Risk, Stock, and Bond Value in Indonesia Public Companies

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Abstract—**Indonesian stock market are unpopular sources of capital for companies. Stock market have 2 main products that is stock and bond. Bond is much more unpopular than stock. This study will examine the relations between risk, stock return, and bond returns relation in Indonesian Public Companies. Sample are 51 companies that listed in Indonesian Stock Exchange and issues bond during 2011-2018. Risk as endogen variable measured by Altman Z score. Stock values as exogenous variables using stock returns and dividend yields as indicators. Endogen variable bond value having bond returns and Yield to maturity as measurements. Data then analysed using warp PLS. The results shows that stock returns are mediating the relations between bankruptcy risk and bond return in Indonesia. This is consistent with optimal capital structure and financial distress theory. Companies usually choose to issued stock rather than bond. If it choose both, it will be like to use stock rather than bond. Hence, investor also choose in the stock when companies risk is higher rather than bond.**

Keywords—bankruptcy risk, stock value, bond value

I. INTRODUCTION

Stock Market usually has two main instrument that is stock and bond. Stock is representation of ownership, while bond is considered as debt. Public companies got it names by issue stock in capital market, but only few of them also issued bond.

Optimal Capital structure suggested that it needs to diversify between asset and debt security in response to bankruptcy risk [1]. Bankruptcy risk is a condition when a companies fail to continue its operations due to financial problems [2]. Share and bond having their own risk and benefit.

Share will traditionally give the holder dividend from issuer companies. Issuing stock considered as cheap source of capital, where companies only pay dividend when they are having free cash flows. If the company do not pay dividend, investor still can return by reselling their share when the price is rising. Higher price usually means higher risk. Once companies paid dividend it could be higher than bond coupon.

Bond, as other types of debt make company have to pay coupon regularly. Instead of that, the holder also has returns by selling their bond at higher price. It makes bond considered as a safer way to investing with fixed income. The higher risk the bigger return and coupon that bondholder get.

A research Bai et al [3] stated that share and bond are competing in the stock market. Indonesia is unique in treating stock and bond market. It uses to be era when government dividend stock and bond market. Stock is traded in Jakarta Stock Exchange as Government Agent, and bond is traded in Surabaya Stock Exchange as Privat Companies before both merging into Indonesian Stock Market. This is why it is important to study in Indonesian context the relation between risk, stock, and bond value.

II. RELATED WORK

Optimal capital structure stated that due to bankruptcy risk, it is important for companies to diversify the funding sources into stock and bond [1]. Hence for investor is always a choice according to market condition to diversified risk by mix between stock and bond.

A research Bai et al [3] explain that corporate risk has effect on stock returns. Based on that research, the first hypothesis in this research is:

H1: Corporate Risk has effect on stock value

Some research Bai et al [3] and Franke et al [4] shows that corporates risk has effect on bond returns. Based on these research, the second hypothesis of this study is:

H2: Bankruptcy Risk has effect on bond value

Empirical previous studies by Migiakis and Bekiris [5], Tsai and Wu [6], Cao et al [7] results stated that share returns affecting bond returns. Third hypothesis based on these study is:

H3: Share value affected bond returns

III. METHODOLOGY

This is a quantitative research. Secondary data is taking from Indonesian stock exchange using purposive sampling with criteria as follows. Listed in Indonesian Stock Exchange during 2010-2018, publish complete data and issues bond during that period.

Hypothesis are testing using Partial Least Square using WarpPLS software. There are exogenous and endogen variables in this research. Exogenous variable is bankruptcy risk using formula [2]:

$$Z = 0,012\ (WC/TA) + 0,014\ (RE/TA) + 0,033\ (EBIT/TA) + 0,006\ (MVE/BVD) + 0,999\ (Sales/\ TA)$$

Notes that Z = Altman Bankruptcy score, WC = Working Capital, TA = Total Asset, RE =Retained Earnings, EBIT = Earnings before Interest and Taxes, MVE= Market Value Equity, BVE = Book Value Debt, Sales = total sales in a year.

