T.C.

ISTANBUL AYDIN UNIVERSITY

INSTITUTE OF SOCIAL SCIENCES

MEASURING FINANCIAL PERFORMANCES VIA TOPSIS AND GREY ANALYSIS; IRON & STEEL SECTOR EXAMPLES

MASTER THESIS

FADİME SARGUT

BUSINESS ADMINISTRATION DEPARTMENT

MASTER PROGRAM

THESIS ADVISOR

ASISTANT. PROF. DR. ÖZGE EREN

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İSTANBUL AYDIN ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜ

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DECLARATION

I hereby declare that this master's thesis titled as "*MEASURING FINANCIAL PERFORMANCES VIA TOPSIS AND GREY ANALYSIS; IRON & STEEL SECTOR EXAMPLES* " has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honor.

(12/01/2018)

FADİME SARGUT

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ABBREVATIONS

AHP	:	Analytical Hierarchy Process
ELECTRE	:	Elemination and Choice Translating Reality English
GAIA	:	Geometrical Analysis for Interactive Aid
GRA	:	Gray Relationship Analysis
GST	:	The Gray System Theory
MAX	:	Maximum
MCMM	:	Multi Criteria Decision Making
MDMM	:	Multicriteria Decision Making Methods
MIN	:	Minimum
PROMETHEE	:	The Preference Ranking Organization Method for Enrichment Evaluation
ROE	:	Return on Equity
TOPSIS	:	Technique for Order Preference by Similarity to Ideal Solution

MEASURING FINANCIAL PERFORMANCES VIA TOPSIS AND GREY ANALYSIS; IRON & STEEL SECTOR EXAMPLES

ABSTRACT

Financial analysis is based on an examination of the relationship between the balance sheet items and income statement that make up the fund structure of the business to determine the extent to which the financial equilibrium has been met and to ensure that rational decisions are taken accordingly.

The purpose of this study is to demonstrate the applicability of Multi-Criteria decision making techniques in financial statement analysis. In the first part of this study, the Financial Tables analysis will be mentioned. In the second part, the types and uses of financial analysis techniques will be discussed. In the third chapter, multi criteria decision making techniques will be mentioned and also in this section, the five most common methods will be mentioned. In the last part, 2011-2016 balance sheet data of Ereğli Iron & Steel Inc. and Kardemir Iron & Steel Inc. will be evaluated with the help of financial analysis techniques.In this context, the financial statements of the two firms were analysed by ratio analysis, one of the financial analysis techniques. In the second stage, the results of the ratios analysis were analyzed using multi criteria decision making techniques. In this context, TOPSIS and GRA methods were utilized.

Keywords: Ratio Analysis, Gray Relational Analysis, TOPSIS, Financial Analysis.

İDEAL ÇÖZÜME BENZERLİK BAKIMINDAN SIRALAMA PERFORMANSI TEKNİĞİ VE GRİ İLİŞKİSEL ANALİZİ İLE FİNANSAL PERFORMANSLARIN ÖLÇÜLMESİ; DEMİR VE ÇELİK SEKTÖRÜ ÖRNEKLERİ

ÖZET

Finansal analiz, finansal dengenin ne derece karşılandığını belirlemek ve rasyonel kararların uygun şekilde alınmasını sağlamak için, şirketin fon yapısını oluşturan bilanço kalemleri ile gelir tablosu arasındaki ilişkinin incelenmesine dayanmaktadır.

Bu çalışmanın amacı çok kriterli karar verme tekniklerinin mali tablolar analizinde uygulanabilirliğini göstermektir.

Çalışmanın ilk bölümünde Mali Tablolar analizinden bahsedilecektir. İkinci bölümünde, finansal analiz tekniklerinin türleri ve kullanımı tartışılacaktır. Üçüncü bölümde çok kriterli karar verme tekniklerinden bahsedilerek bu bölümünün en sık kullanılan beş yöntemden bahsedilecektir. Son bölümde Ereğli Demir ve Çelik A.Ş ve Kardemir Karabük Demir Çelik Sanayi ve Ticaret A.Ş. nin 2011-2016 yıllarının bilançosu verileri mali analiz teknikleri yardımıyla değerlendirilecektir. Bu bağlamda, iki firmanın finansal tabloları, finansal analiz tekniklerinden biri olan oran analizi ile analiz edilmiştir. İkinci aşamada da, oran analizde çıkan değerlerin çok kriterli karar verme tekniklerinde kullanarak analiz edilmiştir. Bu bağlamda TOPSIS ve GRA yöntemleri kullanılmıştır.

Anahtar Kelimeler : Oran Analizi, Gri İlişkisel Analizi, TOPSIS, Finansal Analiz

1. INTRODUCTION

Financial analysis is to determine the extent to which the financial balance has been met and to ensure that rational decisions are taken accordingly by examining the relationship between balance sheet items and income statement that constituting the fund framework of the company (Mucuk, 2001:329).

Financial analysis will be use obtained by applying analysis techniques to accounting information and interpreted to understand the financial position of the company and its operating results.

Effective execution of sound decision making, planning and supervision functions in enterprises makes it necessary to perform financial analysis on a regular basis. For this reason, among the most important responsibilities of business managers is the measurement and analysis of financial performance.

Business manager should know that is necessary what data will accurately reflect the performance of the business, how they can be collected, and how the collected data should be assessed. A responsible managers that if the performance is not satisfactory, it should take measures to make it possible to achieve a higher performance expected.

Among the main questions a business manager should ask himself, what the current financial status of the entity is and to make the financial capacity of the business is enough or not to enter a price war with rivalries, and also there are questions such as whether the company has performed well ın the last period or whether the financial performance of the business lags behind the competitors in the market (Acar, 2003).

Financial Analysis is done on the financial tables. Balance sheet and income table are basic financial statements of the business. There are several types of analysis that are commonly used to perform financial analysis in the accounting process; these are the main and most used ones; Comparative Table Analysis, Vertical Analysis, Trend Analysis, Ratio Analysis and DuPont Analysis. Only Ratio analysis will be used in the analysis section of this study.

The purpose of this study is to demonstrate the applicability of Multi-Criteria decision making techniques in financial statement analysis.

In the first part of this study, the Financial Tables analysis will be mentioned. In the second part, the types and uses of financial analysis techniques will be discussed. In the third chapter, multi criteria decision making techniques will be mentioned and also in this section, the five most common methods will be mentioned. In the last part, 2011-2016 balance sheet data of Ereğli Iron & Steel Inc. and Kardemir Iron & Steel Inc. will be evaluated with the help of financial analysis techniques.

In this context, the financial statements of the two firms were analysed by ratio analysis, one of the financial analysis techniques. In the second stage, the results of the ratios analysis were analyzed using multi criteria decision making techniques. In this context, TOPSIS and GRA methods were utilized.

2. FINANCIAL TABLE ANALYSIS

In order for the information on the financial tables to be used by the users in the best possible manner, these tables need to have certain characteristics. These features are: financial statements must be understandable, appropriate, reliable, and comparable and should be organized on time.

2.1. Financial Analysis Concept

Financial Analysis can be defined as the examination of the changes in financial statement items, the relations between items and the trends they have shown over time and the whole activities of its interpretation by comparing. It with the standard and sector average determined when necessary in order to determine whether an enterprise's financial situation and financial development is sufficient.

2.2. Financial Tables Analysis

Financial Analysis is a process on financial statements. The main financial tables of the enterprises are balance sheet and income table. For this reason, the concept of financial analysis must be mentioned in the balance sheet and income table. This topic will be discussed in detail in the balance sheet and income table.

The comparatives of between the various items in the financial statements are defined by means of percentages , ratios and the measurement and interpretation of these relations. With this analysis, it will be tried to determine what the connections are and what factors play a role in the changes, and it will be predicted where the company will go in time. It is possible to list the principal methods of analysis as follows; Analysis of Comparative Tables (Horizontal Analysis), Vertical Analysis (Analysis by Percentage Method), Analysis by Trend Percentage Method (Trend Analysis), Ratio Analysis (Ratio Analysis). These analytical techniques will be discussed in detail in Chapter 3.

2.2.1. Balance Sheet

A balance sheet is a chart showing an entity's financial situation at a certain point. It is meant by the financial situation is the monetary size of the assets owned by the entity and the resources provided by the assets.

Assets from balance sheet items are classified as Current Assets and Non-Current Assets. Assets from balance sheet items are account groups in each class and accounts in these account groups and account (balance sheet items) in these account groups.

Therefore, there is a relationship between the balance sheet items used in the balance sheet arrangement and the accounts and it is necessary to have an account plan for balance sheet arrangement. The Uniform Chart of Accounts in the Uniform Accounting System in Turkey covers all balance sheet items that should be shown in the balance sheet. The balance sheet is drawn up with the remainder of the account on the balance sheet date of the accounts included in this account plan.

The balance sheet is examined in five groups. These; Current Assets, Non-Current Assets, Short Term Liabilities, Long Term Liabilities and Equities.

- **Current Assets:** All of the possible values that the business can freely spend and the money in the bank will be turning to cash within one year can be called as current assets. Current assets; cash and cash equivalents, marketable securities, trade receivables, other short-term receivables, inventories. Expense and income accruals and other current assets. In the analysis, the total of current assets is called gross working capital. Gross working capital is used to carry out day to day operations such as acquisitions, production, maintenance and repairs, sales, and to payed short-term debts.

- **Non-Current Assets:** The values that are to be used in business activities for more than one year, even those that are not considered to be converted into money for a year or that cannot be converted into money are called non-current assets. Non-current assets; long-term trade and other receivables, financial assets, tangible assets, intangible assets, assets subject to special consumption, future years expenses and income accruals and other non-current assets.

- **Short Term Liabilities:** Debt to be paid within one year is called short term liabilities. However, it is a fact that these debts are to be compensated from the current assets. The Company's financial liabilities, trade payables, other

liabilities, advances received, taxes and other legal liabilities to be paid, liability and expense provisions, future income accruals and expense accruals and other short term liabilities constitute the short term liabilities group.

- **Long Term Liabilities:** Longer term liabilities of a business than one year are called long term liabilities. It is expected that long-term liabilities will be met from the values that will come out of non-current assets in business. Long-term financial liabilities of the business, trade debts, other debts, advances received taxes payable and other liabilities, provisions for liabilities and expenses, income and expense accruals for the future years and other long term liabilities.

- **Equities:** Equity consists of operating capital and period profits and reserves. Equities come from paid capital, capital back-ups, profit back-ups, period profit or loss items.

  The equity refers to the ownership of the entity's owners or partners on the assets and does not place any financial burden, such as interest. It is to be expected that equities in an enterprise will be at least equal to short term liabilities and long term liabilities. This also ensures the safety of buyers. Term losses in equity past years losses are undesirable items. The size of them means that the capital is destroyed.

2.2.2. Income Statement

The income statement is a financial statement showing the entity's operating results for a particular operating period. The income statement shows all the income the entity has earned in a given period and all the costs and expenses incurred in obtaining such income. The net profit for the period or net loss for the period that the entity obtains is included in the income statement.

The balance sheet refers to a specific moment, in other words, the date on which the balance sheet is adjusted, and the remaining balance sheet accounts on that date. Income statement shows the sum of the accounts traded, while expressing a certain period at time. In other words, the accounts that make up the income table do not give any account remuneration at the date when the income statement was issued.

As in the balance sheet, the Uniform Chart of accounts in the Uniform Chart of Accounts is used in the income statement and the income statement is grouped according to the income statement accounts included in this account plan.

- **Gross Sales Profit or Loss:** Gross sales profit or loss relates to the main activity area of the business and indicates the success of the business in its main activity. In the gross sale profit or loss, the revenues incurred for these are deducted from the costs related to the essential activity. However, operating expenses have not yet been reduced. The gross sales profit or loss group includes gross sales, sales discounts, net sales, and the cost of sales.

- **Operating Profit or Loss:** Operating profit or loss arises from the difference between gross sales profit or loss and operating expenses, and is the result of the entity's net profit or loss on its core business. It is important to measure the success of the business in its core business.

- **Ordinary Profit or Loss:** The profit or loss that the entity derecognizes from its activities other than its core business or the result of adding the expense losses is called ordinary profit or loss. Positive results are profit, negative results are damages. According to the Uniform Accounting System, financing costs are separately presented from ordinary profit or loss; if the profit is deducted, if there is a loss, it is added.

- **Period Profit or Loss:** We have already mentioned the extraordinary income and profits, expense and losses that may arise outside the main activities of the business and its main activities. The period profit or loss is calculated by adding to the ordinary profit or loss of the enterprise, adding extraordinary income and profit, or by deducting extraordinary expenses and losses.

3. FINANCIAL TABLE ANALYSIS TECHNIQUES

There are several types of analysis that are commonly used to perform financial analysis in the accounting process; these are the main and most used ones (Çetiner,2007:7);

- Comparative Table Analysis

- Trend Analysis

- Ratio Analysis

- DuPont Analysis

- Vertical Analysis

3.1. Comparative Financial Tables Analysis

Financial statements of an entity for more than one period are prepared comparatively. These tables can be arranged in two period or can be edited by comparing more than two period. The tables prepared in this way allow the entity to see past and current financial position and to identify the differences (increase and decrease) of the current financial position from past years. It can also be found inferences about the future financial situation in this way (Yurdakul, 2006:251).

Important information is obtained about the developments of economic and financial structure, profitability, productivity of the enterprise. The greatest advantage of comparative analysis is that it is considered to be a good indicator of the direction of development of the investigated enterprise. An examination of the changes in the items in the financial tables is important to show that the business and its financial characteristics are developing in which direction. A comparative analysis is also useful for estimating the future development of the enterprise. As long as there are no major changes to the conditions, it is expected that the business will have a favourable development in the past (Oztin, 2002:347).

The balance sheet and income table information of the business for several periods are arranged side by side and compared. The increases and decreases in the items are calculated as percentages.

Difference: Current period-Previous period

Percent: (Current period-Previous period) / Previous Period *100

3.2. Trend Analysis

A vertical percentage analysis is performed to examine the proportional size of a total or group within a financial table of a certain period. Trend analysis is determine of the tendency of equal and much longer periods of time. Thus company, it can be seen how the asset's productivity, debt tendency, equity chance, profitability increase or decrease, and so on over the years as it has been for as long as 8-10 years, and also policies are created accordingly.

In this analysis method, one of the years to be compared is selected as the base year, and the sum of this year is accepted as 100. It is indexed to base year on other years and the increase or decrease is shown as a percentage of the basic year. Long-term development of the business is being studied since the comparative analysis over the years provides for dynamic analysis (Penman, 2012 :316-317; Clemenson ve Sellers, 2013 :257; Toroslu and Durmuş, 2013:80).

The choice of the base year is very important. The base year should be a completely normal year, with no extraordinary traits. A significant year should not be selected as a result of the assessment of profits or crisis in a year when profits are very high or when business' sector and the country as a whole are in crisis in a year. Otherwise, comparisons will be unhealthy. In addition, year to be compared should be free of inflation (Omag, 2014).

3.3. Ratio Analysis

An examination of the relationship between the items in the balance sheet and the income statement. The comparison of these relationships with previous years and other enterprises in that business type (Cetiner, 2002:138).

Significant relationships between the items in the financial statements are expressed as either percentages or multiple times. By establishing mathematical relations between account and account groups, it is tried to reach a judgment on the economic and financial structure, profitability and working situation of the enterprise. The ratio is accepted as a simple mathematical expression of the relationship between two items. In this analysis method calculation of ratios is not enough alone. It is considered important that the ratio, which are a financial instrument by the authorities, are assessed and interpreted in conjunction with the objectives of the enterprise (Akdoğan, 2007:640).

The ratios can be sorted according to their usage as follows (Erdogan, 1997):

- ✓ Rates used in the analysis of the liquidity situation,

- ✓ Rates used in the analysis of the financial structure,

- ✓ Rates used in the analysis of the operating ratio,

- ✓ Rates used in the analysis of the profitability situation.

- • **Acid-Test Ratio:** Represents the ratio of current assets without stock to short-term foreign assets. Stock is ignored in the calculation of this ratio, so stock items need more time to be sold and turned into money than other current assets (Evin, 2014).

Acid-Test Ratio = (Current Assets - Stocks - Other Current Assets) / Short Term Liabilities

It is considered sufficient that the result of the acid test ratio is 1. So, assets that are return without selling the inventory of the company are required to be at a level where they can pay short-term debts.

- • **The Current Rate:** Current rate is calculated by dividing the gross operating capital (current assets) necessary for the companies to continue their operations into short term debts. The current rate indicates the adequacy of the net business capital and the debt paying capacity. However, it is more accurate to evaluate it together with net business capital change. The increase in net business capital is not a sign of increased debt pay-out capacity of the company. Current ratio may decrease if short-term debt is increased from current assets. In addition, the quality of current assets (to find the real value when the sale is

made) should be taken into account when assessing the current rate (Evin, 2014).

Current Ratio = Current Assets / Short Term Liabilities

The current ratio result is 2 considered sufficient. In short, it is desirable that the aggregate current assets of the business have more than doubled from short-term liabilities.

- **The Cash Ratio**: Cash ratio is a measure of how much of the short-term debt of an entity's ready value can be met (Evin, 2014).

Cash Ratio = (Current Assets-Trade Receivables + Inventories) / Short Term Liabilities

It is desirable that the cash rate should not fall below 0.20. Otherwise it puts the business into cash tightness, while a large proportion is a sign that the business does not plan its cash well and cannot use it.

- **Leverage (Debt) Rate:** Determines to what extend the business is dependent on debt. A high leverage ratio means a riskier firm. Even if the profits of the firm are fluctuating, debt payments are fixed and a pre-payment plan is certain. If the cash flow eventually declines, the firm cannot afford to pay its debts (Evin, 2014).

This ratio can be normalized to be around 50%. However, the disruptive effect of the inflation on the passive structure of balance-sheet has increased up to 70% in our country. For this situation, the role of capital shortage in our country and advantages of borrowing is great. However, the relatively high cost of borrowing removes this situation.

