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Prediction of Financial Failure in Borsa Istanbul Insurance Companies with the Altman Z" Score and Ohlson's O-Model

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Abstract

The financial performance of companies has always been a subject of interest for both researchers and investors. There are many methods used to measure financial performance. Despite many methods, it is still not possible to clearly measure whether companies are financially successful or unsuccessful. In this study, the financial failure levels of insurance companies operating in Borsa Istanbul are analyzed. The main purpose of this study is to analyze the financial status of insurance companies operating in Borsa Istanbul and to determine the risk of financial failure by using Altman Z" Score and Ohlson's O-Score models. In the study, the financial failure situations of five insurance companies operating in Borsa Istanbul during the period 2018-2022 were evaluated with the Altman Z" Score model and Ohlson's O-Score model using financial statements, income statements and balance sheet data. As a result of the analysis, according to the Altman Z" Score model, the financial failure status of the insurance companies in Borsa Istanbul is "Gray Area" for all years for three insurance companies and "Failed" for all years for the other two insurance companies. Similar results were obtained in the analysis with Ohlson's O- score model.

Keywords: Financial Failure, Insurance, Altman Z" Score Model

Altman Z" Skoru ve Ohlson O-Modeli ile Borsa İstanbul Sigorta Şirketlerinde Finansal Başarısızlık Tahmini

Öz

Şirketlerin finansal performansı hem araştırmacılar hem de yatırımcılar için her zaman ilgi konusu olmuştur. Finansal performansı ölçmek için birçok yöntem kullanılmaktadır. Birçok yönteme rağmen, şirketlerin finansal olarak başarılı mı yoksa başarısız mı olduğunu net bir şekilde ölçmek hala mümkün değildir. Bu çalışmada, Borsa İstanbul'da faaliyet gösteren sigorta şirketlerinin finansal başarısızlık seviyeleri analiz edilmektedir. Çalışmanın ana amacı, Borsa İstanbul'da faaliyet gösteren sigorta şirketlerinin finansal durumlarını analiz etmek ve Altman Z" Skor ve Ohlson'un O-Skor modellerini kullanarak finansal başarısızlık riskini belirlemektir. Çalışmada, Borsa İstanbul'da faaliyet gösteren beş sigorta şirketinin 2018-2022 dönemine ait finansal başarısızlık durumları, finansal tablolar, gelir tabloları ve bilanço verileri kullanılarak Altman Z" Skor modeli ve Ohlson'un O-Skor modeli ile değerlendirildi. Analiz sonucunda, Altman Z" Skor modeline göre, Borsa İstanbul'daki sigorta şirketlerinin finansal başarısızlık durumu, üç sigorta şirketi için tüm yıllarda "Gri Alan" ve diğer iki sigorta şirketi için tüm yıllarda "Başarısız" olarak belirlenmiştir. Ohlson'un O-Skor modeli ile yapılan analizlerde de benzer sonuçlar elde edilmiştir.

Anahtar Kelimeler: Finansal Başarısızlık, Sigorta, Altman Z" Skor Modeli

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Introduction

The insurance sector has become one of the most dynamic actors among the rising financial institutions in the financial system, and it stands out as an important financial institution for developing countries (World Bank, 2020). This sector has become one of the key elements of financial stability by protecting both individuals and companies against various risks (UN, 2019). In Turkey, insurance is increasing its share in financial markets, but it is still as low as 4% compared to the global average (IMF, 2021). However, factors such as a growing young population, economic growth, regulatory incentives, and awareness-raising efforts point to an increase in demand for insurance. These increases are taking place against a backdrop of economic challenges and adaptation to changing dynamics. Insurance companies must optimise their production and costs to create value and ensure profitability in this environment. Lack of adaptation can lead many companies to face bankruptcy. Therefore, it is important to regularly measure and evaluate the performance of the insurance industry and its companies to avoid financial failure.Financial failure can be defined as the loss of a company's ability to continue its operations or its inability to meet its financial commitments. Financial failure can have significant consequences not only for the company concerned but also for the industrial and economic environment in general. A failed insurance company not only undermines the confidence of customers but can also affect the overall confidence in the industry and lead to volatility in financial markets. For instance, past failures such as GRI Insurance and Mellce Insurance have significantly impacted public trust in the insurance sector. These failures underscore the importance of effective regulatory oversight to maintain confidence in the industry. In Turkey, the regulatory and supervisory body for the insurance sector is the SEDDK (Insurance and Private Pension Regulation and Supervision Agency).

In this process, financial failure prediction methods, also known as performance measurement, are of great importance. Through financial failure prediction methods, the current situation in the sector can be understood, and strategies can be determined to cope with possible risks. Moreover, performance measurement is recognized as an important indicator for public authorities, stakeholders, regulators, and investors. The field of financial failure analysis has a long history, dating back to the early days of company assessment. Initially, the differences between success and failure were examined by comparing companies' financial ratios. Over time, however, financial failure analyses have been developed based on statistical and mathematical foundations. In recent years, advanced analysis methods and software technologies have been used to measure performance at a more advanced level. The present

study aims to evaluate the financial performance of insurance companies listed on Borsa Istanbul for the period 2018-2022. A detailed analysis was carried out using the Altman Z" Score model and Ohlson's O-Score model, with Microsoft Excel Programı being utilised for this purpose. The subsequent sections of the research will address the causes of financial failure and the measures that can be taken to combat it. These will be followed by a discussion of financial failure prediction methods. After explaining the prominent studies on financial failure, the Altman Z" Score model and Ohlson's O-Score model will be applied to a specific sample. The final stage of the research will present the results of an analysis conducted using the Altman Z" Score model and Ohlson's O-Score model, employing five years of financial data. These models will be compared with each other, and the analysis will be an important tool to assess the financial position of insurance companies and to predict potential risks. The results will help us understand the current state of financial performance in the sector and develop forward-looking strategies.

1. Conceptual Framework

In English, financial failure is referred to as "Financial Distress". Although researchers have used the terms financial failure and financial distress for similar purposes, financial distress is actually the result of financial failure. However, the term "financial distress" does not have a precise technical or legal definition (Ağırman, 2018: 409). Coskun and Sayılgan (2008) defined "Financial Distress" as "Financial Distress", while Altaş and Giray (2005), Çelik (2010), İçerli and Akkaya (2006) used it as "Financial Failure" in their studies (Terzi, 2011: 2). Financial failure in businesses can occur in two ways: technical failure and bankruptcy. While the inability of the business to fulfill its obligations is called technical failure, insufficient assets are considered bankruptcy (Şahin & Yangil, 2023: 512). Financial failure can lead to closure or restructuring of companies. Clearly identifying and analyzing the strengths and weaknesses of the business, as well as potential opportunities and threats, helps the financial manager to improve strategic decisions (Uzun, 2005: 159). Businesses are organizations that interact with the areas in which they operate and also affect the environment (Şahin & Yangil, 2023:513). The causes of financial failure are divided into two as internal and external (Akyüz et al., 2017:63). Internal causes are the factors that occur in relation to the activities of the company and can be controlled by the company and arise in the structural elements of the company (Şahin & Yangil, 2023:513). While the lack of adequate knowledge and experience of the management level and the inability to see the dangers and take precautions in advance are considered as one

of the most important factors of financial failure, the problems experienced by companies in debt repayment and insufficient capital are other important factors in internal financial failure. In addition, the wrong choice of location during the establishment process of companies, lack of or excessive technological equipment to be used in the company, errors in calculating production costs and insufficient market research and determination of consumer preferences are other causes of internal financial failure (Akyüz et al., 2017:63). External causes are critical factors that determine the profitability and continuity of companies. External factors that push businesses to financial failure can be analyzed in four main categories: economic environment, legal and political environment, social environment and natural environment (Şahin & Yangil, 2023:513).

