E-CONTENT PREPARED BY

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E-Content prepared for students of

B.Com. Honours and Honours and Programme (Semester-3rd) in Accounting

Name of Course: Financial Management

Topic of the E-Content

Business Risk

Business Risk : A Study on Indian Manufacturing Companies (1994-95 to 2017-18)

The Backdrop

With the notable transformation in the scenario in the economic front since July 1991 along with other aspects of corporate affairs , the earning trends, cost behaviour pattern, capital productivity and liquidity policies in the Indian corporate sector have also changed significantly leading to noticeable changes in the pattern of business risk associated with the corporates. The Indian enterprises have been forced to reorient their strategies for managing their company-specific components of business risk in the post-liberalization era. Some of them have been able to adapt themselves to the new situation while others could not so reorient. In this backdrop, the present paper seeks to analyze the business risk in the selected Indian manufacturing companies during the period 1994-95 to 2017-18.

Research Gap

- A good number of studies on the analysis of business and financial risks have been carried out in India and abroad during the last few decades while a very few studies on the same issue relating to the Indian corporate sector has so far been made during the post-liberalization era.
- Most of the studies so far made in the global perspective are theoretical and associated with financial institutions only.
- Moreover, Gini's coefficient of concentration is presently recognized as a reliable measure of risk. A very few studies on the business risk analysis have been carried out in India using such a measure in the recent past.
- However, no significant study on the analysis of company specific components of business risk associated with the Indian manufacturing sector has so far been made during the post-liberalization era applying composite Business Risk Index (BRI).
- In order to bridge the gap, a suitable 'BRI' has been designed by applying Principal Component Analysis (PCA) and company specific components of business risk in the selected industries belonging to the manufacturing sector in India have been by using such index.

Objectives of the Study

- To measure the company-specific components of business risk, such as liquidity risk, cost structure risk and capital productivity risk of the selected industries using Gini's coefficient of concentration.
- To construct a business risk index incorporating the different company specific components of business risk.
- To ascertain the business risk index of each of the selected industries and to identify the Industry-wise pattern of business risk index.
- To analyze the degree of association between company risk and return of the selected industries.

Methodology of the study

- The study is based on 20 major industries in India which have been selected from the manufacturing sector following purposive sampling procedure.
- 100 companies have been selected by taking the top 5 companies (based on market capitalization as per BSE on 31st March, 2015) from each of the 20 selected industries.
- The study is based on secondary data and the data for the period 1994-95 to 2017-18 used in this study have been taken from Capitaline Corporate Database.
- As the liberalization process started in India during the financial year 1991-92, it is obvious that the effect of it could not be reflected immediately after its inception. Thus, in this study the financial year 1994-95 has been considered as the initial year of the post-liberalization period.
- While measuring company-specific components of business risk of each of the selected industries Gini's coefficient of concentration has been used.

Methodology of the study

- Three variables , such as LR, CSR and CPR has been considered while constructing the BRI.
- The principal components have been given by the linear combination of the variables:

$$PC_1 = a_{11}LR + a_{12}CSR + a_{13}CPR$$
$$PC_2 = a_{21}LR + a_{22}CSR + a_{23}CPR$$
$$PC_3 = a_{31}LR + a_{32}CSR + a_{33}CPR$$

- Here, PCs are the principal components and a values, which are called loadings are chosen in such a way so that the principal components are uncorrelated and the first principal component accounts for the greatest possible portion of the total variation in the data set.

Methodology of the study

$$BRI = \frac{\sum_{j=1}^{3} \lambda_j' P_j'}{\sum_{j=1}^{3} \lambda_j'}$$

where λ_j' $(j = 1, 2, \ldots, 3)$ denotes the j^{th} eigenvalue. Subscript j refers to the number of principal components that also coincides with the number of corresponding indicators. Noting that the values of λ_j' gradually fall as the suffix increases, P_j' $(j = 1, 2, \ldots, 3)$ denotes the j^{th} principal component.