Leverage (Debt) Ratio = Total Debt / Total Assets

- **Leverage Factor:** It is preferred that the ratio of Leverage Factor is low, indicating how much foreign resources are used in funding the firm's assets compared to its own funds. However, the factors that make up the rate need to be examined in a good way. The development of the Leverage Factor over time, which is a good indicator of the capital structure of the companies, allows the companies to observe their preferences in capital structures. As mentioned in the Debt-Assets ratio, it is very important to establish a proper equilibrium

between equity and foreign resources. Companies that work with appropriate management understanding and are in favourable sectors they can work with higher Debt-Assets and Debt-Equity ratios, if their business risk and operational risk rates are low, while it is accepted as a general rule by western financial institutions that the rate should not exceed 100%, it can be accepted that this ratio is between 150% and 200% in the countries where it is difficult to find equity like our country (Evin, 2014).

Leverage Factor = Short-Term Liabilities+Long-Term Liabilities / Equities

- **Ratio of Fixed Assets to Continuous Capital:** This ratio shows how much the company's core capital is used to finance its tangible assets. With this rate, we can measure how successful companies are in funding their financial investments (Evin, 2014).

Fixed Asset - Continuous Capital = Tangible Assets/Long-Term Debt + Equity

- **Interest Coverage Ratio:** It shows how the companies can meet (how many times the interest rate) the profit (interest and profit before tax) and financing costs resulting from all activities that they have shown. It can also be used as a risk and safety indicator for companies. In western countries this ratio is sufficient to be 8: 1, 7: 1. In our country, high interest rates and fluctuating conjuncture in recent years cause this ratio to wavy and be lower than standard. In this case, it is sufficient that the ratio is about 4 or 3 (Evin, 2014).

Interest Coverage Ratio =Profit before Tax + Financing Expense / Financing Expense

- **Receivables Turnover:** Receivable turnover is a measure of the ability of companies to collect their trade receivables and how many times they have transferred their receivables over a year. If a company is able to collect their receivables quickly (if the turnover rate is high), the liquidity can be considered high. The company does not enter into cash tightness on this account, and it can use them more economic areas without much loss of receivables

Company's receivables will differ due to reasons like seasonal fluctuations, inflation, etc. Especially if there are ever-increasing trade receivables items during the period and it is more meaningful to use trade receivables averages in the denominator in order to get the betting factors to go away. For example,

in the year-end balances, the rate may be high because the level of commercial activity generally falls to the lowest level and the receivables are closed (Evin, 2014).

Receivables Turnover =Net Credit Sales(sales revenue) / Trade Receivable

- **Debt Collection,** it is the day-to-day conversion of the receivables turnover rate and gives us the same results as the turnover rate. However, since it gives the results day by day, it shows how many days the companies could collect their receivables on average (Evin, 2014).

The sooner a company can collect its receivables, the higher the liquidity, and the company will not have shortage of cash. Therefore, it can use its receivables in more economic areas before falling in value. When examining the average collection period of receivables, it is possible to reach healthier results by comparing it with the average collection period of the previous term, the sector average and the maturity period applied by the company generally.

Debt Collection: 360 / Receivables Turnover

- **Inventory Turnover :** Another ratio to measure the efficiency of the use of assets; it is the inventory turnover rate which shows how many times inventories are handed over in one year. The purpose of inventory turnover analysis is to see how quickly these assets, which are held as inventory, are consumed by the firm during manufacture and are made ready for sale. In this way, it reveals that how many times inventories have been renewed in a certain period. High inventory turnover rates indicate that inventories are being held and used more optimally. In such a case, companies could earn more profits with less operating capital; but the high inventory-turnover rates of companies might be due to insufficient inventories (Evin, 2014).

Inventory Turnover = Cost of Goods Sold / Inventories

- **Inventory Turnover Period**: The average consumption period of inventories is the day-to-day turnover of the inventory turnover rate and gives us the same results as the inventory turnover rate. However, since it gives the results day by day, it shows the average number of days the companies are out of inventories (Evin, 2014).

Inventory Turnover Period=360/ Inventory Turnover

- **Asset Turnover:** Asset turnover is a measure of the success of the sales volume created by the assets (total assets) of the companies. This ratio shows us whether there is excessive investment in the assets, in other words whether the asset sizes of the companies are increased unnecessarily. This might be a measure of the use of technology or the use of assets in an enterprise.

- If the assets occupy a significant place within total assets, **the asset turnover rate** will be low. This situation is more likely to occur in capital-intensive industrial companies. On the other hand, it is natural that this ratio is high in enterprises where fixed investments are less (for example in trading or finance companies). Asset turnover is an important indicator of the profitability of the enterprise (Evin, 2014).

Asset turnover =Net Sales(Sales Revenue)/Total Assets

- **Gross Margin**: Gross margin is a positive difference between the sales of companies and the cost of sales. When we divide gross profits by net sales, we find gross profit margin. Gross profit margin is only a measure of how much profit margin achieved by sales without taking the company's other revenues and expenses into account. Gross profit margins will yield meaningful results when compared to the companies in the same line of business and the company's past. In this way, we could see how much profit margin is achieved by companies in terms of periods or in the same period against similar companies, i.e. their competitive power and the competitive power improving over periods (Evin, 2014).

Gross Margin=Gross Profit or Gross Loss / Net Sales(Sales Revenue)

- **Net Margin**: Net margin is a value reflecting the results of all the activities of the companies. When we divide net profit for the period by sales, we find net profit margin. Net profit margin is a measure that allows us to make judgment on all the company's operating, investment and financing policies since the company's other revenues and expenses are considered (Evin, 2014).

Net Margin= Net Profit or Net Loss / Net Sales (Sales Revenue)

- **Equity Capital:** Equity capital is one of the main sources of the companies and constitutes the part of the companies which their partners deserve. The components constituting the equity capital are comprised of the undistributed profits of the current and previous period, which the shareholders become entitled to take by the capital they invested but left them to the company (Evin, 2014).

- **Return on Equity (ROE):** Return on equity is a measure of the profitability of a unit of funds that partners have left as a source for the company. This rate, which is used to measure the success of the management, is also used by shareholders to see the return of their participation (Evin, 2014).

Return on Equity (ROE)= Net Profit(Loss) for the period/Equity Capital

3.4. DuPont Analysis

It is used to analyze how the business affects the profitability of its assets. The analysis shown that an business' sales with a high profit margin will not guarantee a profitable period profit, it also indicates that a sales amount related to the resources used for it must also be realized. On the other hand, it also reveals that high sales volume will not give the desired result without an adequate profit margin (Prendergast, P).

$$\text{Profitability of Total Assets} = \frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Total Assets}}$$

$$\text{Equity Profitability} = \frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Total Assets}} \times \frac{\text{Average Total Assets}}{\text{Average Own Funds}}$$

3.5. Vertical Analysis

In the analysis of the Vertical method, the balance sheet total is taken as accepted of 100 and the total rate of each of the account is calculated, and also can be compared of financial statement with the similarities of similar businesses if desired. When the same analysis is made for the income statement, the net sales are accepted as 100 and the proportion of the income statement data to net sales is calculated.

In this analysis method, next to the column where the numerical data in the row is located, and also for a group sum and general sum, a column is opened and the ratios are written in this section.

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It is calculated by the below formula according to group total;

Group Percent: (Item amount / Group sum)*100

It is calculated by the below formula according to general total;

General Percent: (Item amount / General sum)*100

4. MULTI CRITERIA DECISION MAKING (MCDM) METHODS

Multi Criteria Decision Making Methods the data used to compare and financial the countries economical and the results obtained with the model established these data and the order of the options are used in research studies as appropriate methods that can select and classify from among the options (Urfalıoğlu and Genç, 2013:329-360).

Multi-criteria analysis techniques provide for the scientific selection of the environment in which multiple, similar and near features criteria exist. It serves a variety of purposes, such as solving the problem, choosing the best, and determining the performance.

In cases where more than one alternative exists and the alternatives cannot be decomposed according to their differences, Multi Criteria Decision Making (MCDM) methods are used (Turan et al., 2016). In 2009, Wang separated the Multicriteria Decision Making Methods into three groups (Wang, 2009: 2273). These groups are; Basic Methods (Weighted Addition and Multiplication Methods), One Valued Unified Criteria Methods (AHP, TOPSIS, Grey Relational Method, Fuzzy TOPSIS) and Sorting Methods by Proficiency (ELECTRE, PROMETHEE) (Turan et al., 2016). In spite of the fact that these methods have different methods of analysis, similar results can be obtained. Another Multi Criteria Decision Making Methods analysis method is GRA (Gray Relation Analysis). This method provides an easier solution than the methods of mathematical analysis where uncertainty is the case. The GRA method can be used to quantitatively and logically measure the relationship between two sequences. The relation level computed at the end of the constructed operations is called the gray relation level and takes values between '0' and '1' (Feng-Wang, 2000:137).

Multi criteria analysis methods are often used in supplier selections.These analysis methods were used in performance evaluation as well as supplier selection.
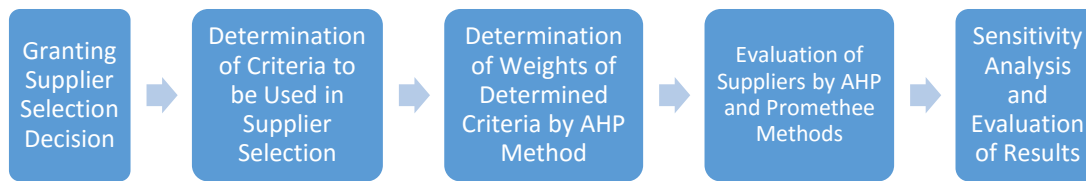
Figure 4.1: Supplier Selection Process

Source: Alkan et al., 2016:262

In Figure 4.1, the supplier selection process determined by multi criteria analysis methods is given in a schema.

In this part of the study, 5 (five) of the most frequently used analytical methods will be examined in this section. These are; TOPSIS (Technique for Order Preference by Similarity to Ideal Solution), PROMETHEE (The Preference Ranking Organization Method for Enrichment Evaluation), ELECTRE (Elemination and Choice Translating Reality English), AHP (The Analytic Hierarchy Process) and GRA (Gray Relationship Analysis).

4.1. TOPSIS (Technique for Order Preference by Similarity to Ideal Solution)

The TOPSIS method is used to find the best option with the help of multiple choice criteria. Positive ideal and negative ideal solutions are available according to the TOPSIS method. In this method, as the ideal solution, the positive ideal solution is considered the closest and negative ideal solution is the farthest option. In the TOPSIS method, the Euclidean distance method is used to calculate the positive ideal and negative ideal solution distances of options (Turan et al., 2016;56-66).

It is frequently seen that TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method which is one of the MDMM (Multicriteria Decision Making Methods) methods is used to measure the economic performance of countries and companies and to prefer the most suitable supplier in manufacturing enterprises (Uygurtürk and Korkmaz, 2012:95-115). In this context, it is possible to list some of the studies done with TOPSIS method and the literature;

Work carried out in order to find the most suitable supplier; in his 2007 work, Eleren studied how to choose the province as the most suitable place for the leather sector by using the Fuzzy TOPSIS method. As a result of the analysis made, it is concluded that Istanbul is the most suitable province (Eleren, 2007). In the study conducted by Eleren and Ersoy in 2007, marble block cutting methods were evaluated by Fuzzy TOPSIS method and the most suitable method was determined (Eleren, 2007). Abalı et al. In 2012, they analysed the scholarship selection in an educational institution using both the AHP (Analytical Hierarchy Process) method and the TOPSIS method (Abalı et al., 2012).

In 2016 Geyik et al. they used very specific decision-making techniques in the selection of the book publishing house. In the study, the criteria were weighted using the Analytical Hierarchy Process (AHP) method. In the later stage, alternatives are listed using the TOPSIS method. In this way, the best alternatives have been identified (Geyik et al., 2016). In a study by Yilmaz and Ballı in 2016, BAHS, TOPSIS and PROMETHEE (The Preference Ranking Organization Method for Enrichment Evaluation) analysed multi-criteria decision making methods in a C # -based program to select an intelligent system for the use of data encryption algorithms. As a result of the analysis made, they obtained the order which is closest to the order made by an expert previously with the PROMETHEE method (Yılmaz and Ballı, 2016).

In 2017, Eren et al. used multi-criteria decision making techniques in the selection of echocardiography devices. In the study, the criteria were weighted using the Analytical Hierarchy Process (AHP) method. In the later stage, alternatives are listed using the TOPSIS method. In this way, the best alternatives have been identified (Eren et al., 2017). In the study conducted by Girgin in 2017, the basic characteristics of students who graduated from the department of map and geomatics engineering were searched for in private sector recruitment and analysed by multi-criteria decision analysis methods. In this context, AHP and TOPSIS methods are used (Girgin, 2017).

Studies aimed at finding the best performance; Yurdakul and İç analyzed the performance of Turkish automotive firms in 2003 using TOPSIS method (Yurdakul and İç, 2003). Özgüven evaluated the performances of retailers who could compete in the global arena in the crisis period by using Fuzzy TOPSIS method in his study in 2011 (Özgüven, 2011). In the study conducted by Uygurtürk and Korkmaz in 2012,

the financial performance of metal industry companies was evaluated using TOPSIS method (Uygurtürk and Korkmaz, 2012).

In the study conducted by Akkaya in 2013, the financial performances of airline companies were evaluated. During the performance evaluation, 63 financial ratios were determined and analysed by TOPSIS method (Akkaya, 2013). Turan et al. In the study they carried out in 2016, they evaluated the economic performance of the Soviet Union, from 1992 until 2014, using the TOPSIS method (Turan et al., 2016). Demir et al. while they were looking at the performance of the economy in 2016, especially in the period referred to as Özal Period, they evaluated how the 24 January decisions taken at that time affected the economy. In addition, the study also compared the AK Party period, which is said to be similar to the Özal period (Demir et al., 2016). In 2017, Ünlü et al. in the study they conducted, BIST 30 firms that have been traded in, have examined their firm performances by using the TOPSIS method (Ünlü et al., 2017).

Two different results can be obtained by using the TOPSIS method. These results are called positive and negative ideal solutions. In this method, the order of the choices is based on the relative proximity of the ideal solution. The positive ideal solution maximizes the utility criterion, while the antithesis is the method that minimizes the cost criterion. The negative ideal solution is the reverse of the positive solution. In the negative solution, the utility criterion is minimized while the cost criterion is maximized (Cheng-Ru, 2008: 256).

The steps of the TOPSIS method are described below (Yanık and Eren,2017);

- **In the first step;** The decision matrix is formed. While the decision matrix, Which is called the initial matrix, contains the desicion points to be ranked for excellence in the rows, there are evaluation factors to be used in decision making in the columns.The decision matrix is shown as follows.

$$R_{m \times n} = [R_{ij}] = \begin{bmatrix} r_{11} & r_{12} & r_{13} & \dots & r_{1n} \\ r_{21} & r_{22} & r_{23} & \dots & r_{2n} \\ \dots & \dots & \dots & \dots & \dots \\ r_{m1} & r_{m2} & r_{m3} & \dots & r_{mn} \end{bmatrix}$$

i∈{1, 2, …, m} and j∈={1, 2, …, n} to be; $r_{ij} = \dfrac{a_{ij}}{\sqrt[2]{\sum_{k=1}^{m} a_{kj}^2}}$.

- **In the second step;** Standard Decision Matrix is established. In this step, the decision matrix is normalized and a standard decision matrix is obtained.

$$R_j = w_1 X_{1j} + w_2 X_{2j} + w_3 X_{3j} \ldots + w_{14} X_{14j}$$

- **In the third step;** Weighted Standard Decision Matrix is created. Firstly, weights related to evaluation criteria are determined. Then the elements in each column of the matrix are multiplied by the corresponding weight value to form a Weighted Standard Decision matrix.

The significance levels (w_i) of the variables used for the analysis are assumed to be equal because of the uncertainty ($w_1=w_2=\ldots=w_{14}=0.071$). This will affect the results of the analysis of these significance levels in the analysis work done, which will ensure that different results are obtained.

$$W_{m \times n} = [w_{ij}] = \begin{bmatrix} w_1 r_{11} & w_2 r_{12} & w_3 r_{13} & \ldots & w_n r_{1n} \\ w_1 r_{21} & w_2 r_{22} & w_3 r_{23} & \ldots & w_n r_{2n} \\ \ldots & \ldots & \ldots & \ldots & \ldots \\ w_1 r_{m1} & w_2 r_{m2} & w_3 r_{m3} & \ldots & w_n r_{mn} \end{bmatrix}$$

$$w_1 + w_2 + \cdots + w_n = 1$$

- **In the fourth step;** Positive ideal solution and Negative ideal solution are created. Positive The largest values of the column values in the Weighted Standard Decision matrix are selected so that the ideal solution set can be generated. The ideal solution set is shown in the following form. Negative The minimum values of the column values in the Weighted Standard Decision matrix are selected so that the ideal solution set can be generated. The ideal solution set is shown in the following form.

Along with the weighted standard decision matrix, there are positive (P^+) and negative (P^-) solution clusters. The elements of the positive and negative solution clusters are constructed by calculating the maximum and minimum values of each column of the weighted standard decision matrix. The positive ideal set of solutions(P^+), is calculated by weighted standard decision matrix.

$$P^+ = \left\{ w_1^+ = \max_{i=\{1,2,\ldots,m\}} w_{i1}, w_2^+ = \max_{i=\{1,2,\ldots,m\}} w_{i2}, \ldots, w_n^+ = \max_{i=\{1,2,\ldots,m\}} w_{in} \right\}$$

The negative ideal set of solutions is calculated by means of a set of weighted standard decision matrix (P^-)

$$P^- = \left\{ w_1^- = \min_{j=\{i,2,\ldots,m\}} w_{i1}, w_1^- = \min_{i=\{1,2,\ldots,m\}} w_{i2}, \ldots, w_1^- = \min_{i=\{1,2,\ldots,m\}} w_{in} \right\}$$

- **In the fiveth step;** Separation measures are calculated. In the TOPSIS method, the evaluation factor value for each decision point has deviations from the positive ideal and negative ideal solution set.

