Financial Analysis in Rail System Enterprises: Application of The Republic of Turkey State Railways Transportation Company

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Abstract: Financial analysis is a fundamental tool used to measure a company's financial condition and performance, particularly its profitability and operational efficiency. This study examines the applicability of financial analysis in railway system operations, specifically focusing on the Republic of Turkey State Railways Transportation Company. The study aims to validate the importance of financial analysis in the railway transportation sector and assess the company's financial condition and performance. The company's basic financial statements, such as the balance sheet and income statement, were analyzed to provide insights into its financial health regarding liquidity, debt, and profitability. Additionally, methods such as ratio analysis were employed to compare the financial performance with past years and to make inferences about potential future performance. The study's results indicate that while the company's financial health is generally strong, there are areas where improvements can be made. Efforts to enhance operational efficiency and implement more effective cost-control measures are recommended to the company. The findings suggest that financial analysis significantly affect in the company's strategic planning processes. In conclusion, this study has demonstrated the importance and applicability of financial analysis in railway system operations through the example of the company in question. Financial analysis can be used as a tool to help railway system enterprises understand their financial condition, make strategic decisions, and ensure long-term sustainability.

Keywords: Financial Analysis, Rail System Enterprises, Financial Performance, Ratio Analysis

Raylı Sistem İşletmelerinde Finansal Analiz: Türkiye Cumhuriyeti Devlet Demiryolları Taşımacılık Anonim Şirketi Uygulaması

Öz: Finansal analiz, bir şirketin finansal durumu ve performansını, özellikle karlılığını ve operasyonel verimliliğini ölçmek için kullanılan temel bir araçtır. Bu çalışmada Türkiye Cumhuriyeti Devlet Demiryolları Taşımacılık Anonim Şirketi özelinde raylı sistem işletmelerinde finansal analizin uygulanabilirliği incelenmiştir. Çalışmanın amacı, demiryolu taşımacılığı sektöründe finansal analizin öneminin doğrulanması ve şirketin finansal durumu ve performansının değerlendirilmesidir. Çalışmada şirketin bilanço ve gelir tablosu gibi temel finansal tabloları analiz edilerek; likidite, borçluluk ve karlılık gibi finansal sağlığına ilişkin bilgiler ortaya koyulmuştur. Ayrıca oran analizi gibi yöntemler üzerinden finansal performansı geçmiş yıllarla karşılaştırılmış ve gelecekteki potansiyel performansa ilişkin çıkarımlar yapılabilmesi sağlanmıştır. Çalışmanın sonuçları, şirketin finansal sağlığının genel olarak güçlü olduğunu ancak bazı iyileştirmeler yapılabileceğini göstermiştir. Şirkete operasyonel verimliliğin artırılmasına yönelik çabalara girişilmesi ve daha etkin bir maliyet kontrolünün yapılması önerilebilir. Sonuçlar, finansal analizin şirketin stratejik planlama süreçlerinde önemli bir rol oynayabileceğine işaret etmektedir. Sonuç olarak, bu çalışmada, örnek şirket üzerinden raylı sistem işletmelerinde finansal analizin önemi ve uygulanabilirliği ortaya koyulmuştur. Finansal analiz, raylı sistem işletmelerinin finansal durumlarını anlamalarına, stratejik kararlar almalarına ve uzun vadeli sürdürülebilirliklerini sağlamalarına yardımcı olan bir araç olarak kullanılabilir.

Anahtar kelimeler: Finansal Analiz, Raylı Sistem İşletmeleri, Finansal Performans, Oran Analizi

1. Introduction

Businesses can utilize financial analysis for decision-making in numerous areas, such as feasibility, planning, investment, and budgeting from the inception stage. In financial analysis, it is possible to compare various items using financial statements. Financial statements are indispensable tools that enable users to understand the various business practices and measure the success of these practices. The selection and interpretation of items to be compared according to the objective constitute the key point of the analysis. Answers to numerous questions, such as the business's investment decisions, whether the targets are met, the level of resource utilization, the efficiency of the strategies followed, and the debt repayment capability, can be obtained through financial statements and the comparison of items within these statements [1]. Knowing which analysis methods to use and how to evaluate the information in the financial statements is critical to the success of the analysis. In this context, selecting the appropriate methodology and effectively interpreting financial data form the cornerstones of analytical processes [2].

