

Analysis To Assessment Potential Bankruptcy of The Company In State Owned Enterprises Agriculture Sector

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Abstract

Predicting potential for bankruptcy is the most important information for stakeholders with an interest in the company. The act of predicting bankruptcy, of course, will reduce the risk of such bankruptcy. The Altman Z-Score, Springate and Zmijewski methods can be used as an indicator tool in predicting potential bankruptcy. The purpose of this study is to determine which method has the highest level of accuracy. The population used in this study were BUMN in the agricultural sector. The sample was selected using purposive sampling method. The analytical method used is descriptive quantitative using secondary data and data analysis techniques using parametric statistical tests, namely Paired Sample t-test. The results showed that the Altman Z-Score and the Springate methods obtained the highest accuracy rate of 93.33% and there was no significant difference between the Altman Z-Score and the Springate and Zmijewski methods in predict potential bankruptcy.

Keywords:

BUMN, Bankruptcy, Z-Score, Springate, Zmijewski.

1. Introduction

The purpose of establishing a company is to get profit so that it can survive or develop in a long period of time and not to experience liquidation, but the development of the era of globalization currently demands a company to improve all aspects that support the company to survive or even develop in the future. One aspect that makes the company can survive or even thrive is an increased or steady return. According to Samryn (2012), stated that profit is a source of internal funds that can be obtained from normal activities of the company that does not require extra costs for storage and its packaging. Profits gained are utilized to maintain the company's existence. Companies that cannot compete in maintaining their existence by themselves will be displaced from their business environment and will undergo bankruptcy.

Competition is done nowadays increasingly strict, companies in this case state-owned enterprises need to pay attention to the value of the company. With the increasing value of the company, investors can see as a condition that the company is in good condition (Mai Ratnasari, 2017). According to Law No. 19 of 2003 concerning State-owned enterprises, the definition of State-owned enterprises is a business entity that is wholly or largely owned by the state through direct inclusion derived from the richness of the country. The existence of State-owned Enterprises in Indonesia is one of the drivers aiming to advance the economy of Indonesia, because State-owned enterprises companies are considered to have an important role in the Indonesian economy. One of the state-owned enterprises that has an important role for Indonesia's economy is the State-owned enterprises of the agriculture sector, Indonesia

is known as an agricultural country which means that the country relies on agricultural sectors both as a source of livelihood as well as support for development. Agriculture is a sector that is very dominant in the income of people in Indonesia because the majority of Indonesians working as farmers. Secretary General of the Agriculture Ministry Syukur Iwantoro said that the value of agricultural gross domestic product sector continues to improve. In 2013, gross domestic product The agricultural sector amounted to only 994.8 trillion, and increased in 2017 to 1334.7 trillion (jpp.go.id, 2019). Besides growing positively, the role of the agricultural sector in national economic growth is also increasingly important and strategic, it is evident from its increasing contributions. In 2014, the agricultural sector (including forestry and fisheries) contributed approximately 13.14% to the national economy and in 2017 it increased to 13.53% (pertanian.go.id, 2019). This improvement is mainly in the strategic commodity of plantations and farms. Even if accumulated, total exports for four years reached Rp 1,764 trillion (news.okezone.com, 2019).

Inversely proportional to the statement of the Minister of Finance Sri Mulyani Indrawati precisely explained the opposite state that there are two groups of State-owned Enterprises that entered the category of distress (emergency) namely various industries and agriculture he detailed the Z-score of various industrial sectors of 0.0 and agriculture sector -0.4. That is, the two sectors risk bankruptcy (cnnindonesia.com, 2019). The State-owned enterprises of the agricultural sector according to Sri Mulyani are in danger or vulnerable condition, this is because the profits obtained by the state-owned enterprises of agriculture companies for the last five years suffered instability, Profit is very important for a company because profits gained can be utilized to maintain the company's existence. Companies that are unable to compete in maintaining their existence by themselves will be displaced from their business environment and will experience bankruptcy, the following profit graphs of the state-owned enterprises of the agricultural sector for the last five years.