Table 1 : Industry wise variation of different indictors of BRI

Company	Liquidity risk (LR)		Cost structure risk (CSR)		Capital productivity risk (CPR)	
	Value	Rank	Value	Rank	Value	Rank
Breweries and distilleries	0.127	18	0.011	19	0.196	5
Cement	0.185	10	0.037	10	0.202	2
Ceramics and granite	0.151	16	0.018	16	0.169	8
Chemicals	0.174	14	0.029	12	0.163	9
Computers-hardware	0.193	9	0.047	8	0.257	1
Consumer goods-electronic	0.168	15	0.02	15	0.112	17
Domestic appliances	0.21	5	0.069	4	0.183	6
Engineering-heavy	0.119	20	0.009	20	0.104	19
Fertiliser	0.201	8	0.055	7	0.197	4
Glass and glass products	0.124	19	0.017	17	0.101	20
Food processing	0.293	1	0.089	2	0.154	12
Infrastructure-general	0.204	6	0.056	6	0.129	15
Leather products	0.144	17	0.016	18	0.111	18
Mining and minerals	0.183	11	0.032	11	0.155	11
Paints and varnishes	0.261	2	0.097	1	0.199	3
Paper	0.18	12	0.027	13	0.161	10
Personal care	0.24	3	0.075	3	0.179	7
Pharmaceuticals	0.231	4	0.068	5	0.141	14
Steel-large	0.175	13	0.022	14	0.128	16
Tyres	0.203	7	0.046	9	0.146	13
Indian manufacturing industry average	0.189		0.042		0.159	

