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An Analysis of Financial Distress

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ABSTRACT :

This study delves into the assessment of financial distress within SEPC Limited. The primary objective is to analyze financial distress within SEPC Limited, while secondary objectives include scrutinizing the Altman's Z-score and Grover's G-score models for evaluating financial distress and conducting risk severity analyses for different projects of SEPC. Through quantitative descriptive approach, this study aims to provide valuable insights into the financial health and risk management practices of SEPC Limited, offering recommendations for mitigating financial distress and enhancing overall performance.

Index terms – Financial distress, Altman Z-score, Grover's G-Score, Risk Severity

Introduction

Construction companies are crucial for the development and maintenance of essential physical and organizational structures, such as transportation, energy, water supply, and telecommunications. However, the construction industry is susceptible to financial distress due to factors such as economic downturns, material price fluctuations, labor shortages, and project delays. Tight profit margins, high competition, and dependency on project-based revenue streams contribute to financial challenges. Financial distress can lead to underinvestment, misallocation of resources, and bankruptcy. Accounting ratios, such as liquidity, leverage, and profitability ratios, play a crucial role in assessing a company's financial health. Monitoring these ratios can help identify warning signs of potential financial distress, such as liquidity issues, excessive debt burden, or declining profitability. This report aims to provide input to management in strategic decision-making, analyzing SEPC Limited's financial distress and analyzing predictive models.

Data and Sources of Data

The data source in the research used is secondary data. Secondary data in research is derived from existing data sources. This could involve re-analyzing or repurposing data that was originally collected for a different purposes.This research uses secondary data in the form of annual financial reports of the company from money control website.the daa collection period ranging from

Statistical tools and econometric models

Altman's Z-Score Model One of the most well-known models for predicting financial distress is Altman's Z-score (Altman, 1968). This model uses several ratios to investigate a predictor of financial distress. This model uses a statistical technique of multiple discriminant analysis to obtain a predictor that is considered to be a linear function of multiple explanatory variables. Five financial ratios have been used in the Z-score model X1, X2, X3, X4 and X5 can be viewed to reflect liquidity, leverage, profitability, solvency and activity ratio, respectively. The Altman Z-Score is computed as follows:

Z= 1.2*X1 + 1.4*X2 + 3.3*X3 + 0.6*X4 + 1*X5

Interpretation of Z-Score

1. If Z-Score is less than 2.0, it suggests high level of distress

2. If Z-Score is between 2.0 and 4.0, it suggests that the firm is in gray or ambiguous area; and

3. If Z-Score is more than 4.0, it implies low distress level. Grovers's G-Score model Grover model is created by designing and reassessment towards Altman Z-score model focused on profitability ratios.

G-Score = 1.650 (X1) + 3.404 (X2) – 0.016 * ROA + 0.057

where

X1 = Working capital/Total assets

X2 = EBIT/Total Assets

ROA = Net income/Total assets

Interpretation of G-Score

1. If Z-Score is less than 0.5, it suggests high level of distress

2. If Z-Score is between 0.5 and 1.0, it suggests that the firm is in gray or ambiguous area; and

3. If Z-Score is more than 1.0, it implies low distress level.

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LEVERAGE

Financial Leverage

Financial leverage, as represented by the ratio of total assets to total equity, provides insight into the extent to which a company utilizes debt financing relative to its equity. A higher financial leverage ratio indicates that the company relies more heavily on debt to finance its assets, while a lower ratio suggests a more conservative capital structure with less debt.

Operating Leverage

Operating leverage measures the ratio of fixed costs to variable costs. A higher operating leverage indicates a higher proportion of fixed costs relative to variable costs.

Combined Leverage

It reflects the overall impact of both debt financing and fixed costs on the company's risk and profitability. A higher combined leverage indicates increased sensitivity to changes in both revenue and financing costs. It helps assess the company's overall risk exposure and financial stability.

RISK SEVERITY ANALYSIS

Majority of the profits of the profits of the company is generated through Two main projects namely Dhanband and Baghmara projects, thus the scope of the project is restricted only to these two projects. The objective is to identify potential risk factors and classify them according to their severity in order to establish strategies for reducing or managing those risks. The process of assessing the potential impact of potential risks for a project, process, or organisation is known as risk severity analysis. Different types of risks are identified, their likelihood and impact are examined, and then their risk are ranked according to their seriousness.

SEVERITY	CLASSIFICATION
0.00-0.20	Very low
0.20-0.40	Low
0.40-0.60	Medium
0.60-0.80	High
0.80-1.00	Very high

Risk severity table is a standard format of classifying the risk using the CLF and CIF concept. After predicting the high and very high risk the organisation should see what the measures are that it can take up to mitigate or reduce its impact on the operations so that organisation can be at a better side. Therefore, when the risk severity is high, the potential harm is similarly significant, and more time and money should be spent mitigating the risk as a result. In contrast, when the risk severity is low, the potential harm is also thought to be minimal, and less management effort may be required.