The cluster consisting of positive ideal solution distance is called (S^+) and the cluster consisting of negative ideal solution distance(S^-). The values obtained from these two clusters reach to the (C) cluster which is composed of the relative solution values of the ideal solution. During the sorting process, the highest priority is the C value.

$$S^+ = \{S_1^+, S_2^+, \ldots, S_m^+\}$$

i={1, 2, ..., m} to be, $S_i^+ = \sqrt{\sum_{j=1}^{n}(w_{1j} - w_j^+)^2}$.

$$S^- = \{S_1^-, S_2^-, \ldots, S_m^-\}$$

i={1, 2, ..., m} to be, $S_i^- = \sqrt{\sum_{j=1}^{n}(w_{1j} - w_j^-)^2}$.

- **In the sixth step;** Relative proximity is calculated. Positive ideal and negative ideal difference measures are used to calculate the ideal resolving relative proximity of each of the decision points.

$$C = \{C_1, C_2, \ldots, C_m\}$$

k={1, 2, ..., m} to be, $C_k = \frac{S_k^-}{S_k^- + S_k^{+,}}$.

For each k value, $0 \leq C_k \leq 1$ equals. In other words, if k is 1, it is the positive ideal solution of the corresponding decision point, 0 is the negative ideal solution of the corresponding decision point.

4.2. PROMETHEE (The Preference Ranking Organization Method for Enrichment Evaluation)

The Promethee method, introduced in 1982, is a multi criteria sorting method (Dağdeviren and Erarslan, 2005). Promethee is a method that allows for the sorting of alternatives taking into account conflicting criteria. This method starts with the

evaluation chart. Alternatives in this table are evaluated according to different critreia (Ömürbek et al., 2014).

There are two kinds of information needed for the implementation of Promethee.We can sort this information in the following way (Ömürbek et al., 2014);

- Function preferences of the decision maker to compare the contribution of alternatives in each criterion.
- Criteria considered are of relative importance.

Some of the works done by PROMETHEE method in literature are;

- In a study conducted by Özgüven in 2012 , a research on special shopping sites also used Promethee ranking method (Özgüven, 2012).
- In 2013, the work done by Genç was introduced to the PROMETHEE method which is used frequently in academic studies and also the aim of GAIA (Geometrical Analysis for Interactive Aid), which is a geometric representation of the method, is to emphasize the advantages of visual decision making on the decision maker (Genç, 2013).
- In 2014, the service quality of the GSM operators was evaluated with the methods of ELECTRE and PROMETHEE in the work done by Çelik and Ustasüleyman (Çelik and Ustasüleyman, 2014).

Promethee method consists of 7 steps. It is possible to describe these steps in the following order (Dağdeviren and Erarslan, 2005);

- **In the first step;** $w=(w1,w2,...,wk)$ weights with k criteria , for the alternatives evaluated by $c=(f1,f2,...,fk)$, the data matrix $A=(a,b,c,...)$ is constucted.
- **In the second step;** The preference function is defined for each criterion.
- **In the third step;** The common preference functions for alternative pairs are determined on the basis of preference functions.
- **In the fourth step;** The alternative index is calculated for the base alternative that based on the common preference functions.
- **In the fiveth step;** Positive ($\Phi+$) and negative ($\Phi-$) superiorities are determined for each alternative.
- **In the sixth step;** Partial priorities are determined by Promethee I. Partial priorities describe the relationships of alternatives to each other.These relations

are; preferences of alternatives and determination of alternatives which are not-different from each other.

- **In the seventh step;** The exact priorities for using Promethee II for alternatives are calculated and the exact values are calculated by evaluating these calculated values on the same plane as all alternatives (Alkan et al., 2016:262).

4.3. ELECTRE (Elemination and Choice Translating Reality English)

The method of ELECTRE (Elemination and Choice Translating Reality English) is a multi decision method originally proposed by Beneyoun in 1966. The method is based on binary superiority comparisons between alternative decision points for each rating factor. The ELECTRE method takes place in 8 (eight) steps (Triantaphyllou, 2000).

It is possible to list these steps as follows;

- **In the first step;** The Decision Matrix is formed.Decision points in order to rank their superiority in the order of the decision matrix and also in the column, are evaluation factors to be used in decision making. This matrix is the initial matrix generated by the decision maker.

- **In the second step;** Standard Decision Matrix is created. The standard decision matrix is obtained by dividing the square of the sum of the squares of the one column elements of the decision matrix.

- **In the third step;** Weighted Standard Decision Matrix is calculated. Assessment factors may significance in their difference in terms of decision maker. The Y matrix is calculated to reflect these significance differences to the ELECTRE solution. The decision maker must first determine the weights of the evaluation factors.

- **In the fourth step;** Compliance and nonconformity sets are determined.To be benefit for the weighted standard decision matrix is used to determine the compliance sets. Decision points are compared with each other in terms of evaluation factors.

- **In the fiveth step;** Compliance and nonconformity sets are created. In order to construct this matrix, the set of compliance and nonconformities calculated in the previous step is used.

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- **In the sixth step;** Matrices of compliance superiority and nonconformity superiority are formed.In this phase, the adaptation matrix is obtained by comparing the element with the adaptation threshold value.

- **In the seventh step;** A total dominance matrix is formed.This matrix consists of multiplication of the elements of the compliance superiority and nonconformity superiority.

- **In the eighth step;** The importance order of the decision points is determined. The rows and columns of the total dominance matrix show the decision points. Ranking is made according to the level of importance of the decision maker.

4.4. AHP (The Analytic Hierarchy Process)

AHP (The Analytic Hierarchy Process), Which is one of the multi criteria decision methods, is based on binary comparisons. Comparisons can be made subjectively or objectively depending on the definition of the criteria. The comparison weights should be done objectively considering how much more important an alternative is than the other. According to the criteria such as the outcome of personal evaluations, conformity, preference and importance, when compared with expert opinions, subjective result arise. Although the subjectively of expert opinions other than quantifiable criteria appears to be an advantage of the AHP method, this personality remove definite to the consequences (Anderson et al., 1998:746-756).

The AHP method is based on naturalness seen during the viewpoint of the human brain created (Çiftçioğlu, 2013). AHP method; based on a binary comparison of alternatives according to the criteria.The AHP provides decision support for the solution of multi criteria and multi alternative problems (Ömürbek et al., 2014).

The AHP was first introduced by Myers and Alpert in 1968.The AHP method developed by Saaty in 1977 consists of five basic steps (Saaty,1980). It is possible to explain these steps in the following order (Alkan et al., 2016:262);

- **In the first step;** The problem is identified,the main target is determined by hierarchical structure.

- **In the second step;** A hierarchy of criteria and alternatives is created.

- **In the third step;** The binary comparison matrix(s) is generated.

- **In the fourth step;** Weight vector will be found.

- **In the fiveth step;** The consistency rate is calculated.In case of inconsistency, the binary comparisons are passed through the eyes and the transactions are repeated until they are consistent.

4.5. GRA (Gray Relationship Analysis)

The Gray System Theory (GST) entered the world of science in the 1980s. In 1982, the Chinese Professor Deng Ju Long has been attracted attention for article in the issue of control problems with Gray systems. This article is the first article mentioned in the GST. GST, which gathers attention in the scientific World, has been involved in the work of many researchers and has been developed by these researchers. GST is a technique that aims to make numerical or digitize ambiguous states.The basic approach is to measure and analyze the responses of uncertain systems that can not be achieved with fuzzy techniques. GST has easier and clearer steps than fuzzy logic. In doing so, if the data is limited, is the advantage of the method (Aydemir et al., 2013:188).

Gray theory provides analysis of the relationship between the available, countable, extensible, independent, dashed numbers and qualified series (Sofyalıoğlu, 2011:159). GST has subdivision like are Gray Relationship Analysis, Gray Modeling, Gray Estimation, Gray Decision Making (Büyükgebiz, 2013:18).

One of the subdivisions of GST, Gray Relational Analysis (GRA),is the most popular with many different areas being applicable. Gray incidence analysis (GIA) is a rating, classification and decision making method. It is a method that is used to analyze the relationships between the dashed data sets and to solve problems in the missing information light (Sofyalıoğlu, 2011:159).

GIA does not need complex and long running calculations, it is the preferred method of research because it leads to clear results, and easy to implement.(Büyükgebiz, 2013:19). In GIA, the relation between value and each criterion can be examined and inter criteria valuation can be made (Tayyar et al., 2014:29).

While the grey concept mentioned in the method states that the information in a system is not fully known, however, white color has full knowledge, black color means that knowledge is never known. The purpose in the grey theory is; to bring the information that is black in the system to a grey state (Çelebi, 2008:23).

The Grey Relational Analysis Process designed by Yuan (2007) is given in Figure 4.9. (Yuan, 2007:42).
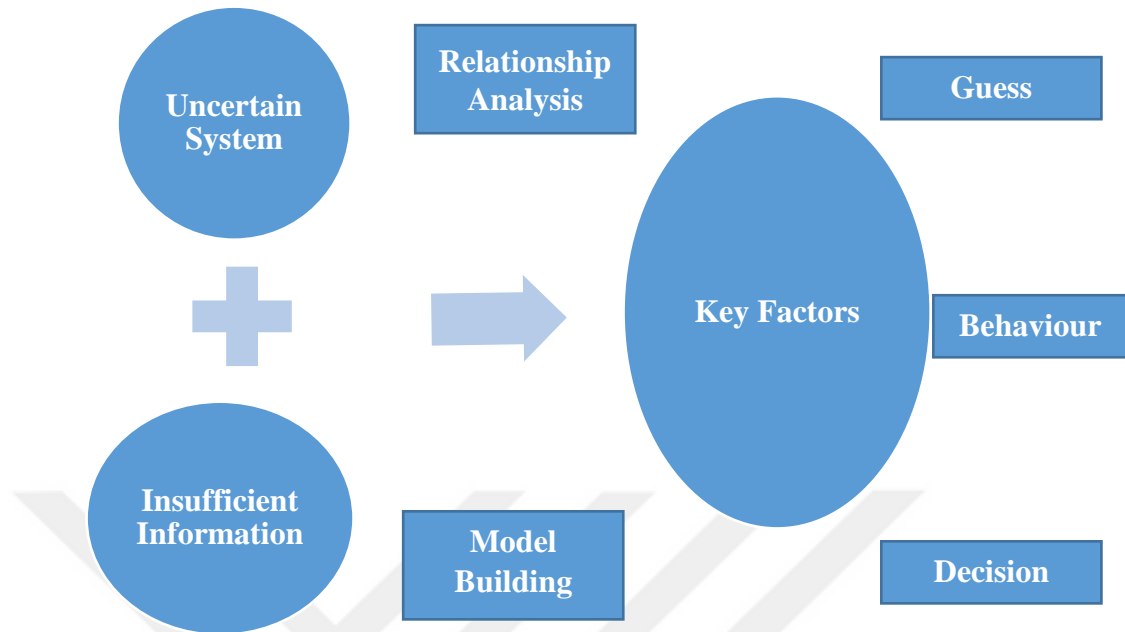
Figure 4.2: Grey Relational Analysis Process

Source: Yuan, 2007:42.

When we look at literature, GRA method is use in performance measurement and supplier selection just like a TOPSIS method. Here are some of these studies;

- In 2009, Özdemir and Deste conducted Gray relational analysis method use for selecting suppliers in the automotive sector (Özdemir and Deste, 2009).

- In the study conducted by Peker and Birdoğan in 2011, gray relational analysis method was used to measure performance in the Turkish insurance sector (Peker and Birdoğan, 2011).

- It was used in the study conducted by Çakmak and Baş Metin in 2012 to the Gray relational analysis and the Compliance analysis were used to the production errors encountered in company (Çakmak and Baş Metin, 2012).

- In the study conducted by Ecer in 2013, gray relational analysis method was used to compare the financial performances of Private Banks in Turkey (Ecer, 2013).

- The Gray relational analysis method was used to evaluate the financial performances of the tourism companies traded in the Stock Exchange Istanbul in the work done by Fatih and Günay in 2015 (Fatih and Günay, 2015).

The GRA method takes place in 6 (six) steps. These steps (Çakır, 2017);

- **In the first step;** The initial decision matrix is constructed. In the decision matrix is to 'm' is the number of alternatives and 'n' is the number of criteria to assumed.

- **In the second step;** Here, the reference series and the comparison matrix are constructed. The reference series can be created by setting the values that would be an ideal alternative; or among the available alternatives, it can be determined by using of the best scores for each criterion.The comparison matrix is reached by adding the first line of reference series in the decision matrix created in the previous step.

- **In the third step;** In this step, normalization is required to make the data uniform. The normalization process is done in three different forms according to the characteristics of the criteria.

In the normalization process for the better contribution of the greatest value, the following equation is used.

$$x_i^*(j) = \frac{x_i(j) - \min_j[x_i(j)]}{\max_j[x_i(j)] - \min_j[x_i(j)]}$$

In the normalization process for the contribution of the smallest value, the following equation is used.

$$x_i^*(j) = \frac{maks_{i=1}^n[x_i(j)] - x_i(j)}{maks_{i=1}^n[x_i(j)] - min_{i=1}^n[x_i(j)]}$$

For the contribution of the ideal value to be optimal, the condition $min_{i=1}^n[x_i(j) \leq x_{idl}(j) \leq maks_{i=1}^n[x_i(j)]$ in the normalization process,in the normalization process with condition to provide the condition, the following equation is used. The target value for the $x_{idl}(j)$, j's criterion.

$$x_i^*(j) = 1 - \frac{[x_i(j) - x_{idl}(j)]}{maks\{maks_{i=1}^n[x_i(j)] - x_{idl}(j); \ x_{idl}(j) - min_{i=1}^n[x_i(j)]\}}$$

- **In the fourth step;** Absolute difference tables between x_0^* and x_1^* are found and an absolute value table is created.

- **In the fiveth step;** In this step, gray relational coefficient matrix is constructed. For this, each element in the matrix is calculated using the following equations.

$$\gamma_{0i}(j) = \frac{\Delta_{min} + \delta\Delta_{maks}}{\Delta_{0i}(j) + \delta\Delta_{maks}}$$

$$\Delta_{maks} = \underset{i}{maks}\ \underset{j}{maks}\ \Delta_{0i}(j)$$

$$\Delta_{min} = \underset{i}{min}\ \underset{j}{min}\ \Delta_{0i}(j)$$

- **In the sixth step;** The gray relational ratios are calculated in this step. It can be seen how the x_0^* series compared to the calculated gray relational degree is similar to the x_1^* reference series.

$$\Gamma_{0i} = \frac{1}{n}\sum_{j=1}^{n} \gamma_{0i}(j) \quad i = 1, 2, 3, \dots \dots, m$$

If the criteria have different weights, the gray relational level of the series is calculated using the following formula.

$$\Gamma_{0i} = \frac{1}{n}\sum_{j=1}^{n} [q_j \otimes \gamma_{0i}(j)] \quad i = 1, 2, 3, \dots \dots, m$$

5. INVESTIGATION OF IRON AND STEEL TRADED IN ISE (ISTANBUL STOCK EXCHANGE)

In this section, Ereğli Iron & Steel Inc. and Kardemir Iron & Steel Inc.'s financial statements will be analyzed by ratio analysis. In Annex-1 Tables A.1A, B, C, D and E, there is 6 (six) years of balance sheet of Ereğli Iron & Steel Inc. In Annex-2 Tables A.1A, B, C, D and E there is 6 (six) years' balance sheet of Kardemir Iron & Steel Inc.

5.1. Ereğli Iron & Steel Ratio Analysis

In this section, the financial statements of Ereğli Iron & Steel Inc. will be analyzed by ratio analysis.

The ratio analysis of Ereğli Iron & Steel Inc.'s 6 (six) year old balance sheet is given in Annex-1 Table A.1

The graph of current ratio, acid-test rate and cash ratio of Ereğli Iron & Steel Inc. is given in Annex-1 A.2 and is shown graphically in Figure 5.1.

	2011	2012	2013	2014	2015	2016
Current rate	2,43	2,08	2,43	2,37	3,06	2,62
Acid Test Rate	0,93	1,03	1,01	1,31	1,78	1,59
Cash Ratio	3,44	2,72	3,10	2,86	3,67	3,15
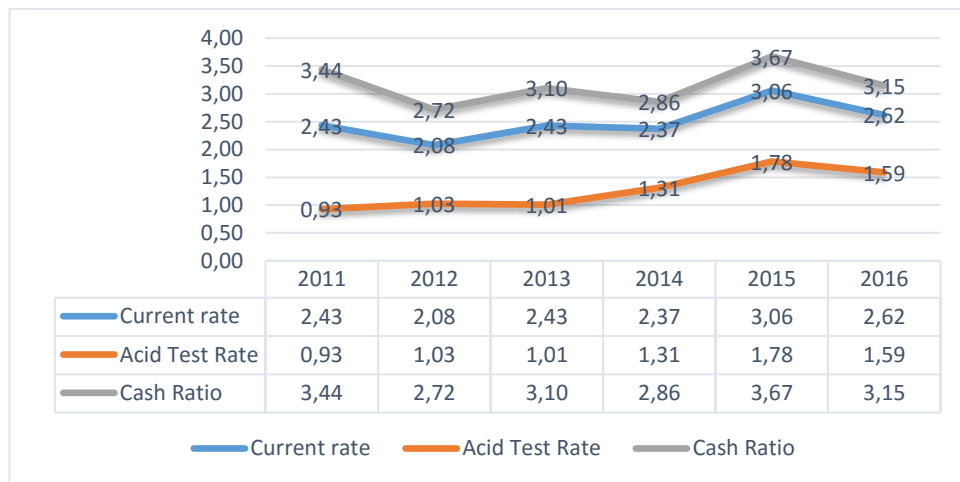
Figure 5.1: Ereğli Iron & Steel Inc.'s Liquidity Ratio

As shown in Figure 5.1, as a result of the ratio analysis on the balance sheet data of Ereğli Iron & Steel Inc.,

The current ratio in the graph of Ereğli Iron & Steel Inc. shows a trend of 2.43 despite the global crisis of 2011 ,however a slight downward trend in 2012. The trend in 2013 was as high as in 2011 and continued its upward tendency in 2014, 2015 and 2016. Ereğli Iron & Steel Inc has been in the range of 1.5-2, which should be in our country by years. In short, it is desirable that the total amount of current assets owned by the enterprise is higher than the short-term liabilities reaching double. Ereğli Iron & Steel Inc has achieved it.