Railway transportation is a critical component of the economy, providing a reliable and efficient means for transporting large quantities of goods and passengers. Financial analysis is paramount for companies operating in this sector for sustainability and growth. Financial analysis assists companies in assessing their financial status, performance, and future potential, thereby enabling strategic decision-making [3]. Railway transportation companies are characterized by complex operations that require substantial capital investments and long-term financing. Financial analysis evaluates the financial health of these companies by revealing their liquidity, debt, and profitability conditions. Analyzing fundamental financial statements such as balance sheets, income statements, and cash flow statements is crucial for understanding their operations' financial structure and sustainability [4].

Significant investment decisions, such as developing railway infrastructure, renewing vehicle fleets, and adopting technological innovations, are made based on robust financial analyses. For example, the construction of a new railway line or the modernization of existing lines entails considerable costs. Conducting financial analyses to accurately assess the return and cost of such investments is imperative [5]. Moreover, financial analysis aids railway transportation companies in achieving operational efficiency and cost control. Income and expenditure analyses help identify high-risk and potential savings areas [6]. For instance, detailed analyses of fuel consumption, personnel expenses, and maintenance costs allow for optimizing expenses.

Railway transportation faces various financial and operational risks. Financial analysis is vital for identifying and managing these risks. External factors such as exchange rate fluctuations, changes in interest rates, and economic downturns can affect the financial performance of railway transportation companies. Financial analysis helps evaluate the impact of these risks and adopt appropriate measures [7]. It is essential for railway transportation companies to utilize financial analysis as a fundamental guide when formulating long-term strategic plans. Maintaining financial robustness and assessing new opportunities are crucial for companies to achieve their growth targets [8]. Financial analysis, by considering past performance data and current market conditions, helps shape future growth strategies [9].

Investors, creditors, regulatory bodies, and other stakeholders rely on financial analyses to understand the financial condition of railway transportation companies. Accurate and comprehensive financial analyses provide confidence to these stakeholders and strengthen their relationships with the company. For example, before investing in a railway company, investors evaluate the financial statements to assess the risks and potential returns of the investment. In this context, insights gained from financial analysis can be considered the most crucial information source for all stakeholders [10].

For railway transportation companies, financial analysis is critical for evaluating financial health, making investment decisions, ensuring efficiency and cost control, managing risks, strategic planning, and providing information to stakeholders. These analyses enable companies to identify their strengths and weaknesses, foresee future opportunities and threats, and make informed strategic decisions [11]. Therefore, financial analysis is indispensable for successful and sustainable business management in the railway transportation sector.

Despite limited examples in international literature, no study has examined the financial health of a railway transportation company in Turkey. Financial analysis of railway transportation companies is an important research topic for the reasons previously mentioned. Such a study can potentially fill the research gap identified in the Turkish literature and open a new research avenue. This study aims to conduct a financial analysis of the financial statements of The Republic of Turkey State Railways Transportation Company (TCDD Transportation Inc.). The company's financials, including debt repayment capacity, financial structure, efficiency, and profitability, have been analyzed. The dataset for this study is based on the financial statements publicly shared by the company through its website.

The next section of the study discusses the research methodology, dataset, and scope of the analysis. The following section presents the research findings. The final section includes conclusions, limitations, and recommendations for future studies.

2. Methodology

In this study, a comprehensive financial analysis methodology was conducted to evaluate the financial health and performance of TCDD Transportation Inc. Various financial analysis techniques were applied to measure the company's financial health.

Initially, the primary financial indicators, such as the balance sheet and income statement for the years 2018-2022, were examined in detail. The company's financial statements are publicly shared via its website. These statements were analyzed to understand the company's liquidity, debt, and profitability conditions. The study employed the following financial analysis methods:

- Liquidity Analysis: Liquidity ratios such as the current ratio and quick ratio were calculated to assess the company's capacity to meet its short-term liabilities.
- Debt Analysis: The company's debt condition was evaluated by examining the ratio of total debt to assets.
- Profitability Analysis: Profitability ratios such as net profit margin, return on equity, and return on assets were used to analyze the company's profitability status.
- Ratio Analysis: Financial ratios were calculated to compare the company's performance with previous years and determine the trends over time.