Forecasting models used to predict financial failure generally tend to predict failure statistically. Through the use of statistical models, financial failure events are objectively determined rather than subjectively interpreted. The predictive ability of a model depends on its capacity to reflect objective data on financial failure (Özdemir, 2012: 28). Models for predicting financial failure are of great importance in the literature. These models contribute to the process of evaluating the measures that companies should take against the risks of financial failure. Identifying the factors that can affect business success can directly benefit not only the company, but also lenders, investors, insurance providers and employees (Ertan and Ersan, 2018:183).

Various methodologies have been developed to predict the financial risks of the business and the potential impact of these risks on financial failure. These methodologies are examined in detail under the headings of univariate and multivariate models and new approaches. One of the challenges of analyzing with univariate models is to rank the importance of different ratios. Different groups of ratios may sometimes exhibit positive and sometimes negative trends. In the analysis process, variables should be included in the analysis by taking into account their impact levels and without ignoring them. The analyst's interpretation skills are critical in this process. In cases where one ratio is insufficient, the evaluation of other ratios may contribute to a more balanced assessment of the debtor's situation. Therefore, multivariate statistical analysis methods gain importance in order to accurately determine the variables that may affect the study and to ensure that the variables used are not affected by other factors (İloğlu, 2020 and Kırkıl, 2016).

New methods for identifying financial failure are rapidly developing both in academic literature and in corporate practice. Among these approaches, analyzing financial data with statistical and

numerical models is particularly prominent. These models, which use machine learning techniques, are considered as an effective tool for predicting financial distress of companies (Bai et al., 2020; Emechebe and Olotuah, 2019). These artificial intelligence-supported models are used as prediction and decision support mechanisms in many areas such as portfolio construction, bankruptcy, stock market and securities as well as financial failure. The wide use of these technologies in recent years has brought about a significant transformation in financial markets and corporate governance.

2. Literature Review

Due to the lack of studies on insurance companies in the literature review, information on the studies that include analysis methods used in the examination of different sectors with similar purposes is included. The chapter will be analyzed in chronological order Beaver (1966) is a pioneering researcher who conducted the first systematic study to predict the financial failure of companies. In his study, he developed a univariate statistical analysis method using financial ratios. Beaver analyzed 30 different financial ratios and grouped them under a single ratio. In order to obtain accurate results from this study, the financial data of a company taken as an example should go back at least 5 years and be analyzed.

Altman (1968) chose the term bankruptcy as a measure of financial failure in his study. He developed multivariate discriminant analysis to determine the financial failure and bankruptcy probabilities of companies. Altman's Z-score model brings a scientific and more contemporary approach to the prediction of corporate financial failure. Altman's Z-score model selected 33 successful and unsuccessful companies using a sampling method and included 22 financial ratios in his model. He then reduced the number of variables to 5 as a result of statistical analysis. If the z-value in the Z-score model was less than 2,675, the company was considered unsuccessful. This model was found to predict the probability of bankruptcy of companies one year in advance with 95% accuracy and two years in advance with 72% accuracy. Deakin (1972) compared the models developed by Beaver (1966) and Altman based on the financial statements of companies. The correct classification rate of Beaver's model was found to be 78%. However, in Deakin's study, he stated that Beaver's method had a higher predictive power than Altman's. Springate (1978) improved Altman's Z model by using multivariate discriminant analysis. In his model, he was able to determine the financial success of companies by considering 4 different ratios. In his model, he stated that if the Z value is less than 0.862, the company is

considered to be unsuccessful. Gordon L.V. Springate tested his model on 40 companies by random sampling method and showed that the accuracy rate of the model was 92.5%.

In the research conducted by Ohlson (1980), a bankruptcy forecasting model was established in a time interval extending to pre-bankruptcy periods. Within the scope of the research, Logistic Regression analysis was applied on the data of 105 bankrupt and 2058 non-bankrupt companies selected between 1970-1976. A total of 119 different models were developed by combining one year before bankruptcy, two years before bankruptcy and one and two years before bankruptcy. These models successfully predicted bankruptcy by 96.12%, 95.55% and 92.84% respectively. Fulmer (1984) aimed to predict financial failure by using the multivariate discriminant analysis method developed by researchers such as Altman and Springate. In his model, he created a criterion called H Score by considering 9 different financial ratios. If the firm's H Score is less than zero, it is associated with failure. Fulmer's model provided 81% accuracy in analyzing the financial failure of companies. In the study conducted by Keasey and Watson (1987), logistic regression model was used to predict financial failure for small-scale companies. In the study conducted on 73 unsuccessful and 73 successful small companies in the UK between 1970-1983, 76.6% correct classification success was obtained by using financial ratios as independent variables. As a result of the study, it is suggested that the use of non-financial criteria should not be ignored in predicting financial failure.

Shirata (1998), in his study, Japanese companies were analyzed to examine the risks of financial failure and 61 financial variables were used for analysis. These variables were analyzed by data mining method and the correct classification success of the model was calculated as 86.14%. Huo (2006) examined the financial failures of bankrupt restaurants in the USA by using Altman Z Score model, Springate model and Fulmer model and it was determined that Altman Z Score model was the most successful model for failure prediction. Campbell et al. (2011) present a model that combines accounting and market-based measures to quantify and price the risk of corporate failure. The study analyzed the performance of stocks that experienced financial distress between 1981 and 2008. The findings of the study show that stocks in financial distress carry high risk and often lag the market. Therefore, investors are advised to focus on safe stocks and avoid distressed stocks. The study suggests that stocks in financial distress may be partially responsible for underperformance. Cihan and Dayı (2014) aimed to evaluate the financial performance of healthcare organizations affiliated to Zonguldak Public Hospitals Union in the period 2008-2012. In the study, financial failures were predicted using Artificial Neural Networks and Altman Z score methods. The results of the study show that Artificial Neural

Networks are an effective method for predicting financial failures. Shahwan (2015) analyzed the financial performance of 86 companies in Egypt using data from 2006 to 2010 and evaluated with Altman Z scores. According to the results of the analysis, it is concluded that the performance of the companies is weak and this method can be useful for predicting financial distress.

Borghesi et al. (2015) used the Altman Z Score model on 113 hospitality companies operating in the United States between 1996 and 2012. In the study, it was observed that while most of the stocks of accommodation companies in the hospitality sector have low returns, some companies have significant profits. Toroman and Karaca (2016) analyzed the financial failures of chemical sector companies in Borsa Istanbul with the Altman Z Score model. According to the results of the study, it was found that the share of net company capital in total assets, the ratio of total debts and the increase in debts have significant effects on the financial performance of companies. Karaca and Özen (2017) used the Altman Z Score model to determine the financial failure risks of tourism companies traded in Borsa Istanbul between 2009 and 2016. As a result of the analysis, it is thought that the plane crisis between Turkey and Russia increased the risk of financial failure for tourism companies in Borsa Istanbul. In the Elsa Imelda and Clara Ignacia Alodia (2017), Ohlson O-score model and Altman Zscorecompared the model. In this study, the bankruptcy threshold value of the Altman model is 2.99. Ohlson O-score was determined as 0.38. Altman model's 1, 2, 3 years respectively. Prior accuracy 63%, 60%, 60%and the O-score model is calculated as 65%, 78%, 75%. Covered in this article, the study showed that the O-score model produced more accurate results.