Above industry average

Below industry average

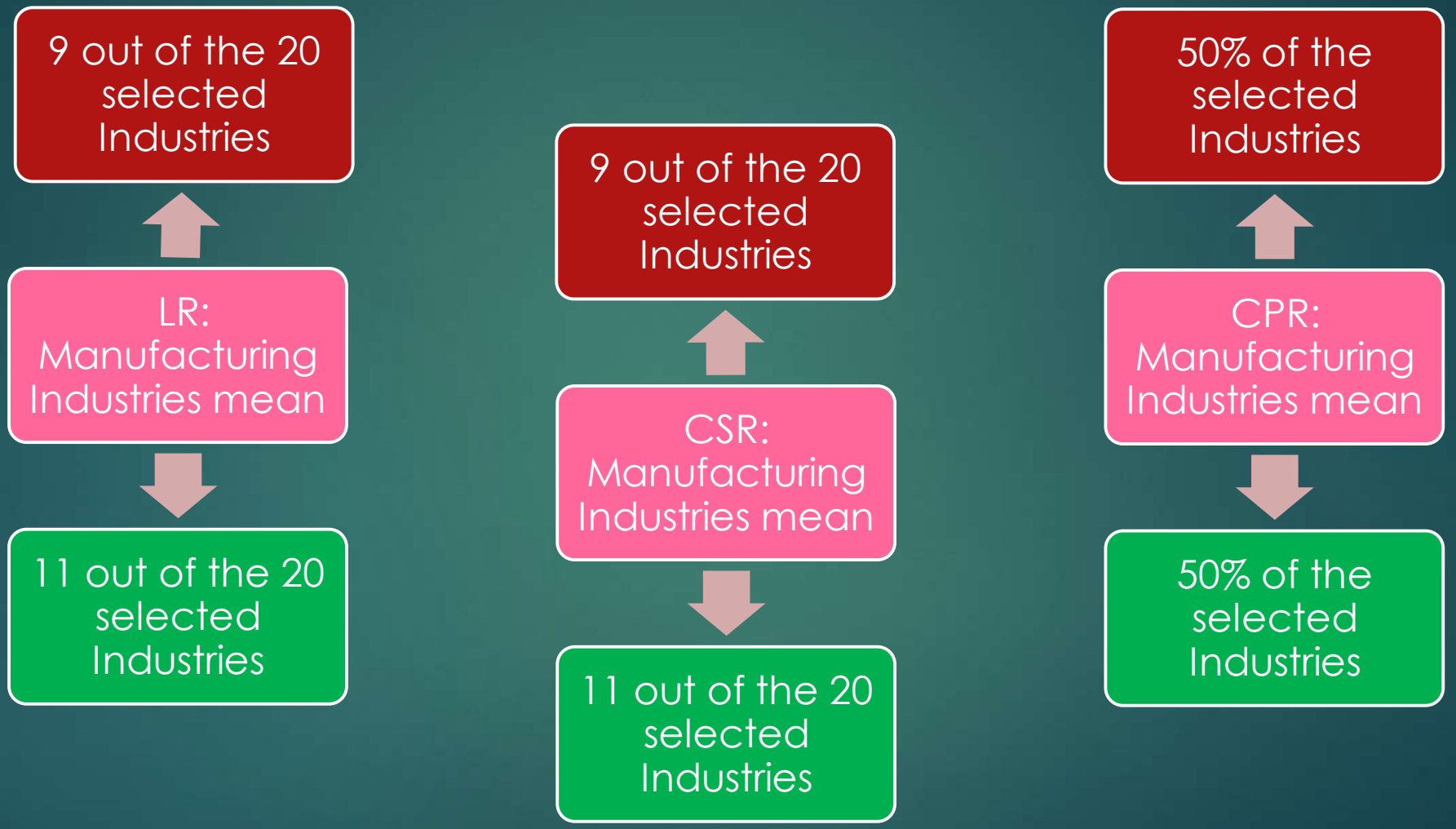

9 out of the 20 selected Industries
LR: Manufacturing Industries mean
11 out of the 20 selected Industries
9 out of the 20 selected Industries
CSR: Manufacturing Industries mean
11 out of the 20 selected Industries
50% of the selected Industries
CPR: Manufacturing Industries mean
50% of the selected Industries

Table 2 : Pair-wise correlation between the indicators of BRI

	Pearson correlation coefficient				Spearman rank correlation		
	LR	CSR	CPR		LR	CSR	CPR
LR	1.00			LR	1.00		
CSR	0.950298* (12.94967)	1.00		CSR	0.983459* (23.03537)	1.00	
CPR	0.339969 (1.533721)	0.388436*** (1.788429)	1.00	CPR	0.339969*** (1.935422)	0.458647** (2.189772)	1.00

Notes: Figure in the parenthesis indicates value of t-statistics.
*Indicate 1% level of significance. **Indicate 5% level of significance. ***Indicate 10% level of significance.

Table 3 : BRI across the selected industries in India

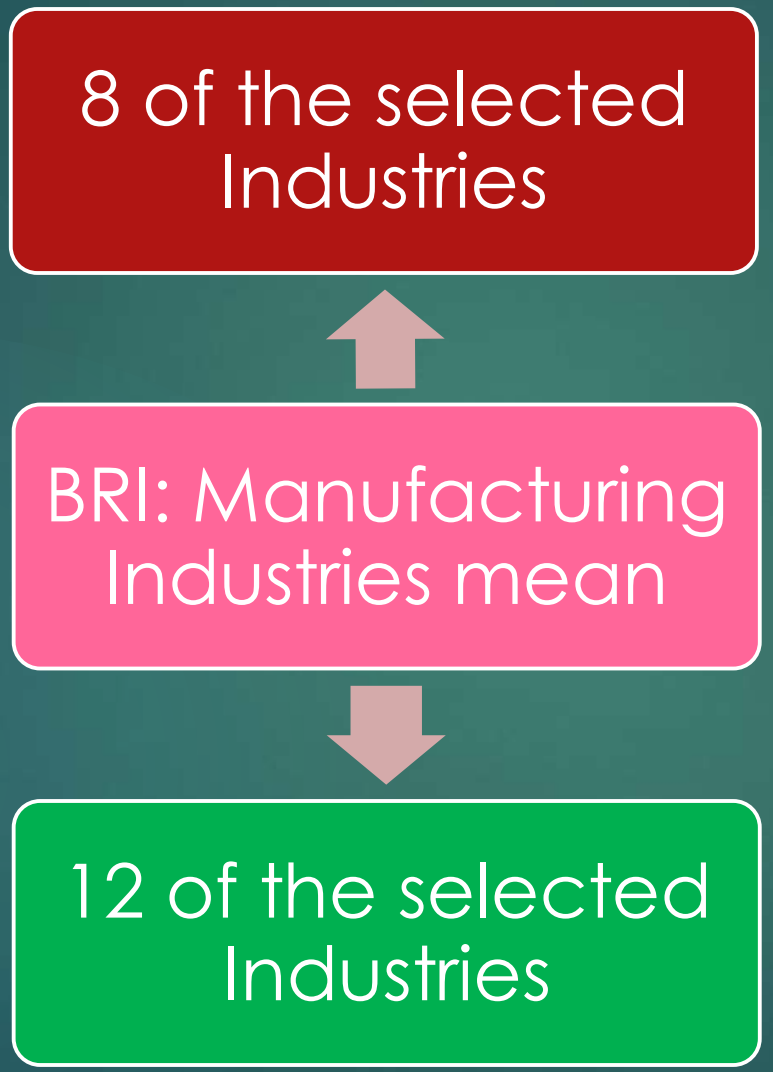
Serial no.	Industry	Business risk index	Rank	Status
1	Breweries and distilleries	0.349	14	B
2	Cement	0.618	8	A
3	Ceramics and granite	0.344	15	B
4	Chemicals	0.425	12	B
5	Computers-hardware	0.868	3	A
6	Consumer good-electronic	0.198	17	B
7	Domestic appliances	0.755	5	A
8	Engineering-heavy	0.010	20	B
9	Fertiliser	0.719	6	A
10	Glass and glass products	0.047	19	B

