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FINANCIAL FAILURE ESTIMATE IN BIST COMPANIES WITH ALTMAN (Z-SCORE) AND SPRINGATE (S-SCORE) MODELS

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Abstract

The aim of this paper is to measure financial failure level of 7 different sector which is on the BIST index in the period of 2014-2016 and enable to compare the level of financial failure by years. Thus, it is to test whether any leading indicator, which gives early warning in detection of companys financial failure exists or not. In this sense, financial data of 166 companies which are registered in BIST comprises the sample of the study. The acquired data was measured by the easily computable and understandable Altman (Z-Score) and Springate (S-Score) models, which give successful results in forecasting the bankruptcy and financial failures. As a result of the analysis, Altman model shows that 115 (%69) out of 166 companies are not under financial stress while Springate model demonstrates that 95 (%57) companies. Both of the models indicate different levels of financial failure. Hovewer, similar results are found when analysis of companies are made by years.

Key Words: BIST, Financial Failure, Altman, Springate

ALTMAN (Z-SCORE) VE SPRINGATE (S-SCORE) MODELLERİ İLE BIST İŞLETMELERİNDE FİNANSAL BAŞARISIZLIK TAHMİNİ

Özet

Bu çalışmanın amacı, Borsa İstanbul (BIST) endeksinde yer alan 7 farklı sektörünün 2014-2016 dönemindeki mali başarısızlık seviyelerini ölçmek ve finansal başarısızlık düzeylerini yıllar itibariyle karşılaştırmaya olanak sağlamaktır. Bunun sonucunda, şirketlerin finansal başarısızlığını belirlemede erken uyarı veren öncü bir göstergenin var olup olmadığının test etmektir. Bu anlamda, çalışmanın örneklemini BIST'e kayıtlı 166 adet şirkete ait mali veriler oluşturmaktadır. Elde edilen veriler şirketlerin olası iflas durumlarını ve finansal başarısızlıklarını öngörmede iyi sonuçlar veren, hesaplanması ve anlaşılması kolay Altman (Z-Score) ve Springate (S-Score) modelleri yardımıyla ölçülmüştür. Analiz sonucunda, Altman modeli 166 işletmeden 115'inin (%69), Springate modeli ise 95'nin (%57) finansal anlamda sıkıntı içerisinde olmadığını göstermiştir. Her iki modelde farklı finansal başarısızlık düzeylerine işaret etmektedir. Ancak, işletmelerin yıllar düzeyinde analizi yapıldığında benzer sonuçlar saptanmıştır.

Anahtar Kelimeler: BIST, Finansal Başarısızlık, Altman, Springate

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1. INTRODUCTION

Financial problems can affect the financial states of companies, as well as national economies, and can lead to changes in the financial structure, cause companies to enter into reconstruction process or go bankrupt. This situation, in which companies find it difficult to fulfill their requirements, can ultimately lead to bankruptcy and thus, injure the investors, lenders and all other shareholders of the company (Bozkurt, 2014, p. 128). So, several models are needed to make sure that the measures are taken in time to mitigate the effects of this negative situation. Among these models are "Springate S-Score" and "Altman Z-Score", which establish a relationship between income statements and balance sheet items and enable predictions of future financial sustainability and bankruptcy regarding the financial performance of companies (Yılmaz and Yıldıran, 2015, p.43). Though, multi-faceted financial failure analyses have been performed in recent years, thanks to the advantages of the statistical and financial methods, detailed literature review showed that, application results of these two methods produced more reliable results compared to others in the assessment of financial failure of institutions.

In the literature, while some of the conducted studies only revealed out the ratios presenting the bankruptcy risk, some others aimed to find out whether there was a statistically significant relationship between financial statements data and bankruptcy risks of businesses. Consequently, models estimating the bankruptcy risk score of each company were revealed out (Bozkurt, 2014, p. 128). Models developed for the prediction of bankruptcy are presented in Table 1. Bankruptcy probability predictions, variables and model critical values of the estimated bankruptcy scores of 8 different bankruptcy indicator models presented in Table 1.