In the study conducted by Çelik (2018), Altman Z score analysis was used to predict the financial failure of manufacturing companies in the BIST30 index in the 2015-2017 period. According to the results of the study, 2 of the identified companies in the BIST30 index had Z-score values below the threshold in all years and these 2 companies were categorized as distressed and risky. All the remaining companies were above the threshold value in all years and these companies were categorized as safe; the risk of bankruptcy was determined to be low. Karadeniz and Öcek (2018) evaluated the financial failure risks of 75 hospitality companies operating in 21 countries in Europe between 2012 and 2016. As a result of their analysis, they determined that the number of accommodation companies at risk of financial failure in Altman Z Score, Springate, Ohlson Score and Fulmer models are very close to each other. In their study, Bulut et al. (2019) investigated the risks of financial failure through machine learning using the Altman Z-score model and Ohlson's o-score models based on companies' accounting data. In

this context predicting the bankruptcy risk of companies with machine learning algorithms, It was concluded that it was more successful than linear classical models. Gülençer (2020) conducted a financial analysis of deposit banks operating in Turkey using TOPSIS and VIKOR methods. As a result of the study, it was determined that state-owned banks underperformed compared to private and foreign-owned banks.

Tekin and Gör (2022) analyzed the financial failure of the Turkish Banking sector using Altman Z Score and Springate methods with data from the 2010-2019 period. According to the data obtained in the study, it was determined that the Altman Z Score was not sufficient to measure financial failure in the banking sector. In the other model used, it was determined that the risks of the sector were low. Güven and Akdeniz (2023) examined the financial failure risks of 11 cement companies listed in Borsa Istanbul between 2017 and 2021. Altman Z Score and Springate S Score models were preferred in the study. According to the results of the models used in the research, it was found that the risk of financial failure in the sector is low.

3. Methodology

The present study aims to predict financial failure for insurance companies traded in Borsa Istanbul by using the Altman Z" Score model and Ohlson's O-Score model, and to analyse the results. The importance of financial failure forecasting as a subject that guides business managers and investors in predetermining risks is increasing. To this end, the Altman Z" Score model and Ohlson O Score model, which are multivariate statistical methods, were employed to analyse the data of insurance companies traded in Borsa Istanbul between 2018-2022, using accounting data that reflect the company's financial performance. The research data were obtained from the official website of the Insurance Association of Turkey and the companies' independently audited financial reports, and the analysis process was carried out using the Excel program.

3.1.Data Collection

The insurance companies identified in the study were selected among the companies traded on Borsa Istanbul due to the ease of access to information. Sectoral distinction was not made in the selection of companies, and both life and non-life branches were considered together. Within the scope of the study, Turkey Insurance was not included in the analysis due to lack of data as it started its operations in 2020.

The insurance companies included in the analysis are shown in Table 1.

Table 1. Insurance Companies in the Scope of the Study

	BIST CODES	**COMPANIES**
1	AKGRT	Aksigorta Joint Stock Company
2	ANSGR	Anadolu Sigorta Incorporated Company
3	RAYSG	Ray Insurance Joint Stock Company
4	AGESA	Agesa Life ve Retirement Joint Stock Company
5	ANHYT	Anadolu Life ve Retirement Joint Stock Company

3.2.Research Model and Method

Below are the ways of calculating the ratios used in the Altman Z" Score and Ohlson's O-Score Model, which will be applied to the data in the study.

Table 2. Ratios and Calculation Methods in the Altman Z" Score Model and Ohlson's O-Score Model

Ratio Name	**Calculation Method**
1 **Working Capital**	Current Assets - Short Term Liabilities
2 **Total Assets**	Assets Current + Assets Non-Current
3 **Profit Before Interest and Tax**	Profit for the Period- (Administrative Expenses + Marketing, Sales and Distribution Expenses + R&D Expenses) + Depreciation Expenses
4 **Total Liabilities**	Current Liabilities + Long Term Liabilities
5 **Total Book Value**	
6 **Undistributed Profit**	
7 **Log**	
8 **Net Profit**	
9 **Change in net profit**	(Net Profit - Net Profit t-1) / (|Net Profit |+ |Net Profit t-1|)

The pioneer in the field of financial failure prediction is Edward Altman. After Beaver, Altman was an important researcher in this field, focusing on financial failure prediction with multiple discriminant analysis. Altman's work in this field has been an important milestone in the measurement of financial failure, as it provided a more comprehensive methodology than previous studies. Altman used multivariate discriminant analysis in his first study in 1968. In multivariate discriminant analysis, companies are divided into bankrupt and non-bankrupt, and then the linear combination of the financial ratios of the two groups is determined. Altman (1968) developed the Altman Z-score model to predict financial failure. In this model, Altman selected a total of 66 companies, 33 successful and 33 unsuccessful companies from the manufacturing sector using the Altman sampling method. Altman categorized the companies into five main categories such as liquidity, profitability, financial leverage, solvency and activity

and identified 22 financial ratios under these categories. Later, he reduced these ratios to 5. He correlated the five ratios with the discriminant function and derived the Z score by weighting the coefficients. The five variables to be used in the prediction of financial failure were determined from the selected 22 variables in the following steps:

- The statistical significance of the alternative functions was assessed by looking at the relative coefficients of each ratio.

- The relationships between the ratios are analyzed in detail.

- The predictive abilities of different discriminant functions were compared.

-The final decision was made by taking the researcher's own opinions into consideration.

Altman (1968) developed the Z score method for the publicly traded manufacturing sector. Accordingly study the result, it was found that the model predicted the risk of financial failure of the companies with 90% accuracy 1 year in advance and 82% accuracy 2 years in advance. Altman's model has been used by many researchers such as Deakin (1972), Almamy et al. (2016) and Rim and Roy (2014) in their analyses.

The Altman Z Score estimation model used in the study is as follows;

$Z= 1.22\ X_1+ 1.4\ X_2+\ 3.3X_3+0.6\ X_4+0.999\ X_5$

X1=Working capital / Total assets

X2= Retained earnings / Total Assets

X3=Profit before interest and tax / Total Assets

X4=Total Book Value / Total Liabilities

X5= Total Sales / Total Assets

Table 3. Altman (1968) Z Score Model Financial Success Indicators

Z Score Values	**Indicators**	**Explanations of Limits**
Less than 1.81	Financial failure (Bankruptcy)	Dangerous area, high risk of financial failure.
Between 1.81-2.99	Uncertain, gray area	Gray area, medium risk of financial failure, difficult to predict.
Greater than 2,99	Safe area	Low risk of financial failure, company is safe.

Over time, Altman's model has kept up with developments around the world and innovated the model over the years. In 1983, Altman conducted a revision study on the model he developed in 1968. This revision aimed to make the model, which was designed for public companies in 1968, available for non-public companies (private industrial companies) in 1983. Thus, the model could be used for non-public companies as well. The fourth variable, X4, in Altman's 1968 model was based on the value of the company in the capital market, whereas in the 1983 model it was calculated by the net book value of equity. This change allowed non-publicly traded companies to use the Altman model. In addition, the coefficients were also modified in the new model.

The Altman Z' Score estimation model used in the study is as follows;

$Z' = 0.717\ X_1 + 0.847\ X_2 + 3.107 X_3 + 0.420\ X_4 + 0.998\ X_5$

X1= Working capital / Total assets

X2= Retained earnings / Total Assets

X3= Profit before interest and tax / Total Assets

X4= Total Book Value / Total Liabilities

X5= Total Sales / Total Assets

Table 4. Altman (1983) Z Score Model Financial Success Indicators

Z' **Score Values**	**Indicators**	**Explanations of Limits**
Less than 1.23	Financial failure (Bankruptcy)	Dangerous area, high risk of financial failure.
Between 1.23-2.99	Uncertain, gray area	Gray area, medium risk of financial failure, difficult to predict.
Greater than 2,99	Safe area	Low risk of financial failure, company is safe.

