

FINANCIAL STRUCTURE AND PROFITABILITY CHALLENGE – AN EMPIRICAL STUDY IN TEXTILE SECTOR.

CMA.C.DHANAPAL* & DR.R.VEERAMANI†

The textile sector employs over 20 million people and is the second largest employment generator. The Indian Textile Industry is the second largest in the world, next to Chinese and is one of the largest foreign exchange earners for the country. It accounts for 14% of the total Industrial production and contributes nearly 30% of the total exports. Textile is a key contributor to GDP to the order of 4%. Most businesses are affected by the slow economy due to lesser sales, costs up, price competition from devaluation of currencies and tight credit. Only smart companies can able to manage the challenges. As finance is the life blood-formulation of good financial structure would provide a solution for many industries facing financial problems. Finding the ways and means to improve the profitability by the use of financial structure would be a boon to textile industries. The objective of the study is to find the relationship between the financial structure and profitability. First step is to use the ratio analysis to measure the impact of financial structure on profit. The financial structure and the achieved profitability of SME and LE are also compared. In the second step Altman's Z score has been used to find the possibility of becoming bankruptcy due to business failure. Suitable hypothesis have been framed to test the influence of financial structure on the growth of the company. This paper also emphasis the need for Business Intelligence- a sophisticated reporting and analytics tool to report about the business performance so as to monitor the financial structure. The detailed literature review shows various factors responsible for higher profitability. This paper also suggests new financial structure and accessibility of finance for meeting the financial problems.

I- Introduction :

Textile accounts for 14% of the total Industrial production and contributes nearly 30% of the total exports. India has strong raw material base-Cotton, Man-made fiber. Jute, Silk and has 21% of world spinning capacity and 33% of worlds weaving capacity.

* Selection Grade Lecturer in commerce, Salem Sowdeswari College, Salem., Tamil Nadu State India (dhanapal.c@gmail.com)

† Reader-in-Commerce, Government Arts College, Salem. Tamil Nadu State ,India

Textile is a key contributor to GDP to the order of 4%. This textile sector has been suffering a lot due to the financial crisis. Though there are so many problems, a successful mill should always try to improve its productivity and profitability by concentrating on the key influencing factors. Most businesses are affected by the slow economy due to lesser sales, costs up, price competition from devaluation of currencies and tight credit. Only smart companies can able to manage the challenges. One of the problems of textile sector –finance has been taken for study for making improvement in its profitability. As finance is the life blood-formulation of good financial structure would provide a solution for many industries facing financial problems. This paper brings out the relationship between various variables affecting the financial structure and profitability.

II- Review of Literature :

The various studies related to the financial structure and profitability are given below:

Peter MacKay, Southern Methodist University, Financial studies (2003) in his article "Real Flexibility and Financial Structure: An Empirical Analysis" stated that the financial leverage is negatively related to production flexibility but positively related to investment flexibility.

Abor, Joshua, in his article "The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana" (2005). Regression analysis is used in the estimation of functions relating the return on equity (ROE) with measures of capital structure. The results reveal that there has been a positive relationship between the ratio of short term debt to total assets and ROE. However, a negative relationship between the ratio of long-term debt to total assets and ROE was found. With regard to the relationship between total debt and return rates, the results show a significantly positive association between the ratio of total debt to total assets and return on equity. The research suggests that profitable firms depend more on debt as their main financing option. In the Ghanaian case, a high proportion (85 percent) of the debt is represented in short-term debt.

Harlan D. Platt (Northern-university Boston), Marjorie B. Platt (Northern university Boston) and Guangli Chen (Battery march

Financial Management Inc., Boston) (2008), in their article "Sustainable growth rate of firms in financial distress" have developed a new formula that describes how the growth firm with no debt capacity can endure. Sustainable growth rate defines the rate at which a company's sales and assets can grow if the company sells no new equity and wishes to maintain its capital structure. The above study shows the need for improving the profitability by tuning the financial structure.

III- Objectives of Study :

The following may be taken as the objectives of the study.

1. To find the relationship between profitability and financial structure.
2. To find the significant difference of profitability and financial structure between large and medium enterprise.
3. To find the relationship between SGR (Sustainable Growth Rate) and profitability.
4. To find the powerful dominating ratio displaying profitability.
5. To find the powerful dominating ratio displaying financial structure ratio.
6. To find the relationship between Z score and profitability.