Table 1: Bankruptcy Indicator Model Scores Estimation and Critical Values

Model	Variables Identified as Bankruptcy Indicators	
Altman (1968)	(X1) Net Working Capital/T. Assets (X2) Undistributed Profits/T. Assets (X3) Profit before Interest and Tax/T. Assets (X4) Equity Market Value/T. Debts (X5) Net Sales / Total Assets Z: 1,2*X1+1,4*X2+3,3*X3+0,6*X4+1*X5	Z score=1,81
Altman (1983)	(X1) Net Working Capital/T. Assets (X2) Undistributed Profits/T. Assets (X3) Profit before Interest and Tax/T. Assets (X4) Equity Book Value/T. Debts (X5)Net Sales/Total Assets Z':0,717*X1+0,847*X2+3,107*X3+0,420*X4+0,998*X5	Z' score=1,23
Altman (1993)	(X1) Net Working Capital/T. Assets (X2) Undistributed Profits/T. Assets (X3) Profit before Interest and Tax/T. Assets	Z'' score= 1,1

	(X4) Equity Book Value/T. Debts Z'':6,56*X1+3,26*X2+6,72*X3+1,05*X4	
Springate **(1978)**	(X1) Working Capital/T. Assets (X2) Profit before Interest and Tax/T. Assets (X3) Profit before Tax/Short-Term D (X4) Sales/T. Assets S: 1,03X1+3,07X2+0,66X3+0,4X4	S score= 0,862
Ohlson **(1980)**	(X1) Log(T. Assets/GNP Index) (X2) Total Debts/Total Assets (X3) Working Capital/T. Assets (X4) Short Term Debts/Current Assets (X5) if Total debts>T. Assets, 1;0 (X6) Net Profit (N.P)/Total Assets (X7) Profit before Interest and Tax/Total Debts (X8) If net profit of the last two years is negative, 1;0 (X9) (N.Pt – N.Pt-1)/(|N.Pt| + |N.Pt-1|) O:0,407X1+6,03X2-1,43X3+0,076X4-1,72X5-2,37X6-1,83X7+0,285X8-0,521X9-1,32	O score= logistic transformation result 0,5
Zmijewski **(1984)**	(X1) Net Profit /T. Assets (X2) Total Debts/T. Assets (X3) Current Assets/Short Term Debts J: -4,3-4,5*X1+5,7*X2+0,04*X3	J score= 0,5
Canada Score **CA-Score**	(X1) Partner Shares/T. Assetst-1 (X2) (Profit before Tax and Interest + Financing Cost t-1)/T. Assetst-1 (X3) Sales Income t-2/T. Assets-2 C: 4,59*X1+4,51*X2+0,3936*X3-2,76	C score= -0,3
Fulmer et al. **(1984)**	(X1) Undistributed Profit/T. Assets (X2) Sales/T. Assets (X3) Profit before Tax/Equity (X4) Cash/Total Debts (X5) Total Debts/T. Assets	F score= 0

	(X6) Short Term Debts/T. Assets (X7) Log Tangible Total Assets (X8) Working Capital/Total Debts (X9) Log Profit before Interest and Tax/Interest F:5,52X1+0,212X2+0,073X3+1,27X4-0,12X5+2,34X6+0,575X7+1,083X8+0,894X9-6,075	

Source: (Bozkurt, 2014, p.170)

2. LITERATURE REVIEW

In literature, there are several empirical studies about financial stress (failure). In foreign literature; Kidane (2004) applied the Altman's score model to determine financial stress in service and technologies businesses and revealed out a weak prediction skill in unsuccessful companies and a powerful prediction skill in successful companies. In their study Pongsatat et al. (2004) examined big and small companies, they compared Altman Z and Ohlson O scores and did not find a significant difference between these models. Huo (2006) examined the restaurants in the USA using three different models, compared Altman Z score, Springate S score and Fulmer F score with each other and found that Altman Z score was more efficient. Jayadev (2006) considered bank data and compared the accuracy rate of internal scoring model and Altman Z score model and he found superior results from Altman Z score model. Jacobs (2007) used Altman Z score model for credit assessment of companies serving in different sectors and reported to have obtained successful results. Moghadam et al. (2009) examined the companies have traded in Tehran Stock Market and compared Altman Z score and Ohlson O score. They found, Ohlson O score was more efficient. Pranowo et al. (2010) used Altman Z score to determine the players that had role in the failure of companies and found that factors such as current ratio, efficiency, leverage and equity were the key players. Imanzadeh et al. (2011) compared Springate S score and Zmijewski J score and revealed out that Springate S score was more reliable. Sanobar (2012) used Altman Z score in banks and obtained quite successful results. Kumar and Kumar (2012) compared three different models, namely Altman Z, Ohlson O and Zmijewski J scores and found that, Ohlson O score was the most efficient one. Rahimipoor (2013) compared Fulmer F score with Toffler T score and found that, Fulmer F score gave more accurate results.

