease in *Shari'ah*-compliant stock returns in the short run. This finding is consistent with Yang (2022), who found that stock market volatility negatively predicts short-run equity. In the short run, the stock

market can be highly volatile and subject to sudden changes in investor sentiment and market conditions. When market risk premium increases, it typically indicates that investors demand higher returns to compensate for the increased risk in the market.

The results also suggested that, in the long run, investor sentiment had a positive impact on *Shari'ah*-compliant stock returns, as indicated by the coefficient of 0.0061 for volume trading (LNVOL), 0.0066 for share turnover (LNSHTO) and 0.0187 for price earning ratio (LNPER). All coefficients were significant at the 1% and 5% levels, suggesting that, in the long run, an increase in investor sentiment can lead to an increase in *Shari'ah*-compliant stock returns. In the short run, the results also showed that investor sentiment had a positive effect on *Shari'ah*-compliant stock returns. For volume trading (LNVOL) and share turnover (LNSHTO) measurements of investor sentiment, the coefficients were positive and significant at the 5% level. The coefficient of price earning ratio (LNPER) was positive and significant at the 1% level. This result supports the findings of Ftiti and Hadhri (2019) and Di and Hasanov (2021).

This study aimed to incorporate the principles of Maqasid al-Shari'ah Theory into the SCAPM and examine the effect of market risk premium (MRP) and investor sentiment on Shari'ah-compliant stock returns. The findings revealed significant relationships between the variables and Shari'ah-compliant stock returns. In the long run, market risk premium positively impacted stock returns, indicating that investors expect higher returns for taking on additional market risk. Conversely, in the short run, an increase in market risk premium led to a decrease in stock returns, reflecting the higher risk perception during volatile market conditions. The decrease in stock returns suggested that Islamic investors may be more cautious and prefer to pay a premium for stocks that align with Shari'ah principles, even in the face of higher market risk. This finding is consistent with the notion that during periods of heightened market volatility and uncertain investor sentiment, investors tend to seek safer investment options and may be more willing to accept lower returns in exchange for adherence to ethical and religious principles. Therefore, market risk premium can negatively predict Shari'ah-compliant stock returns in the short run as investors prioritize risk mitigation and adherence to their ethical preferences.

Furthermore, investor sentiment positively influenced stock returns in the long and short run, highlighting the significance of psychological factors in shaping investment outcomes. These findings support the credibility and robustness of incorporating *Maqasid al-Shari'ah* principles into the SCAPM, providing a comprehensive framework for pricing financial securities in Islamic finance. The inclusion of investor sentiment as a systematic risk factor contributes to a better understanding of the relationship between risk and return in the Islamic financial market. By integrating these elements, the SCAPM can capture the complexities and dynamics of the market, leading to more accurate and reliable asset pricing predictions. These results align with prior studies, confirming the importance of investor sentiment in influencing stock returns in Islamic finance. Overall, this research provides valuable insights for academics and practitioners in Islamic finance and highlights the significance of behavioural finance approaches in understanding market dynamics and investment decisions.

## CONCLUSION

This study explored the impact of market risk and investor sentiment on *Shari'ah*-compliant stock return under the *Shari'ah*-Compliant Asset Pricing Model based on *Maqasid al-Shari'ah* Theory. The minimum expected rate of return has been constructed from the level of necessity (*dharruriyat*) in *Maqasid al-Shari'ah* and the zakat rate. Investor sentiment was measured by three indirect measurements: volume trading, share turnover and price earning ratio. Panel ARDL has been used for econometrics to generate long-run and short-run analyses. Various model specifications have been used for different types of investor sentiment measurements. The result of Panel ARDL shows that Islamic market risk premium and investor sentiment measurements positively impacted *Shari'ah*-compliant stock return in the long run. Interestingly, in the short-run testing, the market risk premium had a reverse, or negative, impact on *Shari'ah*-compliant stock return. Meanwhile, all investor sentiment measurements still had a positive influence on *Shari'ah*-compliant stock returns. This study concludes that market risk premium is still a significant factor in the development of SCAPM, and investor sentiment is one of the other sources of systematic risk that investors should consider when investing in *Shari'ah*-compliant stocks on the Indonesia Stock Exchange.