IV- Key Research Questions:

The following research questions have been framed for the analysis :

- 1) Is there any relationship between profitability and financial structure ?
- 2) Is there any measure to find Sustainable Growth Rate of the business?
- 3) Are there any significant differences between the Medium and Large enterprise in relation to profitability per financial structure?
- 4) Is there any powerful ratio among profitability ratio and also among financial structure ratio?
- 5) Is there any relationship between Z score and profitability?

Based on the research questions suitable hypotheses have been framed and tested.

V- Methodology:

Comprehensive research work was done to achieve the objectives of the study. Ten year data - 1998-99 to 2007-08 of Sambandam Spinning Mills, Kandagiri spinning, Mallur Siddeswara Spinning Mills and Salem Textiles Limited Salem has been employed for this study. The first two mills are large enterprise and the last two mills are medium enterprise.

In the first step various ratios has been calculated to measure the impact of financial structure on profitability. The financial structure and the achieved profitability of medium and large enterprises are compared to find the significant differences between them.

In the second step using the factor reduction analysis the variability percentage -Eigenvalues is arrived .They are used as weights to condense the five ratios into one single ratio. In this way the weighted profitability and weighted financial structure has been arrived for each company. Taking this as the base profit per financial structure of each company is also calculated. Then ANOVA is used to find the significant difference of profit per financial structure between the enterprises.

In the third step Sustained Growth Rate (SGR) for each company is calculated. Its relationship with profitability has been studied by using regression analysis. Principal Component Analysis is employed to find the most powerful ratios among the profitability as well as among financial structure ratios.

In the last step Altman's Z score has been used to find the possibility of becoming bankruptcy/sickness due to business failure. Its relationship with profitability has also been studied by using regression analysis.

Statistical tools such as Regressions, Analysis of variance technique has been employed to the test the hypotheses.

VI- Measurement of Profitability and Financial Structure:

The following ratios are used to measure the profitability and financial structure.

Table - 1 :
Profitability and Financial Structure Ratios

Profitability ratios				
1. Return on Investment ratio	2. Return on Total Assets ratio.	3. Return on shareholder's Fund ratio.	4. EPS	5. Operating Profit ratio
Financial Structure ratios				
1 Financial Leverage	2. Assets Leverage	3. Debt-Equity Ratio	4. Working Capital Policy Index :	5. Cash Flow Ability To Service

The above ratios are calculated for the four companies and its relationship between them is tested.

Hypothesis 1: There is no significant relationship between profitability and financial structure .

The test shows that there has been a strong relationship between profitability and financial structure. Hence the Null hypothesis is REJECTED.

Table -02
Profitability And Financial Structure

COM-PANY	Correlation co-efficient	R ² -	F - ratio	Regression equation	P- Value	Remarks
SSML-LE	-0.8007	64.12 %	14.29	Profitability = 0.477531 - 0.0658774*Fin.str	0.0054	Statically significant Hypothesis Rejected
KSML-LE	-0.9079	82.43 %	37.52	Profitability = 0.420354 - 0.094048* Fin st	0.0003	Statically significant Hypothesis Rejected
MSSM-ME	-0.7693	59.18 %	11.60	Profitability = 0.100501 - 0.00689118*Fin.str	0.0093	Statically significant Hypothesis Rejected
STL-ME	-0.9250	85.65 %	47.77	Profitability = 0.158985 - 0.0383126* Fin.str	0.0001	Statically significant Hypothesis Rejected

Comments: The result shows that there has been a strong relationship between profitability and financial structure irrespective of the size of the enterprise.

Hypothesis 2: There is no significant difference in profitability between large enterprise and medium enterprise.

Hypothesis 3: There is no significant difference in financial structure between large enterprise and medium enterprise.

The following are the details related to Profitability and Financial structure:

Table -03
Summary Statistics for profitability

<i>Method</i>	<i>Average</i>	<i>Standard deviation</i>	<i>Coeff. of variation</i>
LARGE-ENTER	0.213239	0.103153	48.3742%
MEDIUM-ENTER	0.0262832	0.128645	-489.458%

Large enterprise's profitability is almost consistent as evidenced by the Co-efficient of variation.