In the recent studies conducted in Turkey; Terzi (2011) reported to have obtained quite successful results in S score model he used for determining the financial failure risks of the food companies listed on Istanbul Stock Exchange. Zeytinoğlu and Akarım (2013) used Altman Z score and 20 financial ratio to analyze the 2009-2012 period financial data of the food companies listed on Istanbul Stock Exchange. The results they obtained at the end of analysis were able to explain the financial failure of companies at a rate over 88% and they revealed out that, Z score model had a high capability in the prediction of the financial failure of companies. Civan and Dayı (2014) examined the 2008-2012 period financial data of companies affiliated to Zonguldak Association of Public Hospitals using Altman Z model and Artificial Neural Networks. At the end of analysis, it was estimated according to Altman Z score that, 4% of companies were unsuccessful and 27% of those would become unsuccessful with a probability rate of 95%.

2.1. Altman Z-Score Model

Altman Z Model is a method developed by Edward Altman to predict the financial failures of companies. The model is a discriminative analysis tool including five financial ratios and is used for the determination of the bankruptcy risk of the company (Civan and Dayı, 2014, p.3). Though Altman Z score model was developed for the determination of the bankruptcy probabilities of companies, it is also deemed to be a model that could help companies in assessing their financial strength and lenders in making investment decisions (Hauschild, 2013, p.7). In his model, Altman defined 5 financial rations representing 22 financial ratios. He classified these ratios in categories as; liquidity, profitability, leverage, insolvency and activity ratio (Yıldız, 2014, p.76). By using particular weights, these ratios are described through 2 equations as public and nonpublic companies. Values shown in Equation 1 and descriptions for each variable are given for public companies (Hauschild, 2013, p.6):

Equation 1

Z Score = (1,2X1) + (1,4X2) + (3,3X3) + (0,6X4) + (0,999X5)
X1= Net Working Capital/Total Assets
X2= Undistributed Profit/Total Assets
X3= Profit before Interest and Tax/Total Assets
X4= Market Value of Stock Shares/ Book Value of Debts
X5= Net Sales/Total Assets

Whereas the formula and variables given in Equation 1 are used in the financial failure prediction of public companies, the results it gave for private companies were not as accurate as public companies, so the model was modified and formulized as Z' for private industrial companies and Z" model for service companies.

Equation 2

Z' Score = (0,717X1) + (0,847X2) + (3,10X3) + (0,42X4) + (0,998X5)
[private industrial companies]
Z'' Score = (6,56X1) + (3,267X2) + (6,72X3) + (1,05X4)
[service companies]

In Equation 2 shows, the X5 variable available Z Model, is removed out. This is considered to minimize the impact of industry (Zhang and Ellinger, 2006, p.11). Range values necessary for the identification of the Z values obtained and analysis of financial stress are given in Table 2.

Table 2: Altman Z Score Ranges

Z Score(Istanbul Stock Exchange Companies)	Z' Score(industrial companies)	Z'' Score(service companies)
Z<1.8 area with bankruptcy risk	Z'<1.23 area with bankruptcy risk	Z''<1.1 area with bankruptcy risk
1.8<Z<2.99 uncertain area	1.23<Z'<2.9 uncertain area	1.1<Z''<2.6 uncertain area
Z>2.99 safe area	Z'>2.9 safe area	Z''>2.6 safe area

Source: (Hauschild, 2013, s.6)

In this case, different formulations are used for different company structures. On the other hand, Z value, which is suitable for public companies, is mostly used.