Altman's model was thought to be valid only for the manufacturing sector, and therefore not suitable for non-manufacturing and service industries. Therefore, Altman revised and updated his model in 1993. Adjustments were made in the coefficients of the model. The fifth variable of the model, X5, was removed because it was observed that the company could be successful even if this ratio was high.

Altman Z" used in the study The score prediction model is as follows;

$Z'' = 6.56\,X_1 + 3.26\,X_2 + 6.72X_3 + 1.05\,X_4$

X_1 = Working capital / Total assets

X_2 = Undistributed Profit / Total Assets

X_3 = Profit before interest and tax / Total Assets

X_4 = Total Book Value / Total Liabilities

Table 5. Altman (1993) Z Score Model Financial Success Indicators

Z' **Score Values**	**Indicators**	**Explanations of Limits**
Less than 1.1	Financial failure (Bankruptcy)	Dangerous area, high risk of financial failure.
Between 1.1-2.6	Uncertain, gray area	Gray area, medium risk of financial failure, difficult to predict.
Greater than 2,6	Safe area	Low risk of financial failure, company is safe.

In 1980, James A. Ohlson analyzed 105 failed and 2058 successful businesses operating between 1970 and 1976 using regression analysis. Logit regression analysis was used in the model. In the study, businesses that filed for bankruptcy were considered as unsuccessful. In this study, it is an important study in terms of determining not only whether the enterprises are bankrupt or not, but also the probability of bankruptcy. Ohlson argued that the use of logit analysis would solve the problems in terms of the difficulty of providing assumptions and application in the analysis of multiple discriminate analysis, which is frequently preferred in financial failure analysis (Vuran, 2012: 41).

The estimation model used by Ohlson in his study is as follows;

$$O = 0{,}407X_1 + 6.03X_2 - 1.43X_3 + 0{,}076X_4 - 1.72X_5 - 2.37X_6 - 1.83X_7 + 0{,}285X_8 - 0{,}521X_9 - 1.32$$

X_1 = Log (Log (Total Assets/GDP Index))

X_2= Total Liabilities /Total Assets

X_3= Working Capital / Total Assets

X_4 = Current Liabilities / Current Assets

X_5= {0,1}: 1 if Total Liabilities> Total Assets, 0 otherwise

X_6= Net Profit /Total Assets

X_7= Earnings Before Interest Tax/Total Debt

X_8= {0,1}: 1 if the net profit for the last two years is negative, 0 otherwise

X_9-= Change in net profit: (〖Net Profit 〗_t- 〖Net Profit〗_(t-1)) / (〖|Net Profit〗_(t) |+ | 〖Net Profit〗_(t-1) |)

The O score obtained from this model is log transformed and the following formula is obtained.

$$\frac{e^{O\ Skor}}{1 + e^{O\ Skor}}$$

If O-Score> 0.5, the business is safe (successful),

If O- Score <0.5, the business is insecure (unsuccessful).

In the above model, while the first four ratios provide information about the financial situation, the other five variables provide information about financial performance (Vuran, 2012:42). From the data obtained as a result of the study, it is concluded that four variables are significant in determining the bankruptcy status of the enterprises and it is estimated that the risk of bankruptcy is predicted 5 years before the enterprise fails.

4. Research Findings

Since the insurance sector is included in the financial services sector, the Z" Score model developed by Altman for enterprises outside the manufacturing sector and Ohlson O Score model were preferred in this study. Firstly, Altman Z" Score model is discussed and then Ohlson O Score model is analyzed. In the analysis process, the following four ratios were used for the Altman Z" Score model.

$Z'' = 6.56\ X_1 + 3.26\ X_2 + \ 6.72 X_3 + 1.05\ X_4$

$X_1 =$ Working capital / Total assets

$X_2 =$ Undistributed Profit / Total Assets

$X_3 =$ Earnings before interest and tax / Total Assets

$X_4 =$ Total Book Value / Total Liabilities

Companies with an Altman Z" score below 1.1 are classified as financially weak and risky. Those with a score between 1.1 and 2.6 have a gray area of uncertainty, moderate financial risk and unpredictable future conditions. Companies above 2.6 are considered financially strong and less risky. The following tables present the ratios used in the Altman Z" score and Ohlson's O-Score model to assess the financial condition of listed insurance companies operating in Turkey and their corresponding values for the period 2018-2022. Z" and O-Scores were calculated using pre-calculated financial ratios and the results can be seen in Tables 6 and 7.

Table 6. Altman Z" Score Analysis*

Coefficients		6,56	3,26	6,72	1,05		
Company	**Year**	**Working Capital/Total Assets**	**Undistributed Profit/Total Assets**	**Earnings Before Interest and Taxes/Total Assets**	**Total Book Value/Total Liabilities**	**Altman Z" Score**	**Annual Financial Success of the Enterprise**
Ray Insurance	2018	0,1909293	0,0487471	0,0530432	0,2969609	2,0796717	Gray Area
	2019	0,1770516	0,0342614	0,0602727	0,2585616	1,9496735	Gray Area
	2020	0,1607970	0,0343767	0,0446028	0,2326790	1,7109409	Gray Area
	2021	0,1609429	0,0419276	0,0442673	0,2388352	1,7407236	Gray Area
	2022	0,1108256	0,0680690	0,0474569	0,1957279	1,4733466	Gray Area
Aksigorta	2018	0,2010330	0,0007385	0,0936524	0,2546225	2,2178831	Gray Area
	2019	0,1928013	0,0105529	0,1112508	0,2401682	2,2989621	Gray Area
	2020	0,199742	0,0366212	0,0985899	0,2474937	2,3520867	Gray Area
	2021	0,1346867	0,0404695	0,0441366	0,1655404	1,4858918	Gray Area
	2022	0,1344439	0,0235928	**-0,0030389**	0,1791041	1,1265026	Gray Area
Anadolu Insurance	2018	0,1397696	0,0982006	0,0652749	0,2630635	1,9518873	Gray Area
	2019	0,1586591	0,1214448	0,0692549	0,2831471	2,1994117	Gray Area
	2020	0,1755502	0,1474206	0,0534076	0,3033164	2,3095827	Gray Area
	2021	0,1283769	0,1256227	0,0493518	0,2360408	1,8311700	Gray Area
	2022	0,1350120	0,1500144	0,0626138	0,2452980	2,0530545	Gray Area
Agesa Life and Insurance	2018	0,0534285	**-9,1013E-05**	0,0130125	0,0195768	0,4581946	Failure
	2019	0,0455851	0,0048366	0,0100095	0,0204217	0,4035126	Failure
	2020	0,0571516	0,0060815	0,0104142	0,0202928	0,4860316	Failure
	2021	0,1049461	0,0050361	0,0116168	0,0178792	0,8017027	Failure
	2022	0,1069029	0,0077179	0,0112503	0,0196855	0,8227160	Failure
Anadolu Life and Insurance	2018	0,0364759	0,0078567	0,0164654	0,0487849	0,4267675	Failure
	2019	0,0378841	0,0142988	0,0174384	0,0492505	0,4670182	Failure
	2020	0,0378841	0,0147595	0,0181900	0,0458525	0,4670182	Failure
	2021	0,0299083	0,0123122	0,0172181	0,0372700	0,3911750	Failure
	2022	0,0365552	0,0166027	0,0191839	0,0388637	0,4636506	Failure