A risks severity can be calculated as the sum of its impact and likelihood, this idea can be expanded to include many risk sources in a work package, each of which likelihood and impact can be described in term of CLF and CIF.

It is possible to integrate and quantify the likelihood (Li) of risk sources across all a work activity as a single Composite Likelihood Factor (CLF). To calculate the CLF for the work package, the weightage (Wi) of the risk sources for the activities are multiplied by their corresponding Likelihoods.

Composite Likelihood Factor is calculated as follows: L1(W1) + L2(W2) + L3(W3)

+……+Ln(Wn) =LiWi

Where Li and Wi are the probabilities and weights of the risk resource for the activities in a work package, respectively. Li can have values between 0 and 1, and Wi has a value of 1.

CIF- Composite Impact Factor

The effect that a risk will have on the time and expense of a work activity can be used to describe the impact of a risk. This time and financial impact can be viewed as the risk time and cost of the work package activity. Risk impact can be described quantitatively as a numerical value between 0 and 1, where 0 is 1 “no impact” and 1 is “most serious impact” as well as qualitatively as high, medium, or low rating.

Composite Impact Factor (CIF) = I1(W1) +I2(w2) + I3(W4) +….+ In(Wn) = Σ Ii(wi)

Where, Ii and Wi are the impacts and weightages respectively of the i^{th} risk source of the activities of a work packages. The values of Ii ranges from 0 to 1 and Σ Wi =1.

Risk Impact and Risk Likelihood can be used to represent the risk consequence or severity. As a result, the numerical value will fall between 0 to 1. In terms of a qualitative evaluation, this severity can also be stated as “no severity” for a value of 0 and 1v extremely high severity for a value of 1. Risk severity (RS)= Li * Ii where, is Li Composite Likelihood Factor (CLF) and Ii is Composite Impact Factor (CIF).

The scope of our project is only to calculate the risk severity value using the composite Likelihood Factor and Composite Impact Factor CLF and CIF values are used from PWD norms, The full form of PWD is the Public Works Department, PWD is an Indian government agency responsible for building and maintaining public services, such as public government construction, highways, bridges, public transportation, drinking water sources, etc. Hence the risk severity is derived as the product of CLF and CIF and we will classify the severity values based on the risk severity table as very Low, Low, Medium, High, and Very High.

Models and discussion

ALTMAN Z-SCORE

The Altman Z-Score is computed as follows:

Z= 1.2*X1 + 1.4*X2 + 3.3*X3 + 0.6*X4 + 1*X5

TABLE SHOWING CALCULATION OF Z-SCORE

YEAR	CALCULATION	FINANCIAL DISTRESS
2023	Z=1.2*2.56 + 1.4*0.37 + 3.3*(-0.006) + 0.6*1.27 + 1*0.0019	4.3341
2022	Z=1.2*1.15 + 1.4*1.31 + 3.3*(-0.1216) + 0.6*0.98 +1*0.001	3.4021
2021	Z=1.2*1.38 + 1.4*0.79 +3.3*(-0.0805) + 0.6*0.39 + 1*0.2341	2.9645
2020	Z=1.2*1.76 + 1.4*0.56 + 3.3*(-0.0335) + 0.6*0.19 +1*0.2821	3.1815
2019	Z=1.2*1.82 + 1.4*0.5 + 3.3*0.0112 + 0.6*0.63 + 1*0.2919	3.5909

*Value of ratios are ascertained from SEPC Limited.

INTERPRETATION:

The Z-Score calculations indicate varying levels of financial distress for the specified years. In 2023, the Z-Score of 4.3341 suggests a low distress level, indicating a stable financial position. Conversely, for the years 2022 through 2019, with Z-Scores ranging from 2.9645 to 3.5909, the firm finds itself in a gray or ambiguous area, implying a degree of uncertainty regarding its financial health. These scores indicate a potential need for closer examination of the firm's financial performance and risk factors to determine its true standing.

GROVER’S G-SCORE MODEL

The Grover’s G-Score is computed as follows:

G-Score = 1.650 (X1) + 3.404 (X2) – 0.016 * ROA + 0.057

TABLE SHOWING CALCULATION OF G-SCORE

YEAR	G-SCORE CALCULATION	FINANCIAL DISTRESS
2023	G = (1.650*0.3708) + (3.404*(-0.0152)) - (0.016*(-0.006)) + 0.057	0.6172
2022	G = (1.650*0.0806) + (3.404*(-0.0063)) - (0.016*(-0.1216)) + 0.057	0.1705
2021	G = (1.650*0.1621) + (3.404*(-0.0136)) - (0.016*(-0.0805)) + 0.057	0.2795
2020	G = (1.650*0.2645) + (3.404*0.0164) - (0.016*(-0.0335)) + 0.057	0.5498
2019	G = (1.650*0.2662) + (3.404*0.0240) - (0.016*0.0112) + 0.057	0.5777

*Value of ratios are ascertained from SEPC Limited.