There are two endogen variables in this research. First, Stock Value that having stock returns and dividend yield as indicators. Stock returns formula is modified from previous study Bilson et al [8]:

$$R_t = (P_t - P_{t-1} + D_t)/P_{t-1}$$

Notes that R_t = Return per share year t, P_t = Price per share year t, P_{t-1} = Price per share year t-1, D_t = Dividend payment year t. Dividend yield formula is taken from Chen et al [9] as follow:

$$DY = Dividend\ per\ share\ /\ Price\ per\ share$$

Second, Bond Value that using Bond Returns and Bond Yields as indicators. Bond returns formula modified from Aboody et al [10]:

$$BR_t = (BP_t - BP_{t-1} + CP_t)/BP_{t-1}$$

Notes that BR_t = Bond Return year t, BP_t = Bond Price year t, CP_t = Coupon Payment year t, BP_{t-1} = Bond Price year t-1. Bond Yields are calculated using [11]:

$$YTM = (CFn/P)^{1/n} - 1$$

Notes that YTM = Yields to Maturity, CFn = Cash Flow from coupon payment, n = bond age, P = bond price.

IV. RESULTS AND DISCUSSION

There are 3 section in this part. First, sample overview and descriptive statistics. Second, hypothesis testing. Third, discussion.

A. Sample Overview and Statistic Description

There are 517 companies in the population. Hence, only 51 that could be taken as samples. Using 8-year data, total polling data is 408. Sample selection can be seen in Table 1.

TABLE I.   SAMPLE SELECTION

	Firms	Year	Pooling
Companies	517	8	4136
Incomplete Data	466	8	3728
	51	**8**	**408**

Sources: Data Analysis

Table 2 shows descriptive statistics and normality test using Kolmogorov-Smirnov (K-S). All data is not normal, and it is better to proceed the hypothesis testing using Partial Least Square Model.

TABLE II.   DESCRIPTIVE STATISTICS & NORMALITY TEST

Variables	Indicators	Mean	Std. Deviation	K-S
Risk	Z	199.60	2,381.02	0.48
Stock Value	SR	1,070,721.19	3,812,874.74	0.40
	DY	4,700.96	66,982.65	0.52
Bond Value	BR	0.00	0.00	0.46
	YTM	0.16	0.33	0.41
n=408				
*normal distribution p-value>0.05				

Sources: Data Analysis

B. Hypothesis Testing Results

Hypothesis testing result consist two important step. First, validity and reliability test. Second, structural model test.

1) Validity and reliability tests: There are validity and reliability test for variable indicators. The step are as follows.

a) Validity test: Construct validity consist of convergent and discriminant validity.

- Convergent validity can be seen from *loading factor* in Table 3. Since there are 408 samples, Loading Factor > 0.30 for samples more than 350 [12]. It means that all indicators in this study is having convergent validity.

TABLE III.   CONVERGENT VALIDITY

Variables	Indicators	Loading factors
Risk	Z	1*
Stock Value	SR	0.702*
	DY	0.702*
Bond Value	BR	1*
	YTM	1*
*Loading Factor > 0.30		

Sources: Data Analysis

- Discriminant Validity can bee seen through cross loading. All cross *loading* indicators are more than 0.7 within 1 variable and meet validity discriminant criteria. The result can be seen in Table 4.

TABLE IV.   DISCRIMINANT VALIDITY

Indicator	Risk	Stock Value	Bond Value
Z	1*	0	0
SR	0.13	0.702*	-0.015
DY	-0.13	0.702*	0.015
BR	0	0	1*
YTM	0	0	1*
*cross loading > 0.7			

Sources: Data Analysis

b) Reliability test: Reliability are testing using Cronbach alpha and composite reliability. All variable pass cronbach alpha and composite reliability since its value more than 0.6 except for stock value cronbach alpha. But since stock value composite reliability is 0.66 more than 0.6, it still considered passed reliability test. The summary can be seen in Table 5.

