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### **Analysis of the Risk and Return of Bonds and Sukuk Listed on the Indonesia Stock Exchange**

**Abstract. Introduction.** Financial market penetration in terms of both knowledge and accessibility has become more extensive and widespread as a result of economic globalization. This financial development was followed by an increase in funding demand on the financial market. Bonds and sukuk are two financial instruments that are very attractive to investors. Bonds are a type of debt activity agreement that is licensed through a debt certificate, whereas sukuk are certificates that have the same value and are evidence of ownership of a project or certain investment activities such as assets, benefit rights, and services.

**Purpose.** This research aims to identify and analyze the risks and returns of corporate bonds and sukuk listed on the Indonesia Stock Exchange, as well as to determine whether ROA influences the yield spreads of bonds and corporate sukuk listed on the Indonesia Stock Exchange.

**Results.** The research demonstrates that the return on corporate sukuk is greater than the return on corporate bonds, the risk of corporate sukuk is greater than the risk of corporate bonds, there is a significant difference in return between bonds and corporate sukuk, there is a significant difference in risk between bonds and corporate sukuk, and the Return on Assets (High ROA) significantly decreases yield spreads on corporate bonds and sukuk.

**Conclusions.** The rate of return on corporate sukuk as calculated by Yield to Maturity (YTM) is greater than the rate of return on corporate bonds, while the level of risk of corporate sukuk as calculated by Value at Risk (VaR) is lower than the level of risk of corporate bonds. There is a significant difference in return when corporate sukuk and corporate bonds are measured by Yield To Maturity. High Value at Risk (VaR) and Return on Assets (ROA) indicate a large difference in risk between corporate sukuk and corporate bonds, which considerably reduces yield spreads on sukuk and corporate bonds.

**Keywords:** bonds; sukuk risk bonds; bond returns; risk sukuk; return sukuk.

**УДК 330.3**

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### **Аналіз ризику та прибутковості облігацій, які котируються на Індонезійській фондовій біржі**

Проникнення на фінансовий ринок як з точки зору знань, так і з точки зору доступності стало більш широким і поширеним у результаті економічної глобалізації. Цей фінансовий розвиток супроводжувався збільшенням попиту на фінансування на фінансовому ринку. Визначено та проаналізовано ризику та прибутковість корпоративних облігацій, які котируються на Індонезійській фондовій біржі, а також визначено, чи впливає ROA на спреду прибутковості облігацій, які котируються на Індонезійській фондовій біржі.

Норма прибутку на корпоративні облігації розрахована за допомогою прибутковості до погашення (YTM), є більшою за норму прибутковості корпоративних облігацій, тоді як рівень ризику, розрахований за допомогою Value at Risk (VaR), нижчий за рівень ризику корпоративних облігацій. Існує значна різниця в прибутковості, коли корпоративні інструменти оцінюються за показником прибутковості до погашення. Висока вартість під ризиком (VaR) та рентабельність активів (ROA) вказують на велику різницю в ризику між корпоративними інструментами.

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**Ключові слова:** облігації; ризикові облігації; повернення облігацій.  
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**Formulation of the problem.** Currently, Islamic finance continues to develop and expand rapidly on a global scale. The growth is a result of the increasing demand from Muslim consumers, particularly in Muslim-populated nations. In Indonesia, the country with the largest Muslim population in the world, the penetration of the sharia economy began three decades ago and has continued to grow until the last decade. Islamic financial assets have a significantly high average asset quality, and during the 2008 financial crisis, Islamic financial securities recorded a low level of bankruptcy risk but low cost efficiency relative to other conventional securities (Abdelsalam et al., 2022)

**Formulation of research and publications.** This research aims to identify and analyze the risks and returns of corporate bonds and sukuk listed on the Indonesia Stock Exchange, as well as to determine whether ROA influences the yield spreads of bonds and corporate sukuk listed on the Indonesia Stock Exchange.