The acid-test rate was affected by the crisis of 2011 in the graph of Ereğli Iron & Steel Inc., and showing a tendency to be under 1, that is, the effect of stock on the decrease of sales.

2012, 2013, 2014 and 2015, it has the short-term liabilities solvency without depending on liquidity stocks that should be, and it has a consistent management policy since it shows a good value above during these years.

Cash ratio in Ereğli Iron & Steel Inc.'s graph which is the ratio of 0.20 in our country. Shows the fact that the enterprise does plan and use its cash well. Despite the world crisis in 2011, it provides a solid business image with a high cash rate of 3.44, at the level of developed countries.

Ereğli Iron & Steel Inc.'s Interest Coverage Ratio, Leverage(Debt) Rate and Leverage Factor data are given in Table 5.1 and are shown graphically in Figure 5.2.

	2011	2012	2013	2014	2015	2016
Leverage (Debt) Rate	0,46	0,44	0,38	0,35	0,33	0,34
Leverage Factor	0,85	0,77	0,61	0,55	0,49	0,51
Interest Coverage Ratio	2,09	2,16	4,20	8,63	7,08	9,37
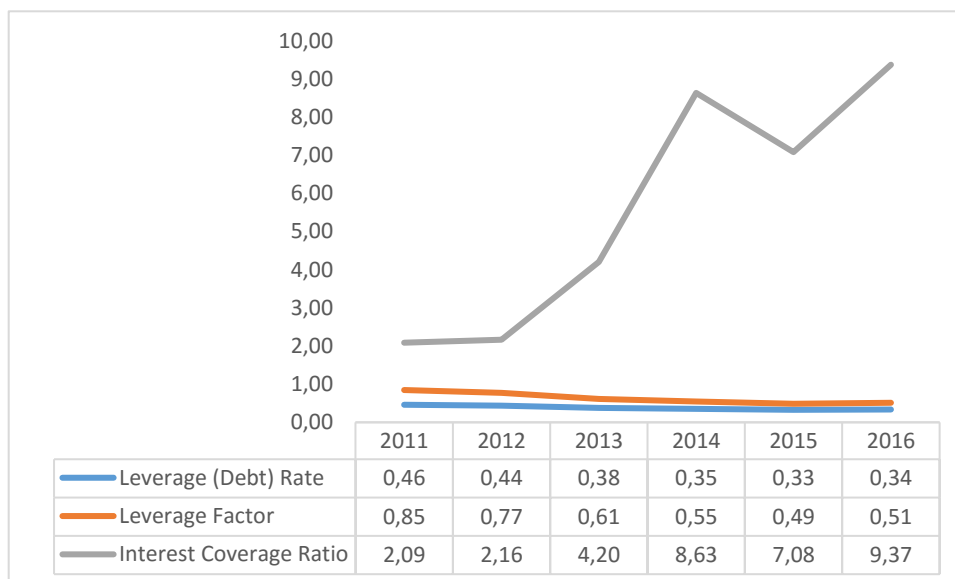
Figure 5.2: Ereğli Iron & Steel Inc.'s Financial Structure Ratios

As shown in Figure 5.2, as a result of the ratio analysis on the balance sheet data of Ereğli Iron & Steel Inc.,

Interest Coverage Ratio, Ereğli Iron & Steel Inc.'s interest coverage ratio shows a trend below the ratio accepted in our country. It can also be used as a risk and safety indicator for companies. First two years trend ratio is decreases however 2013, 2014, 2015 and 2016 increases. The greater this rate, the greater the power to pay the company's interest expenses. This company has a good management team, so done well this.

Leverage Factor, the ratio of debt to equity is much lower than the generally accepted ratio in the 6-years period of Ereğli Iron & Steel Inc. Equity capital has a very strong influence on the resources of the enterprise. Therefore, as seen from the interest coverage ratio, foreign resources are used.

Leverage (Debt) Rate, it is seen that Ereğli Iron & Steel Inc. did have a good management policy with the effect of 2011 crisis and the management policy after 2012 has more improved. While the debt ratio in 2011 was 0.46, it decreased slightly up to 0.44 in 2012. Overall, the enterprise is in a good condition based on the ratio in our country. In 2015 and 2016 it achieved to keep the resource cost at the optimum level.

Ereğli Iron & Steel Inc.'s Receivables Turnover, Debt Collection, Inventory Turnover,Inventory Turnover Period and Asset Turnover ratios are given in table 4.1 and are shown graphically in Figure 5.3.
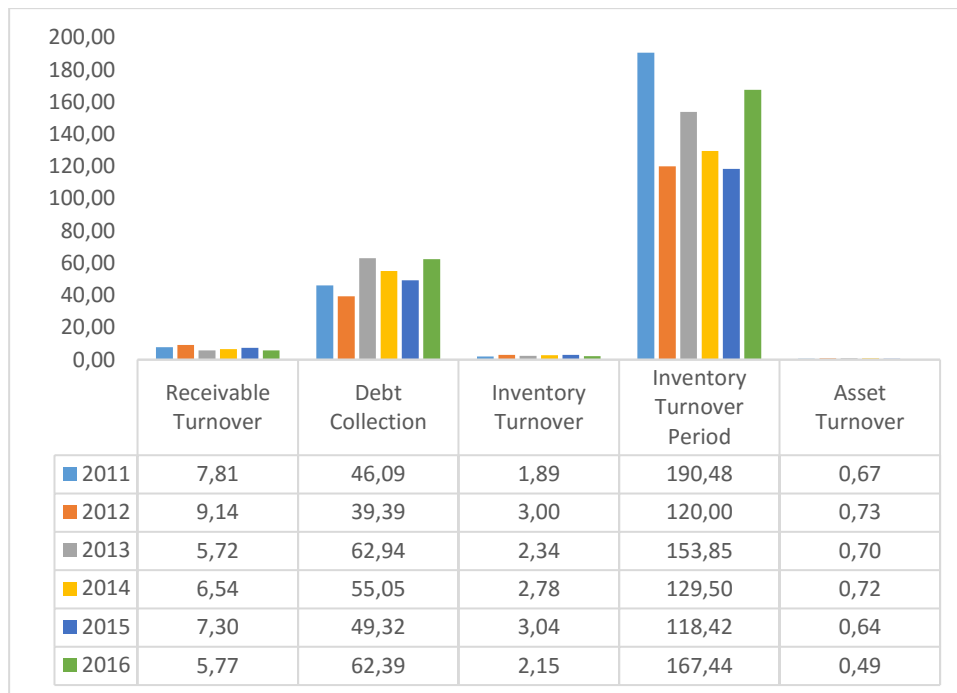
Figure 5.3: Ereğli Iron & Steel Inc's Operating Ratios

As shown in Figure 5.3, as a result of the ratio analysis on the balance sheet data of Ereğli Iron & Steel Inc.,

Receivables Turnover, collects Ereğli Iron & Steel Inc.'s receivables for the 2011-2012 period on average 8.5 times. It collects an average of 6.33 times in 2013-2016. The enterprise is extending the maturity date of its receivables in the last 4 years.

Debt Collection , Ereğli Iron & Steel Inc. has a debt collection of 43 days during 2011-2012. The debt collection between the years 2013 and 2016 is 57 days. The enterprise tried to protect the sales volume by extending the maturity date in the last 4 years. Therefore, the enterprise has increased its sales figure.

Inventory Turnover , Ereğli Iron & Steel Inc.'s inventory turnover rate during 2011-2016 is low. This means that the enterprise keeps does not a lot of inventory.

Inventory Turnover Period, Ereğli Iron & Steel Inc. has a stock inventory turnover period of 147 days between 2011 and 2016. The enterprise stock with an average of 2.44 times and does not have a good sales volume. The enterprise should review its sales policy and the maturity.

Asset Turnover , when the asset turnover rate of Ereğli Iron & Steel Inc. was analysed between 2011 and 2016, and the asset turnover was low since it is an industrial enterprise and its non-current assets are high.

Return on Equity (ROE), Net Margin, and Gross Margin for Ereğli Iron & Steel Inc. are given in Table 5.1 and are graphically shown in Figure 5.4 .

	2011	2012	2013	2014	2015	2016
Return on Equity (ROE)	0,14	0,07	0,11	0,16	0,09	0,10
Net Margin	0,11	0,05	0,09	0,14	0,09	0,13
Gross Margin	0,23	0,11	0,19	0,21	0,17	0,21
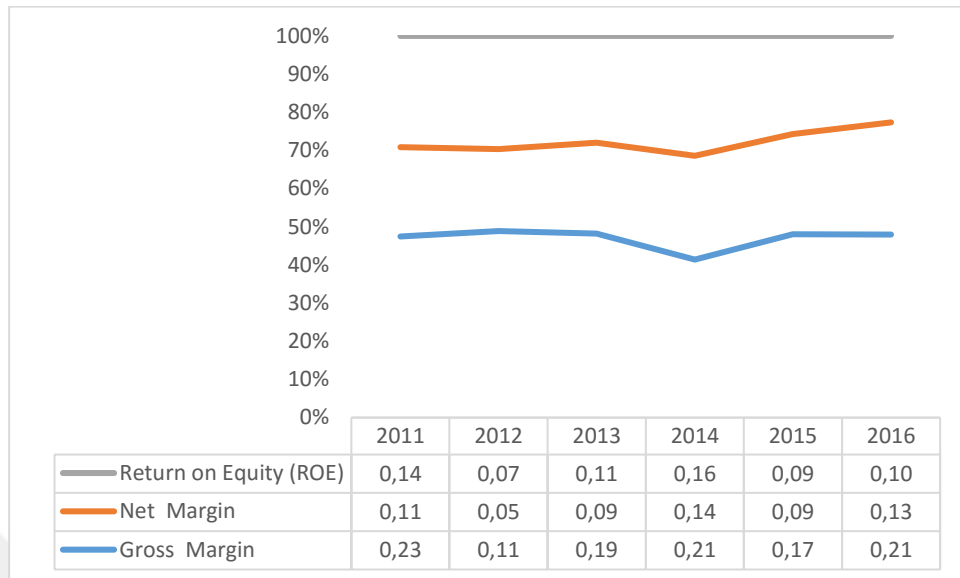
Figure 5.4: Ereğli Iron & Steel Inc.'s Profitability Rates

As seen in Figure 5.4, as a result of the analysis on the basis of the balance sheet data of Ereğli Iron & Steel Inc..

Return on Equity (ROE) Ereğli Iron & Steel Inc. has not had a good management policy for the last three years but it seems that the governance policy in 2014 is slightly better.

Gross Margin, Ereğli Iron & Steel Inc. shows the tendency of snowy marginal decline in the years of 2011-2016. This shows that the competitiveness of the business is gradually declining.

Net Margin, Ereğli Iron & Steel Inc. has not had a good profit margin in the years 2011-2016. The entity transfers non-current assets investment expenditures of approximately 50% of its current assets.

5.2. Kardemir Iron & Steel Inc.'s Ratio Analysis

In this section, the financial statements of Kardemir Iron & Steel Inc. will be analyzed by ratio analysis.

Annex-2 the ratio analysis of Kardemir Iron & Steel Inc. for six (6) years in Table A.1 is included in Annex-2 Tables A.1A, B, C, D, E.

Kardemir Iron & Steel Inc.'s current ratio, acid-test rate and cash ratio table are given in Annex-2 A.2 and are shown graphically in Figure 5.5.

	2011	2012	2013	2014	2015	2016
Current rate	1,63	1,75	1,33	1,42	1,09	1,00
Acid Test Rate	0,63	0,69	0,57	0,62	0,51	0,56
Cash Ratio	2,08	2,43	1,78	1,74	1,49	1,18
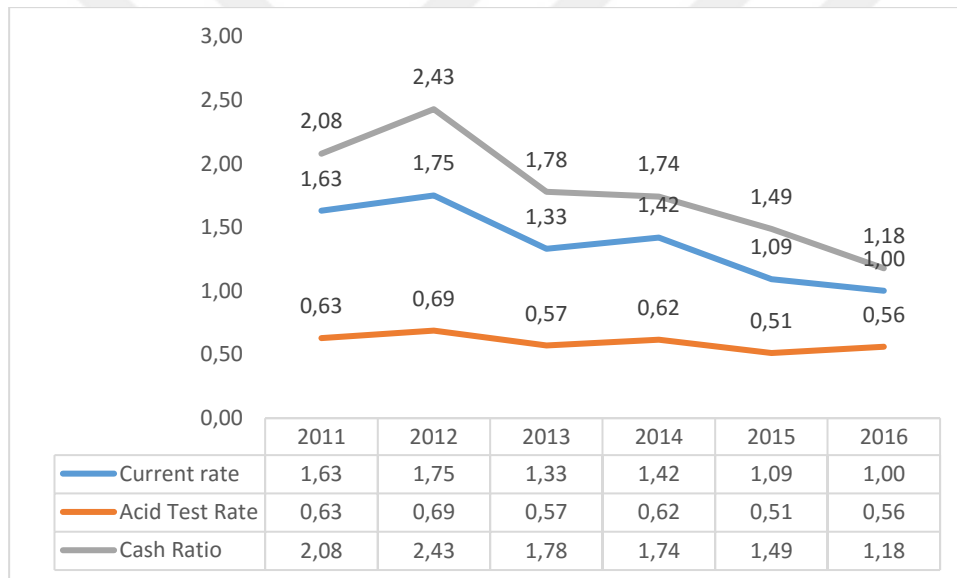
Figure 5.5: Kardemir Iron & Steel Inc.'s Liquidity Ratios

The current ratio, has shown a tendency in Kardemir Iron & Steel Inc. to be below 2, which is the required ratio in the developed countries over the years but countries with high inflation and scarce funding resources, such as our country, 1.5 ratio is considered to be sufficient. The ratio is good in the first two years but show a declining trend in the following years.

Acid-test rate, has shown a trend below 1 in Kardemir Iron & Steel Inc., which is the required rate for developed countries but as it is mentioned above in countries with high inflation and scarce funding resources, such as our country, the rate may be low.

It appears that Kardemir Iron & Steel Inc. needs to improve its sales and have a better management policy.

Cash Ratio, Kardemir Iron & Steel Inc. provides a reliable business image in a crisis environment with a high cash rate but it is necessary to convert idle cash into an advantage for business. With a high cash rate, in the first two years, cash was not managed well, but in the following years cash was turned into advantage.

Kardemir Iron & Steel Inc.'s Interest Coverage Ratio, Leverage Factor and Leverage(Debt) Rate are given in Table 5.6 in Graphic A.2 of Annex-2..

	2011	2012	2013	2014	2015	2016
Leverage (Debt) Rate	0,41	0,47	0,52	0,56	0,54	0,60
Leverage Factor	0,69	0,90	1,08	1,25	1,19	1,53
Interest Coverage Ratio	3,73	6,18	1,72	3,61	0,94	0,72
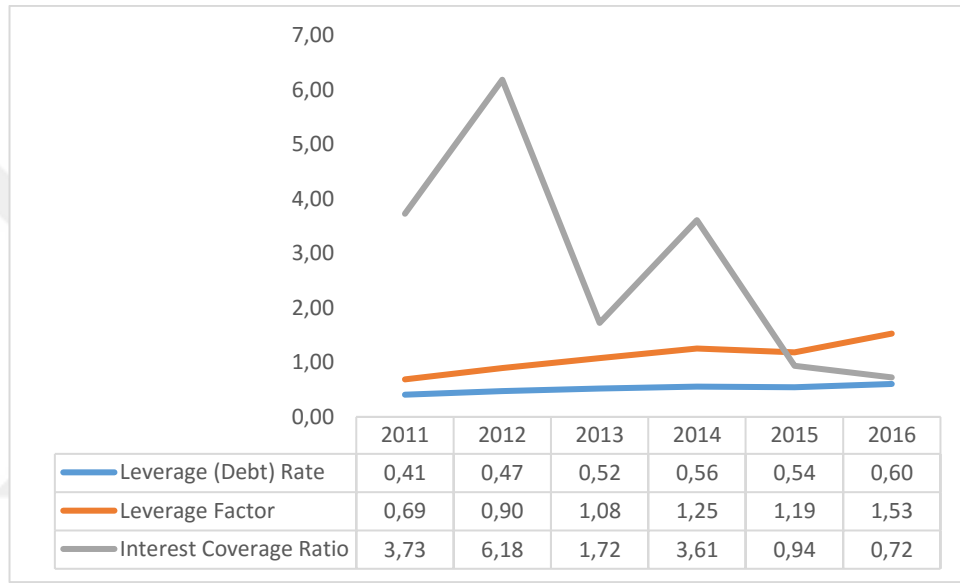
Figure 5.6: Kardemir Iron & Steel Inc.'s Financial Structure Rates

Interest Coverage Ratio, The interest coverage ratio of Kardemir Iron & Steel Inc.'s the risk of financing have decreased significantly over the years.

Leverage Factor, In the six-year period of Kardemir Iron & Steel Inc., the debt to equity ratio is well below the generally accepted ratio. Equity has a very strong impact on operating resource structure. For this reason, the business tends to use foreign resources.

Leverage (Debt) Rate, The general accepted rate for Kardemir Iron & Steel Inc. should be 0.50 but in our country where the inflation rate is high, this ratio has increased up to 0.70. In general, we cannot say that the rate of the company is very bad by years.

Kardemir Iron & Steel Inc.'s Receivables Turnover, Debt Collection, Inventory Turnover , Inventory Turnover Period and Assets Turnover are given in Appendix A-2, Table A.2. it is located.