# CONTRIBUTION

This study provides several contributions to the field of Islamic finance. First, the result of this study can extend the limited research on the framework the understanding and developing the asset pricing model from the *Shari'ah* perspective. This study contributes to the theory by offering a *Maqasid al-Shari'ah* foundation in providing a *Shari'ah*-compliant minimum expected rate of return on investment benchmark and incorporating a market risk premium component and financial behaviour risk in building a *Shari'ah*-compliant asset pricing model. The SCAPM offered is at the concept and framework level and can be easily applied in the financial industry.

The second contribution is in terms of research methodology. The SCAPM offered was tested from the initial period of determining *Shari'ah*-compliant stock in the Indonesian Capital Market using panel ARDL. The long period and the econometric technique that combines the features of the Autoregressive Distributed Lag model to investigate the long-run and short-run relationships between variables should further strengthen the position of this model in its application in the Islamic finance industry.

This study will benefit the regulatory authorities, investors, academicians, and researchers in establishing Islamic value-based stock markets and conducting *Shari'ah*-compliant halal businesses.

# LIMITATIONS OF THE STUDY AND FUTURE RESEARCH

This study focused on the effect of Islamic market risk premium and investor sentiment on *Shari'ah*-compliant stock return under the *Maqasid al-Shari'ah* Compliant Asset Pricing Model in the Indonesia Stock Exchange.

The SCAPM in this article was developed using the approach developed by Abu al-Ma'ali al-Juwayni (d. 478 AH/1085 CE), which was later continued by Abu Hamid al-Ghazali (d. 505 AH/1111 CE) to provide a minimum expected rate of return on investment that a Muslim investor expects. The fulfilment of basic needs and zakat rate is the minimum rate of expected return on investment expected by a Muslim investor. This article introduces the potential for *Shari'ah*-compliant benchmarks using

inflation and zakat as a minimum measure of the expected rate of return on investment.

This study is limited to the *Maqasid al-Shari'ah* approach to develop the SCAPM and examined the effect of the market risk premium and behavioural finance risk proxy by investor sentiment and measured by indirect measurement in the Indonesia stock exchange. It did not consider other direct measurements of investor sentiment and anomalies in asset pricing, such as size and book-to-market value.

## REFERENCES

Ahmad, N. W., Ripain, N., & Noor, N. H. N. M. (2014). Investment in stock market: A review on Islamic perspectives. *Synergizing Knowledge on Management and Muamalah*, 393-403

Ahmed, E.R., Alabdullah, T.T.Y., Islam, M.A. & Asmar, M. (2014). Sukuk legitimacy: a new measurement based on content analysis. *16th Malaysian Finance Association Conference in Sasana Kijang Central Bank of Malaysia, Kuala Lumpur, June 4-6.*

Ahroum, R., & Achchab, B. (2021). Harvesting Islamic risk premium with long–short strategies: A time scale decomposition using the wavelet theory. *International Journal of Finance & Economics*, *26*(1), 430-444.

Al-Abbadi, A. H., & Abdullah, A. (2017). Modeling psychology in Islamic wealth management. *International Journal of Economics and Finance*, *9*(10), 64-85.

Ashker, A. A. F. E. (1987). The Islamic business enterprise. Croom Helm.

Baker, M. & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Journal of Finance*, *61*(4), 1645–1680. doi: 10.1111/j.1540-6261.2006.00885.x.

Baker, M., & Wurgler, J. (2007). Investor Sentiment in The Stock Market. *Journal of Economic Perspectives, 21*, 129–151.

Barberis, N., Shleifer, A. & Vishny, R. (1998). A model of investor sentiment. *Journal of Financial Economics*, *49*(3), 307–343. doi: 10.3386/w5926.

Barberis, N., & Thaler, R., (2003). A Survey of Behavioral finance, In Constantinides, G., M. Harris And R. Stulz, (Eds.), Handbook of The Economics of Finance: Financial Markets And Asset Pricing,Northholland, Amsterdam, 1053–1124.

Białkowski, J., Etebari, A. & Wisniewski, T. P. (2012). Fast profits: Investor sentiment and stock returns during Ramadan. *Journal of Banking and Finance*, *36*(3), 835–845. doi: 10.1016/j.jbankfin.2011.09.014.

Black, F. (1986). Noise. *Journal of Finance, 41*(3), 529-543

Brown, G. W. & Cliff, M. T. (2004). Investor sentiment and the near-term stock market. *Journal of Empirical Finance*, *11*(1), 1–27. doi: 10.1016/j.jempfin.2002.12.001.