**Outline of the main research material.** The Islamic capital market was responsible for the rapid expansion of

Islamic finance, which occurred in Indonesia. Since 2017, the growth of Islamic capital market assets has overtaken the growth of Islamic banking assets, as seen in Figure 1.1. In June of 2020, 955.89 quadrillion rupiah, or 59.43 percent of all Islamic financial assets, was recorded as Islamic capital market assets. In the meantime, Islamic banking has assets of 545.39 trillion rupiah, or 33.91 percent of all Islamic financial assets, while non-bank financial firms have assets worth 107.22 trillion rupiah, or 6.66 % of all Islamic financial assets. This demonstrates that the Islamic finance market in Indonesia is expanding and getting popular. Technological developments are one of the factors that hasten the development of sharia-based investments. With a score of 81.93 on the Islamic finance country index, Indonesia is currently ranked first as the best Islamic banking and finance industry in the world, surpassing Malaysia, which has reigned since 2011. (Global Islamic Finance Report, 2019). The sukuk is one of the instruments that the Indonesian government regularly monitors.

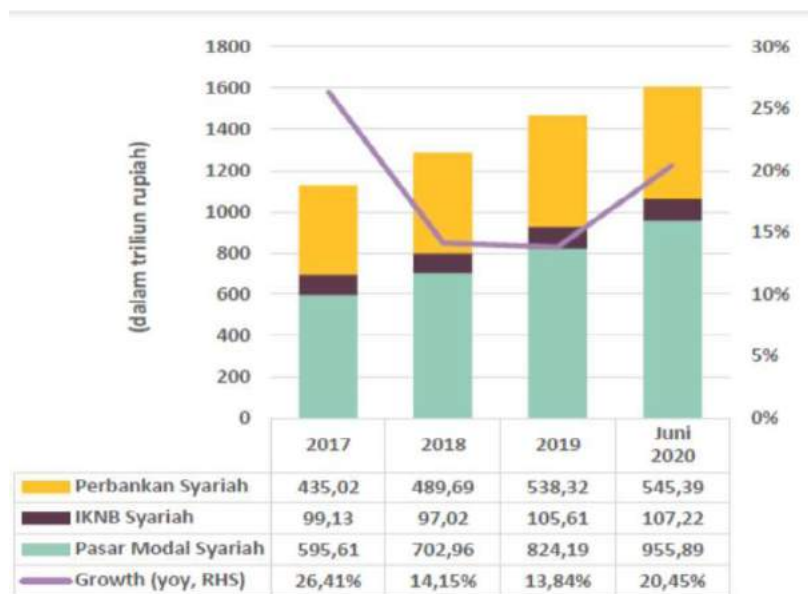


Figure 1 – Indonesian Islamic Financial Assets 2017-2020

Source: Financial Services Authority, 2020

The government is even involved in the sale of sukuk as a potential funding source for infrastructure development. IIFM (2020) indicated that Indonesia dominated the market share of state sukuk with a market share of 21.8 percent of the total market share of state sukuk in the world, which was 18.15 billion USD. This indicates that Indonesian State Sukuk have

become the most sought-after among sukuk investors worldwide. Although corporate sukuk expanded by 30 % from 10.6 trillion to 13.6 trillion rupiah, they are still too small to dominate the sukuk market, and their existence is not as prominently shown as that of state sukuk. On the other hand, corporate sukuk continues to increase gradually and steadily from year to year.

Table 1. **Development of Corporate Bonds and Sukuk in Indonesia**

Year	Bonds	Sukuk
2016	428	53
2017	519	75
2018	588	99
2019	661	144
2020	690	162

Source: data processed by authors

According to data from the Indonesia Stock Exchange, the number of outstanding corporate bonds and sukuk through 2020 increases annually. However, compared to conventional bonds, the number of sukuk issued is significantly lower, at 162 series or approximately 19% of all issued bonds. In contrast, conventional bonds comprised 690 series, or approximately 81 %.

When investors choose to avoid taking risks, the risk premium can rise, and vice versa. Moreover, corporate yield spreads have a strong tendency to move in the same direction. It is essential for market players to be aware of the factors that influence the yield spread. The Return on Assets (ROA) owned by the bond or sukuk issuing corporation is one of them. According to (Saeed et al., 2021), numerous studies have analyzed the distinctions between sukuk and bonds; however, past studies have failed to give additional yield drivers that force issuers to default and to compare the factors that explain sukuk yields and conventional bond yields. As is well-known, Sukuk have a creative and flexible structure in compliance with sharia principles while avoiding Gharar, Maisir, and other prohibited features, resulting in a yield spread pattern that is distinct from that of conventional bonds (Mohd Saad et al., 2020). According to (Saeed et al., 2021), the primary determinants of yield spread for sukuk include indicators of firm character, such as a high Return on Assets (ROA), a high interest coverage ratio, and a significant company size, all of which can decrease yield spread. According to (Saeed et al., 2021) for conventional bonds, leverage and volatility have a close relationship with the yield spread.