	2011	2012	2013	2014	2015	2016
Receivable Turnover	8,02	9,79	10,21	6,23	11,25	5,68
Debt Collection	44,89	36,77	35,26	57,78	32,00	63,38
Inventory Turnover	3,45	2,91	3,50	2,79	3,00	2,98
Inventory Turnover Period	104,35	123,71	102,86	129,03	120,00	120,81
Asset Turnover	0,95	0,78	0,70	0,62	0,43	0,41
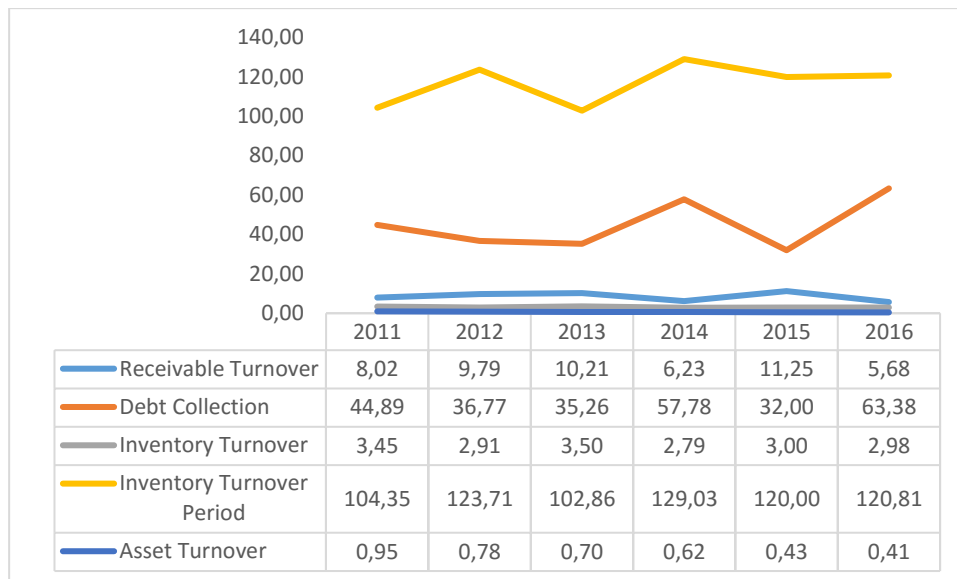
Figure 5.7 Kardemir Iron & Steel Inc.'s Operating Ratios

Receivables Turnover; Kardemir Iron & Steel Inc. collects its receivables on average 8.53 times a year between 2011 and 2016.

Debt Collection; Debt collection of Kardemir Iron & Steel Inc. between 2011 and 2016 is 45 days.

Inventory Turnover Rate; The average inventory turnover rate of Kardemir Iron & Steel Inc. between 2011 and 2016 are 3.8. The business does not have too many stock when viewed locally. Because it is closer to the source of raw materials, it keeps stock at minimum level and takes account of sales volume.

Inventory Turnover Period; The average Inventory Turnover Period of Kardemir Iron & Steel Inc. between 2011 and 2016 are 116.79 days. Company sales policy and its terms need to be reviewed.

Asset Turnover; The fact that Kardemir Iron & Steel Inc. is an industrial enterprise is the main indicator of the low rate, when it is examined between 2011 and 2016. The enterprise has an investment of goodwill between 2011 till 2014, so in these years the rate is higher than the last two years.

Gross Margin, Net Margin, Return on Equity (ROE) for Kardemir Iron & Steel Inc. are given in Table A.2 of Appendix 2 and shown graphically in Figure 5.8.

	2011	2012	2013	2014	2015	2016
Gross Margin	0,19	0,16	0,15	0,20	0,07	0,10
Net Margin	0,12	0,12	0,06	0,15	-0,01	-0,05
Return on Equity (ROE)	0,19	0,17	0,08	0,21	-0,01	-0,06
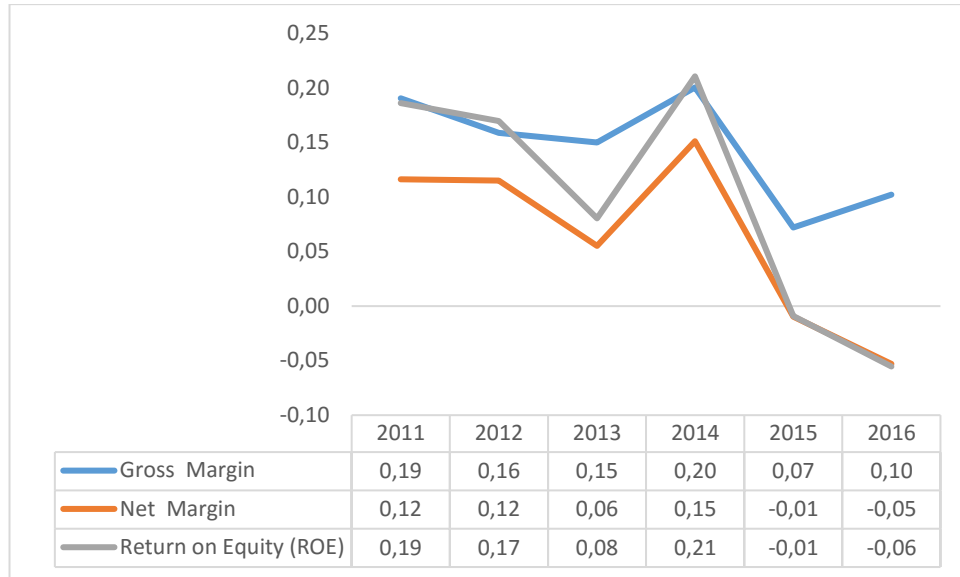
Figure 5.8: Kardemir Iron & Steel Inc.'s Profitability Ratios

Net Margin; Kardemir Iron & Steel Inc. has not achieved a good net margin between 2011 and 2016. The entity has transferred 50% of its current assets to fixed asset investment expenditures.

Gross Margin, Kardemir Iron & Steel Inc.'s gross margin in 2011-2016 shows a downward trend. This shows that the competitiveness of the business is gradually decreasing.

Return on Equity(ROE); Kardemir Iron & Steel Inc.'s return on equity rate in 2014 shows a upward trend, however has not achieved a good return on equity rate for 2011,2012,2013,2015 and 2016 years.

5.3. Performance Analysis in Financial Tables by TOPSIS Method

In this part of the study, financial table performance of Ereğli Iron & Steel Inc. and Kardemir Iron & Steel Inc. companies will be evaluated with the help of quantitative model.

In this section, financial table performance of Ereğli Iron & Steel Inc. and Kardemir Iron & Steel Inc. will be analysed by using the TOPSIS method. 14 (fourteen) variables selected for measurement of financial performance are given in Table 5.1.

Table 5.1: Performance Criteria

The Notation	Description
D_1	Current rate
D_2	Acid Test Rate
D_3	Cash Ratio
D_4	Leverage (Debt) Rate
D_5	Leverage Factor
D_6	Interest Coverage Ratio
D_7	Receivable Turnover
D_8	Debt Collection
D_9	Inventory Turnover
D_{10}	Inventory Turnover Period
D_{11}	Asset Turnover
D_{12}	Gross Margin
D_{13}	Net Margin
D_{14}	Return on Equity (ROE)

In the first step; When the performance criteria were determined, the results of the ratio analysis, which is the method of analysis in the Financial Statements were utilized. In determining the performance values, the fourteen ratios in Table 5.1, which are in accordance with the assumptions of the TOPSIS performance evaluation system, are used as variables.

Determination of the period and variables in the analysis and the size of the decision matrix is also determined as with analysis. In line with this information, the number of columns of the decision matrix in the study is 14 (fourteen ratios determined as performance criterion) and the number of lines is also 12 (the period of 2011-2016 of the two firms whose economic performance will be measured). Table 5.2 contains the data to be used as variables in the analysis.

Table 5.2: Values of Performance Variables by Years

	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir
Current rate	2,43	2,08	2,43	2,37	3,06	2,62	1,63	1,75	1,33	1,42	1,09	1,00
Acid Test Rate	0,93	1,03	1,01	1,31	1,78	1,59	0,63	0,69	0,57	0,62	0,51	0,56
Cash Ratio	3,44	2,72	3,10	2,86	3,67	3,15	2,08	2,43	1,78	1,74	1,49	1,18
Leverage (Debt) Rate	0,46	0,44	0,38	0,35	0,33	0,34	0,41	0,47	0,52	0,56	0,54	0,60
Leverage Factor	0,85	0,77	0,61	0,55	0,49	0,51	0,69	0,90	1,08	1,25	1,19	1,53
Interest Coverage Ratio	2,09	2,16	4,20	8,63	7,08	9,37	3,73	6,18	1,72	3,61	0,94	0,72
Receivable Turnover	7,81	9,14	5,72	6,54	7,30	5,77	8,02	9,79	10,21	6,23	11,25	5,68
Debt Collection	46,09	39,39	62,94	55,05	49,32	62,39	44,89	36,77	35,26	57,78	32,00	63,38
Inventory Turnover	1,89	3,00	2,34	2,78	3,04	2,15	3,45	2,91	3,50	2,79	3,00	2,98
Inventory Turnover Period	190,48	120,00	153,85	129,50	118,42	167,44	104,35	123,71	102,86	129,03	120,00	120,81
Asset Turnover	0,67	0,73	0,70	0,72	0,64	0,49	0,95	0,78	0,70	0,62	0,43	0,41
Gross Margin	0,23	0,11	0,19	0,21	0,17	0,21	0,19	0,16	0,15	0,20	0,07	0,10
Net Margin	0,11	0,05	0,09	0,14	0,09	0,13	0,12	0,12	0,06	0,15	-0,01	-0,05
Return on Equity (ROE)	0,14	0,07	0,11	0,16	0,09	0,10	0,19	0,17	0,08	0,21	-0,01	-0,06

In the course of determining the performance values, fourteen different macroeconomic variables have been determined in accordance with the assumptions of the TOPSIS performance evaluation method. By determining the periods and the variables to be used, the size of the decision matrix is determined.

$$R_{m \times n} = [R_{ij}] = \begin{bmatrix} r_{11} & r_{12} & r_{13} & \dots & r_{1n} \\ r_{21} & r_{22} & r_{23} & \dots & r_{2n} \\ \dots & \dots & \dots & \dots & \dots \\ r_{m1} & r_{m2} & r_{m3} & \dots. & r_{mn} \end{bmatrix}$$

$i \in \{1, 2, \dots, m\}$ and $j \in = \{1, 2, \dots, n\}$ to be; $r_{ij} = \dfrac{a_{ij}}{\sqrt[2]{\Sigma_{k=1}^{m} a_{kj}^2}}$.

While the decision matrix, Which is called the initial matrix, contains the desicion points to be ranked for excellence in the rows, there are evaluation factors to be used in decision making in the columns. The decision matrix is shown as follows.

The decision matrix is given in Table 5.3 .

In the second step; Standard Decision Matrix is established. In this step, the decision matrix is normalized and a standard decision matrix is obtained. The Normalized decision matrix is given in Table 5.4 .

Table 5.3: Standard Decision Matrix

Indicator	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir	Sum	SQRT
Current rate	5,92	4,32	5,89	5,63	9,36	6,85	2,66	3,06	1,77	2,01	1,19	1,00	49,68	7,05
Acid Test Rate	0,86	1,06	1,02	1,72	3,18	2,52	0,40	0,47	0,33	0,38	0,26	0,32	12,52	3,54
Cash Ratio	11,82	7,38	9,63	8,16	13,49	9,90	4,32	5,90	3,17	3,03	2,21	1,39	80,42	8,97
Leverage (Debt) Rate	0,21	0,19	0,14	0,12	0,11	0,11	0,17	0,22	0,27	0,31	0,29	0,37	2,52	1,59
Leverage Factor	0,72	0,60	0,37	0,30	0,24	0,26	0,47	0,81	1,16	1,57	1,41	2,33	10,24	3,20
Interest Coverage Ratio	4,35	4,67	17,65	74,44	50,14	87,77	13,89	38,25	2,97	13,03	0,87	0,53	308,57	17,57
Receivable Turnover	61,05	83,51	32,77	42,73	53,26	33,29	64,40	95,81	104,32	38,80	126,51	32,24	768,68	27,73
Debt Collection	2124,73	1551,36	3961,07	3030,05	2431,98	3892,72	2014,91	1352,20	1243,24	3339,10	1024,00	4017,06	29982,41	173,15
Inventory Turnover	3,56	8,99	5,48	7,71	9,26	4,64	11,87	8,44	12,28	7,79	8,99	8,89	97,90	9,89
Inventory Turnover Period	36281,18	14400,00	23668,64	16769,32	14023,55	28036,78	10888,47	15304,50	10579,59	16649,32	14400,00	14593,94	215595,28	464,32
Asset Turnover	0,44	0,53	0,49	0,52	0,41	0,24	0,90	0,60	0,49	0,38	0,19	0,17	5,36	2,32
Gross Margin	0,05	0,01	0,04	0,05	0,03	0,05	0,04	0,03	0,02	0,04	0,01	0,01	0,36	0,60
Net Margin	0,01	0,00	0,01	0,02	0,01	0,02	0,01	0,01	0,00	0,02	0,00	0,00	0,13	0,35
Return on Equity (ROE)	0,02	0,00	0,01	0,03	0,01	0,01	0,03	0,03	0,01	0,04	0,00	0,00	0,20	0,45

Table 5.4: Normalized Decision Matrix

Indicator	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir
Current rate	0,35	0,29	0,34	0,34	0,43	0,37	0,23	0,25	0,19	0,20	0,16	0,14
Acid Test Rate	0,26	0,29	0,29	0,37	0,50	0,45	0,18	0,19	0,16	0,17	0,14	0,16
Cash Ratio	0,38	0,30	0,35	0,32	0,41	0,35	0,23	0,27	0,20	0,19	0,17	0,13
Leverage (Debt) Rate	0,29	0,27	0,24	0,22	0,21	0,21	0,26	0,30	0,33	0,35	0,34	0,38
Leverage Factor	0,53	0,49	0,39	0,34	0,31	0,32	0,43	0,57	0,68	0,79	0,75	0,96
Interest Coverage Ratio	1,31	1,36	2,65	5,43	4,46	5,90	2,35	3,90	1,09	2,27	0,59	0,46
Receivable Turnover	4,92	5,76	3,61	4,12	4,60	3,63	5,05	6,17	6,43	3,92	7,08	3,58
Debt Collection	29,03	24,81	39,64	34,67	31,06	39,30	28,27	23,16	22,21	36,40	20,16	39,92
Inventory Turnover	1,19	1,89	1,47	1,75	1,92	1,36	2,17	1,83	2,21	1,76	1,89	1,88
Inventory Turnover Period	119,98	75,58	96,90	81,57	74,59	105,47	65,73	77,92	64,79	81,27	75,58	76,09
Asset Turnover	0,42	0,46	0,44	0,45	0,40	0,31	0,60	0,49	0,44	0,39	0,27	0,26
Gross Margin	0,15	0,07	0,12	0,13	0,11	0,13	0,12	0,10	0,09	0,13	0,05	0,06
Net Margin	0,07	0,03	0,06	0,09	0,06	0,08	0,07	0,07	0,03	0,10	-0,01	-0,03

In the third step; When the TOPSIS method is applied, some weights are given to the variables. When these weights are given, the importance of the variables, the effect in our choice, plays an important role.

The following equations are provided by expressing the random variable X_i used in the application and the variable R_i indicating the performance value of the country.

$$R_j = w_1X_{1j} + w_2X_{2j} + w_3X_{3j} \dots + w_{14}X_{14j}$$

The significance levels (w_i) of the variables used for the analysis are assumed to be equal because of the uncertainty ($w_1=w_2=\dots=w_{14}=0.0714$). This will affect the results of the analysis of these significance levels in the analysis work done, which will ensure that different results are obtained.

$$W_{m \times n} = [w_{ij}] = \begin{bmatrix} w_1r_{11} & w_2r_{12} & w_3r_{13} & \dots & w_nr_{1n} \\ w_1r_{21} & w_2r_{22} & w_3r_{23} & \dots & w_nr_{2n} \\ \dots & \dots & \dots & \dots & \dots \\ w_1r_{m1} & w_2r_{m2} & w_3r_{m3} & \dots & w_nr_{mn} \end{bmatrix}$$

$$w_1 + w_2 + \dots + w_n = 1$$

These step, firstly,weights related to evaluation criteria are determined. Then the elements in each column of the matrix are multiplied by the corresponding weight value to form a Weighted Standard Decision matrix.

Table 5.5: Weighted Standard Decision Matrix

Indicator weights	Indicator	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir
0,07	**Current rate**	0,02	0,02	0,02	0,02	0,03	0,03	0,02	0,02	0,01	0,01	0,01	0,01
0,07	**Acid Test Rate**	0,02	0,02	0,02	0,03	0,04	0,03	0,01	0,01	0,01	0,01	0,01	0,01
0,07	**Cash Ratio**	0,03	0,02	0,02	0,02	0,03	0,03	0,02	0,02	0,01	0,01	0,01	0,01
0,07	**Leverage (Debt) Rate**	0,02	0,02	0,02	0,02	0,01	0,02	0,02	0,02	0,02	0,03	0,02	0,03
0,07	**Leverage Factor**	0,04	0,03	0,03	0,02	0,02	0,02	0,03	0,04	0,05	0,06	0,05	0,07
0,07	**Interest Coverage Ratio**	0,09	0,10	0,19	0,39	0,32	0,42	0,17	0,28	0,08	0,16	0,04	0,03
0,07	**Receivable Turnover**	0,35	0,41	0,26	0,29	0,33	0,26	0,36	0,44	0,46	0,28	0,51	0,26
0,07	**Debt Collection**	2,07	1,77	2,83	2,48	2,22	2,81	2,02	1,65	1,59	2,60	1,44	2,85
0,07	**Inventory Turnover**	0,08	0,13	0,11	0,12	0,14	0,10	0,16	0,13	0,16	0,13	0,13	0,13
0,07	**Inventory Turnover Period**	8,57	5,40	6,92	5,83	5,33	7,53	4,69	5,57	4,63	5,81	5,40	5,44
0,07	**Asset Turnover**	0,03	0,03	0,03	0,03	0,03	0,02	0,04	0,03	0,03	0,03	0,02	0,02
0,07	**Gross Margin**	0,01	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,00	0,00
0,07	**Net Margin**	0,01	0,00	0,00	0,01	0,00	0,01	0,01	0,01	0,00	0,01	0,00	0,00
0,07	**Return on Equity (ROE)**	0,01	0,00	0,00	0,01	0,00	0,00	0,01	0,01	0,00	0,01	0,00	0,00

In the fourth step; Along with the weighted standard decision matrix, there are positive (P^+) and negative (P^-) solution clusters. The elements of the positive and negative solution clusters are constructed by calculating the maximum and minimum values of each column of the weighted standard decision matrix. The positive ideal set of solutions(P^+), is calculated by weighted standard decision matrix.

$$P^+ = \left\{ w_1^+ = \max_{i=\{1,2,\ldots,m\}} w_{i1}, w_2^+ = \max_{i=\{1,2,\ldots,m\}} w_{i2}, \ldots, w_n^+ = \max_{i=\{1,2,\ldots,m\}} w_{in} \right\}$$

The negative ideal set of solutions is calculated by means of a set of weighted standard decision matrix (P^-)

$$P^- = \left\{ w_1^- = \min_{j=\{i,2,\ldots,m\}} w_{i1}, w_1^- = \min_{i=\{1,2,\ldots,m\}} w_{i2}, \ldots, w_1^- = \min_{i=\{1,2,\ldots,m\}} w_{in} \right\}$$

Positive The largest values of the column values in the Weighted Standard Decision matrix are selected so that the ideal solution set can be generated. The ideal solution set is shown in the following form. Negative the minimum values of the column values in the Weighted Standard Decision matrix are selected so that the ideal solution set can be generated. The ideal solution set is shown in the following form.