With the state of the company experiencing profit instability, it is not possible that State-owned enterprises of the agricultural sector will experience a revival if it can not be managed well in the future. According to Toto (2011), the bankruptcy is a condition in which the company is no longer able to settle its liabilities. This condition usually does not appear in the company, there is an early indication of the company which is usually recognizable early if financial statements are analyzed more closely in a certain way. Predicting bankruptcy is the most important information for stakeholders, i.e. investors, creditors, auditors, regulatory authorities, management and other interested parties to the company. There are several tools or methods used to detect bankruptcy. Some of the detection tools are produced from various research conducted by some experts who have attention to bankruptcy in various companies in the world. Some of the bankruptcy detection tools include; Altman (Z-Score), Springate (S-Score), and Zmijewski (X-Score), Action predicts bankruptcy, of course, will reduce the risk of bankruptcy. The differences in research results Puput Mellisa & Haposan (2020) where the highest accuracy rate is the Altman Z-Score method with a Score of 90%. Unlike the research conducted by Fadrul dan Ridawati (2020) with the results showed that the highest level of accuracy was on the Zmijewski method with a score of 100%.

The purpose of this research is to overcome bankruptcy predictions in the state owned enterprises of the agriculture sector, whether it is potentially bankrupt or whether it is assessed using the Altman (Z-Score) method, Springate (S-Score), and Zmijewski (X-Score) and which method has the highest level of accuracy.

2. Literature Review

There are many ways to measure the company's financial performance, apart from the potential for bankruptcy as in the journal Agung (2017), that one way to see the condition of a company is measured by its performance.

According to Hanafi in Peter and Yoseph (2011), "Bankruptcy is usually interpreted as failure of the company in running the company's operations to generate profit. Meanwhile, according to Toto (2011), the Bankruptcy is a condition in which the company can no longer afford to settle its liabilities. This condition usually does not appear in the company, there is an early indication of the company which is usually recognisable in advance if the financial statements are analyzed more closely in a certain way.

A number of studies have been conducted to determine the usefulness of financial ratios analysis in predicting company failures. One of the studies of bankruptcy predictions is the Alman Z-Score conducted by Edward I, Altman uses 5 types of ratios, namely :

1. Working capital to total assets ratio.

This ratio is used to measure the liquidity of the company's assets relative to its total capitalism.

2. Retained earnings to total assets ratio.
This ratio is used to measure cumulative profitability.
3. EBIT to total assets ratio.
This ratio is used to measure the actual productivity of an enterprise asset.
4. Market value of equity to book value of total debt ratio.
This ratio is used to measure how much a company's assets can decrease in value before the amount of debt is greater than its assets and the company becomes insolvent.
5. Sales to total assets ratio.
This ratio is used to measure management's ability to improve competition conditions.

Submitted by Kamaludin, Rini Indriani (2012), Altman acquires capital prediction multiple discriminant analysis which can be expressed as follows:

If the company is private, then use the following formula:

$$Z = 0,717X_1 + 0,847X_2 + 3,107X_3 + 0,420X_4 + 0,998X_5$$

Where:

$X_1 = (\text{Current Assets} - \text{Currents Liabilities}) / \text{Total Assets}$.

$X_2 = \text{Retained Earnings} / \text{Total Assets}$.

$X_3 = \text{EBIT} / \text{Total Assets}$.

$X_4 = \text{Book Value of Equity} / \text{Total Liabilities}$.

$X_5 = \text{Sales} / \text{Total Assets}$

Decision Creteria:

$Z > 2,9 = \text{Not bankrupt area}$.

$1,23 < Z < 2,9 = \text{Grey area}$.

$Z < 1,23 = \text{Bankrupt area}$.

Gordon L. V Springate (1978) has conducted research and resulted in a model of bankruptcy prediction made following Altman model procedures. The Springate method uses 4 financial ratios to predict the presence of potential financial difficulties within a company. This Springate method can be used to predict bankruptcy. Menurut Syafrida Hani (2014) The Springate method is a ratio model used to measure the company's financial condition. This model uses more than one financial ratio which is considered to be related to conditions that can measure the bankruptcy level of a company.