The research of bonds and sukuk comprises 415 samples for a more thorough analysis, including 149 samples of SOE bonds, 70 samples of non-BUMN bonds, 105 samples of non-BUMN sukuk, and 91 samples of non-BUMN sukuk. The total number of samples collected for this study was 415. Moreover, there are 182 samples with a maturity of 3 years and 233 samples with a maturity of 5 years, for a total of 415 samples.

According to Brigham and Houston (2016), a signal is an activity done by a firm to convey to investors how management perceives the company's future prospects. This signal consists of information regarding what management has done to fulfill the owner's expectations. The importance of the information released by the corporation stems from its impact on the investment decisions of parties outside the company.

This information is significant for investors and businesspeople because it includes facts, notes, or descriptions of past, present, and future conditions affecting the company's survival and how they will effect the company.

According to (Auronen, 2003), in the 1970s the asymmetric information theory was developed, which asserts that an information imbalance generates inefficient market outcomes. Asymmetric information is the difference between the information obtained by two parties in economic activities. For instance, this asymmetric information exists between investors who would invest in the stock market. Prior to investing, investors must have a thorough knowledge of the investment product. For future capital gains, this ensures that investors will acquire a comprehensive and accurate understanding of the investment product.

The definition of sukuk according to The Accounting and Auditing Organization for Islamic Financial (AAOFI) written by Chermi and Jerbi (2015), sukuk is a certificate that has the same value and is proof of ownership of a project or certain investment activities such as assets, benefit rights, and services.

The concept of yield on sukuk does not use interest, which is usury according to the sharia economy philosophy. Riba in Islam is forbidden or haram. The origin of the word usury is Arabic, and it means "additional" (az ziyadah). According to the Indonesian Islamic Encyclopedia, the original meaning of Ar-Riba is to add, to increase, and to be fertile.

Sukuk are divided into several classifications of certificate issuance by the issuer. Tariq and Dar (2007) describe several classifications of sukuk which were further developed by Alswaidan (2017), namely:

1. Pure Ijarah Sukuk
2. Hybrid / Pooled Sukuk
3. Variable Rate Redeemable Sukuk
4. Fixed-Rate Zero-Coupon Sukuk
5. Embedded Sukuk

Bonds are a type of debt activity agreement authorized by a debt certificate. Companies or governments frequently borrow money by issuing or selling bonds, which are debt securities (Copeland et al., 2005).

Risk is a hidden value that is not known by investors, if not anticipated, will result in losses. This is because risk consists of two primary components, namely

uncertainty, which refers to the chance of encountering a risk, and exposure, which refers to the complete possibility of experiencing a loss(Shalhoob,2016).

According to Farrell and Reinhart (1997), the greater the risk, the greater the expected return. Conventional bonds, including government-issued bonds, carry a moderate risk. While conventional bonds have an average level of risk, this level is lower than that of the stock market. This also applies to sukuk, whether issued by the government or corporations/private parties.

Yield to Maturity is a common tool used to measure the yield or return on an investment based on the anticipated rate of return (Tandelilin, 2017). Here is the formula to calculate the YTM value:

$$YTM = \frac{Ci + \frac{R-P}{n}}{\frac{R+P}{2}} \times 100\% \quad (1)$$

Value at risk (VAR) is one of the most frequent measurements used by observers to determine their portfolio's worst possible risks and losses. VaR with a confidence level of 95% is defined as:

$$VAR_T = V \cdot 1.65 \sigma_T \quad (2)$$

The company's primary objective is to generate a profit or result. Profitability or profit is the main ratio in the financial statements of a corporation. Profitability ratios are utilized to evaluate the efficiency of a company's internal operations that generate profits. Profit is a determining element and a measurement for forecasting or measuring the capital gains on an investment instrument for investors.