Cont....

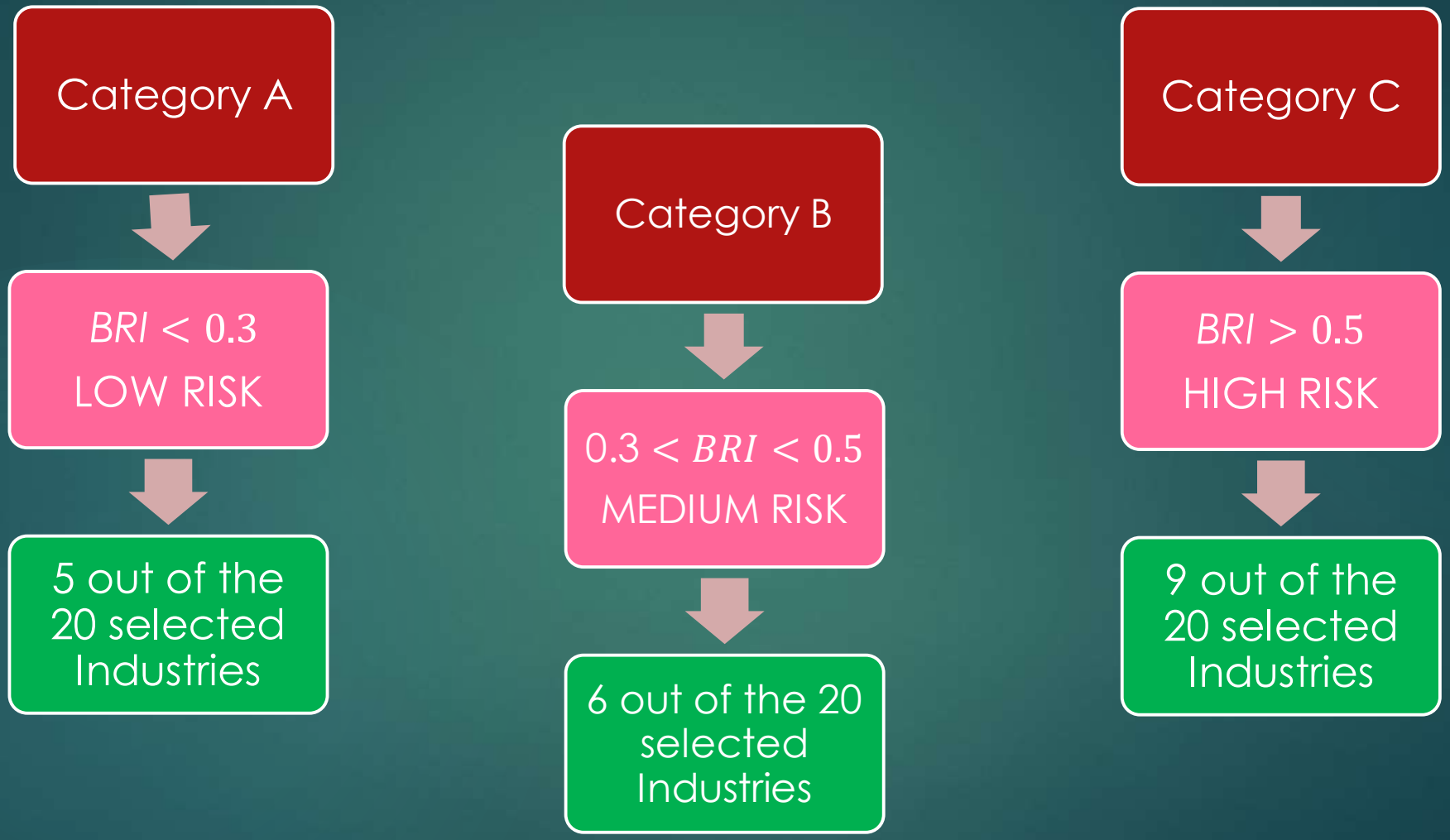
Table 3 (cont..) : BRI across the selected industries in India