Additionally, where necessary, horizontal, vertical, and trend analysis methods were used to examine the trends in the company's financial indicators and make inferences about its future financial performance.

This methodological approach aims to comprehensively evaluate the company's financial health and performance, identify its strengths and weaknesses, and contribute to strategic planning processes.

While static analysis involves analyzing data from financial statements for a single period, dynamic analysis examines the relationships between data from financial statements for

consecutive periods. Therefore, this research methodology can be described as a dynamic analysis method.

3. Findings and Discussion

Balance sheets are one of the basic financial statements that show the financial position of businesses on a specific date. A balance sheet includes the business's assets, liabilities, and equity. It shows the total of all assets owned by the business and the sources from which these assets are financed. The company's financial analysis began by examining the main components of the balance sheet. When the company's current assets are examined, it is seen that they have increased every year from 2018 to 2022. This shows that the company's current assets are increasing steadily from year to year, and its working capital is strengthening. The company's current assets have increased, especially in recent years. A large increase in 2021 indicates that the company has made significant investments in its fixed assets or made large asset purchases. Their total assets have increased every year, especially in recent years. The increase in total assets indicates that the company is growing overall and expanding its asset base. The company's short-term liabilities follow a fluctuating pattern. The fact that short-term debts decreased significantly in 2019 and then increased again in 2020 indicates that the company is experiencing fluctuations in short-term debt management. The fact that long-term liabilities remain relatively stable indicates no major changes in the company's long-term debt. The company's equity capital has generally increased. The general increase in shareholders' equity indicates that the company has strengthened its equity capital. The decrease in 2020 indicates that performance has decreased compared to the previous year. Table 1 shows the adjusted balance sheets for the five periods from 2018 to 2022, allowing one to examine the items in the company's balance sheets and identify increases and decreases.

Table 1. Balance sheet ratios (Million TL)

Balance sheet items	Years					Absolute Difference			
						(+/-) %			
	2018	2019	2020	2021	2022	2019-2018	2020-2019	2021-2020	2022-2021
Current Assets	1158	1360	1767	2644	4064	202	407	877	1420
						17,44	29,93	49,63	53,71
Non-Current Assets	5082	5003	4729	8143	10393	-79	-274	3414	2250
						-1,55	-5,48	72,19	27,63
Total Assets	6240	6363	6496	10787	14457	123	133	4291	3670
						1,97	2,09	66,06	34,02
Short-Term Liabilities	2636	369	1823	1257	1316	-2267	1454	-566	59
						-86	394,04	-31,05	4,69
Long-Term Liabilities	160	156	150	148	148	-4	-6	-2	0
						-2,5	-3,85	-1,33	0
Shareholders' Equity	3444	5838	4523	9382	12993	2394	-1315	4859	3611
						69,51	-22,52	107,43	38,49
Total Liabilities and Equity	6240	6363	6496	10787	14457	123	133	4291	3670
						1,97	2,09	66,06	34,02