* Failure: Dangerous area, high risk of financial failure for the company.
Gray Area: Gray area, medium risk of financial failure, difficulty in forecasting.
Safe Area: Low risk of financial failure, company is safe

Tablo 7. Ohlson's O-score of Insurance Companies by Years

Company	Years	X1	X2	X3	X4	X5	X6	X7	X8	X9	Ohlson's O-Score	Logarithmic Conversion	Annual Financial Success
Ray Insurance	2018	7,375851	0,771033	0,190929	0,791773	0,000000	0,041896	0,068795	0,000000	0,291930	-0,262779	0,434681	Successful
	2019	7,514802	0,794558	0,177052	0,810444	0,000000	0,051480	0,075857	0,000000	0,257071	-0,173691	0,456686	Successful
	2020	7,696582	0,811241	0,160797	0,828467	0,000000	0,042079	0,054981	0,000000	0,068328	0,036358	0,509088	Failure
	2021	7,789913	0,807210	0,160943	0,826712	0,000000	0,040717	0,054840	0,000000	0,104323	-0,041547	0,489615	Successful
	2022	8,179495	0,836311	0,110826	0,878803	0,000000	0,044098	0,056746	0,000000	0,441992	-0,136428	0,465946	Successful
Aksigorta	2018	7,957652	0,797052	0,201033	0,793293	0,000000	0,083194	0,117499	0,000000	0,397168	-0,598842	0,354609	Successful
	2019	8,075500	0,806342	0,192801	0,801461	0,000000	0,106078	0,137970	0,000000	0,251652	-0,594281	0,355653	Successful
	2020	8,196540	0,801607	0,199742	0,795896	0,000000	0,097163	0,122990	0,000000	0,055379	-0,531644	0,370134	Successful
	2021	8,300317	0,857971	0,134687	0,861566	0,000000	0,039893	0,051443	0,000000	-0,302174	0,316959	0,578583	Failure
	2022	8,534568	0,882779	0,134444	0,865556	0,000000	-0,009830	-0,003440	1,000000	-1,000000	1,238705	0,775339	Failure
Anadolu Insurance	2018	8,306784	0,791726	0,139770	0,845543	0,000000	0,048948	0,082446	0,000000	0,354923	-0,514162	0,374218	Failure
	2019	8,398707	0,779334	0,158659	0,824936	0,000000	0,058128	0,088864	0,000000	0,189455	-0,602168	0,353848	Failure
	2020	8,525616	0,767273	0,175550	0,807657	0,000000	0,046429	0,069607	0,000000	-0,006271	-0,587073	0,357307	Failure
	2021	8,656476	0,809035	0,128377	0,859098	0,000000	0,041670	0,061001	0,000000	0,109842	-0,350611	0,413234	Failure
	2022	8,902405	0,857517	0,135012	0,860549	0,000000	0,049035	0,073018	0,000000	0,337095	-0,325576	0,419317	Failure
Agesa Life and Insurance	2018	8,694179	0,980799	0,053429	0,344106	0,000000	0,012898	0,013267	0,000000	0,419652	0,731951	0,675233	Failure
	2019	8,818804	0,979987	0,045585	0,482338	0,000000	0,010623	0,010214	0,000000	0,046411	0,903491	0,711666	Failure
	2020	8,977236	0,980111	0,057152	0,415912	0,000000	0,011092	0,010626	0,000000	0,162519	0,755809	0,680443	Failure
	2021	9,132640	0,982435	0,104946	0,147808	0,000000	0,012254	0,011825	0,000000	0,237804	0,573680	0,639612	Failure
	2022	9,386117	0,980695	0,106903	0,159213	0,000000	0,011798	0,011472	0,000000	0,253522	0,451627	0,611026	Failure
Anadolu Life and Insurance	2018	8,714749	0,953484	0,036476	0,963113	0,000000	0,015934	0,017269	0,000000	0,178283	0,741392	0,677300	Failure
	2019	8,842462	0,953061	0,039473	0,960124	0,000000	0,017573	0,018297	0,000000	0,193521	0,668645	0,661200	Failure
	2020	9,000809	0,956158	0,037884	0,961796	0,000000	0,017958	0,019024	0,000000	0,151922	0,644698	0,655815	Failure
	2021	9,143307	0,964069	0,029908	0,969847	0,000000	0,017100	0,017860	0,000000	0,152099	0,650496	0,657122	Failure
	2022	9,400738	0,962590	0,036555	0,963343	0,000000	0,018679	0,019930	0,000000	0,315685	0,434045	0,606839	Failure

Tablo 8. Comparison of the Altman Z" Score Model and Ohlson's O-Score Model

Company	**Years**	**Z" Score Result**		**O-Score Result**	
Ray Insurance	2018	2,079671771	Gray Area	0,434681	Successful
	2019	1,949673537	Gray Area	0,456686	Successful
	2020	1,710940996	Gray Area	0,509088	Failure
	2021	1,74072367	Gray Area	0,489615	Successful
	2022	1,47334665	Gray Area	0,465946	Successful
Aksigorta	2018	2,2178831	Gray Area	0,354609	Successful
	2019	2,29896218	Gray Area	0,355653	Successful
	2020	2,35208671	Gray Area	0,370134	Successful
	2021	1,48589185	Gray Area	0,578583	Failure
	2022	1,12650261	Gray Area	0,775339	Failure
Anadolu Insurance	2018	0,426767548	Failure	0,6773	Failure
	2019	0,474454153	Failure	0,6612	Failure
	2020	0,467018219	Failure	0,655815	Failure
	2021	0,39117596	Failure	0,657122	Failure
	2022	0,463650613	Failure	0,606839	Failure
Agesa Life and Insurance	2018	0,458194693	Failure	0,675233	Failure
	2019	0,403512687	Failure	0,711666	Failure
	2020	0,486031698	Failure	0,680443	Failure
	2021	0,801702717	Failure	0,639612	Failure
	2022	0,822716035	Failure	0,611026	Failure
Anadolu Life and Insurance	2018	0,426767548	Failure	0,6773	Failure
	2019	0,474454153	Failure	0,6612	Failure
	2020	0,467018219	Failure	0,655815	Failure
	2021	0,39117596	Failure	0,657122	Failure
	2022	0,463650613	Failure	0,606839	Failure

It has been posited that the Ohlson Score is a superior predictor of insolvency when compared with analogous accounting models, such as the Altman Z-Score. However, the results of the two analyses demonstrate significant overlap, as evidenced by the comparison. In the context of insurance companies, the findings of Elsa Imelda and Clara Ignacia Alodia (2017) and Bulut et al. (2019) diverge from the conclusions of the aforementioned studies. Companies classified as 'grey' according to the Altman Z-Score model were found to be successful according to the Ohlson O-Score model, and conversely, companies that were classified as 'failures' according to the Altman method were also found to be unsuccessful according to the Ohlson model.

Conclusion And Discussion

In the business world, the encounter of financial failure is a situation that can cause considerable concern for companies. Financial crises in businesses pose a threat not only to the company itself, but also to the country's economy. For this reason, the early diagnosis and effective management of financial failure are of great importance for companies both to achieve success and to become a sustainable company. The use of data-driven approaches to manage this process has proven to be very beneficial. The use of data to predict the levels of financial failure in businesses has become increasingly preferred. In the contemporary business landscape, companies employ diverse data analysis methods and financial indicators to evaluate their financial performance. These techniques facilitate the tracking of companies' financial health, the identification of potential risks, and the formulation of strategic decisions. The effective management of financial risks is paramount to ensure long-term success. Consequently, companies must meticulously monitor and analyse financial data to enhance their preparedness for future uncertainties. The present study utilises the Altman Z" Score and Ohlson's O-Score analysis to predict the financial failures of insurance companies operating in Borsa Istanbul between 2018 and 2022. The study's findings, based on the aforementioned analyses, categorise RAYSG, ANSGR and AKGRT as gray areas, while AGESA and ANHYT companies are evaluated as unsuccessful. The aforementioned companies, RAYSG, ANSGR and AKGRT, have been categorised as being in the grey area, indicating a medium level of exposure to financial failure and the potential difficulty in predicting the risk of failure. AGESA and ANHYT companies have been evaluated as unsuccessful and are likely to face financial failure.