Table 04
Summary Statistics for financial structure

<i>Enterprise</i>	<i>Average</i>	<i>Standard deviation</i>	<i>Coeff. of variation</i>
LARGE-ENTER	2.954	0.906917	30.7013%
MEDIUM-ENTER	3.354	2.19167	65.3449%

Large enterprise's financial Structure is almost consistent as evidenced by the Co-efficient of variation.

Table -05
Summary statistics for profit per financial structure

<i>SIZE</i>	<i>Average</i>	<i>Standard deviation</i>	<i>Coeff. of variation</i>
LARGE-ENTER	0.0854761	0.0586031	68.5607%
MEDIUM-ENTER	-0.0361093	0.100389	-278.013%

Large enterprise's profit per financial Structure is almost consistent as evidenced by the Co-efficient of variation

Table -06
ANOVA-Profitability

<i>Source</i>	<i>Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F-Ratio</i>	<i>P-Value</i>
Between groups	0.573709	1	0.573709	42.20	0.0000
Within groups	0.516611	38	0.013595		
Total (Corr.)	1.09032	39			

Since the P-value of the F-test is less than 0.05, there is a statistically significant difference between the mean profits from one level of method to another at the 95.0% confidence level. That is there is a significant difference in profitability between large and medium enterprises. Hence, the null hypothesis is REJECTED.

Table -07
ANOVA -Financial Structure by Enterprise

<i>Source</i>	<i>Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F-Ratio</i>	<i>P-Value</i>
Between groups	1.6	1	1.6	0.57	0.4554
Within groups	106.892	38	2.81295		
Total (Corr.)	108.492	39			

Since the P-value of the F-test is greater than or equal to 0.05, there is not a statistically significant difference between the mean financial structures from one level of Enterprise to another at the 95.0% confidence level. Hence, the null hypothesis is ACCEPTED.

Hypothesis 4: There is no significant difference in weighted profitability per financial structure between large enterprise and medium enterprise.

Table -08

ANOVA -Weighted Profitability per Financial Structure by Size

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0.14783	1	0.14783	21.88	0.0000
Within groups	0.256732	38	0.00675609		
Total (Corr.)	0.404562	39			

Since the P-value of the F-test is less than 0.05, there is a statistically significant difference between the mean profits per financial structure from one level of SIZE to another at the 95.0% confidence level. Hence, the null hypothesis is REJECTED.

Multiple Range Tests for profitability-Financial Structure and weighted Profit per Financial Structure: To determine which means are significantly different from which others, Multiple Range Tests is used. The following table consolidates and the shows the significances:

Table -09
Multiple Range Test Results

Factor	Contrast	Sig.	Difference	+/- Limits
Profitability	LARGE- ENTER - MEDIUM- ENTERPRISE	statistically significant difference	0.239522	0.0746424
Financial Structure	LARGE- ENTER - MEDIUM- ENTERPRISE	No significant difference	0.4988	1.07369
Profit per Financial structure	LARGE- ENTER - MEDIUM- ENTERPRISE	statistically significant difference	0.121585	0.0526191

Comments: In case of profitability and profit per financial structure the means of Large and Medium enterprises are significantly

different. However, the means of financial structure between larger and medium enterprises are shows no significant difference at all.

VII- CAGR of All Companies:

The following table shows compound Annualised Growth Rate of the companies:

Table -10
CAGR- All companies

COMPANY	Weighted Profitability	Weighted Financial Structure	Weighted Profit Per Financial Structure	Remarks
SSML-LE	4.91%	-5.46%	10.96%	Positive Growth - profitability and profit per Financial structure. Negative Growth- Financial structure.
KSML_LE	11.79%	-6.68%	19.79%	Positive Growth - profitability and profit per Financial structure. Negative Growth- Financial structure.
MSSM-ME	9.10%	-3.23%	12.73%	Positive Growth - profitability and profit per Financial structure. Negative Growth- Financial structure.
STL-ME	-30.89%	3.46%	-33.20%	Negative Growth - profitability and profit per Financial structure. Positive Growth- Financial structure.

All large enterprises show positive growth in their profitability though there has been change in financial structure. The MSSM-Medium enterprise also shows the same behaviour. However, the STL -has only negative growth in its profitability and weighted

profit per financial structure. However, it shows Positive Growth-Financial structure as they have injected more debts.