When examining company's balance sheet items, the company's assets increased by 1.97% in 2019 compared to 2018, 2.09% in 2020 compared to 2019, 66.06% in 2021 compared to 2020, and 34.02% in 2022 compared to 2021. Figure 1 and Figure 2 summarize the company's asset and liability - equity structure.
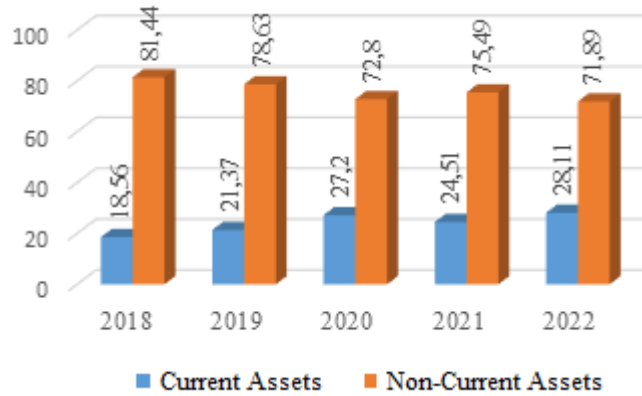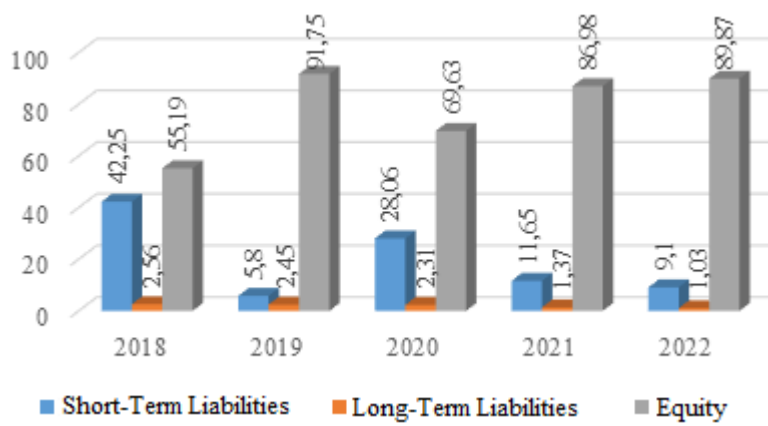
Figure 1. Assets

Figure 2. Liabilities and Equity

Over the years, it has been observed that non-current assets exceed current assets. The decrease in the share of non-current assets in the asset structure from 2018 to 2020 is understood to be due to the differential depreciation values of tangible non-current assets and the increase in inventories and securities within current assets, leading to an increase in the share of current assets in the asset structure. By 2021, an increase in tangible non-current assets led to an increase in non-current assets within the asset structure, but by 2022, there was a decrease again in non-current assets.

Regarding the distribution of resources, it is seen that equity holds a more significant weight than others, indicating that the company possesses a strong and balanced financial structure. It is desirable for long-term liabilities to outweigh short-term liabilities from external sources. However, it is observed that the company has a high proportion of short-term liabilities, increasing repayment risk.

Ratio analysis has been employed to comment on the company's financial health and performance. While all the company's financial ratios have been obtained, practical interpretation has focused on liquidity, financial structure, efficiency, productivity, and profitability ratios due to their practical significance and relevance to the company's overall situation and ratio practicality.

The acid-test ratio has been used to measure liquidity strength. More sensitive than the current ratio, the acid-test ratio complements the current ratio and is more meaningful. It indicates the company's ability to pay short-term debts, with a value of 1 being considered sufficient. The ratio separates inventories from current assets in determining liquidity. A ratio of 1 indicates that the company can meet all its short-term debts with cash or quickly convertible assets. A ratio below

1 suggests weakened debt repayment ability. While a ratio below 1 may initially seem unfavorable, the high speed of inventory conversion into cash can mitigate this negativity. The company's acid-test ratios over the years are listed in the table below.

Table 2. Acid-test ratios between 2018-2022 (Million TL)

Years	2018	2019	2020	2021	2022
Current Assets	1158	1360	1767	2644	4064
Short-Term Liabilities	2636	369	1823	1257	1316
Inventories	578	720	1012	1355	2216
Acid-test ratio	0,22	1,73	0,41	1,03	1,41

In 2018, the company financed its operations with short-term liabilities, resulting in an acid-test ratio below 1 and weakened debt repayment ability, even if all inventories were converted to cash. In 2019, with a decrease in short-term liabilities, the acid-test ratio rose above 1, indicating the company's ability to pay off all short-term liabilities with cash. By 2020, due to high levels of short-term liabilities and an increased share of inventory within current assets, the ratio fell below 1 again, despite the potential conversion of all inventories to cash. The years 2021 and 2022 saw the acid-test ratio rise above 1, indicating the company's capability to meet its short-term debt obligations.

Financial leverage ratios such as the total debt ratio and the ratio of fixed assets to equity have been utilized to assess the company's financial structure and long-term debt repayment ability. The total debt ratio indicates the proportion of assets financed by external sources, also known as the leverage ratio. A ratio of around 50% is generally considered normal; a higher ratio suggests increased financial risk and credit risk [12]. The ratio of fixed assets to equity shows the proportion of fixed assets financed by equity and long-term liabilities, indicating sustainable capital. This ratio is calculated by dividing fixed assets by equity. A ratio below 1 is expected; if it exceeds 1, it indicates that a portion of fixed asset financing is covered by short-term liabilities [13]. Table 3 presents the company's total debt ratios for the relevant years, and Table 4 shows the ratio of fixed assets to equity.