The Springate models in Peter and Yoseph (2011) formulate as follows:

$$S = 1,03 A + 3,07 B + 0,66 C + 0,4 D$$

Where :

A = Working capital / Total asset

B = Net profit before interest and taxes / Total asset

C = Net profit before taxes / Current liabilities

D = Sales / Total asset

Decision Creteria:

$S < 0,862 = \text{Bankrupt area}$.

$S > 0,862 = \text{Not bankrupt area}$.

The prediction Model produced by Zmijewski in 1983 was a repeated research of 20 years. Zmijewski (1984) uses the analysis of liquidity ratios, leverage, and measuring the performance of a company. Zmijewski made predictions with samples of 75 bankrupt companies and 73 healthy companies during the year 1972 to 1978, indicator F-Test to group ratio rate of return, liquidity, leverage turnover, fixed payment coverage, trends, firm size, and stock return volatility, shows a significant difference between a healthy and unhealthy company.

Then this model generates the following formula:

$$X = -4,3 - 4,5X_1 + 5,7X_2 + 0,004X_3$$

X_1 = ROA (Return On Asset)

This first ratio is calculated by comparing net profit after tax with total assets. This ratio measures the return of asset.

X_2 = Leverage (Debt Ratio)

This second ratio compares the total debt to the total assets. This ratio shows how much part of the whole asset is being budget.

X_3 = Likuiditas (Current Ratio)

This third ratio compares current assets with seamless debt. This ratio is used to measure the company's ability to pay for short-term liabilities.

Decision criteria:

If the score is more than 0 (zero) the company is predicted to be bankrupt, but if the score is less than 0 (zero) then the company is predicted to have no potential bankruptcy.

3. Methodology

The types of research used in this study are quantitative descriptive and data analysis techniques using parametric statistical tests, namely Test Paired Sample T-Test.

The research object is the financial ratios of the Altman (Z-Score), Springate (S-Score) and Zmijewski (X-Score) methods to predict bankruptcy. The unit of analysis used in this research is an organization that is the data source whose analysis unit is a response from the organizational or corporate division, in this case the analysis Unit is the enterprises of state owned agriculture sector by using annual data as the basis of research. The location in this research is the enterprises of state owned agriculture sector to obtain data and information needed then researchers use the data source of the site www.bumn.go.id.

This research uses the population of state owned enterprises in agriculture. The method of sample withdrawal in this study purposive sampling means sampling techniques with certain considerations of researchers.

