CIREBON INTERNATIONAL CONFERENCE ON EDUCATION AND ECONOMICS (CICEE)

BANKRUPTCY PREDICTION BASED ON ALTMAN Z SCORE, SPRINGATE, AND ZMIJEWSKI METHODS IN RETAIL SECTOR COMPANIES LISTED ON THE INDONESIAN STOCK EXCHANGE IN 2014-2018

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Abstract
This aims to determine liquidation estimates using the Altman Z-Score, Springate and Zmijewski strategies in retail subsector companies listed on the Indonesia Stock Exchange 2014-2018. The question regarding the strategy used is a quantitative strategy. The information used is in the form of financial statements of each company. The testing procedure for this reflection is to use a Purposive sampling Testing procedure by testing 9 companies. The results obtained from this study are that in the altman *Z-Score* method, there are 4 companies that are predicted to facing bankruptcy, 1 company is estimated to be in the bankruptcy-prone zone and 4 companies are estimated to be safe from bankruptcy. The Altman Z-Score strategy has an accuracy rate of 56%. In the Springate method, there are 7 companies that are anticipated to experience bankruptcy and 2 companies are anticipated not to encounter bankruptcy. The Springate strategy has a precision rate of 22%. And finally in the Zmijewski method there are 5 companies predicted to be healthy and 4 companies predicted to experience bankruptcy, this method has a precision rate of 56%, so the Zmijewski method and the Altman *Z-Score strategy* have the same level of accuracy.
Keywords: Altman *Z-Score,* Springate, Zmijewski, bankruptcy, accuracy.

INTRODUCTION

The trade sector is one of the many economic sectors that can support the Indonesian economy. The Central Bureau of Statistics (BPS) noted that household consumption has the highest contribution in the structure of Indonesia's economic development, which is 56.13%, in second place is Gross Fixed Capital Formation (PMTB) or investment of 32.16%, and finally exports of 20.37%. This shows that the trade sector is a good land to run a business.

The trade sector itself in Indonesia includes many forms and one of them is the retail business. Retail trade is a general trade movement that includes transactions in merchandise or administration, or merchandise and administration, sold by retailers. is conducted by companies or trade teach specifically to conclusion customers who are utilized for

individual, family, or family purposes, with deals volume basically or more than 50% of these conclusion customers and a little parcel of the trade showcase (Utomo, 2009: 46).

Quoting from databoks.katadata.co.id the slowdown in people's purchasing power throughout 2017 had an impact on slowing sales in the retail sector down. Four issuers in the retail sector that have issued financial statements for the 2017 fiscal year experienced a decline in profits. Retail company A experienced the sharpest decline experienced by Supermarket A, throughout last year recording a loss of IDR 191.4 billion from the previous year's profit of IDR 120.59 billion. Three other issuers, Matahari Department Store, experienced a decline in profits of 5.6%, Midi Utama Indonesia shrank 48%, and Sumber Alfaria Trijaya fell 50%.

METHOD

The research conducted is descriptive, meaning that this research is carried out to describe the data that the author has collected and then the data is processed and used as a source of information.

Table 1. Research Variables

Variables	Indicator	Measurement
Altman Z-Score	X1	X1 = Working.Capital/Total.Assets
	X2	X2 = Retained.Earnings/Total.Assets
	X3	X3 = Ebit./Total.Assets
	X4	X4 = Total.Equity/Total Debt
Springate	X1	X1 = Working.Capital/Total.Assets
	X2	X2 = Ebit/Total.Assets
	X3	X3 = Ebt/Current Debt
	X4	X4 = Sales./ Total.Assets
Zmijewski	X1	X1 = Net.Income / Total.Assets
	X2	X2 = Total.Debt/Total Equity
	X3	X3 = Current.Assets / Current.Debt

Source: Rudianto (2013: 254), Harahap (2018: 353), Eurika Fitria Prasandi (2018: 716), Ria Effendi (2018: 310).