The yield spread on corporate bonds and sukuk is the difference between the yield to maturity (YTM) of corporate bonds and the YTM of comparable default-free instruments. The spread equation appears as follows:

$$Spreadit = YTMit - YTM Indobexit \quad (3)$$

(Saeed et al., 2021)

This study used secondary data covering the range of observations from 2016-2019. The types of samples used are bonds with fixed yield characteristics and sukuk ijarah obtained from the Indonesia Stock Exchange (IDX) as well as Indobex joint corporate data for the 2016-2019 period obtained from PHEI (Indonesian Securities Price Appraiser).

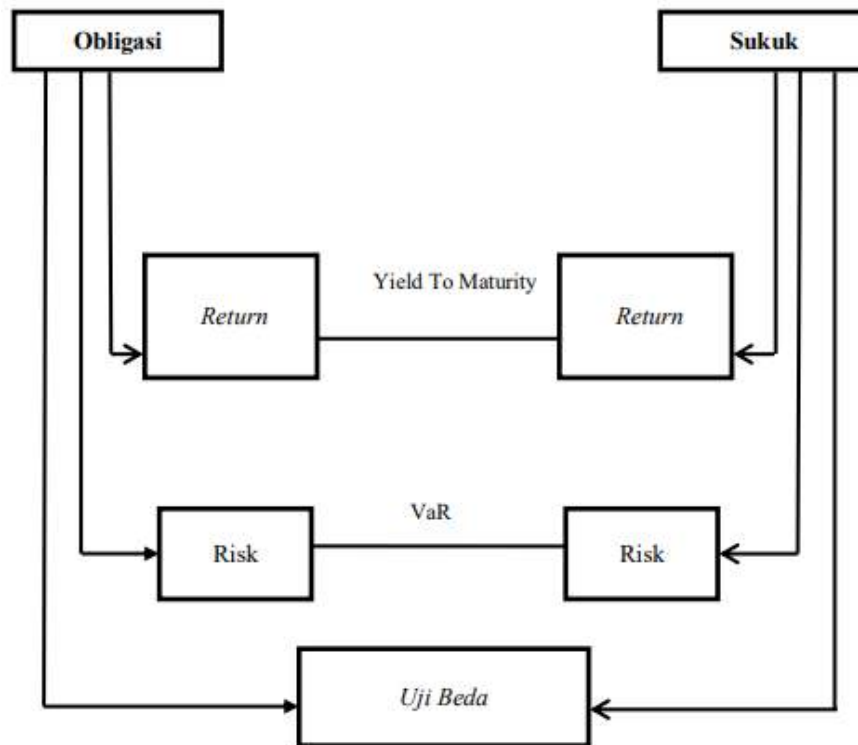


Figure 2 – Research Framework

Source: generated by the authors

Hypothesis

H1: Return on corporate sukuk is higher than return on corporate bonds

H2: The risk of corporate sukuk is higher than the risk of corporate bonds.

H3: There is a significant difference in returns between corporate bonds and sukuk.

H4: There is a significant difference in risk between corporate bonds and sukuk.

H5: High return on assets (ROA) significantly reduces yield spread on corporate bonds and sukuk.

This research makes use of descriptive statistical analysis, nonparametric statistical tests, OLS regression,

and the normality test. This study used version 16 of the STATA application for testing data.

Descriptive statistical analysis is used to show an overview of the minimum, maximum, mean, and

standard deviation values of each variable which can be seen in table 2.

**Table 2. YTM Descriptive Statistics BUMN and Non BUMN Bonds and Sukuk**

Characteristics	BUMN BOnds	Sukuk BUMN	NonBUMN Bonds	Sukuknon BUMN
N	149	70	105	91
Minimum	7,45	6,15	7,46	7,85
Maximum	10,38	11,31	11,32	12,07
Mean	8,62	9,21	8,81	9,22
Std.Deviation	0,71	1,18	0,88	1,09

Source: data processed STATA 16 (2022)

Table shows an overview of the YTM of both SOE and non-BUMN bonds and sukuk. The table reveals that the highest YTM level for BUMN bonds was 10.38 %, while for non-BUMN bonds it was 11.32 %, and for BUMN sukuk it was 11.31 % and 12.07 %, respectively. The lowest value for BUMN bonds is 7.45 %, while the lowest value for non-BUMN sukuk is 7.85 %. The minimum value of sukuk for each company is 6.15 % for BUMN sukuk and 7.85 percent for non-BUMN sukuk.