5. SGR AND PROFITABILITY : SGR is a powerful tool for checking the consistency between sales growth goals and operational efficiency and financial objectives. It is formulated by Robert C Higgins. The following formula is used to find SGR:

$$\text{SGR} = \frac{[b(\text{NP}/\text{S}) \cdot (1 + \text{D}/\text{EQ})]}{[(\text{A}/\text{S}) - (b(\text{NP}/\text{S}) \cdot (1 + \text{D}/\text{EQ}))]}$$

Where NP/S=NET PROFIT MARGIN(NP/Sales);D/E =D/E .Debt-Equity; A/S= T.A/SALES; b=Retention rate of earnings (1-b) is the dividend pay out ratio)

Hypothesis 5: There is no significant relationship between SGR and Profitability.

The following table shows the results of the regression analysis.

Table -11 :SGR and Profitability

COM PANY	Correlation co-efficient	R ²	F - ratio	Regression equation	P- Value	Remarks
SSML -LE	0.9552	91.23%	83.23	SGR = -0.210652 + 1.32531*WTPRO SSM	0.0000	Statically significant -Hypothesis Rejected.
KSML _LE	0.8527	72.71%	21.31	SGR KSM = -0.0542543 + 0.798608*WTPRO KSM	0.0017	Statically significant -Hypothesis Rejected.
MSS M-ME	0.1636	2.67%	0.22	SGR MSSM = -0.117159 + 2.70386*WTPRO MSM	0.6515	Not significant _Hypothesis Accepted
STL- ME	0.5297	28.05%	3.12	SGR STL = 0.72141 + 6.75705*WTPRO STL	0.1153	Not significant _Hypothesis Accepted

Comments: The result shows that there has been strong relationship between profitability and SGR in case of Large enterprises .However there is no significant relationship in case of medium enterprises.

IX- Powerful–Profitability Ratio and Financial Structure Ratio:

To find the most powerful ratio showing the profitability and financial structure of a firm Principal Component Analysis (PCA) is employed. The following table shows the result of the analysis:-

Table -12
PCA-Profitability and Financial Structure ratio

No	PCA	SSM		KSM		MSSM		STL	
	Finstructure	Eigen values	% variance	Eigen values	% variance	Eigen values	% variance	Eigen values	% variance
1	FL	6.5155	89.9670	5.6460	79.3700	21.6328	97.1240	29.5348	80.6600
2	AL	0.6360	8.7860	1.3027	18.3140	0.4677	2.1000	6.4460	17.6040
3	CPLMIX	0.8966	1.2381	0.1632	2.2940	0.1671	0.7502	0.6243	1.7049
4	WCPI	0.0007	0.0094	0.0013	0.0187	0.0054	0.0241	0.0110	0.0301
5	CFL	0.0002	0.0026	0.0002	0.0030	0.0032	0.0001	0.0001	0.0003
	CHIOCE	1,2,3		1,2		1		1,2	
	Total	8.0490	100.00	7.1134	99.999	22.2762	99.998	36.6162	99.999
	Jolliffe cut off	0.0139		0.9959		3.1183		5.1263	
	PROFITABILITY								
1	ROI=EBIT/A	153.3270	99.9990	71.3264	99.9990	35495.4000	100.000	63.2800	88.4090
2	RTA=PAT/A	0.0012	0.0008	0.0007	0.0010	0.0036	0.0000	0.4200	10.7890
3	RTSF=PAT/S.F	0.0004	0.0003	0.0001	0.0001	0.0001	0.0000	0.0285	0.7327
4	EPS	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0020	0.0510
5	OPERPROFIT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0174
	CHIOCE	1		1		1		1	
	Total	153.3287	100.000	71.3273	100.000	35495.4036	100.000	63.7306	99.9991
	Jolliffe cut off	21.4660		9.9858		3.1183		0.5455	

Comments: In relation to financial structure-Financial leverage ratio and Asset leverage ratio plays powerful role as both of them explains more than 98% variations irrespective of its large or medium enterprise nature. However incase of medium enterprise MSSM financial leverage plays vital role. In relation to Profitability-Return on Investment ratio is able to explain more than 88% of the variations. The above selection is based on the Jolliffe cut off applicable for each. The study shows that Financial Leverage ratio and Asset leverage are the main tuners to have an impact on the profitability. The profitability impact can be seen from the ROI ratio.