An examination of the performance of AGESA and ANHYT companies reveals that the most significant ratios contributing to the decline in the Altman Z score are Capital/Total Assets and Profit Before Interest and Tax/Total Assets. These ratios are the model's primary coefficients, offering a more comprehensive evaluation of a company's liquidity position and asset efficiency. The lower ratios observed in AGESA and ANHYT companies are indicative of a suboptimal financial situation.

Another factor that may contribute to failure is the elevated long-term debt levels of AGESA, which surpass the industry average, while ANHYT exhibits significantly higher short-term liabilities compared to other companies. This suggests that both companies have substantial

short-term and long-term debt and liability burdens. This is considered an effective metric for classifying companies as unsuccessful. It is noteworthy that insurance companies operating within the life branch are frequently classified as unsuccessful, and this is believed to be associated with the low demand for life insurance products. According to Ohlson O Score analysis, both Agesa and ANHYT were evaluated as unsuccessful across all years. In contrast, other companies were evaluated as partially successful. It is noteworthy that AKGRT has changed its classification from successful to unsuccessful in the last two years, coinciding with a downward trend in Altman Z" Score values during the same period. A comparison of the two analysis methods reveals that they yield largely consistent results. However, as can be understood from the results, while the O score evaluates the firm as successful or unsuccessful, in the Z" score, the firm is evaluated in three different groups, namely successful, unsuccessful or grey area, also known as normal level. As unsuccessful in all years.It evaluated other companies as partially successful.ANHYT has changed as unsuccessful in the last two years.This coincides with the years in which Altman Z" Score values are also in a downward trend. The findings of the study indicate that, given the absence of any bankruptcy or failure among the companies in question during the period 2018 to 2022, the outcomes derived from the Altman Z" Score and Ohlson's O-Score models are more indicative of potential risk rather than failure. Kulalı's (2016) research reveals that the predictive power of the Altman Z Score model is high for companies operating in the Istanbul Stock Exchange, and Bozkurt's (2014) study also showed that Altman Z and Ohlson's O-Score models are effective for the companies in Borsa Istanbul. The study proposes a comparison and improvement of results obtained by increasing the number of insurance companies and applying different financial failure models. This approach is expected to provide a more comprehensive analysis and contribute to more robust research results.

References

Ağırman, E. (2018). "Finansal Sıkıntı Göstergeleri: Bist'te İşlem Gören İmalat Sanayi Firmaları Üzerine Bir Araştırma", *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 32(2),403-425.

Akdeniz, F., Güven, B. (2023). Altman Z ve Springate S Skor Modelleri Ile Finansal Failurelık Tahmini: Çimento Sektörü Üzerine Borsa İstanbul'da Bir Araştırma. *Gümüşhane Üniversitesi Sosyal Bilimler Dergisi*, 14(2), 728-738.

Akyüz, K. C., Yildirim, İ., Akyüz, İ., Tugay, T. (2017). Borsa İstanbul'da İşlem Gören Kâğıt ve Kâğıt Ürünleri Sanayi İşletmelerinin Finansal Failurelık Düzeylerinin Oran Analizi ve Diskriminant Analizi Yöntemleri Kullanılarak Ölçülmesi. *Düzce Üniversitesi Orman Fakültesi Ormancılık Dergisi*, 13(1), 60-74.

Altman E. I. (1968). "Financial Ratios, Discriminant Analysis and The Prediction of Corporate Bankruptcy". *The Journal of Finance*, 23(4), 589-609.

Altman, E. I. (1993). Corporate Financial Distress: A Complete Guide to Predicting, Avoiding and Dealing with Bankruptcy. 2nd Edition, New York: John Wiley & Sons.

Altman, I. E. (1983). "Why business fail". *The Journal of Business Strategy*, 3(4), 15-22.

Bai, J., Wang, J., Li, S., Wang, G., & Zhang, Y. (2020). "Finansal Failurelık Tahmininde Ağırlıklı Lojistik Regresyon Analizi: Çin'de Bir Örnek". *Uluslararası Finansal Yönetim*, 23(2), 129-150.

Beaver, W. H. (1968). "Market Prices, Financial Ratios and the Prediction of Failure", *Journal of Accounting Research*,6(2),179-192.

Bozkurt, İ. (2014). İflas Olasılığı ile Sistematik Risk İlişkisinin İncelenmesi ve Etkin İflas Göstergesi Modellerinin Tespiti: BİST'de Ampirik Bir Uygulama. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 19(4),127- 142.

Bulut, N., Shakeri, S., Yüzük, S., Aktaş, M. S. (2019). Öznitelik Seçim Yöntemleri ve Makine Öğrenmesi Kullanarak Şirket Bilanço Verilerine Dayalı İflas Riski Tahmini. *Türkiye Bilişim Vakfı BilgisayarBilimleri ve Mühendisliği Dergisi*, 12(2), 20-29.

Çelik, M. K. (2010). Finansal Failurelık Tahmin Modellerinin İMKB'deki Firmalar İçin Karşılaştırmalı Analizi. Doktora Tezi, Trabzon: Karadeniz Teknik Üniversitesi, Sosyal Bilimler Enstitüsü.

Civan, M., Dayı, F. (2014). "Altman Z Skoru ve Yapay Sinir Ağı Modeli ile Sağlık İşletmelerinde Finansal Failurelık Tahmini", *Akademik Bakış Dergisi*, (41),0-0.

Emechebe, A., Olotuah, A. (2019). "Finansal Failurelık tahmini için çoklu karşılaştırma modeli: Nijerya borsasında bir uygulama", *Ulusal Stratejik Yönetim Dergisi*, 11(1), 5-18.

Ertan, A. S., Ersan, Ö. (2018). Finansal Başarisizliği Belirleyen Etkenler: Türkiye İmalat Sektörü Örneği. *Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 40(2), 181-207.

Fulmer, J. G. (1984). "A Bankruptcy Classification Model for Small Firms", *The Journal of Commercial Bank Lending*, 66(11), 25-37.

Gülençer, S. (2020). Türkiye'deki Mevduat Bankalarının TOPSIS ve VIKOR Yöntemleriyle Analizi. *Kırklareli Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi*, 1(1): 1-22.

Huo, Y. H. (2006), "Bankruptcy Situation Model in Small Business: The Case of Restaurant Firms", *Hospitality Review*, 24 (2), 49-58.

İloğlu, H. (2020). Altman Z" Skor Yöntemi ile Havayolu Şirketlerinde Finansal Failurelık Tahmini. Yüksek Lisans Tezi, Ankara: Başkent Üniversitesi, Sosyal Bilimler Enstitüsü.

Karaca, S. ve Özen, E. (2017), "Financial Failure Estimation of Companies in BIST Tourism Index by Altman Model and its Effect on Market Prices", Broad Research in Accounting, Negotiation, and Distribution, 8(2),11-23.