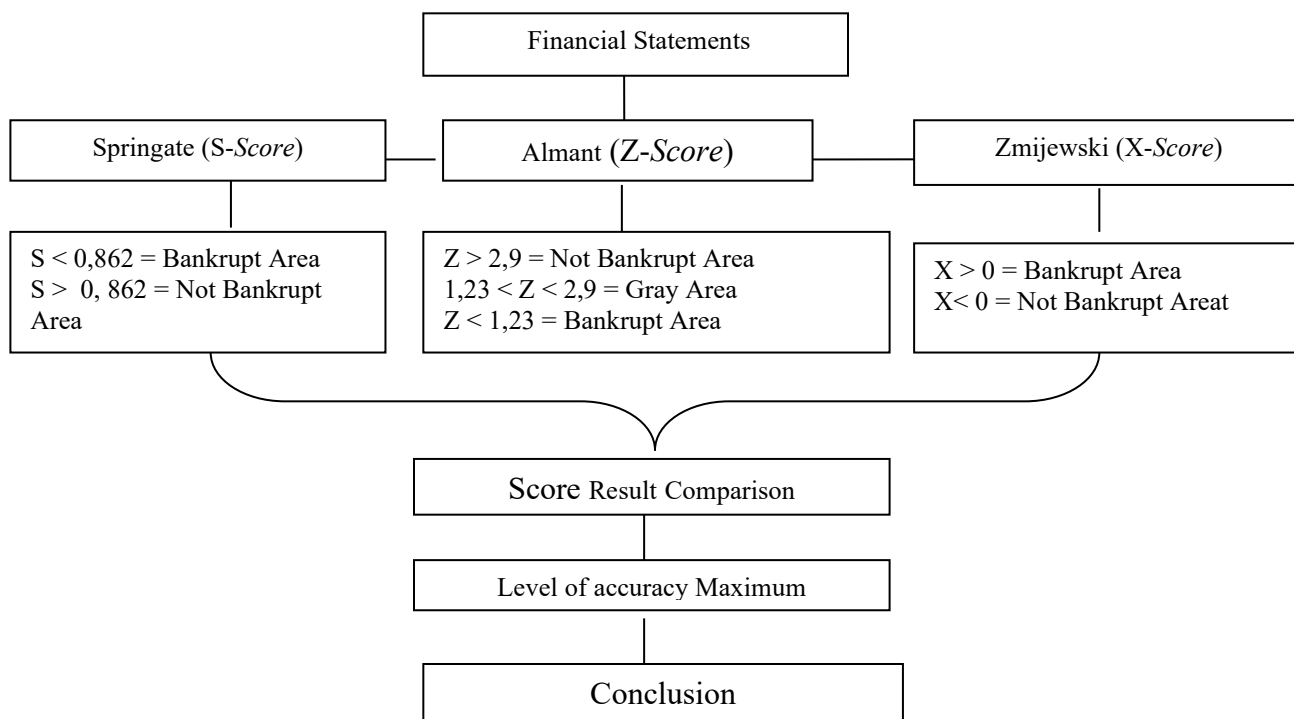


Figure 1. Research Design

4. Analysis and Discussion

4.1. Altman Methods (Z-Score)

The analysis of the Altman method (Z-Score) is a method to predict the bankruptcy potential of a company by combining several common financial ratios and providing different weights with each other. There are three types of formulas derived by Altman, where the formula is used for public companies, private and company non-manufacturer industrial & emerging market credits. The following is the result of calculation method of Altman (Z-Score) on enterprises of state owned agriculture sector.

Table 1. Analysis Result of Altman (Z-Score) Method

Years	$0,717X_1$	$0,847X_2$	$3,107X_3$	$0,420X_4$	$0,998X_5$	Z-Score	Classification
PT Sang Hyang Seri (Persero)							
2014	-0,61	-1,98	1,73	-0,27	0,73	-0,41	Bankrupt
2015	-0,20	-1,63	-0,40	-0,23	0,17	-2,28	Bankrupt
2016	-0,21	-1,71	0,03	-0,24	0,41	-1,72	Bankrupt
2017	-0,30	-2,07	0,29	-0,26	0,71	-1,64	Bankrupt
2018	-0,63	-2,92	-0,64	-0,30	0,31	-4,19	Bankrupt
PT Pertani (Persero)							
2014	0,01	-0,42	-0,45	-0,12	1,36	0,40	Bankrupt
2015	0,22	-0,39	-0,38	0,00	0,93	0,38	Bankrupt
2016	0,33	-0,29	0,05	0,19	0,78	1,06	Bankrupt
2017	0,39	-0,40	0,12	0,17	1,21	1,49	Grey Area

Years	0,717X ₁	0,847X ₂	3,107X ₃	0,420X ₄	0,998X ₅	Z-Score	Classification
2018	0,32	-0,52	-0,19	0,15	1,44	1,20	Bankrupt
PT Perkebunan Nusantara III (Persero)							
2014	-0,04	0,08	0,14	0,20	0,59	0,97	Bankrupt
2015	-0,03	0,01	0,06	0,34	0,36	0,74	Bankrupt
2016	-0,04	-0,06	0,04	0,35	0,31	0,60	Bankrupt
2017	-0,04	-0,05	0,13	0,36	0,31	0,70	Bankrupt
2018	-0,06	-0,07	0,11	0,35	0,27	0,60	Bankrupt

Source: Data processed with Microsoft Excel 2010, 2020.

Based on table 1 value z-score PT Sang Hyang Seri (Persero) from the year 2014 to 2018 based on the point cut off all incoming classification bankruptcy. Then PT Pertani (Persero) from the year 2014, 2015, 2016 and 2018 obtained from the value of his z-score enter the classification bankruptcy while the year 2017 value of z-scorenya based on the point cut off enter the classification grey area and for PT Perkebunan Nusantara III (Persero) same as PT Sang Hyang Seri (Persero) which from the year 2014 to 2018 z-score value obtained based on the point cut off the classification went bankrupt.