Byrne, B. M. (2010). Structural equation modeling with AMOS: Basic concepts, applications and programming. 2nd Ed. New York: Routledge Taylor & Francis Group. 396 p.

Chauhan, Y., Ahmad, N., Aggarwal, V., & Chandra, A. (2020). Herd behaviour and asset pricing in the Indian stock market. *IIMB Management Review*, *32*(2), 143-152.

Chuang, W. J., Ouyang, L. Y. & Lo, W. C. (2010). The impact of investor sentiment on excess returns: A taiwan stock market case. *International Journal of Information and Management Sciences*, *21*(1), 13–28. doi: 10.6186/IJIMS.2010.21.1.2.

Daniel, K., Hirshleifer, D. & Subrahmanyam, A. (1998). Investor psychology and security market under- and overreactions. *Journal of Finance*, *53*(6), 1839–1885. doi: 10.1111/0022-1082.00077.

De Bondt, W. F. M. & Thaler, R. (1985). Does the Stock Market Overreact?', *The Journal of Finance*, *40*(3), 793–805. doi: 10.1111/j.1540-6261.1985.tb05004.x.

De Bondt, W. F. M. & Thaler, R. H. (1987). Further Evidence On Investor Overreaction and Stock Market Seasonality. *The Journal of Finance*, *42*(3), 557–581. doi: 10.1111/j.1540-6261.1987.tb04569.x.

De Long, B. J., A. Shleifer., L. H. Summers., R. J. Waldman. (1990). Noise Trader Risk in Financial Markets. *Journal of Political Economy, 98*(4), 703- 738

Di, L., Shaiban, M. S., & Hasanov, A. S. (2021). The power of investor sentiment in explaining bank stock performance: Listed conventional vs. Islamic banks. *Pacific-Basin Finance Journal*, *66*, 101509.

El-Din, S. E. D. T., & Hassan, M. K. (2007). 15 Islam and speculation in the stock exchange. *Handbook of Islamic Banking*, *240*.

Fisher, K. L., & Statman, M. (2000). Investor sentiment and stock returns. *Financial Analysts Journal*, *56*(2), 16-23.

Ftiti, Z., & Hadhri, S. (2019). Can economic policy uncertainty, oil prices, and investor sentiment predict Islamic stock returns? A multi-scale perspective. *Pacific-Basin Finance Journal*, *53*, 40-55.

Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). Multivariate Data Analysis: A Global Perspective", Pearson Education, London.

Hanif, M. (2011). Risk and return under Shari'a framework: An attempt to develop Shari'a compliant asset pricing model (SCAPM). *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *5*(2), 283-292. Retrieved from http://jespk.net/paper.php?paperid=63

Harris, R. D., & Tzavalis, E. (1999). Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of Econometrics*, *91*(2), 201-226.

Hazny, M. H., Mohamad Hasim, H. & Yusof, A. Y. (2020). Mathematical modelling of a shariah-compliant capital asset pricing model. *Journal of Islamic Accounting and Business Research*, *11*(1), 90–109.

Hirshleifer, D. (2001). Investor psychology and asset pricing. *The Journal of Finance*, *56*(4), 1533-1597.

Ibn Ashur, M. A. T. (2006). *Ibn Ashur treatise on maqasid al-shari'ah*. The Other Press.

Kahneman, T. (1979). D. kahneman, a. tversky. *Prospect theory: An analysis of decisions under risk*, 263-291.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, *115*(1), 53-74.

Khan, M. A., Ahmad, R., Azmi, A., & Akbar, M. (2019). A new sentiment index for the Islamic stock market. *Investment Analysts Journal*, *48*(2), 146-172.

Kutu, A. A., & Ngalawa, H. (2016). Dynamics of industrial production in BRICS countries. *International Journal of Economics and Finance Studies*, *8*(1), 1-25.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, *108*(1), 1-24.

Lintner, J. (1965). Security prices, risk, and maximal gains from diversification. *The Journal of Finance*, *20*(4), 587-615.

Mahastanti, L. A., Asri, M., Purwanto, B. M., & Junarsin, E. (2021). Capital Aset Pricing Model (CAPM) Revisited: The Context of Sharia-based Stocks with the Barakah Risk Premium Variable. *Jurnal Keuangan dan Perbankan*, *25*(2), 324-341.

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica: Journal of the Econometric Society*, 768-783.