Bonds and sukuk have yields in the range of 9% and 8%, respectively, relative to the mean. Despite having differing standard deviations, the YTM of sukuk is more distributed than the YTM of bonds. According to descriptive statistical research, the return on corporate sukuk is greater than the return on corporate bonds. The

average return on SOE bonds is 8.62 cent, while the average return on non-BUMN bonds is 8.81 %. The average return on SOE sukuk is 9.21 %, while the average return on non-BUMN sukuk is 9.22 %. The descriptive data of YTM bonds and sukuk indicate that the returns on corporate sukuk are higher than the returns on corporate bonds.

From the results of the normality test using the Shapiro Wilk test for YTM sukuk and bonds Prob > z is smaller than 0.05, which is 0.0000, it can be concluded that the data are not normally distributed. Therefore, the Mann Whitney non-parametric test was used for hypothesis testing. The results of the Mann Whitney test are shown in Table 4.2.

**Table 3. Mann Whitney Test Results on YTM Bonds and Sukuk**

Mann Whitney Test	
	YTM
Mann-Whitney U	86320
Wilcoxon W	1416979
Z	5.400
Prob>z	0.0000

Source: data processed STATA 16 (2022)

The statistical data presented in Table 3 indicate that the Mann Whitney Test has a significance value of 0.000 < 0.05, indicating that the H3 hypothesis is accepted, i.e. there is a significant difference between the YTM of sukuk and bonds.

The YTM of each bond sample group was compared to the YTM of the sukuk sample group using normality and homogeneity tests. The independent sample t test was used to test the comparison hypothesis for each group of bonds and sukuk. Table 4 contains the test results.

**Table 4. Results of Independent Sample t test YTM Bonds and Sukuk**

Comparison	t Test
YTM Bonds and YTM Sukuk	0,2750

Source: data processed STATA 16 (2022)

The YTM of each bond sample group was compared to the YTM of the sukuk sample group using normality and homogeneity tests. The independent sample t test was used to test the comparison hypothesis for each group of bonds and sukuk. Table 5 contains the test results.

**Table 5. Results of Independent Sample t test YTM Bonds and Sukuk BUMN and Non BUMN**

Comparison	t Test
YTM Bondsand YTM Sukuk BUMN	4,5388
YTM Bondsand YTM Sukuk non BUMN	2,8609

Source: data processed STATA 16 (2022)

Using normality and homogeneity tests, the YTM of each bond sample group was compared with the YTM of the overall sukuk sample group. To test the comparison hypothesis, the Kruskal Wallis test was utilized because, despite having the same variance, the data were not normally distributed. Table 6 demonstrates the statistical output data.

**Table 6. YTM Bonds and Sukuk Kruskal Wallis Sampel Sample Group**

Statistics Test, b	YTM	
	BUMN	Non BUMN
Chi-Square	20,214	8,241
Df	1	1
Asymp. Sig. a. Kruskal Wallis Test b. Grouping Variable: Instrument	0,0001	0,0041

Sumber: data processed STATA 16(2022)

Table 7 shows descriptive statistics on the VaR of bonds and sukuk, with a confidence level of 95%, based on a sample of state-owned and non-state-owned bonds and sukuk with investment periods of 3 and 5 years.

**Table 7. Descriptive Statistical Test Results VaR Bonds and Sukuk**

Characteristics	BUMN Bonds	BUMN Sukuk	non BUMNBonds	non BUMNSukuk
N	149	70	105	91
Minimum	69	174	133	152
Maximum	1911	382	1273	458
Mean	990	288	803	405
Std. Deviation	0,0238	0,0232	0,0282	0,0286
VaR 5%	-0,0044	-0,0052	-0,0049	-0,0050

Source: data processed STATA 16 (2022)

After the normality test, it was determined that for hypothesis testing using non-parametric statistics, particularly the Mann Whitney test, table 8 presents the results of the test.