Table 3. Total debt ratios between 2018-2022

Years	2018	2019	2020	2021	2022
Total liabilities (Million TL)	2796	525	1973	1405	1464
Total assets (Million TL)	6240	6363	6496	10787	14457
Total debt ratio	44,81	8,25	30,37	13,02	10,12

When examining the company's total debt ratios over the years, they are below 50%. This indicates that the company does not heavily rely on external sources of financing and, consequently, does not incur high-interest expenses.

Table 4. The ratio of non-current assets to permanent capital between 2018-2022

Years	2018	2019	2020	2021	2022
Non-current assets (Million TL)	5082	5003	4729	8143	10393
Equity (Million TL)	3444	5838	4523	9382	12993
Long-Term Liabilities (Million TL)	160	156	150	148	148
Non-current assets to permanent capital	1,41	0,83	1,01	0,85	0,79

When examining the ratios of the company's non-current assets to permanent capital, it is observed that in 2018 and 2020, these ratios were above 1. As previously noted in earlier analyses, this indicates a deficiency in net working capital. During 2018 and 2020, short-term liabilities were used alongside permanent capital to finance non-current assets. In 2019, 2021, and 2022,

the ratios of non-current assets to permanent capital were below 1, indicating that non-current assets were financed with permanent capital.

Activity ratios are used to determine how efficiently and effectively the company utilizes its assets in conducting its operations. The higher the turnover rates of elements within the operating cycle and other asset elements during the operating period, the more profitable and efficient the company is considered to be. Therefore, activity ratios are also referred to as ratios used in the analysis of efficiency, turnover rate, or operational status [14]. In analyzing the company's operations, inventory turnover, inventory turnover period, receivables turnover, receivables collection period, trade payables turnover, average payment period of trade payables, and asset turnover have been interpreted.

Inventory turnover ratios are used to measure how quickly inventories are consumed in production or converted into sales revenue [15]. Table 5 presents the company's inventory turnover ratios for the relevant years, and Table 6 presents the inventory turnover periods.

Table 5. Inventory turnover ratio between 2018-2022

Years	2017	2018	2019	2020	2021	2022
Cost of sales (Million TL)		2832	3387	3022	4240	8857
Inventories (Million TL)	441	578	720	1012	1355	2216
Average inventories (Million TL)		509,5	649	866	1183,5	1785,5
Inventory turnover ratio		5,56	5,22	3,49	3,58	4,96

When examining the company's inventory turnover ratios, it is observed that inventories were converted to cash through sales 5 times in 2018, 5 times in 2019, 3 times in 2020, 3 times in 2021, and 4 times in 2022. The inventory turnover ratios have decreased over the years. In 2019, the decline in inventory turnover was due to an increase in inventory outpacing sales. This decline continued into 2020 as inventories increased while sales decreased. In 2021 and 2022, both inventories and sales increased; however, the increase in sales was more significant than the increase in inventories, resulting in a rise in inventory turnover.

Table 6. Inventory turnover period between 2018-2022

Years	2018	2019	2020	2021	2022
Inventory turnover period ratio	5,56	5,22	3,49	3,58	4,96
Inventory turnover times	64,75	68,96	103,15	100,56	72,58

When examining TCDD Transportation Inc.'s inventory turnover period, it is observed that inventories were converted to cash every 64 days in 2018, every 68 days in 2019, every 103 days in 2020, every 100 days in 2021, and every 72 days in 2022.

Receivables turnover indicates how many times a company collects its receivables in a year and is calculated by dividing net sales by average trade receivables for a period. Trade receivables encompass the receivables arising from the company's main activities. The receivables turnover ratio indicates the speed at which the company's receivables are converted to cash, thus showing its liquidity [16]. Table 7 presents the company's receivables turnover ratios for the relevant years, and Table 8 presents the receivables collection periods.