Table 5.6: Positive and Negative Ideal Solution Set (**P +** & **P−**)

Indicator	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir	A positive	A negative
Current rate	0,02	0,02	0,02	0,02	0,03	0,03	0,02	0,02	0,01	0,01	0,01	0,01	0,03	0,01
Acid Test Rate	0,02	0,02	0,02	0,03	0,04	0,03	0,01	0,01	0,01	0,01	0,01	0,01	0,04	0,01
Cash Ratio	0,03	0,02	0,02	0,02	0,03	0,03	0,02	0,02	0,01	0,01	0,01	0,01	0,03	0,01
Leverage (Debt) Rate	0,02	0,02	0,02	0,02	0,01	0,02	0,02	0,02	0,02	0,03	0,02	0,03	0,03	0,01
Leverage Factor	0,04	0,03	0,03	0,02	0,02	0,02	0,03	0,04	0,05	0,06	0,05	0,07	0,07	0,02
Interest Coverage Ratio	0,09	0,10	0,19	0,39	0,32	0,42	0,17	0,28	0,08	0,16	0,04	0,03	0,42	0,03
Receivable Turnover	0,35	0,41	0,26	0,29	0,33	0,26	0,36	0,44	0,46	0,28	0,51	0,26	0,51	0,26
Debt Collection	2,07	1,77	2,83	2,48	2,22	2,81	2,02	1,65	1,59	2,60	1,44	2,85	2,85	1,44
Inventory Turnover	0,08	0,13	0,11	0,12	0,14	0,10	0,16	0,13	0,16	0,13	0,13	0,13	0,16	0,08
Inventory Turnover Period	8,57	5,40	6,92	5,83	5,33	7,53	4,69	5,57	4,63	5,81	5,40	5,44	8,57	4,63
Asset Turnover	0,03	0,03	0,03	0,03	0,03	0,02	0,04	0,03	0,03	0,03	0,02	0,02	0,04	0,02
Gross Margin	0,01	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,00	0,00	0,01	0,00
Net Margin	0,01	0,00	0,00	0,01	0,00	0,01	0,01	0,01	0,00	0,01	0,00	0,00	0,01	0,00
Return on Equity (ROE)	0,01	0,00	0,00	0,01	0,00	0,00	0,01	0,01	0,00	0,01	0,00	0,00	0,01	0,00

In the fiveth step; The cluster consisting of positive ideal solution distance is called (S^+) and the cluster consisting of negative ideal solution distance (S^-). The values obtained from these two clusters reach to the (C) cluster which is composed of the relative solution values of the ideal solution. During the sorting process, the highest priority is the C value.

$$S^+ = \{S_1^+, S_2^+, \dots, S_m^+\}$$

$$i = \{1, 2, \dots, m\} \text{ to be, } S_i^+ = \sqrt{\sum_{j=1}^{n}(w_{1j} - w_j^+)^2} \,.$$

$$S^- = \{S_1^-, S_2^-, \dots, S_m^-\}$$

$$i = \{1, 2, \dots, m\} \text{ to be, } S_i^- = \sqrt{\sum_{j=1}^{n}(w_{1j} - w_j^-)^2}.$$

In the TOPSIS method, the evaluation factor value for each decision point has deviations from the positive ideal and negative ideal solution set.

Table 5.7: The closeness to positive and negative ideal solution cluster

S Positive	S Negative
0.8619	3.9945
3.3668	0.8585
1.6844	2.6881
2.7780	1.6254
3.3098	1.0903
1.0692	3.2350
3.9744	0.6132
3.2378	1.0119
4.1548	0.2674
2.7975	1.6593
3.4920	0.8132
3.1689	1.6279

In the sixth step: Positive ideal and negative ideal difference measures are used to calculate the ideal resolving relative proximity of each of the decision points.

$$C = \{C_1, C_2, \ldots, C_m\}$$

k={1, 2, …, m} to be, $C_k = \frac{S_k^-}{S_k^- + S_k^+}$.

For each k value, $0 \leq C_k \leq 1$ equals. In other words, if k is 1, it is the positive ideal solution of the corresponding decision point, 0 is the negative ideal solution of the corresponding decision point.

Table 5.8: TOPSIS Ranking

R&D TOPSIS Ranking	Country	Closeness to Ideal solution
1	2011 Ereğli	0.82253
2	2016 Ereğli	0.75160
3	2013 Ereğli	0.61477
4	2014 Kardemir	0.37232
5	2014 Ereğli	0.36913
6	2016 Kardemir	0.33937
7	2015 Ereğli	0.24778
8	2012 Kardemir	0.23812
9	2012 Ereğli	0.20318
10	2015 Kardemir	0.18890
11	2011 Kardemir	0.13366
12	2013 Kardemir	0.06048

As seen in Table 5.8, it is generally observed that the financial statements of Ereğli Iron & Steel company are better than the financial statements of Kardemir Iron & Steel company. The best financial performance of 2011 belongs to the financial statements of Ereğli Iron & Steel company. Kardemir Iron & Steel company is the last place in the order. According to the results of the analysis, it is observed that the economic crisis experienced in 2012 affected Ereğli Iron & Steel company most. When it comes to 2013, Ereğli Iron & Steel company has improved its financing, however Kardemir Iron & Steel company is still observed to be affect by the crisis.
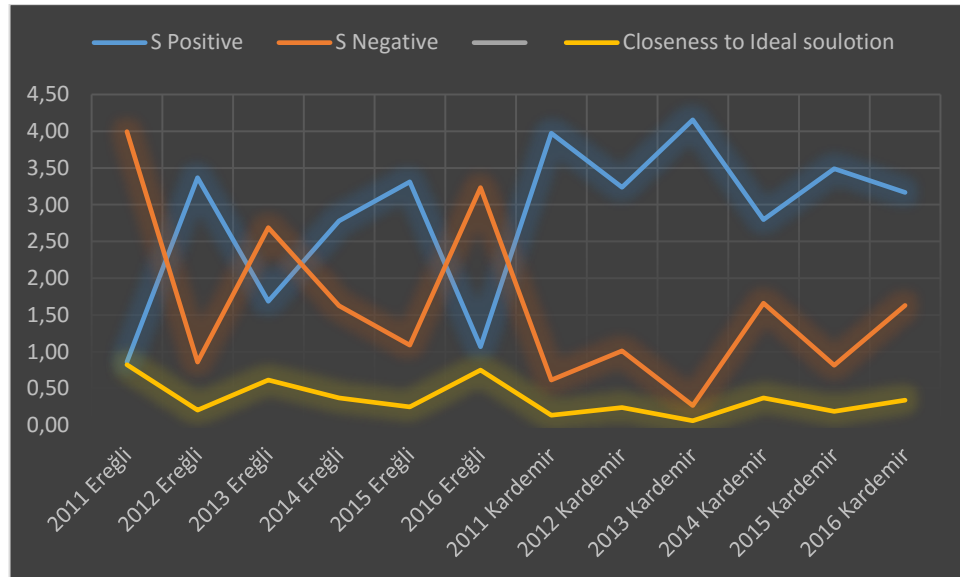
Figure 5.9: TOPSIS Ranking

Figure 5.9 shows the result of TOPSIS analysis, (Table 5.7 and Table 5.8) are scattered on the graph.

5.4. Performance Analysis in Financial Tables by GRA

Grey Relationship Analysis (GRA) is one of the multi-criteria decision making methods such as the TOPSIS method and is used for similar purposes by the TOPSIS method. The Grey System Theory, developed as a new system by Deng in 1982, focuses on the direction of the relationship of two or more components built on unknown (Feng-Wang, 2000:136).

When the literature studies in the fourth chapter are examined GRAY analysis it was observed that the TOPSIS method used for similar purposes.

As we mentioned earlier, the Gray relational analysis method consists of six steps. In this study, the analysis in the TOPSIS method of working fort he GRAY analysis method will use the exact same variables used for the TOPSIS analysis.

In the first step; Creating the Decision Matrix

$$X_{n \times m} = [X_{ij}] = \begin{bmatrix} X_{11} & X_{12} & X_{13} & \ldots & X_{1m} \\ X_{21} & X_{22} & X_{23} & \ldots & X_{2m} \\ \ldots & \ldots & \ldots & \ldots & \ldots \\ X_{n1} & X_{n2} & X_{n3} & \ldots & X_{nm} \end{bmatrix}$$

In the equation $X_{m \times n}$, m represents the number of variables, and n represents the year. It is assumed that there are 'm' number of alternatives in the decision matrix, and 'n' number of criteria. The Decision Matrix of the Table 5.2 used in the TOPSIS method is used for in this analysis method. For this reason, the table has not been given here again.

In the second step; Reference Series and Comparison Matrix Creating

Here, the reference series and the comparison matrix are constructed. The reference series can be created by setting the values that would be an ideal alternative, or among the available alternatives, it can be determined by using the best scores for each criterion. The comparison matrix is reached by adding the first line of reference series in the decision matrix created in the previous step.

$$RS = (RS_1, RS_2, RS_3, RS_4, RS_5, RS_6)$$

$$RS_j = \max_{i=1}^{n} \{x_{ij}\}, \quad RS_j = \min_{i=1}^{n} \{x_{ij}\}$$

The reference series is written on the first line of the decision matrix. The reference series is calculated by the above formulations. The reference series constitute the decision matrix through the values making the maximum and minimum. In this view, a comparison matrix is formed. Table 5.9 shows the reference series belonging to the analysis.

Table 5.9: Reference Series

Variables	Reference Series
Current rate	3.05877
Acid Test Rate	1,78426
Cash Ratio	3,67254
Leverage (Debt) Rate	0,32715
Leverage Factor	0.48622
Interest Coverage Ratio	9,36880
Receivable Turnover	11,24784
Debt Collection	32,00000
Inventory Turnover	3,50383
Inventory Turnover Period	102,85714
Asset Turnover	0,94708
Gross Margin	0,23229
Net Margin	0.15119
Return on Equity (ROE)	0,21070

In the third step; Consolidation of Decision Matrix and Reference Series

$$RS_{n \times m}[x_{ij}] = \begin{bmatrix} RS_1 & RS_2 & RS_3 & \cdots & RS_n \\ x_{11} & x_{12} & x_{13} & \cdots & x_{1n} \\ x_{21} & x_{22} & x_{23} & \cdots & x_{2n} \\ \cdots & \cdots & \cdots & \cdots & \cdots \\ x_{m1} & x_{m2} & x_{m3} & \cdots & x_{mn} \end{bmatrix}$$

In this step, the reference series and the decision matrix are combined.

In the fourth step; Creating Normalized Data Matrix

The data used in this phase are normalized. The normalized data matrix is formed as follows.

$$y_{n \times m} = [y_{ik}] = \begin{bmatrix} y_n & y_2 & y_3 & \cdots & y_m \\ y_{11} & y_{12} & y_{13} & \cdots & y_{1m} \\ \cdots & \cdots & \cdots & \cdots & \cdots \\ y_{n1} & y_{n2} & y_{n3} & \cdots & y_{nm} \end{bmatrix}$$

$$y_{ik} = \frac{x_{ik} - \min\limits_{i=1}^{n}\{x_{ik}\}}{\max\limits_{i=1}^{n}\{x_{ik}\} - \min\limits_{i=1}^{n}\{x_{ik}\}}$$

$$y_{ik} = \frac{\max\limits_{i=1}^{n}\{x_{ik}\} - x_{ik}}{\max\limits_{i=1}^{n}\{x_{ik}\} - \min\limits_{i=1}^{n}\{x_{ik}\}}$$

In this step, the final state of the decision matrix combined with the reference series is normalized. The calculated Normalize data matrix is given in Table 5.10 .

Table 5.10: Normalize Data Matrix

	X	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir
Current rate	1	0,6962	0,5230	0,6930	0,6670	1,00	0,7855	0,3057	0,3641	0,1598	0,2030	0,0443	0,00
Acid Test Rate	1	0,3266	0,4053	0,3910	0,6290	1,00	0,8458	0,0916	0,1384	0,0457	0,0814	0,00	0,0394
Cash Ratio	1	0,9062	0,6168	0,7720	0,6732	1,00	0,7893	0,3615	0,5014	0,2413	0,2261	0,1240	0,00
Leverage (Debt) Rate	1	0,5200	0,6086	0,8108	0,9071	1,00	0,9613	0,7089	0,4731	0,3086	0,1730	0,2224	0,00
Leverage Factor	1	0,6549	0,7256	0,8794	0,9432	1,00	0,9769	0,8055	0,6044	0,4316	0,2625	0,3273	0,00
Interest Coverage Ratio	1	0,1575	0,1662	0,4022	0,9143	0,7353	1,0000	0,3473	0,6316	0,1156	0,3338	0,0243	0,00
Receivable Turnover	1	0,3834	0,6213	0,0084	0,1542	0,2909	0,0165	0,4214	0,7379	0,8144	0,099	1,00	0,00
Debt Collection	1	0,5508	0,7646	0,0141	0,2656	0,4482	0,0315	0,5893	0,8479	0,8961	0,1783	1,00	0,00
Inventory Turnover	1	0,0000	0,6877	0,2810	0,5498	0,7152	0,1651	0,9638	0,6301	1,00	0,5591	0,6868	0,6766
Inventory Turnover Period	1	0,0000	0,8043	0,4181	0,6960	0,8224	0,2629	0,9830	0,7620	1,00	0,7013	0,8043	0,7952
Asset Turnover	1	0,4739	0,5902	0,5315	0,5761	0,4237	0,1477	1,0000	0,6812	0,5395	0,3839	0,0395	0,00
Gross Margin	1	1,0000	0,2210	0,7364	0,8755	0,6294	0,8751	0,7386	0,5412	0,4865	0,8017	0,00	0,1876
Net Margin	1	0,8198	0,4908	0,7202	0,9425	0,7223	0,8978	0,8297	0,8235	0,5301	1,0000	0,2126	0,0000
Return on Equity (ROE)	1	0,7440	0,4532	0,6227	0,8135	0,5565	0,5853	0,9079	0,8465	0,5106	1,0000	0,1738	0,0000

In the fiveth step; Creation of the Absolute Value Matrix

In this step, the difference between the reference series and the sequence values is taken into account and the coefficient of difference is calculated and the absolute value matrix is formed. The absolute value matrix is shown with the equals help of $z_{n+1 \times m} = [z_{ik}]$ equation.

$$z_{n+1 \times m} = [z_{ik}] = \begin{bmatrix} y_n & y_2 & y_3 & \cdots & y_m \\ z_{11} & z_{12} & z_{13} & \cdots & z_{1m} \\ \cdots & \cdots & \cdots & \cdots & \cdots \\ z_{n1} & z_{n2} & z_{n3} & \cdots. & z_{nm} \end{bmatrix}$$

The absolute value matrix is given in Table 5.11 .