Keasey, K., and Watson, R. (1987, Autumn). Non-Financial Symptoms and The Prediction of Smal Company Failure: A Test of Argenti's Hypotheses. *Journal of Business Finance and Accounting*, 14(3), 335-354.

Kırkıl, M. (2016). Kredi Derecelendirme Altman Z Skor Modelinin Tarımsal Üreticilere Uygulanması. Yüksek Lisans Tezi, İstanbul Ticaret Üniversitesi, Finans Enstitüsü.

Kulalı, İ. (2016). Altman Z-Skor Modelinin Bist Şirketlerinin Finansal Failurelık Riskinin Tahmin Edilmesinde Uygulanması. *Uluslararası Yönetim İktisat ve İşletme Dergisi,* 12(3), 283-291.

Ohlson, J. A. (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research,* 18, 109-131.

Özdemir, F. S., Choı, F. D., ve Bayazıtlı, E. (2012). "Finansal Failurelık Tahminleri Yönüyle UFRS ve Bilginin İhtiyaca Uygunluğu", *Mali Çözüm*, 17-52.

Şahin, T., Misirdali Yangil, F. (2023). Finansal Failurelık Konusunda Yapılan Lisansüstü Tez Çalışmalarına Yönelik Bir İçerik Analizi. Kastamonu Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 25(2), 509-527.

Shahwan, T. M. (2015). The effects of corporate governance on financial performance and financial distress: Evidence from Egypt. *Corporate Governance*, 15(5), 641-662.

Shirata, C. Y. (1998). Financial Ratios as Predictors of Bankruptcy in Japan: An Enpirical Research. Proceedings of The Second Asian Pacific Interdisciplinary Research in Accounting Conferen.

Springate, G. L. (1978). Predicting the possibility of failure in a Canadian firm: A discriminant analysis. Doctoral dissertation, Simon Fraser University.

Tekin, B., Gör, Y. (2022). "Finansal Failurelık Tahmin Modelleri ve Bankacılık Sektörü Mali Tabloları Üzerinden Bir Uygulama: Altman ve Springate Modelleri", *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*,0(40), 373-404.

Terzi, S. (2011). "Finansal Rasyolar Yardımıyla Finansal Failurelık Tahmini: Gıda Sektöründe Ampirik Bir Araştırma", *Çukurova Üniversitesi İİBF Dergisi*, 15(1), 1-18.

Toraman, C., Karaca, C. (2016). "Kimya Endüstrisinde Faaliyet Gösteren Firmalar Üzerinde Mali Failurelık Tahmini: Borsa İstanbul'da Bir Uygulama", *Muhasebe ve Finansman Dergisi*, 0 (70), 111-128.

Vuran, B. (2009). Prediction of business failure: a comparison of discriminant and logistic regression analyses. *İstanbul Üniversitesi İşletme Fakültesi Dergisi*, 38(1), 47-63.

Uzun, E. (2005). İşletmelerde Finansal Failurelığın Teorik Olarak İrdelenmesi. *Muhasebe ve Finansman Dergisi*, (27), 158-16.

Genişletilmiş Özet

Sigorta sektörü, gelişmekte olan pazarların finansal sistemlerinde en dinamik aktörlerden biri haline gelmiştir. Bu sektör, hem bireylerin hem de işletmelerin çeşitli risklere karşı korunmasını sağlayarak finansal istikrarın temel unsurlarından biri olmuştur. Türkiye'de sigortacılık, finansal piyasalardaki payını artırmakla birlikte dünya geneline kıyasla henüz %4 gibi düşük bir oranda seyretmektedir. Ancak, genç nüfusun artması, ekonomik büyüme, düzenleyici teşvikler ve bilinçlendirme çabaları gibi faktörler, sigortaya olan talebin artacağına işaret etmektedir. Bu artışlar, ekonomik zorluklar ve değişen dinamiklere uyum sağlama gibi zorluklarla mücadele ederek gerçekleşmektedir. Sigorta şirketleri, bu ortamda değer yaratmak ve karlılık sağlamak için üretim ve maliyetlerini optimize etmelidir. Adaptasyon eksikliği, birçok işletmenin iflasla karşı karşıya kalmasına neden olabilir. Bu nedenle, sigorta sektörünün ve şirketlerinin performansını düzenli olarak ölçmek ve değerlendirmek, finansal başarısızlık durumuyla karşılaşmamak adına önem arz etmektedir. Finansal başarısızlık, bir şirketin faaliyetlerini sürdürme yeteneğini kaybetmesi veya finansal taahhütlerini yerine getiremeyecek duruma gelmesi olarak tanımlanabilmektedir. Finansal başarısızlık, sadece ilgili şirket için değil, aynı zamanda endüstriyel ve ekonomik çevreler için de önemli sonuçlar doğurabilmektedir. Başarısız bir sigorta şirketi, sadece müşterilerin güvenini sarsmakla kalmaz, aynı zamanda sektöre olan genel güveni de etkileyebilir ve finansal piyasalarda dalgalanmalara yol açabilmektedir. Bu süreçte, performans ölçümü olarak adlandırılan finansal başarısızlık tahmin yöntemlerinin önemi büyüktür. Finansal başarısızlık tahmin yöntemleri sayesinde sektördeki mevcut durum anlaşılabilir ve olası risklerle başa çıkabilmek için stratejiler belirlenebilmektedir. Ayrıca, performans ölçümü, kamu otoriteleri, paydaşlar, düzenleyiciler ve yatırımcılar için önemli bir gösterge olarak kabul edilmektedir. Finansal başarısızlık yöntemleri, işletmelerin finansal durumunu değerlendirmek amacıyla uzun bir geçmişe sahiptir. Başlangıçta, işletmelerin finansal oranları karşılaştırılarak başarı ve başarısızlık arasındaki farklar incelenmiştir. Zamanla, finansal başarısızlık analizleri, istatistiksel ve matematiksel temellere dayalı olarak geliştirilmiştir. Son yıllarda ise, gelişmiş analiz yöntemleri ve yazılım teknolojileriyle daha ileri düzeyde performans ölçümü yapılmaktadır.

Bu çalışma, Borsa İstanbul'da işlem gören sigorta şirketlerinin finansal başarısızlık riskini Altman Z" Score ve Ohlson O-Score modelleri ile tahmin etmeyi amaçlamaktadır. Sigorta sektörü, finansal sistemdeki en dinamik aktörlerden biri haline gelmiştir ve hem bireyleri hem de şirketleri çeşitli risklere karşı koruyarak finansal istikrarın temel unsurlarından biri olmuştur. Bu bağlamda, finansal başarısızlık tahmini, sigorta sektöründe faaliyet gösteren şirketlerin performansını değerlendirmek ve olası risklere karşı stratejiler geliştirmek için büyük önem taşımaktadır. Bu çalışmada, 2018-2022 döneminde Borsa İstanbul'da işlem gören beş sigorta şirketinin finansal başarısızlık durumları analiz edilmiştir. Analizde

kullanılan finansal veriler, Türkiye Sigorta Birliği'nin resmi web sitesinden ve şirketlerin bağımsız denetimden geçmiş finansal raporlarından elde edilmiştir. Çalışmada kullanılan sigorta şirketleri Aksigorta (AKGRT), Anadolu Sigorta (ANSGR), Ray Sigorta (RAYSG), Agesa Hayat ve Emeklilik (AGESA) ve Anadolu Hayat ve Emeklilik (ANHYT) olarak belirlenmiştir. Edward Altman tarafından geliştirilen Z" Score modeli, şirketlerin finansal başarısızlık riskini tahmin etmek için kullanılan bir yöntemdir. Model, şirketlerin likidite, karlılık, finansal kaldıraç, ödeme gücü ve faaliyet performansını değerlendiren beş finansal oran kullanır. Model, firmaların finansal başarısızlık riskini üç farklı kategoriye ayırarak değerlendirir: "Başarısız", "Gri Alan" ve "Güvenli".