2.2. Springate S-Score Model

The model developed by Gordon L.V. Springate uses the multivariate discriminative analysis just like Altman Z Model. Springate uses four basic ratios to estimate an S value for successful and unsuccessful companies. The estimation is as given below (Sevil et al. 2013, p.191):

S Score = (1,3X1) + (3,07X2) + (0,66X3) + (0,4X4)

X1= Net Working Capital/Total Assets
X2= Profit before Interest and Tax/Total Assets
X3= Profit before Tax/Short Term Debts
X4= Net Sales/Total Assets

If S < 0.862, it is predicted that the company will go bankrupt. Values estimated based on Altman Z Score and Springate S Score models were used in the study.

3. DATA and METHODOLOGY

3.1. The Purpose, Scope and Limitations of the Study

This study has two main purposes. The first one is to identify the bankruptcy risks of the companies list on Istanbul Stock Exchange by using Altman and Springate models. The second one is to compare the financial failure risk prediction capabilities of Altman and Springate models and to find out an efficient bankruptcy indicator model for the companies with accessible data. The study made use of the financial data of 7 sectors and 166 companies listed on Istanbul Stock Exchange which continued their activities non-stop in period 2014-2016. Financial data were collected from the financial statements of the companies. The study was performed in 3 stages. In the first stage, company data was analyzed based on Altman Model. In the second stage, financial data was analyzed based on Springate Model and in the Scores obtained for these two methods were compared with each other in the final stage. The reason why Altman and Springate models were selected among several other models was that, they had the best linear ratio combination discriminating financially unsuccessful companies from successful companies; compared to other financial ratios, they had higher capability to predict whether the company had financial stress risk before going bankruptcy and also because of the fact that, these two models fit better for the size, activity area and financial structure analyses of the companies affiliated to Istanbul Stock Exchange. Even though a number of similar studies were conducted in literature. This study is distinct with respect to its variables such as sectoral diversity and sample size. Sectoral distribution of the number of companies included in the study is shown in Table 3.

Table 3: Sectoral Distribution of the Companies Included in the Study

SECTORS	N	Number of companies that have continued their activities non-stop in period between 2014-2016	Percentage Distribution
Mining	6	3	1.81%
Manufacturing	191	113	68.07%
Electricity	7	5	3.02%
Construction	10	4	2.41%
Wholesale and Retail	34	22	13.25%
Transportation, Communication and Storage	10	6	3.61%
Technology	16	13	7.83%
Total	**274**	**166**	**100%**

Although in Istanbul Stock Exchange there were 274 companies in these 7 sectors, the study was restricted to 166 companies. Limitations of the study were that; it did not cover all the sectors trading in Istanbul Stock Exchange and it ignored the multiple relationships with other bankruptcy indicator models.

3.2. Data Collection

The ratios between income statements and balance statement items were used in the study for the assessment of financial failures of companies. The ratios between balance items were realized over the equation and balance statement items defined for Altman Z Score and Springate S Score.

13950 observations were used in the estimation of bankruptcy risks of companies. Once the financial ratios were determined, "Z" value and "S" value (independent variable) for each observation (company) were estimated from the sum of relevant variables. Distribution ranges of the Scores obtained are given in Table 4. If model critical values are below the value given in Table 4, companies are shown to be on the verge of bankruptcy.

Table 4: Altman Z Score and Springate S Score Ranges

Z Score	S Score
Z < 1.8 area with bankruptcy risk	S < 0,862 red area (bankruptcy risk)
1.8 < Z < 2.99 uncertain area	S > 0,862 green area (safe)
Z > 2.99 safe area	

3.3. Methodology

Altman Z Score and Springate S Score methods which are based on financial ratios and are deemed to be efficient in the prediction of financial failure were used in the study. Bankruptcy risks were obtained with the estimation of the below equations.

Altman Z Score equation;

Z Score = (1,2X1) + (1,4X2) + (3,3X3) + (0,6X4) + (1X5)
X1= Net Working Capital/Total Assets
X2= Undistributed Profit/Total Assets
X3= Profit before Interest and Tax/Total Assets
X4= Market Value of Stock Shares/ Book Value of Debts

Springate S Score equation;
S Score = (1,3X1) + (3,07X2) + (0,66X3) + (0,4X4)
X1= Net Working Capital/Total Assets
X2= Profit before Interest and Tax/Total Assets
X3= Profit before Tax/Short Term Debts
X4= Net Sales/Total Assets

With Altman Z index and Springate S index values obtained from the financial statements of companies, situations of companies were classified in two categories as 'companies with bankruptcy risk (financially unsuccessful)' and 'companies with no bankruptcy risk (financially successful)'.