INTERPRETATION:

The G-Score calculations for the specified years reveal the financial distress levels of the firm. In 2023, with a G-Score of 0.6172, the firm finds itself in a gray or ambiguous area, indicating some uncertainty about its financial health. Conversely, in 2022, the G-Score of 0.1705 falls below 0.5, suggesting a high level of distress, signifying potential financial instability or difficulty. For the years 2021 through 2019, with G-Scores ranging from 0.2795 to 0.5777, the firm remains in a gray or ambiguous area. These scores highlight fluctuations in the firm's financial condition over the specified period, emphasizing the importance of ongoing monitoring and analysis to mitigate risks and ensure stability.

FINANCIAL LEVERAGE

TABLE SHOWING CALCULATION OF FINANCIAL LEVERAGE

YEAR	TOTAL ASSET	TOTAL EQUITY	FIANCIAL LEVERAGE= TOTAL ASSET/ TOTAL EQUITY
2023	1861.16	1,321.53	1.4083
2022	2047.65	971.53	2.1077
2021	2271.47	971.53	2.3380
2020	2413.58	971.53	2.4843
2019	2537.34	971.53	2.6117

*Value for calculation are ascertained from SEPC Limited

INTERPRETATION:

The findings reveal a consistent increase in SEPC Limited's financial leverage ratio from 2019 to 2023. For instance, in 2019, the company had a leverage ratio of approximately 2.61, indicating that it borrowed Rs.2.61 for every rupee of its own funds. By 2023, this ratio declined to around 1.41, suggesting a reduced reliance on debt financing but still indicating a substantial borrowing.

OPERATING LEVERAGE

TABLE SHOWING CALCULATION OF OPERATING LEVERAGE

YEAR	FIXED COSTS	VARIABLE COSTS	OPERATING LEVERAGE= FIXED COSTS/ VARIABLE COSTS
2023	410.3	99.89	4.1075
2022	293.63	158.25	1.8555
2021	576.09	147.77	3.898
2020	554.51	154.4	3.5914
2019	629.21	153.35	4.1031

*Values for calculation are ascertained from SEPC Limited.

INTERPREATAION:

The findings reveal fluctuations in SEPC Limited's operating leverage ratios over the study period. Operating leverage ratios ranged from approximately 1.86 to 4.11, indicating varying degrees of reliance on fixed costs relative to variable costs. Higher ratios in 2019 and 2023 suggest a substantial proportion of fixed expenses, while lower ratios in 2022 indicate a comparatively reduced reliance on fixed costs but still underscore significant fixed cost structures.

COMBINED LEVERAGE

TABLE SHOWING CALCULATION OFCOMBINED LEVERAGE

YEAR	FINANCIAL LEVERAGE	OPERATING LEVERAGE	COMBINED LEVERAGE=FINANCIAL LEVERAGE+OPERATING LEVERAGE

2023	1.4083	4.1075	5.5159
2022	2.1077	1.8555	3.9631
2021	2.3380	3.8986	6.2366
2020	2.4843	3.5914	6.0757
2019	2.6117	4.1031	6.7148

*Values for calculation are ascertained from SEPC Limited

INTERPRETATION:

The combined leverage, calculated as the sum of financial leverage and operating leverage, has exhibited a consistently high trend over the years. For instance, in 2019, the combined leverage was 6.7148, indicating reliance on both debt financing and fixed operating costs to support operations. This trend continued to 2023, where the combined leverage reached 5.5159. The combined leverage has been consistently high over the years. This suggests that the company has been relying heavily on both debt financing (financial leverage) and fixed operating costs (operating leverage) to support its operations.

RISK SEVERITY ANALYSIS

TABLE SHOWING RISK SEVERITY ANALYSIS FOR BAGHMARA PROJECT

S. No	Description of project risk (activity)	CLF	CIF	(CLF) * (CIF) Quantitative risk (severity)	Qualitative risk
1	Survey	0.301	0.626	0.19	Very low
	Pipeline works				
2	(a) Procurement of pipes	0.367	0.912	0.33	Low
3	(b) Laying and jointing of pipes	0.127	0.456	0.06	Very low
4	(c) Testing and commissioning	0.156	0.498	0.08	Very low
	Elevated Service Reserviour				
5	(a) Civil works	0.298	0.551	0.16	Very low
6	(b) Mechanical works	0.197	0.551	0.11	Very low
7	Distribution Network, Raising Mains and other related works	0.195	0.623	0.12	Very low
8	Testing, Commissioning and Trail Run	0.265	0.817	0.22	Low

*CLF and CIF Values are furnished by PWD-Public Works Department

INTERPRETATION:

By analyzing the risk severity factor using CLF and CIF and the risk severity table, we can assess that the procurement of pipes and the process of testing, commissioning and trail run has low level of risk, which is in the range of 0.20 to 0.40, By which we can say that these activities have a small risk factor that is involved. The other activities are in the range of very low risk compared to all, then comes mechanical works, civil works, distribution network and survey. But the amount of risk is very less. Hence the company can focus on the other areas.