Populasion & Sample

Uma Sekaran (2014: 121) defines that "Population (populace) alludes to the complete bunch of individuals, occasions or things of intrigued that analysts need to explore". The populace in this ponder is retail sub-sector companies recorded on the Indonesian stock trade in 2014-2018.

In this study, researchers used a sampling technique carried out by *purposive sampling* method. Sugiyono (2017: 301) defines that "purposive sampling can be a method of examining sources of information with certain considerations". These criteria are:

No.	Criteria	Counter Criteria	Pro Criteria
1	Retail Sector Companies.listed.on the Indonesia Stock.Exchange.2014-2018	-	27

| 2 | Retail sector companies.that issued financial. reports in the. 2014-2018. period | (7) | 20 |
| 3 | Retail sector companies whose net profit suffered losses for at least 2 years in the 2014-2018 period | (11) | 9 |

Table 2. Sampling Criteria

The sample of companies for this study after sampling techniques using *purposive sampling* method is 9 companies, with a period of 5 years. So as to get a research sample of 45 samples.

RESULTS AND DISCUSSION

Altman Method

YEAR	Z-Score Value								
	HERO	TRIO	MPPA	SKYB	RIMO	KOIN	CENT	ECII	GLOB
2014	3,138	5,482	3,807	2,273	-62,340	1,797	2,113	13,408	3,353
2015	2,978	-129,403	2,840	-2,915	-15,061	1,356	6,397	18,067	-112,604
2016	4,500	-124,576	2,185	32,400	-11,503	1,125	3,822	16,218	-67,472
2017	3,579	-109,633	-3,263	41,487	6,807	0,947	1,871	14,305	-76,229
2018	2,813	-157,417	-2,027	30,080	4,697	0,651	1,774	13,398	-125,585
Average	3,402	-103,109	0,708	20,665	-15,480	1,175	3,195	15,079	-75,707

Bankruptcy.Prediction.using the Altman Z-Score strategy on nine tests of retail segment companies listed on the Indonesia Stock Exchange for the 2014-2018 period shows that four companies are predicted to experience bankruptcy, namely retail companies TRIO, retail companies MPPA, retail companies RIMO and retail companies GLOB. And there is also one company that is predicted to enter the bankruptcy-prone zone, namely retail companies KOIN While there are Four companies are not expected to go bankrupt, namely the retail company CENT.

Springate Method

YEAR	Z-Score Value								
	HERO	TRIO	MPPA	SKYB	RIMO	KOIN	CENT	ECII	GLOB
2014	0,630	1,518	1,713	0,725	-10,736	1,314	-0,316	1,837	1,441
2015	0,667	-35,566	1,288	-65,347	-2,479	1,099	-0,255	1,311	-24,712
2016	0,895	-10,595	1,025	26,969	-1,881	0,946	-0,092	0,680	-3,892
2017	0,566	0,128	-0,503	-3,048	0,086	0,947	-0,045	0,887	-0,845
2018	0,503	-1,107	-0,036	-2,743	0,046	0,886	0,219	1,050	-1,221
Average	0,652	-9,125	0,697	-8,689	-2,993	1,039	-0,098	1,153	-5,846

Bankruptcy prediction using the Springate method on nine samples of retail division of companies listed on the Indonesia Stock Exchange for the 2014-2018 period, it appears that there are seven companies that are expected to go bankrupt, namely retail companies HERO, retail companies TRIO, retail companies MPPA, retail companies SKYYB, retail companies RIMO, retail companies CENT, and retail companies GLOB. while two companies that are predicted to be healthy or not experiencing bankruptcy using the Springate method are retail companies KOIN and retail companies ECII.