Naik, P. K. & Padhi, P. (2016). Investor sentiment, stock market returns and volatility: Evidence from National Stock Exchange of India', *International Journal of Management Practice*, 9(3), pp. 213–237. doi: 10.1504/IJMP.2016.077816.

Osmani, N. M., & Abdullah, M. F. (2009). Towards an Islamic stock market: a review of classical and modern literatures. *International Review of Business Research Papers*, *5*(5), 121-130.

Pandey, P., & Sehgal, S. (2019). Investor sentiment and its role in asset pricing: An empirical study for India. *IIMB Management Review*, *31*(2), 127-144.

Paudel, S., Silveri, S. D., & Wu, M. (2022). Investor sentiment and asset prices: Evidence from the ex-day. *Journal of Banking & Finance*, *139*, 106492.

Pesaran, M.H. & Smith, R., (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics*, *68*(1), 79-113.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American statistical Association*, *94*(446), 621-634.

Rafindadi, A. A., & Yosuf, Z. (2013, December). An application of panel ARDL in analysing the dynamics of financial development and economic growth in 38 sub-Saharan African continents. In *Proceeding-Kuala Lumpur International Business, Economics and Law Conference* (Vol. 2).

Razak, M. A. A. (2011). Human nature: An Islamic perspective. *Journal of Islam in Asia (E-ISSN 2289-8077)*, *8*, 251-274.

Ritter, J. R., (2003). Behavioral finance. *Pacific-Basin Finance Journal, 11*(4), 429–437.

Narayan, P. K., Bannigidadmath, D. (2017). Does financial News Predict Stock Returns? New Evidence from Islamic And Non-Islamic Stocks. *Pacific-Basin Finance Journal, 42,* 24–45.

Sadaf, R. & Andleeb, S. (2014). Islamic Capital Asset Pricing Model (ICAPM). *Journal of Islamic Banking and Finance*, 2(1), pp. 187–195. Retrieved from http://jibfnet.com/journals/jibf/Vol_2_No_1_March_2014/11.pdf

Shah, S. F., & Albaity, M. (2022). The role of trust, investor sentiment, and uncertainty on bank stock return performance: Evidence from the MENA region. *The Journal of Economic Asymmetries*, *26*, e00260.

Shaikh, S. A. A. (2009). Corporate finance in an interest free economy: An alternate approach to practiced Islamic Corporate Finance. *Journal of Islamic Banking & Finance, International Association of Islamic Banks*. Retrieved from https://mpra.ub.uni-muenchen.de/19459/1/MPRA_paper_19459.pdf

Shaikh, S. A., Ismail, M. A., Ismail, A. G., Shahimi, S., & Mohd. Shafiai, M. H. (2019). Cross section of stock returns on Shari'ah-compliant stocks: Evidence from Pakistan. *International Journal of Islamic and Middle Eastern Finance and Management*, *12*(2), 282-302.

Sharpe, W.F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, *19*(3), 425-442.

Shin, Y., Yu, B., & Greenwood-Nimmo, M. (2014). Modelling asymmetric cointegration and dynamic multipliers in a non-linear ARDL framework. *Festschrift in honor of Peter Schmidt: Econometric methods and applications*, 281-314.

Soualhi, Y. (2015). Application of Sharī'ah contracts in contemporary Islamic finance: A maqāṣid perspective. *Intellectual Discourse*, *23*. Retrieved from https://journals.iium.edu.my/intdiscourse/index.php/id/article/v iew/689

Treynor, J. L. (1962). Jack treynor's' toward a theory of market value of risky assets. *Available at SSRN 628187*.

Trichilli, Y., Abdelhédi, M. and Boujelbène Abbes, M. (2018) 'Googling Investor's Sentiment: Powerful Measure in Conventional and Islamic MENA Financial Markets', *International Economic Journal*, 32(3), pp. 454–469. doi: 10.1080/10168737.2018.1522055.

Yang, A. (2022). Understanding Negative Risk-Return Trade-offs. *Available at SSRN 4116731*.

Zerbib, O. D. (2022). A Sustainable Capital Asset Pricing Model (S-CAPM): Evidence from Environmental Integration and Sin Stock Exclusion. *Review of Finance*, *26*(6), 1345-1388.

Zhu, Z., Ji, Q., Sun, L., & Zhai, P. (2020). Oil price shocks, investor sentiment, and asset pricing anomalies in the oil and gas industry. *International Review of Financial Analysis*, *70*, 101516.