Table 7. Receivables turnover ratio between 2018-2022

Years	2017	2018	2019	2020	2021	2022
Net sales (Million TL)		2131	2572	2105	2848	6895
Trade receivables (Million TL)	805	449	446	273	814	816
Average trade receivables (Million TL)		627	447,5	359,5	543,5	815
Receivables turnover ratio		3,39	5,75	5,85	5,24	8,46

When examining the company's receivables turnover ratio, it is observed that due to the size of trade receivables in 2017, the ratio was 3.39 in 2018. In 2019, the ratio increased to 5.75 due to an increase in net sales and a slight decrease in trade receivables. By 2020, both net sales and trade receivables had decreased, but the ratio increased to 5.85 due to a more significant decline in trade receivables. In 2021, despite an increase in net sales, the ratio fell to 5.24 due to a larger increase in trade receivables. In 2022, the ratio rose to 8.46 due to an increase in net sales, while trade receivables remained relatively unchanged.

Table 8. Receivables collection period between 2018-2022

Years	2018	2019	2020	2021	2022
Receivables turnover ratio	3,39	5,75	5,85	5,24	8,46
Ave. collection period of receivables	106,19	62,61	61,54	68,70	42,55

The trade payables turnover ratio indicates how many times a company's payables are paid in a year and is calculated by dividing net purchases by average trade payables for a period [17]. The trade payables turnover ratio should be compared and evaluated against the average payment period of trade payables and the average collection period of trade receivables. Table 9 presents the company's trade payables turnover ratios for the relevant years, and Table 10 presents the average payment periods of trade payables.

Table 9. Trade payables turnover ratio between 2018-2022

Years	2017	2018	2019	2020	2021	2022
Cost of selling goods-services (Million TL)		2832	3387	3022	4240	8857
Trade payables (Million TL)	270	2530	214	1705	1126	1094
Average trade payables (Million TL)		1400	1372	959,5	1415,5	1110
Trade payables turnover ratio		2,02	2,47	3,15	2,99	7,98

When examining the company's trade payables turnover ratios, it is observed that the ratio increased steadily in 2019 and 2020, indicating that the company could pay its debts quickly with cash. During this period, due to using cash to pay off debts, the company would not be able to use this cash for other investments. By 2021, there was a decrease in the trade payables turnover ratio, indicating that the company extended the payment period of its trade payables. In 2022, however, there was an increase in the trade payables turnover ratio. This increase was due to the cost of goods sold more than double the previous period.

Table 10. The average payment period of trade payables between 2018-2022

Years	2018	2019	2020	2021	2022
Trade payables turnover ratio	2,02	2,47	3,15	2,99	7,98
The payment period of trade payables	178,22	145,75	114,28	120,41	45,11

When examining the company's average payment period for trade payables, it is observed that trade payables were paid in 178 days in 2018, 145 days in 2019, 114 days in 2020, 120 days in 2021, and 45 days in 2022. If we evaluate the average payment period of trade payables alongside the average collection period of receivables, it is observed that receivables were collected in 106 days in 2018, 62 days in 2019, 61 days in 2020, 68 days in 2021, and 42 days in 2022. Since it is expected that the payment period for trade payables should at least be as long as the collection period for receivables, the fact that the company's payment period for trade payables exceeds the collection period for receivables is considered positive.

The asset turnover ratio indicates how many times a company's assets are turned over through sales, and a higher ratio is considered favorable. The ratio is calculated by dividing net sales by total assets. A ratio of 2 is considered appropriate for large companies, while for small companies,

a ratio between 2 and 4 is deemed suitable [18]. The company's asset turnover ratios from 2018 to 2022 are presented in Table 11.

Table 11. Total assets turnover ratio between 2018-2022

Years	2018	2019	2020	2021	2022
Net sales (Million TL)	2131	2572	2105	2848	6895
Total assets (Million TL)	6240	6363	6496	10787	14457
Total assets turnover ratio	0,34	0,41	0,32	0,26	0,48

When examining the company's asset turnover ratios, it is observed that the ratios remained below 2 over the years, indicating low efficiency. This suggests that the company has not been using its assets efficiently, resulting in low productivity. Profitability is the ultimate outcome, and profitability ratios provide information on how effectively the company is managed.