Table 8. Mann Whitney Test Results on the VaR of Bonds and Sukuk

Mann Whitney Test	
	VaR
Mann-Whitney U	1361,000
Wilcoxon W	1348,000
Z	-4,580
Prob>z	0,0001

Source: data processed STATA 16 (2022)

The VaR comparison between each sample group of bonds and the sample group of sukuk was conducted using normality and homogeneity tests. Therefore, the independent sample t test was utilized to examine the comparison hypothesis for each set of VaR bonds and sukuk. The test results are showed in Table 9.

Table 9. Results of Independent Sample t test VaR Bonds and Sukuk

Comparison	t Test
VAR Bonds and sukuk	0,1792

Source: data processed STATA 16 (2022)

The VaR of each sample group of bonds and the VaR of the sample group of sukuk were determined using the independent sample t test. Table 10 demonstrates the output.

Table 10. Result of Independent Sample t test VaR of BUMN and Non BUMN Bonds and Sukuk

Comparison	t Test
VaR of BUMN Bonds and Sukuk	3,5670
VaR of non-BUMN Bonds and Sukuk	0,2247

Sumber: data diolah STATA 16 (2022)

Table 11. Shapiro-Wilk ROA Normality Test Results and Yield Spread

Variable	Obs	W	V	z	Prob>z
Y_Spread	415	0.11813	0.250	1.316	0.96476
ROA_num	415	0.94065	0.442	6.737	0.85043

Source: data processed STATA 16 (2022)

Using the OLS regression equation, the influence of ROA on SOE bonds and sukuk yield spread can be observed in the figure below. The ROA coefficient witnessed a higher profitability-related rate of return. When the ROA grows by 1%, the yield spread will decrease by 0.012 %.

Table 12. OLS ROA Regression Results and SOE Yield Spread

Y_Spread	Coef.	Std. Err	T	P> t
ROA_num	-0.0121	0.0063	-1.91	0.0043
_cons	6.6038	0.1357	48.64	0.0000

Source: data processed STATA 16 (2022)

Due to the profitability of Non-BUMN Bonds and Sukuk, the ROA coefficient witnessed a higher rate of return. When the ROA grows by 1%, the Yield Spread decreases by 0.022%.

Table 13. OLS ROA Regression Results and Non-BUMN Yield Spread

Y_Spread	Coef.	Std. Err	t	P> t
ROA_num	-0.0226	0.0044	-1.44	0.0046
_cons	6.5162	0.0013	37.90	0.0000

Source: data processed STATA 16 (2022)

Using descriptive statistical tests, non-parametric statistical tests, OLS regression, and normality tests, version 16 of the STATA application was used to analyze the research data and generate a summary of the findings:

Table 14. Research Result Summary

	Hypothesis	Result
H1	Return on corporate sukuk is higher than return on corporate bonds	Hypothesis H1 accepted
H2	The risk of corporate sukuk is higher than the risk of corporate bonds	Hypothesis H2 rejected
H3	There is a significant difference in return between corporate bonds and sukuk	Hypothesis H3 accepted
H4	There is a significant risk difference between corporate bonds and sukuk	Hypothesis H4 accepted
H5	High Return on Assets (ROA) significantly reduces yield spreads on corporate bonds and sukuk	Hypothesis H5 accepted

Source : data processed by author (2022)

The descriptive statistical study conducted suggests that the return on corporate sukuk is higher than the return on bonds. The average return on SOE bonds is 8.62 %, while the average return on non-BUMN bonds is 8.81 %. The average return on SOE sukuk is 9.21 %, while the average return on non-BUMN sukuk is 9.22 %.

The findings of the study of the high rate of return on corporate sukuk, both SOEs and non-BUMN, with a term of 3 years and 5 years, compared to corporate bonds, demonstrate to investors that sukuk appears to be a more attractive investment instrument, even with a short maturity.

Based on the descriptive statistical analysis conducted, it can be stated that the level of risk associated with corporate sukuk is lower than the risk associated with bonds. With a 95 % confidence level or calculated using a 5 % significance level, BUMN bonds have a risk level of -0.0044 and non-BUMN bonds have a risk level of -0.0049, however the risk level for BUMN sukuk is -0.0052 and for non-BUMN sukuk it is -0.0050.