Table 5.11: Absolute Value Matrix

	X	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir
Current rate	1	0.3038	0.4770	0.3070	0.3330	0.0000	0.2145	0.6943	0.6359	0.8402	0.7970	0.9557	1.0000
Acid Test Rate	1	0.6734	0.5947	0.6090	0.3710	0.0000	0.1542	0.9084	0.8616	0.9543	0.9186	1.0000	0.9606
Cash Ratio	1	0.0938	0.3832	0.2280	0.3268	0.0000	0.2107	0.6385	0.4986	0.7587	0.7739	0.8760	1.0000
Leverage (Debt) Rate	1	0.4800	0.3914	0.1892	0.0929	0.0000	0.0387	0.2911	0.5269	0.6914	0.8270	0.7776	1.0000
Leverage Factor	1	0.3451	0.2744	0.1206	0.0568	0.0000	0.0231	0.1945	0.3956	0.5684	0.7375	0.6727	1.0000
Interest Coverage Ratio	1	0.8425	0.8338	0.5978	0.0857	0.2647	0.0000	0.6527	0.3684	0.8844	0.6662	0.9757	1.0000
Receivable Turnover	1	0.6166	0.3787	0.9916	0.8458	0.7091	0.9835	0.5786	0.2621	0.1856	0.9010	0.0000	1.0000
Debt Collection	1	0.4492	0.2354	0.9859	0.7344	0.5518	0.9685	0.4107	0.1521	0.1039	0.8217	0.0000	1.0000
Inventory Turnover	1	1.0000	0.3123	0.7190	0.4502	0.2848	0.8349	0.0362	0.3699	0.0000	0.4409	0.3132	0.3234
Inventory Turnover Period	1	1.0000	0.1957	0.5819	0.3040	0.1776	0.7371	0.0170	0.2380	0.0000	0.2987	0.1957	0.2048
Asset Turnover	1	0.5261	0.4098	0.4685	0.4239	0.5763	0.8523	0.0000	0.3188	0.4605	0.6161	0.9605	1.0000
Gross Margin	1	0.0000	0.7790	0.2636	0.1245	0.3706	0.1249	0.2614	0.4588	0.5135	0.1983	1.0000	0.8124
Net Margin	1	0.1802	0.5092	0.2798	0.0575	0.2777	0.1022	0.1703	0.1765	0.4699	0.0000	0.7874	1.0000
Return on Equity (ROE)	1	0.2560	0.5468	0.3773	0.1865	0.4435	0.4147	0.0921	0.1535	0.4894	0.0000	0.8262	1.0000

In the sixth step; Creation of GRA Coefficient Matrix

In order to form this matrix, except for the first line of the absolute value matrix calculated in the previous steps and z matrix, and maximum and minimum values for each column must be calculated. In addition, the weight coefficient in this matrix is calculated just as in the TOPSIS method.

$$K_{n \times m} = [K_{ij}] = \begin{bmatrix} k_{11} & k_{12} & k_{13} & ... & k_{1m} \\ k_{21} & k_{22} & k_{23} & ... & k_{2m} \\ ... & ... & ... & ... & ... \\ k_{n1} & k_{n2} & k_{n3} & .... & k_{nm} \end{bmatrix}$$

$$k_{ij} = \frac{z_j^{\mp 0,5} z_j^+}{z_{ij} + 0,5 \, z_j^+}$$

i= 1, -n ve j= 1, -m.

$$z_j^+ = \max_{i=1}^{n} \{z_{ik}\}$$

$$z_j^- = \min_{i=1}^{n} \{z_{ik}\}$$

$$w_1 \times k_{11} + w_2 \times k_{12} + \cdots + w_m \times k_{1m}$$

$$\cdots$$

$$w_n \times k_{n1} + w_{n2} \times k_{n2} + \cdots + w_{nm} \times k_{nm}$$

$$\dot{\Gamma}_i = \sum_{j=1}^{m} k_{ij} w_j$$

i= 1, -n

To summarize is the maximum value in the previous mathematical formula is written in max, the minimum value in min. In the weight column, one dividied by variables' number, so $\frac{1}{14} = 0,07$ is written. The values in the other columns are obtained as the result of dividing the variable by the maximum and minimum values of the previous mathematical value.

The coefficient matrix obtained as the result of the analysis with the GIA model is given in Table 5.12 and the performance results are given in Table 5.13 .

Table 5.12: GIA Coefficient Matrix

Mak	Min	Weight	2011 Ereğli	2012 Ereğli	2013 Ereğli	2014 Ereğli	2015 Ereğli	2016 Ereğli	2011 Kardemir	2012 Kardemir	2013 Kardemir	2014 Kardemir	2015 Kardemir	2016 Kardemir
1	0	0.0714	0.6221	0.5118	0.6196	0.6002	1.0000	0.6998	0.4187	0.4402	0.3731	0.3855	0.3435	0.3333
1	0	0.0714	0.4261	0.4567	0.4509	0.5741	1.0000	0.7643	0.3550	0.3672	0.3438	0.3524	0.3333	0.3423
1	0	0.0714	0.8420	0.5661	0.6868	0.6047	1.0000	0.7036	0.4392	0.5007	0.3972	0.3925	0.3634	0.3333
1	0	0.0714	0.5102	0.5609	0.7255	0.8432	1.0000	0.9282	0.6320	0.4869	0.4197	0.3768	0.3914	0.3333
1	0	0.0714	0.5917	0.6457	0.8056	0.8980	1.0000	0.9558	0.7200	0.5583	0.4680	0.4040	0.4263	0.3333
1	0	0.0714	0.3724	0.3749	0.4555	0.8536	0.6539	1.0000	0.4338	0.5758	0.3612	0.4287	0.3388	0.3333
1	0	0.0714	0.4478	0.5690	0.3352	0.3715	0.4135	0.3370	0.4636	0.6561	0.7292	0.3569	1.0000	0.3333
1	0	0.0714	0.5268	0.6799	0.3365	0.4051	0.4754	0.3405	0.5490	0.7668	0.8280	0.3783	1.0000	0.3333
1	0	0.0714	0.3333	0.6155	0.4102	0.5262	0.6371	0.3746	0.9325	0.5748	1.0000	0.5314	0.6148	0.6072
1	0	0.0714	0.3333	0.7188	0.4621	0.6219	0.7379	0.4042	0.9671	0.6775	1.0000	0.6260	0.7188	0.7094
1	0	0.0714	0.4873	0.5496	0.5162	0.5412	0.4646	0.3697	1.0000	0.6107	0.5205	0.4480	0.3424	0.3333
1	0	0.0714	1.0000	0.3909	0.6548	0.8006	0.5743	0.8001	0.6567	0.5215	0.4934	0.7160	0.3333	0.3810
1	0	0.0714	0.7351	0.4954	0.6412	0.8968	0.6429	0.8302	0.7459	0.7391	0.5155	1.0000	0.3884	0.3333
1	0	0.0714	0.6614	0.4776	0.5699	0.7284	0.5300	0.5466	0.8445	0.7651	0.5054	1.0000	0.3770	0.3333

Table 5.13: GRA Order

	Ereğli	Kardemir
2011	0.5635	0.6541
2012	0.5438	0.5886
2013	0.5479	0.5682
2014	0.6618	0.5283
2015	0.7235	0.4980
2016	0.6468	0.3838

Table 5.13 shows the results of the analysis made according to the GRA model. This matrix is obtained by multiplying the sum of the data contained in the column and sum of the data in the weight column.
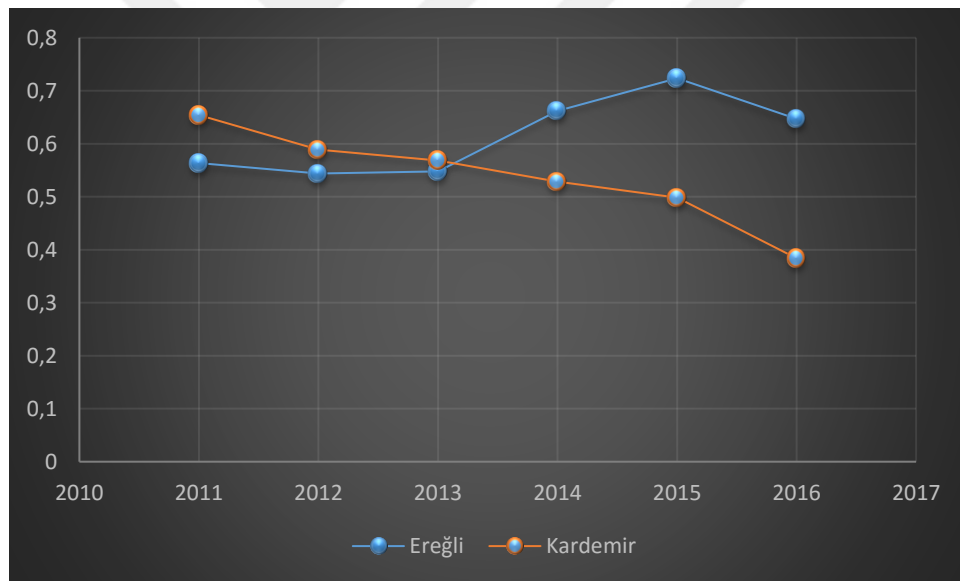
Figure 5.10: GRA Order

In Figure 5.10, the analysis results of the GRA model in Table 5.13 are presented in graphical form.

The best performance of the GRA analysis results is listed in Table 5.14 .

Table 5.14: GRA Performance Ranking

		Order
1	2015 Ereğli	0.7235
2	2014 Ereğli	0.6618
3	2011 Kardemir	0.6541
4	2016 Ereğli	0.6468
5	2012 Kardemir	0.5886
6	2013 Kardemir	0.5682
7	2011 Ereğli	0.5635
8	2013 Ereğli	0.5479
9	2012 Ereğli	0.5438
10	2014 Kardemir	0.5283
11	2015 Kardemir	0.4980
12	2016 Kardemir	0.3838

As seen in Table 5.14, it is generally observed that the financial statements of Ereğli Iron & Steel Company are better than the financial statements of Kardemir Iron & Steel Company. The best financial performance of 2015 belongs to the financial statements of Ereğli Iron & Steel Company. Kardemir Iron & Steel Comany is the last place in the order. According to the results of the analysis, it is observed that the economic crisis experienced in 2012 affects Kardemir Iron & Steel Company the most. By 2013, it is observed that Ereğli Iron & Steel Company has financed its financing, however Kardemir Iron & Steel Company can be affected by the crisis.

5.5. Comparison of Results of TOPSIS and GRA Methods

Under this heading, TOPSIS and GRA analysis results will be compared with each other. The results obtained using both analysis methods in this context are given in Table 5.15 .

Table 5.15: TOPSIS and GRA Comparison-1

		TOPSIS Order	**GRA Order**
1	2011 Ereğli	0.8225	0.5635
2	2012 Ereğli	0.2032	0.5438
3	2013 Ereğli	0.6148	0.5479
4	2014 Ereğli	0.3691	0.6618
5	2015 Ereğli	0.2478	0.7235
6	2016 Ereğli	0.7516	0.6468
7	2011 Kardemir	0.1337	0.6541
8	2012 Kardemir	0.2381	0.5886
9	2013 Kardemir	0.0605	0.5682
10	2014 Kardemir	0.3723	0.5283
11	2015 Kardemir	0.1889	0.4980
12	2016 Kardemir	0.3394	0.3838

When we examine data the comparison in Table 5.15 , it is observed that both methods of analysis are very different according to years. For in 2012, according to the TOPSIS method result of amount 0.203 found, while according to the GRA method result of amount 0.5438 found.

Table 5.16 contains a comparison table of the best-performing sequencing of both analysis methods.

Table 5.16: TOPSIS and GRA Comparison-2

	TOPSIS Order			**GRA Order**
1	2011 Ereğli	0.82253	2015 Ereğli	0.7235
2	2016 Ereğli	0.75160	2014 Ereğli	0.6618
3	2013 Ereğli	0.61477	2011 Kardemir	0.6541
4	2014 Kardemir	0.37232	2016 Ereğli	0.6468
5	2014 Ereğli	0.36913	2012 Kardemir	0.5886
6	2016 Kardemir	0.33937	2013 Kardemir	0.5682
7	2015 Ereğli	0.24778	2011 Ereğli	0.5635
8	2012 Kardemir	0.23812	2013 Ereğli	0.5479
9	2012 Ereğli	0.20318	2012 Ereğli	0.5438
10	2015 Kardemir	0.18890	2014 Kardemir	0.5283
11	2011 Kardemir	0.13366	2015 Kardemir	0.4980
12	2013 Kardemir	0.06048	2016 Kardemir	0.3838

It is clear that there is also a difference in the comparison of the best performance rankings given in Table 5.16. The best company and year for one analysis method has a very low ranking in another analysis method.

When we look at the table, the firms and years with the best performance in both analysis methods actually have differences. There are differences in the analysis result depending on the calculation method of both analysis methods. However, these differences completely affect the result.

When we examine the financial statements of the firm, it is the GRA method which is closest to the obtained data. In this context, it is possible to say that using the GRA method will provide more accurate results when analyzing the financial statements of companies.

6. CONCLUSION

The ability of business to continue and grow depends on its ability to cope with its competitors that is competitive power. The fact that the competitor's power can be determined in a healthy way also requires that the financial performance of the business be measured and analyzed. In this study, two firms operating in the iron & steel industry were analyzed based on both financial analysis techniques and quantitative methods. Three analytical techniques have been used in this context. In the first phase, firms' ratios were analyzed using ratio analysis. In the second stage, TOPSIS and GRA analysis methods were applied with the results of the analysis method used in the first step. The results of both analysis methods were then compared.

Multi-criteria analysis techniques provide for the scientific selection of the environment in which multiple, similar and near features criteria exist. It serves a variety of purposes such as solving the problem choosing the best and determining the performance.

Gray method provides an easier solution than the methods of mathematical analysis where uncertainty is the case.

The TOPSIS method is used to find the best option with the help of multiple choice criteria.

It is clear from the performance evaluation made by both analysis methods that there are some differences. The two techineques steps are so different from each other because of the gray method makes a point shot on the other hand we want to buy a phone using the topsis method, but we can not decide between the model, the price, the color, etc., the topsis makes it easier for us to concentrate on an option.

When we look at the TOPSIS and GRA Comparison-2, the firms and years with the best performance in both analysis methods actually have differences. There are differences in the analysis result depending on the calculation method of both analysis methods. However, these differences completely affect the result. When we examine the financial statements of the firm, it is the GRA method which is closest to the obtained data. In this context, it is possible to say that using the GRA method will provide more accurate results when analyzing the financial statements of companies.

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APPENDIX

Appendix-1. Ereğli Iron & Steel Inc. 2011-2016 Financial Data Period

	2011	2012	2013	2014	2015	2016
V A R L I K L A R						
DÖNEN VARLIKLAR	6.024.733.105	5.854.230.082	6.008.498.444	7.371.353.000	7.999.975.000	11.063.224.000
Nakit ve Nakit Benzerleri	1.102.710.213	1.829.716.171	761.111.225	2.186.810.000	2.934.703.000	4.586.911.000
Diğer Kısa Vadeli Finansal Varlıklar	9.232.974	543.101	7.373.780	36.628.000	44.445.000	64.310.000
Ticari Alacaklar	1.141.698.002	1.047.300.360	1.708.538.168	1.756.860.000	1.632.629.000	2.016.901.000
- İlişkili Taraflardan Ticari Alacaklar	9.723.604	17.941.389	36.693.787	36.409.000	43.130.000	54.877.000
- İlişkili Olmayan Taraflardan Ticari Alacaklar	1.131.974.398	1.029.358.971	1.671.844.381	1.720.451.000	1.589.499.000	1.962.024.000
Diğer Alacaklar	277.962	296.045	4.181.400	3.800.000	2.069.000	1.883.000
Türev Araçlar						
Stoklar	3.628.497.829	2.848.119.207	3.383.086.889	3.258.389.000	3.237.890.000	4.255.047.000
Canlı Varlıklar						
Peşin Ödenmiş Giderler	42.506.830	18.404.660	18.115.211	37.320.000	52.754.000	42.513.000
Cari Dönem Vergisiyle İlgili Varlıklar						
Diğer Dönen Varlıklar	99.809.295	109.850.538	126.091.771	37.320.000	95.485.000	95.659.000

	2011	2012	2013	2014	2015	2016
V A R L I K L A R						
DURAN VARLIKLAR	7.365.849.568	7.287.190.543	8.025.985.849	8.562.321.000	10.634.515.000	12.588.053.000
Finansal Yatırımlar	66.086	84.594		63.000	79.000	122.000
Diğer Alacaklar	43.206.240	43.225.706	22.711.009	23.738.000	15.069.000	13.787.000
Yatırım Amaçlı Gayrimenkuller	46.577.264	46.577.264	51.646.848	57.691.000	71.731.000	94.882.000
Maddi Duran Varlıklar	6.911.644.581	6.997.897.584	7.673.555.919	8.199.357.000	10.264.461.000	12.151.972.000
Maddi Olmayan Duran Varlıklar	164.152.691	152.910.729	159.150.181	168.559.000	172.865.000	205.479.000
- Diğer Maddi Olmayan Duran Varlıklar		5.013.650	10.436.084			
Peşin Ödenmiş Giderler	41.870.745	22.841.651	28.428.931	25.348.000	43.939.000	70.757.000
Ertelenmiş Vergi Varlığı	110.735.816	14.073.770	17.836.321	31.881.000	23.807.000	34.243.000
Diğer Duran Varlıklar	120.702					10.856.000

	2011	2012	2013	2014	2015	2016
K A Y N A K L A R						
KISA VADELİ YÜKÜMLÜLÜKLER	2.475.405.792	2.817.904.101	2.475.405.792	3.105.422.000	2.615.423.000	4.226.720.000
Kısa Vadeli Borçlanmalar	394.588.121	867.824.521	198.608.086	637.577.000	1.047.256.000	1.257.986.000
Uzun Vadeli Borçlanmaların Kısa Vadeli Kısımları	1.093.280.760	1.154.609.147	1.281.188.311	1.428.252.000	216.168.570.000	1.043.968.000
Diğer Finansal Yükümlülükler	558.936	4.180.528	14.581.592	6.096.000	19.495.000	19.137.000
Ticari Borçlar	533.658.501	428.055.750	504.185.643	417.255.000	582.203.000	915.076.000
- İlişkili Taraflara Ticari Borçlar	9.852.736	11.727.235	14.443.149	18.329.000	26.630.000	35.008.000
- İlişkili Olmayan Taraflara Ticari Borçlar	523.805.765	416.328.515	489.742.494	398.926.000	555.573.000	880.068.000
Diğer Borçlar	9.499.032	7.784.500	6.255.648	7.389.000	33.680.000	42.126.000
Ertelenmiş Gelirler	133.991.395	95.524.729	92.988.073	76.458.000	93.377.000	106.353.000
Dönem Karı Vergi Yükümlülüğü			44.990	129.708.000	455.624.000	217.769.000
Kısa Vadeli Karşılıklar	77.424.150	113.061.323	205.026.407	234.528.000	145.586.000	437.007.000
- Çalışanlara Sağlanan Faydalara İlişkin Kısa Vadeli Karşılıklar	98.046.626	101.317.114	108.794.189	123.722.000	168.724.000	119.700.000
Diğer Kısa Vadeli Yükümlülükler	29.612.053	33.337.428	18.787.886	44.437.000	72.140.000	40.650.000

	2011	2012	2013	2014	2015	2016
K A Y N A K L A R						
UZUN VADELİ YÜKÜMLÜLÜKLER	3.687.681.410	2.907.604.439	2.852.258.782	2.517.945.000	3.480.875.000	3.764.524.000
Uzun Vadeli Borçlanmalar	3.289.928.316	2.396.318.269	2.020.282.825	1.347.905.000	1.904.361.000	1.617.534.000
- Çalışanlara Sağlanan Faydalara İlişkin Uzun Vadeli Karşılıklar	273.178.661	346.248.924	392.231.844	487.724.000	505.915.000	567.419.000
- Diğer Uzun Vadeli Karşılıklar	10.400.444	14.576.726	12.290.194	23.839.000		
Ertelenmiş Vergi Yükümlülüğü	113.234.445	150.043.899	427.102.170	658.110.000	1.048.802.000	1.577.032.000
Diğer Uzun Vadeli Yükümlülükler	939.544	416.621	351.749	367.000	442.000	479.000