4. FINDINGS

In the first part of the study, financial failures of the companies listed on Istanbul Stock Exchange were estimated with Altman Z model. Previous year financial statements of relevant companies were examined to identify the financial ratios and the data sets obtained were put into relevant place in the equation for Altman Z model. In Figure 1, Z values obtained at the end of analysis are shown in three different ranges, including 2014-2016 period.

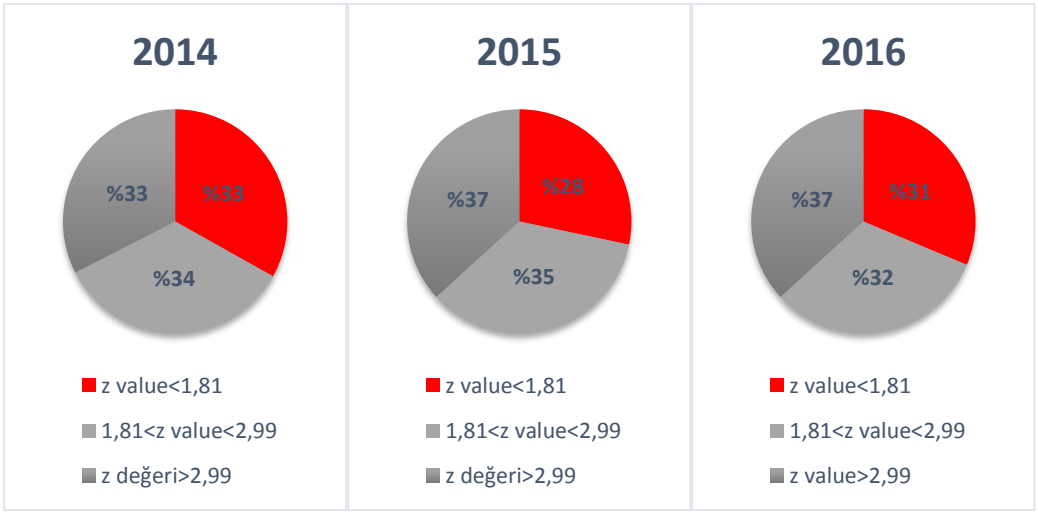

Figure 1: Graphic Illustration of Z Values over Years

In Figure 1, "Z" index value of companies are classified into three categories as the companies in successful area (green), uncertain area (gray) and unsuccessful area (red).

According to the results of the model, company success level was lower in 2014 compared to 2015 and 2016. In parallel with these values, 2015 is the most successful period with a ratio of 72%. 35% of this ratio consisted of successful companies and the remaining 32% consisted of uncertain companies. The ratio of successful companies remained stable in 2016 whereas the ratio of unsuccessful companies increased to 31%. The number of companies and sectoral distributions within Z values range in period 2014-2016 are presented in Table 5 and Table 6.

Table 5: Number of Companies within Z Values Range on Sectors Basis

SECTORS	2014			2015			2016		
	z value< 1,81	1,81<z value<2 ,99	z value> 2,99	z value<1 ,81	1,81<z value<2, 99	z value>2, 99	z value<1, 81	1,81<z value<2 ,99	z value>2, 99
Mining	1	1	1	1	1	1	1	1	1
Manufacturing	35	45	33	26	47	40	33	42	38
Electricity	4	1	0	5	0	0	3	2	0
Construction	3	1	0	3	1	0	3	1	0
Wholesale and Retail	8	4	10	9	3	10	8	3	11
Transportation Communication and Storage	3	1	2	2	2	2	3	1	2
Technology	1	4	8	1	4	8	1	3	9
	55	**57**	**54**	**47**	**58**	**61**	**52**	**53**	**61**
Total	**166**			**166**			**166**		