This demonstrates that sukuk can be an attractive investment option for investors due to their lower risk profile compared to bonds. In addition, some researchers recommend incorporating sukuk into a portfolio since they help lower investment risk. According to research (Bhuiyan et al., 2020), sukuk can decrease the risk value of a portfolio by 30 to 50 percent. In agreement, (Cakir&Raei, 2007) also concluded that incorporating 27% sukuk in the portfolio reduced VaR in the Pakistan

case study. So that sukuk can serve as a portfolio hedge against the impact of a greater risk.

Based on the findings of the Independent sample t test, bond returns differ significantly from sukuk returns; the significance value is  $0.2750 > 0.05$ ; therefore, the hypothesis is accepted; there is a significant difference between the bond sample group and the sukuk sample group returns.

Based on the descriptive statistical analysis undertaken, it can be stated that the level of risk associated with corporate sukuk is lower than the risk associated with bonds. With a 95 % confidence level or calculated using a 5 % significance level, BUMN bonds have a risk level of -0.0044 and non-BUMN bonds have a risk level of -0.0049, however the risk level for BUMN sukuk is -0.0052 and for non-BUMN sukuk it is -0.0050.

This demonstrates that sukuk can be an attractive investment option for investors due to their lower risk profile compared to bonds. In addition, some researchers recommend incorporating sukuk into a portfolio since they help lower investment risk. According to research (Bhuiyan et al., 2020), sukuk can decrease the risk value of a portfolio by 30 to 50 percent. In agreement, (Cakir&Raei, 2007) also concluded that incorporating 27% sukuk in the portfolio reduced VaR in the Pakistan case study. So that sukuk can serve as a portfolio hedge against the impact of a bigger risk.

The yield differential between sukuk and bonds was significantly narrowed by a high return on assets (ROA). Based on the results of the OLS regression equation



analysis, the ROA coefficient for SOEs exhibited a greater profitability-related rate of return. When the ROA grows by 1 percentage point, the yield spread will fall by 0.012 percentage points. Similarly to the Non-SOE sample group, the ROA coefficient witnessed a greater rate of return in relation to the profitability of Bonds and Sukuk. When the ROA grows by 1%, the yield spread will decrease by 0.022 %.

An increase in ROA indicates an increase in profitability for the issuer, so reducing the risk of default and ensuring that the yield spread is not excessive. Obviously, it is safer for investors to anticipate capital gains from yields. For investors to understand the yield spread of an issuing company, they must first analyse the financial statements that detail the elements that generate the yield spread. Because it will provide an overview of the default risk associated with issued bonds or sukuk.

**Conclusions.** The following conclusions can be taken from the findings of the analysis and calculations previously given:

1. The rate of return on corporate sukuk calculated by Yield to Maturity (YTM) is higher than the rate of return on corporate bonds.
2. The risk level of corporate sukuk which is calculated using Value at Risk (VaR) is lower than the risk level of corporate bonds.
3. There is a significant difference in return between corporate sukuk and corporate bonds calculated by Yield To Maturity.
4. There is a significant difference in risk between corporate sukuk and corporate bonds calculated by Value at Risk (VaR).

5. High Return on Assets (ROA) significantly reduces yield spreads on sukuk and corporate bonds.

Suggestions:

Based on the results of the analysis and discussion of the data that has been carried out in chapter IV, the following conclusions can be drawn:

1. This research is designed to provide companies with a reference for understanding the level of risk in taking decisions regarding the issuance of sukuk or bonds, allowing them to improve the quality of future financial reports.
2. To decide whether to invest in the company's sukuk and bonds, investors, as providers of cash or owners of capital, must obtain further information regarding the risks they will encounter and the returns they will receive. Investors are also recommended to invest in firms with excellent profitability ratios so that they can pay off or meet their obligations and their capital does not depend solely on investments or debt, hence lowering the chance of default on sukuk or bonds issued by the company.
3. This research can be used as a reference when undertaking more research on the risk and return on sukuk and corporate bonds using the Yield to Maturity (YTM) and Value at Risk (VaR) approaches and the determination of Return on Assets (ROA) to Yield Spreads. It is recommended that additional research be conducted to extend the duration of the study so that more data samples may be collected. In addition, future research may employ a method with a new approach to VaR and incorporate a wider determinant variable that influences the yield spread.

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