TABLE V.   RELIABILITY TEST

Variable	Cronbach Alpha	Composite Reliability
Risk	1*	1*
Stock Value	-0.029	0.66*
Bond Value	1*	1*
*Cronbach alpha >0.6		
**Composite reliability > 0.6		

Sources: Data Analysis

2) Structural model tests: Structural Model tests are started with Model Fit dan Quality Indices. Result can be seen in Table 6.
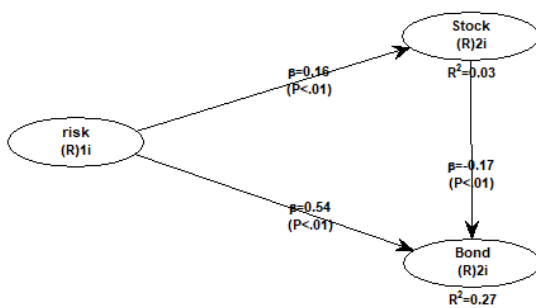
TABLE VI.   MODEL FIT AND QUALITY INDICES

Indices	Value	P	Acceptable if	Notes
APC	0.289	<0,001	P ≤ 0,05	A
ARS	0.148	<0,001	P ≤ 0,05	A
AARS	0.145	<0,001	P ≤ 0,05	A
AVIF	1.085		≤ 5, ideally ≤3,3	U
AFVIF	1.006		≤ 5, ideally ≤3,3	U
GoF	0.35		small ≥0,1; medium ≥0,25; large ≥0,36	M
SPR	1		≥ 0,7, ideally = 1	I
RSCR	1		≥ 0,9, ideally = 1	I
SSR	0.667		≥ 0,7	U
NLBCDR	0.5		≥ 0,7	U
A= acceptable, I= ideal, U = unacceptable, M = medium				

Sources: Data Analysis

Goodness of Fit in this study is 0.35 and considered as medium. Almost 5 out 9 indices are acceptable with three among them are ideal. This is enough to state that research model is fit.

Sources: Data Analysis

Fig. 1. Structural model test.

Structural Model Test can be seen in Figure 1 and Table 7. The result is as follows. First, hypothesis 1 is accepted with beta 0.016 and p value 0.01 (less than 0.05) and R^2 0.003. Second, hypothesis 2 is accepted with beta 0.054, p value 0.01

(≤0.05), R^2 0.267. Third, hypothesis 3 is accepted with beta -0.17, p value 0.01 (less than 0.05), and R^2 0.026. Q^2 model is 0.2882, it means that independent variables can explain 28.82% of dependent variables.

TABLE VII.   HYPOTHESIS TESTING RESULTS

Hypothesis		Beta	Score P	R^2
H_1	Risk-->SR	0.16	0.01*	0.003
H_2	Risk-->BR	0.54	0.01*	0.267
H_3	SR-->BR	-0.17	0.01*	0.026
Q2				0.2882
Conclusion: Partially Mediated				
			*significant p value ≤ 0.05	

Sources: Data Analysis

C. Discussions

Three important findings in this research. First, bankruptcy risk has positive effect on share value. It means that the higher bankruptcy risk the more company choose to increase share value by giving dividend. It also means that the higher risk, the more investor chooses to buy share. It consistent previous research Bai et al [3].

Second, financial risk has positive effect on bond value. It means that the higher risk, the bigger coupon payment from companies. Investor also choose higher risk bond to seek higher returns. This is consistent with previous research Bai [3] and Franke et al [4].

Third, risk has negative effect on bond value. It means that if have to choose between the same risky companies, share is the choice for investor and issuer companies rather tahan bond. This is consistent with previous study Migiakis and Migiakis [5], Tsai and Wu [6], also Cao et al [7].

Additional finding is share value is mediating the relation between bankruptcy risk and bond value. Since risk has effect on share and bond value, and share value has effect on bond value it means that the relation partially mediated [13].

This result consistent with optimal capital structure. This is condition where firms have to make use optimally the mix of ownership and debt securities in the stock market. Hence, the investor in the market also choose to diversified risk between various securities instruments.

V. CONCLUSION AND FUTURE SCOPE

There are four conclusions in this research. First, there are two limitations of this research and its suggestion for further study. First, only few Indonesian companies that issues bond instead of stock. Further research can use longer year to expand the number of pooling data. The number of samples can also add by using companies that listed in other countries' stock market. Second, this research using Partial Least Square (PLS), further research can use pooling data analysis method using Eviews.

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