X- Z Score And Profitability - Prediction of Business Failure:

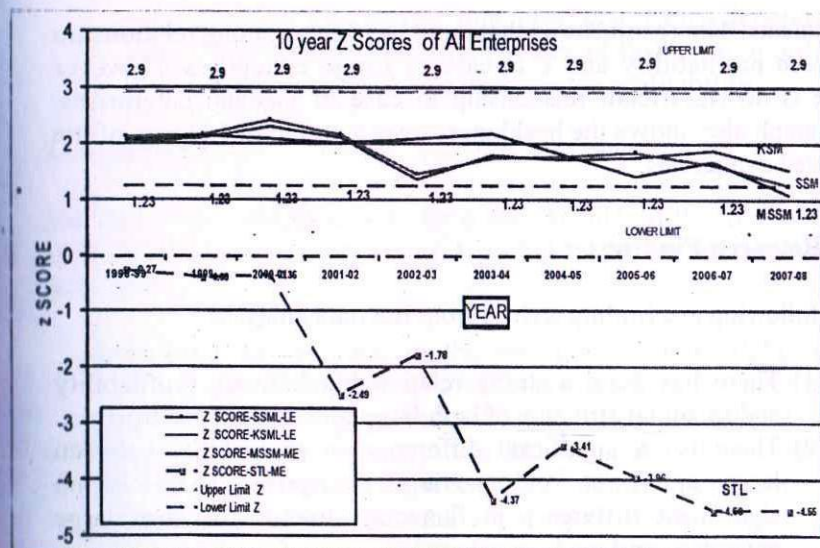
Altman's Z score predicts the business failure /financial distress .He has used five ratios to predict the sickness of a concern. He has used five ratios which captures the different aspects of profitability and risk. The reliability rate of the model is 95%.He has given upper and lower limits for manufacturing companies. If a concern Z score is below the lower limit such concern is predicted to attain sickness. The following table shows the details:

Table -13
Z score -Prediction

Year	1998-99	1999	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Z SCORE-SSML	2.13	2.17	2.42	2.16	1.46	1.74	1.77	1.85	1.63	1.25
Z SCORE-KSML	2.01	2.10	2.30	2.10	1.37	1.79	1.72	1.75	1.89	1.53
Z SCORE-MSSM	2.07	2.14	2.09	2.01	2.09	2.18	1.82	1.42	1.68	1.09
Z SCORE-STL	-0.27	-0.39	-0.35	-2.49	-1.78	-4.37	-3.41	-3.96	-4.56	-4.55
Upper Limit Z	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
Lower Limit Z	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23

The following are the indicators of the financial healthiness.

- 1) SCORE of 2.90 or above indicates that bankruptcy is not likely. A score of 1.23 or below is a strong indicator that bankruptcy is likely. Higher score is desirable for a good financial healthiness.
- 2) The financial healthiness based on the scores towards business failure is not likely in case of SSML and KSML-Large Enterprise and MSSM-Medium enterprise .However STL - Medium enterprises it is below the lower score and has already reached the sickness.



Hypothesis 6 : There is no significant relationship between Z score and profitability: The following table shows the Z scores:

Table -13
Z score and profitability

COM-PANY	Correlation co-efficient	R ²	F - ratio	Regression equation	P- Value	Remarks
SSML-LE	0.958654	91.90%	90.79	SGR SSM = -0.220329 + 1.35498* WTPRO SSM	0.0000	Statically significant - Hypothesis Rejected.
KSML-LE	0.840829	70.70%	19.30	SGR KSM = -0.0517466 + 0.779779* WTPRO KSM	0.0023	Statically significant - Hypothesis Rejected.
MSSM-ME	0.184915	3.42%	0.28	SGR MSSM = -0.154974 + 3.2109* WTPRO MSM	0.6090	Not significant - Hypothesis Accepted.
STL-ME	0.568498	32.32%	3.82	SGR STL = -2.37096 + 34.2721* WTPROTSTL	0.0864	Not significant - Hypothesis Accepted.

Comments: The result shows that there has been a strong relationship between profitability and Z in case of Large enterprises .However there is no significant relationship in case of medium enterprises. The graph also shows the healthiness over a period of 10 years of the selected companies.