Therefore, we can see that the risk level for all the activities has the risk ranging from very low to low risk by which we can interpret that these activities will not cause any huge losses to the business as the severity ranges only from 0.00 to 0.40. Thus, the project is recommended for execution. It is advisable that the company undertakes these kinds of projects.

TABLE SHOWING RISK SEVERITY ANALYSIS FOR DHANBAND PROJECT

S.NO	Description of project risk (activity)	CLF	CIF	(CLF) * (CIF) Quantitative risk (severity)	Qualitative risk
1	Water treatment plant	0.298	0.551	0.16	Very low
2	Elevated Service Reservior.	0.298	0.551	0.16	Very low
3	Intake well with pump house	0.195	0.623	0.12	Very low
4	Mechanical and electrical work at intake well	0.197	0.623	0.12	Very low
5	Mechanical & electrical part at WTP	0.197	0.551	0.11	Very low
6	Raw and clear water rising main	0.195	0.623	0.12	Very low
7	Distribution main	0.195	0.623	0.12	Very low
8	Twin type Staff Quarter -1 unit	0.195	0.623	0.12	Very low
9	Compound wall (1080 M Long)	0.195	0.551	0.11	Very low
10	House connection for 29373 nos consumer	0.195	0.623	0.12	Very low
11	Miscleneous works	0.156	0.498	0.08	Low

*CLF and CIF Values are furnished by PWD-Public Works Department

INTERPREATION:

The quantitative analysis reveals that the majority of project risks exhibit very low severity, with the product of Consequence Likelihood Factor (CLF) and Consequence Impact Factor (CIF) generally ranging between 0.08 and 0.16. Specifically, risks 1 to 10 show combined risk scores ranging from 0.08 to 0.16, indicating minimal risk. However, Misc works stands out with a slightly higher severity, scoring 0.08, suggesting a comparatively elevated level of risk. Overall, the data underscores a predominantly low-risk environment for the project, with attention warranted for mitigating the specific concerns associated with Misc risk to ensure project success.

RESULTS AND DISCUSSION

- The Z-Scores for different years signal varying degrees of financial distress. In 2023, the score of 4.3341 points to a stable financial position, while scores ranging from 2.9645 to 3.5909 in the years 2019 to 2022 suggest a more uncertain financial health. These earlier scores indicate the importance of scrutinizing the firm's financial performance and risk factors to accurately gauge its standing.
- The G-Scores computed for the specified years provide insights into the firm's financial distress levels. In 2023, with a G-Score of 0.6172, the firm's financial health appears uncertain. Conversely, in 2022, the G-Score drops below 0.5 to 0.1705, indicating heightened distress. From 2019 to 2021, G-Scores ranging from 0.2795 to 0.5777 suggest persistent ambiguity. These findings underscore fluctuations in the firm's financial status.
- SEPC Limited's financial leverage ratio has steadily risen from 2019 to 2023. In 2019, the ratio was about 2.61, meaning the company borrowed Rs.2.61 for each rupee of its own funds. By 2023, this ratio dropped to roughly 1.41, showing less dependence on debt financing but still borrowing majorly.
- The findings indicate fluctuations in SEPC Limited's operating leverage ratios over time. These ratios ranged from about 1.86 to 4.11, reflecting varying reliance on fixed costs versus variable costs. Higher ratios in 2019 and 2023 suggest a significant proportion of fixed expenses, while lower ratios in 2022 show a reduced dependency on fixed costs, although still highlighting considerable fixed cost structures.
- Over the years, the combined leverage, has remained consistently high. In 2019, it was 6.7148, indicating reliance on both debt financing and fixed operating costs. This trend continued in 2023, reaching 5.5159, suggesting heavy dependence on both for operations.

- The analysis using CLF and CIF methods suggests that procurement of pipes and testing processes have a low risk level (0.20 to 0.40). Other activities like mechanical and civil works, distribution, and survey entail very low to low risk. Overall, the project is recommended for execution, with minimal potential losses (severity scores 0.00 to 0.40), allowing the company to focus on other areas.
- The analysis highlights a generally low-risk environment for the project, with most risks exhibiting minimal severity, indicated by combined risk scores of 0.08 to 0.16. Notably, Misc works pose a slightly higher risk at 0.08, warranting attention for effective mitigation strategies to ensure project success.

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