The company's profitability has been measured from equity, sales, and assets. Equity profitability is measured using the return on equity ratio, sales profitability is measured using the gross profit margin, operating profit margin, and net profit margin ratios, and asset profitability is measured using the return on assets ratio.

The return on equity ratio is obtained by dividing net profit by average equity. This ratio, which indicates the profitability of equity, is calculated to determine how efficiently and effectively the values allocated to the company by its shareholders are being utilized [19]. Table 12 presents the company's return on equity ratios for the relevant years.

Table 12. Return on equity ratio between 2018-2022

Years	2017	2018	2019	2020	2021	2022
Net profit (Million TL)		-925	-1087	-1333	-1641	-2511
Equity (Million TL)	4368	3444	5838	4523	9382	12993
Average equity (Million TL)		3906	4641	5180,5	6952,5	11187
Return on equity ratio		-0,24	-0,23	-0,26	-0,24	-0,22

When examining the company's return on equity ratio, it is observed that due to the company's losses over the years, the return on equity ratio has also been negative, indicating losses. Despite an increase in equity over the years, the increase in losses has resulted in similar ratios. This indicates that the values allocated to the company have not been used efficiently and effectively.

The gross profit margin is calculated by dividing gross profit by net sales. The operating profit margin, which shows profitability from operations, is used to measure the profitability of the company's core activities. This ratio is calculated by dividing operating profit by net sales. The net profit margin indicates the profit obtained from net sales. A higher ratio is interpreted as favorable for the company, indicating efficiency. Table 13 presents the company's gross profit margin for the relevant years, Table 14 presents the operating profit margin, and Table 15 presents the net profit margin.

Table 13. Gross sales profit margin between 2018-2022

Years	2018	2019	2020	2021	2022
Gross sales profit (Million TL)	-701	-815	-917	-1392	-1962
Net sales (Million TL)	2131	2572	2105	2848	6895
Gross sales profit margin	-0,33	-0,32	-0,44	-0,49	-0,28

When examining the company's gross profit margin, it is evident that the cost of goods sold and services exceeds the net sales revenue over the years, resulting in a negative gross profit margin and indicating that the company is experiencing losses.

Table 14. Operating profit margin between 2018-2022

Years	2018	2019	2020	2021	2022
Operating profit (Million TL)	-879	-1109	-1355	-1709	-2651
Net sales (Million TL)	2131	2572	2105	2848	6895
Operating profit margin	-0,41	-0,43	-0,64	-0,60	-0,38

When examining the company's operating profit margin, the negative gross profit margin over the years, combined with operating expenses, results in a negative operating profit, indicating an operating loss. The decreasing trend in the operating profit margin suggests a decline in the profitability and efficiency of the company's core operations.

Table 15. Net profit margin between 2018-2022

Years	2018	2019	2020	2021	2022
Net profit (Million TL)	-925	-1087	-1333	-1641	-2511
Net sales (Million TL)	2131	2572	2105	2848	6895
Net profit margin	-0,43	-0,42	-0,63	-0,58	-0,36

When examining the company's net profit margin, it is observed that period losses have increased over the years. Despite a positive trend in the net profit margin in the last two years, the margin has remained negative. Generally, it can be said that the company has been in a negative situation in terms of profitability, but the level of negativity has decreased in recent years.

The return on assets ratio is calculated to determine whether assets are effectively utilized for business profitability. Table 16 presents the return on assets.

Table 16. Return on assets between 2018-2022

Years	2018	2019	2020	2021	2022
Net profit (Million TL)	-925	-1087	-1333	-1641	-2511
Total assets (Million TL)	6240	6363	6496	10787	14457
Return on assets ratio	-0,15	-0,17	-0,21	-0,15	-0,17

The company's total assets profitability ratios decreased from 2018 to 2020. Although there was an upward trend in 2021, the ratio declined again in 2022. Despite the company's significant assets over the years, the negative net profit margin has resulted in low active profitability ratios.