Serial no.	Industry	Business risk index	Rank	Status
11	Food processing	0.936	2	A
12	Infrastructure-general	0.500	10	B
13	Leather products	0.122	18	B
14	Mining and minerals	0.432	11	B
15	Paints and varnishes	1.052	1	A
16	Paper	0.423	13	B
17	Personal care	0.837	4	A
18	Pharmaceuticals	0.656	7	A
19	Steel-large	0.278	16	B
20	Tyres	0.510	9	A
Indian manufacturing industry average		0.504		

Note: 'A' implies 'BRI above the industry average' and 'B' implies 'BRI below the industry average'.


8 of the selected Industries
BRI: Manufacturing Industries mean
12 of the selected Industries

Systematic Analysis of BRI values



Simple Regression Model

The simple regression model with robust standard error is represented in terms of the following equation:

$$(ROCE)_i = \alpha_i + \beta(BRI)_i + u_i$$

Here, ROCE denotes the return on capital employed, BRI denotes the business risk index and u_i denotes the random disturbance term which follows individually and identically distributed $(i.i.d)$ normal.

Table 4 : Simple regression analysis

Dependent variable: ROCE Method: least squares Included observations: 20				
Variable	Coefficient	Std. error	t-statistic	Prob
BRI	22.51491	6.463077	3.483621	0.0027
C	14.65122	3.759484	3.897135	0.0011
R-squared	0.402700	Mean dependent var		26.00000
Adjusted R-squared	0.369517	S.D. dependent var		10.56808
S.E. of regression	8.391366	Akaike info criterion		7.186923
Sum squared resid	1267.471	Schwarz criterion		7.286496
Log likelihood	–69.86923	Hannan-Quinn criter.		7.206361
F-statistic	12.13561	Durbin-Watson stat		2.073201
Prob (F-statistic)	0.002651			

Conclusions

- The study reveals a wide variation in the level of BRI across the selected industries in India during the study period. Based on the BRI values, eight industries were placed in the category of 'above the Indian manufacturing industry average' whereas the remaining 12 industries were able to find place in the category of 'below the Indian manufacturing industry average'. The highest volatility in operating profitability due to fluctuations in company specific factors was observed in paints and varnishes industry while engineering-heavy industry had enjoyed the least business risk during the study period.

Conclusions

- Another notable outcome of the study is that strong evidences of positive relationship between LR and CSR and between CSR and CPR were observed during the study period. However, the relationship between LR and CPR was positive in both the cases while it was found to be significant in one case only.
- A 'high-high' combination of business risk and return is theoretically desirable. The empirical results obtained from the analysis of simple regression of BRI on ROCE provides strong evidence of the significant positive influence on operating profitability implying that in the said cases high risk was well compensated by high risk premium, i.e., high return in the selected industries during the period under study.

Limitations of the Study:

- This study was carried out only on the basis of the data reported in published financial statements.
- Only the company-specific components of the business risk associated with the selected companies were analysed in this study. The analysis of economic-specific and industry-specific components of business risk was not made in this study.
- The issue relating to minimization of cost structure risk through forex management was not considered in this study


Thank You!