XI- Research Findings :

The following are finding arrived from the data analysis:

- 1) There has been a strong relationship between profitability and financial structure of both large and medium enterprises.
- 2) There is a significant difference in profitability between large enterprise and medium enterprise. There is no significant difference in financial structure between large enterprise and medium enterprise.
- 3) There is a significant difference in profitability per financial structure between large enterprise and medium enterprise. The CAGR shows that there has been a positive growth in profitability between large enterprise and one medium enterprise- MSSM.
- 4) There is a significant relationship between SGR and Profitability in case of Large Enterprises. However there is no such significant relationship incase of medium enterprise.
- 5) The study shows that Financial Leverage ratio and Asset leverage ratio are the main tuners to make an impact on the profitability. The profitability impact can be seen from the ROI ratio.
- 6) There is a significant relationship between Z score and profitability incase of large enterprises. However there is no such significant relationship in case of medium enterprise. The financial healthiness based on the scores towards business failure is not likely in case of SSML and KSML- Large Enterprise and MSSM-Medium enterprise .However STL -Medium enterprise's score is below the lower score and has already reached the sickness.

- 7) The research also shows that profitable firms depends on more debt funds as their main source of financing in order to have leverage effect and to improve the profitability.

XII- Suggestions :

The following strategies may help the Textile Mills to meet the global challenges to grow up as a global leader by improving the profitability.

1. **Interest Charges:** Due to the injection of more debt funds heavy interest charges occurs. Mills are unable to use debt funds to magnify the profit as they are very often the subject to so many risks. From the study it is found out that almost 40% of the EBIT goes towards interest charges. Borrowing at lower rate of interest and timely use of debt capital shall reduce the interest burden. To avoid heavy interest use matching principle in the mixing of Short term and long term funds. Longterm funds in the form of issue of bonds for specific period and short term funds like commercial papers may be planned in addition to the other sources of finding funds so as to get optimal capital-mix.
2. **TUF loan:** Government has been giving Technology Up gradation Fund to modernize the plant at lower rate of interest. This is a boon to the textile sector since it would increase the productivity as well as the profitability.
3. **Business Intelligence:** It is a process through which the performance of the organization is monitored with KPI's (Key Performance Indicators) and reported for immediate action and follow up. It is a "Measure- Monitor- Manage- Analyze-Plan system. Business Dash boards provide multiple scorecards with visual indicators with traffic signals- red, green and yellow. It also provides drill down information with multiple dimensions to take immediate steps. It also displays Compare Charts, Trend Charts for knowing the performance and its deviations. Alerts and work flow corrections are also indicated by that business Intelligent Software. Close watch over the financial leverage, Asset leverage, Cash flow management and working capital shall make a concern to reduce the interest burden and at the

same time enjoy the benefit of zooming profit by taking timely actions with the help of the business Intelligence software.

4. **Vendor management:** The cotton contains **contaminations**. They have to be reduced to increase the yarn realization. Using the **SIXSIGMA technique** the contaminations in the cotton can be evaluated for acquiring good Quality yarn. Vendors may be educated to supply good quality cotton to improve the yarn yield. This would increase the profitability.
5. **Unused capacity management:** The actual situation would show the unused capacity in a particular period may be managed by doing job works so as to recover the cost and increase profitability.
6. **Clusters and Global Brand :** Mega Units having about 10 lac Spindles each and 50,000 looms or both should have to be formed by consolidating smaller and medium sized units to have cost and marketing advantage. Indian exporters and garment manufacturers should come together privately or through State sponsored agencies to do **joint Brand marketing** to capture the world market to increase their profitability.

XIII- Conclusion:

The improvement in profitability depends on the improvement in productivity and operational performance. A concern's SGR depends on the consistency in sales growth, operational efficiency and financial objectives. Z score predicts the chances of becoming sick. Therefore a concern in order to have a SGR and also to avoid business failures should manage the financial structure properly and bring improvement in profitability. We may also say that the TUF, Integrated Textile Park and Cluster Proposals are all investment oriented and can provide good results for the Industry. To make Indian Textile Industry as a global leader the above mentioned strategies may be tuned and properly used. Introduction of Business Intelligence system and enterprise reporting and timely management of fund would increase the profitability.

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