Table 6: Z Values Table based on the Success of Sectors over Years

SECTORS	2014			2015			2016		
	Lowest	Highest	Average	Lowest	Highest	Average	Lowest	Highest	Average
Mining	-1,841	3,966	1,652	-0,545	3,716	1,863	-1,481	2,110	0,076
Manufacturing	0,647	6,534	2,710	-0,545	8,527	2,927	-1,481	11,078	2,827
Electricity	0,694	1,829	1,249	0,859	1,709	1,216	0,760	2,040	1,637
Construction	1,051	2,780	1,660	0,736	2,786	1,639	0,580	2,490	1,308
Wholesale and Retail	-0,080	30,048	4,168	-0,001	17,329	3,669	-0,297	20,534	3,810
Transportation Communication and Storage	0,395	5,058	2,476	0,446	5,844	2,651	0,365	5,039	2,254
Technology	1,408	3,690	2,887	0,904	7,018	3,306	0,578	7,571	3,470

When Altman Z Score model was studied on the basis of sectors, the lowest Z value averages for 2014 and 2015 observed in Istanbul Stock Exchange were in Electricity Gas and Water sector. We believe this might be due to the fact that, this sector was most affected by the decrease in total industrial production. By 2016, the mining sector average was the one with the lowest ratio. The main reasons for this is few number of companies serving in mining sector and most importantly, the political stress experienced by mining companies in this year. Sectoral averages of the 7 sectors showed that, the highest average belonged to wholesale and retail companies. The reason behind this is considered to be the transition from particularly small stores to urban, innovative big scaled supermarkets/hypermarkets hosting a variety of products. Likewise; examination of sectoral averages show that, information and technology comes the second. Advancements in software market and the increase in the applications of virtual companies, e-trading, e-state, mobile business, e-banking etc. are deemed to be the factors which have promoted technology companies to the locomotive sectors category.

In the second part of the study, companies affiliated to Istanbul Stock Exchange were reanalyzed using Springate S Score model. In Figure 2, companies were illustrated in graphics in two categories for financial failure. The ones below the S Score value (0.862) were shown in unsuccessful companies (red) category and the ones above the Score value were shown in the successful companies (green) category on year basis.

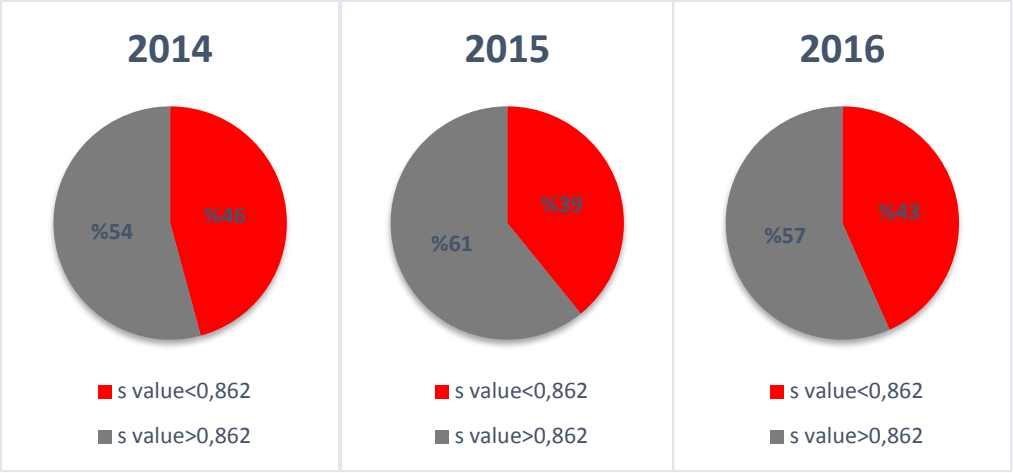

Figure 2: Graphic Illustration of S Values Over Years

Estimations performed with Springate S score revealed out that, 2014 period was financially less successful compared to the periods 2015 and 2016. In this sense, financial success of the year 2014 was lower both in Altman Z Score and in Springate S Score compared to other years. As in Altman Z Score, 2015 was revealed out to be the most successful year in financial terms. Financial success ratio of this period was estimated to be 61%. In Altman Z Score, this ratio was estimated to be 72%, 37% of which was successful and 35% uncertain. In summary, financial success was lower in 2013 period in both models. There was an increase in the following year (2015) and a decrease again in the final year (2016). The number of companies and sectoral distributions within S range in period 2014-2016 are presented in Table 7 and Table 8.