James A. Ohlson tarafından geliştirilen O-Score modeli, şirketlerin iflas riskini tahmin etmek için kullanılan bir lojistik regresyon modelidir. Model, şirketlerin finansal durumunu değerlendiren dokuz oran kullanır. O-Score modelinde firmalar başarılı veya başarısız olarak sınıflandırılır. Altman Z" Score modeline göre, RAYSG, ANSGR ve AKGRT şirketleri tüm yıllarda "Gri Alan" olarak değerlendirilirken, AGESA ve ANHYT şirketleri tüm yıllarda "Başarısız" olarak değerlendirilmiştir. Gri alan, şirketlerin finansal başarısızlık riski taşıdığı ancak bu riskin net bir şekilde belirlenemediği durumu ifade ederken, başarısız kategorisi, şirketlerin yüksek risk taşıdığı ve finansal başarısızlık olasılığının yüksek olduğu durumu ifade etmektedir. Bu durum, RAYSG, ANSGR ve AKGRT şirketlerinin finansal performansının belirsiz olduğunu ve bu şirketlerin gelecekteki finansal başarısızlık riskinin orta düzeyde olduğunu göstermektedir. AGESA ve ANHYT şirketleri ise, tüm yıllarda finansal başarısızlık riski taşıyan şirketler olarak değerlendirilmiştir. Ohlson O-Score modeline göre ise AGESA ve ANHYT şirketleri tüm yıllarda başarısız olarak değerlendirilmiş, diğer şirketler ise kısmen başarılı olarak değerlendirilmiştir. Bu sonuçlar, Altman Z" Score modelinin sonuçları ile genel olarak tutarlıdır. Ancak, O-Score modelinin değerlendirme kriterleri daha keskin olduğu için bazı farklılıklar ortaya çıkabilmektedir. O-Score modelinde, AGESA ve ANHYT şirketlerinin yüksek finansal başarısızlık riski taşıdığı ve bu şirketlerin finansal performansının zayıf olduğu görülmektedir. AGESA ve ANHYT şirketlerinin başarısız olarak değerlendirilmesinin en önemli nedenlerinden biri, çalışma sermayesinin toplam varlıklara oranı ve faiz ve vergi öncesi karın toplam varlıklara oranının düşük olmasıdır. Bu oranlar, şirketlerin likidite durumu ve varlık verimliliği hakkında daha kapsamlı bir değerlendirme sunmaktadır. Ayrıca, AGESA'nın uzun vadeli borçlarının sektör ortalamasının üzerinde olması ve ANHYT'nin kısa vadeli borçlarının diğer şirketlere göre önemli ölçüde yüksek olması, bu şirketlerin başarısız olarak değerlendirilmesine yol açan diğer önemli faktörlerdir.

Çalışmada elde edilen sonuçlar, sigorta şirketlerinin finansal performansını değerlendirirken bu modellerin kullanışlı olduğunu ve gelecekteki belirsizliklere karşı daha hazırlıklı olmalarını sağladığını göstermektedir. Bu tür finansal analizler, şirketlerin finansal sağlığını izlemek, potansiyel riskleri belirlemek ve stratejik kararlar almak için kritik öneme sahiptir. Altman Z" Score ve Ohlson O-Score

modelleri, sigorta şirketlerinin finansal başarısızlık riskini değerlendirmede etkin araçlar olarak kullanılabilir ve bu analizler, şirketlerin finansal risklerini yönetmede önemli bir rol oynayabilir. Altman Z" Score ve Ohlson O-Score modellerinin sonuçları, sigorta şirketlerinin finansal durumunu değerlendirmede tutarlıdır. Ancak, bu modellerin sonuçları, şirketlerin finansal başarısızlık riskini belirlemek için tek başına yeterli olmayabilir. Şirketlerin finansal performansını değerlendirirken, diğer finansal analiz yöntemlerinin de kullanılması ve daha kapsamlı bir değerlendirme yapılması önemlidir. Bu bağlamda, gelecekte yapılacak araştırmalarda, sigorta şirketlerinin finansal başarısızlık riskini değerlendirmek için farklı finansal analiz modellerinin ve yöntemlerinin kullanılması önerilmektedir. Bu çalışma, Borsa İstanbul'da işlem gören sigorta şirketlerinin finansal başarısızlık riskini değerlendirmek için Altman Z" Score ve Ohlson O-Score modellerinin etkinliğini ortaya koymaktadır. Çalışmada elde edilen sonuçlar, sigorta şirketlerinin finansal performansını değerlendirirken bu modellerin kullanışlı olduğunu ve gelecekteki belirsizliklere karşı daha hazırlıklı olmalarını sağladığını göstermektedir. Bu tür finansal analizler, şirketlerin finansal sağlığını izlemek, potansiyel riskleri belirlemek ve stratejik kararlar almak için kritik öneme sahiptir. Gelecekte yapılacak araştırmalarda, sigorta şirketlerinin finansal başarısızlık riskini değerlendirmek için farklı finansal analiz modellerinin ve yöntemlerinin kullanılması önerilmektedir. Bu yaklaşım, daha kapsamlı bir analiz sağlayacak ve araştırma sonuçlarının daha güçlü olmasına katkıda bulunacaktır. Ayrıca, sigorta şirketlerinin finansal performansını değerlendirirken, sektörel ve ekonomik faktörlerin de dikkate alınması önemlidir. Sigorta sektörünün dinamik yapısı ve sürekli değişen ekonomik koşullar göz önünde bulundurulduğunda, bu faktörlerin analize dahil edilmesi, daha doğru ve güvenilir sonuçlar elde edilmesini sağlayacaktır. Bu çalışma, sigorta sektöründeki şirketlerin finansal başarısızlık risklerini tahmin etmek ve değerlendirmek için önemli bir adım olarak görülebilir. Sigorta şirketlerinin finansal sağlığını izlemek ve riskleri yönetmek hem şirketler hem de genel ekonomik istikrar açısından kritik öneme sahiptir. Bu tür analizler, sigorta şirketlerinin finansal performansını daha iyi anlamak ve gelecekteki belirsizliklere karşı hazırlıklı olmak için vazgeçilmez araçlar olarak hizmet etmektedir.

Sonuç olarak, bu çalışma, sigorta şirketlerinin finansal başarısızlık riskini değerlendirmek için Altman Z" Score ve Ohlson O-Score modellerinin kullanışlılığını ve etkinliğini ortaya koymaktadır. Bu modeller, sigorta şirketlerinin finansal performansını izlemek ve potansiyel riskleri belirlemek için önemli araçlar olarak kullanılabilir. Bu tür finansal analizler, şirketlerin finansal sağlığını izlemek, potansiyel riskleri belirlemek ve stratejik kararlar almak için kritik öneme sahiptir. Ayrıca, finansal başarısızlık riskinin tahmini, yatırımcılar, yöneticiler ve diğer paydaşlar için önemli bilgiler sağlar. Bu bağlamda, Altman Z" Score ve Ohlson O-Score modellerinin sigorta sektöründe finansal başarısızlık riskini değerlendirmede etkin araçlar olduğu söylenebilir. Bu modellerin kullanımı, sigorta şirketlerinin finansal risklerini yönetmede önemli bir rol oynayabilir ve gelecekteki belirsizliklere karşı daha hazırlıklı olmalarını sağlayabilir.