4.2. Springate Method (S-Score)

As it is known that in order to predict the potential of bankruptcy is not only the Altman (Z-Score) method alone but there are various methods, one of which is the Springate (S-Score) method. In this case the ratio used is the financial ratio chosen according to the Springate method Working Capital to Total Assets (A), Earnings Before Interest and Taxes to Total asset (B), Earnings Before Taxes to Current liabilities (C) dan Sales to Total Assets (D). Here are the results of calculation of the Springate S-score method on the State owned enterprises agriculture sector:

Table 2. Analysis Result Of Springate (S-Score) Method

Years	1,03A	3,07B	0,66C	0,4D	S-Score	Classification
PT Sang Hyang Seri (Persero)						
2014	-0,87	-0,39	0,13	0,29	-0,84	Bankrupt
2015	-0,29	-0,39	-0,10	0,07	-0,71	Bankrupt
2016	-0,30	0,03	-0,05	0,17	-0,16	Bankrupt
2017	-0,44	0,28	0,01	0,29	0,14	Bankrupt
2018	-0,90	-0,64	-0,17	0,12	-1,58	Bankrupt
PT Pertani (Persero)						
2014	0,02	-0,44	-0,33	0,55	-0,21	Bankrupt
2015	0,31	-0,38	-0,22	0,37	0,09	Bankrupt
2016	0,47	0,05	0,01	0,31	0,84	Bankrupt
2017	0,37	0,12	0,02	0,49	1,20	No Bankruptcy
2018	0,02	-0,44	-0,33	0,55	-0,21	Bankrupt
PT Perkebunan Nusantara III (Persero)						
2014	-0,06	0,14	0,05	0,24	0,36	Bankrupt
2015	-0,05	0,06	0,00	0,15	0,15	Bankrupt

2016	-0,06	0,04	-0,02	0,12	0,09	Bankrupt
2017	-0,06	0,12	0,07	0,12	0,25	Bankrupt
2018	-0,08	0,11	0,04	0,11	0,18	Bankrupt

Source: Data processed with Microsoft Excel 2010, 2020.

Based on table 2 the S-score value of PT Sang Hyang Seri (Persero) from 2014 to 2018 based on the cut off point all the admission classification went bankrupt. Then PT Pertani (Persero) from the year 2014, 2015, 2016 and 2018 results obtained from the value of his s-score entered the classification of bankruptcy while the year 2017 the value of his s-score based on the point cut off entry classification is not bankrupt and for PT Perkebunan Nusantara III (Persero) from the year 2014 to 2018 s-score value obtained based on the cut-off point in the classification went bankrupt.

4.3. Zmijewski Method (X-Score)

As it is known that in order to predict the potential of bankruptcy not only the Altman (Z-Score) method and the Springate (S-Score) method alone but there are various methods, one of these is the Zmijewski (X-Score) method. In this case the ratio used is the financial ratio chosen according to the Zmijewski method, Net Income After Tax to Total Assets (X_1), Total Liabilities to Total Asset (X_2) and Current Asset to Current Liabilities (X_3). Thus it will be known how the potential prediction of bankruptcy in the State Owned enterprises of the agriculture sector by using this method Zmijewski (X-Score). Here is the result of the calculation method Zmijewski (X-Score) in the company of State Owned agriculture sector:

Table 3. Analysis Result Of Zmijewski (X-Score) Method

Years	-4,3	4,5 X_1	5,7 X_2	0,004 X_3	X-Score	Classification
PT Sang Hyang Seri (Persero)						
2014	-4,3	1,347	16,395	0,002	10,75	Bankrupt
2015	-4,3	-0,648	12,325	0,003	8,67	Bankrupt
2016	-4,3	-0,323	13,641	0,003	9,66	Bankrupt
2017	-4,3	0,094	15,364	0,002	10,97	Bankrupt
2018	-4,3	-1,466	19,924	0,001	17,09	Bankrupt
PT Pertani (Persero)						
2014	-4,3	-0,73	7,85	0,004	4,27	Bankrupt
2015	-4,3	-0,45	5,65	0,007	1,79	Bankrupt
2016	-4,3	0,02	3,90	0,010	-0,43	No Bankruptcy
2017	-4,3	0,08	4,08	0,012	-0,31	No Bankruptcy
2018	-4,3	-0,30	4,19	0,011	0,18	Bankrupt
PT Perkebunan Nusantara III (Persero)						
2014	-4,3	0,056	3,893	0,003	-0,47	No Bankruptcy
2015	-4,3	-0,027	3,138	0,003	-1,14	No Bankruptcy
2016	-4,3	-0,056	3,097	0,003	-1,15	No Bankruptcy
2017	-4,3	0,049	3,076	0,003	-1,28	No Bankruptcy
2018	-4,3	0,033	3,122	0,003	-1,21	No Bankruptcy

Source: Data processed with Microsoft Excel 2010, 2020.

Based on table 3 x-score value of PT Sang Hyang Seri (Persero) from the year 2014 to 2018 based on the point cut off all incoming classification is bankrupt. Then PT Pertani (Persero) in 2014,2015 and 2018 results obtained from the value of x-scorenya entered the classification bankrupt while the year 2017 and 2018 his x-score value based on the point cut off in the classification does not go bankrupt and for PT Perkebunan Nusantara III (Persero) from 2014 to 2018 x-score value obtained based on the cut-off point of the classification does not go bankrupt.

4.4. Comparison of Accuracy Rate Prediction Results

Table 4. Results Comparison Prediction

No	Predictive method	Result Prediction			Amount
		Bankruptcy Area	Grey Area	No bankruptcy	
1	Altman	14	1	0	15
2	Springate	14	0	1	15
3	Zmijewski	8	0	7	15

Source: Data processed with Microsoft Excel 2010, 2020.

Based on table 4 Altman method (Z-Score) in predicting the potential bankruptcy of state-owned enterprises of the agricultural sector there 14 times that are in the bankrupt area meaning predicted to be potentially bankrupt and 1 in the grey area means it is potentially bankrupt or may also not go bankrupt, then for the Springate (S-Score) method there are 14 times that are in the bankrupt area and 1 once in the area is not bankrupt and for the method Zmijewski (X-Score) there are 8 times that enter the area of bankruptcy and 7 in the area is not bankrupt. Once known the number of predicted outcomes of each method, a calculation of the accuracy rate against bankruptcy predictions is required by:

$$Accuracy\ Rate = \frac{Correct\ amount\ of\ predictions}{Number\ of\ samples} \times 100\%$$

4.5. Recapitulation of Altman Method Accuracy (Z-Score), Springate (S-Score) And Zmijewski (X-Score)

Table 5. Recapitulation Of Accuracy Level
Altman (Z-Score), Springate (S-Score) and Zmijewski (X-Score) Methods

Years	PT Sang Hyang Seri	PT Pertani (Persero)	PT Perkebunan
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	(Persero)				Nusantara III (Persero)	
	Correct Predictions	Sample	Correct Predictions	Sample	Correct Predictions	Sample
2014	3	3	3	3	2	3
2015	3	3	3	3	2	3
2016	3	3	3	3	1	3
2017	2	3	2	3	1	3
2018	3	3	3	3	2	3
Amount	14	15	14	15	8	15
Accuracy Level	93,33%		93,33%		53,33%	

Source: Data processed with Microsoft Excel 2010, 2020

Based on the calculation of accuracy rate of potential prediction of nobility it has been known that on table 5 methods Altman (Z-Score) and Springate (S-Score) get the accuracy rate of 93,33% with 14 times the company in prediction of true bankruptcy of 15 sample period 2014-2018 and method Zmijewski (X-Score) get gain accuracy level of 53,33% from 2014 to 2018 It can be concluded that the Altman (Z-Score), Springate (S-Score) and Zmijewski (X-Score) methods provide a different level of accuracy in State-owned agricultural sector enterprises. The methods that have the highest level of accuracy are the Altman (Z-Score) and Springate (S-Score) methods with an accuracy rate of 93.33% respectively.