In the final stage of the company's financial analysis, DuPont analysis has been conducted for each year covered by the analysis. DuPont analysis is a method used to examine a company's financial performance in more detail. Developed by DuPont Corporation in the 1920s, it derives its name from there. This analytical method breaks down a company's return on equity (ROE) into three main components: net profit margin, asset turnover ratio, and financial leverage. DuPont analysis is formulated as follows:

$$Return\ on\ equity = \frac{Net\ profit}{Equity} = \frac{Net\ profit}{Sales} \ x \ \frac{Sales}{Total\ assets} \ x \ \frac{Total\ assets}{Sales} \quad (1)$$

The multiplication of these three components determines the company's return on equity (ROE). DuPont analysis is used to understand how each of these components affects the company's financial performance. For instance, if a company has a low return on equity, DuPont analysis can help determine whether this is due to a low net profit margin, low asset turnover ratio, or low financial leverage ratio. This enables management to make strategic decisions to improve in these areas. Due to reporting losses each year during the analysis period, the company records negative values for return on equity. The analysis results for each year show similarities due to this

consistent reason. The DuPont analysis for the year 2022 is as follows and is shown in detail in Figure 3:

$$Net\ profit\ margin = \frac{Net\ profit}{Sales} = -0{,}36 \qquad (2)$$

$$Total\ assets\ turnover = \frac{Sales}{Total\ assets} = 0{,}48 \qquad (3)$$

$$Financial\ leverage = \frac{Total\ assets}{Equity} = 1{,}11 \qquad (4)$$

$$Return\ on\ equity = -0{,}36x0{,}48x1{,}11 = -0{,}19 \qquad (5)$$

Figure 3. DuPont analysis of TCDD Transportation Inc. for 2022

The return on assets has been calculated as -0.17%. Due to the negative return on assets at -0.17%, it is impossible to discuss either return on equity or return on assets for the company. The company should reduce expenses to improve sales profitability to increase return on assets. By increasing sales profitability, the company can subsequently enhance return on equity and return on assets by increasing financial leverage or asset turnover ratio. Equity comprises 89% of the total, and 0.19% constitutes equity profitability, which is lower than the -0.17% return on assets. Therefore, the company can improve return on equity by increasing sales profitability to enhance net profit, effectively utilizing assets to increase asset turnover ratio, and leveraging financial leverage.

4. Conclusion

This study examined TCDD Transportation Inc.'s financial statements and ratios for the years 2018-2022 to evaluate the company's financial position and performance. The analyses in this paper are limited to the data obtained from the financial statements of the case company.

The company's total assets showed a steady increase over the five-year period. Current assets increased by over 250% from 2018 to 2022, while fixed assets also experienced significant growth. The high level of equity indicates that the company has a strong financial structure. However, the high short-term liabilities increase the company's short-term debt repayment risk.

Liquidity ratios assess the company's ability to pay its short-term debts. The acid-test ratio was low at 0.22 in 2018 but exceeded 1 in 2019 and 2021, indicating an improvement in the company's ability to pay short-term debts. Total debt ratios remained below 50%, indicating the company is effectively managing its debts.

Activity ratios such as inventory turnover accounts receivable turnover, and accounts payable turnover were analyzed. Inventory turnover fluctuated from 2018 to 2022 but showed an increasing trend in 2021 and 2022. Accounts receivable turnover increased to 8.46 in 2022, indicating a shorter collection period for the company's receivables. Accounts payable turnover also increased to 7.98 in 2022, demonstrating the company's ability to pay its debts quickly.

The company's profitability ratios showed negative values. Return on equity, gross profit margin, and operating profit margin indicated losses over the years. However, there has been a reduction in the level of negativity in net profit margin ratios in recent years.

The 2022 DuPont analysis revealed that the company's return on equity was negative and highlighted the need for the company to reduce expenses to increase sales profitability and improve its financial performance. Increasing asset turnover and financial leverage ratios could positively impact return on equity.

The results of TCDD Transportation Inc.'s financial analysis indicate that the company's financial structure is generally sound, but improvements are needed in specific areas. Enhancing operational efficiency and implementing effective cost-control measures could further enhance the company's financial performance. Additionally, attention to managing short-term debts and increasing sales profitability could contribute to the company's long-term sustainability. These findings could play a significant role in the company's strategic planning processes and help achieve future growth and development goals.

Acknowledgment

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