Table 7: Number of Companies within S Values Range on Sectors Basis

SECTORS	2014		2015		2016	
	s value<0,862	s value>0,862	s value<0,862	s value>0,862	s value<0,862	s value>0,862
Mining	1	2	1	2	2	1
Manufacturing	46	67	37	76	43	70
Electricity	5	0	5	0	4	1
Construction	3	1	3	1	3	1
Wholesale and Retail	14	8	12	10	9	13
Transportation, Communication and Storage	4	2	3	3	6	0
Technology	3	10	4	9	5	8
Total	**76**	**90**	**65**	**101**	**72**	**94**
	166		**166**		**166**	

Table 8: S Values Table based on the Success of Sectors over Year

SECTORS	2014			2015			2016		
	Lowest	Highest	Average	Lowest	Highest	Average	Lowest	Highest	Average
Mining	0,361	5,602	2,720	0,814	1,089	0,966	0,201	1,081	0,697
Manufacturing	-0,257	4,186	1,112	-0,155	4,566	1,268	-0,184	4,431	1,132
Electricity	-2,605	0,254	-0,549	-0,903	0,288	-0,227	-0,442	1,006	0,096
Construction	-0,141	1,249	0,307	0,055	1,331	0,700	0,329	1,280	0,728
Wholesale and Retail	-1,194	2,512	0,672	-1,127	2,769	0,964	-0,440	17,429	1,828
Transportation Comunication and Storage	-0,380	1,113	0,613	-0,165	1,308	0,682	-0,366	0,685	0,384
Technology	0,657	2,117	1,339	0,426	2,847	1,242	0,008	2,453	1,231

S values table for 2014-2016 period showed that, just as in Altman Z values table, the lowest S values average in Istanbul Stock Exchange belonged to Electricity Gas and Water sector. The decrease of Electricity Gas and Water sector covering only the 2014 and 2015 period in Altman Z values table continued in all other years in Springate S values table. It can be concluded from these results that, the wholesale and retail sector in Istanbul Stock Exchange preserved its financial success in general among the other sectors. As different from Altman Z Score, Springate S Score model showed that, mining sector was the leader in Istanbul Stock Exchange (a natural result of the limited number active companies) and technology companies preserved their stability over the years. In summary, while there were some differences in percentiles of the two models, they revealed out similar results in sectoral analysis. To enable a better understanding of the issue, data belonging to two models are shown in Table 9.

Table 9: Altman and Springate Models Comparison Table

	Altman Z-Score		Springate S-Score	
	Successful/ Unsuccessful (N)	Successful / Unsuccessful (%)	Successful / Unsuccessful (N)	Successful / Unsuccessful (%)
2014	112/54	67/33	76/90	54/46
2015	105/61	72/28	65/101	61/39
2016	105/61	69/31	72/94	57/43

According to Table 9, company success/failure percentages and number of companies for period 2014-2016 differ in Altman and Springate models. On the other hand, analysis made

on year basis shows that, financial failure levels of 166 companies from 7 different sectors trading in Istanbul Stock Exchange, is the highest in 2014 in both models. Financial success ratio is the highest in 2015 in both models. 2016 is financially more stressful period compared to 2015.

5. CONCLUSION

Data belonging to 166 companies serving in 7 different sectors were tested using Altman Z Score and Springate S models and both models revealed out similar results in the determination of financial failure. Yearly based averages analyzed in Altman Z model showed that, approximately 69% of the companies were successful whereas the Springate S model showed that the level of success reached 57%. With respect to this, it wouldn't be wrong to say that financial failure prediction models gave similar results.

On the other hand; the fact that the results of models might not be able to predict bankruptcy of companies for sure does not mean that companies do not have financial risks. Company failures (bankruptcies) do not only depend on financial statements or financial indicators but also on management policies and strategies such as economic conjuncture, bad location, inadequate management, weak market etc. Objective analyses and methods are needed in order to manage this process efficiently. Indeed, Altman and Springate financial failure prediction models are considered to be able to fulfill this need and be an important indicator of the future for investors and creditors.

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