Zmijewski Method

YEAR	X-Score Value								
	HERO	TRIO	MPPA	SKYB	RIMO	KOIN	CENT	ECII	GLOB
2014	-1,358	11,590	2,022	4,730	-7,602	17,273	-2,117	-3,903	8,397
2015	-1,134	38,282	3,508	-26,095	-11,568	21,610	-2,994	-3,977	29,768
2016	-2,257	-5,076	5,689	-9,155	-12,503	23,330	-2,680	-3,757	-3,500
2017	-1,817	-7,234	17,373	-3,952	-3,487	28,087	-1,257	-3,699	-9,423
2018	-0,041	-9,912	14,687	-3,816	-3,242	37,360	-0,267	-3,716	-7,715
Average	-1,321	5,530	8,656	-7,658	-7,681	25,532	-1,863	-3,810	3,505

Bankruptcy prediction using the Zmijewski method on nine samples of retail sector companies listed on the Indonesia Stock Exchange for the 2014-2018 period shows from nine sample companies there are five companies that are predicted to be healthy or not experiencing bankruptcy, namely retail companies HERO, retail companies SKYB, retail companies RIMO, retail companies CENT and retail companies ECI. While the four companies that are predicted to experience bankruptcy are retail companies TRIO, retail companies MPPA, retail companies KOIN and retail companies GLOB.

Accuracy Level

Table 3. Accuracy Level

PREDICTION	ALTMAN	SPRINGATE	ZMIJEWSKI
Not Bankrupt	4	2	5
Prone to Bankruptcy	1		
Bankrupt	4	7	4
Total Sample	9	9	9
The Reality of Bankruptcy	0	0	0
Accuracy Level	56%	22%	56%
Error Type	44%	78%	44%

The results of the calculation of the accuracy level of the three methods used to predict the bankruptcy of nine samples of retail division companies recorded on the Indonesia Stock above show that the Altman Strategy and the Zmijewski Strategy are methods that have the highest and highest level of precision. Altman Strategy and the Zmijewski Strategy obtained an accuracy rate of 56% and the Springate method was ranked last with an accuracy rate of 22%.

CONCLUSION

This research aims to predict the bankruptcy of retail sub-sector companies recorded on the Indonesia Stock Trade for the 2014-2018 period using three bankruptcy prediction methods, namely the Altman, Springate and Zmijewski methods. However, this is not a verdict of bankruptcy, but only a warning for companies to improve their performance in order to avoid bankruptcy.

In addition to predicting bankruptcy, this research also examines the accuracy of each method used to find out which method has the highest accuracy in predicting in accordance with reality. The calculation results using the three methods above can be concluded that :

1. Liquidation expectations using the Altman Z-Score strategy in nine retail division companies listed on the Indonesia Stock Exchange for the 2014-2018 period appear to be four companies are predicted to experience bankruptcy, namely retail companies TRIO, retail companies MPPA, retail companies RIMO and retail companies GLOB. And there is also one company that is predicted to enter the bankruptcy-prone zone, namely retail companies KOIN. While there are four four companies. that are anticipated not to go. bankrupt, to be specific retail companies CENT.

2. Bankruptcy prediction using the Springate method on nine samples of retail segment of companies listed on the Indonesia Stock Exchange for the 2014-2018 period, there appear to be seven companies that are expected to be liquidated, namely retail companies HERO, retail companies TRIO, retail companies MPPA, retail companies SKYB, retail companies RIMO, retail companies CENT, and retail companies GLOB. while two companies that are predicted to be healthy or not experiencing bankruptcy using the Springate method are retail companies KOIN and retail companies ECII.

3. Bankruptcy prediction using the Zmijewski method on nine samples of retail segment companies recorded on the Indonesia Stock Trade for the 2014-2018 period shows from nine sample companies there are five companies that are predicted to be healthy or not experiencing bankruptcy, namely retail companies HERO, retail companies SKYB, retail companies RIMO, retail companies CENT and retail companies ECII. While the four companies that are predicted to experience bankruptcy are retail companies TRIO, retail companies MPPA, retail companies KOIN and retail companies GLOB.

4. The results of the calculation of the accuracy level of the three methods used to predict the bankruptcy of nine samples Of the many retail segment companies listed on the Indonesian Stock Exchange above, it appears that the Altman Strategy and the Zmijewski Strategy are the strategies that have the highest level of accuracy and achieve break-even. Altman strategy and Zmijewski strategy obtained an accuracy rate of 56% and the Springate method was ranked last with an accuracy rate of 22%.

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