4.6. Paired Sample T Test

According to Priambodo (2017) This test was conducted to determine whether there is a difference between two paired dependent samples, which is a significant difference in predicting the potential of bankruptcy between the scores of Altman, Springate and Zmijewski predictions methods. The decision is based on the value of Sig. (2-tailed). If the value is Sig. (2-tailed) > 0.05, then there is no significant difference between the two sample groups. But when the value of GIS. (2-tailed) < 0.05, there is a significant difference between the two sample groups. Here is the result of SPSS output on testing paired sample T test.

Table 6. Test Paired Sample t Test

	Paired Differences		t	df	Sig. (2-tailed)	
	Std. Deviation	95% Confidence Interval of the Difference				
		Lower				Upper
Pair 1 Z-Score - S-Score	1,10049	-,77610	,44277	-,587	14	,567
Pair 2 Z-Score - X-Score	7,50808	-8,12384	,19184	-2,046	14	,060
Pair 3 S-Score - X-Score	6,56436	-7,43456	-,16411	-2,242	14	,042

Source: Data processed with SPSS Statistic 25, 2020

Based on the results in table 6 shows the value of the Sig. (2-tailed) in the pair of 1 between the score of Altman (Z-Score) and Springate (S-Score) method is 0.567, indicating $0.567 > 0.05$ which means there is no significant difference between the two sample groups. Then pair 2 between the scores of Altman methods (Z-Score) and Zmijewski (X-Score) were 0.060 results showing $0.060 > 0.05$ which means there is no significant difference between the two sample groups. And the last pair of 3 pairs between the Springate (S-Score) and Zmijewski (X-Score) method is 0.042, indicating $0.042 < 0.05$ which means there is a significant difference between the two sample groups.

5. Conclusion and Advice

Then the researcher took some conclusions as follows:

1. The Altman method (Z-Score) in the agricultural sector enterprises predicts as many as 3 companies with 15 samples, then based on the cut-off point can be known the number of bankruptcy predictions which amounted to 14 levels of accuracy obtained Alman (Z-Score) method of 93,33%.
2. The Springate (S-Score) method in the agricultural sector enterprises predicts as many as 3 companies with 15 samples, then based on the cut-off point can be known the number of bankruptcy predictions which amounted to 14 with the level of accuracy obtained by this Springate (S-Score) method amounted to 93,33%.
3. Zmijewski (X-Score) method in the enterprises of the agriculture sector predicts as many as 3 companies with 15 samples, then based on the cut-off point can be known number of bankruptcy predictions which amounted to 8 with the level of accuracy gained by this method Zmijewski (X-Score) amounted to 53,33%.
4. Based on the calculation results and data analysis using the method Zmijewski (X-Score), Springate (S-Score) and Zmijewski (X-Score) in the State owned enterprises of the agriculture sector can be known the highest

level of accuracy, namely the Altman (Z-Score) and Springate (S-Score) methods with an accuracy level of 93,33%, the lowest is the Zmijewski (X-Score) 53,33%.

5. There is no difference in the score between the Altman (Z-Score) method with Springate (S-Score) and Zmijewski (X-Score) in predicting the potential of bankruptcy in the agricultural sector's State enterprises. It is supported by test results paired T-test samples between the Altman (Z-Score) and Springate (S-Score) methods that produce a Sig. (2 tailed) value of 0.567 and between the Altman (Z-Score) and Zmijewski (X-Score) methods that produce a Sig. (2 tailed) value of 0.06. It shows a score of more than 0.05 which means there is no score difference in predicting the potential of bankruptcy.

This research is expected to provide advice to companies and for further research,

1. For the company
For the management of the company, it can be used as an ingredient of retrieval considerations to improve aspects of operation, liquidity and capital structure so that the company's performance is expected to increase.
2. For further researchers
This research is expected to be one of the references for further research and also in hopes can be a further research material done by other researchers in the State Owned who are moving in a sector other than agriculture, adding another method of bankruptcy analysis (such as, Grover model), and increase the period of research time so that the research results more comprehensive.

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