	2011	2012	2013	2014	2015	2016
ÖZKAYNAKLAR	7.287.548.072	7.415.912.085	8.706.819.719	10.310.307.000	12.538.192.000	15.660.033.000
ANA ORTAKLIĞA AİT ÖZKAYNAKLAR	7.086.723.062	7.204.811.565	8.466.789.905	10.003.303.000	12.180.429.000	15.207.669.000
Ödenmiş Sermaye	2.150.000.000	3.090.000.000	3.500.000.000	3.500.000.000	3.500.000.000	3.500.000.000
Sermaye Düzeltme Farkları	731.967.735	342.195.166	156.613.221	156.613.000		156.613.000
Karşılıklı İştirak Sermaye Düzeltmesi	-74.637.969	-103.599.856	-116.232.173	-116.232.000		
Paylara İlişkin Primler/İskontolar					106.447.000	106.447.000
Kar veya Zararda Yeniden Sınıflandırılmayacak Birikmiş Diğer Kapsamlı Gelirler veya Giderler	-619.453	-28.869.742	-43.554.737	-101.563.000	-80.580.000	-72.090.000
Kar veya Zararda Yeniden Sınıflandırılacak Birikmiş Diğer Kapsamlı Gelirler/Giderler	-15.272.360	-30.193.496	835.320.304	1.623.162.000	4.010.257.000	6.530.218.000
- Yabancı Para Çevirim Farkları	-489.005	-315.217	844.664.278	1.616.002.000	4.012.449.000	6.522.205.000
- Riskten Korunma Kazanç/Kayıpları	-14.783.355	-29.878.279	-9.343.974			
Kardan Ayrılan Kısıtlanmış Yedekler	550.543.376	432.878.502	500.949.412	617.355.000	950.831.000	1.166.197.000
Geçmiş Yıllar Karları/Zararları	2.493.154.042	2.943.936.846	2.607.272.495	2.616.106.000	2.527.180.000	2.420.078.000
Net Dönem Karı/Zararı	1.020.567.649	452.016.769	919.974.007	1.601.415.000	1.125.913.000	1.516.438.000
KONTROL GÜCÜ OLMAYAN PAYLAR	200.825.010	211.100.520	240.029.814	307.004.000	357.763.000	452.364.000
TOPLAM KAYNAKLAR	13.390.582.673	13.141.420.625	14.034.484.293	15.933.674.000	18.634.490.000	23.651.277.000
DÖNEM KARI/ZARARI	1.039.128.177	483.575.552	960.407.573	1.660.791.000	1.162.309.000	1.571.702.000
Finansman Giderleri	-956.618.752	-416.373.024	-299.969.934	-217.729.000	-191.144.000	-187.805.000
Satışlar	8.920.544.781	9.570.396.709	9.780.751.418	11.484.137.000	11.914.581.000	11.636.504.000
Satışların Maliyeti	-6.848.422.807	-8.541.548.522	-7.921.852.193	-9.045.652.000	-9.854.290.000	-9.166.325.000
BRÜT KAR/ZARAR	2.072.121.974	1.028.848.187	1.858.899.225	2.438.485.000	2.060.291.000	2.470.179.000
Fvök	1.995.746.929	899.948.576	1.260.377.507	1.878.520.000	1.353.453.000	1.759.507.000
Pay Başına Kazanç	0,3254	0,1291	0,2628	0,4575	0,3217	0,4333

Appendix-2. Ereğli Iron & Steel Inc. Ratio Analysis (2011-2016)

	2011	2012	2013	2014	2015	2016
LIQUIDITY RATIOS						
Current rate	2.43	2.08	2.43	2.37	3.06	2.62
Acid Test Rate	0.93	1.03	1.01	1.31	1.78	1.59
Cash Ratio	3.44	2.72	3.1	2.86	3.67	3.15
FINANCIAL STRUCTURE RATIOS	2011	2012	2013	2014	2015	2016
Leverage (Debt) Rate	0.46	0.44	0.38	0.35	0.33	0.34
Leverage Factor	0.85	0.77	0.61	0.55	0.49	0.51
Interest Coverage Ratio	2.09	2.16	4.2	8.63	7.08	9.37
OPERATING RATIOS						
Receivable Turnover	7.81	9.14	5.72	6.54	7.30	5.77
Debt Collection	46.09	39.39	62.94	55.05	49.32	62.39
Inventory Turnover	1.89	3.00	2.34	2.78	3.04	2.15
Inventory Turnover Period	190.48	120	153.85	129.50	118.42	167.44
Asset Turnover	0.67	0.73	0.7	0.72	0.64	0.49
PROFITABILITY RATIOS	2011	2012	2013	2014	2015	2016
Gross Margin	0.23	0.11	0.19	0.21	0.17	0.21
Net Margin	0.11	0.05	0.09	0.14	0.09	0.13
Return on Equity (ROE)	0.14	0.07	0.11	0.16	0.09	0.10

Appendix-3. Kardemir Iron & Steel Inc. 2011-2016 Financial Data Period

	2011	2012	2013	2014	2015	2016
VARLIKLAR						
DÖNEN VARLIKLAR	637.642.090	815.623.503	775.973.819	1.212.084.607	1.363.216.317	1.641.863.611
Nakit ve Nakit Benzerleri	41.459.912	119.923.510	8.254.783	53.448.895	259.824.l28	329.638.278
Ticari Alacaklar	198.241.639	172.317.657	177.429.827	351.460.951	198.339.605	411.566.846
- İlişkili Taraflardan Ticari Alacaklar	46.736.970	43.501.896	66.452.325	108.971.447	22.156.822	109.281.701
- İlişkili Olmayan Taraflardan Ticari Alacaklar	151.504.669	128.815.761	110.977.502	242.489.504	176.182.783	302.285.145
Diğer Alacaklar	6.210.527	11.387.493	11.364.647	17.665.889	21.020.625	8.589.806
- İlişkili Olmayan Taraflardan Diğer Alacaklar		11.387.493	11.364.647	17.665.889	21.020.625	
Türev Araçlar						7.480.241
Stoklar	373.822.393	488.257.138	439.613.525	627.058.155	690.580.812	700.444.816
Peşin Ödenmiş Giderler		17.055.037	135.692.657	103.360.851	158.699.520	163.219.066
Cari Dönem Vergisiyle İlgili Varlıklar					1.288.353	1.434.640
Diğer Dönen Varlıklar	17.907.619	6.682.668	3.618.380	59.089.866	33.463.274	19.489.918

	2011	2012	2013	2014	2015	2016
DURAN VARLIKLAR	1.042.092.407	1.355.457.150	1.808.547.291	2.329.525.410	3.774.076.407	4.014.146.042
Finansal Yatırımlar	7.890.579	7.890.579	7.890.579	8.302.988	8.302.988	8.302.988
Diğer Alacaklar	115.776	152.251	135.485	213.771	243.426	281.802
- İlişkili Olmayan Taraflardan Diğer Alacaklar		152.251	135.485	213.771	243.426	
Özkaynak Yöntemiyle Değerlenen Yatırımlar	15.876.999	15.608.329	14.741.303	15.829.237	17.589.005	15.931.975
Yatırım Amaçlı Gayrimenkuller	4.037.628	3.920.986	3.804.344	3.687.702	35.151	640.787
Maddi Duran Varlıklar	956.535.803	1.263.056.738	1.583.911.147	2.159.918.543	3.658.379.379	3.827.013.541
Maddi Olmayan Duran Varlıklar	1.499.721	9.961.684	15.407.808	15.015.648	29.792.367	32.301.405
- Şerefiye	9.338.821	9.338.821	9.338.821	9.338.821		
- Diğer Maddi Olmayan Duran Varlıklar		622.863	6.068.987	5.676.827		
Peşin Ödenmiş Giderler		35.866.110	153.613.328	105.940.950	15.231.039	3.181.751
Ertelenmiş Vergi Varlığı	10.866.968	9.869.939	18.145.831	7.938.085	36.892.796	120.928.330
Diğer Duran Varlıklar	35.930.112	9.130.534	10.897.466	12.678.486	7.610.256	5.563.463
TOPLAM VARLIKLAR	**1.679.734.497**	**2.171.080.653**	**2.584.521.110**	**3.541.610.017**	**5.137.292.724**	**5.656.009.653**

	2011	2012	2013	2014	2015	2016
K A Y N A K L A R						
KISA VADELİ YÜKÜMLÜLÜKLER	391.043.354	465.890.485	583.296.310	854.051.014	1.247.551.730	1.639.129.772
Kısa Vadeli Borçlanmalar	98.583.209	41.349.814	127.722.907	52.890.659	5.365.937	6.000.000
Uzun Vadeli Borçlanmaların Kısa Vadeli Kısımları		42.639.275	70.133.859	168.940.973	327.345.311	494.386.418
Ticari Borçlar	124.256.722	172.581.097	173.526.216	262.750.744	781.394.110	679.956.695
- İlişkili Taraflara Ticari Borçlar		4.098.900	2.169.070	6.016.507	4.752.835	7.733.324
- İlişkili Olmayan Taraflara Ticari Borçlar		168.482.197	171.357.146	256.734.237	776.641.275	672.223.371
Diğer Borçlar	2.085.545	2.837.272	4.705.330	4.319.846	2.026.918	2.142.779
- İlişkili Olmayan Taraflara Diğer Borçlar		2.837.272	4.705.330	4.319.846	2.026.918	2.142.779
Türev Araçlar					87.874	545.871
Ertelenmiş Gelirler		178.016.207	155.504.583	319.647.076	82.758.979	412.905.490
Dönem Karı Vergi Yükümlülüğü	7.957.617	5.847.145	12.122.891	173.723	87.874	19.702
Kısa Vadeli Karşılıklar	11.157.596	15.623.769	20.367.078	34.598.571	25.743.080	35.039.320
- Çalışanlara Sağlanan Faydalara İlişkin Kısa Vadeli Karşılıklar	7.913.162	8.224.087	18.165.021	12.001.244	17.310.973	26.430.789
- Diğer Kısa Vadeli Karşılıklar	3.244.434	7.399.682	2.202.057	22.597.327	8.432.107	8.608.531
Diğer Kısa Vadeli Yükümlülükler		6.995.906	19.213.446	10.729.422	22.398.866	8.153.497

	2011	2012	2013	2014	2015	2016
UZUN VADELİ YÜKÜMLÜLÜKLER	294.061.196	561.535.102	757.666.412	1.116.674.146	1.540.771.977	1.779.493.820
Uzun Vadeli Borçlanmalar	224.062.005	461.701.706	646.145.349	991.812.383	1.394.811.818	1.600.232.856
Ticari Borçlar	4.082.147					31.869.391
- İlişkili Olmayan Taraflara Ticari Borçlar						31.869.391
Diğer Borçlar		1.110.635	1.508.477	1.282.973		
- İlişkili Olmayan Taraflara Diğer Borçlar		1.110.635	1.508.477	1.282.973		
Ertelenmiş Gelirler					6.757.193	6.777.130
- Çalışanlara Sağlanan Faydalara İlişkin Uzun Vadeli Karşılıklar	65.654.431	98.166.270	109.951.812	121.751.699	139.202.966	140.614.443
Ertelenmiş Vergi Yükümlülüğü	9.490	495.717				
Diğer Uzun Vadeli Yükümlülükler	253.123	60.774	60.774	1.827.091		

	2011	2012	2013	2014	2015	2016
Ö Z K A Y N A K L A R	994.629.947	1.143.655.066	1.243.558.388	1.570.884.857	2.348.969.017	2.237.386.061
ANA ORTAKLIĞA AİT ÖZKAYNAKLAR	994.540.762	1.143.555.592	1.243.441.158	1.570.646.402	2.338.996.835	2.237.501.123
Ödenmiş Sermaye	878.755.482	878.755.482	1.055.000.000	1.140.000.000	1.140.000.000	1.140.000.000
Sermaye Düzeltme Farkları	4.613.596	4.613.596	4.613.596	4.613.596	4.613.596	4.613.596
Karşılıklı İştirak Sermaye Düzeltmesi (-)	-83.892.336	-83.892.336	-100.717.910	-108.832.621	-79.282.262	-79.282.262
Karşılıklı İştirak Sermaye Düzeltmesi Nominal Tut. Aşan Kısmı	4.610.075	4.610.075	21.435.649	29.550.360		
Paylara İlişkin Primler/İskontolar	11.803.953	11.803.953	11.803.953	11.803.953	11.803.953	11.803.953
Kar veya Zararda Yeniden Sınıflandırılmayacak Birikmiş Diğer Kapsamlı Gelirler veya Giderler					888.974.563	889.208.412
Kardan Ayrılan Kısıtlanmış Yedekler	12.872.748	17.924.829	27.265.195	33.450.099	33.450.113	33.450.113
Geçmiş Yıllar Karları/Zararları	-19.418.817	115.498.521	123.892.166	129.068.640	370.771.935	361.861.436
Net Dönem Karı/Zararı	185.196.061	194.241.472	100.148.509	330.992.375	-21.335.053	-123.789.879
KONTROL GÜCÜ OLMAYAN PAYLAR	89.185	99.474	117.230	238.455	-27.828	-115.062
TOPLAM KAYNAKLAR	1.679.734.497	2.171.080.653	2.584.521.110	3.541.610.017	5.137.292.724	5.656.009.653
DÖNEM KARI/ZARARI	185.195.356	194.251.191	100.098.631	330.978.338	-21.436.461	-123.877.113
Finansman Giderleri (-)	-67.913.194	-37.468.169	-138.180.528	-126.795.152	-330.648.983	-450.390.812
Satışlar	1.590.849.528	1.686.666.273	1.812.224.881	2.189.237.874	2.230.892.163	2.336.737.097
Satışların Maliyeti (-)	-1.287.932.643	-1.418.827.899	-1.540.329.476	-1.750.253.342	-2.070.050.497	-2.088.034.463
BRÜT KAR/ZARAR	302.916.885	267.838.374	271.895.405	438.984.532	160.841.666	238.702.634
Fvök	253.108.550	231.719.360	238.279.159	457.773.490	309.212.522	326.513.699
Pay Başına Kazanç	0,211	0,221	0,095		-0,0187	-0,0186

Appendix-4. Kardemir Iron & Steel Inc. Ratio Analysis (2011-2016)

	2011	2012	2013	2014	2015	2016
LIQUIDITY RATIOS						
Current rate	1.63	1.75	1.33	1.42	1.09	1.00
Acid Test Rate	0.63	0.69	0.57	0.62	0.51	0.56
Cash Ratio	2.08	2.43	1.78	1.74	1.49	1.18
FINANCIAL STRUCTURE RATIOS						
Leverage (Debt) Rate	0.41	0.47	0.52	0.56	0.54	0.60
Leverage Factor	0.69	0.90	1.08	1.25	1.19	1.53
Interest Coverage Ratio	3.73	6.18	1.72	3.61	0.94	0.72
OPERATING RATIOS						
Receivable Turnover	8.02	9.79	10.21	6.23	11.25	5.68
Debt Collection	44.89	36.77	35.26	57.78	32.00	63.38
Inventory Turnover	3.45	2.91	3.50	2.79	3.00	2.98
Inventory Turnover Period	104.35	123.71	102.86	129.03	120	120.81
Asset Turnover	0.95	0.78	0.70	0.62	0.43	0.41
PROFITABILITY RATIOS						
Gross Margin	0.19	0.16	0.15	0.20	0.07	0.1
Net Margin	0.12	0.12	0.06	0.15	-0.01	-0.05
Return on Equity (ROE)	0.19	0.17	0.08	0.21	-0.01	-0.06

CURRICULUM VITAE

PERSONEL INFORMATION

Surname Name :Sargut Fadime

E-Mail Address :Fatos_sargut@hotmail.com

Date of Birth :1983

Place of Birth :Kastamonu

Nationality :T.C.

Permanent Address : Yeşilova mah. Reyhan cad. Dere sok. N:10/10 K.Çekmece/İstanbul

Marital status : Single

Driving License : yes"B"

Educational Background:

Afyon Kocatepe University-Business Administration (2000-2003).
Anadolu University-Business Administration (2012-2014).
Istanbul Aydın University- Business Administration Department Master Program (MBA) (2018).

WORK EXPERİENCE

Professional Experience

Company	Position	Started date	Ouıtted date	Reason of leaving
Savino Del Bene Nakliyat A.Ş.	Accounting and Finance Specialist	2016 -	continues	------

Responsible all accounting and finance department as whole.

Checkpoint Checknet Etiket Ltd.Şti.   Credit Controller   2013   2014   Resingnation

Following reconciliations with foreign clients and bank accounts, to prepare a payment list, Payments, etc.

One Agency İst.Ltd. Accounting Specialist 2012   2013   Resingnation

Following day to day accounting, following accounts payable, following all incoming and outgoing invoices, following reconciliations with clients and bank accounts, following day to day all project document reports, etc.

Informatik Bilg.Sist. Accounting Specialist 2008 2009For learning English in the UK.

Following day to day accounting, following accounts receivable and accounts payable, following all incoming and outgoing invoices, following reconciliations with clients and bank accounts, payments, fee calculations, preparing value added tax (VAT), withholding tax return, social security, etc.

Sipahioğlu Çelik Accounting Specialist   2007   2008
          Resingnation

Foreign Languages Understanding Oral Written
English   well   well   well

Computer skills

Sap, Gate, Word, Excel, Eta, Logo, Link, lotus

Attended Seminers,Courses and Training

To improve English at Greenwich ISIS Course in the UK (2009).
To improve English at Twin Group in the UK (2010).
Financial Consultant Intern (2016-2018)

Hobbies-Activetes-Any Memberships
I like reading , swimming and walking.